PROPOSED LIDDELL COLLIERY CONTINUED OPERATIONS
REPORT ON THE ASSESSMENT OF A DEVELOPMENT APPLICATION
(DA 305-11-2001) PURSUANT TO SECTION 79C OF THE
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

FILE: S00/01703

1. INTRODUCTION AND BACKGROUND

1.1 The Applicant

The Applicant for the proposal is Liddell Coal Operations Pty Limited (Liddell Coal). Liddell Coal is a joint venture between Enex Coal Pty Limited (Enex Coal) and Mitsui Matsushima Australia Pty Limited. Subsequent to the lodgement of the Development Application (DA), Xstrata Resources acquired Liddell Coal.

1.2 Overview of the proposal and its location

Liddell Coal seek approval for the continued operations at the Liddell Colliery, located between Lake Liddell, Hebden Road, Antiene Rd, and the New England Highway, approximately 25 kilometres north-west of Singleton (Refer to Figure 1). The proposal falls partly within both the Singleton and Muswellbrook local government areas (LGAs).

There is a relatively long history of coal mining activities at the Liddell Colliery with the site comprising parts of areas that were formerly held by other operators. Subsequently there are a number of development consents that relate to the Liddell Colliery site. As such the Applicant is seeking approval to consolidate the existing consents for the mining operations and allow the continuation of mining for an additional 21 years at the Liddell Colliery.

The proposal is expected to have a capital investment of approximately $54 million. Liddell Coal operations currently employs approximately 150 people, of whom 50 are Liddell Coal staff and 100 are employees or permanent subcontractors of the mining contractors. The proposal will provide continued employment opportunities for these employees.

The Applicant proposes to increase Run-of-Mine (ROM) coal production at the Liddell Colliery from 3 million tonnes per annum (Mtpa) to approximately 4.5 Mtpa as a result of the introduction of larger scale machinery. The EIS describes that as of June 2001, the estimated total resource present within the Liddell Colliery Holding was approximately 643Mt (million tonnes). The Liddell Project proposes to mine approximately 90.8Mt of this total resource, predominantly targeting the Liddell and Barrett Seams of the Wittingham Coal Measures.

Product coal is to be transferred via the Liddell Coal loading facility and the Main Northern Railway to the Port of Newcastle, using existing infrastructure. The coal will then be exported from the Port of Newcastle ship loading facility. A limited amount of old tailings will be hauled by truck to the nearby Macquarie Generation power stations.

The proposed open cut mine extension will utilise the existing Liddell Colliery facilities, however the administration, workshop, store, and amenities facilities will need to be relocated to permit mining of the existing site. Open cut mining will be extended to two new pits to the south-east of the existing operations, and mining techniques will be modified to allow greater flexibility and to maximise production. The proposal also includes the establishment of new water management infrastructure, a new access route from Old State Highway, and relocation of telecommunications and electricity infrastructure.

The EIS outlines that the majority of the future open cut operations during the 21 year period will be concentrated in the southern portion of the DA area, although completion of mining in the specific areas of the partially mined Mountain Block, Reservoir Block, Antiene East Block and Railway Block to the north (refer to Figure 4.1 of the EIS) will be undertaken in the first four years. Mining to the south will essentially comprise an extension of the Central, South and Ten North Pits (known as the South Pit) on the western side of the Main Northern Railway and the

extension of the Barrier and Entrance Blocks (known as the Barrier Pit) on the eastern side of the Main Northern Railway. Mining in the South Pit and the Barrier Pit will progress in a south-easterly direction and down dip, and will result in mining through underground workings.

1.3 State Significant, Integrated, Designated Development

The proposal is defined as State Significant Development under the *Environmental Planning and Assessment Act 1979* ("the Act"). As such, the Minister for Planning is the consent authority for this DA. Under Section 91 of the Act, the development proposal is also an 'integrated development', as, in addition to requiring development consent, the application requires other approvals or licences from other government agencies. These licenses or approvals include:

- An environment protection licence from the Environment Protection Authority under section 48 of *the Protection of the Environment Operations Act 1997*;
- A permit from the Department of Land and Water Conservation under Part 3A of the *Rivers and Foreshores Improvement Act 1948*, a licence under section 116 of the *Water Act 1912* and an authority under Part 8 of *the Water Act 1912;*
- Consent from the National Parks and Wildlife Service under section 90 of *the National Parks and Wildlife Act 1974*;
- An approval from the Mine Subsidence Board under section 15 of the *Mine Subsidence Compensation Act 1961*; and
- Approvals from Muswellbrook Shire Council and Singleton Shire Council under section 138 of the *Roads Act 1993*.

The approval bodies have submitted their general terms of approval (GTAs), which have generally been adopted as conditions in the recommended instrument of consent. All the approval bodies have been consulted in relation to the consent conditions and are satisfied that their general terms of approval have been included in the conditions.

The proposal is also Designated Development under the *Environmental Planning and Assessment Regulation 2000* ("the Regulation") and an EIS has therefore been prepared in support of the application.

1.4 Lodgement of DA and exhibition

On 1 November 2001 Liddell Coal lodged the DA and EIS with the then Department of Urban Affairs and Planning. The DA and EIS were publicly exhibited from 20 November 2001 until 9 January 2002, in accordance with the *Environmental Planning and Assessment Act, 1979*. Submissions were received until close of the exhibition period. A detailed summary of submissions resulting from the public exhibition of the proposal is given at Appendix 1.

Public notification of the DA involved the placement of notices in the *Singleton Argus* and *the Muswellbrook Chronicle*, and the placement of site signs at various locations on and around the DA area. The Department also advised all adjoining and surrounding landowners of the proposal in accordance with legislative requirements.

The Department is satisfied that the requirements for public exhibition of the DA and EIS and public participation have been fully met.

1.5 Local Council position

- Singleton Shire Council

Singleton Shire Council (SSC) considered the application and provided no objection to the proposal. However, SSC requested additional information regarding works to be carried out within public road reservations. The Applicant subsequently provided this information to the Council. Once these issues were resolved, Council resolved to support the application for continued operation at the Liddell Colliery, subject to conditions and the inclusion of Council's GTAs. These conditions and GTAs have been incorporated in the recommended conditions of consent to the council's satisfaction.

- Muswellbrook Shire Council

Muswellbrook Shire Council (MSC) resolved to support the application, subject to a number of conditions being incorporated in the final instrument of consent. These conditions generally related to the formulation of plans of management, auditing of the operations and agreements for Section 94 contributions. These negotiated conditions and GTAs have been incorporated in the recommended conditions of consent to the Council's satisfaction.

1.6 Government agencies' position

A total of 11 submissions were received from government agencies, including Singleton Shire Council and Muswellbrook Shire Council. No agencies raised objections to the proposal. However, a number of issues were raised in submissions which either required the Applicant to undertake further assessment or provide clarification, including impacts of discharges on local watercourses and water quality, impacts on infrastructure, and road works. The issues and points of concern raised in these submissions were forwarded to the Applicant for further consideration, and where appropriate, further assessment. The Department is satisfied that all issues have been addressed adequately by the Applicant and are considered in detail in this Report.

1.7 Local community position

No submissions were received from private individuals, however submissions were received from the Hunter Valley Water User's Association, and the Nardell Coal Corporation (Nardell Coal Mine). The Hunter Valley Water User's Association raised concern regarding the amount of saline water to be discharged and submitted that there should be monitoring beyond every discharge point in the river. Nardell raised concern regarding the impacts of blasting on Nardell's workings, potential for inflows into the underground workings and the significant increase of water to be discharged. The Department requested that the Applicant respond to these issues and believes that they have been adequately resolved or are adequately addressed by the recommended conditions of consent.

1.8 Request for Commission of Inquiry

No submissions were received requesting a Commission of Inquiry for this proposal.

2.0 THE PROPOSAL

2.1 Site details and infrastructure

Liddell Coal seeks development consent to continue the existing open cut coal mining operation at Liddell Colliery located approximately 25 kilometres north-west of Singleton in the Upper Hunter Valley (refer to Figure 1). The current Colliery holding comprises the former Liddell, Durham, Hazeldene and Foybrook mines which commenced underground mining in 1923. The Colliery has been in continuous operation using open cut or underground mining methods since the 1950s and is located within an area dominated by mining and power station activities.

The site falls partly within both the Singleton and Muswellbrook LGAs. The site is generally bisected north-south by the boundary between Singleton and Muswellbrook LGAs and north west-south east by the Main Northern Railway (refer to Figure 1).

The existing office and amenities located within the Coal Preparation Plant (CPP) complex will continue to service the requirements of the continued operations of this Project. The open cut administration and contractor facilities will be removed, prior to the mining operation encroaching on the area, in approximately Year 15. All open cut and contractor administration personnel will be relocated to the existing CPP office complex and two demountable office buildings will be established. The existing workshop at the CPP complex will be used to service contractor plant and equipment. The Applicant considers that, with the inclusion of the demountable buildings, the CPP complex facilities will be sufficient to accommodate the additional personnel.

In addition, a new road will be required to access Liddell Colliery, as a private section of Pikes Gully Road and part of the Old State Highway will be mined under this proposal. The Old State Highway is administered by Singleton Shire Council and Muswellbrook Shire Council, and therefore an approval is required from these authorities under the *Roads Act 1993*. Both Council's have indicated that they will be in a position to grant such an approval. The new access road will be a two lane, all weather road which will intersect the Coal & Allied Haul Road on the southern side of Bayswater Creek.

The proposed mining operations will also require relocation of a number of 11kV electricity lines and copper cable telecommunications lines that service Liddell Colliery. Conditions of consent require the Applicant to consult with affected service authorities, including Energy Australia, Telecommunications Infrastructure Providers and the Land Information Centre, when preparing the Mining Operations Plan. Following this consultation, the Applicant shall make arrangements satisfactory to those authorities for the protection or relocation of services, with particular reference to transmission lines, optical fibre cables and copper network cables and State Trigonometric Points.

Further, a level crossing over the Main Northern Railway will also be required in order to transfer large equipment across the railway line to and from the South and Barrier Pits. The conditions of consent provide that the Applicant shall construct, locate and operate the level crossing over the Main Northern Railway, generally in accordance with the Figure 4.10 of the EIS and in consultation and to the satisfaction of Rail Infrastructure Corporation (RIC). The consent also provides that the Applicant shall develop a protocol in consultation with RIC to schedule the use of the level crossing to accommodate the train schedule of Main Northern Railway. The transfer of large equipment across the level crossing will be supervised by RIC.

2.2 Land Ownership and Land Use

The current Colliery Holding comprises the former Liddell, Durham Hazeldene and Foybrook Mines, which commenced underground mining in 1923 and open cut mining in 1946. The Colliery has been in continuous operation, using open cut or underground mining methods since the 1950s.

The majority of the land within the DA area is either owned or leased by Liddell Coal or its parent company. Other landholders with the DA area include:

- Novacoal (a subsidiary of Coal & Allied);
- Singleton Shire Council - as the manager of part of Old State Highway;
- Muswellbrook Shire Council - as the manager of part of the Old State Highway, and
- DLWC as the manager of a small number of Crown road reserves and a parcel of foreshore reserve.

All landholders granted landholder's consent to lodge the DA over the respective parcels of private land.

The majority of the land surrounding the Colliery, particularly to the west, south and south-east, is occupied by mining and power generation operations. Land to the north, north-east and east of the Colliery is generally privately owned rural land, and predominantly used for grazing purposes. The nearest residences are located approximately 1 kilometre to the east and north-east of the current operations, however all but one of these properties predicted to be impacted by this proposal have been previously acquired by mining or industrial operators

The Liddell Joint Venture owns one of the thirteen residences at which the relevant air quality criteria are predicted to be exceeded by this proposal. Of the remaining residences, eleven are now owned by Liddell's parent company, Xstrata Resources. The remaining residence is owned by Coal & Allied (Rio Tinto). A further private property (Scriven) is also potentially impacted by the proposal, however the residence on this property has been previously burnt down.

All the land subject to this DA is zoned Rural 1(a), except for an area adjacent to Lake Liddell, which is zoned Special Uses 5(a) an the Main Northern Railway corridor, zoned Special Uses 5(b). Land within the surrounding area is zoned Rural 1(a), with the exception of Liddell and Bayswater Power Stations (refer to Figure 2.1 in the EIS).

2.3 Production process and stages of development

Figure 4.1 of the EIS provides a description and schematic overview of the 21-year mine plan for the continued operations of the Colliery. The mine plan describes that Year 1 of the operation involves deepening of the existing pits without further pit expansion, except for a south-easterly extension of the Reservoir Block.

The EIS outlines that the majority of the future open cut operations during the 21 year period will be concentrated in the southern portion of the DA area, although completion of mining in the Mountain, Reservoir, Antienne East and Railway Blocks to the north will be undertaken in the first four years. The majority of mining in these northern areas will be completed within the subsequent 18 months following the lodgement of the DA and will comprise deepening of the pits without substantial additional disturbance.

Mining to the south will essentially comprise an extension of the Central, South and Ten North Pits (known as the South Pit) on the western side of the Main Northern Railway and the extension of the Barrier and Entrance Blocks (known as the Barrier Pit) on the eastern side of the Main Northern Railway. Mining in the South Pit and the Barrier Pit will progress in a south-easterly direction and down dip, thereby continuing to mine through underground workings.

Mining in the Barrier Pit will be completed by Year 15, however this pit will be left open for water storage and potential future mining. Shaping and rehabilitation of overburden will continue on the north-western side of the Main Northern Railway after this period. The Year 21 conceptual mine plan is based on the assumption that mining would continue southwards subject to further development consent at the end of the 21-year mining operation (refer to Figure 4.2- 4.4 of the EIS). In the event that Liddell Coal does not continue mining after the expiration of this consent, the site will be returned to a final landform.

The Applicant advises that the conceptual mine plan has been designed to accommodate mining by either dragline or truck and excavator operations, and the EIS describes that a combination of mining techniques may be used at the site to allow greater flexibility in the extraction of the resource. It is proposed to continue using truck and excavator mining methods for the first two years of the operation. The EIS proposes that one of the existing excavators will be replaced by a larger 800-tonne excavator. A fleet of 240-tonne trucks would be required at the same time to service this unit. The EIS notes that in Year 4, a decision will be made on the introduction of a dragline. If a dragline were to prove feasible it would commence operations in the South Pit. If the dragline does not prove feasible, the remaining small excavator will be replaced by an additional 800 tonne excavator and a further fleet of 240 tonne rear dump trucks.

The processing of the extracted coal and the transportation arrangements are discussed in Section 2.5 of this Report.

2.4 Annual production, hours of operation and employment

The EIS describes that as of June 2001, the estimated total resource present within the Liddell Colliery Holding was approximately 643Mt. The Liddell Project proposes to mine around 90.8Mt of this total resource, predominantly targeting the Liddell and Barrett Seams of the Wittingham Coal Measures. These seams are reported to range from 0.4 metres to 9 metres in thickness and are suitable for thermal and coking coal purposes.

As a result of the introduction of larger scale machinery, ROM coal production from the mine will increase from approximately 3Mtpa to 4.5Mtpa. The estimated coal production rates throughout the 21-year operation are shown in Table 1 below.

Table 1 - Production schedule

Year	Coal (ROM) Mt	Coal (Product) Mt*	Cumulative ROM Production (Mt)
1	3.8	2.7	3.8
7	4.0	2.8	27.8

14	4.5	3.2	59.3
21	4.5	3.2	90.8

Note: *Based on current predictions of ROM coal suitability for product. These tonnages may vary during the life of the project, with maximum product coal potentially being equal to ROM coal extracted.

To allow for the continued operations at the Liddell colliery and extension of the pits, the EIS describes that it will be necessary to construct an access road, level crossing and mine water dams. The construction of this infrastructure will be undertaken progressively over the life of the 21-year operation. The peak number of construction employees engaged in these activities will be approximately 20. Construction activity will be conducted during daylight hours, six days per week.

Liddell Coal operations currently employs approximately 150 people, of whom 50 are Liddell Coal staff and 100 are employees or permanent subcontractors of the mining contractors.

Mining activity and coal production are currently conducted 24 hours per day, seven days per week. Train loading is conducted 24 hours per day, subject to shipping demand and availability. The EIS advises that there is no expected change in the existing workforce for this proposal. The Applicant proposes that hours of operation will continue to be seven days per week, 24 hours per day.

2.5 Transport arrangements and coal preparation

The EIS describes that coal is transported by truck along internal haul road to the ROM receival facility located to the north-west of the CPP building. ROM coal stockpiled at the ROM receival facility is reclaimed and loaded onto a feeder conveyor, for direct transfer to the CPP. The CPP has the capacity to process up to 4.5Mtpa of ROM coal to produce semi-soft coking coal and thermal coal. The coal is broken down, then washed, screened, rinsed, crushed, dewatered and stacked in product coal stockpiles. Coal is reclaimed from the product coal stockpiles and loaded onto trains through a loading bin on the Newdell rail loop

Product coal will continue to be transported to the Port of Newcastle by rail via the Liddell rail loading bin, Newdell rail loop and Main Northern Railway. The proposed increase in ROM coal production from 3 Mtpa to 4.5 Mtpa will lead to an increase in product coal transportation from approximately 2.25 Mtpa to 3.4Mtpa. However, there will be no increase in the peak daily train trips of five (10 train movements, as the daily throughput of from Liddell Colliery is limited by other coal loading facilities on the Newdell rail loop). However the number of days on which train movements occur will increase, with train loading occurring on approximately 127 days per year.

2.6 Justification

The Applicant provides various justifications for the proposal proceeding. Should continued operations at the Liddell Colliery occur, the EIS submits that there will be immediate benefits to the community through the continuation of employment opportunities. This will provide continuation of employment for approximately 50 Liddell Colliery employees and approximately 100 contractors. In addition, the proposal will improve the long-term efficiency and economics of the Liddell Coal Mining operations, ensuring ongoing product flexibility and competitiveness in the coal market. As the proposal constitutes the continuation of existing operations at the site, it is considered that there will be no significant economic or social impact on the communities of Singleton or Muswellbrook. Similarly, there will be no impact on social infrastructure such as education health or recreation services and no need for additional accommodation. The Department concurs that there would however be significant social and economic impacts if the colliery does not continue to operate due to lost employment and revenue.

2.7 Amendment to the DA

Following the review of the EIS and the issues raised by key government agencies, the Applicant elected to amend the DA prior to determination. Since the DA was lodged, the Applicant advised the Department about two significant changes in the proposed on-site water management regime occurred. A more detailed engineering design undertaken by the Applicant indicated that Dam 13B would have a live capacity of 5000ML rather than the

conceptual estimated of 3200ML. The information provided by the Applicant indicated that the additional capacity of the dam is located entirely within the footprint illustrated in the EIS for this dam.

A number of additional opportunities for off-site transfer of water from Liddell Colliery were realised. The Applicant advised that the Howick coal preparation plant has increased operations and is taking approximately 15-20ML/week and a borehole has been approved by DLWC to allow Mt Owen Mine to access water stored in the Liddell underground workings (up to 42ML/ week). The Applicant revised the water management model to take these factors into consideration. The results from the revised water management modelling indicate that discharge to Bowmans Creek will not be required, provided that sufficient water can be discharged under the Hunter River Salinity Trading Scheme to Bayswater Creek using a staged discharge arrangement.

On this basis, Liddell Coal has amended the DA boundary to remove the Ravensworth Dam, and the pipeline between Dam 13B and the Ravensworth Dam. The Department concurs that the proposed amended application represents a reduction in environmental impacts associated with the proposal. The integrated approval bodies were notified of this amendment and no objections were raised.

3.0 STATUTORY PLANNING MATTERS

Various State, regional and local statutory planning provisions apply to the proposed mine. The proposal is a "designated development" under Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* and an EIS has been prepared in support of the application.

3.1 Local Planning Considerations

The Project is within both the Singleton Shire Local Government Area and the Muswellbrook Local Government Area.

3.1.1. Singleton Shire Local Environmental Planning Considerations

The planning provisions for the Shire are contained within the Singleton Shire Local Environmental Plan (LEP) 1996. Under this plan, the proposed Project area is zoned 1(a) Rural. The Applicant advises that the proposal is consistent with the objectives of the zone and is permissible with development consent. The Department is satisfied that the project is permissible and consistent with the zone objectives.

3.1.2. Muswellbrook Shire Local Environmental Planning Considerations

The planning provisions for the Shire are contained within the Muswellbrook Shire Local Environmental Plan (LEP) 1985. Land subject to the DA is within the following zones:

- Zone No. 1(a) (Rural 'A' Zone);
- Zone No. 5(a) (Special Uses "A" Zone); and
- Zone No. 5(b) (Special Uses "B" (Railways) Zone.

The EIS advises that the proposed mining activities are permissible within zone No. 1(a) with development consent. However, the activities are not permissible within Zone No. 5(a) and No. 5(b). The Applicant notes that in accordance with Section 76(A)8 of the EP& A Act where part of a proposal is SSD and would be prohibited under the planning provisions, the development may be carried out with development consent. For the current proposal, the Department concurs that the majority of the land within the DA area is zoned 1(a), under which mining is permissible with development consent.

3.2 Regional Environmental Plans

The Hunter Regional Environmental Plan (REP) 1989 applies to the proposal. The REP provides a framework to guide and control growth and development in the region. The REP includes objectives relating to the management

of coal and other mineral resources and extractive industries in the region. The Department considers that the proposal is consistent with the objectives of the REP.

3.3 State Environmental Planning Policies (SEPP)

SEPP No. 33 (Hazardous and Offensive Development)

SEPP 33 was introduced in 1992 to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact.

The Department has reviewed the proposed development and concluded that it is not considered to be "potentially hazardous development" as it does not pose a significant off-site risk impact (unmitigated scenario). As such the proposal does not trigger the risk impact provisions of the SEPP and a Preliminary Hazardous Analysis is not required.

SEPP No. 34 (Major Employment Generating industrial Development)

SEPP 34 prescribes that the Minister for Planning is the consent authority in respect of development to which the policy applies. The SEPP applies to projects which, in the opinion of the consent authority, have a capital investment of $20 million or more, or would after the construction stage employ 100 or more persons on a full time basis.

The proposal is expected to have a capital investment of approximately $54 million and will provide continued employment for approximately 150 people. The project therefore satisfies the provisions of this SEPP, as validated by the Minister on 27 March 2002.

SEPP No. 44 (Koala Habitat Protection)

SEPP 44 applies to both Singleton and Muswellbrook Shires, as it is identified in Schedule 1 of the policy as a local government area where koalas are known to occur. The Applicant advises that a detailed assessment has been conducted to determine whether the site contains core koala habitat and these findings are summarised in Section 2.3.4 of the EIS and are presented in full in Appendix 4 of the EIS. This assessment concludes that no core Koala habitat was found to occur at the site and therefore there is no requirement to prepare a Koala Management plan for this site. The Department concurs with this assessment.

SEPP No. 45 (Permissibility of Mining)

SEPP No. 45 provides that if mining is permissible on land with development consent in accordance with an environmental planning instrument and the provisions of that instrument are satisfied then mining is permissible on that land without those provisions having to be satisfied. Mining is permissible under the current Rural 1(a) zoning, which constitutes the majority of the DA area, and therefore there is no need to invoke SEPP 45 for this proposal.

3.4 Schedule 3 of EP&A Regulation

Under Schedule 3 of the *Environmental Planning and Assessment Regulation* (the Regulation), the proposed development is defined as 'designated development' since it is a 'Coal Mine'. The proposal is an open cut mine which will produce or process more than 500 tonnes of coal per day and will disturb a total surface area of more than 4 hectares of land. Subsequently, this required the preparation of an EIS in support of the DA.

Director-General's requirements for the EIS were issued to the Applicant on 5 February 2001. The EIS was prepared by Umwelt (Australia) and submitted with the DA. The Department was satisfied that the Director-General's requirements had generally been addressed and the EIS was adequate to be placed on exhibition.

Procedures relating to the preparation and public notification of the EIS have been followed.

3.5 Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act)

The Commonwealth EPBC Act commenced operation on 16 July 2000, with the primary objective of providing protection for the environment, particularly those aspects of the environment that are matters of "national environmental significance". The EPBC Act establishes a scheme requiring environmental assessment and approval of proposals likely to significantly impact on such matters and a determination by the Minister as to whether the proposal is a "controlled action" under the EPBC Act.

The EIS advises that as the project does not relate to any of the matters of national environmental significance prescribed by the Act, approval from the Commonwealth Minister for the Environment is not required for this proposal. The Department concurs with this conclusion.

3.6 Threatened Species Conservation Act, 1995

The EIS addresses each of the matters set out in section 5A of the EP&A Act, and concludes that there was unlikely to be a significant impact on threatened species and therefore a species impact statement (SIS) was not required. The Department's review of this assessment noted that since the section 5A assessments were undertaken, there have been additions to the listed species and additional preliminary listings to the *Threatened Species Conservation Act 1995*. The Department therefore requested that the Applicant undertake further assessment of these species under the provisions of the Act, and further written evidence was provided for the Department's consideration The Department's assessment of flora and fauna, which is detailed in the "Department's Consideration" section below, and concludes that the proposal is unlikely to significantly impact on any threatened species.

3.7 Conclusion

The proposal is in accordance with the provisions of all the relevant environmental planning instruments.

4.0 SUBMISSIONS RECEIVED

In accordance with section 79 of the EP&A Act, the Department received a total of 13 submissions in response to the exhibition of the proposal. Eleven of these submissions were received from Government agencies, one from a special interest group and one from a nearby coal company. The issues raised in these submissions are summarised in detail in Appendix 1. The submissions and position of the Muswellbrook and Singleton Local Councils are considered in Section 1.5 of this Report.

4.1 Government agencies

In response to the exhibition of the document and review by the agencies, the Department received 11 submissions from government agencies, including two submissions from Singleton Council and Muswellbrook Council. Four of these submissions were formal requests for additional information from integrated approval bodies, as discussed below.

None of these submissions raised any direct objections to the proposal, however several agencies did provide comment on the assessment undertaken for the project and/ or required clarification as to certain potential impacts.

The Department's consideration of the issues raised by government agencies is provided in Section 5 of this Report.

The key comments raised by these agencies included the following. Agencies not specifically mentioned below did not raise any objections or provide comments.

Key issues and requests for additional information

- NPWS

NPWS requested additional assessment regarding the archaeological and aboriginal cultural assessment. Specifically NPWS required a geomorphic assessment and improved mapping of the locations of the material, clarification of past disturbance of the sites, concerns regarding the representativeness in the sampling of the study area and the justification for the criteria applied to the assessment of the sites. This information was provided to the satisfaction of NPWS and the agency subsequently provided GTAs for the proposal.

- EPA

EPA requested additional information regarding the increases in salinity in Bowmans Creek, further explanation about the water management system and water storage, further justification for discharges to the Hunter River and Bowmans Creek and demonstration of the impacts of discharging saline water. EPA also sought further clarification about the ownership of residences and clarification of cumulative dust impacts. This information was provided and EPA subsequently provided GTAs for the proposal. The EPA also raised some concerns about the potential health impacts on tenants of properties which have been previously acquired by mining companies and requested that this concern be addressed by the conditions of consent. The Department is satisfied that an appropriate approach has been developed in the conditions of consent to advise tenants about the potential health impacts associated with exposure to particulate matter.

- DLWC

DLWC requested further information, including a detailed analysis to quantify the likely range of salinity increases in Bowmans Creek if leakage occurs, assessment of the post-equilibration of local groundwater tables and the post-mine life groundwater table equilibration levels. DLWC also requested an assessment of the likelihood of each water management scenario, details of a remediation program and performance measures for remediation procedures adopted for managing the impacts of mining on Bowmans Creek. Further, DLWC requested details of a timetable for remediation of groundwater or time periods during which Liddell Coal will accept responsibility for management of on-site groundwater affected by the proposal. This information was provided to the satisfaction of DLWC and the agency subsequently provided GTAs for the proposal.

- NSW Fisheries

NSW Fisheries did not raise any objection to the proposal however noted concerns about discharges to Bowmans Creek and the possible impacts on aquatic plant and animal communities from increased salinity.

- NSW Heritage Office

The Heritage office expressed satisfaction with the European heritage assessment and requested that the management strategy outlined in the EIS be formalised in the consent conditions.

- DMR

DMR expressed support for the increased production, increased employment and expressed satisfaction that all issues have been addressed and that environmental issues are manageable.

4.2 Public submissions to the proposal

The Department did not receive any submissions from private individuals in response to the exhibition of the EIS. However submissions were received from the Hunter Valley Water User's Association and the Nardell Coal Corporation.

The Hunter Valley Water User's Association raised concern as to the amounts of saline water to be discharged and its impact on Hunter River. These issues are discussed in Section 5.1 of the Report. Nardell Coal raised a number of concerns including the potential for blasting impacts on Nardell's workforce and the main underground headings; increases in water discharges; impacts on infrastructure that crosses the Creek, and in respect of the potential for inflows into the underground workings at Nardell as a result of the increased water discharges into Bayswater Creek. These concerns are addressed in Section 5 of the report and an adequate response has been provided from the Applicant in regard to these issues.

4.3 Consideration of Need for COI

In response to the exhibition period, no submissions were received requesting a COI for the Liddell project. The key issues have been addressed to the satisfaction of the Department and other government agencies, and a number of stringent consent conditions have been recommended to ensure the predicted impacts from the mine can be adequately managed and mitigated, including environmental monitoring. The Department does not consider that a COI is warranted and it would not add any further value to the assessment process.

5. PLANNING NSW CONSIDERATION

Key issues

In the Department's opinion, the key issues for assessment, taking into consideration the submissions received on the proposal and the contents of the EIS, are:

- Impacts on surface water and groundwater
- Air quality impacts
- Noise impacts
- Impacts on flora and fauna
- Visual impacts
- Impacts on roads and transport
- Aboriginal and non-Aboriginal heritage.
- Socio-economic impacts
- Building assessment

5.1 Surface and groundwater

The Applicant engaged Mackie Environmental Research to undertake a surface and groundwater assessment of the continued mining operations. The key findings of this report are contained in Section 5.4 of the EIS and are included in full in Appendix 6 to the EIS. The Applicant also commissioned Umwelt (Australia) to undertake an assessment of the potential impacts on Bayswater and Bowmans Creeks as a result of mine water discharges from Liddell Colliery in accordance with the Hunter River Salinity Trading Scheme (HRSTS) as detailed in Appendix 7 of the EIS.

The Applicant's position

- Groundwater impacts

The Applicant reports that the Liddell Colliery is located in an area with two general aquifer types: an alluvial aquifer associated with Bayswater and Bowmans Creek and a more regional hardrock aquifer associated with the coal measures. The EIS notes that the alluvial aquifer is unconsolidated and highly permeable, while the hardrock aquifer provides limited groundwater storage and transmission. The alluivial aquifer of Bowmans Creek is described in the EIS to contain high quality water and has sufficient yield to provide water supply for irrigation, stock and domestic purposes. However the EIS notes that the water held in the hardrock aquifer is of poor quality and low yield.

Mackie Environmental Research undertook computer based modelling of current and continued mining in order to predict the groundwater flow processes that could evolve during operations at Liddell Colliery. The simulations are reported to include the cumulative effects of existing operations at Cumnock No.1 Colliery and previous underground workings at Liddell Mine and Hazeldene Mine. This modelling predicts a peak groundwater seepage into the South and Barrier Pits of 0.55 ML/day from the Barrett seam and 0.70 ML/day from the Liddell seam. The increase in mine water make, together with dewatering of underground workings ahead of the mining operation and surface run-off is expected by the Applicant to generate approximately 8-11 ML/day, compared to existing water make of 5-8ML/day.

The EIS describes that mining operations over the next 21 years will extract coal to a maximum depth of 220 metres. Mining will result in depressurisation of the hardrock aquifer, which will be transmitted through the old underground workings and interburden. The Applicant describes that as the mine progresses down-dip, it will be necessary to further dewater the Liddell underground workings. Dewatering of the hardrock aquifer in the underground workings will also result in reduced groundwater levels and pressures within the affected coal measures. The Applicant advises that there will be no mining in the alluvial aquifer, however the EIS describes that the fall in groundwater pressures may change the leakage between alluvial and hard rock aquifer systems.

Open cut mining is predicted to depressurise interburden layers and coal seams for a distance of approximately 1.5 km from the pit perimeters. This zone of depressurisation is described to be located entirely on land owned by Liddell Coal and other mining companies. The EIS notes that there are no registered groundwater bores or licensed surface water users within the area of predicted depressurisation.

- Surface water

The EIS describes that Liddell Colliery is located within the catchments of Lake Liddell to the west, Bowmans Creek (Foy Brook) to the east and Bayswater Creek to the south. Lake Liddell overlies a portion of the Liddell Colliery Holding, however there is no plan to mine beneath the lake. Active mining is located within 1 kilometre of both Bowmans Creek and Bayswater Creek.

Bowmans Creek is described in the EIS to be a southerly flowing drainage line, flowing along the eastern boundary of the current Liddell operations, before converging on the Hunter River. Bowmans Creek is a natural system with significant riparian and aquatic communities. The catchment of Bayswater Creek has been substantially disturbed by agricultural and mining activity and significantly reduced by the construction of Lake Liddell.

The EIS provides an assessment of the operational aspects of the mine water management systems using a dynamic modelling approach based upon prediction of runoff, flow to dams and pumping between dams. The model is described to incorporate mine water usage rates and HRSTS discharges at prescribed times and events and approximates water balances for the proposed operation under wet and dry conditions. These balances indicate that under wet conditions dam storage levels rapidly increase and it will be necessary to store surplus water in the underground workings, and construct additional storages. The scenario chosen in the EIS indicates that the predicted water make from this option is in the range of 0-7000 ML/day under all weather conditions over the last century. The median water surplus is estimated to be 2800 ML/year and it is indicated that water storages will need to be provided to contain surplus water.

The Applicant also advises that it is proposed to discharge mine water in Bayswater Creek via Dam 13B at a maximum rate of 1000ML/day. The Applicant also originally proposed to discharge into Bowmans Creek, however as outlined in the section “Water Storage - Amendments” of this Report, given the on-site developments with water management subsequently reviewed this requirement and determined that no discharge to Bowmans Creek would be necessary.

The calculated hydraulic capacity of Bayswater Creek is 2315 ML/day, and the tributary discharge limit for Liddell Colliery is calculated to be 1544 ML/day. The Applicant considers that the maximum proposed rate of discharge of 1000 ML/day is unlikely to adversely affect water quality in Bayswater Creek due to the degraded nature of the creek system.

The EIS describes that the discharge of mine water from Liddell Colliery will be governed by the rules of the HRSTS. The EPA has reportedly advised that a maximum river salinity is to be achieved during high and flood flows. The EIS reports that the maximum rate of discharge will meet the proposed salinity targets for upper limit flow thresholds and medium ambient river salinity levels.

The Applicant considers that surface water quality will be generally unaffected by mining operations through the installation and maintenance of erosion and sedimentation control structures. The EIS justified this position in that an extensive water quality management system is in place at Liddell Colliery, including a newtwork of clean water dams, sedimentation basins, raw water storage at Dam 13, Liddell CPP, Antiene void tailings storage, temporary in-pit storages and the old underground workings. The EIS notes that the water quality in rehabilitated areas will be monitored and impaired quality water will be maintained in the mine water system. The arrangement of these structures and the mine water management system in place is shown in Figure 5.2 to 5.4 of the EIS.

Management measures proposed by the Applicant

- **Groundwater**

The EIS describes that mine water make will be managed in essentially the same manner as is presently employed at the Liddell Colliery. In terms of groundwater, the EIS identifies that the key area to be managed is groundwater seepage in open cut and underground workings. The Applicant advises that surplus water will be managed in essentially the same way as is presently employed at Liddell, with advance dewatering of Liddell workings undertaken through sustained pumping at the existing 8 South bore holes to storage dams. However additional storage capacity may be required to contain the increased water make.

The EIS outlines that the proposed increase in water make as a result of dewatering of underground workings ahead of open cut mining operations will require augmentation of the existing on-site storage capacity. The Applicant advised that further more detailed engineering design prepared subsequent to the lodgement of the DA, indicates that Dam 13B will have a live capacity of 5000ML rather than the conceptual estimate of 3200ML.

Given the development in site water management since the lodgement of the EIS, namely the realisation of a number of additional opportunities for the off-site transfer of water from Liddell and the increase storage of Dam 13B, the Applicant advises that it will no longer be necessary to construct the Ravensworth Dam, nor discharge to Bowmans Creek from the Barrier dam. These arrangements are discussed in more detail below.

In addition, in order to minimise potential inflow from the Bowmans Creek alluvium and the old underground workings, the EIS describes that the hydraulic water level may be balanced between the old workings and the alluvium. This long-term natural equilibration of water levels between the underground workings and the alluvium is considered to reduce the potential flow of water either into or out of the alluvium by reducing the hydraulic gradient.

- **Surface water**

<u>Site water management</u>

The quality of the surface water will be managed primarily by the existing water management system at Liddell Colliery, which includes an extensive network of clean water dams, sedimentation basins, raw water storage, temporary in pit storages and the old underground workings. To augment the existing structures, a number of clean water diversion banks will be constructed to minimise the mixing of clean water with dirty water, and thereby reduce the volume of water to be treated in the sediment control system.

<u>Water make</u>

The EIS outlines that the proposal will result in an increase in water make from 5-8ML/day to 8-11ML/day as a result of a dewatering of underground workings ahead of open cut mining operations. This increase in water make will necessitate additional on site storage capacity and the Applicant proposes to construct a 5000 ML dam to replace the existing 676 ML dam.

<u>Water storage – amendments since lodgement of the DA</u>

The additional information provided to the EPA noted that two project changes occurred at the site since the preparation of the EIS. Firstly, more detailed engineering design indicates that Dam 13B will have a live capacity of 5000ML rather than the conceptual estimate of 3200ML. Secondly, a number of additional opportunities for the off-site transfer of water from Liddell have been realised, including the Howick CPP has increased operations and is taking approximately 15-20 ML/week and a borehole has been approved by DLWC to allow Mt Owen to access water stored in the Liddell underground workings (up to 42ML/week).

The revised water management model prepared following the request for further information from EPA indicates that discharge via Bowmans Creek will not be required provided that sufficient water can be discharged under the HRSTS via Bayswater Creek using a staged discharge arrangement. The Applicant submits that the stage discharged arrangement, in conjunction with the construction of Dam 13B is sufficient to provide a 90% probability

of on-site containment for the first 14 years of operation using a conservatively high assessment of both water make and off-site transfer to other mines.

The additional information outlines that if the upper bound water make estimates are realised during Years 14-21, it may be necessary to construct the Barrier Dam and/or retain water in worked out mine pits to compensate for the reduced storage capacity of Dam 13B by mining encroachment in these later years. However, the Barrier Dam will not discharge to Bowmans Creek under this DA and the proposed Ravensworth Trig Dam and pipeline will not be required.

Issues raised in the submissions

A number of submissions were received by the Department concerning the potential surface and groundwater impacts of the proposal. These submissions included three key government agencies requests for additional information regarding the potential water impacts of the proposal on surface and groundwater. The issues raised by the agencies are outlined below.

- EPA

The EPA requested additional information on a number of issues. Firstly, the EPA required more details quantifying the daily range of salinity increases in Bowmans Creek if leakage occurs and an update of the information in the EIS regarding the water quality guidelines. In addition, the EPA required further information explaining and justifying the scenarios chosen in water management systems; explanation and justification for discharges to Hunter River and Bowmans Creek; and impacts of saline discharges. The Applicant provided this information to the satisfaction of the EPA and the agency subsequently provided GTAs for the proposal.

- DLWC

DLWC requested additional information including a more detailed analysis to quantify the likely range of salinity increases in Bowmans Creek if leakage occurs, assessment of the post-equilibrium of the local groundwater tables and further details of the remediation program for groundwater. These issues are summarised in more detail in Appendix 1. The Applicant provided this information to the satisfaction of the DLWC and the agency subsequently provided GTAs for the proposal.

- NSW Fisheries

NSW Fisheries also commented on the potential increase in saline water discharges during low level periods increasing salinity levels in Bowmans Creek. Further, NSW Fisheries considered that the proposal does not reflect favourably with recommendations contained within the draft report of the Healthy Rivers Commissions. Since the proposal no longer involves discharge to Bowman's Creek, the Department considers that these concerns have been adequately resolved.

- Hunter Valley Water User's Association

The Hunter Valley Water User's Association raised concern regarding the amount of saline water to be discharged and submitted that there should be monitoring beyond every discharge point in the river. The Applicant responded that there is only one licensed Hunter River extraction point in the vicinity of the river between Bayswater Creek and Glennies Creek station, which is located approximately 200 metres downstream of Glennies Creek station. The Applicant considers that the Glennies Creek station provides sufficient monitoring for the determination of water quality at this licensed extraction point. In light of the further advice provided by the Applicant, the Department considers that these issues have been adequately addressed.

Department's position

- Groundwater

The Department is satisfied that the impact of the proposal on groundwater resources has been adequately assessed by the Applicant and reported in the EIS, and appropriate management measures have been formulated. However, in order to address the impacts that are predicted to occur as a result of the proposal and to substantiate the predictions in the EIS, the Department has recommended a number of requirements in the conditions of consent. The Department has incorporated in the conditions of consent a requirement that the Applicant prepare a

Site Water Management Plan in consultation with DLWC, SSC, MSC and DMR and to the satisfaction of the Director-General and DLWC. This plan shall include measures for the management of the quality and quantity of groundwater, reporting mechanisms and contingencies plans. In addition, the Applicant is also required to implement a groundwater monitoring plan for the DA area to establish background water quality and to assess the short and long term environmental impact associated with mining operations.

The conditions also incorporate DLWC's GTAs requiring the Applicant to outline a methodology to demonstrate that mining operations will be undertaken in such a manner that will ensure groundwater quality will comply with water quality limits and to outline procedures to reduce leakage from Bowmans Creek to the underground workings. The content of the final consent conditions has been formulated in consultation with DLWC and this agency indicated that the substance of the consent is appropriate to manage these concerns.

The Department considers that these management and monitoring measures required in the conditions of consent, along with those detailed by the Applicant in the EIS will ensure that the quantity and quality of the groundwater is protected. Further, should unpredicted impacts eventuate or measures prove ineffective, the conditions also provide that the Management Plan must outline contingency measures for managing adverse impacts of the development on surface and groundwater.

- Surface water

In response to the Department's review of the EIS and following concerns of the relevant government agencies, the Department has included a number of conditions relating to the potential impacts on surface water hydrology. The Department has also included the GTAs submitted by DLWC and EPA in the recommended conditions of consent, and has made reference to the general advice of these agencies.

The Applicant will be required to prepare a Site Water Management Plan in consultation with DLWC, SSC, MSC and DMR, and to the satisfaction of the Director-General and DLWC. This plan shall be required to include measures for the management of surface water; measures to prevent the degradation of surface water quality; the design of all storages and diversions and contingency plans for managing adverse impacts. The Plan must also detail contingency measures for salinity mitigation should the monitoring program identify that any sustained increase in the salinity of Bowmans Creek is attributable to activities associated with the Project. In addition the plan is required to ensure ongoing development of an arrangement with other mining operations to supply surplus water from the Liddell Colliery during the dry periods when other operations may have a water deficit.

The conditions also incorporate the GTAs from the EPA including concentration limits for discharges and monitoring requirements for these discharges. The final content of the conditions have been formulated in consultation with the relevant agencies. The Department is satisfied that the conditions of consent, which require consultation with DLWC, SSC, MSC and DMR will adequately protect the quality and quantity of surface water potentially impacted by the continued operations at Liddell.

5.2 Air quality

The Applicant commissioned Holmes Air Science to undertake an assessment of the air quality impacts of the proposed continuation of mining at the Liddell colliery. A comprehensive report is contained in full in Appendix 9 to the EIS, and the key findings are outlined in Section 5.7 of the EIS.

Air quality criteria

The EIS identifies two classes of air quality criteria relevant to coal mining activities, this being dust deposition and dust concentration levels, as detailed in Tables 2, 3 and 4 below.

Table 2. Long Term Particulate Matter Criteria

POLLUTANT	CRITERION	AGENCY
Total Suspended Particulate Matter (TSP)	90ug/m^3 (annual mean)	NH & MRC
Particulate matter < 10um (PM_{10})	30 ug/m^3 (annual mean)	NSW EPA

Table 3. Short Term Particulate Matter Criterion

POLLUTANT	CRITERION	AGENCY
Particulate matter < 10um (PM_{10})	50ug/m^3 (24 hr average)	NSW EPA

Table 4 NSW EPA Long Term Criteria for Dust Fallout

POLLUTANT	AVERAGING PERIOD	MAXIMUM INCREASE IN DEPOSITED DUST LEVEL	MAXIMUM TOTAL DEPOSITED DUST LEVEL
Deposited dust	Annual	2 g/m^2/month	4 g/m^2/month

Note: dust is assessed as insoluble solids as defined by AS 3580.10.1-1991 (AM-19)

Existing air quality

The EIS describes that dust deposition levels were measured at 12 locations surrounding Liddell Colliery, and monitored from July 1999 to January 2001. These results indicate that the annual average dust deposition rates are typically less than 2g/m^2/month.

The Applicant has also measured TSP since January 2000, and PM_{10} using a High Volume Sampler since October 2000. The EIS details that there were four occasions during that period on which the 24-hour average TSP concentrations equalled or exceeded 90ug/m^3, with all other measurements of TSP below 90ug/m^3. Apart from one recorded level of 49ug/m^3 during this monitoring period, PM_{10} values were generally below 30ug/m^3 during the monitoring period.

Liddell Colliery air quality impacts

The EIS assessed the impacts from the project for Years 7, 14 and 21. The Applicant advises that the principal emissions will be dust, particulate matter and some minor emissions of carbon monoxide, nitrogen oxides and sulphur dioxide from the combustion of diesel fuel in earth moving equipment and released when explosives are used. The operations at the site which will generate air emissions include drilling, blasting, loading and hauling overburden; dragline operation; dozer operation; loading and hauling coal and road grading. In addition there will

be particulate matter due to wind erosion from exposed land in the pit and waste dumps, and also from stockpiles at the CPP. The estimated TSP emissions from these activities is detailed in Table 7 of Appendix 9 to the EIS.

The EIS describes that the assessment of air quality impacts as a result of the projects considers two mine options. The first option is a pure truck and excavator operation, and the second option involves a mixture of truck and excavator and dragline. Particular matter emissions inventories have been prepared for both options and the truck and shovel with dragline was found to be the option that generated the greatest quantity of particulate matter. The EIS therefore modelled the truck and excavator and dragline operation to ensure a conservative assessment is made of the operations.

In addition, the EIS outlines that ambient levels will arise from sources other than Liddell. Accordingly, the air dispersion modelling for this project includes emissions from Liddell and the immediate neighbours, which include Cumnock, Nardell, Ravensworth East, Glendell and Mt Owen, in addition to some small background emissions to account for all other sources.

Dispersion model predictions at the maximum impacted non-mined owned residence are detailed in Table 5.

Table 5. Maximum predicted dust concentration and dust deposition levels to occur as a result of the Proposal.

	TSP Annual Average	**Dust deposition**	**PM_{10} (annual average)**	**PM_{10} (24 hour maximum)**
Maximum predicted level	19 ug/m^3	0.5g/m^2/month	11ug/m^3	>30 ug/m^3
Background	45 ug/m^3	2 g/m^2/month	15 ug/m^3	-
Total	64 ug/m^3	2.5 g/m^2/month	26 ug/m^3	>30 ug/m^3
Criteria	90 ug/m^3	4 g/m^2/month	30 ug/m^3	50 ug/m^3

As detailed in Table 5, the modelling in the EIS indicates that the maximum predicted (increment plus background):

- annual average TSP concentration will be 64ug/m^3 at the location of the maximum impacted non-mine owned land in Year 21 of operation, which is below the EPA criterion of 90ug/m^3;
- annual average dust deposition rate will be 2.5g/m^2/month the location of the maximum impacted non-mine owned land in Year 21 of operation, which is below the EPA criterion of 4g/m^2/month;
- annual average PM_{10} concentration will be 26ug/m^3 at the location of the maximum impacted non-mine owned land in Year 21 of operation, which is below the EPA criterion of 30ug/m^3; and
- 24-hour average PM_{10} concentration will be >30ug/m^3 (increment only) at the location of the maximum impacted non-mine owned land in Year 21 of operation, which is below the EPA criterion of 50ug/m^3.

Cumulative impacts of the Liddell Colliery and other mining activities

The Applicant has also undertaken an assessment of the cumulative impacts of the project, by considering the particulate matter emissions from continued operations of the Liddell Colliery in combination with other dust sources. The EIS describes that the additional sources will be other nearby mines, more distant mines, agricultural activity and natural occurrences including bushfires and wind erosion sources. These sources include Cumnock, Nardell, Glendell, Ravensworth East and Mt Owen mines. The impacts of these sources were accounted by adding 0.5g/m^2/month to the annual average dust deposition rate, 10ug/m^3 to the annual average TSP concentration and 5ug/m^3 to the annual average PM10 concentration.

The cumulative impact assessment indicates there will be exceedences of the relevant air quality goals at thirteen residences and at one property where the residence has burnt down. All but one of these properties have now been acquired by Liddell's parent company Xstrata with the remaining property owned by Coal and Allied. The land on which the residence has burnt down is owned by Scriven. Should a new dwelling be proposed to be constructed at this location, the Applicant may be required to acquire this property in accordance with the conditions of consent.

Mitigation measures proposed by the Applicant

The Applicant proposes a range of mitigation measures, as follows:
- watering of haul roads and other trafficked areas;
- confinement of haul truck movements to confined routes;
- watering of stockpiles as required; and
- fitting of dust controls on drills.

In addition, the EIS describes that the mine will be operated so as to achieve best practice control for dust emissions, including:
- a blasting protocol to ensure that dust emissions from blasting are not carried over residences;
- dust generating mining operations, should be relocated at non-sensitive areas where practicable when adverse weather conditions apply and private residences may be affected.

Issues raised in submissions

The issue of air quality impacts was not raised in any submissions from private, special interest or business groups. The EPA did request some clarification of the cumulative dust impacts and the assessment presented in the EIS and additional details of the dust exceedences and mitigation measures at the dwellings identified in the EIS. The Applicant provided this information to the satisfaction of the EPA and who subsequently provided their GTAs for the proposal.

The EPA also raised the issue of the potential health impact on tenants occupying mine owned residences. The EPA suggested that the Department incorporate conditions to ensure that all existing and potential tenants are advised of the potential health implications of living in these properties. Accordingly, the Department addressed this issue in the conditions of consent.

Department's position

The Department is generally satisfied with the air quality impact assessment presented in the EIS and by the additional information. The Department acknowledges that, based on the assessment in the EIS, the Liddell project in isolation is not likely to have an adverse impact on the particulate matter levels outside the DA area, nor at any privately owned residences. The Department is satisfied that all relevant EPA air quality goals for particulate matter including dust deposition rates and concentrations of TSP and PM_{10} will be met.

In order to ensure that air quality impacts are minimised, the Department has included in the recommended conditions of consent a requirement for the Applicant to manage the air emissions from the Liddell project to ensure the relevant air quality criteria are satisfied. The Applicant will also be required to prepare a Dust Management

Plan. This plan shall detail procedures for dealing with dust emissions from the construction and operation of the mine. The Applicant will also be required to undertake monitoring and report against the relevant EPA criteria, and provide reports of the results to the Department every six months. The Department has also included in the consent a requirement that should the criteria be exceeded and an alternative agreement does not exist, a landholder may request further independent investigation and, where appropriate, additional ameliorative measures.

In the situation that these management measures do not reduce the particulate matter levels below the relevant criteria at any private non-mine owned residence, the Applicant will be required to acquire the property. Should the monitoring indicate that the exceedence is a result of cumulative impacts, the Applicant will be required to enter into a Joint Acquisition Management Plan for the purchase of the property.

In order to address EPA's concerns regarding potential health impacts on tenants occupying mine owned dwellings in areas where the relevant criteria are exceeded, the Department has recommended the Applicant prepare a Long Term Dust Exposure - Residential Tenancy Management Plan in consultation with EPA and NSW Health and to the satisfaction of the Director-General. This plan is required to ensure that all existing and prospective tenants of the properties, at which the EPA criteria are predicted to be exceeded are advised of the impacts.

The Department considers that the proposed recommended conditions of consent and the management measures proposed by the Applicant will satisfactorily manage the potential air quality impacts from the Liddell Colliery.

5.3 Noise impacts and vibration

5.3.1. Noise

Applicant's position

Noise criteria

The Applicant undertook a noise impact assessment for the proposed continued operations at Liddell Colliery. The key features of the assessment are summarised in Section 5.8 of the EIS, and are reported in full in Appendix 10 to the EIS.

The Applicant advises that the noise criteria for the proposed continued operation of Liddell Colliery have been established with reference to the EPA's Industrial Noise Policy. This policy defines noise criteria for intrusiveness and amenity, and sets the appropriate criteria at the most stringent of these two values.

The EIS describes that background noise levels were monitored at four locations in the vicinity of Liddell Colliery during December 2000, January 2001 and July 2001. Operator attended measurements were also taken in order to determine the character and contribution of noise sources to the total ambient noise level. Following this monitoring, the adjusted background noise level was set to 30dBA, including extraneous influences such as rain and insect noise. The relevant noise criteria are therefore 35dBA for daytime, evening and for night time at all residential locations.

The EIS also considers the Environmental Noise Control Manual (EPA 1994) which provides criteria for residential receivers in regard to rail traffic noise. These criteria are 60dBA (24 hour "noise exposure") for L_{Aeq} 24 hour and 55dBA L_{Amax}, evaluated at the most exposed property boundary. In respect to Road Traffic Noise, the EIS notes that in accordance with the Environmental Criteria for Road Traffic Noise (RTNP) (May 1999) the noise limits for arterial roads are 60 dBA $L_{Aeq\ 15\ hour\ daytime}$ and 55 dBA $L_{Aeq\ 9\ hour\ night\text{-}time}$.

Impact assessment

- Liddell in isolation

The Applicant assessed noise levels at all residential locations within proximity of the Liddell development application area. A summary of the predicted noise levels for the most potentially affected residences are

presented in Table 6 below, with predictions for all other residences being below the relevant noise criteria of 35dBA.

Table 6. Noise Impact Assessment under Worst Case Weather Conditions for the most affected residences.

Location	Ownership	Predicated Noise Level (dBA)				Intrusive criterion
		Year 1	Year 7	Year 14	Year 21	
Res. 3 Hebden Rd	Ravensworth East (Xstrata)	**43**[1]	41[1]	**40**	31	35
Res. 15 – Hebden Rd	Scriven (burnt down)	**41**	**38**	**35**	28	35
Res. 16 – Hebden Rd	Liddell Joint Venture (Xstrata)	**42**	**40**	**38**[2]	29	35
Res. 17 – Hebden Rd	Nova Coal (Coal & Allied)	**44**	**43**	**39**	26	35
Res. 18 – Hebden Rd	Hunter Valley Coal Corp (Xstrata)	**35**[1]	**35**[1]	32	28	35
Res. 21 – Hebden Rd	Ravensworth East (Xstrata)	**40**[1]	**39**[1]	**39**[1]	31[1]	35
Res 23 – Hebden Rd	Glendell Joint Venture (Xstrata)	**37**[1]	**36**[1]	**39**[1]	31[1]	35

Note: Worst case temperature inversion with no wind unless otherwise noted
Residences not shown comply with the intrusiveness criterion of 35 dBA
Noise levels in bold and underline exceed the project specific criterion of 35dBA
[1] inversion and wind is worst case
[2] SW wind is worst case

The above table indicates that there are six residences and one property (residence burnt down) that will experience noise levels in excess of the intrusiveness criterion of 35dBA. These residences have all been subject to previous acquisition policies and have been purchased by other mining operators. Of these six residences, the Applicant owns one, two are owned by Ravensworth East, one is owned by the Glendell Joint Venture, the Hunter Valley Coal Corporation owns one and Nova Coal owns one. Notably, the mining operations consisting of Ravensorth East, the Glendell Joint Venture, the Liddell Joint Venture and the Hunter Valley Coal Corporation are owned by the Applicant's parent company, Xstrata. It is therefore expected that satisfactory arrangements may be negotiated internally within the structure of the parent company.

The EIS notes that the Scriven property is the only privately owned property likely to experience noise in excess of 35dBA. Although the property has burnt down, the conditions protect this landowner if they do wish to rebuild in the future. If a landowner selects a suitable site on vacant land for a future dwelling which would be exposed to noise levels in excess of the noise criteria then an independent investigation may be triggered, and where appropriate acquisition may be requested by the landowner.

Rail traffic impacts

The EIS outlines that Liddell Colliery rail movements will increase the current Liddell rail contributed L_{Aeq} (24 hour) noise level by approximately 1.7dBA. The L_{Amax} noise level would remain unchanged. The Applicant therefore advises that the contribution from Liddell Colliery trains would meet the EPA's LAeq (24 hour) criterion of 60 dBA and the L_{Amax} criterion of 85dBA at a distance of 25 metres and greater. The EIS concludes that the impact of the proposed Liddell trains on the Main Northern Railway would be negligible and that the trains will not increase the maximum noise levels from the existing movements on the rail line.

Road Traffic impacts

The EIS outlines that the tailings will be transported to the power stations via Pikes Gully Road and the New England Highway. This haulage route does not pass any residential premises and the EIS predicts that there will not be any noise impact at residential locations from this activity.

Cumulative impacts

The EIS describes that the Liddell Colliery is located in an area dominated by mining operations, and the Applicant undertook an assessment of the cumulative noise impacts associated with simultaneous operation of Liddell Colliery and the surrounding mines. The assessment is detailed in Appendix 10 of the EIS and concludes that the cumulative noise emissions from Liddell Colliery and surrounding operations will be below the acceptable amenity level at the nearest relevant residences.

Mitigation measures proposed by the Applicant

The EIS acknowledges that the project specific criterion of 35dBA will be exceeded at six residences. These properties have all been previously acquired by the industrial operators in the area. The only noise affected residence not owned by Xstrata is Residence 17, which is owned by NovaCoal (Coal & Allied). The EIS reports that Liddell Coal has entered into an agreement with the owner of this residence to limit noise to 65dBA for the next 5 years. As noted above the Scriven residence has burnt down, however should the landowner choose to rebuild on this site, the Applicant will also be required to enter into an agreement with this landholder.

Notwithstanding, the EIS describes that Liddell Coal will continue to implement the existing noise minimisation practices including:

- periodic noise monitoring at nearby residences;
- maintenance of plant and equipment in good working order; and
- use of proximity of signalling devices when loading rear dumps, rather than sounding horns.

Issues raised in submissions

No submissions raised concern regarding the noise impacts from the proposal, however in providing GTAs for the Project, the EPA noted that the development may exceed project specific noise levels at a number of residences. The EPA notes advice from the Applicant that a negotiated agreement either exists, or will be reached, between the proponent and the owners of these properties and sought to include these provisions as GTAs. The Department has incorporated these requirements in the consent conditions.

The EPA also included noise limits of 35dB(A) at all residences that are not the subject of a private agreement between the Applicant and the owner of the residence. This condition has been incorporated into the recommended conditions of consent.

Department's position

The Department is satisfied that the noise modelling and assessment undertaken by the Applicant and reported in the EIS is generally adequate and that the potential noise impacts have been appropriately predicted.

As part of the recommended development consent conditions, the Applicant will be required to prepare a Noise Management Plan for the Project to address any noise impacts potentially associated with the Project. This plan is to include details of monitoring programs, mitigation measures and a protocol for handling noise complaints.

In order to protect the amenity of private residences, the Department has also included noise limits, as recommended by the EPA, which the Applicant must aim to achieve unless a negotiated agreement is in place with the landholder. Should the criteria be exceeded, the conditions of consent require the Applicant, in the first instance to implement further management measures in accordance with a noise reduction plan.

Should the noise limits exceed the established acquisition criteria, and the mitigation measures do not bring the noise levels within the criteria, the Applicant will be required to purchase the relevant property at the request of the landowner. In the situation that the exceedence is the result of cumulative impacts, the Applicant will be required to formulate a Joint Acquisition Management Plan. The consent conditions recognise upfront that the Scriven property is predicted to experience dust levels greater then the dust acquisition criteria on a cumulative basis, and the Applicant shall at the written request of the landholder purchase the Scriven property in accordance with the Joint Acquisition Management Plan. The Department is satisfied that the recommended conditions of consent along with the management measures proposed by the Applicant shall adequately minimise noise emissions from the Project and protect the amenity of residents and the interests of the other industrial operations in the vicinity of the colliery.

5.3.2. Blasting

The EPA sets guidelines for blasting based on human comfort levels. The recommended maximum level for airblast is 115dB Linear Peak. However this level should not exceed 120 dB Linear Peak at any time. This level may be exceeded on up to 5% of the total number of blasts over a period of 12 months.

The EIS describes that the level of airblast and ground vibration has been predicted for each of the four stages of mine development. The results of the modelling are contained in Section 5.8.7 of the EIS and the blast prediction results are reported in full in Appendix 10 of the EIS.

The blast predictions reported in the EIS indicate that the airblast and ground vibration levels will meet EPA guidelines for blasting at all non-mine owned residences and other sensitive structures surrounding the development, during all operational stages at the Liddell Colliery, with appropriate maximum instantaneous charge (MIC) limits in place, except at Residences 3 and 15 (Scriven – burnt down), as identified in the EIS. Residence 3 has been recently acquired by the existing Ravensworth East coal mine (Xstrata) and so arrangements for this residence should be able to be negotiated internally. Residence 15 has burnt down and the EIS details that blast limits do not apply until such a time as a new dwelling is constructed on the site.

Blast management

a. Residences

The EIS describes that existing blast design and monitoring procedures will continue to be implemented to ensure that blasting at Liddell Colliery does not exceed the existing EPA limits at residences, unless an agreement for higher limits has been negotiated with the landholder.

The EIS describes that the Applicant has entered into an agreement with Coal & Allied as the landholder for the residence at Location 17 to allow airblast of 135dB Linear Peak and 100mm/s ground vibration. As described above, Residence 3 has recently been acquired by Ravensworth East, and as the property is now owned by the Applicant parent's company it is expected that an agreement for similar vibration and airblast limits will be internally negotiated for this residence.

b. Other structures

The EIS describes that there are no current limits for airblast and vibration for heritage buildings, and a recent review of appropriate standards recommend that structures susceptible to vibration be assessed on a case by case basis. The Applicant advises that a structural assessment of the former Chain of Ponds Hotel is proposed to be conducted prior to vibration levels exceeding 2mm/s to determine appropriate vibration limits.

The Applicant is also required to comply with vibration limits at other structures within the DA area, eg rail related structures, power poles and dam walls. The EIS describes that should the monitoring network detect exceedence of the vibration limits the necessary corrective action will be implemented to bring these impacts within the required limits.

The Applicant advises that in order to manage blasts such that the potential for exceedence of the relevant criteria is minimised, Liddell Coal will continue to implement the existing blast management procedures. The existing procedures include:

- training all relevant personnel on environmental obligations and the safe handling of explosives;
- designing and undertaking blasts to ensure that vibration and airblast limits are met, including use of adequate stemming, a delay detonation system, and careful drilling and hole loading to ensure that the required blast design is implemented;
- monitoring blasts at sensitive locations to verify whether vibration and airblast limits are met;
- modification of the blast design, if necessary;
- documentation of the date, location of blast holes and quantify of explosive used each day; and
- periodic review of blast management procedures to evaluate performance and identify corrective action, if required.

Issues raised in submissions

Nardell Coal raised concern in their submission regarding the potential impacts from blasting on Nardell's workforce and main underground headings. These concerns were raised with the Applicant and an appropriate response was provided. The Applicant responded that the nearest distance from the Liddell 21 year mine plan to Nardell surface facilities and underground workings is approximately 630 metres. The Applicant submits that a comparable impact is likely to be experienced at the Chain of Ponds Hotel, located approximately 610 metres from the Liddell 21 year mine plan. Predicted maximum levels at the Hotel are 3.6mm/s and 128.6dB, which are significantly lower than the recommended vibration limits for protection of normal residential structures (5mm/s) and commercial/ industrial buildings (25mm/s). The Applicant submits that no significant adverse vibration impacts are likely on Nardell infrastructure.

In providing their GTAs, the EPA included specific requirements relating to blasting which have been incorporated in the conditions of consent, including limiting blasting operations to between 9am to 5pm, Monday to Saturday. In addition, the EPA stipulated that the ground vibration and overpressure of all blasts be monitored at locations in accordance with the Blast Management Plan and overpressure must be measured at noise sensitive sites. These conditions have been generally included in the conditions of consent.

NSW Heritage also noted the potential for structural damage to the Chain of Ponds Hotel from vibrations caused by blasting, and concurred with the recommended mitigative measures in the EIS, as outlined above. These conditions have also been specifically recognised in the conditions of consent, as outlined below.

Department's position

The Department is satisfied that the EIS has adequately assessed the impacts of blasting on residential dwellings and other structures of significance, including heritage buildings, underground utilities, rail and other surface infrastructure.

The Department has recommended a number of conditions to manage blasting and associated impacts. As an overriding condition, the Applicant is required to manage blasting so as not to exceed certain overpressure levels at nearby residential properties and other sensitive noise locations and to ensure that ground vibration does not exceed a certain peak particle velocity.

The Applicant is also required to prepare a Blasting Vibration Management Plan in consultation with EPA, Rail Infrastructure Corporation, Energy Australia and NSW Dams Safety Committee. The Plan is required to detail compliance standards along with mitigation and monitoring measures, measures to protect underground structures

and surface infrastructure, and measures to consider the timing of blasting at neighbouring mines. The Applicant is also required to provide notification to residents within 3 kilometres of blasting locations of future blasting events.

In order to minimise the risk of blasting to the Chain of Ponds Hotel, the conditions require the Applicant to undertake monitoring at the Chain of Ponds Hotel. Prior to the exceedance of vibration levels of 2mm/s, the Applicant shall undertake a structural assessment of the former Chain of Ponds Hotel, in consultation with DMR and NSW Heritage to determine the appropriate blast impacts to be maintained for all future operations.

The Department is satisfied that these management measures and monitoring provisions will satisfactorily mitigate impacts from blasting and provide an adequate monitoring framework so that any deleterious effect can be identified and appropriate mechanisms are introduced to ameliorate these effects.

5.4 Flora and Fauna

The Applicant's position

The Applicant undertook a flora and fauna assessment for the proposed continued operations, the results of which are contained in full in Appendix 8 to the EIS and summarised in Section 5.5 of the EIS. The EIS describes that the flora and fauna survey was undertaken in December 2000 and March 2001.

Vegetation communities

The EIS indicates that five vegetation communities were recorded in the study area, *Eucalyptus crebra/Eucalyptus moluccana* Woodland*, Allocasuarina leuhmannii* Woodland, Riparian Vegetation, Aquatic Vegetation and Pastoral Grassland, with the latter being dominant. Each of the community areas is reported to show high levels of disturbance, with evidence of past and ongoing grazing activities. The communities are also described to contain a significant number of weed species and a significant portion of the DA area is described to be disturbed by existing mining operations and is devoid of vegetation.

The community of *Eucalyptus crebra/ E. moluccana* Woodland is located adjacent to Dam 13 and the southwest of Barrier Block, occupying approximately 46 hectares. The community also shows signs of disturbance, particularly from grazing.

The *Allocasuarina luehmannii* woodland is described in the EIS to be the largest woodland community in the study area, occupying approximately 81 hectares adjacent to Bowmans Creek. The community is reported to generally contain immature trees, with several mature and medium size trees occurring. The community is described to lack a well defined shrub layer and exhibited a very open ground cover, comprising a mix of native and introduced grasses and ground cover species along with a range of introduced species.

The Applicant advises that remnant riparian vegetation was identified in three patches along Bayswater Creek, Bowmans Creek and Chain of Ponds Creek. Aquatic vegetation, ranging from sedge and rush vegetation to fully aquatic species occurs in the study area in both natural and constructed waterways.

The majority of the DA area is however described to be vegetated with pastoral grassland containing a mix of native and introduced grasses and groundcover species. These areas generally lack tree and shrub vegetation, although scattered eucalypt individuals occur throughout the area.

The Applicant advises that no threatened flora species were located during the surveys. One species of threatened flora, *Eucalyptus glaucina*, has been recorded within a 20 kilometre radius of Liddell Colliery, however the EIS concludes that none are expected to occur in the DA area due to the absence of suitable habitat.

Fauna

The flora and fauna survey also concluded that three general fauna habitat types occur within the study area – pastoral grassland, woodland/forest and aquatic habitat. The three habitats are described to be generally degraded from past agricultural and clearing activities.

A total of 68 bird species were recorded during field survey, including two nocturnal species, sixteen species associated with water bodies and nine raptor species. However, no threatened bird species were recorded.

Seven amphibian species were identified during the field surveys, however these species were generally restricted to the aquatic vegetation community. Seven reptile species were also identified.

The flora and fauna survey recorded twenty-one mammal species. Despite the level of disturbance within the study area, the study recorded four threatened bat species (Common Bent-wing Bat, Eastern Freetail Bat, Greater Broad-nosed Bat and the Large-footed Myotis).

A further six threatened fauna species (Green & Golden Bell Frog, Glossy Black-Cockatoo, Eastern False Pipistrelle, Grey-headed Flying Fox, Brown Treecreeper and Hooded Robin) are also considered likely to occur given the presence of suitable habitat and known records in the locality, although not directly recorded during the field survey.

Impact on flora

The EIS describes that the proposal to continue mining at the Liddell Colliery is reported to result in the removal of 63 hectares of woodland and 483 hectares of pastoral grassland habitat. The development will also result in the removal of 34 hectares of aquatic habitats, and replacement through construction of up to two mine water dams and a number of sediment control basins.

The Applicant assessed that the floral diversity of the vegetation remnants in the study area is similar to other vegetation remnants in the region, and the communities present are not considered to be floristically significant. However the EIS describes that the woodland vegetation does however have some significance in a local context as a large portion of the region has been cleared of remnant native vegetation.

The EIS describes that the vegetation communities identified within the DA area are degraded and have been affected by past mining, clearing and grazing activities. The development of approximately 260 hectares of habitat corridors will result in a net gain of approximately 197 hectares of native woodland vegetation. The development of mine water storages and sediment control dams will result in the isolation of areas of remnant vegetation. The EIS therefore concludes that the continuation of mining at Liddell Colliery will not significantly impact on the floral assemblages present due to the highly disturbed nature of the area and the lack of significant floral species.

Impact on fauna and habitats

The EIS describes that the proposed continued mining operations are generally considered unlikely to have a significant impact on the fauna habitat in the region, with only small areas of woodland habitats affected. The development is described to have only minimal impact on aquatic habitats. Approximately 483 hectares of pastoral grassland will be affected, however this community provides limited habitat potential.

The Applicant conducted Section 5A Assessments for eleven threatened species known or likely to occur in the study area to determine if the proposal is likely to have a significant impact on these species or their habitats, and therefore whether a Species Impact Statement (SIS) is required. The Applicant concluded from these assessments that a SIS was not required for any of the species. The Department supports this conclusion, provided that adequate mitigation measures are incorporated for the management of the proposal (as described below).

Mitigation measures proposed by the Applicant

The EIS proposes a range of measures to limit the potential impact of the continued mining operations on flora and fauna. These measures are outlined as follows:

- tree hollows salvaged during the clearing of vegetation will be installed in rehabilitated areas to provide habitat;
- logs removed from the vegetation communities will be stockpile and placed in habitat corridors within the rehabilitated areas to replace the ground fauna habitat that is to be lost;
- development of a vegetation clearance to ensure clearing is carried out in a safe and ecologically responsible manner;
- a program of revegetation rehabilitation will be implemented involving re-establishment of native species in order to prevent erosion and further denigration of the communities once landforms are stabilised; and
- establishment of approximately 260 hectares of habitat corridors through the rehabilitated areas. It is proposed that the habitat corridors will link areas of remnant vegetation to the north of the DA area to habitat areas along Bowmans Creek.

Department's position

The Department reviewed the flora and fauna survey provided by the Applicant and considered the terrestrial flora and fauna survey to be generally satisfactory. However some further assessment in respect of the aquatic assessment and location of two threatened bird species was required.

The Department considers that the field surveys were conducted during suitable periods for detecting a range of flora and fauna species. A range of survey techniques were used to target threatened fauna species recorded in the locality and a suitable amount of survey effort for both flora and fauna was conducted in the study area. In addition, the consultants assessed threatened fauna species that were not recorded in the study area but could occur given the presence of habitat, and information from previous studies conducted in the area was obtained.

The Applicant also considered the EPBC Act and whether a referral needed to be made to Environment Australia. Despite a number of migratory species being recorded in the study area and the potential for the nationally threatened Green & Golden Bell Frog occurring, the Applicant did not consider a referral to be necessary. The justification provided was that the proposal is not considered to *modify, destroy or isolate an area of important habitat for migratory species*. The Department is satisfied with this position for migratory species.

Although no consideration is given to the Green & Golden Bell Frog, this species was not recorded in the study area despite surveys being conducted during the breeding season. As the EPBC Act does not list threatened species habitat, the Department is satisfied that a referral is not needed for this species.

The Department is also satisfied that the Section 5A Assessments which were conducted for eleven threatened species known or likely to occur in the study area correctly determined that the proposal is not likely to have a significant impact on these species or their habitats, and therefore a Species Impact Statement (SIS) is not required.

The Department notes that a range of mitigation measures are proposed in the EIS to minimise impacts to the ecological environment and threatened species known or considered likely to occur in the study area. These measures include the provision of habitat corridors; regeneration; salvaging and replacing of tree hollows, and sensitive vegetation clearance protocols. The Department supports these measures but provided the following comments in respect of the proposed habitat corridors:

- habitat corridors should extend along the entire length of both Bowmans Creek and Bayswater Creek to ensure water quality, maintain the flow of water through the creek and provide adequate habitat to a number of terrestrial and aquatic species, including the four threatened bat species recorded foraging along Bayswater Creek;
- ongoing management of weeds and monitoring of regeneration of habitat corridors should occur throughout the life of the project;
- the width of the habitat corridors should be enlarged to minimise edge effects and connect all of the proposed corridors together. This will not only improve the effectiveness of the habitat corridors for flora and fauna but

also reduce weed invasion; enhance the movement of fauna species and dispersal of flora species, and reduce soil erosion and sedimentation impacts to watercourses and surrounding areas;
- location of a habitat corridor where threatened species are recorded.

The Applicant provided a detailed response to the Department's concerns regarding the proposed mitigation measures. In respect of the aquatic ecology, the Applicant clarified that there will be no disruption to fish passage in either Bayswater Creek or Bowmans Creek as a result of the proposed mining area. The construction of the new access road will require the construction of services corridor and a crossing over Bayswater Creek. This crossing will be designed in accordance the NSW Fisheries (1999) "Policy and Guidelines for bridges, causeways, culverts and similar structures" ensuring that fish passages are maintained.

In respect of the Department's concerns regarding the habitat corridors, the Applicant provided a revised habitat corridor plan and this revised plan was deemed to be satisfactory. The Applicant submitted that the 260 hectares of habitat corridors is in excess of the 63 hectares of woodland habitat to be removed under the proposal and is considered to adequately compensate for the losses of communities on site. The additional information submitted that the habitat corridors will enhance and strengthen the linkage between the woodland areas to the north of the Mountain Block area and the remnant vegetation along Bowmans Creek. Further, in response to the Department's request, the Applicant noted that Liddell Coal does not own any land within the riparian zones of Bayswater and Bowmans Creeks, other than a small area immediately adjacent to the coal preparation plant.

The Department was satisfied with the Applicant's response and considers that the mitigation and management measures outlined in the EIS and the recommended consent conditions will mitigate any potential adverse impacts on flora and fauna in the Project area, including threatened species. Notably, the Applicant will be required to prepare, or review and update the existing, Flora and Fauna Management Plan. This plan shall include details of vegetation management and a protocol for identifying and managing significant impacts on any threatened fauna species that have not been identified in the EIS.

5.5. Visual impacts

Applicant's position

The Applicant undertook an assessment of the visual impacts of the proposal and the findings are reported in Section 5.10 of the EIS. The EIS describes that the area affected by the continued operation of Liddell Colliery is undulating cleared and semi-cleared grazing land with isolated patches of woodland. The majority of the land surrounding the Colliery, particularly to the west, south and southeast is occupied by mining and power generation operations. Land to the north, northeast and east of the Colliery is generally privately owned rural land, predominantly used for grazing purposes. In light of the surrounding land use, the proposed continued mining operations will potentially be viewed from limited residences adjacent to Hebden Road in the east and north-east, the Main Northern Railway and a number of public roads such as Antienne Road, Hebden Road, Old State Highway and the New England Highway. The EIS indicates that potential views from public roads are intermittent, depending on local topography. The EIS indicates that potential views of the proposed mine from the north are generally restricted by natural undulations in the surrounding landform, while the dominance of Lake Liddell limits views from the west.

- Year 1 Operations

The EIS describes that the visual effect of the proposed operation at Year 1 will be similar in character to that of the existing landscape. Liddell colliery is described to be visible from Hebden Road, Antiene Road, New England Highway and Old State Highway, as well as three residences to the north and north-east. These views are described in Table 7.

Table 7 – Description of views from available vantage points in Year 1 of operations

Vantage point	Views

Travelling south on Old State Highway	Rehabilitated slopes adjacent to Lake Liddell in the north-west of the DA area
Travelling east along Antienne Highway	Rehabilitated slopes adjacent to Lake Liddell in the north-west of the DA area
Old State Highway	Views of shaped overburden dumps on the north side of the South Cut and Central Pit
Hebden Road	Views of Mountain Block highwall and Antiene East overburden dump
Closest residences to the east (company owned)	Views of Mountain Block highwall and Antiene East overburden dump
New England Highway- from western foreshore of Lake Liddell	Long distance views (approx. 2 km), minimal changes to the landscape.
New England Highway – approx 1.25 km south of DA boundary	Dominant views of existing operations in the Entrance and Barrier Blocks
Residences along Hebden Road	To varying degrees screened from the mine site by the natural undulations in the landform and established vegetation

- Year 7 Operations

The visual impacts outlined in the EIS from the proposal during Year 7 of the operations are outlined in Table 7.

Table 8 – Description of views from available vantage points in Year 7 of operations

Vantage Point	Views
From the west over Lake Liddell	restricted by the rehabilitated overburden of previous mining operations.
Residences located along Hebden Road	shield by undulating topography, screening vegetation and rehabilitated areas of shaped overburden
New England Highway – south of the continued operations	sections of East Pit emplacement area

- Year 14 of operations

The EIS describes that in Year 14, the visual effect of the operations are similar in character to Year 7. However, the visual effect of views from the south and south-east will be more extensive due to the extension of the Barrier Pit mining area during the period. Potential impacts from the Residence 21 include visibility of the unshaped overburden above 175 metres on the east face of the Barrier Pit emplacement area. The EIS describes that the visual effect will be high due to contrasting bare earthworks and rehabilitation areas over a substantial portion of the landscape, however this residence has recently been acquired by Xstrata and the existing Ravensworth East coal mine as it fell within its acquisition zone.

- Year 21 of operations

The EIS describes that rehabilitated final landform elements dominate views of the proposed operations from the west, north and northeast. Views from Residence 21 (Xstrata owned) will be obscured by natural undulations of the intervening topography.

Views will be available from the New England Highway, located to the south, of areas of unshaped and shaped overburden. The potential visual effect is high as the views will include bare earthworks that will create colour contrasts over an extensive length of the landscape. These views will however be experienced over approximately 3.5 km and are consistent with the current views experienced by users of this section of the highway.

- Mine Lighting

The EIS advises that the Liddell Colliery is currently a 24-hour operation and contributes to the general night glow experienced from mining and related activities in this general vicinity. Mining will progress in a general southerly direction, and consequently the night lighting effects on nearest residence to the north and northeast will be reduced as the mine plan progresses. The direct effect of lighting will be mitigated by both the distance to residences and intervening topography. The EIS identified that Residence 3 and Residence 21 will potentially experience an increased lighting impact as mining progresses. Since the publication of the EIS, both these properties have been acquired by the existing Ravensworth East coal mine (Xstrata) and it is anticipated that any arrangements to mitigate these impacts may be internally negotiated.

Mitigation measures proposed by the Applicant

The Applicant proposed that the potential visual impact of the proposal will be minimised through:
- prompt rehabilitation of disturbed areas;
- prioritisation of rehabilitation, focusing effort on areas that are most visually prominent from off-site private residences and public transport routes; and
- directing lighting away from residences, where practicable.

The EIS also notes that natural undulations in the surrounding landform and rehabilitation of previously mined areas provides a shield to residences located to the west and north of the development application area. The Barrier Pit emplacement area will shield the views of the residence from the north-east and east. Revegetation of the emplacement area will provide an improved native vegetation outlook for these residences.

Issues raised in submissions

The Department did not receive any submissions raising concerns about the visual impact of the proposal.

Department's position

The Department considers the assessment of the potential visual impacts in the EIS to be satisfactory and appreciates that the colliery operates in an environment dominated by existing mining and industrial operations. It is noted that the principal private residence to be visually impacted has recently been acquired by the Ravensworth East coal mine.

Notwithstanding, in order to ensure that the visual impacts of the proposal are minimised, the conditions of consent recommended by the Department require the Applicant to prepare a Landscape and Revegetation Management Plan for the DA area to address all visual and landscaping issues associated with the Project.

The consent conditions require the plan to include an on-site landscaping strategy, appropriate erosion control and sediment control practices, details of visual appearance of any buildings or structures that are proposed to be constructed or relocated/ renovated, work programs to be undertaken, and maintenance of all landscape works.

Further, the Applicant is required to screen or direct all on-site lighting away from residences and roadways, and prepare a Lighting Management Plan for the DA area to control any potential lighting impacts.

The conditions also provide that in the event that a landowner considers that the visual impacts from the proposal once operational are greater than that predicted in the EIS at their dwelling, the Applicant shall, upon the receipt of a written request, consult the landowner, discuss their concern, provide possible mitigation measures and implement specific measures to address these issues.

The Department considers that these measures are adequate to mitigate visual impacts from public vantage points and residences.

5.6. Transport and Roads

Applicant's position

Coal transportation

The proposed increase in ROM coal production will lead to an increase in product coal transportation from approximately 2.25 Mtpa to 3.4Mtpa. There will be no increase in the five peak daily train trips as the daily throughput from Liddell Colliery is limited to 25 000 tonnes by other coal loading facilities on the Newdell rail loop. The Applicant concludes that as there will be no increase in the peak daily train movements, there will be no change to the existing daily traffic volume.

Site access

The Applicant advises that access to the Liddell site is currently provided via the New England Highway, Old State Highway and a private section of Pikes Gully Road. Alternative access from the New England Highway is available via the Liddell Access Road and Pikes Gully Road and via the Old State Highway, Liddell Station Road and Pikes Gully Road.

The proposal will require the construction of a new road to access Liddell Colliery, since a private section of Pikes Gully Road and part of Old State Highway will be mined as part of the proposal. The new access road is described to be a two lane, all weather road which will intersect the Coal & Allied haul road on the southern side of Bayswater Creek.

- Proposed activities

The EIS indicates that an approximate 1.1 kilometre length of the northern section of the Old State Highway will be closed. This section of the Old State Highway currently provides access to the Liddell Coal Operations. This access for mining and related purposes would be retained by construction of a private access road by Liddell Coal to link to the existing private road system in the area. In addition, existing easements for service infrastructure would be retained along the alignment of the private access road.

- Construction traffic impacts

The EIS describes that traffic impacts associated with construction activity will include traffic volumes associated with the transport of labour, materials and equipment to and from the particular construction site. The construction sites for the access road, level crossing, Dam 13B and Barrier Dam will be accessed via the Old State Highway.

The EIS reasons that the proposed construction traffic on Old State Highway will have no significant impact on public road users, as these roads do not provide access to any residential locations or a thoroughfare to any destination other than Liddell Colliery and adjacent mines and rail loading facilities. Access to adjacent mines and rail loading facilities will be maintained via Liddell Access Road, Pikes Gully Road and Liddell Station Road.

The EIS outlines that short road closures may be required during construction of the intersection of the new access road with Old State Highway. However, the Applicant advises that the road closures on Old State Highway will only affect traffic associated with Liddell Colliery and will be scheduled to coincide with low traffic volumes. Alternative access for Coal & Allied and EnergyAustralia will be available during intersection road works via Pikes Gully Road.

- Operational Traffic Impacts

The EIS advises that during the operation of the mine there will be no significant change to the existing workforce or service vehicle traffic. However, there will potentially be an increase in truck traffic as a result of the haulage of old tailings to Macquarie Generation Power Stations (Liddell Power Station and potentially Bayswater Power Stations) located approximately 4 kilometres to the northwest of Liddell Colliery.

The Applicant proposes to transport old tailings from Liddell Colliery to Macquarie Generation power stations using 25 tonne trucks via the New England Highway. The proposed maximum rate of transportation is 80 truck movements per day, although tailings transportation will on average be undertaken on only 5 days per week.

Tailings will be transported to either Bayswater or Liddell Power Stations via Pikes Gully Road, Liddell Access Road, Coal & Allied haul road and the New England Highway. Unloaded vehicles will return to Liddell Colliery via either the New England Highway, Liddell Access Road and Pikes Gully Road.

The predicted peak traffic volumes generated by the proposed development during tailings haulage are shown in Table 9.

Table 9. The predicted peak traffic volumes generated by the proposal.

Location	**Existing Traffic**		**Predicted Daily Liddell Traffic Volume**		**Percentage Increase**
	Average daily traffic volume	**Peak Hourly Traffic Volume**	**Average daily traffic volume**	**Peak Hourly Traffic Volume**	
New England Hwy north of Pikes Gully Road	10241	1536	80	12	0.8
Liddell Access Road	1317	198	40	6	3.0
Pikes Gully Road	1469	220	80	12	5.4
New England Highway south of Old Highway	10667	1600	0	0	0

The EIS takes account of the increase in the volume of traffic of the Liddell Access Road and the Pikes Gully Road and compares these increases with the level of service on these roads. Based on the likely percentage increase in traffic volume and in consideration of the Level of Service (LOS) for these roads, the EIS concludes that the increase in traffic volumes is low and does not affect the LOS for either Pikes Gully Road or Liddell Access Road.

Since lodgement of the DA, Macquarie Generation advised the Applicant that that transport of old tailings to the powers stations will no longer be permissible via the M2 conveyor access road. The Applicant considers that the only available transport route for this material is the New England Highway.

Singleton Council advised that they did support the use of the Coal and Allied over pass to access the New England Highway, and therefore as an alternative the Applicant proposes to access the New England Highway by upgrading the merge lane from Pikes Gully Road to the New England Highway in order to allow laden trucks to pass under the

New England Highway at a location where the highway has two northbound lanes. This option is considered by the Applicant to negate the need to use the Coal and Allied overpass or for trucks to turn right from Liddell access road onto the New England Highway. Use of the merge lane by laden trucks would require road widening, however such road widening would be undertaken entirely within the Pikes Gully Road Reserve.

This matter was raised with the RTA and no objections were raised by this agency regarding the proposal to access the New England Highway via the Pikes Gully Road underpass and existing merge lane. Appropriate wording for this condition was also formulated to the satisfaction of SSC.

Intersection analysis

The EIS describes that the existing intersection of the New England Highway and Liddell Access Road is an Austroads Type C intersection. The practical absorption capacity (ie the number of vehicles that can turn into New England Highway from Liddell Access Road without unacceptable delay) is 380 vehicles per hour. The traffic volume on the Liddell Access Road including tailings haulage traffic is calculated by the Applicant to be 232 vehicles per hour, which is less than the practical absorption capacity for this intersection. The EIS therefore concludes that the existing intersection is adequate for the maximum potential increased traffic volume resulting from the haulage of tailings to Macquarie Generation power stations. However, due to safety concerns of trucks turning right onto New England Highway, Liddell Coal has elected to utilise the existing Coal & Allied overpass to access the northbound lane of the New England Highway.

The Applicant advises that there will be no change to the existing traffic volume on Old State Highway as a result of the Project, and therefore there is no need to upgrade the existing intersection. The short term construction traffic of up to 20 vehicles per day is not expected to significantly affect the serviceability of the existing intersection.

Management measures proposed by the Applicant

The Applicant advises that the principal construction traffic impacts will be the requirement for temporary road diversion and/ or closure during construction of the intersection of the new access road with Old State Highway. The EIS describes that notification of road closure will be coordinated with Singleton and Muswellbrook Shire Councils, as required. Notification will include emergency services and posting of signs on the New England Highway north and south of the affected roads, in addition to Pikes Gully Road west of the intersection with Liddell Station road. The EIS describes that appropriately qualified traffic controllers will be employed to direct traffic during these closures.

The EIS outlines that there are no specific management controls on State Highway, Pikes Gully Road, Hebden Road or New England Highway required as a result of the project.

Issues raised in submissions

SSC raised issues in regard to the transport and road related aspects of the Project. SSC requested submission of a concept plan and written description which clearly shows and describes all works proposed to be carried out within the public road reservations. The Applicant responded to this request and provided this additional clarification. SSC expressed satisfaction with this information and subsequently provided GTAs for the proposal. These conditions have been incorporated in the conditions of consent.

The conditions provided by SSC imposed restriction on the transport of material, including that the transport of tailings by truck along the New England Highway is to be restricted to old tailings with residual energy content and not more than 80 truck movements per day. In addition, the transport of tailings to the surrounding power station is to be via the Pikes Gully Road underpass merging lane and New England Highway.

In addition SSC provided that the road closure and purchase of land within the road reserve it to be in accordance with Council's standard conditions for road closure and road valuation, and that the right be reserved for Council to recover assess with thin the road closure area.

RTA raised no objections in regard to the project nor the proposal to access the New England Highway via the Pikes Gully Road underpass and existing merge lane.

MSC raised concern about mine vehicles accessing Hebden Road from the DA area, and sought conditions to be included to address these concerns. A condition was negotiated with the Applicant and the MCS whereby vehicular access to the DA area from Antienne Road within the MSC LGA boundary will be restricted to crossing the road to access the DA area, access to the existing construction pad adjacent to the crossing and transport of heavy machinery to the site via Hebden Road, unless otherwise agreed by MSC.

Department's position

The Department is generally satisfied with the transport assessment presented in the EIS. It is considered that the construction traffic impacts can be managed by the conditions of consent and that there is not likely to be any change to the existing workforce or service vehicle traffic. The Department notes that the proposal will result in an increase in the number of heavy vehicles on the road network, but considers that the Applicant has demonstrated that these increases in traffic volumes are low and within the handling capacity of the roads. Similarly, the Department considers that as there will be no increase in the peak daily train movements there will be no change to the existing daily rail traffic volume and that such usage is within the carrying capacity of the existing rail network.

The recommended conditions include several requirements relating to transport and roads. Firstly, the conditions have incorporated SSC recommendations restricting transport of old tailings along the New England Highway and to not more than 80 truck movements per day.

In addition, the Applicant is also required to undertake the road closure and purchase of land within the road reserve in accordance with the Council's standard conditions for road closure and reserve the right for SSC to recover assets from this section of the Old State Highway.

The Department also notes that the Applicant may need to undertake temporary road closures, and has required the Applicant to prepare a Public Road Management Plan. This management plan is required to detail a number of management measures including proposed safety measures; strategies for informing road users of the road closures and procedures to allow for the passage of emergency vehicles.

It is considered that the range of conditions which have been recommended by the Department, along with the suggested conditions provided by SSC will adequately manage the transport and traffic associated impacts and ensure the safety of road users. Both MSC and SSC have been consulted on the content of the final conditions and both have expressed satisfaction with the conditions of the final consent.

5.7 Aboriginal archaeology and European heritage

5.7.1. Aboriginal archaeology

The Applicant's position

The Applicant conducted an Aboriginal archaeological study in conjunction with the Upper Hunter Wonnarua Council Inc (UHWC) to assess the impacts to Aboriginal Heritage items in the proposed mining area. The results of the study are contained in full in Appendix 11 to the EIS, and are outlined in Section 5.9.1 of the EIS.

The study area within Liddell Colliery lies in the area of interest of the Upper Hunter Wonnarua Council (UHWC) and the Wanaruah Local Aboriginal Land Council.

During the survey of previously undisturbed areas within the proposed 21-year mine plan, 37 previously unrecorded Aboriginal sites were identified. The EIS reports that these sites include 12 isolated finds and 25 artefact scatters comprising between 2 and 202 artefacts. The most extensive sites are reported to occur along the major drainage lines of Bayswater Creek, Chain of Ponds and Bowmans Creek. A relatively large number of sites were recorded as occurring on slopes within the study area, however these are generally within 100 metres of a drainage line or

stream channel. The majority of sites were located on drainage depressions, stream channel banks and/ or their associated flats.

The EIS describes that the majority of Aboriginal sites contained less than 50 artefacts, only five contained more than 50, and only 2 contained more than 60. Very few of the sites are located *in situ* due to the high proportion of sites that were located in extremely disturbed contexts. In terms of the cultural significance of the sites, 29 of the sites have been assigned low significance at the local level, and the remaining sites have been assigned moderate significance. All sites of moderate significance are located adjacent to Bayswater Creek and will not be disturbed by the proposed mine plan.

Six sites recorded during the archaeological assessment will be impacted by the mining operations within the next 12 months. The mining that will impact these sites is permitted under the existing development consent for the Liddell Colliery, and will be subject to a separate Consent to Destroy process with the NPWS.

The EIS outlines that a total of 31 sites will be affected by this proposal, as outlined in Table 10, excluding the six sites that will be subject to a separate Consent to Destroy under the existing development consent.

Table 10. Overview of sites to be affected by the proposal

Impacting development	No of sites to be impacted	Significance of sites to be impacted
Open cut mining	17	low, except for LID 14 which is of high significance
Construction of Dam 13B on Chain of Ponds Creek	4	Moderate
Construction of 1200ML Barrier Dam adjacent to Bowmans Creek	3	Low
Construction of access road and service corridor	2	Moderate
Extension of out of pit dump	3	Low

The EIS also identifies that two sites of moderate significance may be partially impacted by the installation of the pipeline between Dam 13B and the Ravensworth Dam east of Hebden Road. However given that the Ravensworth Dam and the pipeline are no longer proposed as part of this development, it is expected that these sites will no longer be impacted.

Management measures proposed by the Applicant

The Applicant advises that an Aboriginal Heritage Management Plan will be formulated to provide management direction on specific sites identified within the study area and to ensure ongoing consultation and participation by the local Aboriginal community.

In addition, the EIS describes that:

- applications for Consent to Destroy with Surface Salvage for the artefact scatters to be impacted;
- applications for consent to destroy without salvage will be submitted for the isolated finds to be impacted by mining;
- a salvage program involving detailed surface collection will be conducted for the sites associated with Chain of Ponds and Bayswater Creek;
- a salvage program involving detailed surface collection, manual excavation, and analysis of all artefacts an features uncovered for the sites associated with Bowmans Creek and its terraces, prior to dam construction in these areas; and
    - as part of the pre-construction activities for Dam 13B, grader scrapes will be undertaken within a 50 metre corridor on either side of the length of Chain of Ponds Creek to be impacted by dam construction. These scrapes will be monitored by UHWC to ensure that no burial sites are located within this area and to collect artefacts exposed during this process.

Issues raised in submissions

NPWS reviewed the EIS and supporting documentation and requested additional information for the purposes of providing their GTAs.

NPWS considered that the Aboriginal Cultural Assessment by the Upper Hunter Wonnarua Council adequately comments on the concerns and recommendations of the Aboriginal community in regard to the proposed development. The additional information requested by NPWS included a geomorphic assessment of the landscape. NPWS also considered that the sampling of the lease area was biased in its focus on the drainage channels. The Applicant was requested to address this lack of surveying in other landform units on the advice from NPWS that the sampling in the different landform units should be comparable.

NPWS also requested further clarification of the values which were applied to assess the significance of the artefacts. The Applicant provided the additional information as requested and NPWS expressed their satisfaction with this level of assessment. NPWS provided GTAs for the project including requirements that the Applicant prepare an Aboriginal heritage management plan, develop a salvage strategy and ensure appropriate involvement with the Aboriginal community. NPWS also required in their GTAs that the Applicant shall manage the area of land along Bowman's Creek not being impacted by the current development proposal as a heritage management area to ensure that no adverse impacts from the project and associated activities occur within that area.

The Department's position

The Department is satisfied that the Applicant has undertaken an adequate assessment of the archaeological resource likely to be impacted by the proposal in consultation with UHWC, and as supplemented by the additional information provided at the request of NPWS.

In order to ensure that the loss of the archaeological resource is minimised, the Department has conditioned a range of management provisions incorporating NPWS GTA's. The over-riding requirement is that the Applicant is to prepare an Archaeology and Cultural Management Plan. The plan is to include management strategies for all parts of the DA area not affected by the proposal, induction procedures for personnel at the site and details of a development strategy. The conditions also require regular consultation with the relevant Aboriginal community groups and that the community be provided with the opportunity to collect artefacts from all locations for which a Section 90 consent is to be obtained. In keeping with the recommendations of the NPWS, the conditions also provide that the Applicant is required to obtain a Consent to Destroy for a number of sites prior to any works associated with the destruction or interference with the respective site and establishment of the management area.

5.7.2. European heritage

The Applicant's position

The Applicant commissioned Umwelt (Australia) to undertake an assessment of the European heritage values within the proposed area of continued operations.

The EIS describes that a search of the Register of the National Estates and the State Heritage Register revealed that there is no entry relating to any property in the DA area. However the search identified a number of sites in the vicinity of the colliery, including:

- The Chain of Ponds Hotel – approximately 600 metres from the proposed mining activity;
- Ravensworth Homestead – approximately 3 kilometres south of the study area;
- Ravensworth Public School – located approximately 5 kilometres from the study area; and
- Rix's Creek Coke Ovens and Associated Works. – located approximately 16 kilometres from the study area

On the basis of the assessment of the archaeological record, the EIS advises that there are no known archaeological resources within the study area, and certainly none that have been accorded local significance or

higher. It appears that the Chain of Ponds Hotel is the only known heritage resource disclosed by the archaeological record that is within the area potentially affected by continued operations at the colliery.

In addition to an assessment of the archaeological record, the Applicant undertook a field survey and identified two areas of structural evidence within the study area, as follows:

- the open cut office and outbuildings, which was formerly the office of Hazeldene underground mine, considered to be of local significance (identified in the EIS as LMH 1); and
- stock feed sheds, considered to be of no particular significance (identified in the EIS as LMH 2).

The EIS advises that the projected continued operations will result in the demolition of all buildings in the former underground mine office precinct and both agricultural feed shelter structures.

The study also describes that the site of the Police Lock-up appears to be approximately 40 metres outside the study area. The EIS advises that remains of the Police Lock-up are likely to be almost entirely sub-surface and unlikely to be subject to damage from vibration as the result of operational blasting. Given the distance of the precinct from the DA area, the EIS concludes that there is likely to be limited likelihood of impact, providing that the recommended management recommendations are implemented, as discussed below.

Mitigation measures

The Applicant proposes the following management strategy to minimise any potential impacts on the historical resource, as follows:

- the undertaking of a full dilapidation study and recording of the fabric of the holdings of the Chain of Ponds Hotel precinct within 12 months of development consent for continued operation at the Colliery;
- conduct periodic blast monitoring at the Chain of Ponds Hotel until such time as vibration levels reach 1.5mm/s. At this time, a permanent blast monitoring will be established to record vibration and airblast; and
- marking and/or flagging the perimeter of the precinct and establishing protocols for the operation of the plant and machinery involved in drainage work along the Chain of Ponds Creek so as to minimise the potential for impact on the potential archaeological deposit at the former Police Lock-up precinct.

Issues raised in submissions

NSW Heritage made a submission in respect of the impacts of the proposal on European heritage values, supporting the implementation of the management strategy outlined in the EIS.

Department's position

The Department considers that the Applicant has undertaken an appropriate assessment of the heritage values associated with the site and potentially to be impacted by the proposal. It is generally concurred that the proposal poses only minimal risk to any items of European heritage significance, although the proximity of the Chain of Ponds hotel to the proposed mining area is noted.

In order to ensure that any such risk to this resource is minimised, the Department has recommended that the Applicant include in the Aboriginal and Cultural Heritage Management Plan appropriate measures for the management of the resource. The Department has also recommended that the measures outlined in the EIS, as discussed above, be undertaken by the Applicant. It is considered that these management measures will adequately manage any potential impacts on European heritage.

5.8 Socio-economic impacts

The Applicant's position

The Applicant has undertaken a socio-economic analysis for the continued operations of the Liddell Colliery, the results of which are contained in Section 5.17 of the EIS.

In summary, the Liddell project will provide employment opportunities for 150 employees. Of these employees 40.7 % will live in Singleton, 20.6 % will live in Cessnock and 11.3 % will live in Muswellbrook. Other significant places of residence are predicted to include Maitland and Scone. The EIS describes that a significant portion of the $14.7 million gross annual payroll would be spent in the Singleton and Muswellbrook LGA, thereby contributing greatly to the economic development of the region.

The EIS outlines that the most significant effect of the continuation of mining activities at Liddell Colliery is in the continuation of employment for approximately 50 Liddell Colliery employees and approximately 100 contractors. The continuation of 150 employment opportunities for the 21 year life of continued operations will have significant flow on effects in the local community. The EIS therefore describes that the social impact of the continuation of employment is on the maintenance of this employment and in turn, the lifestyle of the workforce.

The Applicant predicts that the proposed continuation of mining at Liddell Colliery will not have a significant social impact on the local community, as there is no requirement for additional personnel in the continued operation. The EIS notes that there will be no impact on social infrastructure such as education and recreational services, nor on any impacts on housing and accommodation.

Issues raised in submission

No submissions raised concern regarding the socio-economic impact of the proposal. However in providing recommended conditions for the project, MSC submitted that, prior to the granting of development consent, the Applicant should be required to enter into a legally binding agreement with MSC to comply with the provisions of Council's Section 94 Contributions and associated Community Enhancement Program. The Applicant has accepted the inclusion of a condition in accordance with the request from MSC.

The Department's position

The Department is satisfied that the Applicant has provided adequate consideration of the social and economic impacts of the proposal. Following the request from MSC, the Department considers it is appropriate to include a condition requiring a negotiated agreement between the Applicant and MSC for a contribution in accordance with MSC's Section 94 Contributions Plan. In the event that the Applicant and MSC are unable to reach agreement on a contribution, the Director-General would determine a contribution following an independent investigation paid for by the Applicant.

5.9 Building Assessment

The Department considers that the mine will require a Construction Certificate for the erection of the following buildings / structures, as detailed in Table 11

Table 11. BCA Classification for the building/ structures to be erected.

Structure	BCA Classification
Office	Class 5
Amenities	Class 8

Conditions pertaining to building matters are included in the recommended instrument of consent. Condition 12 (b) and (c) deal with structural adequacy and verification of construction. In addition, section 80A(11) of the Act refers to clause 133 of the Environmental Planning and Assessment Regulation (2000) which contains prescribed building conditions that are part of development consent.

5.10 Ecologically Sustainable Development (ESD)

Applicant's Position

The Applicant addresses the concept of ecologically sustainable development in Section 7.3 of the EIS. The EIS states that the principles of ESD have been applied to the Project and have been incorporated in the overall development description.

Submissions received

No submissions raised concerns about ESD.

Department's Position

Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* states that an EIS must include reasons justifying the carrying out of development in the manner proposed having regard to amongst other things, the principles of ESD. For the purposes of Schedule 2 the principles of ESD are:

(a) The precautionary principle – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
(b) Inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
(c) Conservation of biological diversity and ecological integrity.
(d) Improved valuation and pricing of environmental resources.

The EIS addresses the four ESD principles and the Department believes the principles are reinforced through the recommended consent conditions.

6.0 SCOPE OF CONDITIONS OF CONSENT

The recommended conditions of consent at Attachment "A" have been prepared taking into consideration the General Terms of Approval and other issues raised by Government agencies, Council, and all other submitters including special interest groups and private business.

The recommended conditions of consent provide for appropriate management and monitoring of noise and dust, surface and groundwater, archaeological issues and flora and fauna. The conditions of consent also include specific provisions for land acquisition, set appropriate noise and dust criteria, require the preparation of Annual Environmental Management Plan Reports and compliance reports, a number of environmental management plans, and the formation of a Community Consultative Committee.

The Department has undertaken extensive consultations with the Applicant concerning the content and intent of the conditions of consent.

7.0 CONCLUSION

The Department considers that there are no environmental impacts from the proposed continued operations at the Liddell Colliery, which could not be effectively managed through the recommended consent conditions. The proposal is consistent with State and regional planning objectives.

8.0 RECOMMENDATION

It is RECOMMENDED that the Minister approve the development application (DA 305-11-01) for the proposed continued operations at the Liddell Colliery, as submitted by the Liddell Joint Venture subject to the attached conditions of consent.

Endorsed

Nick Agapides
Manager, Mining and Extractive Industries

Sam Haddad
Executive Director

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Environmental Planning Officer, Mining and Extractive Industries

79C Evaluation

(1) Matters for consideration - general

In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:

(a). the provisions of:

- **any environmental planning instrument, and**
- **any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority, and**
- **any development control plan, and the regulations (to the extent that they prescribe matters for the purposes of this paragraph), that apply to the land to which the development application relates,**

The Department's consideration of these matters is contained in Section 3.1 through to Section 3.7 of this Report (pages 7-9). The Department is satisfied that all relevant planning issues have been addressed and considered in the determination of the development application. The Department concludes that the proposal is consistent with the aims, objectives and provisions of all the applicable planning instruments, plans and policies.

(b). the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.

The likely environmental impacts of the proposal are considered and assessed in Section 5 of the Report (pages 12-40). The Department has considered all the environmental, social and economic impacts of the proposal and concludes that the proposed development can be managed, subject to the imposition of the recommended conditions of consent. The recommended conditions of consent address performance criteria, environmental management plans, environmental monitoring and environmental auditing, which would apply to the development if approved.

(c). the suitability of the site for the development,

The suitability of the site for the development is considered in Section 3 (pages 7-9) and Section 5 (pages 12-40) of this Report. The proposal is consistent with land use objectives; the potential impacts of the proposal can be effectively managed and a number of alternatives have been considered yet rejected. The Department concludes on the basis of this assessment that the site is suitable for the proposal.

(d). any submissions made in accordance with this Act or the regulations.

A detailed discussion of the issues raised in submissions is contained in Section 4 (pages 10-11) and referenced in Section 5 (pages 12-40) of this Report, including consideration of submissions from government agencies, councils, elected representatives, business and private individuals. The issues raised in the submissions have been addressed in this assessment of the proposal and/or appropriate conditions of consent have been incorporated to manage these concerns and potential impacts.

(e). the public interest.

The public interest of the proposal is considered in Section 1 through to Section 5 of this Report (pages 1-40). It is considered that the proposal is consistent with State and regional planning objectives relating to environmental management, sustainable economic development and employment generation. The Department therefore considers that the proposal is in the public interest and all environmental, economic and social issues have been addressed in the assessment of the proposal.