Centennial Coal

WESTERN COAL SERVICES PROJECT

ECONOMIC ASSESSMENT

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Centennial Coal
Environment Matters

Prepared by

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EXECUTIVE SUMMARY

- This Economic Impact Assessment supports the Environmental Assessment in relation to an application by Centennial Coal Pty Ltd (Centennial) under Section 3A of the NSW *Environmental Planning and Assessment Act 1979* for improvement works on the Western Coal Services (WCS) site, situated at Blackman's Flat NSW.
- Western Coal Services is a key component of Centennial's coal production and supply chain infrastructure in its Western Coalfield operations. As is described in the overarching Environmental Impact Statement the proposed Project involves construction of additional processing infrastructure adjacent to the existing product beneficiation infrastructure, which will increase total processing capability to a maximum of 7.0 million tonnes per annum (Mtpa). The Project also includes upgrades of distribution infrastructure (haul roads and conveyor systems), reject management capability and pollution control infrastructure. Economic impacts of these works are assessed in this report.
- The majority of Project works will take place on the existing WCS operational footprint. However, the construction of the haul road link from WCS to the existing Angus Place Colliery to Mount Piper Power Station haul road will require works in a previously unutilised area. At present there are two optional routes for the haul road link, which are being assessed.
- Capital cost for the Project including the preferred western haul road option is approximately $104 million[1] ($107.5 million for the eastern route option) over the period 2014 to 2015. This will have extended benefits through the local and broader economy during the construction phase.
- During the construction phase, an average workforce of 50 (with a peak of 120) persons will be directly engaged on the Project, with an estimated $2.5 million (NPV) in wages paid over the period.
- The incremental output facilitated by the Project is projected to generate approximately $200 million in royalties and $410 million in corporate taxes over the forecast period. Total benefit to the NSW and regional community is estimated at $374 million. Total assessed costs are $102 million, with a resultant Project NPV of $272 million.

[1] Further economic estimates discussed in the executive summary relate to this project based on the westerly haul road option.

- Centennial's operations, and the broader mining industry, are critical to the economic sustainability of the Lithgow LGA and the surrounding region. This role is extensively acknowledged in Lithgow City Council's Economic Development Strategy.
- An additional three (3) permanent employment positions will be created at Western Coal Services as a result of the operation of the new infrastructure. It is anticipated that these positions will be occupied by workers resident in the local region. As a result their households will contribute to the local economy through consumption and other economic activity.
- In addition to the new direct positions being created, Western Coal Services will play a crucial role in sustaining employment at the mines it services. At present, Angus Place Colliery has an approved workforce of 225 permanent employees and an additional 75 contractors. Springvale Mine has 270 employees. The sustainability of both of these operations is reliant on the new infrastructure provided by the Project as, in addition to continued supply to domestic customer, it will allow increases in vital export opportunities.
- There are a range of external costs and benefits associated with both the construction and operations phases of the Project. The monetised estimate of these externalised impacts provides only one measure of their outcomes, which must also be viewed in the context of material resulting from the community consultation process.
- There are some cumulative impacts of the Project related to the industrial context of the area surrounding the WCS site. However, the Project is also consistent with the industrial nature of the area and its present uses.
- The external impacts will relate chiefly to residents of the immediate Blackmans Flat area. However, there is some possibility of impacts, such as some visual and cumulative impacts on the neighbouring community of Lidsdale or persons transiting the immediate vicinity..
- Centennial Coal recognises that the dominant land use in the immediate vicinity of the Western Coal Services Upgrade Project is industrial. Despite this, the locality of Blackmans Flat is within the zone of affectation for a number of industrial sites operated by various individual companies including the proponent. Within the main residential area of Blackmans Flat, there a number of residences where conventional strategies to manage the impacts of noise, dust and a changed visual environment may be difficult to achieve.

On this basis, Centennial has developed, following direct engagement with residents in the main residential area of Blackmans Flat, a strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents. This strategy will:

- Mitigate the impacts of the WCS Upgrade Project related to noise, dust and visual amenity on the main residential area of Blackmans Flat;
- Result in an individual agreement with each private property owner in the main residential area of Blackmans Flat; and
- Allow for the WCS Upgrade Project to be developed to its full potential and positively contribute to the long term viability of the industry in the region.

- With respect to the external impacts, Centennial and its specialist advisers are developing mitigation programs that will ameliorate impacts to the greatest practical extent. Although the precise nature of the future impacts is difficult to assess at this early stage, Centennial Coal is prepared to enter into an undertaking with relevant state and local government instrumentalities to develop a comprehensive strategy five years out from the end of the nominal project life. This will be aimed at managing the remediation and mine closure processes. This approach is expected to allow a more effective means of managing impacts in the context of the greater knowledge of their extent that will be available at that time.

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ABBREVIATIONS

ABS:	Australian Bureau of Statistics
BAU:	Business as Usual
BCA:	Benefit-Cost Analysis
BCR:	Benefit-Cost Ratio
CO_2e:	Carbon dioxide-equivalent
DTIRIS:	Department of Trade, Investment, Regional Infrastructure & Services
EDS:	Economic Development Strategy
EHR:	Eastern Haul Road (Project option)
EMS:	Environmental Management System
EPA:	Environment Protection Authority
GHG:	Greenhouse Gas
INP:	Industrial Noise Policy (NSW)
I/O:	Input/Output
LCC:	Lithgow City Council
LGA:	Local Government Area
MRRT:	Minerals Resource Rent Tax
MTPA:	Million Tonnes per Annum
NPV:	Net Present Value
PV:	Present Value
REA:	Reject Emplacement Area
ROM:	Run of Mine (‘raw’ coal)
TPA:	Tonnes per Annum
WCS:	Western Coal Services
WDV:	Written down value
WHR:	Western Haul Road (Project option)

1. ECONOMIC ANALYSIS AND IMPACT ASSESSMENT: PURPOSE AND APPROACH

Centennial Coal (Centennial) currently operates the Western Coal Services (WCS) site at Blackmans Flat in the Lithgow LGA, NSW. WCS is the product beneficiation plant which treats coal presently produced by Springvale Mine and prospectively by Angus Place Colliery and other potential resources in the area. Briefly, the role of the plant is to receive raw or "run of mine" coal from the mines, and prepare it for dispatch and delivery to export customers.

The upgrade works proposed are principally subject to the NSW *Environmental Planning and Assessment Act 1979* (*EP&A Act*). At $104 million, the anticipated capital investment for the Western Coal Services Project is in excess of the gateway capital requirement ($30 million) under the *Act*. As such, the Project is a State Significant Development listed under Clause 5 (3) of Schedule 1 of *SEPP (State and Regional Development) 2011*, therefore Part 4 Division 4.1 of the EP&A Act applies. Presentation of an economic assessment is a provision under Schedule 2 (7) of the associated *Environmental Planning and Assessment Regulation 2000*, which requires:

(1) (c) an analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure.

(1) (f) the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4).

This Assessment addresses the economic impacts as provided for in these requirements. The approach to this Assessment is to initially estimate the economic costs and benefits of the project. The cost estimates include the quantified benefit or cost to the community of other external impacts of the Project, such as social and environmental outcomes, where estimation of these is practicable. This element of the approach is consistent with the requirements of subclause (7) (4) (d), Schedule 2, of the *Environmental Planning and Assessment Regulation 2000*. Subsequently, the extended regional economic benefits and costs of the project are discussed.

2. PROJECT BACKGROUND AND JUSTIFICATION

2.1 Mine production and plant capability data

Springvale Mine and Angus Place Colliery currently supply coal to the Wallerawang and Mount Piper Power Stations, with limited export capability via Lidsdale Siding. Angus Place currently has no access to export markets, while Springvale has the ability to export up to 2 Mtpa of coal using the underside of Overland Conveyor 2 from the existing Western Coal Services Site to Lidsdale Siding.

There are also several other potential mining resources held by Centennial Coal in the local area which could generate up to one million tonnes per annum of export coal. Under present arrangements, this additional product could not be transported to Lidsdale Siding or the Western Coal Services site without using the public road network. In order to provide flexibility to meet future export and domestic markets from both key mines as well as anticipated future projects, while simultaneously managing impacts such as those relating to truck movements on public roads, Centennial is seeking approval to upgrade its existing facilities.

Springvale mine has current approval to produce 3.4 million tonnes per annum (Mtpa) of coal. Angus Place Colliery has approval for production of 4 Mtpa. At present the mines produce approximately 3.4 Mtpa and 4 Mtpa respectively in line with these approvals. In order to enable Springvale Mine and Angus Place Colliery to achieve full combined production, Centennial has identified that improvements to facilities at Western Coal Services are required to match export coal preparation plant capacity with production capability from the two mines. The proposed upgrade Project would increase processing capacity from the current 2.0mtpa to 7.0mtpa. Concurrently, complementary works to increase transportation capacity and flexibility and public safety through dedicated infrastructure are also proposed. The components of the proposed works are described in Section 2.2.

2.2 Description of proposed works

In order to achieve the required operational improvements, the following works are proposed:

- Upgrading the existing Washery at the Western Coal Services site by constructing additional processing infrastructure adjacent to the existing facility

which with the existing plant is capable of processing a combined total of 7.0 Mtpa.

- Provision for sufficient reject disposal capacity for a 25 year economic life;
- Increasing the rate and utilisation of the return side of existing overland conveyor system to enable up to 6.3 Mtpa to be delivered to Lidsdale Siding for export;
- Supply up to 50,000 tonnes per annum (tpa) by road to domestic customers;
- Construction of additional conveyors, transfer points and other coal handling infrastructure requirements to cater for the upgraded WCS facility;
- Construction of a private haul road linking the Western Coal Services site with the existing private haul road from Angus Place Colliery to Mount Piper Power Station. This private road will cross a section of the existing Pine Dale Mine operation and include passage over the Castlereagh Highway;

In addition to these Project works, the present application seeks to consolidate all existing approvals relating to Centennial's coal processing and transport operations in the area under this single consent.

3. PROJECT ECONOMIC ANALYSIS

3.1 Focus of analysis

There are two principal aspects of economic impact related to the project. There will be short to mid-term effects resulting from economic activity associated with the construction phase. Subsequently, there will be ongoing direct economic effects associated with utilisation of incremental capacity at WCS. In addition, the WCS infrastructure upgrade will facilitate anticipated continuation of production at Springvale Mine and Angus Place Colliery as previously identified. As such, the upgrade will support ongoing levels of employment and economic activity associated with these mines for the economic life of each mine. The economic stimulus provided by these activities also results in the flow of further activity in the regional, state and national economies, as the goods and services required to support mining activity are produced and supplied, and the incomes received by employees are redistributed through consumption and other economic activity.

As would be expected, Centennial has conducted internal analyses in order to determine the financial and economic feasibility of various project options. The project subject of this Environmental Assessment represents the best of the

alternatives considered from the perspective of economic efficiency and commercially and environmentally sustainable development and operations.

The economic analysis presented in this assessment provides an overview of the conclusions of the comparative approach adopted by Centennial in respect of the various project options. The analysis requires certain assumptions to be made in relation to the expected outcomes of the Project, which are detailed in the appropriate sections of this report.

It should be noted that in developing the economic assessment of the Project, certain information has been used which Centennial considers to be commercially sensitive. Centennial is in a position to provide this information on a confidential basis, as is provided for in the Planning NSW draft guidelines (2002) should this be required. Accordingly, this Economic Assessment presents the costs and benefits to the State and regional communities, with corporate financial outcomes excluded

3.2 Analysis of project alternatives

Two alternative proposals have been considered in detail by Centennial. Additionally, the business-as-usual (BAU) case, in which operations would proceed on their current basis, is also considered. The three cases assessed are:

- Project based on the preferred option, which is westerly alignment of haul road link [WHR] (Option 1[2]);
- Project including alternative easterly alignment of haul road link [EHR] (Option 2);
- Do Nothing/ Business-as usual [BAU] (Option 3).

A number of other alternative options are not analysed. This results from those options having been determined by Centennial as being of substantially lower feasibility during the process of identifying the current project options. The principle difference between the two haul road options is the capital cost. The capital cost of the Project including the western haul road alignment is $104 million, compared with $107.5 million for the eastern alignment. It is noted that there is no material difference in assumptions relating to operations cost modelling or revenue projections for either option.

[2] As indicated in the diagram included in Environmental Impact Statement.

The BAU option will basically result in export capacity being constrained to the current 2 mtpa. This will constrain Centennial Coal's opportunities to export coal product in circumstances where domestic supply arrangements may curtail production.

3.3 Project-related economic evaluation

The benefit – cost analysis (BCA) data presented in the following table are present values, at an assumed discount rate of seven (7) per cent[3] except as otherwise noted. For the purposes deriving the estimates in this analysis, asset utilisation is assumed for the 20-year period 2014 - 2033 inclusive. It is noted that the nominal economic 'life' of the infrastructure is 25 years, however, over this longer period, utilisation may be contingent to some extent on deployment in servicing production from other Centennial reserves in the area, which are not as yet approved for extraction. The following analysis assumes that all additional product processed by the WCS upgrade will be prepared for export, consistent with current practice. The analysis is based on the preferred Project option, which is the westerly alignment of the haul road link.

3.3.1 Estimation of economic benefit

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

- Salaries and wages paid to contract workers in the development phase of the Project. These incomes then support additional activity in other sectors of the economy;
- Estimate of profit accruing to construction contractors engaged on the Project. These profits are then distributed to owners of the entity, with similar flow-on effects to those noted above;
- Salaries and wages paid to full time employees at WCS, with similar flow-on effects to those noted above;

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

- 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. These taxes include provision for the carbon tax. As liability for the Mineral Resources Rent Tax (MRRT) is contingent on market demand, the prospect of incurring the tax is acknowledged, but no reliable quantified estimate can be made.

The nominal capital cost of the Project is $104 million, over the development program, as previously identified. This activity will support an average of 50 contract employees over the period. Extended beneficiation operations resulting from the Project will require an additional 3 FTE employees. These effects 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 much of their incomes.

In addition to these household income-related benefits, the royalties and taxes generated are also a source of benefit. Table 1 shows the valuation of these benefits, and the bases of the valuation for each.

Table 1: Economic benefits of Western Coal Services Upgrade Project

Economic Benefit	Estimation assumptions	Estimate
Construction-phase contractor employee salaries	Average 50 contract personnel @ ≈ $65K.	Assessed NPV ≈ $2.5 million
Construction-phase contractor profit margin	Assumed as 7.6% of construction cost[4]	Assessed on project cost NPV ≈ $6.8 million
Western Coal Services operation-stage additional employment	Direct additional operations employment: 3 FTE positions, average salary ≈ $110K.	Assessed NPV ≈ $15 million.
Coal royalties (State Government)	Based on assessed output over 25 year mine life, and royalty rate of 6.7%[5]	Assessed NPV ≈ $200.7 million
Federal taxes (Corporate taxes, MRRT)	Based on assessed corporate income & relevant corporate tax rates Total assessed NPV ≈ $410 million	Return to NSW @30.1%: ≈ $123.4 million[6]
Carbon tax (Federal Government)[7]	Scope 1 & 2 emissions 0.014Mtpa per annum @ $23/tonne CO_2e. Assessed NPV ≈ $83.5 million	Return to NSW @30.1%: ≈ $25.1 million
Economic benefit		**≈ $374 million**

3.3.2 Estimation of economic costs

The Director General's Requirements (DGRs) issued by the DP&I for the Project identifies key issues that the EIS prepared for the Project must address. These relate to:

- Land resources;
- Water resources;
- Biodiversity;
- Heritage;
- Air quality;

[4] Australian Bureau of Statistics (2012): ABS Cat. No 1301.0 Year Book Australia 2012. Average profit margin on heavy/civil engineering construction 2008-09 (7.6%); 2009-10 (7.6%)

[5] Deep underground coal (+400m) 6.2 percent; other underground coal 7.2 percent, open cut coal 8.2 percent. The variance from these standards relates to the mining of coal at various seam depths over mine life in relation to Springvale Mine.

[6] Commonwealth of Australia (2012): Budget 2012-13 Budget Paper No 3, Part 3, General Revenue Assistance. Table 3.2 General revenue assistance by State.
<http://www.budget.gov.au/2012-13/content/bp3/html/bp3_04_part_3.htm >

[7] Carbon tax is separated from other Federal taxes, as it is also adopted as a measure of impact with respect to Greenhouse Gas (GHG) emissions.

- Greenhouse gases (GHG);
- Noise;
- Traffic and transport;
- Visual;
- Waste;
- Hazards;
- Social and economic; and
- Rehabilitation.

Each of these matters is addressed within the EIS prepared for the Project, and the majority are the subject of specialist assessment reports forming part of the EIS. A qualitative and quantitative analysis of these aspects of the Project is included in Table 9. The table also details mitigation strategies proposed by Centennial for addressing these impacts.

In order to estimate the net cost or benefit of the Project, it is necessary to provide a quantified or monetised estimate of these externalised impacts, based on specialist assessments of their magnitude and relevant valuation methodologies, which are displayed in Table 2.

In relation to these valuations, the following key points must be observed:

- 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 as closely represent similar existing conditions *for this project* as was achievable. However, in some instances the valuation methodologies are either more general, or related to projects of a different nature. In this regard, it is important to emphasise that the present Project relates to the development of industrial infrastructure on a site, and in a geographic area that already features some existing, similar infrastructure and activity. This fact of itself is a significant mitigating factor in terms of valuing the extent of impacts on social amenity in this area.
- A number of the matters identified in the DGRs are not quantified, as the levels of impact are not significant (such as waste, which is managed in a

manner that has minimal risk of external impacts, and bushfire hazards which present a risk to WCS, rather than WCS increasing the risk of such an event.

- As the Project design will minimise truck traffic on public roads, no cost is assigned to this aspect of traffic and transport impacts. Other impacts such as GHG emissions and air and noise impacts are included in the relevant assessments for those impacts. Similarly, the assessment for wastes (particularly reject material) is included in the assessment for soil and water.
- The assessment methodology for air impacts (refer to Table 2) is based on a study that examined the health impacts of air pollution. As a consequence, the estimate calculated for this impact recognises the health aspects of operations associated with the proposed Project.

Table 2: Valuation methods – socioeconomic and biophysical impacts

Description	Methodology/Source of Valuation mechanism	Valuation measure/unit[8]	Comment on application
Noise	Day B, Bateman I & Lake I (2010): "Estimating the Demand for Peace and Quiet Using Property Market Data" - Hedonic pricing (impact on dwelling values) EVRI reference number: 06153-105312	$75 - $196/dBA per annum (upper bound assumed for estimation)	Based on perceived changes in property valuations. Application contingent on number of affected properties, and estimated exceedances of standards. Upper bound applied in valuation.
Soil and water	Streever WJ, Callaghan-Perry M, Searles A, Stevens T & Svoboda P (1998): "Public Attitudes and Values for Wetland Conservation in New South Wales, Australia" – simulated market price/WTP EVRI reference number 02309-0732	$149/household per annum	Relates principally to discharge of mine waters into Wangcol Creek. Census 2011 data enumerates the number of households in Lithgow LGA as 7,787.
Traffic and transport	Evaluation included under other impact assessments	Not applicable	Increases in transport movements chiefly restricted to private haul roads. Air quality, noise and GHG emissions considered in relevant evaluations.
Air	DEC NSW (2005): "Health Costs of Air Pollution in the Greater Sydney Metropolitan Region" - cost of injury/replacement; WTP EVRI reference number: 07200-41439	$236 - $1,098 per capita per annum (upper bound assumed for estimation)	Valuation relates to all air pollution in Sydney GMR. Application herein relates to residential receivers at Blackmans Flat and Wolgan Road. Upper bound applied in valuation.
Greenhouse gas (GHG)	Australian Government, Clean Energy Future http://www.cleanenergyfuture.gov.au/clean-energy-future/carbon-price/	$23 per tonne/$CO_2$-e	Assumes incremental Scope 1 & 2 costs (which are combined in the specialist report) as assessed.

[8] All values adjusted by three percent per annum to allow for inflation.

Description	Methodology/Source of Valuation mechanism	Valuation measure/unit[9]	Comment on application
Heritage	Allen Consulting Group (2005): "Valuing the Priceless: The Value of Heritage Protection in Australia" – choice modelling/WTP	$6.80 per capita p.a. for each 1,000 places protected	Assumes Census 2011 population count (Lithgow LGA) of 20,160, and nine (9) identified indigenous heritage sites.
Biodiversity	Land & Water Australia (2005): *Making Economic Valuation Work for Diversity Conservation:* Australian Government Department of Environment & Heritage: - simulated market price/ WTP	$145/household per annum (preservation of 700 species –flora & fauna - VIC)	Implied cost of $0.21 per species. Applied to four (4) threatened bat species, four (4) threatened bird species, one (1) threatened flora species and one (1) Endangered Ecological Community (total ten [10] species) identified on Centennial Coal Services site which may be affected, total $2.10 per household p.a. 7,787 households (as above).
Visual	Curtis I.A. (2004): "Valuing Ecosystem Goods and Services: A New Approach Using a Surrogate Market and the Combination of Multiple Criteria Analysis and a Delphi Panel to Assign Weights to Attributes – actual market pricing. EVRI reference number: 0663 - 1365	$1,014 - $1,292/Ha per annum (upper bound assumed for estimation)	Estimate of aesthetic impact on residential receptors in Blackmans Flat. Valuation based on maximum 30.95 Ha area to be cleared for works. Other works to be conducted in existing WCS operations envelope. Upper bound applied in valuation.

[9] All values adjusted by three percent per annum to allow for inflation.

Table 3: Economic costs of Western Coal Services Upgrade Project

Economic cost	Estimation assumptions	Estimate of cost
Noise	5 residential receivers in noise affectation zone, 9 residential receivers in noise management zone	Assessed NPV ≈ $182K
Soil & water	Relates principally to mine water discharge into Wangcol Creek	Assessed NPV ≈ $16 million
Air	12 identified residential properties, assumed 35 residents[10]	Assessed NPV ≈ $1.8 million
GHG emissions	Scope 1 & 2 emissions, 0.014Mtpa.	Assessed NPV ≈ $83.5 million
Heritage	Assumes Census 2011 population count (Lithgow LGA) of 20,160, and nine (9) identified indigenous heritage sites.	Assessed NPV ≈ $21K
Biodiversity	Removal of 30.95Ha of native vegetation. Possible impacts on 2 vulnerable flora species, 2 endangered fauna species and three vulnerable fauna species	Assessed NPV ≈ $251K
Visual amenity	Residents of Blackmans Flat chiefly affected, some possible impacts on residents of Lidsdale.	Assessed NPV ≈ $436K
Economic cost		**≈ $102 million**

3.4 Sensitivity analyses – alternative Project options

Planning NSW Cost Benefit Analysis for mining and coal seam gas proposals (2012) and NSW Treasury Economic Appraisal Principles and Procedures (TPP 07-6, 2007) require sensitivity analyses to be conducted as part of the assessment methodology. The economic assessment above is conducted at a seven per cent discount rate, as indicated by the guidelines. TPP 07-6 stipulates a lower bound of four (4) per cent and an upper bound of ten (10) per cent for sensitivity analyses. The application of these parameters to the present proposal and the BAU case is displayed in Table 5. For the purposes of this analysis, the NPV of Project capital costs is included for assessment of the assessment of the Project alternatives, and the written down value (WDV) of the existing plant is similarly adopted as the comparative cost for the BAU case.

Table 5: Sensitivity analysis – Project options - adjusted discount rates (NPV)

Project option component	Discount Rate 4% $M	Discount Rate 7% $M	Discount Rate 10% $M
Option 1 (WHR) total cost	(242)	**(236)**	(230)
Option 1 (WHR) total benefit	622	**538**	478

[10] ABS 2011 Census data: Persons per household for Lidsdale State Suburb (incorporating Blackmans Flat Gazetted Locality): 2.9 persons/household

Option 1 (WHR) NPV	380	**302**	248
Option 2 (EHR) total cost	(246)	**(239)**	(233)
Option 2 (EHR) total benefit	622	**538**	478
Option 2 (EHR) NPV	376	**299**	245
Option 3 (BAU) total cost[11]	(46)	**(46)**	(46)
Option 3 (BAU) total benefit	204	**164**	135
Option 3 (BAU) NPV	158	**118**	89

As the change in discount rates is proportional for each alternative case, the NPV of the proposed project and that for the alternative haul road alignment are superior to the BAU case in each instance. There may be any number of possible scenarios that vary from the forecast relativities between revenues and costs. The manipulation of the discount rate provides some indication of the range covered by such possible variances and the associated project risk.

A further means of testing the strength of the economic case for the proposal is to adjust the economic performance assumptions. In framing these test criteria, it is considered that capital and operating cost assumptions will behave in a relatively predictable manner, in the context of an assumption for inflation over time. Conversely, the most likely source of variation relates to export prices for coal, which are comparatively volatile. Table 4 displays the output of this analysis, based on price assumptions derived from market data and price adjustments at ten and twenty per cent higher and lower. As is the case with the proceeding analysis, changes in revenue associated with price variances are reflected as changes in tax and revenue benefit to NSW.

Table 6: Sensitivity analysis - project options- adjusted price Assumptions - (Net Present Values)

Evaluation Element	Option 1 (WHR) $M	Option 2 (EHR) $M	Option 3 (BAU) $M
Base case[12]	302	299	118
Revenue ∆ 10%	331	328	133
Revenue ∆ 20%	379	376	148
Revenue -10%	242	239	104
Revenue -20%	207	204	93

[11] Assumes baseline costs in proportion to incremental costs of project
[12] Refer to Table 5.

Separate analyses adopting adjustments to discount rates and operating outcomes assumptions demonstrate the positive economic outcomes for the Project. The Project outcomes are significantly greater than for the BAU case, and are likely to be positive in most foreseeable eventualities.

4. EXTENDED ECONOMIC IMPACT ANALYSIS

4.1 Approach

This analysis firstly identifies and where appropriate, quantifies the broader impacts of the Western Coal Services Project proposal. The effect of the stimulus provided to regional and broader economies by direct construction and operating activity and the associated impacts is then considered. This analysis is then extended to the application of multipliers to quantify the extended benefit/cost relativities of the proposal.

4.2 Regional context

Centennial's operations in the Lithgow and adjacent Mid-Western Regional Council LGAs are significant contributors to these regional economies. As WCS and the mines it services are situated in the Lithgow LGA, it is appropriate to closely consider the recognised contribution of the mining industry and the implications of the Project in this regional economy.

4.2.1 Lithgow City Council Economic Development Strategy

The importance of the coal mining industry to the regional economy is explicit in Lithgow City Council's Economic Development Strategy (EDS) 2010-2014. This is substantiated by the following material included in the EDS;

- *"In 2006, the mining sector employed 10% of the total Lithgow resident workforce second only to the Retail sector at 11.2%*" [emphasis added].
- "*The largest employer in Lithgow Local Government Area is mining".*
- *"Only the mining sector had a greater percentage contribution to gross regional product (27%) than its share of employment (12%)*[13].

Clearly the sector is of significant importance in the context of such a relatively small regional economy. The comparison of employment to output identified in the second point is indicative of a number of factors. Firstly, mining is relatively capital intensive,

[13] Note that this figure refers to total employment in the mining sector in Lithgow. The former figure of ten percent relates to the *resident* workforce of the LGA.

so the labour input may be comparatively lower. The EDS 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 EDS 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 proposal to upgrade Western Coal Services is a critical element in sustaining longer-term operation of the Springvale and Angus Place mines in the area and maintaining employment in those mines.

These sustained and additional positions are of significant regional importance. The EDS 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 EDS:

- *"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".*

The sustainability of the mining sector and its related employment is clearly vital to the broader economic wellbeing of the area. As is established throughout this economic assessment, the proposed 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. The content of the EDS indicates that LCC is cognisant of the finite nature of mining in the area and its conclusions are evidently that the regional economy will continue to remain reliant on the role of the mining industry for some time.

Although the actual operation of the new infrastructure at the Western Coal Services site will result in a net increase of three positions, it is the role of the site in sustaining mine operations at Angus Place Colliery and Springvale Mine and possibly other future projects in the area that provides the largest contribution to the continued prosperity of the regional economy. Together the two mines employ 495 permanent personnel and a further 75 contractors at Angus Place. Assuming an average salary of $150,000 per annum, the NPV of Centennial employees' salaries over the 20-year forecast period is around $690 million. Contractor salaries are additional to this estimate. The 'pay packet effect' of these incomes on the local economy is very significant, as is substantiated by LCC's assessment of the local economy and its focus on these households' disposable incomes. The infrastructure project is critical to the ongoing operation of these mines and as such has an integral role in ensuring that these employment levels are maintained.

4.2.2 Community consultation

A multi-faceted process of community consultation is detailed in the Social Impact Assessment forming part of the Environmental Impact Statement. The process produced key findings on community perceptions regarding this application, and the level of industrial development in the general vicinity of WCS. The consultation process focused on the residents of Blackmans Flat in particular. The SIA notes that '*The locality of Blackmans Flat is the primary area of affectation for this Project. This is because of the proliferation of power generation and mining activities and associated infrastructure resulting in long standing, significant and unresolvable land use conflicts*'. Other findings include:

- Community stakeholders acknowledge that mining and power generation has brought about benefits to the community via both direct and indirect employment.
- The visual nature of mining and mine related infrastructure seems to be tolerated and accepted as part of the way of life of the community around Lithgow, Wallerawang and Lidsdale.

- However, affected residents express little tolerance for mining and other associated industry when there are adverse impacts on the amenity of residential areas from factors such as noise, dust, odour, visual impacts etc.
- The proliferation of industry around this locality has resulted in a significant level of land use conflict and the ongoing operation of industry in the vicinity of Blackmans Flat has had, and will continue to have, a negative impact on the amenity of the area and day to day lifestyle of residents.
- Identified benefits arising from mining such as construction of additional infrastructure, maintenance of existing and creation of additional jobs, role in the export economy does not outweigh the impact on community amenity even if the industry (e.g. mine) operates within approved limits.

Consultation has led to the conclusion that irrespective of design and operational mitigation initiatives, the Project, as part of a long, historical process of industrial development, will contribute to the continued decline in amenity for Blackmans Flat residents. Centennial has developed, following direct engagement with residents in the main residential area of Blackmans Flat, a strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents. It is noted that the range of other mitigation strategies to be adopted for the Project will be effective in relation to managing impacts on the broader LGA community.

4.3 Extended economic impacts

An estimate of the extended economic impacts associated with the construction works on the Western Coal Services Project, and the ongoing operation of the infrastructure, can be derived using input-output (I/O) multipliers. The methodology is a commonly-used approach to providing an approximation of the economic effects of one industry's activities across the rest of the economy[14]. There are certain limitations to the application of I/O multipliers. These are also acknowledged by ABS[15]. The practical effect of these limitations is that the output of multiplier analysis can only be considered as *indicative* of outcomes that may result from economic stimuli.

[14] 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*;
[15] For example ABS Cat No 1301.0, *Year Book Australia, 2002*

The NSW Department of Trade, Investment, Regional Infrastructure and Services (Division of Resources and Energy) [16] identified output and employment multipliers for mining and related services. While acknowledging the aforementioned limitations on multiplier analysis, the application of the relevant NSW Government Department's declared multipliers adds validity to the analysis. A further advantage of the DTIRIS multipliers is the inclusion of services related to mining in its scope. This is of some relevance, as it provides for a project such as the Western Coal Services Project. The improved infrastructure will add value in the export supply chain to support mining and therefore can be considered as such a service. The relevant multipliers are displayed in Table 7

Table 7: 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

The relatively large GVA multiplier in this instance demonstrates the importance of incomes generated by the relevant project. It should be noted that GVA comprises all components of income to labour, plus the gross operating surplus of the corporate entity. Due to the foreign ownership of Centennial, the latter will accrue beyond the NSW, however, the former would be concentrated in the State and the immediate region, and have significant effect as identified in the LCC EDS (2010). In addition to these operations-related multipliers, specific multipliers for construction were also identified on the same bases as those for mining and services[17]. These are relevant for assessment of the impacts of the initial stimulus associated with the infrastructure improvement works.

Table 8: 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

[16] *The Contribution of Primary Industries to the NSW Economy, Key Data 2012*: <http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0010/427645/Contribution-of-primary-industries-key-data-2012.pdf >

[17] The original source of the DTIRIS multipliers is ABS Cat. No. 5246.0 (as above). GVA multiplier derived from ABS Cat No, 5246.0 & Multipliers for Culture-Related Industries, CMC SWG, Canberra.

In this instance the GVA multiplier would have wider geographic impacts in terms of economic activity, as suppliers and contractors may be more likely to originate beyond the immediate region, given the specialised nature of the infrastructure being constructed.

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 estimated net benefit of the Project ($272 million) would 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 stimulus would result. These positions represent employment supported in the broader economy as a result of the demand for additional goods and services related to the Project.

4.4 Quantitative and qualitative assessment of economic and environmental impacts

Tables 2 and 2 respectively identified the bases for quantifying the environmental impacts contained in the DGRs, and the relevant estimates for the Project. Table 9 compares the benefit and cost impacts in the context of those quantified assessments and also key qualitative aspects of each impact, with particular emphasis on the matters identified through the community consultation process and material included in the LCC EDS. In addition, the table also identifies the policies and specific actions employed by Centennial in managing and mitigating the externality impacts of the Project.

Table 9: Economic Impact Assessment – Summary Table

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Infrastructure construction and commissioning	The development phase of the project will have an overall positive economic contribution at a regional level and also to the local community.	Actual capital expenditure: Westerly haul road alignment: $104 million (NPV $88.9 million); Direct construction employment: Average 50 FTE over 2 years @ ≈ $65K, (NPV ≈ $2.5 million [construction period 2014-2015])	Outcomes of project and incremental NPV positive, therefore development costs neutralised. Economic benefits may not mitigate cumulative impacts on the most affected residents (of Blackmans Flat)	Nil required Mitigation of impacts on residents of Blackmans Flat through a strategy to manage the cumulative impacts of the various incompatible land uses in the area is discussed in relevant sections of this report
Western Coal Services operations	The project will have an overall positive economic contribution at a regional level and also to the local community	Direct additional operations employment: 3 FTE positions, average salary ≈ $150K (NPV ≈ $15 million [20 years]) Additional royalty income to NSW associated with increased output: ≈ $200.7 million. Additional company tax ≈ $400 million. Estimated ≈ $120.4 million returned to NSW Positive economic impact of mining industry acknowledged by LCC	Outcomes of project and incremental NPV positive, therefore development costs neutralised. Economic benefits may not mitigate cumulative impacts on the most affected residents (of Blackmans Flat)	Mitigation of impacts on residents of Blackmans Flat strategy to manage the cumulative impacts of the various incompatible land uses in the area is discussed in relevant sections of this report

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Noise	Operational noise: likely residual noise impacts above INP project specific criteria Sleep disturbance: goals likely to be achieved at all but three (3) residential receivers. Traffic noise: change in noise level not discernible to most people. Construction noise: predicted construction noise levels are below the highly noise affected level for the scenarios considered.	Mitigation strategy will reduce impacts to lowest practicable level.	Noise affectation zone: > 5dBA above project specific criteria; maximum exceedance 11dBA. 5 residential receivers, notional cost $10,780 Noise management zone: < 5dBA above project specific criteria (average 3dBA). 9 residential receivers, notional cost $5,292 Total notional cost of noise impacts: $16,072 per annum, NPV ≈$182K	WCS/Centennial EMS Noise Management Plan (Coal Services Site) Noise Management Plan (Haul Roads) Community consultation. Direct engagement with relevant property holders as required. Refine onsite noise mitigation/operational procedures. Acoustical mitigation at receivers. Negotiated agreements with property holders.
Soil and water	Assessed risk of impacts ranges from very low to moderate. Sources of moderate risk restricted to existing WCS footprint, except for mine water discharge into Wangcol Creek. Waters in Wangcol Creek contaminated both upstream and downstream of SCS site.	Mitigation strategy will reduce impacts to lowest practicable level.	Relates principally to mine water discharge into Wangcol Creek. Notional cost to community (Lithgow LGA): $1,160,263, NPV ≈$16 million.	WCS/Centennial EMS Water Management Plan (Coal Services Site) Erosion & Sediment Control Plan Subsurface Drainage Management Plan (Coal Services) Commitments to EPA to conduct further investigations.

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Traffic and transport	Major impact on the existing traffic environment would be during the construction phase only No additional haul truck movements on public road network.	Haul road link will not increase reliance on public road network.	Notional & actual costs to community captured in noise, air quality, and GHG emissions assessments.	Construction of haul road overpass (Castlereagh Highway) in accordance with AUSROADS guidelines. All construction sites to implement construction traffic management plan. WCS/Centennial EMS
Air	Nearest sensitive receptors at Blackmans Flat are unlikely to experience dust concentrations above the PEA's air quality assessment criteria. There are not predicted to be any exceedances of the annual criteria for PM_{10}, TSP or deposition at Blackman's Flat.	Mitigation strategy will reduce impacts to lowest practicable level.	$1,098 per capita per annum - 16 identified residential properties, assumed total population of 47 individual residents[18] . Notional cost to community: $51,606 per annum, NPV ≈ $1.9 million	WCS/Centennial EMS Dust Management Plan Coal Services: Watering of unpaved haul roads and bulldozer routes & possibly exposed areas. General Environmental Management Procedures (Coal Services) Environmental Monitoring Plan Largest practical payload capacities to reduce number of movements Strategy to manage the cumulative impacts from the various incompatible land uses on these residents

[18] ABS 2011 Census data: Persons per household for Lidsdale State Suburb (incorporating Blackmans Flat Gazetted Locality): 2.9 persons/household.

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
GHG production	Emissions equal approximately 0.008% of NSW emissions (2008); 0.002% of Australian emissions (2008).	Increase in Commonwealth taxes (carbon tax) revenues $83.5 million (life of project NPV)	Scope 1 & 2 emissions 0.014Mtpa per annum @ $23/tonne CO_2e. Notional cost $9 million per annum[19], NPV ≈ $83.5 million (equivalent to tax revenue benefit).	WCS/Centennial EMS Emissions reduced due to larger truck payloads and lower number of movements associated with haul road changes. Some marginal reductions due to altered operations model.
Heritage	9 identified Aboriginal sites within SCS site boundaries. The only area that may contain relics would be that associated with the new haul road. The relevant area has had significant land disturbance from previous mining operations dating back to the 1920's.	No impacts anticipated due to historical site degradation	Notional cost to community (Lithgow LGA): $1,234 per annum, NPV ≈ $21K	WCS/Centennial EMS Cultural Heritage Plan

[19] Assumes carbon tax rate as a proxy for the externality cost imposed on the relevant community.

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Biodiversity (Flora & fauna)	After due consideration against the relevant key thresholds assessment criteria as set out within *Draft Guidelines for Threatened Species Assessment for Part 3A Applications*, the proposal is expected to have minimal impacts on the ecology of the site. Assessments have concluded that no significant impacts are likely to relevant threatened species or EECs listed under the TSC Act 1995 or MNES.	No significant impacts anticipated.	Potential removal of maximum 30.95Ha of native vegetation. Possible impacts on two vulnerable flora species, two endangered fauna species and three vulnerable fauna species. Notional cost (upper bound): $16,353 per annum (Lithgow LGA), NPV ≈ $251K	WCS/Centennial EMS General Environmental Management Procedures Haul Road Link Option 1 adopted, resulting in lesser impacts. Clearing for project to be minimised. Erosion and sedimentation controls. Ongoing monitoring for weed infestations
Visual amenity	The Project will introduce a new element into the landscape external to the WCS site, being the new private haul road, which will cross the Castlereagh Highway near the current entrance road to the WCS site. Dwellings within Blackmans Flat will potentially view some elements. Field survey revealed that existing built elements, vegetation and intermediate ridges within the landscape will naturally screen views through to and across the site. The proposed elements will be satisfactory in the environment where appropriate rehabilitation and mitigation measures are taken.	No impacts anticipated	Estimate calculated on basis of area of site to be potentially disturbed. Residents of Blackmans Flat chiefly affected, with some possible impacts on residents of Lidsdale. Notional cost to the community: ≈$39,990 per annum, NPV ≈ $436K	Existing built elements, vegetation and intermediate ridges within the landscape will naturally screen views through to and across the site. Strategy to manage the cumulative impacts from the various incompatible land uses on these residents discussed in relevant sections of this report

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
Agricultural land	Areas that have been subject to previous mining which are not required for the ongoing operation of WCS will be rehabilitated. The rehabilitation program is currently designed to replace previous native forest vegetation communities as the site would be unsuitable for future agricultural activities.	General area will be rehabilitated as bushland (open space).	Due to historic and continuing disturbance of the land, no agricultural or other productive use will be sustained on the rehabilitated land	WCS/Centennial Environmental Management System Rehabilitation and Landscape Plan (Coal Services)
Land use/ Rehabilitation	The study area has had a long mining history but has also been associated with the disposal of fly ash from Mount Piper Power Station and has approval for Lithgow City Council to use a portion of the WCS site for municipal waste disposal. The proposed expansion of the reject emplacements will need to use previously mined overburden as final capping material. As there are no remaining topsoil stockpiles, alternative topdressing material will need to be imported to the site or manufactured on site using available overburden.	Rehabilitation to include areas that have previously remained untreated. Rehabilitation strategy includes use of seed stock from threatened native flora. Continued rehabilitation, monitoring and reporting in relation to the Lamberts Gully Mine site.	Due to historic and continuing disturbance of the land, no agricultural or other productive use will be sustained on the rehabilitated land	WCS/Centennial Environmental Management System Rehabilitation and Landscape Plan (Coal Services) Slope Stability Management Plan (Coal Services) Reject Emplacement Procedure (Coal Services)

Impact	Environmental Assessment Commentary	Benefits	Costs	Mitigation/treatment
General resident amenity	The locality of Blackmans Flat is the primary area of affectation for this Project. This is because of the proliferation of power generation and mining activities and associated infrastructure resulting in long standing, significant and unresolvable land use conflicts.	Positive outcome of mitigation strategy will resolve the major land use conflict and result in better amenity outcomes for affected residents	Ongoing impacts on resident amenity (as disclosed throughout this report) are expected should the mitigation approach be unsuccessful.	Strategy to manage the cumulative impacts from the various incompatible land uses on these residents discussed in relevant sections of this report
Waste	The project includes capacity for disposal of reject material from the beneficiation process. Approximately 15 per cent of throughput is reject material. Tailings management through existing tailings dams as required Other wastes (consumables such as lubricants, containers etc.) are disposed of through regular collection by licensed contractors	The emplacement of reject material in mine voids forms part of the rehabilitation process	Quantified impacts included in assessment of soil & water and land use/rehabilitation	A proportion of waste material is blended with other coal to produce saleable material. WCS/Centennial EMS Reject Emplacement Procedure (Coal Services) Hazardous Substances Management Plan
Hazards	Access to the Western Coal Services site is restricted, reducing the likelihood of any foreseeable impact on public safety A Bushfire Management Plan applies to all Centennial Coal's operations in the area, including the Western Coal Services site.	No impacts anticipated	No impacts anticipated	WCS/Centennial EMS Bushfire Management Plan Inspections and Maintenance Program (Coal Services)

The assessments of impacts presented in Table 9 must be considered in the context of the material arising from the community consultation process (Section 4.2.2). That information suggests that the cumulative impacts of industrial activity are such that the additional externalities generated by the project may have no practical effect on the affected residents of Blackmans Flat, as their situation is already at a point that their issues are 'unresolvable'.

Centennial Coal recognises that the dominant land use in the immediate vicinity of the Western Coal Services Upgrade Project is industrial. Despite this, the locality of Blackmans Flat is within the zone of affectation for a number of industrial sites operated by various individual companies including the proponent.

Within the main residential area of Blackmans Flat, there a number of residences where conventional strategies to manage the impacts of noise, dust and a changed visual environment may be difficult to achieve.

On this basis, Centennial has developed, following direct engagement with residents in the main residential area of Blackmans Flat, a strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents. This strategy will:

1. Mitigate the impacts of the WCS Upgrade Project related to noise, dust and visual amenity on the main residential area of Blackmans Flat;
2. Result in an individual agreement with each private property owner in the main residential area of Blackmans Flat; and
3. Allow for the WCS Upgrade Project to be developed to its full potential and positively contribute to the long term viability of the industry in the region.

It must also be recognised that a number of the benefits and costs of the Project accrue to the LGA and broader communities. Some of these, such as eventual rehabilitation and return to bushland appear to be valued by these broader communities, but are insufficient to mitigate the problems encountered by the most proximate residents. Given the existing nature of land use in the area, the historical disturbance of the land and the existing 'unresolvable' conflicts, it is acknowledged that there is little likelihood of the land being restored to another productive use, such as agriculture. It is also recognised that any return to a state which approximates

surrounding undisturbed bushland in the broader area will take a significant period of time. In order to allow the latter to eventuate, however, Centennial proposes to develop a comprehensive mine closure and rehabilitation strategy that will ultimately facilitate some recovery of the area. In order to ensure that this plan is as effective as possible, Centennial Coal proposes an agreement with relevant state and local government authorities based on developing a detailed strategy five years prior to expected cessation of operations. This will allow the rehabilitation and restoration strategy to address impacts in the context of their known extent at that time.

4.8 Summary

There are several sources of benefit associated with this proposal. From Centennial's perspective, there are benefits in terms of operational scale and access to export markets and the resultant commercial benefits. Centennial has assessed a number of alternatives to the current Project options in arriving at this conclusion. The preferred option proposed by Centennial is based on assumptions that ensure that any negative external costs resulting directly from the Project are assessed on a conservative (i.e.' highest cost') basis, thus reducing the likelihood of impacts being underestimated.

The proposed infrastructure upgrade is consistent with existing industrial infrastructure in the immediate surrounds. The haul road component of the Project will result in some impacts, particularly in the form of potential dust generation and visual amenity associated with construction of the required flyover at the intersection with the Castlereagh Highway. In all other respects the new works and infrastructure are contained within the boundaries of the existing WCS site and associated existing mine site areas and will be subject to Centennial Coal's EMS and its associated mitigation strategies detailed in Table 9.

The negative impacts associated with the proposal must necessarily be placed in the context of this existing use of Western Coal Services and surrounding industrial infrastructure. The mitigation approach presently being pursued by Centennial Coal demonstrates a clear understanding of the magnitude of impacts on the most-affected residents. From the perspective of the very significant contribution of mining to the regional and broader economies, it appears that the broader community, and certainly the local government administration, consider that these costs are outweighed by the benefits that such a mining-related Project will generate.

5. ADDITIONAL REQUIREMENTS

5.1 Cumulative impacts

As part of the assessment of such a Project, it is necessary to have regard to the impacts of the existing regional situation, and in particular any other concurrent expansion or application that may cumulatively increase impacts in the area. As has been observed previously, the proposed works are consistent with the industrial character of the surrounding area. Blackman's Flat is the key area where cumulative impacts are most relevant, particularly with respect to amenity, noise and dust impacts which were identified by residents during the community consultation process.

The relevant existing and pending applications in respect of the Lithgow LGA at present are as follows:

- Existing Wallerawang power station including approval for a Development Application (024/11DA) in July 2011 for new storage silos;
- Existing Mount Piper power station including the following applications:
  - Application for a Western Rail Coal Unloader (06_0271) approved in June 2009;
  - Application for a new Base Load Power Station (MP 09_0119) approved in January 2010; and
  - Application for the Ash Emplacement project under part 3A (MP 09_0186) not yet determined.
- Activities such as those related to forestry operations and recreational activities (such as motorised vehicles on the Newnes State Forest);
- Existing Springvale Mine including:
  - longwalls 415 to 417 beneath Sunnyside Ridge Road;
  - an application to be made for one new dewatering bore 8; and
  - the existing ventilation facility and its approved upgrade
- Existing Pine Dale Mine including:
  - Part 3A approval in 2011 for the Yarraboldy extension of an open cut mine; and
  - A request for DGRs was lodged in December 2011 for an additional and larger extension to the open cut mine.
- The Lidsdale Siding Upgrade Project is a Centennial project to improve rail loading facilities including a reclaim tunnel and train track extension, near Wallerawang. DGRs issued in January 2012;
- Expansion of Invincible Mine is part of the Coalpac Consolidation project 10_0178 and includes an extension to the north by open cut and high wall mining.

The contribution of the Project to the major sources of potential cumulative impacts is tabulated below. These major impacts accord with the relative magnitude of the impacts disclosed in specialist reports supporting the Environmental Impact Statement, and Centennial's risk assessment in respect of the Project and the community's perception of these impacts, as expressed in the Community Consultation report. The latter was initially disclosed in the Government Briefing Paper relating to this project. The Social Impact Assessment relating to this Project (James Marshall & Co.) has also examined cumulative impacts from the perspective of a sensitivity analysis, based on alternative scenarios for the future of the Western Coal Services Site. This material indicates that in the context of the feasible alternatives available to Centennial Coal, the proposed Project has been developed to sustain continued operations and the associated socioeconomic benefits that capital and operational investment brings to the region. The Project also includes a robust suite of mitigation programs and activities aimed at managing negative impacts. In balance, the Project as proposed represents an economically and environmentally sustainable development, in the context of an area of extensive existing industrialisation.

Table 10: Specialist assessment of project contribution to cumulative impacts

Description	Assessed cumulative impact
Noise and vibration	Cumulative mining and industrial noise sources at or below relevant acceptable amenity levels (day and evening). Cumulative level exceedance at night time for four (4) residential receivers.
Air quality	Probability modelling method suggests that exceedances are likely to occur on less than one day per year, or, alternatively 0.3% of the time.
Visual	Proposed elements will be satisfactory in the environment where appropriate rehabilitation and mitigation measures are taken.
General resident amenity	Within the main residential area of Blackmans Flat, there a number of residences where conventional strategies to manage the impacts of noise, dust and a changed visual environment may be difficult to achieve. On this basis, Centennial has developed, following direct engagement with residents in the main residential area of Blackmans Flat, a strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents.

5.2 Intra-generational and inter-generational equity

The positive economic impact of mining and related services to the regional community is substantiated in the assessment of economic impacts undertaken in this document, and in the conclusions contained in the LCC Economic Development

Strategy. The evidence suggests that the positive effects of these contributions on the regional economy are apparent and significant. The EDS in particular emphasises the economic risk that possible reductions in mining activity pose for the region. The mining sector is the major regional economic driver of the sustainability of commercial, retail and service industries in the area. The proposed Project will promote intra-generational equity, as it will facilitate the continuation of mining at a level that supports present mining production and employment and contributes to sustaining the local economy to the benefit of the broader community. The benefits of increased access to export markets that the infrastructure upgrade would facilitate also have broader positive implications for the NSW and Australian economies over a period of approximately 20 years.

From the perspective of intergenerational equity, the continuation of Centennial's mining activity, which is supported by the Project, will also sustain longer-run employment in the mining industry and in the other sectors that benefit from the flow of mining-related expenditure and incomes through the regional economy. A withdrawal or reduction in these economic stimuli will eventually have broader and longer-run impacts, negatively affecting the sustainability of businesses in the Lithgow region and placing the availability of more diverse local employment opportunities at risk. The present proposal will forestall this outcome and allow local and state authorities' additional time in which to develop and institute policies for socioeconomic sustainability and environmental recovery after the ultimate cessation of mining.

In addition to consumption effects, such direct and extended impacts would also be likely to entail household wealth effects in the region. A decline in overall business activity that would flow from any significant curtailment in mining may result in negative impacts on property values and other forms of savings that have some influence on longer-run household finances. In order to address associated changes in lifetime consumption preferences, households may reduce immediate consumption, further inhibiting regional economic stability. It is clear that the LCC EDS anticipates such a threat in relation to possible contraction of the regional mining industry. It follows that in its key role in augmenting Centennial's current export capability, the Western Coal Services Project will provide greater certainty for the regional economy over the life of the Project and those of the mines it will support. This level of certainty is best exemplified by the 570 mine positions (including contractors), and 18 WCS positions that will be supported by the capacity created through this Project. From a public administration perspective, the Project will

forestall reductions in mining activity, which in turn will contain increases in transfer payments and other reactive solutions that create demands on public finances and other resources, and provide scope for development of post-mining socioeconomic strategies.

With particular regard to the most affected residents of Blackmans Flat, there are also qualitative intergenerational impacts. As is noted in the SIA, these affected parties expressed concerns in relation to ongoing financial security and health, among other issues. Following direct engagement with residents in the main residential area of Blackmans Flat, Centennial has developed a strategy to manage the cumulative impacts on these residents resulting from the various incompatible land uses

6. SUMMARY

The proposed capacity upgrade for Western Coal Services is an integral part of Centennial's export supply chain infrastructure in the Western Coalfield. The economic analyses conducted in this report establish that the Project will have a positive economic impact on operating outcomes for Centennial. This is principally a result of the role of the Western Coal Services Project in supporting continued operations and associated employment at Springvale Mine and Angus Place Colliery and possibly other Centennial mines and resources in the area, allowing greater access to export opportunities and providing scope for potential future production.

The assessment of the importance of mining in the regional economy is emphasised in the Lithgow City Council EDS. The Environmental Impact Statement also recognises the crucial contribution of mining to the region identified during the community consultation process relating to this proposal. In addition to these regional benefits, benefits to NSW in terms of royalty income and Australia with respect to the potential for tax revenues associated with increased export revenues are also anticipated.

Along with these significant economic benefits, there are number of specific and broader socioeconomic and environmental impacts that are assessed in this analysis. In considering these matters, it is important to acknowledge that in each instance Centennial has developed and/or is pursuing mitigatory and/or compensatory strategies to ameliorate impacts associated with the Project.

The notional valuation of these costs indicates that they are of lesser magnitude than the positive benefits to be realised from the Project and its flow-on benefits. Although economic valuation is one valid measure of externalised impacts, Centennial recognises that the community may value certain environmental or social ‘assets’ in other ways. The valuation methodologies applied in these analyses are based on concepts such as ‘willingness to pay’, hedonic pricing and cost of injury/cost to replace. The latter is particularly relevant in relation to assessments of air quality impacts, as this assessment addresses health impacts from the perspective of ‘cost of injury’. As such these qualitative aspects are recognised in the analysis.

The approaches proposed by Centennial to mitigate relevant impacts may further reduce the level of negative externalities. This is particularly relevant to the residents of Blackmans Flat. Centennial Coal has developed a strategy to manage the cumulative impacts derived from the various incompatible land uses on these residents which will benefit the parties directly involved, the LGA more broadly, and will also entail positive outcomes in terms of intergenerational equity.

REFERENCE LIST

AECOM (2012): *Phase 1 Environmental Site Assessment, Coal Services Site Upgrade Project, Blackmans Flat NSW*, AECOM, Sydney NSW.

Allen Consulting Group (2005): *Valuing the Priceless: The Value of Heritage Protection in Australia*, Research Report 2, Heritage Chairs and Officials of Australia and New Zealand, Sydney.
<http://www.heritage.nsw.gov.au/docs/Research_ValuingthePriceless_2005.pdf >

Australian Bureau of Statistics (2012): 2011 Census Data
<http://www.abs.gov.au/websitedbs/censushome.nsf/home/data?opendocument#from-banner=LN >

Australian Government Department of Foreign Affairs and Trade (2012): Australian Treaty Series 1989 No.36. AGPS Canberra.
< http://www.austlii.edu.au/au/other/dfat/treaties/1989/36.html >

Barnson Pty Ltd (2012): *Traffic Impact Assessment, Centennial Coal Services Upgrade*, Barnson Pty Ltd, Dubbo NSW.

http://www.bree.gov.au/documents/publications/req/REQ_MAR2013.pdf

Centennial Coal (2012): *Springvale Coal Services Upgrade Project Briefing Paper.* Centennial Coal, Sydney NSW

Cultural Ministers Council (2001): *Multipliers for Culture and Related Industries*, National Centre for Culture and Recreation Statistics, Australian Bureau of Statistics, November 2011.
<http://www.archive.dcita.gov.au/2007/12/cultural_ministers_council/media_releases/multipliers_for_culture_related_industries_2001#Output,20added20employment%20multipliers>

Day B, Bateman I & Lake I (2010): “Estimating the Demand for Peace and Quiet Using Property Market Data” EVRI reference number: 06153-105312
<https://www.evri.ca/Global/Splash.aspx >

DEC NSW (2005): “Health Costs of Air Pollution in the Greater Sydney Metropolitan Region” EVRI reference number: 07200-41439
<https://www.evri.ca/Global/Splash.aspx >

Environmental Valuation Reference Inventory.
<https://www.evri.ca/Global/Splash.aspx >

James Marshall & Co (2013): Social Impact Assessment, Western Coal Services Project, Blackmans Flat.
Land & Water Australia (2005): *Making Economic Valuation Work for Diversity Conservation:* Australian Government Department of Environment & Heritage
<http://www.environment.gov.au/biodiversity/publications/economic-valuation/pubs/economic-valuation.pdf>

Lithgow City Council (2010): Economic Development Strategy 2010-2014.
<http://archive.lithgow.nsw.gov.au/documents/Final%20EDS%20Strategy%20Adopted%202106.pdf >

New South Wales Department of Trade, Investment, Regional Infrastructure & Services (2012): *The Contribution of Primary Industries to the NSW Economy, Key Data 2012*. DTIRIS, NSW Government 2012.

New South Wales Treasury (2007): *Economic Appraisal Principles and Procedures Simplified*, Policy and Guidelines Paper TPP 07-6, Office of Financial Management, NSW Treasury, Sydney.

PAE Holmes (2012): *Air Quality Impact and Greenhouse Gas Assessment, Centennial Coal Services Site Upgrade.* PAE Holmes, Sydney NSW

Planning NSW (2002): *Guideline for economic effects and evaluation in EIA*.

Planning NSW (2012): Cost Benefit Analysis for mining and coal seam gas proposals (2012).

RPS (2012): *Ecological Assessment, Springvale Coal Services Washery Upgrade and Coal Distribution Project*, RPS Hamilton NSW.

RPS (2012): *Coal Services Washery Upgrade and Coal Distribution Project, Visual Impact Assessment,* RPS Australia East Pty Ltd, Sydney NSW.

SLR Consulting Australia Pty Ltd (2012): *Coal Services Washery Upgrade and Distribution Project – Noise Impact Assessment.* SLR Consulting, Newcastle NSW.

Streever WJ, Callaghan-Perry M, Searles A, Stevens T & Svoboda P (1998): "Public Attitudes and Values for Wetland Conservation in New South Wales, Australia" EVRI reference number 02309-0732 <https://www.evri.ca/Global/Splash.aspx >