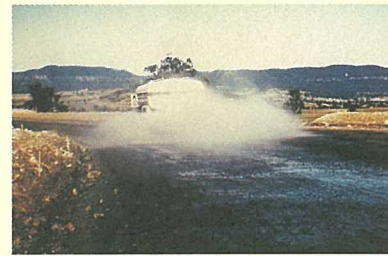


SUMMARY OF MITIGATION MEASURES

15

15.1	Methodology.....	15.1
15.1.1	Flora And Fauna.....	15.1
15.1.2	Water Management.....	15.1
15.1.3	Socio-Economic Measures.....	15.2
15.1.4	Archaeology.....	15.2
15.1.5	Air Quality.....	15.3
15.1.6	Noise And Vibration.....	15.5
15.1.7	Visual Effects.....	15.6
15.1.8	Transport.....	15.8
15.2	Environmental Management Plan Outline.....	15.10
15.2.1	Background.....	15.10
15.2.2	Construction.....	15.11
15.2.3	Operation And Maintenance.....	15.12
15.2.4	Mine Security And Signage.....	15.19
15.2.5	Contingency Planning.....	15.19
15.2.6	Complaints Procedure.....	15.20
15.3	Environmental Monitoring Programme.....	15.20
15.3.1	Reporting.....	15.20
15.3.2	Climate.....	15.21
15.3.3	Air Quality.....	15.21
15.3.4	Noise.....	15.22
15.3.5	Blasting.....	15.22
15.3.6	Water.....	15.22
15.3.7	Rehabilitation.....	15.23



This chapter presents a summary of the measures proposed in the EIS to mitigate areas of environmental impact. An environmental monitoring program is also described.

15.1 METHODOLOGY

Schedule 2 of the Environmental Planning and Assessment Regulation, 1994 requires that an EIS contain a compilation of measures proposed to mitigate any adverse effects of the development on the environment. This chapter summarises the mitigation measures identified and described in Chapters Seven to Fourteen. An environmental monitoring strategy is described along with an outline of an Environmental Management Plan for the proposal.

15.1.1 Flora and Fauna

Measures proposed to mitigate impacts on flora and fauna include:

- ◆ minimising vegetation removal;
- ◆ retaining vegetation on Mount Pleasant and other small pockets throughout the site for ecological and visual purposes;
- ◆ checking of potential habitat logs and hollows prior to clearing;
- ◆ staged replanting to keep pace with mining sequence;
- ◆ control of feral species in consultation with the Rural Lands Protection Board;
- ◆ maintenance of rehabilitation areas to control weed invasion;
- ◆ creation of several large waterbodies, represented by the final voids which could be used as a water source by native fauna; and
- ◆ overall increased areas of woodland/forest available for use by fauna.

15.1.2 Water Management

A water management plan has been developed for surface and groundwater flows on the site. This encompasses the diversion, collection, storage and treatment of both surface and groundwaters. The water management and control strategy for the proposed mine includes:

- ◆ conveying clean runoff from undisturbed areas around mining operations to discharge into natural drainages. This has the added benefit of minimising losses to downstream water flows from surface runoff;
- ◆ controlling and managing stormwater and groundwater collected in the open-cut pits;

- ◆ the harvesting, storage and treatment of runoff waters to provide an operational water supply for dust suppression, coal washing and other on-site uses;
- ◆ minimising supply requirements from the Hunter River;
- ◆ the release of surplus waters to the Hunter River in compliance with the Hunter Salinity Trading Scheme;
- ◆ staged construction of fine rejects emplacements and environmental dams to ensure maintenance of downstream water quality; and
- ◆ initiation of a long-term water monitoring program.

Computer modelling has identified that the proposal has the potential to affect surface and groundwater supplies in proximity to the site.

Where economic loss of water yields from surface waters and boreholes is demonstrated, Coal & Allied will offer to replace water supplies either by borehole deepening or provision of alternative water sources.

15.1.3 Socio-economic Measures

The following mitigation measures are proposed:

- ◆ ongoing consultation with local residents during the construction and operation of the mine and implementation of effective complaints handling procedures;
- ◆ liaison with CES and other relevant organisations regarding training needs and measures that can be implemented to assist youth unemployment and increasing the skill base such as study scholarships and grants;
- ◆ liaison with Muswellbrook TAFE to provide mine related, administration and environmental courses;
- ◆ monitoring of demand for temporary accommodation and need for a construction camp;
- ◆ monitoring in conjunction with Muswellbrook Shire Council to assess demands on community services and formulation of community development programs if required.

15.1.4 Archaeology

Recommendations of the archaeological studies include:

- ◆ an archaeological salvage program to recover material and information from sensitive areas, particularly less disturbed areas, should be carried out prior to the proposed development;
- ◆ wherever practical the development should avoid impact on Aboriginal sites particularly in the less disturbed areas identified by Rich (1995);

- ◆ preparation of a management plan should ensure the protection of sites not destroyed by the proposal;
- ◆ protection of sites adjacent to works, for example by fencing, to ensure they are not accidentally destroyed during construction and mining;
- ◆ cessation of work at a particular location if additional artefacts are identified during development. Consultation with the National Parks and Wildlife Service would be sought; and
- ◆ continued consultation with the Wanaruah Local Aboriginal Land Council and Wonnarua Tribal Council Incorporated.

These recommendations will be implemented by Coal & Allied. The aims of further work are to enable the full assessment of site significance and to facilitate the maximum retrieval of information about any sites which may be lost.

15.1.5 Air Quality

A variety of dust mitigation measures will be incorporated into the proposal. These will be applied during design and operation.

i. Design Measures

The following dust mitigation measures will form part of the mine design:

- ◆ the length of haulage routes will be minimised. This will reduce the length of truck travel and hence reduce the potential for dust generation;
- ◆ haul roads will be constructed within the pit where possible. The in-pit location has the effect of retaining a proportion of the dust generated;
- ◆ the use of bunding. Bund walls will assist in retaining some of the generated dust especially in the early years of mine development; and
- ◆ a variety of dust control measures will be used at the coal stockpiles and preparation plant:
 - coal dump hoppers will be equipped with fogging sprays;
 - water sprays will be installed where practical to reduce dust escaping from initial ROM coal crusher feed chutework and from the final ROM coal crusher delivery chutework;
 - conveyors transfers will be largely enclosed and/or fitted with water sprays at those transfer points likely to generate significant amounts of dust;
 - conveyors will be equipped with wind guards and/or partially enclosed by sheeting connected to the conveyor or be largely enclosed by gantry sheeting (see *Figure 17*) or, in the case of the underground sections of the reclaim conveyor will be located in a tunnel. An exception to this will be the elevated conveyor feeding the product stacker which will not be enclosed due to the high moisture content of the product coal;

- travelling stackers will have a luffing capability so that the distance that the coal is permitted to free fall is kept to practical minimum.
- water sprays will be available for use on the stockpiles in high winds and during very dry weather conditions; and
- reclamation of coal from the product stockpiles will be by reclaimers located below the coal stockpile.
- ◆ prestripping will be strictly limited and rehabilitation works designed to minimise exposed area;
- ◆ out of pit emplacements will be minimised; and
- ◆ blasting will be designed to avoid premature venting.

ii. *Operational Measures*

The following dust mitigation measures will be undertaken during the mine's operation:

- ◆ limiting exposed areas. Restricting the disturbed surface area is an effective approach to dust control. This is achieved by minimising the area disturbed ahead of mining and maximising the rate of rehabilitation after the completion of mining in an area;
- ◆ watering of working surfaces, and watering and route marking of active haul roads;
- ◆ regular maintenance of all haul roads. Watering and regular maintenance are expected to result in a control efficiency of at least 50 per cent;
- ◆ care in truck loading to prevent spillage of overburden material and coal;
- ◆ collection of dust during drilling. Drill rigs will be fitted with dust aprons and dust extraction cyclones;
- ◆ controls on blasting during periods of high winds. Blasting on exposed areas will be stopped during periods of wind speed in excess of 10 metres/second blowing from the north to west sector, if it is considered safe to do so;
- ◆ progressive rehabilitation of rock emplacements will be undertaken;
- ◆ if coarse angular drill chips are not available then imported stemming will be used rather than drill fines;
- ◆ NONEL blast initiation systems will be used in preference to surface detonation chord;
- ◆ monitoring will be performed to assist in optimising blast design parameters to minimise dust generation;
- ◆ to provide advance warning of meteorological conditions that are likely to result in adverse impacts, the mine will subscribe to the Bureau of Meteorology weather service for regular updates;

- ◆ restriction and/or shutdown of some or all activities when wind speed exceeds 10 metres per second in key directions, if it is considered safe to do so; and
- ◆ water sprays will be operated to control dust at the dump hoppers in the vicinity of the ROM coal crushers, at conveyor transfer points and on the coal stockpiles.

15.1.6 Noise and Vibration

i. Noise and Vibration from Blasting

The maximum instantaneous charge required to meet the overpressure assessment criterion of 115 dB(Lin) is less than that required to satisfy the vibration criterion. Overpressure will therefore dictate the maximum instantaneous charge that can be used. The highest predicted values of overpressure and vibration will be in the south-west of the township of Kayuga in Years 4 and 5.

Techniques to reduce blast overpressure will be investigated during future mine development. This will include:

- ◆ close attention to blast design and execution in the North Pit during Years 4 and 5;
- ◆ providing sufficient stemming to ensure that excessive overpressure is not produced;
- ◆ controls on blasting under low cloud conditions, where a temperature inversion may be inferred; and
- ◆ conducting a small trial detonation to monitor overpressure during unfavorable conditions.

Should it not be possible to limit overpressure to the assessment criterion then Coal & Allied would offer to purchase affected residences.

ii. Noise Control Measures

The noise amelioration measures proposed include:

- ◆ construction of an extensive noise mitigation bund along the eastern edge of the South Pit;
- ◆ limiting machinery and truck operations on sensitive overburden emplacements in the east of the site to daytime hours unless reduced sound levels from new equipment allows greater flexibility;
- ◆ limiting night-time machinery and truck operations within the pit during years 7 - 12 to the second-highest bench to give maximum protection to residences near Muswellbrook;
- ◆ minimising transient noise sources, in particular noise from truck reversing alarms. Use of alarms with variable sound levels will be trialled;
- ◆ use of best noise minimisation technology wherever practicable. This includes noise considerations in the selection of suitable plant and machinery for the site; and
- ◆ acquisition of residences affected by noise levels which exceed the criterion.

15.1.7 Visual Effects

i. Mitigation Priorities

Mitigation priorities are outlined in *Table 15.1*.

Table 15.1 MITIGATION PRIORITIES

Phase of Project	Mitigation Measure
Year 1 (before mining commences)	<ul style="list-style-type: none"> • Fence off vegetation to be retained and improve areas with additional plantings⁽¹⁾. • Screen planting along site boundaries adjacent to Wybong Road and Dorset Roads. • Initial screen planting for fine rejects area. • Commencement of bund construction
Years 2 to 4 (up to the start of mining)	<ul style="list-style-type: none"> • Progressive planting of bund and infrastructure areas. • Rehabilitation of the 'Piercefield' and 'Warkworth South' pits highwalls.
Years 2 to 20 (mining operations)	<ul style="list-style-type: none"> • Progressive rehabilitation of mined areas. • Completion of additional screen planting for fine rejects emplacement areas.
Post Mining	<ul style="list-style-type: none"> • Final rehabilitation of mine landscape and fine rejects emplacements.

Notes: 1. A substantial amount of advance tree planting has already been undertaken on site.

ii. Topographic Measures

The most effective means of minimising the project's longterm visual effects would be to provide a landform similar to the pre-mining landform described in Section 13.1.2. New landforms will emulate the existing pattern of ridges and valleys to form an appropriate link between the retained land to the west and east of the mine site.

Existing ridgelines of benefit in reducing or eliminating potential views of the mine will be largely retained where possible, with some requiring mining in the final stages of the project.

A more indirect measure to address local views is to screen parts of the mine with visual bunds. The main bund proposed along the eastern boundary will significantly reduce visual impacts from the east. The bund has been designed within the spacial limitations of the site to emulate the existing landform scale and shape including a variable ridgeline elevation.

The proposed closures of sections of Castlerock Road and ultimately Wybong Road (in conjunction with Muswellbrook Shire Council) will also assist in reducing visible mine areas from the west and south. A visual bund will be constructed with vegetative screening along parts of the replacement road constructed in the western portion of the site.

iii. Vegetative Measures

Vegetative measures to reduce visual effects will play an important role from the initial stages of mine development until well after the cessation of mining. The new plantings on the bunding, rehabilitated landforms and fine rejects emplacement areas will screen these areas as well as re-establishing vegetation patterns consistent with the site's former woodland character.

The bund will be planted or directly seeded using mixed native tree species with a preference for those indigenous to the site. Vegetation will be more densely concentrated along the ridges and upper side slopes becoming sparser down the side slopes.

Appropriate plantings of native tree species will be interspersed throughout the industrial area and surrounds as conceptually shown on *Figure 14*. The new landforms created as part of the rehabilitation process will be quickly stabilised with grasses and seeded with native tree species.

Other general principles relevant to the establishment of vegetation on site include:

- ◆ undertaking extensive planting programs from the beginning of the project in order to establish effective screens as quickly as possible;
- ◆ using direct seeding techniques for large revegetation areas such as emplacement landforms. More mature sized species will be used in limited high profile areas where immediate results are required such as the administration area; and
- ◆ consideration of rehabilitated side slopes for planting of commercial species.

Experience with rehabilitation and stabilisation techniques gained from the Hunter Valley No. 1 Mine by Coal & Allied will be applied to this project.

iv. Operational Measures

Operational measures to reduce visual effects involve the siting or treatment of mine structures and the design and operational criteria applied to nightlighting. The use of existing gullies for the location of the rail loop, infrastructure and fines rejects emplacement will assist in reducing potential views of these areas. Haul roads will be located behind or to the side of ridges wherever practical.

Structures identified as potentially visible owing to height or size will be treated using appropriate design, colours and surface materials.

Specific lighting modifications will include the lowering of fixed lighting for operational areas and the directing of work lights away from settlements. Other general design criteria which will be used to minimise the effects from site lighting include:

- ◆ providing only sufficient lighting necessary for safe and efficient operation;
- ◆ where safety will not be compromised, provision of time delay automatic switch-off for access lighting where suitable;
- ◆ enclosing all buildings, most elevated conveyor galleries and parts of the conveyor transfer stations; and
- ◆ using bunding and vegetation to screen lighting.

15.1.8 Transport

A significant number of road and rail transport improvements in the Muswellbrook area will be required to be implemented the future Mount Pleasant, Kayuga and Bengalla Mines.

These transport improvements will be implemented in consultation with Muswellbrook Shire Council and other government agencies, so as to accommodate the cumulative increases that occur in the locality as a result of the mines.

The following summary provides a description of which safeguards and works are anticipated to be implemented by the Mount Pleasant Mine and which works will be provided by other mines and rail freight operators. A commitment by the Mount Pleasant Mine to implement future roadworks is made on the basis that these works will be implemented at specified stages of mine operations and their implementation may be delayed until such time as the mine development proceeds.

i. *Kayuga Bridge Traffic Safeguards (Mount Pleasant Mine)*

- ◆ Contractual arrangements to prevent heavy traffic usage of the bridge by the Mount Pleasant Mine (during the hours of 6.45 to 8.45 am and 3.15 to 5.15 pm on weekdays) by either construction or operations traffic from the mine.
- ◆ Signs to be erected on the bridge, subject to approval from Muswellbrook Shire Council, in both directions to specify the above requirements.

ii. *Management of Temporary Road Closures due to Blasting (Mount Pleasant Mine)*

- ◆ Minimum 24 hours notice of all road closures to be provided.
- ◆ Solar powered signs to be installed to advise traffic of road closures and alternative routes.

- ◆ Blasting operations at Bengalla, Mount Pleasant and Kayuga Mines to be co-ordinated to minimise traffic disruption from road closures on Wybong Road, Castlerock Road, Dorset Road and the proposed Mount Pleasant Northern Link Road.
- iii. *Intersection Improvement Works (Mount Pleasant Mine)*
- ◆ Future intersection for Mount Pleasant Mine Access from Mount Pleasant Western Link (Year 9 of mine operations).
 - ◆ Future intersection of Mount Pleasant Western Link Road with Bengalla Mine Link Road (Year 9 of mine operations).
 - ◆ Future intersection of Mount Pleasant Western Link Road with Mount Pleasant Northern Link Road and Castlerock Road (Year 3 of mine operations).
 - ◆ Future intersection of Mount Pleasant Northern Link Road with Kayuga Road (Year 3 of mine operations).
 - ◆ A 65 per cent contribution towards the cost of future intersection improvements at the Denman Road and Thomas Mitchell Drive intersection.
- iv. *Roadworks Improvements (Mount Pleasant Mine)*
- ◆ Construction of a bridge to carry the Bengalla Mine Link Road over the proposed Mount Pleasant Rail Loop.
 - ◆ Close Castlerock Road and construct Mount Pleasant Northern Link Road to Dorset Road (Year 3 of mine operations).
 - ◆ Close Wybong Road in conjunction with Muswellbrook Shire Council and construct Mount Pleasant Western Link Road (Year 9 of mine operations).
 - ◆ All roads to be constructed to 100 km/hr design standard to Council and RTA requirements.
 - ◆ A contribution of 50 per cent to be made to the annual road maintenance costs for the section of the Bengalla Mine Link Road between Denman Road and the western limit of the 1 in 100 year flood level.
 - ◆ From the time of commencement of mine construction, any additional annual maintenance costs for Wybong Road between the mine access and Kayuga Road (including the Rosebrook Bridge) are to be met by the Mount Pleasant Mine. The calculation of these additional costs is to be based on historic maintenance costs to Council for this section of road for the three year period July 1994 to June 1997.

v. *Roadworks Improvements (by other mines)*

- ◆ Construct a 500 metre extension to the Dartbrook Mine Link Road and open this road for public traffic usage (by Kayuga Mine).
- ◆ Complete Bengalla Mine Link Road (from Denman Road to Wybong Road) (by Bengalla Mine).
- ◆ Close part of Dorset Road and construct Kayuga Mine Link Road (by Kayuga Mine).

vi. *Rail Transport (Mount Pleasant Mine)*

- ◆ Product coal from the proposed mine is to be transported by rail.
- ◆ A new rail loop with Category 6 coal loading capacity is to be constructed at the Mount Pleasant Mine.

vii. *Rail Transport (Rail Freight Operators)*

- ◆ Signalling and scheduling improvements will need to be provided by the Rail Access Corporation and FreightCorp respectively to reduce delays and stops and starts by coal trains at Muswellbrook Junction; and
- ◆ Increased coal train capacity with more 8,000 tonne capacity trains will need to be provided by rail freight operators in the longer term to facilitate operations of the Muswellbrook to Antienne section of the Main Northern Rail Line.

15.2 ENVIRONMENT MANAGEMENT PLAN OUTLINE

15.2.1 Background

The Director's requirements for the EIS (see Appendix A) specify that an outline of an Environmental Management Plan (EMP) be provided for the management and mitigation of environmental impacts for the construction and operation of the mine. The plan should include:

- ◆ a demonstration of sound environmental management practices;
- ◆ identification of all licensing and approval requirements; and
- ◆ an outline of a monitoring programme and procedures for reporting results.

The plan will act as an environmental operations manual for the mine's management and operation staff. It will also be an advisory document to regulatory authorities. Consequently, it will be updated as required.

Separate outlines are provided for the mine's construction and operational phases. All proposed safeguards will be incorporated into specific management plans prior to work commencing.

15.2.2 Construction

Management plan outlines for construction of the mine facilities are given below. These will be prepared in accordance with development consent conditions and in consultation with authorities, including:

- ◆ Department of Land and Water Conservation;
- ◆ Environment Protection Authority;
- ◆ Department of Urban Affairs and Planning;
- ◆ Muswellbrook Shire Council;
- ◆ Department of Mineral Resources;
- ◆ NSW National Parks and Wildlife Service;
- ◆ the Roads and Traffic Authority of NSW; and
- ◆ State Rail Authority (Freight Corp and Rail Access Corporation)

The plan for construction of the mine facilities will address the following:

- ◆ development approval conditions;
- ◆ working hours;
- ◆ noise control;
- ◆ traffic;
- ◆ dust control;
- ◆ management of excavation material;
- ◆ waste disposal measures;
- ◆ erosion and sediment controls;
- ◆ revegetation and rehabilitation methodology;
- ◆ approvals and/or licences required; and
- ◆ monitoring requirements.

15.2.3 Operation And Maintenance

The environmental management of Mount Pleasant Mine will involve many factors differing in both origin and location. As such, a site specific Environmental Procedures Manual will be prepared to describe monitoring and operational procedures, as well as assigning environmental management responsibilities to specific positions within the management structure. The manual will also establish procedures for mine security, complaint reporting and contingency plans to be followed in the event of an emergency.

The manual will detail procedures under the following key areas:

i. Waste Management

❖ Management and Documentation of Contractors

Objective: to ensure that waste is responsibly managed on and off site and contractors have appropriate licences to handle wastes that they collect.

Procedures: a system will be developed to track wastes until they are reused, recycled, or disposed. Environmental information required to hire contractors will also be documented.

❖ Register of Waste Contractors

Objective: to ensure that the contact details and relevant licence numbers of contractors used are easily accessible.

Procedures: a list of contact details will be developed including collection frequency, contract arrangements and application of the waste tracking system.

❖ Segregation and Management of Wastes

Objective: to minimise the generation of wastes and segregate wastes for appropriate management.

Procedures: details of waste categories, location of waste disposal facilities, disposal and cleaning practices, responsibilities of waste contractors and collection frequency will be documented. Procedures will be developed to cover:

- ◆ Office Wastes;
- ◆ Environmental Management in the Workshop;
- ◆ Disposal of Industrial Tyres;
- ◆ Segregation and Management of Wastes in Production Areas; and
- ◆ Segregation and Management of Wastes in the Workshop.

ii. *Water Management*

❖ *Dam Inspections*

Objective: to ensure that dams are regularly checked and the conditions of any site licences are met to minimise impacts on the environment.

Procedures: details of measures to be taken to ensure that mine water dams are maintained at an appropriate level to safeguard against unlicensed discharges.

❖ *Site Pumping*

Objective: to ensure that pumping operations maximise on site storage and manage potential impacts of uncontrolled discharges to the surrounding environment.

Procedures: appropriate steps will be listed that need to be taken to protect the environment from uncontrolled discharges when pumping water around the site.

❖ *Dam Desiltation*

Objective: to maintain 75 per cent of design capacity by the periodic removal of accumulated sediment.

Procedures: steps to be undertaken to desilt dams will be listed.

❖ *Monitoring of Environmental Dams*

Objective: to ensure that the environmental dams are regularly checked to minimise potential for overflows into downstream watercourses.

Procedures: measures to be taken to prevent dam overtopping will be listed including reference to pumping, desiltation requirements and dam discharge procedures.

❖ *Dam Operating Procedures*

Objective: to ensure dams in the mine water management system contain sufficient water for dust suppression and coal preparation. Minimise the need for discharges from the main water storage dam in accordance with the Hunter Salinity Trading Scheme.

Procedures: accountability of the water management system will be identified including steps to be followed for the transfer of water within the mine water system. Actions to be taken in the event of a potential discharge from the main storage dam will also be given.

❖ *Water Reticulation*

Objective: to ensure the efficient recycling of water on site, removal of water from operational pits and control of discharges.

Procedures: responsibility for the water reticulation system and guidelines on how to divert water around the mine will be outlined.

❖ Response to Dam Discharge

Objective: to ensure that discharges of surplus water from the main storage dam to the Hunter River are in accordance with the Hunter River Salinity Trading Scheme.

Procedures: list site accountabilities to discharge under the Scheme, location of authorised discharge points, critical limits of compliance and steps to be undertaken in response to a discharge opportunity.

❖ Fines Emplacement Dams

Objective: to provide for the safe disposal of fine rejects material which minimises the potential for leachates to the surrounding environment and allows the recycling of water back to the mine system.

Procedures: outline measures for pumping fine rejects to the emplacements, measures to ensure integrity of the dams, water recycling, quantities of rejects pumped, tests to determine the physical and chemical characteristics of the rejects, decommissioning and rehabilitation procedures.

iii. Noise and Air Quality Management

❖ Dust Suppression on Haul Roads

Objective: to minimise the amount of airborne dust material being generated, particularly on haul roads, loading and dumping areas and other trafficable areas.

Procedures: the maintenance of active haul roads and manoeuvring areas with gravel and water carts will be documented. Criteria for dust suppression on roads and steps to be taken to fill water carts will be given along with criteria for truck and machinery operation

❖ Dust Suppression for Drill and Blast Operations

Objective: to minimise the health and environmental hazard to employees and surrounding communities associated with the generation of airborne dust from drilling and blasting operations.

Procedures: outline steps to be taken to minimise dust generation from drilling and blasting operations including the use of water sprays and dust extraction, suitability of stemming materials and meteorological conditions.

❖ Environmental Considerations in Blasting

Objective: to provide a checklist of environmental factors which need to be considered prior to blasting to minimise the effects of overpressure on neighbouring residents.

Procedures: details of steps to be undertaken prior to blasting in regard to environmental and community considerations. Steps will include notification of surrounding residents, notification of road closures, assessment of weather conditions and sensitivity of areas likely to be affected.

❖ Night Lighting

Objective: to provide sufficient lighting to maintain safe working conditions without causing disturbance to the surrounding community, particularly residents in Muswellbrook.

Procedures: outline criteria which need to be considered when lighting is used, including safety, placement of lights and direction of lighting to prevent fugitive light on residences to the east and southwest,

❖ Dust Suppression on Stockpiles

Objective: to minimise airborne dust generated from the coal stockpiles by utilising installed dust suppression equipment.

Procedures: operation and maintenance of dust suppression equipment on the coal stockpiles.

iv. Land Management and Rehabilitation

❖ Topsoil Management

Objective: to respread stripped topsoil directly on to landform reconstruction areas to minimise the need for topsoil stockpiling. Where topsoil stockpiling is necessary it will be managed to maintain the quality of the soil for rehabilitation.

Procedures: criteria for the location and maintenance of topsoil stockpile areas will be listed. Locational criteria will include avoidance of active areas, trees and watercourses, stockpile height and erosion considerations. Maintenance criteria will include segregation of varying topsoil quality, stockpile status (active or closed), long term management and weed control.

❖ Surface Preparation and Revegetation

Objective: to ensure that the rehabilitated land surface provides a stable landform, vegetated with a mix of pasture and native tree species. To achieve this emplacement shaping must conform to the rehabilitation plan and surface preparation must be completed according to certain criteria.

Procedures: details of the steps that need to be taken when preparing the surface for rehabilitation including topsoil resspreading, rock raking and establishing drainage works. Seeding, maintenance and access criteria will also be listed.

❖ Archaeology and Heritage

Objective: to ensure that any sites of Aboriginal and European heritage on site be identified so that relevant management, documentation and protection measures can be implemented.

Procedures: steps to identify, manage, protect and seek permission to destroy Aboriginal and Non-Aboriginal heritage sites will be listed.

❖ Weed Control

Objective: to control weed growth in disturbed areas which may compete with native tree species trying to establish.

Procedures: regular inspections of rehabilitation areas will be required to determine if spraying is necessary. Criteria for the use of chemicals on site will be developed.

❖ Soil Erosion Control

Objective: to minimise erosion which has the potential to result in the sedimentation of dams and waterways as well as a loss of topsoil and associated nutrients.

Procedures: methods to minimise and combat erosion will be listed. These include response to gullying, interception and control of overland flows and landform shaping and slope criteria.

❖ Final Landform Planning

Objective: to ensure that the physical form and timing of land shaping complies with approved rehabilitation plans.

Procedures: the actions involved and responsibility for the final land shaping process will be identified.

❖ Topsoil Stripping

Objective: to ensure that land clearing and topsoil stripping are carried out in accordance with relevant approvals and licence conditions.

Procedures: criteria for land clearing and topsoil stripping will be developed. Land clearing will include consideration of trees as a timber resource or viable seed source, maximum clearing area in advance of mining and removal of vegetation. Topsoil stripping will be carried out in accordance with an approved stripping plan, with regard to timing, machinery and stripping technique.

❖ Spoil Shaping

Objective: to ensure that final landform shaping conforms to relevant approvals, is structurally stable and blends with the regional landscape

Procedures: landform shaping criteria will consider drainage, slopes and burial of unsuitable spoil material.

v. Environmental Monitoring

❖ Water Quality Monitoring

Objective: to obtain an understanding of water quality on site in comparison to the receiving waters and ensure compliance with relevant licence conditions, approvals, standards and legislation.

Procedures: details of the parameters to be measured, frequency of monitoring, location of monitoring sites, data collection, storage, analysis and reporting requirements will be specified.

❖ Air Quality Monitoring

Objective: to comply with relevant licence conditions, approvals, standards and legislation and to assess the effectiveness of dust control measures in minimising fugitive dust.

Procedures: assessment criteria, frequency of monitoring, location of monitoring sites, data collection, storage, analysis and reporting requirements will be outlined.

❖ Meteorological Monitoring

Objective: to comply with relevant licence approvals and conditions, obtain information in order to verify adverse meteorological events causing abnormal monitoring results and provide advice to operational staff on conditions which may affect dust, noise and blasting.

Procedures: monitoring parameters and frequency, collection, storage and reporting requirements will be outlined.

❖ Noise Level Monitoring

Objective: to comply with relevant licence conditions, approvals, standards and legislation and to assess noise impacts on the health and safety of the workforce and surrounding community.

Procedures: criteria for the measurement of noise including monitoring locations, collection methods, data analysis and reporting will be outlined.

❖ Blast Monitoring

Objective: to comply with relevant licence conditions, approvals and standards and to monitor the impact of blasting on the workforce and neighbouring residents.

Procedures: blasting limits, monitoring locations, recording parameters and reporting requirements will be detailed.

❖ Rehabilitation Monitoring

Objective: to ensure that the performance of rehabilitation is monitored and recorded on a regular basis to aid in the identification of successful planting methods and species. It will also allow identification of weeds and implementation of weed control programs.

Procedures: timing of visual and quantitative inspections, assessment of the need for weed control and corrective action will be detailed.

vi. Environmental Management Systems

❖ Inspection of the Coal Preparation Plant Workshop and Surface Facilities

Objective: to ensure that aspects of the waste and hazardous substances management system are functioning correctly and that problems are addressed within an appropriate timeframe.

Procedures: management criteria will be outlined including responsibilities, inspection documentation and administration of the workshop and surface facilities.

❖ Inspection of Production Areas of the Coal Preparation Plant

Objective: to ensure that all components of the environmental management system for the production areas of the coal preparation plant including waste, hazardous substances and water function correctly. Identified problems will be recorded and addressed.

Procedures: management criteria will be outlined including responsibilities, inspection documentation and administration of the coal preparation plant.

vii. Environmental Reporting and Administration

❖ Reporting to Government Authorities

Objective: to ensure that an annual report on a number of environmental issues is submitted to relevant government regulatory bodies.

Procedures: details on who receives the report, report timing, and information requirements will be outlined.

❖ Environmental Statute Breach Reporting

Objective: to ensure that in the event that an environmental statute breach, correct reporting, recording and remedial action is undertaken.

Procedures: describe the reporting requirements in the event of a breach of an environmental statute.

❖ Community Consultative Committee

Objective: to continue to foster and formally establish a working relationship with surrounding residents to facilitate increased understanding, trust and issue resolution.

Procedures: an outline of the Committee representatives will be provided along with Coal & Allied's requirements and obligations to the committee.

❖ Community Complaints

Objective: to ensure that complaints are documented and managed in a consistent manner to resolve issues and community concerns.

Procedures: an outline of Coal & Allied's complaints protocol is given in Section 15.2.6.

viii. Training and Awareness

❖ Employee Induction

Objective: to induct new employees during their early months of employment so that they obtain a proper understanding of Coal & Allied's mode of operations and administrative structure.

Procedures: a formal induction program will be developed outlining company policy, operational procedures, environmental awareness, safety and reporting.

❖ Training and Environmental Awareness

Objective: to facilitate the continued training and education of personnel to enable them to best perform assigned tasks with regard to environmental issues and safety.

Procedures: employee training requirements will be assessed on an individual basis. Environmental awareness training will consider issues relating to mine lighting, noise, air quality, blasting, rehabilitation and water management.

ix. Administration

❖ Writing Procedures

Objective: to develop standardised recording and reporting methods so that environmental procedures and impacts can be documented and managed in a consistent and thorough manner.

Procedures: develop a standard reporting structure and requirements associated with environmental procedures.

❖ Review and Update

Objective: to review and regularly update the environmental management plan as required.

Procedures: review requirements, timing and updating procedures will be outlined.

❖ Auditing Procedures

Objective: to ensure that every element of the Company's environmental management system is internally audited on a yearly basis.

Procedures: the manner in which audits are to be conducted will be outlined including responsibility, reporting and updating requirements.

x. *Emergency Response*

❖ Spill Response

Objective: to minimise potential environmental contamination by providing guidelines for the actions required in response to a spill. The objectives of spill clean-up will be to contain and recover or dispose of as much of the spill as possible in a safe and timely manner.

Procedures: steps needed to be taken to confine, recover and dispose of spillages will be outlined.

❖ Use of Emergency Response Equipment

Objective: to minimise environmental contamination by containing spills as soon as possible.

Procedures: the location and instructions for the use of emergency response equipment will be outlined.

15.2.4 *Mine Security And Signage*

Site security will be an important component of the EMP. The plan will detail fencing, access arrangements and inspection programs. Contact details and staff responsible for liaison will be detailed as well as visitor management and registration procedures.

15.2.5 *Contingency Planning*

Conditions may arise which require a specific response to prevent or mitigate an environmental impact during construction of the mine facilities and mine operations. In order to prepare for this a range of anticipated contingencies and predetermined corrective actions will be specified in the EMP, including responsibility. Generic examples are summarised in *Table 15.2*.

Table 15.2 EXAMPLE OF CONTINGENCY PLANNING

Anticipated Problem	Potential Impact	Corrective Active	Responsible Person
Release of fuel/oil from machinery	contamination of waters	<ul style="list-style-type: none"> Remove or isolate source, use adsorbent booms to remove oil, make any repairs as required. 	Site Supervisor
Excessive dust	nuisance	<ul style="list-style-type: none"> Use water sprays or cease dust generating activities until better dust control can be achieved 	Site Supervisor

15.2.6 Complaints procedure

As a result of the increased community awareness about the environmental impacts of mining, it has become extremely important to document and manage complaints in a consistent and thorough manner. This will also ensure the resolution of issues and community concerns is achieved as quickly as possible.

The EMP will detail procedures for receiving and acting on complaints and the appropriate chain of reporting and responsibility.

Procedures for managing complaints will include:

- ◆ establishing a 24 hour complaint hotline;
- ◆ recording complaint details
 - date and time of complaint
 - method by which complaint was lodged
 - personal details of complainant if provided
 - nature of complaint
 - action taken in relation to the complaint including any follow-up contact; and
- ◆ complaint resolution.

15.3 ENVIRONMENTAL MONITORING PROGRAMME

15.3.1 Reporting

A network of environmental monitoring stations will be installed within and adjacent to the Mount Pleasant Mine. Monitoring will be performed within a procedural framework provided by the EMP. The network will monitor five main parameters:

- ◆ climate;
- ◆ dust;
- ◆ noise;
- ◆ blasting; and
- ◆ water management.

Monitoring results will be summarised in Annual Reports provided to the following authorities:

- ◆ Department of Urban Affairs and Planning;
- ◆ Environment Protection Authority;
- ◆ Department of Mineral Resources; and
- ◆ Muswellbrook Shire Council.

15.3.2 *Climate*

A meteorology station (WS1) is currently located on site as shown on *Figure 32*. It contains a number of sensors measuring wind speed and direction, air temperature, rainfall, relative humidity and solar radiation. This station will be relocated to the south-west corner of the site in an area representative of the prevalent site conditions. Monitoring will use “real time” data gathering technology using modem or microwave links. Data will be collected and maintained in a computer file format.

To provide advance warning of meteorological conditions that are likely to result in adverse impacts, the mine will subscribe to the Bureau of Meteorology weather service for regular updates. Information sought will include the likely presence of temperature inversions, changes in wind speed and direction and extreme rainfall events.

15.3.3 *Air Quality*

Air quality will be measured in two forms: dust deposition; and dust concentration.

Dust deposition monitoring will be undertaken using a network of depositional gauges located within the Mount Pleasant Mine site and sensitive adjacent areas. The siting of gauges will be in accordance with Environmental Protection Authority conditions as well as constraints relating to the Bengalla Mine (to the south) and proposed Kayuga Mine (to the north).

Dust concentration will be monitored using a network of high volume samplers to collect two types of particle size, PM₁₀ and TSP. These terms are defined in Chapter Eleven. The aim of this monitoring will be to measure the concentration of suspended particles in ambient air.

The potential for “real-time” monitoring will be investigated as this technology becomes practically viable.

15.3.4 Noise

Ambient Noise levels will be monitored at a number of sensitive locations around the Mount Pleasant Mine site. Noise levels will be measured at regular intervals using a manually operated noise meter, and over longer periods using unmanned noise loggers.

The use of "real-time" monitoring technology will also be investigated. Locations of monitoring sites, frequency of sampling and reporting procedures will be specified in the EMP.

15.3.5 Blasting

Blast monitoring will be undertaken continuously, measuring and recording overpressure and ground vibration. The EMP will provide details of the mine's blast monitoring network including the number and position of blast monitors and early warning units. The network will instantaneously transfer all blast monitoring data to a computer on site for recording. The EMP will document procedures for responding to incoming data.

15.3.6 Water

Surface waters and groundwaters together with numerous other environmental parameters, are currently monitored on a regular basis over a wide area. Locations include a number of boreholes within the alluvial lands, boreholes within the coal measures and surface drainages in the western fine rejects area.

A comprehensive surface and groundwater monitoring programme will be instigated as part of the mine environmental monitoring plan. The monitoring programme will include all current monitoring activities together with an expanded programme incorporating all dams and drainages, additional groundwater monitoring bores and real time mine water management through computer based systems. All data will be regularly reviewed with baseline and alert conditions being continually updated. Compliance monitoring will be maintained throughout the mine life and during the aftercare period.

Regular monitoring of pit water and spoils leachate will be undertaken to develop an optimal strategy for salt minimisation within spoils. This may include measures to accelerate or retard leaching through enhanced percolation of rainfall.

Water management monitoring will include:

- ◆ weather monitoring as outlined in Section 15.3.2;
- ◆ measurement of water levels and water quality (EC, pH and ionic speciation) within a regional network of monitoring bores;
- ◆ measurement of water levels and water quality (EC and pH) within the mine water dam system through integrated real time management systems;
- ◆ monitoring of sedimentation dams for suitability of runoff releases to natural drainages;

- ◆ monitoring of the fine rejects emplacement area environment dam and downstream monitoring bores for water quality (EC, pH, ionic speciation and trace elements);
- ◆ monitoring of pumpage and water usage for washery, dust suppression and truck washdown;
- ◆ compliance monitoring and measurement of water discharges (including quality monitoring to Schedule 2, Clean Waters Act) to the Hunter River in accordance with the Hunter Salinity Trading Scheme;
- ◆ regular checks on all dams, contour banks, channels and diversions to ensure the maintenance of stable grassed surfaces;
- ◆ installation of a transfer system to convey data from the mine to DLWC in compliance with the trading scheme; and
- ◆ annual reporting as part of licensing conditions.

15.3.7 Rehabilitation

The EMP will specify procedures to achieve rehabilitation requirements included as conditions of the mining lease. Surveys of rehabilitation will consider species selection, rehabilitation method and fauna diversity and habitat values. A structure for rehabilitation reporting will be detailed and reports will form an integral part of the EMP.

PART D

PROJECT

VALIDATION

16.1	Methodology.....	16.1
16.2	Ecologically Sustainable Development.....	16.1
16.2.1	Context.....	16.1
16.2.2	Precautionary Principle.....	16.2
16.2.3	Social Equity Including Intergenerational Equity.....	16.3
16.2.4	Conservation Of Biological Diversity And Maintenance Of Ecological Integrity.....	16.4
16.2.5	Improved Valuation And Pricing Of Environmental Resources.....	16.4
16.3	EIS Findings.....	16.6
16.3.1	Bio-Physical Environment.....	16.6
16.3.2	Human Environment.....	16.7
16.4	Justification Of The Project.....	16.8
16.4.1	Mount Pleasant Resource.....	16.8
16.4.2	The Proposal.....	16.8
16.4.3	Mine Development.....	16.9
16.4.4	Surface And Groundwater Management.....	16.9
16.4.5	Visual Amenity.....	16.9
16.4.6	Land Use And Capability.....	16.9
16.4.7	Land Acquisition Policy.....	16.10
16.4.8	Cumulative Impacts.....	16.10
16.4.9	Project Benefits.....	16.11
16.5	Consequences Of Not Proceeding With The Proposal.....	16.12



This chapter presents a justification for the proposal. An examination of the principles of ecologically sustainable development is also given.

16.1 METHODOLOGY

The Environmental Planning and Assessment Regulation, 1994 requires that an EIS include:

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

A new coal mine at Mount Pleasant could be justified if:

- ◆ the mine can be constructed and operated cost-effectively; and
- ◆ environmental and socio-economic benefits exceed any disbenefits and overall development impacts are acceptable to the community.

This section draws together information from other chapters which justifies the project.

16.2 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

16.2.1 Context

This section describes Ecologically Sustainable Development (ESD) and how it relates to the proposal.

The broadest meaning of ESD is "using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life, now and in the future, can be increased". Apart from being another term for environmental protection, it suggests how far protection needs to extend. It does this by measuring how a development influences the natural environment's ability to maintain itself.

The main thrust behind ESD is that current and future generations should have a natural environment that functions as well as or better than the one inherited.

The *NSW Environmental Planning and Assessment Regulation, 1994*, lists four principles of ecologically sustainable development to be considered in assessing a project. They are:

- ◆ the precautionary principle;
- ◆ social equity, including inter-generational equity;
- ◆ conservation of biological diversity and ecological integrity; and
- ◆ improved valuation and pricing of environmental resources.

These principles are similar to those set down in the *Protection of the Environment Administration Act*. An analysis of these principles follows.

16.2.2 *Precautionary Principle*

i. *Interpretation*

According to the *NSW Protection of the Environment Administration Act*, the precautionary principle means that 'if there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation'.

This principle was developed in response to one of the great difficulties of interpreting scientific data. The scientific method produces results based on confidence limits. These are controlled by the scope of data acquisition, interpretation methods and general understanding within a particular scientific discipline of a particular phenomena. This has been used as a way of validating a lack of response to a potential threat of serious or irreversible environmental degradation.

In the application of this principle:

- ◆ careful evaluation should always be undertaken to avoid serious or irreversible environmental damage; and
- ◆ an assessment of consequences of various options should be undertaken in formulating a proposal (Department of Urban Affairs and Planning, 1995).

ESD requires that uncertainty and the associated risk level be considered in decision making.

ii. *Justification*

The environmental consequences of the proposal have been documented. Scientific and engineering analysis of the existing environment has been thorough. It has involved computer modelling, scientific analysis and interpretation of the individual and cumulative environmental impacts of the proposed development. This has enabled the impacts of mining to be predicted with a reasonable degree of certainty. The analysis and results are presented in Chapters Seven to Fourteen with a summary of mitigation measures in Chapter Fifteen.

The proposal was developed from a number of options which looked at:

- ◆ alternative methods of mining the resource;
- ◆ alternative infrastructure arrangements; and
- ◆ a number of locations to build a rail line to dispatch product coal.

The final proposal was selected on the basis that it met local community and company needs in an environmentally acceptable manner while still ensuring economic viability.

Studies have indicated that the proposal will have a minimal impact on native flora and fauna. Rehabilitation proposals will result in a final landform with a mix of native forest and pasture. Progressive rehabilitation will minimise potential adverse impacts and result in an improved fauna habitat in the long

term. Rehabilitation of the final landform equivalent to the pre-mine land capability will ensure the future long term viability of agricultural enterprises on site.

Potential visual impacts will be minimised by topographic, vegetative and operational measures during mine development. The final landform has been designed to emulate existing landforms and vegetation patterns.

Detailed surface and groundwater studies were conducted to assess potential impacts of the proposal on the water regimes.

Coal hardrock aquifers will be depressurised which will cause borehole water levels to decline near the mine. Water levels in these boreholes will decline steadily over the mine life and will not recover. Where economic loss of yield is demonstrated, water supplies will be replaced either by deepening or replacement of bores, or by provision of alternative sources of water. Bores and groundwater resources within the alluvial lands immediately east of the site, will be largely unaffected.

Potential groundwater impacts have been identified within the western fine rejects catchment. Calculations indicate any deep seepage of rejects leachate is likely to adopt an easterly flow direction and emanate as highwall seepage within the developing mine pit. The leachate is expected to be benign in respect of trace elements but potentially elevated in salts although the salinity will fall over a period of time as leaching and flushing occurs within the emplacement structures. As a precautionary measure, observation bores will be constructed in the western catchment and equipped when necessary to act as pumping bores to attract seepage and return pumped waters to the mine water system.

All rainfall and runoff from disturbed areas will be directed to, and contained within the mine water management system. Water within this system will exhibit increased salt content and will be used for dust suppression, coal washery, fire hazard control and other on site uses. Mine development will reduce runoff in local drainages until rehabilitation allows runoff to be redirected back to these drainages.

A detailed water management simulation of the mine development has demonstrated that the mine will operate with a deficit in supply. Make up water will be drawn from the Hunter River at a declining rate from 9.4 megalitres per day at the commencement of mining, to about 7.5 megalitres per day during Years 20 and 21. Any release of surplus water to the Hunter River will be in compliance with the Hunter Salinity Trading Scheme.

Threats of serious or irreversible environmental degradation were not identified. Thus, the proposal does not rely upon a lack of scientific certainty to justify proceeding with the proposal. It is concluded that the proposal does not compromise the precautionary principle of ecologically sustainable development.

16.2.3 Social Equity including Intergenerational Equity

i. Interpretation

Social equity involves value concepts of justice and fairness so that the basic needs of all sectors of society are met and there is a fairer distribution of costs and benefits to improve the well-being and welfare of the community, population or society (Department of Urban Affairs and Planning, 1995). Social equity does

not imply equality but should include concepts of equal access to opportunities for improved welfare, with a bias towards advantaging the least well-off sectors of society.

Social equity also includes concerns for intergenerational equity which requires 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 (Department of Urban Affairs and Planning, 1995).

ii. *Justification*

Results of studies indicate that impact to flora and fauna will be minimal. This preserves future generations' equity in our natural heritage.

Groundwater seepage into the mine pit(s) will depressurise coal measures over the life of the mine. During this period, certain areas of the alluvium adjacent to the Hunter River which might presently be subject to upward migration of saline groundwater from the coal measures, could undergo a reversal of hydraulic gradients resulting in improved groundwater quality. Following mining and a period of groundwater pressure recovery, hydraulic gradients may again reverse and saline pockets occur. While it is unlikely that groundwater levels in the pits will ever return to pre-mining levels due to replacement of hardrock with spoils, there is opportunity for marginally increased salt levels in spoils materials through leaching.

Seepage from spoils to areas beyond the proposed pits (via migration within coal seams) may potentially affect water quality in localised areas within the alluvium. However, calculations indicate that any seepage and impact on alluvial floodplain water quality will be sufficiently slow for this to be largely mitigated by reduced salt loads and dilution effects within the floodplain. In addition seepage from the western fine rejects emplacements has the potential to migrate regionally within the deeper coal seams. However, calculations indicate seepage will be directed towards the mine pit and subsequent void. Carefully designed capping will ensure minimal percolation and leaching of salts contained within the emplacements.

In order to confirm modelling results, a long term programme of spoils leachate monitoring will be initiated. Comparison with long term research at other mine locations will enable any abnormal impacts to be identified, and appropriate mitigative measures introduced.

The project will result in a nett change in the local landform from a predominantly undulating area used for grazing to a more variable landform consisting of three elements: forested slopes; developed pastures which would be suitable for grazing; and a void or pit left following mining.

The first two elements will ensure that the post mining land capability is able to support the equivalent pre-mining land use as discussed in Chapter Seven. A void represents a change in resource which may have some potential benefits for future generations: it may provide an access for future underground mining; it may provide a space for exploitation by future generations; or it may be left. If it has no beneficial future use, the void will be an unavoidable consequence of recovering the coal resource.

Construction and operation of the mine will deliver significant economic benefits to the local community and region through employment, income and output. As outlined in Chapter Ten, Coal & Allied is an Equal Opportunity Employer and will be seeking to maximise employment opportunities for appropriately

skilled people in the local area. Suitable training or retraining courses will be organised by Coal & Allied in conjunction with the Commonwealth Employment Services and other relevant organisations.

16.2.4 Conservation of Biological Diversity and Maintenance of Ecological Integrity

i. Interpretation

Biological diversity refers to the diversity of genes, species, populations, communities and ecosystems and the linkages between them. Biological resources provide food, many medicines, fibres and industrial products. They are also responsible for vital ecological services such as maintaining soil fertility and the supply of clean and fresh water (Harding *et al.* 1994). Maintenance of biological diversity will ensure life support functions and can be considered a 'minimal' requirement for intergenerational equity.

ii. Justification

Flora of the Mount Pleasant site have been assessed. These are either cleared grazing lands or sparse woodland and native forest. Study has indicated that plant species identified at these sites are not unique to these areas and are not endangered.

Faunal studies identified species presently using the site. Environmental safeguards have been incorporated into the proposal which will ensure that alternative habitats are available for species that would be affected. Assessment indicated that the faunal safeguards will avoid impact to biological diversity and ecological integrity will not be degraded.

Rehabilitation of land after mining will improve the local flora communities and will eventually replace fauna habitats. The final landform incorporates a mixture of native forest and pasture which could be considered a more diverse ecosystem than the predominantly grazing landuse currently on site.

16.2.5 Improved Valuation and Pricing of Environmental Resources

i. Interpretation

This principle is a component of 'Intergenerational Equity'. The need to determine proper values for services provided by the natural environment, such as the atmosphere's ability to receive gaseous emissions, cultural values and visual amenity. Applying standard methods of valuation and pricing to environmental resources is a difficult process. This is largely due to the intangible nature of much of the natural environment. The environment has conventionally been considered a free resource as environmental factors have been excluded from determining the real cost of an activity. Improving valuing and pricing of the environment will thus have two affects. Firstly, the real cost to the environment, and subsequently to ourselves, will be apparent and thus included within the real costs of any project. Secondly, the economic imperative of reducing costs *per se* will result in development being conducted in an ecologically sustainable manner. This does not simply mean that monetary values should be applied to the environment so that market forces will protect it. Significant qualitative analysis of particular activities is, however, feasible.

ii. Justification

There are several methods that could be used to compare measurable economic factors, such as the costs of coal production equipment, with more intangible factors, such as the effects on Aboriginal heritage. This EIS has examined the environmental consequences of the project and identified amelioration measures for areas of significant adverse impact. These are summarised in Chapter Fifteen. An indirect indication of the value of these environmental resources would be the cost of the proposed mitigation measures. The costs of these have been factored into the company's economic analysis for the project which indicates that the project is economically viable.

16.3 EIS FINDINGS

16.3.1 Bio-physical Environment

Various components of the biological and physical environments were examined. The findings are summarised below:

- ◆ *Flora and Fauna.* The proposal will not significantly affect any rare or endangered flora and fauna. Proposed rehabilitation will further minimise potential impacts and will result in a more diverse ecosystem in the long-term.
- ◆ *Noise and Blasting.* Up to 71 non-company owned residences will be affected by significant increases. The company proposes to offer affected private landowners a choice of either property purchase at a fair and equitable market value or the installation of noise abatement measures.
- ◆ *Air Quality.* Up to 65 non-company owned residences will receive more dust than the assessment criterion. The company proposes to offer these landowners a choice of either property purchase at a fair and equitable market value or the installation of ameliorative measures at their residence. Assessment of dust deposition rates in relationship to human health indicates that the proposal will not significantly affect mine employees or the surrounding community. Studies indicate that dust from the mine will not significantly affect plant growth or grazing animals.
- ◆ *Water Quality.* Coal hardrock aquifers will be depressurised which will cause borehole water levels to decline near the mine but this may improve alluvial water quality for up to 80 years after mining.

All runoff from disturbed areas of the mine will be contained in the mine water management system. Mine development will affect 30 to 70 per cent of the drainage catchments on the eastern side of the site. The fine rejects emplacement will reduce runoff water from catchments west of the site. Where economic loss of yield results from the proposal, water supplies will be replaced.

Potential groundwater seepage from the fine emplacements will be minimal because fine rejects has low permeability. Monitoring and management measures will be installed downstream of the emplacement area to contain seepage which could affect ground water quality in the catchment. Seepage from overburden emplacements could affect water quality in localised areas of the floodplain alluvium, albeit at a very low rate.

16.3.2 Human Environment

Various components of the human environment were examined and the findings are summarised below:

- ◆ *Heritage and Archaeology.* The site does not have a substantial archaeological resource. Most of the area contains sparse archaeological material. The eastern part of the site bordering the Hunter River floodplain has been largely disturbed by previous land uses. This limits its potential to provide specific information of past Aboriginal use. Less disturbed areas on the western portion of the site are potentially more significant. A large concentration of artefacts in this area appears unique in a local and possibly regional context given the sparse archaeological material in surrounding areas. Recommendations are made for salvage excavation and collection of important sites.

Heritage items around the site could possibly be affected by vibration from blasting. Coal & Allied will protect those buildings not already safeguarded by other mining operations developments.

- ◆ *Visual.* The post mining landform will change the local landscape. The landform was designed to emulate existing landforms and vegetation patterns. Progressive rehabilitation will limit the extent of disturbance during construction.
- ◆ *Local Road Network.* Future traffic impacts have been assessed for Mount Pleasant Mine and for cumulative traffic from Bengalla, Mount Pleasant and Kayuga Mines. Traffic impacts are only significant on the future mine link roads, with minimal traffic increases on most existing roads.

Dangerous goods such as explosives or fuel would generally be transported to the site via Thomas Mitchell Drive effectively bypassing the town of Muswellbrook and other residential areas. Future closure of the section of Wybong Road adjacent to Mount Pleasant Mine will reduce through traffic on the Kayuga Bridge from Wybong Road. There will also be significant reductions in existing local traffic because of rural properties will be acquired for mining.

Mount Pleasant and Bengalla Mines will generate minimal future traffic on the Kayuga Bridge. Kayuga Mine may generate some traffic along this route but overall future traffic movements on the bridge will be much lower than existing traffic volumes.

- ◆ *Socio-Economic.* The operational phase of the development will provide significant economic benefits to the region, the State and Australia through employment income and output. Direct benefits will generate additional economic activity in other sectors.
- ◆ *Land Use.* The staged development of the project will allow areas not affected by mining to remain available for grazing. Rehabilitation of land after mining will maintain the pre-mining land capability.

16.4 JUSTIFICATION OF THE PROJECT

16.4.1 *Mount Pleasant Resource*

New South Wales has extensive coal resources that have yet to be developed. As demand continues to grow, supply is being constricted by a limited accessible resource and ongoing expansion of conflicting land uses. The Mount Pleasant resource is estimated to be 1,423 million tonnes with the potential to contribute about 439 million ROM tonnes towards meeting this demand, which could be recovered by open-cut mining.

The Mount Pleasant also site contains a suitable large tonnage, low ash resource which could be used with future coal water mixture technology.

16.4.2 *The Proposal*

i. Mining Method

A key production and operational objective of the Mount Pleasant mine is to optimise resource use and minimise resource sterilisation. Open-cut mining methods provide the most efficient means of utilising the resource at Mount Pleasant. Underground mining would provide only 15 per cent of the coal recovery achievable by open cut methods.

ii. Infrastructure Location

Locating the infrastructure in the south west corner of the site meets the operational, environmental and socio-economic objectives outlined in Chapter Three. The main advantages of this site over other alternatives considered is the higher level acceptability to the community in terms of environmental outcomes and costs. This location maximises the opportunity for maintaining the visual quality of the local area and minimises noise impacts on surrounding residences.

iii. Rejects Emplacement

The proposal for the fine rejects emplacement and additional out-of-pit emplacements developed from the need to locate the infrastructure in the south west corner of the site. In order to achieve an outcome that was both acceptable to the community and economically viable, less expensive means of handling fine rejects was required. By placing rejects conventionally to the west of the coal preparation plant, some of the project costs could be reduced to a level that allowed the project objectives to be met. In addition, the placement of the reject material in a single location provides an opportunity to later recover this material for use as a potential fuel source for power stations.

The extent of out-of-pit emplacements for coarse rejects achieves the objective to maximise resource use and minimise resource sterilisation. Alternatives to the proposed emplacement areas did not meet project objectives, due to either coal sterilisation or unacceptable landform elevations and slope angles. Backfilling of the Piercefield and Warkworth South Pits would sterilise coal below these areas.

iv. *Product Coal Dispatch*

The objectives of the Hunter Regional Environmental Plan, 1989 (Section 4.1.2) encourages the transport of coal by rail or other non-road means. All product coal from Mount Pleasant will be transported by rail from the mine to the Port of Newcastle. The Mount Pleasant rail loop will be located to the west of the Bengalla site and connected to the infrastructure area by an overland conveyor. Alternative product dispatching involving a joint-user facility at the Bengalla site or high capacity overland conveyors were not feasible due to the difference in the timing of the two projects. These options also reduced operational flexibility and reduced the ability of the project to meet visual amenity objectives.

16.4.3 Mine Development

Coal will be extracted from eight seams of the Wittingham Coal Measures, commencing in the east and working down the dip in a series of parallel strips towards the west. Early mine development will include the progressive construction of a bund in the east of the site which will effectively screen the mining operations and haul roads from Muswellbrook. Environmental impacts from noise and blasting on Muswellbrook will diminish as the mine progresses to the west.

16.4.4 Surface and Groundwater Management

Surface and groundwater management has been designed to maximise on site mine water usage and minimise extraction of water from the Hunter River. Water from undisturbed and rehabilitated areas will be diverted around active mine areas to maximise available runoff to surrounding catchments. Where economic loss of yield results from the proposal, water supplies will be replaced to protect surrounding landowners from any economic loss. Surplus mine water will only be released to the Hunter River in compliance with the Hunter Salinity Trading Scheme and would generally be limited to extreme storm events.

16.4.5 Visual Amenity

Initially the mine will be visible from unobstructed elevated locations in Muswellbrook but this will progressively diminish as overburden is used to construct the southern bund in the east of the site. Progressive rehabilitation and landscaping will limit the extent of disturbed views during mine operations and minimise impacts on the local visual amenity. The final landform has been designed to emulate the existing landforms and vegetation patterns of the area.

16.4.6 Land Use and Capability

Coal & Allied wishes to maximise the potential to rehabilitate mined areas to their original land capability. During mine operations land not directly required for mining purposes will continue to be available for appropriate land uses. Rehabilitation of land following mining will ensure that post mining land capabilities for the more productive agricultural lands are maintained. The final void represents an unavoidable change in resource which may have potential future benefits.

16.4.7 Land Acquisition Policy

Coal & Allied recognises the need to provide affected landowners identified in *Figure 51* with the opportunity of property purchase based on market value, to allow relocation without economic loss. Properties not directly affected by the proposal will be protected during the construction and operation of the mine by the environmental safeguards outlined in this EIS. The establishment of an environmental monitoring program will ensure that the effectiveness of environmental safeguards is maintained and a forum for the resolution of community concerns is provided.

16.4.8 Cumulative Impacts

Concern has been raised by the community and government regulatory authorities about the potential of mining and other activities in the Upper Hunter Valley to cause cumulative impacts that extend beyond individual developments. This has been the subject of a wide ranging investigation titled the *Upper Hunter Cumulative Impact Study* (Department of Urban Affairs and Planning, 1997). The findings of this report have been considered in the assessment of the Mount Pleasant project.

Cumulative impacts from vegetation clearing and habitat loss will be offset by habitat enhancement of proposed rehabilitation areas. Mount Pleasant, Bengalla and Kayuga Mines do not individually nor cumulatively link to surrounding larger vegetated areas or conservation reserves. None of the proposed mines will disturb any unique ecosystems or habitats of conservation significance.

Cumulative operations from the Mount Pleasant, Dartbrook, Bengalla and Kayuga Mines will depressurise the hardrock coal measures resulting in lower pit inflow rates at each mine. Cumulative depressurisation is expected to be regionally more extensive although seepage to and from alluvial areas is not expected to differ from that calculated for Mount Pleasant Mine (see Section 9.3.1).

Potential cumulative socio-economic impacts include substantial increases in direct employment, income and output and significant flow on effects for the local area and Upper Hunter region. This will provide an economic base capable of fostering community growth, development and expanded services. Increased employment opportunities may result in a greater demand for rental accommodation housing and community services.

Modelling predictions of cumulative dust deposition derived for the Mount Pleasant, Kayuga and Bengalla developments are conservative and therefore actual levels are expected to be lower than those predicted. Significant increases in cumulative dust levels will be confined to an area west of Muswellbrook.

One residence located to the south west of the Mount Pleasant Infrastructure area could be cumulatively affected by noise from the Mount Pleasant and Bengalla Mines. At other residences most likely to be affected by cumulative noise, calculated values are within the relevant criteria for a single mine. A number of residences in Kayuga village will receive less than 40 dB(A) daytime noise from either the Mount Pleasant or Kayuga Mines alone, but more than this value for the two combined.

Cumulative landscape changes will be evident over 11 kilometres from the southern part of Bengalla Mine to the northern part of Kayuga Mine. Assuming the three commence within five years the most evident cumulative effect will be the rapid development of emplacement landforms, most of which would continue to grow throughout the life of each project until final rehabilitation.

Cumulative traffic impacts from the Bengalla, Mount Pleasant and Kayuga Mines will be limited to increases on the future mine link roads, with minimal increases on existing roads.

Analysis of future rail operations has indicated that most sections of the Main Northern rail line from Muswellbrook to Newcastle have adequate spare capacity to accommodate additional coal train movements during both average and peak daily periods. However future peak demand from the Bengalla, Mount Pleasant and Kayuga Mines is expected to exceed the current capacity of the Muswellbrook to Antienne section of the rail line, which is currently 11 or 12 coal train paths in each direction daily. This may need to be increased by revised timetabling or other means to accommodate 13 coal trains in each direction daily at peak periods.

16.4.9 Project Benefits

The Mount Pleasant Mine will result in significant benefits for Australia, the State, Hunter region and Muswellbrook area including:

- ◆ approximately 256 construction jobs and 320 operational jobs representing potential employment opportunities for local residents;
- ◆ initial capital costs of \$310 million of which about \$81 million would be spent in the Hunter region on materials and equipment;
- ◆ a peak production value of about \$340 million per year, with a further \$292 million in associated output;
- ◆ average yearly employee salaries of \$24.6 million dollars, generating an additional \$16.2 million in flow on effects;
- ◆ company tax, importing tax, income tax, sales tax and fuel excises for the Federal Government;
- ◆ payroll tax, freight charges and royalty charges for coal for the State Government;
- ◆ developer contributions for the maintenance of community services, development application fees, rates and charges to Muswellbrook Shire Council;
- ◆ increased educational opportunities through liaison with Muswellbrook TAFE regarding mine related, administration and environmental courses;
- ◆ increased patronage of local establishments, accommodation and shops by the construction and operational workforce as well as the use of local services and materials; and
- ◆ a stable economic base fostering community growth, development and provision of expanded services

16.5 CONSEQUENCES OF NOT PROCEEDING WITH THE PROPOSAL

If the project does not proceed then the project objectives outlined in Chapter Three would not be realised and the following consequences will result:

- ◆ a new coal mine producing export quality coal products will not be developed;
- ◆ the company would not establish a long term coal reserve which will limit its ability to supply existing and emerging markets (including the potential for coal water mixture technology);
- ◆ the coal resource on site may not be developed. There may be other proposals initiated which do not optimise resource use, for example underground mining, but this could not be guaranteed;
- ◆ constraints and uncertainty regarding the future development of the site will remain;
- ◆ regional road network changes related to the development will not be implemented;
- ◆ rehabilitation opportunities that enhance existing fauna habitat values will not be realised;
- ◆ there will be a loss of local employment opportunities, both short-term construction work and also long-term operation work; and
- ◆ a new source of revenue will not be established. Revenue will not flow through to all levels of government (local, state and federal) as well as to Coal & Allied;
- ◆ development contributions towards community infrastructure and services as a result of the project will not be provided;
- ◆ wages and salaries paid to mine employees will not flow on to the local and regional economy.

The environmental consequences of the proposal are not discussed in this section. If the project does not proceed then the environmental outcomes discussed in this EIS such as dust levels, noise, water management and visual effects would not eventuate.

REFERENCES

- AMBS Australian Museum Business Services (1994)
Casino Management Area EIS. Volume C. Fauna Appendix: Schedule 12 species descriptions for fauna impact statement and Fauna species list for Casino Management Area.
- ANZECC (1990)
Towards a National Greenhouse Strategy for Australia. Australian and New Zealand Environment and Conservation Council.
- Australian Bureau of Statistics (1993)
Estimated Resident Population and Components of Change in Population of Statistical Local Areas in NSW 1986 to 1991. Catalogue No. 3208.1.
- Australian Bureau of Statistics (1994)
Hunter Region Agricultural Statistics. Compiled by L. Davies, NSW Agriculture.
- Australian Bureau of Statistics (1995)
1994 Regional Statistics. Catalogue No. 1304.1.
- Australian Bureau of Statistics (1996)
Estimated Resident Population of Statistical Local Areas, NSW at June 30 1994 Final and 1995 Preliminary. Catalogue No. 3210.1.
- Australian Bureau of Statistics (1996)
Tourist Accommodation, New South Wales. Catalogue No. 3210.1.
- Austroads, (1988)
Guide to Traffic Engineering Practice, Part 5 Intersections at Grade, 1988.
- Briggs, JD and JH Leigh (1996)
Rare or Threatened Australian Plants. CSIRO Publishing, Collingwood.
- Bullen, R.; Hede, A; and Williams, T. (1996)
Sleep Disturbance Due to Environmental Noise: A Proposed Assessment Index Acoustics Australia. Vol. 24 (1996) No. 3 pp. 91-95.
- Charman, P.E.V. and Murphy, B.W. (eds) (1991)
Soils - Their Properties and Management: A Soil Conservation Handbook for New South Wales. Sydney University Press.
- Coal Resources Development Committee (1994)
Effects of Land Use on Coal Resources.
- Davies, L and Llewelyn, R (1994)
Beef Enterprise Budgets for NSW. NSW Agriculture Maitland.
- Davies, L and Ware, B (1992)
Economics of Dairying in the Singleton District. Agnote Reg 2/085 NSW Agriculture.
- Davies, L and Watson, R (1995)
Winter Crop Budgets for the Upper Hunter. NSW Agriculture Maitland.

REFERENCES

- Department of Mineral Resources (1986)
Australian Code for Reporting Identified Coal Resources and Reserves.
- Department of Mineral Resources (1995)
Coal Industry Profile.
- Department of Planning (1989)
Hunter Regional Environmental Plan 1989. Sydney.
- Department of Planning (1994)
Population Projections, Non-Metropolitan Local Government Areas in NSW 1991 - 2021.
- DUAP, (1995)
Upper Hunter Cumulative Freight Transport Study, Stage 1 Report, November 1995.
- DUAP, (1996)
Upper Hunter Cumulative Freight Transport Study, Supplementary Report, October 1996.
- DUAP, (1997)
Upper Hunter Cumulative Impact Study. Draft Water Quality Analysis. Umwelt Australia Pty Ltd.
- DUAP, (1997)
Upper Hunter Cumulative Impact Study. Draft Air Quality Study. Nigel Holmes and Associates.
- Elliott, G.L. and Veness, R.A. (1981)
Selection of topdressing material for rehabilitation of disturbed areas in the Hunter Valley. *Jnl. Soil Cons. N.S.W.* 37 (37-40).
- Eleland, K. (1994)
Report to the Honorable Robert Webster, Minister for Planning and Minister for Housing. Establishment and operation of Bengalla Open Cut Coal Mine, Muswellbrook, August 1994.
- Envirosciences (1993)
Annual Environmental Report. Mount Pleasant Project.
- Envirosciences (1992)
Muswellbrook Rural Lands Strategy. Prepared for Muswellbrook Shire Council.
- Envirosciences (1993)
Environmental Impact Statement for Bengalla Coal Mine. Bengalla Mining Company Pty Limited.
- Envirosciences (1990)
Environmental Impact Statement for Narama Coal Mine. Prepared for Narama Joint Venture.
- ERM Mitchell McCotter (1995)
Extension of Mining at Mt Thorley Operations Fauna Impact Statement. Prepared for Mount Thorley Operations.
- Garnett, S. (1992)
Threatened and Extinct Birds of Australia. Royal Australasian Ornithologists Union Report 82.

- Gibbs, D and Wiggers, J (1982)
Socio-Economic Implications of Growth in the Hunter Region, 1982. ANZAAS Conference, Sydney.
- Hall, L.S. and Richards, G.C.(1979)
Bats of Eastern Australia. Queensland Museum, booklet No. 12.
- Harden, G. (1990-1993) (editor)
Flora of New South Wales. Volumes 1 to 4. Royal Botanic Gardens, Sydney. Published by New South Wales University Press.
- Hedberg, P and Doyle, S (1993)
Ten Hectare Winegrape Vineyard Development Budget. UNE - Orange Agriculture College.
- Houghton, P.D. and Charman, P.E.V. (1986)
Glossary of Terms used in Soil Conservation. Soil Conservation Service of NSW.
- Hoye, G.A. (1993)
A survey of the bat fauna of the area proposed for open cut coal mining within Authorisation No. A437 at Mt. Arthur near Muswellbrook, NSW.
- Hunter Valley Research Foundation (1995)
An Economic Assessment of the Upper Hunter. Prepared for Department of Urban Affairs and Planning.
- Hyde, R., Malfroy, H., Watt, G. N., Maynod, J. (1981)
Hunter Valley Meteorological Society - An interim report to the State Pollution Control Commission. School of Earth Sciences, Macquarie University.
- Marchant, S and Higgins, P.J (editors) (1993)
Handbook of Australian, New Zealand and Antarctic Birds. Vol. 2 Raptors to Lapwings. Oxford University Press, Melbourne.
- Mitchell McCotter (1989)
Maules Creek Socio-Economic Study. For Kembla Coal and Coke Pty Ltd.
- Muswellbrook Shire Council, (1995)
State of the Environment Report - July 1994 to June 1995.
- Muswellbrook Shire Council, (1997)
Muswellbrook Western Roads Strategic Traffic Study, April 1997.
- NGGIC (1994)
National Greenhouse Gas Inventory 1988 and 1990. National Greenhouse Gas Inventory Committee.
- NRMA (1995)
NRMA Accommodation Directory 1995-96.

REFERENCES

OECD (1993)

Methane Emissions from Coal Mining - a revised draft chapter. In OECD (1991) *Estimation of Greenhouse Gas Emissions and Sinks*. Final report from the OECD Experts Meeting, February, 1991. Prepared for the IPCC, OECD.

Parnaby, H.E.(1992)

An interim guide to identification of insectivorous bats of South-eastern Australia. Technical Reports of the Australian Museum No. 8, 33pp.

Pizzey, G. (1991)

A Field Guide to the Birds of Australia. Angus and Robertson Publication.

Resource Planning (1993)

Environmental Impact Statement - Bayswater No. 3 Coal Mine Project.

Resource Planning (1994)

Mt. Owen Coal Project near Ravensworth, NSW. Fauna Impact Statement. Prepared for Hunter Valley Coal Corporation Pty Ltd.

Richards, G.C.(1983)

Yellow-bellied Sheath-tail Bat. In: The Complete Book of Australian Mammals edited by Strahan, R. The National Photographic Index of Australian Wildlife, Australian Museum. Cornstalk Publishing, p. 315.

RTA, (1996)

Unpublished Daily Traffic Volumes for Main Roads Barry Armstrong, pers communities, November 1996.

Rust PPK (1997)

Draft Kayuga Mine Environmental Impact Statement.

Schodde, R. and Mason, I. J. (1980)

Nocturnal Birds. Lansdowne Editions, Melbourne.

Simpson, K and Day, N (1989)

Field Guide to the Birds of Australia. A book of Identification. Penguin Books Australia Ltd.

Specht, RL (1981)

Foliage Protective Cover and Standing Biomass. In DN Anderson and AN Gillison (eds): *Vegetation Classification in Australia*. CSIRO Publications.

Strahan, R. (1991)

The Australian Museum Complete Book of Australian Mammals. Angus and Robertson, Australia.

Vallet, M. (1987)

"Sleep Disturbance" in P. Nelson (ed.) *"Transportation Noise Reference Book"*, Butterworths.

GLOSSARY

GLOSSARY OF TERMS

A1Horizon:	This is the upper most layer of a soil generally referred to as topsoil. It has a high content of organic matter relative to other horizons, a dark colour and maximum biological activity. This is the most useful part of the soil for revegetation and plant growth.
Acid Mine Drainage:	Acid leachate flowing from overburden caused by oxidisation of pyritic materials to form sulphuric acid.
AHD:	Australian Height Datum.
Alluvium:	Sediment deposited by a flowing stream, consisting of unconsolidated material including gravel, clay, silt and sand.
Apedal:	A soil in which little or none of the material occurs in peds or aggregated in the moist state. Apedal soils are without apparent structure and are typically massive or single grained.
Aquifer:	A porous soil or geological formation, often lying between impermeable subsurface strata, which holds water and through which water can percolate slowly over long distances to groundwater springs and wells.
Attenuation:	The reduction in magnitude of some variable in a transmission system, for example, the reduction of noise with distance as it travels through air.
Background Noise:	Existing noise in the absence of the sound under investigation and all other extraneous sounds. Generally represented by the L ₉₀ level which is the noise level exceeded for 90 per cent of the time.
Base Line:	Studies conducted to establish prevailing environmental conditions.
Batter:	The excavated or constructed face resulting from earthmoving operations which generally has a uniform gradient.
Bench:	A strip of relatively level ground breaking the continuity of a steep slope or stream.
Box-Cut:	A relatively narrow but deep excavation with steep faces on three sides usually sunk to allow access to underground workings or as the initial excavation in open-cut mines.
Catchment Area:	The area from which a river or stream receives its water.
Cation Exchange Capacity:	The capacity of the soil to hold and exchange cations such as calcium, magnesium, potassium and sodium usually expressed in centimoles of positive charge per kilogram of soil.
Cation:	Ion with a positive charge.

Coagulation:	The destabilisation of colloidal particles brought about by the addition of a chemical reagent known as a coagulant.
Coal Reserves:	Those parts of the Coal Resources which are planned to be mined.
Coal Resources:	All of the potential useable coal in a defined area identified by geological data.
Coarse Rejects:	Solid material from a coal washery consisting of coarse and fine rock fragments such as carbonaceous shales and up to 30 per cent carbon.
Coking Coals:	Low volatile hard coking coal and low ash semi-soft coking coal is used for iron and steel production.
Cross Bank:	Short bank of earth built across a vehicular track to divert runoff.
Decibel (dB):	A unit for expressing the relative intensity of sounds on a logarithmic scale from zero (for average least perceptible sound) to about 130 (for the average pain level).
Decibel dB(A):	A modified decibel scale which is weighted to take account of the frequency response of the normal human ear.
Dip:	The direction in which the rock strata is inclined.
Dispersible Soils:	Sodic soils in which the clay fraction forms a suspension on wetting, often leading to severe tunneling and gully erosion.
Dispersion Percentage:	The percentage of clay and fine silt in a soil which disperses into suspension.
Duplex Soils:	A soil in which there is a sharp change in texture between the A and B horizons.
Dyke:	A sheet like body of igneous rock that has intruded across the structure of the adjacent host rocks.
Easement:	A 'right of way' over a strip of land.
Effluent:	The liquid waste of sewage and industrial processing.
Electrical Conductivity:	The measure of electrical conduction through water or a soil-water suspension generally measured in millisiemens per centimetre or micro-siemens per metre. An approximate measure of soil or water salinity.
Endangered Species:	Those species listed in Schedule 12 of the National Parks and Wildlife Act, 1974 as threatened or vulnerable and rare in NSW.
Final Void:	The excavation remaining at the cessation of open-cut mining.

Fine Rejects:	Fine residual waste material separated in the coal preparation process.
Flocculation:	The process by which destabilised colloidal or very fine clay particles, suspended in water, come together into larger masses which eventually settle out of suspension. Flocculation depends on the balance between exchangeable ions on the clay and those in solution, as well as the overall ionic strength of the solution.
Geophysical data:	A description of geology with respect to its structure, composition and development.
Geotechnical:	Relating to the form, arrangement and structure of the geology.
Groundwater:	Subsurface water which is within the saturated zone and can supply wells and springs. The upper surface of this saturated zone is called the water table.
Habitat:	The environment in which a plant or animal lives, and often described in terms of their geography, climate and vegetation.
Hydrogeologic:	The relation of hydrological phenomena to the surface geology.
Hydrology:	Science that relates to the properties, distribution and circulation of the earth's water.
Igneous:	Rock formed from magma which has cooled and solidified at the earth's surface (volcanic) or within the earth's crust (plutonic).
In-Situ:	In its original place.
Indigenous:	Native to, or originating in, a particular region or country.
Intrusion:	The forcing of extraneous matter, like molten rock, into some other formation.
L ₁₀ Noise Level:	The noise level in dB(A) exceeded for 10 per cent of the monitoring duration.
L ₉₀ Noise Level:	The noise level in dB(A) exceeded for 90 per cent of the monitoring duration. Also referred to as background noise level.
Land Capability:	The ability of a parcel of land to be used for a given use sustainably, that is without permanent damage.
Leaching:	The process of removing soluble matter(s) from soil or rock by water.
Lithology:	The physical characteristics of a rock.

Magnetometer:	An instrument used for measuring magnetic intensity. In ground surveys the magnetometer is used for measuring the vertical intensity, while aeromagnetic surveys usually measure the total intensity to determine the extent of geological resources.
Mean:	The average value of some characteristics in a set of data.
Median Value:	A value above and below which there are equal numbers of data values.
Megalitre(ML):	One million litres.
Meteorology:	Science dealing with atmospheric phenomena and weather.
Mobile Plant:	Construction equipment which can be readily moved around a site (e.g. bulldozers, scrapers, etc.).
Native:	Belong to the natural flora or fauna in a region.
Noise Creep:	Where several acceptable background noise sources collectively exceed the acceptable noise limit.
Out-Of-Pit Emplacement:	A stockpile of spoil or overburden transported and dumped away from the excavation of an open-cut mine.
Outcrop:	Exposed bedrock at the ground surface.
Overburden to Coal Ratio:	Ratio of coal to non coal rock material expressed in cubic metres of overburden to tonnes of coal.
Overburden:	Rock and soil materials overlying a useful resource material such as coal.
Particulates:	Fine solid particles which remain individually dispersed in gases.
Permeability:	The capacity of rock or solid to transmit fluids (through pores, bedding planes or joints).
pH:	Scale used to express acidity and alkalinity. Values run from 0-14 with seven representing neutrality. Numbers less than 7 represent acidity.
Piezometer:	A small diameter bore lined with a slotted tube used for determining the standing water level of groundwaters.
Reafforestation:	The replanting of forest trees.
Recycling:	The return of waste materials to the production system so that the need for raw materials is reduced.
Rehabilitation:	The process of restoring to a condition of usefulness.

Revegetation:	The process of re-establishing a vegetation cover.
ROM:	Run-of-mine.
Roosting:	A place where animals rest or stay.
Saline (Soil):	Contains mineral salts sufficient to impair productivity.
Salinity:	A measure of the concentration of dissolved solids in water.
Seam:	An identifiable discrete coal unit.
Sediment Control Structures:	Barriers or other containing structures designed to prevent sediment from being washed into streams.
Sedimentation:	A dam built to retard runoff from disturbed areas and allow sediment to settle out before letting clean water discharge.
Sewage:	Waste matter discharged to a sewer.
Sewerage:	Works for collecting, treating and disposing of sewage.
Sill:	Is an igneous intrusion that is emplaced parallel to bedding.
Slurry:	A fluid composed of part liquid, part solid which can be pumped.
Socio-economic:	Combination of social and economic factors.
Sodic Soil:	Soils containing sufficient exchangeable sodium to adversely affect soil stability.
Spoil:	The unconsolidated waste earth and rock excavated from a mine.
Spontaneous Combustion:	Spontaneous ignition of some or all of a combustible material.
Subcrop:	A unit of material that occurs just below the soil profile.
Temperature Inversion:	An increase in air temperature with height.
Thermal Coal:	Medium to high ash, low sulphur thermal coals are used for domestic power generation and cement manufacture, whilst medium to low ash, high energy thermal coals are exported.
Threatened Species:	Animals that are in danger of extinction or may now be considered extinct, but have been seen in the wild in the last 50 years.
Time of Concentration:	The time required for all parts of a catchment to simultaneously contribute runoff flow to a given outlet point.

Topography:	Description of all the physical features of an area of land and their relative positions, either in words or by way of map.
Total Suspended Particulates (TSP):	A measure of the total amount of small solid or liquid particles suspended in or falling through the atmosphere.
Total Suspended Solids:	A total of the total amount of undissolved matter in a volume of water.
Turbidity:	A measure of the amount of suspended solids (usually fine clay or silt particles) in water.
Volatile Matter:	Matter which is readily transformed to a gaseous state.
Vulnerable & Rare Species:	Animals that are likely to move into the threatened species category as their populations are decreasing because of over exploitation, extensive habitat destruction or other environmental disturbances.
Woodland:	Land covered by trees which do not form a closed canopy.

APPENDICES

DIRECTOR'S REQUIREMENTS

A

Table A.1 SCHEDULE 2 ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION
1994

	Matters to be included	EIS Reference
1.	A summary of the environmental impact statement.	Summary
2.	A statement of the objectives of the development or activity.	Chapter 3
3.	An analysis of any feasible alternatives to the carrying out of the development or activity, having regard to its objectives, including:	Chapter 2
	(a) the consequences of not carrying out the development or activity; and	5.6
	(b) the reasons justifying the carrying out of the development or activity.	5.5, 16.4
4.	An analysis of the development or activity, including:	
	(a) a full description of the development or activity; and	Chapter 6
	(b) a general description of the environment likely to be affected by the development or activity, together with a detailed description of those aspects of the environment that are likely to be significantly affected; and	Chapters 6 to 14
	(c) the likely impact on the environment of the development or activity, having regard to:	
	i. the nature and extent of the development or activity;	Chapter 6
	ii. the nature and extent of any building or work associated with the development or activity;	6.3
	iii. the way in which any such building or work is to be designed, constructed and operated; and	6.3
	iv. any rehabilitation measures to be undertaken in connection with the development or activity; and	6.5, 7.2.5
	(d) a full description of the measures proposed to mitigate any adverse effects of the development or activity on the environment.	Chapters 7 to 14
5.	The reasons justifying the carrying out of the development or activity in the manner proposed, having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development.	Chapter 16
6.	A compilation (in a single section of the environmental impact statement) of the measures referred to in Item 4(d).	Chapter 15

Table A.1 SCHEDULE 2 ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION
1994 (Contd)

	Matters to be included	EIS Reference
7.	A list of any approvals that must be obtained under any other Act or law before the development or activity may lawfully be carried out.	4.2.3, Appendix F
8.	For the purposes of this Schedule, "the principles of ecologically sustainable development" are as follows:	
	(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.	16.2.2
	(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.	16.2.3
	(c) Conservation of biological diversity and ecological integrity.	16.2.4
	(d) Improved valuation and pricing of environmental resources.	16.2.5

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS

	Requirements	EIS Reference
1.	<p>Planning and environmental context</p> <p>(a) Planning information and permissibility</p> <p>The following information should be provided:</p> <ul style="list-style-type: none"> • zonings, permissibility and any land use constraints; 4.1, 7.1 • compatibility of the proposal with 4.1 <ul style="list-style-type: none"> – Hunter Regional Environmental Plan 1989 and Hunter Regional Environmental Plan - Heritage 4.1.2, 4.1.3 – any relevant Development Control Plans 4.1.5 • existing land uses 7.1 • any heritage items or environmental protection areas; 4.1.3, 10.4, 10.5 <p>Discuss the application:</p> <ul style="list-style-type: none"> • clause 17(2)(b) of Muswellbrook Local Environmental Plan 1985; 4.1.4 • Section 100A of the Environmental Planning and Assessment Act, 1979 should it be determined that the application of Clause 17(2) is inappropriate. 4.1.5 <p>Test the proposal against the provisions of clause 17(2)(b) of Muswellbrook Local Environmental Plan 1985. 4.1.4</p> <p>(b) Site description and locality information</p> <p>The following information should be provided:</p> <ul style="list-style-type: none"> • title details; land tenure including any Crown tenure, owner's consent or direction from the Minister for Mines; 5.1.3, Appendix P • site description and maps, plans, aerial photographs clearly identifying the location of the proposal relative to surrounding roads, Muswellbrook, any other communities and dwellings and any land use likely to be affected by the development, utilities including transmission lines, pipelines, cables or easements, sight lines from dwellings or public spaces such as roads. Volume 2 	<p>Chapter 8</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS

	Requirements	EIS Reference
	<p>(c) Overview of the affected environment</p> <p>This should provide details of the environment in the vicinity of the development site and also of aspects of the environment likely to be affected by any facet of the proposal. Baseline information should be provided on the following:</p> <ul style="list-style-type: none"> • meteorological characteristics which may influence erosion, dust or noise impacts. These may include prevailing wind and intensity, average yearly rainfall, seasonal distribution, storm intensity, storm return period; • surface contours and general topography. These may include slope gradient, slope length, catchment size, drainage; • presence and condition of watercourses, flood liability, any water storage or drinking water catchments including groundwater bores within 1 kilometre, watertable and the relationship with the maximum excavation depth; • predominant native vegetation communities, any vegetation communities and their habitat value or other items of conservation value; • feature of heritage, conservation or archaeological value; • visual amenity; • suitability of the land for agricultural purposes; • social and economic aspects of the environment. 	<p>7.3, 11.4, 12.1, 12.3.4, Supplementary Reports 3 and 6</p> <p>9.1, 9.6, Supplementary Report 3</p> <p>9.1.2, 9.2, Supplementary Report 3</p> <p>8.1.2, 8.2</p> <p>10.4, 10.5</p> <p>13.1</p> <p>7.1.2, 7.2.4</p> <p>10.2, 10.3</p>
2.	<p>Description of the proposal</p> <p>The description of the proposal should provide general background information on:</p>	<p>Chapter 1 Chapter 6</p>
	<p>(a) Proposal objectives</p> <p>Clearly identify objectives and characteristics of the proposal. There should be a clear statement of the proposal having regard to the:</p> <ul style="list-style-type: none"> • extent of surface mining; • quantity and types of material to be mined and coal processed; • coal to be marketed; 	<p>Chapter 3</p> <p>6.1, 6.2</p> <p>2.1.3</p> <p>2.1.3, 6.1.2</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<ul style="list-style-type: none"> duration/expected life of the operation; proposed future of the site following the expiration of the proposal; and any proposal for future expansion including staging and proposed timing. 	<p>6.2.1</p> <p>6.1.7, 6.2.6, 6.5.7</p> <p>6.5.7</p>
	<p>(b) Coal Resource</p> <p>Describe the characteristics and economic significance of the resource. Information provided should include:</p> <ul style="list-style-type: none"> the geological factors influencing coal quality and occurrence, size and quality of any proven, possible or probable reserves; exploration methods and summary of results; and depth of overburden and topsoil and overburden characteristics. 	<p>2.2, 2.1.3</p> <p>2.1.2</p> <p>2.1.5, Supplementary Report 1</p>
	<p>(c) Proposed works</p> <p>Describe the proposed mining and processing operations. This should include:</p> <ul style="list-style-type: none"> coal mining techniques; removal of overburden; staging; the number and the slope, height, depth and width of benches; depth and rate of mining; type of machinery and equipment to be used; estimated daily, weekly and annual volumes of material to be extracted and transported, including coal haulage on-site and transportation off-site; identify constraints on increased volumes including equipment, market demand, etc.; employment (during construction and operation); 	<p>Chapter 6</p> <p>6.1.2, 6.1.3</p> <p>6.1.2</p> <p>6.1.3</p> <p>6.1.3, Volume 2</p> <p>6.1.3, Volume 2</p> <p>6.1.4</p> <p>6.1.2, 14.4</p> <p>14.4</p> <p>6.2.2, 6.2.3</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<ul style="list-style-type: none"> • hours of operation for construction, extraction, coal and overburden handling, processing, transport and maintenance; • quantities and management of topsoil, overburden, rejects and tailings and coal to be stockpiled or stored; • details of coal preparation to be undertaken on site, including screening, crushing and processing; • disposal of waste, including coarse and fine rejects; • methods of loading and transport of material within the site and from the site, access roads, conveyors, coal loaders, rail spur lines; • quantities and method of storage of fuels and chemicals including explosives on the site; and • sanitary and waste disposal arrangements. 	<p>6.2.5</p> <p>7.2.5, 5.4.4, 5.5.3, 6.3.3, 6.3.5</p> <p>6.3.4</p> <p>6.3.5</p> <p>6.3</p> <p>6.3.4, 6.3.9</p> <p>6.3.9</p>
	<p>(d) Site layout plans</p> <p>Plan or plans clearly indicating the location of the following:</p> <ul style="list-style-type: none"> • maximum area to be disturbed at the various stages; • any significant vegetation communities to be cleared; • processing, storage, loading or transport plant; • storage areas for topsoil, overburden, ROM and product coal; • storage of waste, fuels, chemicals and explosives; • drainage network, bunding, sedimentation dams; • landscaping; and • parking queuing and turning areas and truck wash-down areas. 	<p>Volume 2</p> <p>Figures 8 to 12</p> <p>Figure 30</p> <p>Figures 14 to 20</p> <p>Figures 8 to 12, 14</p> <p>Figure 14</p> <p>Figure 33</p> <p>Figure 13, 14 Supplementary Report 10</p> <p>Figure 14</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<p>(e) Acquisition policy</p> <p>Outline the policy of acquisition for properties or residences likely to be detrimentally affected by the proposal.</p> <p>Include a report on the status of land acquisition or leasing arrangements for the project, including identification of land required but not yet committed to the project.</p>	6.6, 7.1.3
	<p>(f) Site preparation works</p> <p>Description of works prior to mining operations commencing including:</p> <ul style="list-style-type: none"> any clearing including burning, chipping or mulching, removal and storage of overburden; construction of access roads, dams, drainage and sediment control systems; and construction of processing plant, loading or storage facilities and equipment. 	<p>6.1.2</p> <p>6.1.2, 6.4</p> <p>6.1.3, 6.3.2, 6.3.5, 6.2</p>
	<p>(g) Infrastructure considerations</p> <p>The following factors should be considered:</p> <ul style="list-style-type: none"> electricity supply; measures to protect or the need to relocate easements, cables, pipelines which may be impacted by the proposal; energy conservation measures; water requirements, source of water supply, demands on water resources (particularly the Hunter River), proposed supply or storage, identify water recycling and reuse options; waste disposal requirements, proposed methods and locations for disposal; and transport requirements. 	<p>6.3.9</p> <p>11.9.3</p> <p>9.5, 6.3.9</p> <p>6.3.10</p> <p>14.4, 6.3.3, 6.3.5</p>
	<p>(h) Landscaping and rehabilitation</p> <p>The following issues should be addressed:</p> <ul style="list-style-type: none"> proposed final land use of the site; 	6.1.7, 6.5.7, 7.2.4

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<ul style="list-style-type: none"> • assess the general suitability of the soil material for rehabilitation purposes, proposed length of storage of top soil and management to maintain viability, measures to separate less fertile subsoil overburden from more fertile topsoil; progressive erosion control strategy during and after construction, proposed use of any waste from the operation in land formation; • progressive revegetation of all disturbed areas, including surface preparation, sowing techniques, propagation, species, rates and staging of the propagation program, any requirement of fertiliser, need for temporary revegetation; • consideration of final drainage patterns; • any need for pre-development planting programme; and • monitoring and maintenance program. 	<p>7.2, 6.5.4, Supplementary Report 2</p> <p>6.5</p> <p>6.4, 6.5.3</p> <p>13.4.2</p> <p>15.3.7, 6.5.6</p>
	<p>(i) Alternatives and justification</p> <p>Consideration of alternatives and justification for the preferred proposal. This should include an assessment of the environmental impacts or consequences of adopting alternatives including:</p> <ul style="list-style-type: none"> • coal mining techniques or technology; • mine design, site layout or access roads; • proposed infrastructure location, particularly the establishment of a joint rail loop with the Bengalla proposal; • disposal methods; and • alternative rehabilitation and end use options. <p>The selection of the preferred options should be justified in terms of:</p> <ul style="list-style-type: none"> • type, quality and quantities of coal in relation to market demand; and • environmental factors including the bio-physical, economic and social factors. 	<p>Chapter 5</p> <p>5.2</p> <p>5.3, 5.4</p> <p>5.4</p> <p>5.4, 5.5.3</p> <p>6.5.7, 6.7.6</p> <p>2.2, 2.3</p> <p>16.3, 16.4</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
3.	Analysis of environmental impacts and mitigating measures (a) Cumulative impact <ul style="list-style-type: none"> Any likely cumulative effects of the proposed operation when considered together with other coal mining operations in this locality. In particular, consideration of other existing and proposed coal mines including the Bengalla coal mine proposal, the Dartbrook coal mine, future Bayswater No 3 coal mine and the Drayton coal mine; <p>Identify any likely cumulative impacts on the surrounding rural area and Muswellbrook township having regard to dust, noise, vibration, visual impacts, water quality issues, traffic impacts, and any loss of heritage items, vegetation or fauna habitat.</p>	8.2.7, 9.3.4, 10.3.8, 11.5, 12.3, 13.3.5, 14.3, 14.4.3
	(b) Air quality <p>Issues to consider include:</p> <ul style="list-style-type: none"> identification of fixed and mobile sources of air pollution such as mining, processing, handling, storage or transport operations; likely impact of the proposal on the local and regional air quality, (this should include baseline data on ambient quality of the air, projected dust emissions and deposition rates and frequency and times of significant emissions); meteorological conditions under which nearby dwellings and sensitive land are likely to be affected; mitigation and management measures to minimise the generation of dust and to ensure compliance with air quality objectives; and dust monitoring programme (deposition and concentration). 	<p>Chapter 11, Supplementary Report 6</p> <p>11.4</p> <p>11.3, 11.4</p> <p>11.4</p> <p>11.6</p> <p>15.3.3</p>
	(c) Water quality <p>Issues to consider include:</p> <ul style="list-style-type: none"> description of potential sources of water pollution; condition of the Hunter River, other waterbodies or environmentally sensitive areas which could be impacted by: 	<p>Chapter 9</p> <p>9.2.3, 9.4</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<ul style="list-style-type: none"> - demand on water resources, particularly flow levels and water quality of the Hunter River; - any change in the surface or groundwater hydrology as a result of the proposal; and/or - any change in the water quality as a result of any activity on the site; • drainage and sediment management system; • water balance; • potential impacts on groundwater; • any effects on the local or regional watertable and implications for other users; • adequacy of measures to ensure no contamination of the groundwater; and • plan for ongoing maintenance and monitoring of water quality controls to ensure their correct installation, operation and effectiveness. 	<p>9.3., 9.6.4</p> <p>9.3., 9.4., 9.6.4</p> <p>9.4, 9.6.3</p> <p>9.5, 6.4</p> <p>9.5</p> <p>9.6</p> <p>9.4., 9.6.2</p> <p>9.4., 9.6.4</p> <p>13.3.6, Supplementary Report 3</p>
	<p>(d) Erosion and soil stability issues</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> • meteorological data, soil properties and characteristics and attributes of soil units; • landform characteristics which influence the erosion hazard, ratio of the rate of runoff to rate of rainfall; • integrated erosion and sediment control measures; and • maintenance program of all erosion control works. 	<p>7.2.1, 7.3, Supplementary Report 2</p> <p>7.2.3</p> <p>6.4</p> <p>6.4</p>
	<p>(e) Noise and vibration impacts</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> • existing acoustic environment including a statistical breakdown of the meteorological conditions (predominant wind, temperature, humidity and inversion conditions) and any topographical features which will influence the noise or vibration impacts; 	<p>Chapter 10</p> <p>12.1, 12.3.4, 12.3.2</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<ul style="list-style-type: none"> proposed hours of mining and processing operations and traffic movement; noise levels from fixed and mobile noise sources, including rail; predictive noise levels at potentially affected dwellings; mitigation and management measures to control the generation of noise to ensure compliance with relevant noise standards including details of noise control measures; in relation to blasting: <ul style="list-style-type: none"> identification of any dwellings or residential zones within approximately two kilometres of the site; outline management strategies for all night time operations especially drilling and blasting including frequency of blasting and results of trial blasts; predicted overpressure and ground vibration at neighbouring dwellings; and mitigation and management measures to control the generation of blasting impacts and to ensure compliance with relevant standards; and proposed monitoring program 	6.2.5, 12.3.2 12.5, 12.3 12.3, 12.5 12.3.7, 15.1.6 7.1.3 12.4, 15.1.6 12.4 12.4, 15.1.6 15.3.5
	<p>(f) Traffic impacts</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> estimated average and maximum hourly, daily and weekly transport movements for both road and rail; proposed transport routes and possible alternative routes or transport modes; potential impact on the road maintenance program; road safety issues; and proposed measures to improve safety. 	Chapter 14 14.3, 14.3.2, 14.4.3 14.2.3 14.2, 14.3.6 14.2.5, 14.3.3, 14.3.5 14.5.2

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<p>(g) Visual impact</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> consideration of the site in relation to any landscapes of local or regional significance as considered from the fore, middle and background; visibility from nearby properties, Muswellbrook and general surrounds; lighting impacts from lights for security and night time operations; visual impacts from the clearing of vegetation, exposure of highwalls, and shape, location and size of stockpiles; form and bulk of coal preparation plant, dragline and rail loading facilities, location of access roads and fences; orientation of mining advance relative to sighting lines; and proposed landscaping to reduce visual impacts, and location, layout and species composition of intended screening. 	<p>Chapter 13</p> <p>13.1</p> <p>13.3.1, 13.3.2, 13.3.3, 13.3.4</p> <p>13.3</p> <p>13.2</p> <p>13.2</p> <p>13.3</p> <p>13.4, 6.5</p>
	<p>(h) Agricultural viability</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> sensitive agricultural uses in the vicinity of the mine; and any effects on the agricultural viability of the adjoining land holdings; particularly in relation to dust and water. 	<p>7.1, 7.2.4</p> <p>11.8, 9.4, 9.6</p>
	<p>(i) Spontaneous combustion</p> <p>Consider the likelihood of spontaneous combustion. Issues to consider include:</p> <ul style="list-style-type: none"> overburden characteristics; disposal and emplacement; and monitoring and management practices. 	<p>2.1.5</p> <p>6.3.5</p> <p>6.3.5</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<p>(j) Flood liability</p> <p>The following issues should be included:</p> <ul style="list-style-type: none"> determine the potential impact of floods on the proposal (especially rail and road access); and any likely effects of the operation on flood liability of surrounding lands. 	<p>9.6.5</p> <p>4.1.2</p>
	<p>(k) Flora and fauna impacts</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> plant species and communities within the authorisation area and its habitat significance; extent of disturbance of flora; details of proposed mitigation methods to protect indigenous plant species; fauna known likely to occur within the authorisation area and note occurrence of any endangered fauna; assessment of the effects on fauna and its habitat; measures to ameliorate impact and to prevent weed invasion, vermin or feral animal problems. 	<p>Chapter 8, Appendix H</p> <p>8.1.2, 8.2.1</p> <p>8.1.6</p> <p>8.2.8</p> <p>8.2</p> <p>8.2.5, 8.2.6</p> <p>8.2.8</p>
	<p>(l) Heritage aspects</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> any likely affectation of sites of Aboriginal, archaeological or European heritage value (including industrial heritage) if located in the vicinity of operations; assessment of significance; and proposed measures to mitigate impacts or conserve the heritage significance of the sites or items. 	<p>Supplementary Report 4</p> <p>10.4, 10.5</p> <p>10.4, 10.5</p> <p>10.4.4, 10.5.2</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<p>(m) Social environment</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> • affect on population growth (urban and rural areas) and changes to population location; • the consequent housing and social service needs and measures to monitor and, if necessary, satisfy demand; • changes in the amenity of the area; and • impacts on the health of the community from any potential changes in the air quality, noise and vibration and safety on the roads. 	<p>Chapter 8</p> <p>10.3.3</p> <p>10.3.4, 10.3.5</p> <p>10.3.7</p> <p>10.7, 10.3.7, 4.7, 14.3.5, 12.3.5</p>
	<p>(n) Economic environment</p> <p>Issues to consider include:</p> <ul style="list-style-type: none"> • changes to local employment patterns; • cost of living for employees and non-employees; • community growth and commercial development; • impact on property values (also taking account of the aesthetic impact of the mine and infrastructure); and • impact on municipal finances. 	<p>Chapter 8</p> <p>10.3.2</p> <p>10.3.6, 10.3.8</p> <p>10.3.8</p> <p>10.3.7, 10.3.8</p> <p>4.1.4</p>
	<p>(o) Section 94 Contributions</p> <p>Outline and quantify the likely level of section 94 Contributions (having regard to Muswellbrook Council's section 94 Contributions Plan) and possible application to affected community facilities and/or community services.</p>	<p>4.1.4</p>
	<p>(p) Electricity transmission line</p> <p>Assess the implications and environmental impact of the proposed relocation of the electricity transmission line and if necessary, proposed mitigation measures.</p>	<p>6.3.9, 13.2.</p>

Table A.2 GUIDE TO THE DIRECTOR'S REQUIREMENTS (Contd)

	Requirements	EIS Reference
	<p>(q) On-going management</p> <p>Outline proposed rehabilitation and on-going management for the proposal. This should provide a comprehensive framework for managing or mitigating environmental impacts for the life of the operation. The plan should:</p> <ul style="list-style-type: none"> • demonstrate strategies for sound environmental practice during construction, operation and decommissioning of the site; • identify all government licensing and approval requirements and demonstrate how the plan will facilitate compliance with these requirements; and • set out the framework of a monitoring program of all key impacts on the environment (this framework should indicate what specific information will be monitored, the monitoring intervals, procedures to be undertaken should the monitoring indicate an environmental problem, and the reporting procedures) 	<p>Chapter 15</p> <p>15.2</p> <p>4.2.3, Appendix F</p> <p>15.3</p>
4.	<p>Consultation</p> <p>(a) Government agency consultation</p> <p>Results of consultation with Environment Protection Authority; Department of Mineral Resources; Department of Land and Water Conservation (Soil Conservation, Water Resources); Department of Agriculture, Department of Fisheries, National Parks and Wildlife Service; State Rail Authority; and Roads and Traffic Authority.</p>	<p>Chapter 4</p> <p>4.4, Appendix B</p>
	<p>(b) Potentially affected landowners</p> <p>Consideration and review of key issues which emerged from discussion with potentially affected landowners.</p>	<p>4.5, Appendix C</p>
	<p>(c) Community consultation</p> <p>Details of consultation with the Muswellbrook and rural community undertaken to date. Consideration and review of key environmental issues discerned by community.</p>	<p>4.3.1, 4.3.2, 4.5 Appendix C</p>



Department of Urban Affairs and Planning

94019

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Dear Mr Parsons,

MOUNT PLEASANT OPEN CUT COAL MINE PROJECT, NEAR MUSWELLBROOK

I refer to your letter received 11 April 1995 indicating that you are consulting with the Director with regard to the preparation of an environmental impact statement (EIS) for the above development.

2. Part of the subject site is zoned 7(L1) Environment Protection under Muswellbrook Local Environmental Plan 1985. It is noted that development of a mine may be prohibited in this zone. You should liaise with Muswellbrook Council to ensure that a development application for the purpose of a mine may be properly considered and determined.
3. If a development application may be considered and is lodged for the proposal, and it is a designated development within the meaning of Schedule 3 of the Environmental Planning and Assessment Regulation, 1994, an EIS must accompany the development application to Muswellbrook Council. The EIS shall be prepared in accordance with clause 51 of the Regulation (see Attachment No. 1) and shall bear a certificate required by clause 50 of the Regulation.
4. It would appear that the proposal is subject to a direction under Section 101 of the Environmental Planning and Assessment Act, 1979. Consequently, the Minister for Urban Affairs and Planning will determine the development application.
5. Pursuant to clause 52 of the Regulation, the Director requires that the matters listed in Attachment No. 2 be specifically addressed in the EIS.
6. In preparing your EIS you should also approach Muswellbrook Council and take into account any comments that the Council considers may apply.

7. Should you require any further information regarding this matter please do not hesitate to contact us again.

Stephen Brown 18/5/95.

Yours sincerely,
Stephen Brown
Acting Manager
Assessments and Major Hazards Branch
As Delegate for the Director

Department of Urban Affairs & Planning

ATTACHMENT NO 1

STATUTORY REQUIREMENTS FOR ENVIRONMENTAL IMPACT STATEMENTS

Pursuant to clauses 51 and 84 of the Environmental Planning and Assessment Regulation, 1994, the contents of an EIS must include:

SCHEDULE 2

1. A summary of the environmental impact statement.
2. A statement of the objectives of the development or activity.
3. An analysis of any feasible alternatives to the carrying out of the development or activity, having regard to its objectives, including:
 - (a) the consequences of not carrying out the development or activity; and
 - (b) the reasons justifying the carrying out of the development or activity.
4. An analysis of the development or activity, including:
 - (a) a full description of the development or activity; and
 - (b) a general description of the environment likely to be affected by the development or activity, together with a detailed description of those aspects of the environment that are likely to be significantly affected; and
 - (c) the likely impact on the environment of the development or activity, having regard to:
 - (i) the nature and extent of the development or activity; and
 - (ii) the nature and extent of any building or work associated with the development or activity; and
 - (iii) the way in which any such building or work is to be designed, constructed and operated; and
 - (iv) any rehabilitation measures to be undertaken in connection with the development or activity; and
 - (d) a full description of the measures proposed to mitigate any adverse effects of the development or activity on the environment.
5. The reasons justifying the carrying out of the development or activity in the manner proposed, having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development or activity in the manner proposed, having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development.
6. Compilation, (in a single section of the environmental impact statement) of the measures referred to in item 4 (d).
7. A list of any approvals that must be obtained under any other Act or law before the development or activity may lawfully be carried out.
8. For the purposes of this Schedule, **“the principles of ecologically sustainable development”** are as follows:
 - (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.

Note: The matters to be included in item (4) (c) might include such of the following as are relevant to the development or activity:

- (a) the likelihood of soil contamination arising from the development or activity;
 - (b) the impact of the development or activity on flora and fauna;
 - (c) the likelihood of air, noise or water pollution arising from the development or activity;
 - (d) the impact of the development or activity on the health of people in the neighbourhood of the development or activity;
 - (e) any hazards arising from the development or activity;
 - (f) the impact of the development or activity on traffic in the neighbourhood of the development or activity;
 - (g) the effect of the development or activity on local climate;
 - (h) the social and economic impact of the development or activity;
 - (i) the visual impact of the development or activity on the scenic quality of land in the neighbourhood of the development or activity;
 - (j) the effect of the development or activity on soil erosion and the silting up of rivers or lakes;
 - (k) the effect of the development or activity on the cultural and heritage significance of the land.
-

ATTACHMENT NO 2
DIRECTOR'S REQUIREMENTS
MOUNT PLEASANT OPEN CUT COAL MINE PROPOSAL, NEAR MUSWELLBROOK

The matters listed below should be clearly and succinctly outlined in the text and where appropriate supported by adequate maps, plans, diagrams or other descriptive details to enable all concerned to gain a clear understanding of the full scope of the development and its likely impact on the environment.

Issues contained in the requirements are not necessarily a comprehensive identification of all issues which may arise in respect of this proposal relevant to the preparation and consideration of an EIS. There may be other issues, not included, that are appropriate for consideration in the EIS. It is the applicant's responsibility to identify and address as fully as possible the matters relevant to the specific development proposal in complying with the requirements for EIS preparation (see Attachment No 1).

1. Planning and environmental context

**Planning
information &
permissibility**

The following information should be provided:

- zonings, permissibility and any land use constraints;
- compatibility of the proposal with:
 - Hunter Regional Environmental Plan 1989 and Hunter Regional Environmental Plan - Heritage; and
 - any relevant Development Control Plans;
- existing land uses; and
- any heritage items or environmental protection areas.

Discuss the application:

- of clause 17(2)(b) of Muswellbrook Local Environmental Plan 1985; and
- of Section 100A of the Environmental Planning and Assessment Act, 1979 should it be determined that the application of Clause 17(2)(b) is inappropriate.

Test the proposal against the provisions of clause 17(2)(b) of Muswellbrook Local Environmental Plan 1985.

**Site description and
locality information**

The following information should be provided:

- title details; land tenure including any Crown tenure, owners' consent or direction from the Minister for Mines.
- site description and maps, plans, aerial photographs clearly identifying the location of the proposal relative to surrounding roads, Muswellbrook, any other communities and dwellings and any land use likely to be affected by the development, utilities including transmission lines, pipelines, cables or easements, sight lines from dwellings or public spaces such as roads.

Overview of the affected environment

This should provide details of the environment in the vicinity of the development site and also of aspects of the environment likely to be affected by any facet of the proposal. Baseline information should be provided on the following:

- meteorological characteristics which may influence erosion, dust or noise impacts. These may include prevailing wind and intensity, average yearly rainfall, seasonal distribution, storm intensity, storm return period.
- surface contours and general topography. These may include slope gradient, slope length, catchment size, drainage.
- presence and condition of watercourses, flood liability, any water storage or drinking water catchments including groundwater bores within 1 kilometre, watertable and the relationship with the maximum excavation depth.
- predominant native vegetation communities, any vegetation communities and their habitat value or other items of conservation value.
- features of heritage, conservation or archaeological value.
- visual amenity.
- suitability of the land for agricultural purposes.
- social and economic aspects of the environment.

2. Description of the proposal.

The description of the proposal should provide general background information on:

Proposal objectives

Clearly identify objectives and characteristics of the proposal. There should be a clear statement of the proposal having regard to the:

- extent of surface mining;
- quantity and types of material to be mined and coal processed;
- coal to be marketed;
- duration/expected life of the operation;
- proposed future of the site following the expiration of the proposal; and
- any proposal for future expansion including staging and proposed timing.

Coal resource

Describe the characteristics and economic significance of the resource. Information provided should include:

- the geological factors influencing coal quality and occurrence, size and quality of any proven, possible or probable reserves;
- exploration methods and summary of results; and
- depth of overburden and topsoil and overburden characteristics.

Proposed works	<p>Describe the proposed mining and processing operations. This should include:</p> <ul style="list-style-type: none">• coal mining techniques;• removal of overburden;• staging;• the number and the slope, height, depth and width of benches;• depth and rate of mining;• type of machinery and equipment to be used;• estimated daily, weekly and annual volumes of material to be extracted and transported, including coal haulage on-site and transportation off-site;• identify constraints on increased volumes including equipment, market demand etc.;• employment (during construction and operation);• hours of operation for construction, extraction, coal and overburden handling, processing, transport and maintenance.• quantities and management of topsoil, overburden, rejects and tailings and coal to be stockpiled or stored;• details of coal preparation to be undertaken on site, including screening, crushing and processing;• disposal of waste, including coarse and fine rejects;• methods of loading and transport of material within the site and from the site, access roads, conveyors, coal loaders, rail spur lines;• quantities and method of storage of fuels and chemicals including explosives on the site; and• sanitary and waste disposal arrangements
Site layout plans	<p>Plan or plans clearly indicating the location of the following:</p> <ul style="list-style-type: none">• maximum area to be disturbed at the various stages;• any significant vegetation communities to be cleared;• processing, storage, loading or transport plant;• storage areas for topsoil, overburden, ROM and product coal;• storage of waste, fuels, chemicals and explosives;• drainage network, bunding, sedimentation dams;• landscaping; and• parking, queuing and turning areas and truck wash-down areas.
Acquisition policy	<p>Outline the policy of acquisition for properties or residences likely to be detrimentally affected by the proposal.</p> <p>Include a report on the status of land acquisition or leasing arrangements for the project, including identification of land required but not yet committed to the project.</p>

Site preparation works	<p>Description of works prior to mining operations commencing including:</p> <ul style="list-style-type: none">• any clearing including burning, chipping or mulching, removal and storage of overburden;• construction of access roads, dams, drainage and sediment control systems; and• construction of processing plant, loading or storage facilities and equipment.
Infrastructure considerations	<p>The following factors should be considered:</p> <ul style="list-style-type: none">• electricity supply; measures to protect or the need to relocate easements, cables, pipelines which may be impacted by the proposal;• energy conservation measures;• water requirements, source of water supply, demands on water resources (particularly the Hunter River), proposed supply or storage, identify water recycling and reuse options;• waste disposal requirements, proposed methods and locations for disposal; and• transport requirements.
Landscaping and rehabilitation	<p>The following issues should be addressed:</p> <ul style="list-style-type: none">• proposed final land use of the site;• assess the general suitability of the soil material for rehabilitation purposes, proposed length of storage of top soil and management to maintain viability, measures to separate less fertile subsoil overburden from more fertile topsoil; progressive erosion control strategy during and after construction, proposed use of any waste from the operation in land formation;• progressive revegetation of all disturbed areas, including surface preparation, sowing techniques, propagation, species, rates and staging of the propagation program, any requirement of fertiliser, need for temporary revegetation;• consideration of final drainage patterns;• any need for pre-development planting programme; and• monitoring and maintenance program.
Alternatives and justification	<p>Consideration of alternatives and justification for the preferred proposal. This should include an assessment of the environmental impacts or consequences of adopting alternatives including:</p> <ul style="list-style-type: none">• coal mining techniques or technology;• mine design, site layout or access roads;• proposed infrastructure location, particularly the establishment of a joint rail loop with the Bengalla proposal• disposal methods; and• alternative rehabilitation and end use options.

The selection of the preferred options should be justified in terms of:

- type, quality and quantities of coal in relation to market demand; and
- environmental factors including the bio-physical, economic and social factors.

3. Analysis of environmental impacts and mitigating measures.

Environmental impacts usually associated with open cut coal mining operations are listed below. The potential impacts of the proposal on the environment should be addressed in the EIS in satisfactory detail and suitably quantified. In addition, the proposed mitigation and management strategies to mitigate the impacts should be identified and take account of the effectiveness of the measures proposed.

Cumulative impact Any likely cumulative effects of the proposed operation when considered together with other coal mining operations in this locality. In particular, consideration of other existing and proposed coal mines including the Bengalla coal mine proposal, the Dartbrook coal mine, future Bayswater No.3 coal mine and the Drayton coal mine.

Identify any likely cumulative impacts on the surrounding rural area and Muswellbrook township having regard to dust, noise, vibration, visual impacts, water quality issues, traffic impacts, and any loss of heritage items, vegetation or fauna habitat.

Air quality

Issues to consider include:

- identification of fixed and mobile sources of air pollution such as mining, processing, handling, storage or transport operations;
- likely impact of the proposal on the local and regional air quality, (this should include baseline data on ambient quality of the air, projected dust emissions and deposition rates and frequency and times of significant emissions);
- meteorological conditions under which nearby dwellings and sensitive land are likely to be affected;
- mitigation and management measures to minimise the generation of dust and to ensure compliance with air quality objectives; and
- dust monitoring programme (deposition and concentration).

Water quality

Issues to consider include:

- description of potential sources of water pollution;
- condition of the Hunter River, other waterbodies or environmentally sensitive areas which could be impacted by:
 - demand on water resources, particularly flow levels and water quality of the Hunter River;

Department of Urban Affairs and Planning

- any change in the surface or groundwater hydrology as a result of the proposal; and/or
- any change in the water quality as a result of any activity on the site.
- drainage and sediment management system;
- water balance;
- potential impacts on groundwater;
- any effects on the local or regional watertable and implications for other users;
- adequacy of measures to ensure no contamination of the groundwater; and
- plan for ongoing maintenance and monitoring of water quality controls to ensure their correct installation, operation and effectiveness.

Erosion and soil stability issues

Issues to consider include:

- meteorological data, soil properties and characteristics and attributes of soil units;
- landform characteristics which influence the erosion hazard, ratio of the rate of runoff to rate of rainfall;
- integrated erosion and sediment control measures; and
- maintenance program of all erosion control works.

Noise and vibration impacts

Issues to consider include:

- existing acoustic environment including a statistical breakdown of the meteorological conditions (predominant wind, temperature, humidity and inversion conditions) and any topographical features which will influence the noise or vibration impacts;
- proposed hours of mining and processing operations and traffic movement;
- noise levels from fixed and mobile noise sources, including rail;
- predictive noise levels at potentially affected dwellings;
- mitigation and management measures to control the generation of noise to ensure compliance with relevant noise standards including details of noise control measures;
- in relation to blasting:
 - identification of any dwellings or residential zones within approximately two kilometres of the site;
 - outline management strategies for all night time operations especially drilling and blasting including frequency of blasting and results of trial blasts.
 - predicted overpressure and ground vibration at neighbouring dwellings; and
 - mitigation and management measures to control the generation of blasting impacts and to ensure compliance with relevant standards; and
- proposed monitoring program.

Traffic impacts

Issues to consider include:

- estimated average and maximum hourly, daily and weekly transport movements for both road and rail;
- proposed transport routes and possible alternative routes or transport modes;
- potential impact on the road maintenance program;
- road safety issues; and
- proposed measures to improve safety.

Visual impact

Issues to consider include:

- consideration of the site in relation to any landscapes of local or regional significance as considered from the fore, middle and background;
- visibility from nearby properties, Muswellbrook and general surrounds;
- lighting impacts from lights for security and night time operations;
- visual impacts from the clearing of vegetation, exposure of highwalls, and shape, location and size of stockpiles;
- form and bulk of coal preparation plant, dragline and rail loading facilities, location of access roads and fences;
- orientation of mining advance relative to sighting lines; and
- proposed landscaping to reduce visual impacts, and location, layout and species composition of intended screening.

Agricultural viability

Issues to consider include:

- sensitive agricultural uses in the vicinity of the mine; and
- any effects on the agricultural viability of the adjoining land holdings; particularly in relation to dust and water.

Spontaneous combustion

Consider the likelihood of spontaneous combustion. Issues to consider include:

- overburden characteristics;
- disposal and emplacement; and
- monitoring and management practices.

Flood liability

The following issues should be included:

- determine the potential impact of floods on the proposal (especially rail and road access); and
- any likely effects of the operation on flood liability of surrounding lands.

Flora and fauna impacts

Issues to consider include:

- plant species and communities within the authorisation area and its habitat significance;
- extent of disturbance of flora;
- details of proposed mitigation methods to protect indigenous plant species;
- fauna known likely to occur within the authorisation area and

Department of Urban Affairs and Planning

note occurrence of any endangered fauna;

- assessment of the effects on fauna and its habitat;
- measures to ameliorate impact and to prevent weed invasion, vermin or feral animal problems.

Heritage aspects

Issues should include;

- any likely affectation of sites of Aboriginal, archaeological or European heritage value (including industrial heritage) if located in the vicinity of operations;
- assessment of significance; and
- proposed measures to mitigate impacts or conserve the heritage significance of the sites or items.

Social environment

Issues should include:

- affect on population growth (urban and rural areas) and changes to population location;
- the consequent housing and social service needs and measures to monitor and, if necessary, satisfy demand;
- changes in the amenity of the area; and
- impacts on the health of the community from any potential changes in air quality, noise and vibration and safety on the roads.

Economic environment

Issues should include:

- changes to local employment patterns;
- cost of living for employees and non-employees;
- community growth and commercial development;
- impact on property values (also taking account of the aesthetic impact of the mine and infrastructure); and
- impact on municipal finances.

Section 94 Contributions

Outline and quantify the likely level of Section 94 Contributions (having regard to Muswellbrook Council's Section 94 Contributions Plan) and possible application to affected community facilities and/or community services.

Electricity transmission line

Assess the implications and environmental impact of the proposed relocation of the electricity transmission line and if necessary, proposed mitigation measures..

On-going management

Outline proposed rehabilitation and on-going management for the proposal. This should provide a comprehensive framework for managing or mitigating environmental impacts for the life of the operation. The plan should:

- demonstrate strategies for sound environmental practice during construction, operation and decommissioning of the site;
- identify all government licensing and approval requirements and demonstrate how the plan will facilitate compliance with these requirements; and

- set out the framework of a monitoring program of all key impacts on the environment (this framework should indicate what specific information will be monitored, the monitoring intervals, procedures to be undertaken should the monitoring indicate an environmental problem, and the reporting procedures)

4. Consultation

Government agency consultation Results of consultation with Environment Protection Authority; Department of Mineral Resources; Department of Land and Water Conservation (Soil Conservation, Water Resources); Department of Agriculture; Department of Fisheries; National Parks and Wildlife Service; State Rail Authority; and Roads and Traffic Authority.

It is the responsibility of the person preparing the EIS to determine other Departments relevant to the proposed development.

Potentially affected landowners Consideration and review of key issues which emerged from discussion with potentially affected landowners.

Community consultation Details of consultation with the Muswellbrook and rural community undertaken to date. Consideration and review of key environmental issues discerned by community.

New South Wales Government Department of Urban Affairs and Planning

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Mr Stephen Hafer
Environmental Scientist
ERM Mitchell McCotter Pty Ltd
PO Box 943
CROWS NEST NSW 2065

ERM Mitchell McCotter Quality System	Ref No. 94019
Referred to Hafer	
Date received 07 APR 1997	
<input type="checkbox"/> refer to verification record <input checked="" type="checkbox"/> verification not required	
Signature: <i>Stephen Hafer</i>	Date: 7-4-97
Project Manager	

Contact: Gordon Kirkby
Our Reference: N95/00147/001
Your Reference: 94019L54

3 APR 1997

Dear Mr Hafer,

Proposed Mt. Pleasant Coal Mine and Associated Infrastructure - Muswellbrook Shire

Thank you for your letter of 12 March 1997 re-consulting with the Director-General under clause 52(5) of the Environmental Planning and Assessment Regulation 1994 with regard to her requirements for the preparation of an Environmental Impact Statement for the above proposal.

Under clause 52 of the Regulation, in addition to her requirement's issued on 18 May 1995, the Director-General requires that the following matters be specifically addressed in the EIS:

- the application of State Environmental Planning Policy No.45 - Permissibility of Mining;
- the application of section 5A of the Environmental Planning and Assessment Act 1979 and the Threatened Species Conservation Act 1995 and the need for a Species Impact Statement to be prepared;
- the findings and recommendations of the draft Muswellbrook Western Roads Strategy;
- cumulative impacts associated with the interaction of the proposal with the adjacent Kayuga open cut mine proposal;
- cumulative impacts associated with coal transportation by rail to Port Waratah.

In finalising the EIS regard should be had to the findings and recommendations of the draft Upper Hunter Cumulative Impact Study.

Should you have any further enquiries, please contact Gordon Kirkby on (02) 9391 2071.

Yours sincerely,

David Mutton
David Mutton
Acting Manager
Major Assessments and Hazards Branch

Governor Macquarie Tower
1 Farrer Place, Sydney 2000
Box 3927 GPO, Sydney 2001

Telephone: (02) 9391 2000
Facsimile: (02) 9391 2111

New South Wales Government Department of Urban Affairs and Planning

BOB McCOTTER

Mr Rory Gordon
Manager, Environmental Services
Coal and Allied Operations Pty Ltd
PO Box 509
SINGLETON NSW

Contact: Gordon Kirkby

Your Reference: N95/00147/001

2330
ERM Mitchell McCotter Quality System

Referred to	SH	Ref. No.	94017
Date received	21 APR 1997		15 APR 1997
<input checked="" type="checkbox"/> refer to verification record <input checked="" type="checkbox"/> verification not required			
Signature: <i>[Signature]</i>		Date: 21/2/97	

Dear Mr Gordon,

Proposed Mt Pleasant Coal Mine and Associated Infrastructure - Muswellbrook Shire

I refer to your recent inquiry regarding the Director-General's requirements for the above proposal and seeking clarification as to the required level of assessment to be undertaken with regard to the cumulative impacts associated with coal transportation by rail to Port Waratah.

By way of clarification, the Director-General requires that the EIS address cumulative impacts in terms of the likely additional number, size and frequency of trains using the rail network to Port Waratah as a result of the proposed development, when compared to the current situation. This requirement does not extend to an assessment of impacts associated with the general operations of the rail network itself, as this is considered to be beyond the scope of an EIS for an individual development.

You may need to liaise with State Rail Access and the Freight Rail Corporation in relation to the measures being undertaken to manage the impacts of coal rail transport. The EIS may benefit from an outline of such measures.

I hope this has helped to clarify the matter.

Should you have any further enquiries, please contact Gordon Kirkby on (02) 9391 2071.

Yours sincerely,

[Signature]
David Munton
Acting Manager
Major Assessments and Hazards Branch

Governor Macquarie Tower
1 Farrer Place, Sydney 2000
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New South Wales Government Department of Urban Affairs and Planning

.....

Mr. R. Gordon
Manager, Environmental Services
Coal and Allied Operations Pty Ltd
P.O. Box 509
SINGLETON NSW 2330

Contact:

N95/00147/001

Our Reference:

Your Reference:

8 May, 1997

Dear Mr. Gordon,

Proposed Mt. Pleasant Coal Mine - Muswellbrook Shire

I refer to earlier correspondence concerning the Director-General's EIS requirements for the above proposed development, particularly as they relate to the assessment of coal transportation by rail from the proposed development to the Port of Waratah. You have requested further more specific clarification of those requirements as indicated in the Department's letters of 3 and 15 April, 1997.

I am writing to confirm that it is not required nor expected for your organisation as proponent of one activity to undertake a cumulative impact assessment of the rail coal chain in the Hunter Valley. It is appropriate however for the EIS to alert the community and decision makers as to the contribution of your proposed activity to the existing situation. This will enable the Department (and others) to undertake the broad cumulative assessment and advise the Minister accordingly and in due course.

In order to avoid any potential ambiguities and consistent with the above, I wish to confirm that the EIS for the proposed Mt. Pleasant Coal Mine is required to address as far as feasible the impacts of the development proposals on the operation of the existing rail network in the Hunter Valley by way of an assessment of the likely additional number, size and frequency of trains using the existing rail network to Port Waratah, relative to the current situation.

As previously indicated you will benefit from consulting with State Rail Access and the Freight Rail Corporation in relation to these matters.

I trust the above clarifies the situation for you.

Yours sincerely,

Shaddad
Sam Haddad
Assistant Director-General

Governor Macquarie Tower
1 Farrer Place, Sydney 2000
Box 3927 GPO, Sydney 2001

Telephone: (02) 9391 2000
Facsimile: (02) 9391 2111

GOVERNMENT AUTHORITY RESPONSES

B

Table B.1 SUMMARY OF ISSUES RAISED

Issue	Reference in EIS
Description of the proposal	Chapter 6
<i>Objectives</i>	
– extent of mining	6.1.3
– quantities of materials mined/processed/market	6.1.2
– duration	6.1.2
– site future	6.1.7, 6.5.7, 7.2.4, 6.5.4
<i>Coal Resource</i>	
– coal quality/reserves	2.2, 2.1.3
– exploration details	2.1.2
– overburden characteristics	2.1.5
<i>Proposed Works</i>	
– mining techniques	6.1.2, 6.1.3
– overburden removal	6.1.2
– staging	6.1.3, 6.2.1
– bench details	6.1.3
– depth/rate of mining	6.1.3
– machinery/equipment	6.1.4
– volumes of materials on/off site	6.1.2, 14.4
– employment	6.2.2, 6.2.3, 10.2.2, 10.3.2
– hours of operation	6.2.5
– quantities of noncoal materials	7.2.5, 5.5.3, 6.3.3, 6.3.5
– details of coal preparation	6.3.4
– disposal of rejects	6.3.5
– methods of loading/transport of coal on/off site	6.3
– storage methods of fuels, chemicals, explosives on site	6.3.4, 6.3.9
– waste disposal (sewerage)	6.3.9
– spontaneous combustion	6.3.5, 2.1.5
<i>Plans of Site Layout</i>	Volume 2 - Figures
– area disturbed for each stage	6.1.3, Figures 8 to 12
– processing, storage, loading or transport plant	6.3
– storage areas of topsoil, overburden, ROM and product coal	Figures 8 to 12, 18, 19
– storage of waste, fuels, explosives	6.3.9, 6.3.10, Figure 14

Table B.1 SUMMARY OF ISSUES RAISED (Contd)

Issue	Reference in EIS
– parking, queuing and turning areas, truck washdown	Figure 14
<i>Site Preparation Works</i>	
– clearing, burning, overburden storage	6.1.2
– access roads, dams, drainage controls	6.1.2, 6.4
– infrastructure construction	6.3
Alternatives and Justification	Chapter 5
– other techniques or technologies	5.2
– mine design and layout	5.3, 5.4
– end use	6.5.7, 6.2.6
– transport options	5.4
– ROM coal transport	5.4.4, 5.5.4
Social and Economic impacts	Chapter 10
– procedures for unforeseen impacts on landowners	15.2.6
– Acquisition policy	6.6
– local and regional landscape significance	13.1
– visibility from nearby residences/Muswellbrook	13.3.1
– lighting impacts at night (Highway)	13.3.2
– visual impacts (line, form, highwalls, stockpiles, plant, dust)	13.2, 13.3
– affect on population, social services, amenity	10.3.6, 10.3.7
– health of the community	11.7, 10.3.6, 10.3.7
– local employment	10.3.2
– cost of living	10.3.7, 10.3.6
– community growth and commercial development	10.2.8
– property values	10.3.7
– municipal finances	4.1.4
– Section 94 contributions	4.1.4

Table B.1 SUMMARY OF ISSUES RAISED (*Contd*)

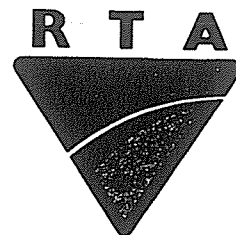
Issue	Reference in EIS
Biophysical impacts	Chapter 9, Supplementary Report 3
<i>Water management</i>	
– discharges to the Hunter River	9.3., 9.6.4
– infrastructure drainage and wastewater controls	6.4
– site water balance	9.5
– maximised onsite reuse	9.5, 9.4
– wet weather overflows	9.5
– segregation of water qualities	9.5
– priorities of water use (poorest first)	9.5
– control measures for pit water, leachate, runoff	6.4, 9.5
– liquid storage arrangements	6.3.4
– bores within 1km	9.2.3
– drainage network, bunding, sedimentation dams	6.4
– water supply source	9.5.1
– potential sources of water pollution	9.5
– changes to groundwater/surface hydrology	9.6.2
– measures to protect groundwater	9.6.2
– flood liability	9.6.5
– downstream water quality and quantity	9.6.1, 9.6.3
– design parameters	9.5
– ground water effects on agriculture	9.6.1, 9.6.2
<i>Soils</i>	Chapter 7, Supplementary Report 2
– rehabilitation plan	7.5, 7.2.5
– land capability (esp. I II III)	7.2.4
– properties of overburden materials	2.1.5
– final landform	6.3, 6.5.7
– land management	6.5.7
– surface contours and general topography	6.5.7
– final land capability	7.2.5
– agricultural capability	7.2.4
<i>Flora and Fauna</i>	Chapter 8, Appendix H
– significant communities/species to be disturbed	8.1.2, 8.2.1
– rehabilitation details, prep/sowing/prop/fertilisers	6.5
– predevelopment planting	13.4.2

Table B.1 SUMMARY OF ISSUES RAISED (Contd)

Issue	Reference in EIS
- measures to prevent weed invasion/ferals	8.2.8
- predominant vegetation communities	8.1.2, 8.2.1
Land use and Infrastructure	
- maintenance of travelling stock reserves	
- Aboriginal heritage	10.5, Supplementary Report 5
- land tenure, title details	7.1.3
- traffic volumes and routes (hourly, daily, weekly)	14.2, 14.4.2, 14.4.3
- impact on local road network	14.3
- peak traffic flows and times	14.3.1, 14.3.2
- road safety	14.2, 14.3.6
- contingency plan for coal haulage	Chapter 14
- zonings, permissibility and land use	4.1
- compatibility with REP, DCPs	4.1.1
- heritage items or environmental protection areas	4.1.3, 10.5, 13.3.4
- clause 17(2)(b) LEP, Sect 100A of EPA Act	4.1.1, 4.1.3
- crown lands	7.1.3
- transmission line relocations	6.3.9, 13.2.2
Noise and Vibration	
	Chapter 12
- noise levels and cumulative impacts	12.3.6
- measures to mitigate noise impacts	12.3.7
- levels from fixed and mobile equipment	12.3.1
- existing acoustic environment	12.1
- operating hours	6.2.5
- rail/road noise levels	12.2, 12.5
- construction noise, impacts, controls	12.3
- application of ANZECC guidelines for blasting	12.2.3, 12.4
- meteorological conditions (inversions etc)	12.3.4
- potentially affected residences	Appendix P
- dwellings/areas within 2km of mine (blasting)	Appendix P
- nighttime strategies	12.3.5
- overpressure/vibration at dwellings	12.4
- EPA traffic noise guidelines (zoning, ENCM)	12.5.2

Table B.1 SUMMARY OF ISSUES RAISED (*Contd*)

Issue	Reference in EIS
Air Quality	Chapter 11, Supplementary Report 6
– EPA air quality criteria	11.2
– measures to mitigate air quality impacts	11.6
– potential implications on regional air quality	11.5
– anticipated dust emission and TSP rates	11.4.2, 11.4.3
– shortterm worst case dust scenario	11.4.4
– greenhouse gas emissions	11.9
– accuracy of wind data for actual conditions	Supplementary Report 6
– meteorological conditions	11.2, 7.3
– fixed and mobile sources	11.4.1
– effects of dust on human health	11.7, Supplementary Report 9
– dust impacts on grazing animals	11.8.3, Supplementary Report 8
– effects of dust on plant growth	11.8.2, Supplementary Report 7
– cumulative dust impacts	11.5
– dust control measures	11.6
EIS process	
– community consultation	4.3
– government consultation	4.4
– potentially affected landowners	Appendix P
General	
Environmental monitoring program (framework)	15.3
– dust	15.3.3
– rehabilitation	15.3.7
– water quality	15.3.6
– erosion controls	6.4.4
– noise and vibration	15.3.4, 15.3.5
Environmental management plan (outline)	15.2
Principles of Ecologically Sustainable Development	16.2



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ERM Mitchell McCotter
P O Box 943
CROWS NEST NSW 2065

ERM Mitchell McCotter Quality Systems		
Referred to	T. Booker	Ref No. 94019
Date received	24 DEC 1996	
<input type="checkbox"/> refer to verification record		
<input checked="" type="checkbox"/> verification not required		
Signature	<i>[Signature]</i>	Date 6/1/97

Attention Mr Mark Gilligan

PLANNING FOCUS MEETING FOR THE PROPOSED MOUNT PLEASANT COAL MINE MUSWELLBROOK

Dear Sir

In response to the Planning Focus Meeting held at Muswellbrook on 4 December 1996 it is considered that the EIS for the proposed Mount Pleasant Coal Mine near Muswellbrook will need to address the issues listed in the attached schedule.

Appropriate traffic studies to determine possible traffic volumes, peak flows, travel desire corridors, accident rates and possible intersection arrangements should be undertaken to ensure minimal impact on the major roads in the study area as a result of the proposed development.

Yours faithfully

[Signature]
C W Nunn
Zone Planner
Newcastle

23/12/96


SHIRE OF MUSWELLBROOK - PROPOSED MOUNT PLEASANT OPEN CUT COAL MINE. REPORT ON 2ND PLANNING FOCUS MEETING

A 2nd planning focus meeting for the proposed development of a coal mine at Mount Pleasant was held at the John Hunter Motel, Muswellbrook on 4 December 1996. The relocation of the proposed mine infrastructure to the south western corner of the Mount Pleasant authorisation (away from Muswellbrook township) and its subsequent effects on the original proposal necessitated the 2nd planning focus meeting.

- Road requirements and traffic flows will be affected by the proposed relocation.
- Road closures and realignments are planned (final proposals will be influenced by "The Muswellbrook Western Roads Strategic Traffic Study" currently being prepared for Muswellbrook Council). The proposed strategy will be incorporated in the EIS so that the impact assessment reflects the future road systems.

The following issues need to be addressed during the preparation and presentation of the EIS for this proposal.

- **Anticipated traffic volumes** - the following details determined
 - volume of employee and delivery traffic
 - origin and route of the traffic to the mine
 - impact of this traffic on the local road network
 - impact of road closures and realignments on local road network
 - times during which the peak flows of mine traffic will occur to ensure these do not coincide with other peak traffic (if possible)
- **Contingency plan for coal haulage**
 - consideration needs to be given as to whether a contingency plan for coal haulage will be needed in the event of disruption to rail haulage.



M Jenkins
Road Network Officer
19 December 1996

Level 16

55 Market Street

Sydney NSW 2000

GPO Box 47 Sydney

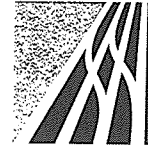
NSW 2001 Australia

12 December, 1996

Mr Mark Gilligan
ERM Mitchell McCoher
PO Box 943
CROWS NEST NSW 2065

Fax: 9906 5375

ERM Mitchell McCoher Quality System	
Related to	Mail
Ref No.	94019
Date received	18 DEC 1996
<input type="checkbox"/> Verification not required	
Signature:	<i>[Signature]</i>
Date:	18/12/96



RAIL ACCESS
CORPORATION

Telephone 02 9224 8000

Facsimile 02 9224 8900

Dear Mr Gilligan,

Mt Pleasant Coal Project - Second Planning Focus

Thank you for the opportunity to attend the second Planning Focus Meeting on 4 December 1996.

The relocation of the project's balloon loop siding and rail loading facility will not affect the site's serviceability by rail from the Ulan - Muswellbrook line.

We support Coal and Allied's intention to load trains through the highest category loader (Class 6) with mass control facilities to optimise loading, and to load maximum length trains about 1.5kms in length. These measures enhance the mainline rail system's capacity to meet the future coal haulage needs through Muswellbrook.

Rail Access Corporation (RAC) will need to confer with Coal and Allied on the mainline track and signalling requirements for interfacing the propose balloon loop with the Ulan - Muswellbrook. RAC approval will be required for installation of the balloon loop junction, the resultant signalling and safeworking changes, and for the operation of Mt Pleasant trains on the rail network owned by RAC.

We would be pleased to assist with any future questions which may arise. We look forward to the opportunity to participate in this project development process.

Yours sincerely


JAMIE McDONALD
Manager Operation Services

RECEIVED 14 JUN 1995

YOUR REFERENCE: 940 19L13
OUR REFERENCE: H091 H205 Vol.5
CONTACT OFFICER: B. Preston
TELEPHONE: (02) 2674991
FAX NUMBER: (02) 2674942



DEPARTMENT OF
CONSERVATION AND
LAND MANAGEMENT

23 - 33 Bridge St
Sydney NSW 2000
GPO Box 39
Sydney NSW 2001

Phone (02) 228 6111
Fax (02) 228 6140

14 June 1995.

M/S Jan Parsons
Erm Mitchell McCotter Pty Ltd
PO Box 943
CROWS NEST NSW 2065

The Department of Land and Water Conservation incorporates the former
Department of Conservation and Land Management and Water Resources.

94019

MOUNT PLEASANT COAL PROJECT

Dear M/S Parsons,

Thank you for your letter of 16th March 1995, addressed to the Newcastle Office of the
Land Information Centre.

The mine is to be a large open cut operation that will destroy a number of survey control
marks in its early stages. A Survey Control Information Management System search over
the proposed mine area has been obtained. Twenty four marks are in danger of being
destroyed (see attached map). One of the marks is a 1st Order level mark. The rest have
accuracy 5 Horizontal values and accuracy 5 or 7 vertical values in SCIMS. A copy of the
search printout is attached.

The marks (apart from SSM 3209) were placed as control for mine boreholes. A such,
some runs were not closed, leading to the low order of accuracies. As they were placed in
rural land for the proposed mine and would be quite hard to find, the main loser in their
destruction will be the mine itself. Not all marks will go in the operation, which will take
about twenty years.

In view of the marks being destroyed, the mine should establish a Mine Baseline as a
priority. It should also establish other marks on the site to SCIMS accuracy 3 or 4 as
control for construction and other mine activities. Levels should be transferred from the
SCIMS 1st order level net prior to the destruction of SSM 3209. Perhaps some of the
existing marks could be upgraded to serve this function.

After the mining work has been completed would you please advise me so that action can be taken to rectify any disturbance or damage and resurvey the marks. A compensation claim to cover the survey costs will be lodged with the Mines Subsidence Board after the resurvey has taken place.

A copy of this letter has been sent to the Mines Subsidence Board.

Yours faithfully

A handwritten signature in cursive script, appearing to read 'B. Preston'.

B. PRESTON
For D.M. GRANT
SURVEYOR GENERAL OF NEW SOUTH WALES

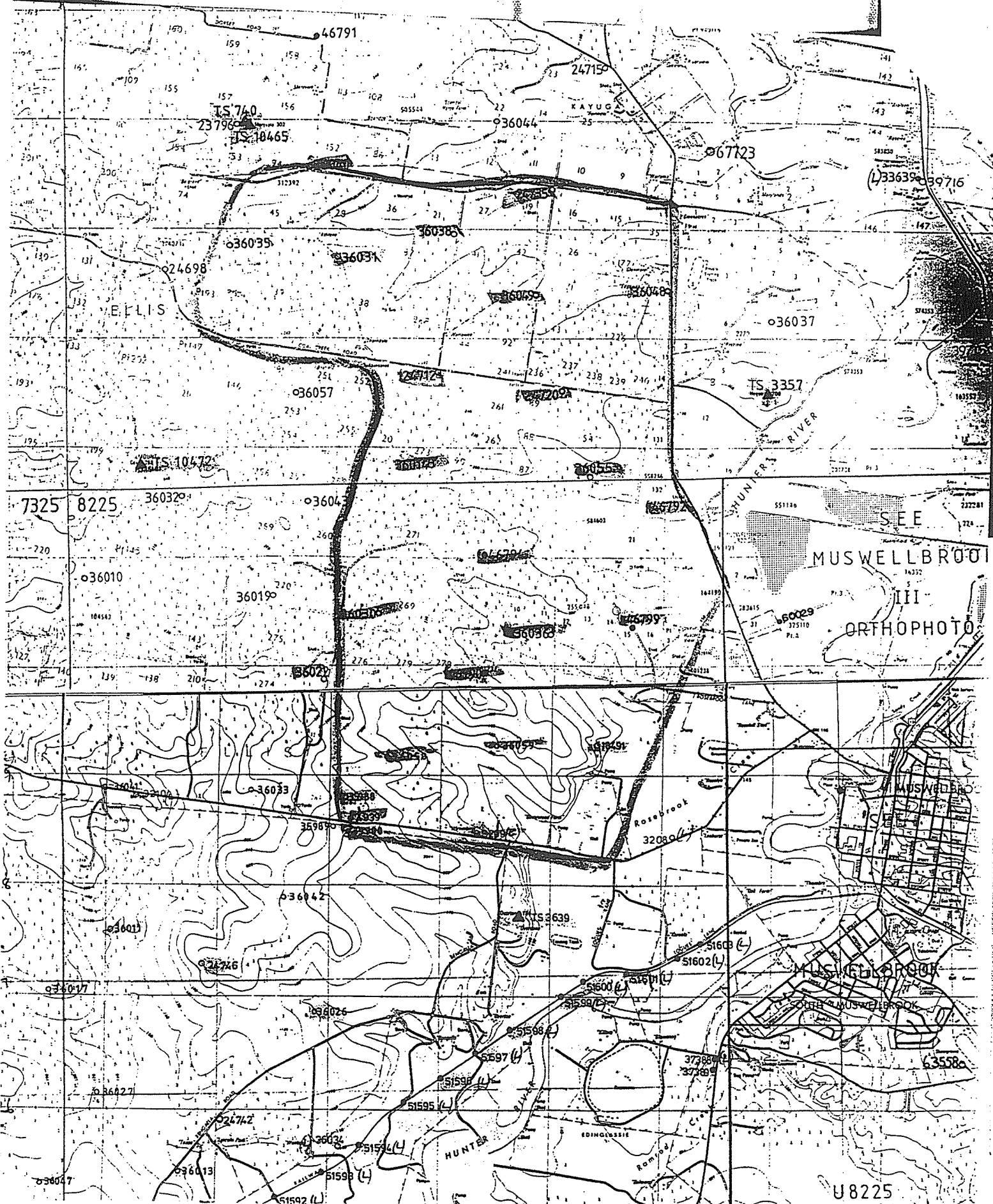
MARK CO-ORDINATE LISTING FROM SURVEY CONTROL BRANCH, NEWCASTLE, FROM SCIMS AS AT 21ST FEB, 1995.

TO: MOUNT PLEASANT

DATE: 24/3/95

TYPE	NO.	NAME	STAT	HEIGHT	ISG EASTING	ISG NORTHING	ACC. H V	H.ADJ	V.ADJ	ZONE
PM	46792		!	154.20	287745.80	1431998.04	5 5	81037	955	561
PM	46790		!	212.90	285576.45	1430698.01	5 5	81037	955	561
PM	46794		!	220.00	285871.36	1431841.01	5 5	81037	955	561
PM	46799		!	197.50	287013.57	1431303.89	5 5	81037	955	561
PM	4939		*	204.371	284600	1429500	9 1	87372	71136	561
SSM	3209		!	169.698	285700	1429300	9 1	87372	71136	561
SSM	18491		!	163.3	286819.20	1430176.24	5 7	81037	72066	561
SSM	35990		!	200.8	284572.57	1429340.16	5 7	81037	72066	561
SSM	35988		!	196.6	284513.51	1429167.12	5 7	81037	72066	561
SSM	36058		!	198.6	284974.01	1429977.45	5 7	81037	72066	561
SSM	36059		!	179.0	285935.56	1430089.56	5 7	81037	72066	561
SSM	36030		!	243.9	284921.97	1431279.41	5 7	81037	72066	561
SSM	36036		!	170.6	286435.70	1431050.60	5 7	81037	72066	561
SSM	36014		!	214.0	285298.97	1432665.54	5 7	81037	72066	561
SSM	36055		!	180.0	286792.33	1432478.89	5 7	81037	72066	561
SSM	36031		!	220.6	284511.35	1434543.46	5 7	81037	72066	561
SSM	36035		!	241.8	283636.79	1434673.26	5 7	81037	72066	561
SSM	36038		!	186.9	285572.62	1434768.14	5 7	81037	72066	561
SSM	36049		!	196.0	286303.18	1434234.22	5 7	81037	72066	561
SSM	36048		!	185.4	287488.60	1434178.17	5 7	81037	72066	561
SSM	36022		!	220.2	284379.02	1430668.14	5 7	81037	72066	561
SSM	24712		!	232.70	285357.86	1433524.92	5 5	81037	955	561
SSM	24720		!	229.10	286462.19	1433332.10	5 5	81037	955	561
SSM	24735		!	177.0	286437.33	1435172.38	5 7	81037	72066	561
SSM	36040		!	243.4	284320.15	1435428.16	5 7	81037	72066	561

BLUE COLOUR - STATE SURVEY MARKS LIKELY TO
BE AFFECTED BY MINING



94019



Environment
Protection
Authority
New South Wales

NSW Government Offices
117 Bull Street Newcastle West NSW 2302
PO Box 488G Newcastle NSW 2300
Tel .049. 26 9971 Fax .049. 29 6712

MAY 1995

Mr J Parsons
ERM Mitchell McCotter
PO Box 943
CROWS NEST NSW 2065

Our Reference: 272262A1 CC:TS

Your Reference:

Contact: Mr Colin Charters

Dear Mr Parsons

30 MAY 1995

MT PLEASANT COAL PROJECT

Further to our letter dated 10 April 1995 concerning issues to be addressed in an Environmental Impact Statement (EIS) for the proposed Mt Pleasant project, the following guidelines may assist in the preparation of your noise impact assessment.

1 Noise Monitoring Methodology for Measurement of Ambient Noise

Measurement Period

The duration of measurements should be sufficient to cover a reasonable period and a minimum of one week is considered essential. Longer periods may be required to obtain a **full week's worth of valid data** where the effects of weather cause data to be discarded. Valid data is data collected when the wind speed is less than 5 metres per second and there is no rain.

Ambient noise measurement should be based on a 15 minute sampling period. However, other measurement periods may be used where appropriate. Justification for varying the measurement period from 15 minutes would need to be provided.

Accounting For Meteorology

Both wind and rain can cause localised effects on the instrument measuring the ambient noise level, such that the noise level is increased. For instance, rainfall striking the instrument or nearby structures may generate erroneously high noise levels. Similarly, increased noise levels may occur due to localised aerodynamic

effects from wind on the case or microphone of the measuring instrument.

The preferred method for recording meteorological conditions is by a local weather monitoring station situated adjacent to the noise monitor with readings taken frequently during the day including wind direction and strength and rainfall. The alternative is to collect meteorological data from nearby official weather stations.

Unattended Monitoring

The relatively high cost makes attended monitoring impractical over extended periods. For this reason the Environment Protection Authority (EPA) accepts the need for unattended monitors. The major problem with unattended monitors is knowing exactly what noise has been measured.

One method of reducing the uncertainty of the source of noise is to provide a tape recording that samples the noise climate at set intervals or samples noise events where the noise exceeds a specified level. Thus an indication can be gained of the noise climate during the period of monitoring.

Assigned Background Noise Level

The EPA currently assigns the background noise level on the basis of the lowest repeatable 90th percentile noise level ($L_{A90, 15min}$) for the operating period. The operating period refers to the period over which activities associated with the proposed development would occur. The background noise level is not the minimum level measured over the operating period. It is the lowest $L_{A90, 15min}$ that is repeated over the operating period. This approach is used to ensure that the background level assigned is not due to some aberration in the noise climate but also embraces the principle of "worst case analysis".

2 Creeping Background

Consideration needs to be given to background noise level in the event that approval is granted for the Bengalla mine.

This will involve identification of residences that will be affected by cumulative impacts from both mines.

3 Meteorological Conditions

Details of meteorological conditions should include conditions under which ambient noise measurements were

made, namely wind speed and direction, temperature, humidity, rain and inversion details (a statistical breakdown would be best). A noise impact statement should include predictions which take into account significant meteorological conditions. Typical values for temperature inversions in the upper Hunter are normally 5 degrees Celsius per 100 metres.

4 Noise Monitoring Sites

It is important that the proponent monitor ambient noise levels at locations most likely to be affected by the operation of the Mt Pleasant mine, and most likely to be affected by creeping background noise, ie. locations affected by 2 or more major noise sources.

If creeping background can be demonstrated in the future from the data collected by this monitoring program, then additional control measures would need to be implemented to maintain acceptable noise levels.

5 Times of Operation

The times of operation for the proposal should be detailed, with the activities proposed to be carried out during the daytime and night-time.

6 Zoning of Noise Receiver Areas

The zoning of the noise receiver area should be determined from the table in Chapter 21 - Environmental Noise Control Manual (ENCM). Several zonings may be applicable to the project. Planning levels (L_{10}) can only be calculated once sufficient background noise data has been obtained from a number of sites. Once the background noise levels are known and the zoning of the noise receiver area is determined, the appropriate planning level(s) can be calculated using Table 20-1 in the ENCM. The table takes into account creeping background noise impacts.

7 Noise Prediction Contours

Noise contours should be shown on maps.

The EIS should predict the noise levels for a number of scenarios, for neutral weather conditions and unfavourable weather conditions with a temperature inversion.

The EIS should detail the location of all plants used to predict the noise contours.

8 Blasting Guideline

The EPA has adopted the Australian and New Zealand Environment Conservation Council guideline titled "Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration"

9 Traffic Noise

The EIS should detail any traffic movement, traffic mix and proposed routes for the next 10 years. The EIS should detail the environmental goal for traffic noise. The EIS will need to comply with EPA traffic noise guidelines detailed in the ENCM.

10 Noise Control

The EIS needs to demonstrate that best management practises and best available technology economically achievable have been employed to limit noise impacts.

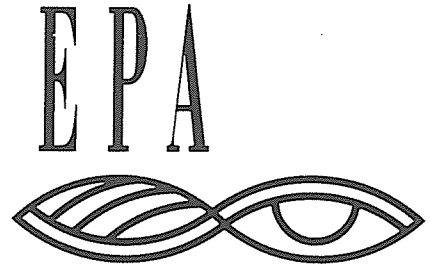
The EIS should also include detailed evidence of the social and economic worth of the project, so that these factors can be considered in assessing what noise levels should apply.

If you have any inquires concerning this matter please contact myself at this office, telephone 049 269701.

Yours faithfully



COLIN CHARTERS
A/Head, Operations Unit, Hunter
for Director-General



Environment
Protection
Authority
New South Wales

NSW Government Offices
117 Bull Street Newcastle West NSW 2302
PO Box 488G Newcastle NSW 2300
Tel .049. 26 9971 Fax .049. 29 6712

Mr J Parsons
ERM Mitchell McCotter
PO Box 943
CROWS NEST NSW 2065

Our Reference: 272262A1 CC:MC

Your Reference:

Contact: Mr Colin Charters

94019
10 APR 1995

Dear Mr Parsons

MT PLEASANT COAL PROJECT

The following comments by the Environment Protection Authority (EPA) relate to a proposal by Coal & Allied Industries Limited to establish an open cut coal mine at Mt Pleasant near Muswellbrook. They are based upon information provided at a planning focus meeting at Muswellbrook on 8 March 1995.

Certain information, as outlined in Appendix A, must be provided in the EIS (or in documentation in support of an application for Pollution Control Approval), to enable the EPA to accurately assess the environmental implications of the project.

Aspects of the proposal which are of particular interest are:

- 1 The capability of the mine to meet the EPA's air quality criteria and acceptable noise planning levels especially having regard to cumulative emissions from multiple mines in the locality;
- 2 the ability to establish an adequate buffer zone to augment measures to control dust and noise and minimise their effects, off-site. This has several components; purchase or private agreement with owners of property which will be subject to impact(s), and a procedure for dealing with landowners who may beome affected but were not so identified initially;
- 3 potential health implications of dust emissions in association with gas emitted from the two local power stations;

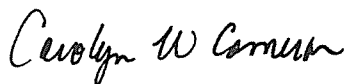
- 4 proposals for site water management including:
 - 4.1 the extent to which discharge to the Hunter River might be necessary and how any such discharge might be incorporated into the EPA's saline water discharge scheme;
 - 4.2 the need for effective wastewater and drainage controls in the infrastructure area which is in close proximity to the Hunter River.
- 5 Disposal of fine and coarse reject material.

In summary, the EPA requires that an EIS address all matters relating to air, water or noise pollution and waste disposal. The document must identify potential pollution problems and propose control measures using Best Available Technology Economically Achievable (BATEA) principles. Impacts likely to affect residential dwellings or sensitive land uses should be identified and quantified.

The company should be advised that, subject to all the necessary approvals being granted, any commitments made in the EIS may be formalised as a condition of either a Pollution Control approval or licence. Consequently, pollution control measures should not be proposed if they will not be implemented or are unrealistic.

If you have any inquiries concerning this matter please contact Mr Colin Charters at this office, telephone (049) 269 701.

Yours faithfully



CAROLYN CAMERON
A/Regional Manager, Hunter
for Director-General

Encl.

INFORMATION REQUIRED FOR EPA ASSESSMENT

MT PLEASANT COAL PROJECT

The following information must be provided in the EIS (or documentation in support of a Pollution Control Approval) to enable the Environment Protection Authority (EPA) to accurately assess the environmental implications of any mining proposal.

1 MINING OPERATION

- 1.1 Details of the mine and infrastructure including layout and map of the general locality.
- 1.2 Location of nearby residences and any land use likely to be affected by the operation.

2 AIR POLLUTION

The EIS should demonstrate that the operation will be able to operate within our objectives which are to control, to the maximum extent practicable, the generation of dust on-site, to retain any dust generated within the property, to minimise adverse effects of the operation on the amenity of local residents and sensitive land uses and to limit the effects of dust on regional air quality. The EIS should also include:

- 2.1 Anticipated dust emission and TSP/deposition rates.
- 2.2 Projected cumulative dust levels from multiple mining activities.
- 2.3 An assessment of short-term, worst-case impacts of dust emissions by postulating hypothetical meteorological conditions under which nearby residences and sensitive land uses may be affected by the operation.
- 2.4 A description of dust control measures to be implemented.

3 WATER POLLUTION

The EIS must detail measures to be implemented to prevent adverse impacts, by wastewater and contaminated stormwater, on the water quality of local streams and groundwater. The EIS should also include:

- 3.1 A water management plan and site water balance incorporating the following principles:

Maximum on-site reuse and disposal of wastewater together with the use of control and storage works to avoid, to the maximum practicable extent, any dry weather discharge.

Minimisation of wet weather overflows of contaminated stormwater.

Segregation of contaminated water from non-contaminated water to minimise the volume of polluted water to be dealt with.

Allocating priorities in water use so that the poorest quality stored water is reused first.

3.2 Details of stormwater diversion works particularly in regard to their capacity and stabilisation.

3.3 Control measures which will be adopted to prevent pollution of waters by pit water, leachate, stormwater runoff, etc.

3.4 Plans to manage any contaminated water accumulated in excess of re-use or storage capacity. If discharge to the Hunter River is unavoidable, how any such discharge might be incorporated into the EPA's saline water discharge scheme.

3.5 Liquid storage arrangements.

4 NOISE POLLUTION

4.1 GENERAL

Mining and coal treatment, handling and transport operations must not cause offensive levels of noise at neighbouring residences. The proposal will be assessed in accordance with EPA criteria described in the "Environmental Noise Control Manual". The EIS should also include:

4.1.1 Noise levels of fixed and mobile equipment to be used.

4.1.2 An assessment of the existing acoustic environment and a noise assessment to identify and predict future noise levels at affected residences.

4.1.3 Projected cumulative noise levels in residential areas from multiple mining activities.

4.1.4 Details of any noise control measures to be implemented.

4.1.5 Hours of operation.

4.1.6 The extent to which rail traffic will cause increased noise along haulage routes and road traffic along access roads.

4.1.7 Construction noise - emissions, impacts and control measures.

4.2 BACKGROUND NOISE

The EPA is currently reviewing its policy on the determination of background noise. A major element of the interim policy is to apply the concept of the **lowest repeatable minimum** value as the level that best describes the background noise.

4.3 BLASTING

The EPA has adopted the Australian & New Zealand Environment Conservation Council (ANZECC) guideline titled "Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure & Ground Vibration". This supersedes the EPA's blasting guideline contained in Chapter 154 of the Environmental Noise Control Manual.

The ANZECC guideline recommends that blasting not take place outside the hours of 9.00 a.m. - 5.00 p.m. Monday to Saturday. Blasting should not take place on Sundays or Public Holidays. The EIS must apply the ANZECC guideline for blasting criteria.

5 GENERAL

5.1 MONITORING PROGRAM

An on-going, environment monitoring program should be designed to ensure the necessary data is available against which future environmental impacts can be measured and performance evaluated.

We strongly recommend consideration be given to the installation of real-time, TSP dust monitoring instruments. These would enable a better analysis of episodic dust events and complaint investigation.

5.2 REHABILITATION

The EIS must contain proposals for progressive rehabilitation. Because disturbed land has the potential to erode and cause sedimentation, the EPA has an interest in achieving prompt, high quality rehabilitation. However, precise requirements in this regard are primarily the responsibility of the Department of Conservation and Land Management's Soil Conservation Service.

The EPA encourages any effort by adjoining mines to co-ordinate rehabilitation plans with a view to integrating and blending final landforms across their common boundaries.

5.3 WASTE MANAGEMENT

The company should prepare a waste management plan which details the company's philosophy and proposals for minimising and disposing of waste, other than mine spoil.

5.4 ENVIRONMENTAL MANAGEMENT PLAN

The company will rely on effective management and a high level of day-to-day supervision to ensure its compliance with its legal responsibilities. We strongly recommend a site environmental management plan be developed to ensure management and staff are fully conversant with their obligations at all times.

5.5 CONSTRUCTION PHASE

Impacts of specific activities involved in site preparation should be identified. Details of appropriate erosion and sedimentation controls, dust suppression and, if relevant, noise controls, should be included in the EIS.

All areas disturbed during construction, which are not included in the working area, must be revegetated to a high standard.

5.6 CUMULATIVE ENVIRONMENTAL IMPACT

The Department of Planning is presently developing a project titled "Upper Hunter Cumulative Impact Assessment". Depending on the time frame for completion of the mine EIS, the proponent may be able to benefit from the outcome of that work.

In the interim, all cumulative environmental impacts arising from the proposal and other major landuses in the area should be identified, assessed and quantified where possible.

5.7 ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT (ESD) PRINCIPLES

Although the mining sector processes non-renewable resources the basic concepts of ESD can still be applied.

5.7.1 The Precautionary Principle

- * The proposal should include decision making processes that are predictable and transparent. This should include:
 - making information available at an early stage so that major issues can emerge and be addressed during the project planning stage;

- adopting consultative mechanisms between the proponent and the community as a means of minimising disputation at the formal environmental assessment stage;
 - establishing appropriate conflict resolution mechanisms for use during the project approval process.
- * Discussion of Best Practice Environmental Management techniques including the potential use of environmental management plans and environmental audits.
 - * Ensuring that best practice monitoring and enforcement procedures are proposed.
 - * Identifying the responsibilities of the proponent and government agencies for environmental management and enforcement.

5.7.2 Inter and Intra Generational Equity

- * Overall project management and investment in plant and equipment that minimises pollution, waste and is energy efficient.
- * Ensure rehabilitation of disturbed land for a predetermined land use.

5.7.3 Conservation of Biodiversity and Ecological Integrity

- * The identification and assessment of all environmental characteristics and habitat values that could be affected by the proposal.
- * The identification and assessment of the likely environmental impacts on these characteristics and values.
- * The implementation of measures designed to minimise likely environmental impacts.
- * Consideration given to adopting a whole of life cycle approach through;
 - use of environmentally benign materials, products and processes. e.g. fuel efficient motors, use of recyclable and recycled materials.
 - integrated waste minimisation, reuse and recycling.

5.7.4 Valuation and Pricing of Resources

- * The costs and benefits of all aspects of the proposal should be considered. This should include non-economic environmental resources within a defined area around the subject site using methodologies such as contingency valuation.

Consideration could be given to measuring positive environmental initiatives (e.g. energy savings) for possible use as a trade off for other environmental concessions.

5.8 GREENHOUSE GAS EMISSIONS

- 5.8.1 Using the methodologies published with the National Greenhouse Gas Inventory (1994) estimate the total annual volume of all major greenhouse gases that are likely to be emitted from all aspects of the proposed development. Major greenhouse gases include carbon dioxide, methane, nitrous oxide, carbon monoxide, oxides of nitrogen, non methane volatile organic compounds and perfluorocarbons.
- 5.8.2 Estimate the net increase or decrease in greenhouse gas emissions from the proposed development and compare it to estimates in the 1990 National Greenhouse Gas Inventory for total Australian emissions and for the energy and transformation industry sector.
- 5.8.3 Specific consideration should be given to measures to minimise the emission of all major greenhouse gases from the proposed development
- 5.8.4 The use of coal bed methane or renewable energy technologies such as solar and/or wind energy should be considered for on site power generation.

6 EPA APPROVAL AND LICENSING

Should Development Approval be granted for the proposal the Company will be required, in accordance with Section 17K of the Pollution Control Act, to obtain the EPA's approval to construct the mine (under the Clean Air Act, Clean Waters Act and Noise Control Act). Mine approvals are issued subject to appropriate conditions aimed at controlling or minimising the generation of air and water pollution and offensive noise.

Prior to commencing operation of the mine the Company will be required to obtain a Licence under the Pollution Control Act. Operating conditions, as well as monitoring and reporting requirements, will be attached to that licence.

RECEIVED 8 APR 1995



ERM Mitchell McCotter
PO Box 943
Crows Nest
NSW 2065

1 Civic Ave. [redacted]
PO Box 4
Singleton NSW 2330
Phone (065) 72 1707
Fax (065) 72 1592

FAX: 02 9065375

31 March 1995

Attention: Mr J Parsons

Dear Sir

RE: MOUNT PLEASANT PROJECT- Response to Initial Planning Focus

Thank you for the Project briefing at the recent Planning Focus meeting. As this was a conceptual Project presentation it is not possible to deal with specific findings of background studies.

Issues which this Department generally requires to be covered in an EIS for a development such as this are covered in the document 'Guidelines to Meet Requirements for Information on Soil and Land Stability in Proposals for Open Cut Mining and Rehabilitation'. A copy can be provided if required. Major subject areas are:

Soils and Land Capability

The identification and distribution of soils on the authorisation should be clearly mapped. This is required for both identification of suitable soils for rehabilitation and to assist in classifying the area in terms of the land capability. The identification of potentially arable areas as represented by class I, II or III land is of particular relevance. Class I and II areas will be closely associated with the alluvial plain, which should be shown.

Properties of Overburden Materials

The chemical properties of the overburden and interburden materials by strata should be reported. This is required to identify materials unsuitable for rehabilitation or which may possess other environmentally undesirable properties. The potential for spontaneous combustion and the possible affect on rehabilitation should be addressed.

Final Landform and Rehabilitation

The EIS should conceptually show the proposed rehabilitated landform, including drainage patterns and how the final landform integrates with surrounding topography. This should include the proposed Bengalla final landform as illustrated in the Bengalla



The Department of Conservation and Land Management incorporates: the Soil Conservation Service, Crown Lands Service, Land Information Centre, Valuer-General's Office, Land Titles Office and Forestry Policy Unit.

EIS. While it is acknowledged that the development would most likely extend beyond the initial consent period, a plan based on the assumption of mining ceasing after the initial period should be included.

Rehabilitation should cover the design, implementation techniques and scheduling. Of particular significance for this project is proposals for the rehabilitation of any class I, II or III land that may be disturbed. The proposed distribution of the land capability of the final landform should be produced.

Land Management

Given that the Authorisation includes considerable areas that will not be mined in the short term, consideration should be given to productive management of these lands. We have requested land management plans be prepared for the total holdings as a development consent condition for recent developments.

Water Management

CaLM has an interest in surface water management, particularly as it applies to erosion and sediment control, and the effect of the quantity and quality of water on downstream recipients. Erosion and sediment control should relate to both the infrastructure development and mining and rehabilitation. While detailed plans are not required at this stage, criteria such as design rainfall, runoff coefficients and approximate catchment sizes should be included.

Off-site effects

The potential for on-site activities to adversely impact on the land capability or cause soil degradation of adjacent areas should be addressed. Possible issues include dust fallout, gaseous emissions and quality of water discharged.

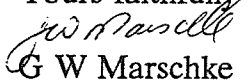
Crown Lands Issues

Land tenure within the Authorisation should be clearly identified, with particular emphasis on any Crown Lands that would be directly or indirectly affected.

Information available to date indicates that the issues pertinent to CaLM are capable of being addressed by means of sound management and existing techniques. All potential impacts should however be clearly identified in the EIS and control practices elucidated.

Should you have any questions on the above or require further information please contact the undersigned at our Singleton Office.

Yours faithfully



G W Marschke

Mining Industries Officer



RECEIVED 03 APR 1995

Head Office: 145 Newcastle Road,
Wallsend, NSW Australia.
Telephone: (049) 51 9555.
Facsimile: (049) 51 9320
International: + 6149519555

31 March 1995

94019

MUCS3259/95-140
CONTACT: Mr D Wijayasinghe
TELEPHONE: (065) 429000 Ext 9024

ERM Mitchell McCotter
(Attn: Mr Jan Parsons)
PO Box 943
CROWS NEST NSW 2065

Dear Mr Parsons

RE: MT PLEASANT PROJECT

With regard to the mine power supply arrangements we wish to bring to your attention the following items.

- 1 The 66kV power supply to Mt Pleasant Mines will be tapped off the existing 66kV line to Dartbrook Underground Mine.
- 2 A considerable length of the existing 66kV line to Dartbrook Mine needs to be relocated to accommodate Mt Pleasant mining requirements.
- 3 One year of lead time is required for Orion Energy for:
 - i route selection
 - ii consent from property owners/procurement of easements
 - iii environmental impact assessment/study
 - iv preparation of design and drawings
 - v procurement of material
 - vi construction of the 66kV line
- 4 Existing 11kV lines within the Mt Pleasant Mine lease may require relocation.

Therefore, we would appreciate being informed of mine development to allow sufficient time to accommodate these power supply modifications.

Yours faithfully

B.L. Daniels

Bernie Daniels
Customer Operations Manager
Western Region

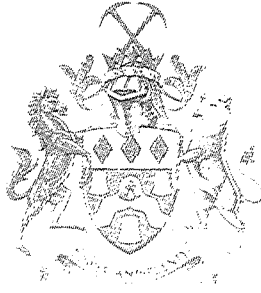
Address all communications to:
The Chief Executive,
P.O. Box 487, Newcastle, N.S.W. 2300, Australia.
(DX 7853, Newcastle)

Muswellbrook Shire Council

94019

TELEPHONE - PERSONAL ENQUIRIES

PLEASE ASK FOR Kerry Nichols/JJ
OUR REFERENCE
YOUR REFERENCE 520/00



ADMINISTRATION CENTRE
MUSWELLBROOK N.S.W. 2333

22nd March, 1995

RECEIVED 01 APR 1995

ERM Mitchell McCotter
PO Box 943
CROWS NEST NSW 2065

ATTENTION: MR JAN PARSONS

Dear Sir

Mt. Pleasant

I refer to the Technical Briefing held on the 8th February, 1995 and thank Mitchell McCotter and Coal and Allied for the opportunity to comment on the overall project prior to preparation of the Environmental Impact Statement.

The following technical comments are offered of a technical nature and further comments may be raised by Council at a later Date.

- A. It was noted that co-disposal of tailing as new technology and as yet unproven. Other measures such as the dry press filter belt system should be investigated in the Environmental Impact Statement as an alternative method should the co-disposal system not be acceptable.
- B. Mt Pleasant in this vicinity, is a significant visual resource and the final land form and mining procedures should not visually detract or impede on the visual quality of this area. Every effort should be taken to totally screen the development. In this regard Coal and Allied should investigate suitable planting and re-vegetation of exposed areas now to provide some mature growth prior to site works commencing.
- C. It is noted that the 66 KV power line through the site would be relocated. There was considerable public comment on the actual location of this line to service the Dartbrook Infrastructure. As the construction of this line was not included in the E.I.S. for the Dartbrook Mine a separate assessment under Part 5 of the Environmental Planning and Assessment Act had to be carried out. The relocation of this line and other general infrastructure connections to this site should be investigated and commented upon in the E.I.S.
- D. It was established in the Bengalla and Bayswater Commissions of Enquiry that the background noise levels in this area were generally high for Rural locations. This was generally considered to be the result of background noise creep due to the operations of adjoining mines. The impact of background noise creep should be investigated in relation to the cumulative impact of mining in this area and levels accepted by this mining operations should be such that the impact outside of the buffer area is minimal.

.../2

- E. During previous Commissions of Inquiry it was also noted that the wind data both in terms of direction and velocity differed significantly. This was thought to be due to local wind patterns created by the topography of the area. This created some concern and you should ensure that the wind data presented in the E.I.S. is correctly researched and accurately reflects the climatic conditions.
- F. The impact of the construction of the Rail Line on the Agricultural Production of the Area should also be investigated. This will cut across prime agricultural land and as such will present a barrier for general agricultural practise. Provisions may need to be made for the crossing of the Rail Line by stock for general farm activities. The preferred method is under the Railway Line by via-ducts. It was also noted that the Mine may start as a Dry Mine but may produce water in its latter stages. Provisions would be incorporated to ensure all mine water is held and disposed of on site.
- H. The question of transport to and from the Mine Site requires further investigation. The access at present would appear to be via the Kayuga Bridge which would be unacceptable if traffic volumes increased to the level expected to be created by this Mine. Alternative access may be available if the Bengalla Project proceeds however in the initial stages a significant damage and a marked reduction in the road service level can be expected around the Kayuga Bridge area, Hunter Terrace area and the intersection with the New England Highway. The adequacy of these areas and the impact on these areas by traffic generated by the mine should be examined in the study.
- I. As stated in your briefing Castlerock Road will be closed due to mining in the initial stages. It would be preferred if the link could be constructed between Castlerock Road and Wybong Road to bring traffic to the south rather than to the north. An overall traffic plan should be investigated for the area as it would be desirable that this link road connect with the proposed River Crossing for Bengalla thus producing a by-pass for Muswellbrook.
- J. The Ground Water Study should also investigate the impact of mining on the agricultural production in the Sandy Creek Area. From the plates presented it showed that significant draw downs would occur around the Sandy Creek Area as off-site flows decreased. This is an Agricultural Area and depends on wells and bores for future production.
- K. It was generally held that although the videos give an accurate representation they do not allow the public to fully appreciate the scale of the development. For this reason it is suggested that larger panoramic plates be produced together with a model of the area.
- L. One of the main concerns in regard to the Mining Project is its Visual Impact, particularly in the North Muswellbrook Area. Considerable effort should be directed to reducing this impact and providing suitable screening and information to permit proper assessment.
- M. As previously advised Council was concerned about the extension of the Rail Loop and the Provision of another Rail Loadout Terminal. This question should be extensively investigated as it is generally held that Council supports centralised loading facilities in preference to individual sites.

- N. Flooding to the Floodplain Area needs to be critically examined. From previous comments it would appear that there are significant flows along the Western side of the Floodplain and the construction of the Rail Line as proposed may interfere with these flows. The effect of this construction should ensure that afflux within the area does not detrimentally impact on any existing Residences or Farm Operations. It should also be noted that since the 1955 Flood the Rail Line to Ulan has been lifted which would introduce another factor to be considered in this assessment.

The above comments are preliminary suggestions for further investigation. They are not conclusive and other issues may arise during further discussions. They are proposed for your assistance only and should not be taken as a formal comment on Council's Position in regard to the development.

Should you require further information or assistance please contact Council's Planning Services Manager, Mr Kerry Nichols at Council's Administration Centre, Muswellbrook.

Yours faithfully

L.P. Fisher

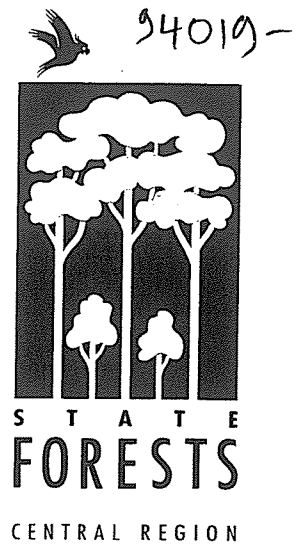
L.P. Fisher
GENERAL MANAGER



Your reference

Our reference

File 27 - Contact *Glenda*



6 September 1994

ERM Mitchell Mc Cotter Pty Ltd
P.O.Box 943
CROWS NEST, NSW 2065

Attention: Jan Parsons

State Forests of
New South Wales

Advisory Forester
PO Box 102
Maitland NSW 2320
Phone (049) 33 4787
Fax (049) 33 2576

Dear Madam,

Re: Proposed Mount Pleasant Coal Project

Your advice regarding the planning focus meeting and proposed EIS for the Mount Pleasant Coal Project is noted. State Forests interest in this matter is limited to encouraging increased rural tree cover and effective environmentally sound land management.

Trees are an essential component of sustainable farming and we recommend that the EIS include proposals for effectively establishing adequate shade and shelter belts as well as visual screening.

State Forests' personnel have considerable expertise in tree establishment and care, including the revegetation of open cut mine sites. We are able to provide professional advice on re-establishing adequate tree cover and on the ongoing maintenance of such plots. Our tree and shrub Nursery at Muswellbrook provides suitable plants at competitive prices.

Yours faithfully,

Glenda Briggs
Advisory Forester
Central Region

Locked Bag 90
Parramatta NSW 2124

Level 9
126 Church Street
Parramatta NSW 2150

Tel: (02) 843 9453
Fax: (02) 843 9469

Our Ref: ES:ES M/1579

Terry Kearney
General Manager
Coal, Grain and Minerals

23 March, 1995

ERM Mitchell McCotter
PO Box 943
Crows Nest
NSW 2065
Attn. (Jan Parsons)

Dear Sir,

Mt Pleasant Coal Project Planning in Focus

Thank you for the opportunity to attend and participate in the Planning in Focus meeting for this project. I refer to the March 1995 Planning in Focus Report and additional rail points raised in the course of the Planning in Focus meeting and site visit.

The provision made for a rail spur line and train loading capacity of 5000 tonnes per hour well meets the requirements to service this project with maximum sized trains. These trains now consist of 84 NHRH type wagons each of 120 tonnes gross capability which will deliver almost 8000 tonnes of coal per trip. Freight Rail endorses the project's commitment from the outset to providing the highest level of rail facilities for the transport of coal.

We note mining, economic, materials handling, and logistical reasons have been applied in choosing the final option shown by the Planning in Focus report as the preferred rail loading facility site. The proposed short spur rail line to link the proposed balloon loop with Ulan line appears to be readily implementable. Additional engineering detail will allow us to comment more fully on technical aspects of the proposed line, and to liaise with Coal & Allied's engineering consultants to establish a preferred alignment and gradients which optimize operating and environmental requirements.

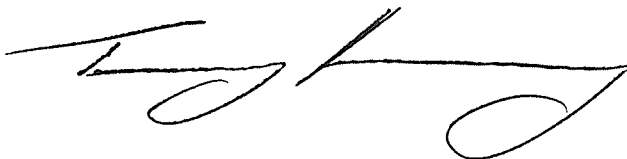
We support the significantly increased radius curve where the proposed line is to join the existing Ulan to Muswellbrook railway. This will allow a higher pass through speed for Mt Pleasant trains and will assist to minimise any need to brake and accelerate trains moving through the proposed rail junction. The rail operation can be signalled to enable loaded trains to be remain at Mt Pleasant balloon loop and depart when a clear passage is available through to Muswellbrook. This avoids trains stopping, standing and re-starting at the proposed junction.

The Mt Pleasant proposed spur line crosses the Wybong Road. It was initially raised at the meeting that a level crossing was a possible option for Freight Rail to consider. Subsequent examination of the rail / road crossing area on the project inspection suggested the site best lent itself to Wybong Road passing over the top of the railway on a bridge. The railway line running on the side of the hill at this point appears capable of being placed into a cutting. This then facilitates the Wybong Road to be carried over the line on a bridge. Wybong Road may itself require regrading to provide the necessary vertical clearances over rail line. A grade separated crossing provides the safest option for both road and rail users, and it is suggested it should be examined further.

Figure 6 graph of coal production in the Planning in Focus report indicates a potential for domestic coal to be produced by the project. Subsequent reports prepared for the project should identify whether other transport options may necessarily arise, particularly if significant tonnages were to evolve for the domestic market. Questions may arise on this point at the EIS stage.

Please do not hesitate to contact my office should you need additional assistance on points raised. I appreciate the opportunity given to review and comment upon this project.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Terry Kearney', with a stylized, flowing script.

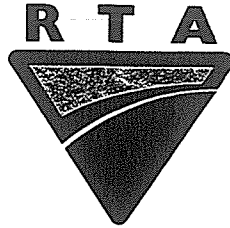
TERRY KEARNEY
General Manager

Copy to:
Department of Mineral Resources
Attn. David Agnew
PO Box 51
Singleton NSW 2330

94019

Roads and Traffic
Authority
New South Wales

92/M4195;1
C Johnstone
(049) 277 332



The Manager
ERM Mitchell McCotter
PO Box 943
CROWS NEST NSW 2065

Zone Planning Section
59 Darby Street
Locked Bag 30
Newcastle
New South Wales 2300
Telephone (049) 24 0331
Facsimile (049) 24 0342
DX7813 Newcastle

Attention : Mr Jan Parsons

PLANNING FOCUS MEETING FOR THE PROPOSED MOUNT PLEASANT COAL
MINE, MUSWELLBROOK

Dear Sir

In response to the Planning Focus Meeting held at Muswellbrook on 8 March 1995 it is considered that the Environmental Impact Study for the proposed Mount Pleasant Coal Mine near Muswellbrook will need to address the issue listed in the attached Schedule.

Appropriate traffic studies to determine possible **traffic volumes, peak flows, travel desire corridors, accident rates** and possible **intersection arrangements** should be undertaken to ensure minimal impact on the major roads in the study area as a result of the proposed development.

Yours faithfully

Mr C Nunn
Zone Planner
16 March, 1995

SHIRE OF MUSWELLBROOK. PROPOSED MOUNT PLEASANT OPEN CUT
COAL MINE. REPORT ON PLANNING FOCUS MEETING.

The Planning Focus Meeting for the proposed development of a coal mine at Mount Pleasant to the west of Muswellbrook was held at the John Hunter Motel, Muswellbrook, on 8 March 1995. During the meeting and site inspection it became apparent that the following issues would need to be addressed during the preparation and presentation of the Environmental Impact Study for the proposal.

- Anticipated Traffic Volumes

The following details need to be determined:

- The Volume of employee and delivery traffic .
 - The origin and route of this traffic to the mine site.
 - The impact of this traffic on the local road network particularly the Kyuga Road Bridge and the related intersections.
 - The times during which the peak flows of mine traffic will occur to ensure these do not coincide with other peak traffic if possible.
- Rail Crossing of Wybong Road (Main Road 208)

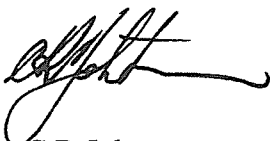
Wybong Road is a regional road which is under the care and control of Muswellbrook Council. Details of the proposed crossing will need to be resolved with Council.

- Contingency Plan for Coal Haulage

Consideration needs to be given to whether a contingency plan for Coal haulage will be needed in the event of disruption to rail haulage

- Lighting

The positioning of any flood lighting which will be visible from the New England Highway will need careful consideration to minimise the effects on Highway traffic.



C R Johnstone
Development Officer
16 March 1995

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 17/02 '97 MON 15:28 FAX 61 2 99018493 TITLES BRANCH

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NSW DEPARTMENT OF MINERAL RESOURCES
 Minerals and Energy House, 29-57 Christie Street
 (P.O. Box 536), St Leonards, NSW 2065, Australia
 Phone (02) 9901 8888 • Fax (02) 9901 8777
 DX 3324 St Leonards

Rory Gordon
 Manager, Environmental Services
 Coal & Allied Operations Pty Ltd
 P O Box 509
 SINGLETON NSW 2300

C96/0938

Dear Mr Gordon

PLANNING FOCUS MEETING MT PLEASANT COAL PROJECT

I refer to the Planning Focus Meeting held in respect of the above project on Monday 2 December, 1996. The Departments comments which follow are based on the presentation at the meeting and a review of the document "Planning Focus Meeting Update Report" dated December 1996, for the Mount Pleasant Project. These comments were generally raised with company representatives at the meeting.

1. The changes identified in the revised Mt Pleasant Project have developed from a joint working party of the Company and Muswellbrook Shire Council. The changes which primarily involve relocation of proposed infrastructure facilities from the eastern to the western perimeter of the project area, have been developed to meet local community needs as determined by Muswellbrook Shire Council. The Department notes that Council's John Colvin acknowledged at the meeting the Company's achievement of these outcomes to enable the development to proceed.
2. The changes above have consequentially resulted in fundamental modifications to mine development sequencing, increased out of pit overburden emplacement, the rate of progressive rehabilitation and out of pit fine washery reject disposal, increased truck haul distance and energy use.
3. The necessity for development of the Satellite Pit and Warkworth South Pit and the significant western out of pit emplacements of 126 million cubic metres of overburden has resulted in a large area of active mine disturbance. The proponent must commit to maximising the rate of progressive rehabilitation of these areas, with the exception of the Satellite Pit which is to be left open. Notwithstanding, a significant Security Deposit would be anticipated against final rehabilitation commitment of this area of active mine disturbance.

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4. The Department of Mineral Resources fundamentally would encourage and facilitate over the mine life, the optimal integration of rehabilitation landforms across the Mt Pleasant northern boundary with Kayuga development and across the southern boundary with Bengalla development. The Department recognises the constraints against documenting such desired outcomes at the planning approval stage. The Department therefore recognises that contingency worst case landforms, as proposed and permissible according to standard rehabilitation requirements, by necessity must be documented in development applications.

The Department recommends that the proponent state in the EIS that there will be the opportunity for optimal integration of rehabilitation landforms over the mine life, and where practical, these opportunities will be facilitated through the staged mine plan development approvals under the Mining Lease. There are many precedents for such outcomes in the Hunter Coalfields.

5. The location of facilities in the South West results in significant truck haul distances. It is apparent that there may be improved environmental, energy and economic outcomes by the use of ROM coal transport conveyor(s). This could be identified in the EIS as an alternative to truck transport, subject to feasibility assessment.
6. The proposal for out of pit disposal of fine coal washery reject via a life of mine tailings dam is, in the general case, not a preferred option of the Department of Mineral Resources. Tailings dams are however, conventional for underground mine developments and for some open cut mine developments where fine rejects are not amenable to more advanced mechanical dewatering and hydraulic co-disposal (of fine and coarse reject) techniques. The EIS should present the case as to why more advanced fine reject disposal techniques are not feasible for the Mt Pleasant project.

Department recognises the proponent's contingency requirement for planning approval of a tailings dam area. Nevertheless, opportunities for in-pit disposal of tailings must be identified and maximised. The void of the Warkworth South Pit, and perhaps later in mine life the void of North Pit, should be assessed for fine reject disposal opportunities.

Where conventional tailings dam disposal is proposed, the proponent should address the following objectives in the EIS;

- State of art design and construction techniques,
- Enhanced dewatering techniques (to maximise water recycling, to maximise fine reject density disposal, to accelerate progressive capping and rehabilitation).
- Long term stability of the rehabilitation landform.

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- Environmental risk assessment and control.
- Operational safety under the Coal Mines Regulation Act and Dam Safety Act.

It is apparent that the proposed tailings dam is located outside Authorisation 459 and within Authorisation 102. The potential for coal sterilisation (underground and open cut resources) should be documented to the Department's satisfaction. The Department would require that a Mining Lease Application for Mt Pleasant development should embrace the tailings dam facility and pipeline corridor

7. The changes proposed, especially in regard to mine sequence development and fine rejects disposal would necessitate a comprehensive review of the mine's water balance over the life of operations. The earlier mine plan, at Planning Focus 1 anticipated net deficit of water and no water discharge. Considering the increased area of open pit and disturbances a net surplus of mine water might be anticipated in wet year scenarios.

The environmental impacts of water management and controls must be comprehensively addressed in the EIS for mine life. Predictive modelling of surface and groundwaters post mining should also be identified.

J HAWKE
MANAGER
INDUSTRY DEVELOPMENT BRANCH

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In reply please send to: Singleton
Our reference: 95/50SGM:SA
B.A.95/1905
Your reference:
Contact: Garry Moore

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The Manager,
ERM Mitchell McCotter,
P.O. Box 943,
CROWS NEST NSW 2065

ATTENTION: MR. JAN PARSONS

15th March, 1995.

Dear Sir,


MOUNT PLEASANT PROJECT
PLANNING FOCUS MEETING - 8TH MARCH 1995

In reply to the above meeting for the proposed Open Cut Mine, the Board makes the following comments:-

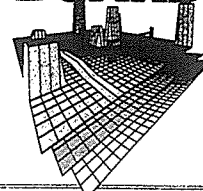
1. As the proposal is for open cut extraction, the Board is mainly concerned with the erection of improvements in relation to the development which is located within the Muswellbrook Mine Subsidence District.
2. The proposed relocation of any transmission lines will require the Board's approval prior to the commencement of construction.
3. Any road deviations or relocations will also require the Board's approval.
4. Any other proposed improvements will require the Board's approval prior to any construction being undertaken, including proposed mine buildings and associated works.

For any further information, please contact the Board's Singleton Office.

Yours faithfully,


Garry Moore,
District Supervisor

**MINE
SUBSIDENCE
BOARD**



The Mine Subsidence Board
OFFICES:

NEWCASTLE

Ground Floor,
NSW Government Offices,
117 Bull Street,
Newcastle West 2302
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Newcastle 2300
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Facsimile: (049) 29 1032
DX 4322 Newcastle West

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PO Box 9, Boolaroo 2284
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Facsimile: (049) 50 8101
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WYONG

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30 Hely St,
Wyang 2259
Postal Address:
PO Box 157, Wyong 2259
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Facsimile: (043) 52 1757
DX 7317 Wyong

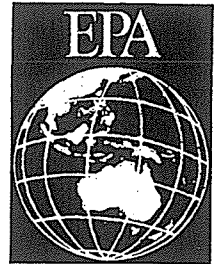
SINGLETON

Joint Coal Board Building
1 Civic Avenue,
Singleton 2330
Postal Address:
PO Box 524, Singleton 2330
Telephone: (065) 72 4344
Facsimile: (065) 72 4504

PICTON

RE Middleton
Admin. Centre,
Picton 2571
Postal Address:
PO Box 40, Picton 2571
Telephone: (046) 77 1967
Facsimile: (046) 77 2040

→ JP
94019



Environment
Protection Agency

CONTACT Gillian Morrison
EXTENSION 06 2741592

RECEIVED 7 0 4 8 1995

Mitchell McCotter Consultants
PO Box 943
CROWS NEST NSW 2065

PROPOSED MOUNT PLEASANT OPEN CUT COAL MINE, MUSWELLBROOK, NSW

In response to the Planning Focus Meeting for the Mt Pleasant open cut coal mine held at Muswellbrook on the 8th of March 1995 this Agency makes the following comments.

The Planning Focus Meeting (the Meeting) and the visit to the mine site will be useful in the environmental assessment of the proposal. Information flow and co-operation between the proponent and Government bodies will assist with efficient implementation of Commonwealth legislative requirements.

It would be expected that there will be intense public concern regarding the Mt Pleasant coal mine, especially when taken in conjunction with the immediately adjacent Bengalla project, should it go ahead.

This suggests a considerable degree of public consultation is required and at present this appears insufficient, despite the emphasis placed on the Shopfront in Muswellbrook. It was mentioned that the local people were being contacted but it was not clear if this was from the Shopfront, through advertising, displays, open days and the meetings mentioned or if residents directly affected by the project are being contacted individually. It may be appropriate for individual contact to be made if this is not already in hand.

The visual aspects of the mine can be alleviated to some extent but it is considered that the rail loop and coal loading operation provides a larger problem. While it is possible to reduce much of the railway's visual impact, noise will be a more difficult problem. The proximity to Muswellbrook, noise throw from the small valley where the rail loop is to be located, coal loading effects and the frequency of trains are of concern.

As a means of reducing the noise problem it would appear that more study is required into the economic use of the existing Dartbrook rail loop, transporting coal to the rail loop by conveyor across or beside the private Dartbrook bridges and under the highway and rail line. The location of the mine facilities to site C should be further considered.

The influence of existing and proposed mines on the waters of the Hunter River requires considerable study. The proposed Upper Hunter Regional Land Use Study will presumably address this problem. It is suggested that the recommendations of that study are taken into account and implemented where applicable. It is further recommended that the regulatory bodies be able to alter the NSW Shire and State conditions for the Mt Pleasant Coal Mine if the existing conditions are inconsistent with the recommendations of the Upper Hunter Regional Land Use study.

A no water release policy is recommended as a general standard for the mine.


The households on the alluvial flood plain which will be affected by the rail loop if it is placed in the position proposed at the Planning Focus Meeting, should have access to compensation and have the opportunity to sell at the market price of a comparable area unaffected by mining.

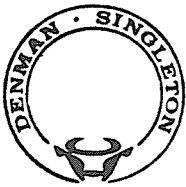
Transport will be a problem with increased use of local roads and traffic strain being put on particular corners and bridges. It may be appropriate for the Company to assist the council in sealing and upgrading roads affected by the increased load.

Aboriginal heritage aspects of the mine site area require further study. It is understood that this is in progress. It is not clear if the studies include the proposed rail path, but they clearly should.



John Ashe
Assistant Secretary
Environment Assessment Branch

 March 1995



Denman-Singleton
Rural Lands Protection Board

98 JOHN STREET, SINGLETON. 2330

PHONE:
(065) 72 2868
FAX:
(065) 72 2533

94019

22 March 1995

Mitchell McCotter Consultants
P O Box 943
CROWS NEST NSW 2065

Dear Sir/Madam

Further to the attendance of the Board's Ranger, Mr Ken Hassett, at the Planning Focus Meeting "Mt Pleasant" Authorisation, conducted by Coal & Allied Operations on Wednesday 8 March 1995, the Board wishes to draw your attention to the following.

To enable the movement of stock by foot in times of drought or other necessity, this Board has approximately 57 Travelling Stock Reserves (TSRs) under its control. Most of these are fenced paddocks where stock are rested overnight.

One of these reserves is TSR 156, known as Clarks Reserve and is located within the Mount Pleasant Authorisation. Cattle are commonly moved between this TSR and the next reserve which is located within the village of Kayuga, via a crown road which is also partly within the Authorisation area (see attached extract from the Parish Map of Ellis, TSRs shaded pink, crown roads shaded green).

The Board needs to retain these facilities but would be prepared to discuss possible relocation via a "Public Purposes Exchange".

Please address this issue in your preparation of the Environmental Impact Statement.

If you require any further information please contact this Board's Ranger, Mr Ken Hassett.

Yours faithfully

A handwritten signature in cursive script that reads "Trudie C Stammers".

Trudie C Stammers
Secretary

COMMUNITY CONSULTATION

C

This appendix provides details of the community consultation undertaken.

C.1 COMMUNITY CONSULTATION METHODOLOGY

C.1.1 Overview

A number of techniques were used to facilitate communication between the community and the study team during the preparation of the EIS. These included:

- ☐ interviews with residents;
- ☐ public displays;
- ☐ media liaison;
- ☐ information brochures;
- ☐ community comments forms;
- ☐ submissions; and
- ☐ day-to-day contact.

C.1.2 Interviews with Residents

Three rounds of interviews with residents and landowners within and immediately surrounding the site were undertaken. The third round of interviews was in 1997 following completion of the preliminary findings of the EIS and identification of affected residents and property acquisition area.

The first round in 1995 was co-ordinated by representatives of Coal & Allied and was undertaken to formally notify residents of the mining proposal, respond to questions and concerns and identify issues which required further attention. Approximately 75 interviews were held at this stage.

The second round of interviews was co-ordinated by ERM Mitchell McCotter. The purpose of these interviews was to provide residents with information about the EIS process, identify the level of concern for particular issues and identify any additional issues which should be addressed in the EIS. Approximately 90 interviews were held from a total of 180 households visited. An information brochure and community comments form were left at properties where no-one was home.

All residents within and immediately surrounding the site were provided with an invitation to the public display and a contact name and number for further information.

A copy of each interview pro-forma is attached.

C.1.3 Public Display

A public display was held in Muswellbrook over two weekends in 1995 and 1997. The display included background information about Coal & Allied, information about the proposed mine, the environmental investigations underway and opportunities for members of the community to be involved in the process. A large model highlighting the proposed mining area was on display and copies of an information brochure and community comments form were available for people to take home. The aim of the second display was to provide an update on the EIS process and proposed mine plan.

The display open between 2.00 pm and 8.00 pm on Friday and 10.00 am and 4.00 pm on Saturday on the weekends of 28/29 April 1995, 12/13 May 1995, 31/1 February 1997 and 7/8 February 1997. It was staffed at all times by one representative from Coal & Allied and one representative from ERM Mitchell McCotter.

The public displays were widely advertised in the local media as well as during interviews with local residents. Approximately 340 people visited the display over the two weekends in 1995 and 90 people visited the display over the two weekends in 1997.

C.1.4 Media Liaison

Media releases were issued and advertisements placed in the local media to publicise the study and the opportunity for members of the community to be involved.

C.1.5 Information Brochures

Two community information brochures were prepared and distributed during the course of the study. The first brochure provided background information about the Mount Pleasant project and the environmental investigations underway. A community comments form was included, seeking feedback on major issues and concerns relating to the project. The second information brochure provided an update on the EIS process.

A copy of each brochure is attached.

C.1.6 Community Comments Form

A community comments form was distributed during interviews with residents and was available during the public display. Members of the community were encouraged to complete the form, which asked questions relating to the level of concern felt for particular issues (such as air quality, dust, noise, visual change etc.) and general comments relating to the Mount Pleasant Project.

A total of 73 completed forms were returned to ERM Mitchell McCotter in 1995 using the reply paid facility.

A copy of the community comments form is attached.

C.1.7 Submissions

In addition to completing the community comments form, a number of individuals prepared a more detailed written submission. Issues raised in these submissions were considered during the preparation of the EIS.

C.1.8 Day-to-Day Contact

Contact details for Coal & Allied and ERM Mitchell McCotter were widely publicised to ensure that members of the community could have ready access to information as required. Coal & Allied's Mount Pleasant Project Office in Muswellbrook is also open during office hours for enquires and consultations.

C.2 FINDINGS

C.2.1 Overview

Overall, there was a high degree of interest in the mining proposal. This was evident in the attendance at the public display and completion of community comments forms by residents within and immediately surrounding the Authorisation as well as the broader Muswellbrook community.

Feedback acquired during the consultation process is summarised under the following headings: community comments forms, resident interviews (Coal & Allied) and resident interviews (ERM).

C.2.2 Community Comments Form

i. Sample

A total of 73 forms were completed and forwarded to the study team. The sample included residents of Muswellbrook (township), Kayuga, Aberdeen, Dartbrook, Castlerock, Wybong Road, Dorset Road, Kayuga Road, Coal Creek Road, Bengalla Road, Logues Lane and Collins Lane. Almost 40 per cent of the sample have lived at their current address for over 20 years.

A separate submission was also forwarded to the EIS study team by the residents of Castlerock Road, detailing issues and concerns relating primarily to the proposed closure and deviation of Castlerock Road. The submission was prepared following a meeting of approximately 40 property owners in the district to discuss the mining proposal. The issues raised in the submission are summarised in this section under the heading "Additional Issues".

ii. Level of Concern

Respondents were asked to rate their level of concern for particular issues based on a scale from one to five, with 'one' indicating they are not concerned and 'five' indicating they are very concerned. The results of this question are provided in *Table C.1*.

Table C.1 LEVEL OF CONCERN (%)

Issue	1 Not Concerned	2	3	4	5 Very Concerned	Not Sure/ No Ans.	Total
Air Quality	1.4	2.7	1.4	8.2	86.3	0	100.0
Water Quality	4.1	2.7	8.2	8.2	75.4	1.4	100.0
Flora and Fauna	8.2	4.1	31.6	12.4	41.0	2.7	100.0
Visual Change	1.4	2.7	16.4	19.2	58.9	1.4	100.0
Noise	1.4	4.1	9.6	13.7	69.8	1.4	100.0
Change in Land Use	5.6	8.2	17.8	20.5	45.2	2.7	100.0
Work Opportunities	16.4	9.6	19.2	16.4	31.5	6.9	100.0
Traffic Increases on Local Roads	2.7	4.1	9.6	16.4	65.8	1.4	100.0
Impact on Local residents	0	1.4	8.2	9.6	79.4	1.4	100.0
Maintain the Coal Industry	26.0	5.5	26.0	13.7	21.9	6.9	100.0

The issues which respondents are most concerned about include air quality, impact on local residents, water quality, noise and traffic increases on local roads. Respondents are generally less concerned about maintaining the coal industry.

iii. Additional Issues

Respondents were asked to describe any additional issues which they thought should be examined during the study. These are summarised below, with the issues raised most frequently appearing at the top of the list. (A number in brackets at the end of the issue description indicates the number of times it was mentioned on a comments form).

- impact on road closure/deviation on local residents. Many of the residents of the Castlerock area travel to and from Muswellbrook on a daily basis and are concerned about the inconvenience and additional travel time which may be required if Road (Castlerock Road also known as Coal Creek) is closed and deviated. Also concerned about additional expenses for petrol and freight charges for transport of stock, as well as potential for property devaluation as area may no longer be considered to be "close to town"; (12 plus the Castlerock residents submission)
- quality of life, the effect the mine will have on people living in the area; (11)
- close proximity of the mine to the township of Muswellbrook; (8)
- reduced property values for residents living adjacent to the mine; (8)
- employment opportunities for local people; (8)
- life in limbo - the uncertainty involved in this stage of the planning process; (7)

- ❑ lights radiating from the mine at night time; (7)
- ❑ health impacts (eg asthma etc.); (6)
- ❑ effects of blasting and vibration; (5)
- ❑ prevailing westerly winds; (5)
- ❑ impact on the water table; (5)
- ❑ cumulative impacts of mines/industry in the area; (5)
- ❑ close proximity of infrastructure area and rail loop to residential properties; (4)
- ❑ flooding and flood mitigation; (4)
- ❑ social and economic impacts on Muswellbrook; (4)
- ❑ effect of dust on productivity of agricultural areas/crops etc.; (4) and
- ❑ quality of roads. (3)

Other issues mentioned include:

- ❑ energy supplies for future generations;
- ❑ difficulty for locals to obtain rental accommodation at reasonable rates;
- ❑ ash;
- ❑ smell;
- ❑ stormwater runoff;
- ❑ dust suppression;
- ❑ tree planting for visual screening;
- ❑ excess water storage;
- ❑ effect of dust on the quality of drinking water from rainwater tanks;
- ❑ water usage during droughts;
- ❑ recycling water on site; and
- ❑ discharge of waste water to Hunter River.

iv. *Further Comments*

Respondents were asked if they had any further comments about the Mount Pleasant Project. These are summarised below:

- ☐ would like to see increased use of rail transport for coal rather than road haulage;
- ☐ regular repair and maintenance will be required for the roads;
- ☐ the mine is too close to town. A larger buffer zone is required;
- ☐ Mount Pleasant mine should draw employees from the local area;
- ☐ tree planting is needed along the boundary for a visual screen. Local plants should be used for this purpose;
- ☐ what are Coal & Allied's intentions regarding the rehabilitated site? Will land be resold?
- ☐ the information brochure implies that grazing and pasture is unimportant, but it is important to landowners in the area;
- ☐ blasting plans should be prepared;
- ☐ train activity should be restricted between certain times;
- ☐ mine should cease operation when north-westerly or westerly winds prevail;
- ☐ may need to install ducted air conditioning in all dwellings in the area;
- ☐ need further community liaison after mining is underway;
- ☐ no computer modelling will stop dust coming into town;
- ☐ need high level of consultation with local residents regarding road closures, deviations etc.;
- ☐ compensation should be considered for those directly affected;
- ☐ information dissemination process seems to be well thought through;
- ☐ rail loop should be moved. Visual and noise impacts are of concern to many residents;
- ☐ the mining company must be responsible for cost of repairs for damage to homes caused by mining;
- ☐ the mining company must be responsible for rehabilitation of land and ensure Muswellbrook does not become a ghost town after mining is completed; and
- ☐ night time curfew on mining and loading must be imposed given that the site is so close to town.

C.2.3 Residents Interviews (Coal & Allied)

i. Sample and Results

Approximately 75 resident interviews were conducted by representatives from Coal & Allied during April and May 1995. Respondents were asked to raise issues and rate their level of concern for a number of issues. Their level of concern for each issue is provided in Table C.2.

Table C.2 LEVEL OF CONCERN (%)

Issue	Level Of Concern				
	Strong	Moderate	Low	N/A	Total
Water	25.3	22.7	22.7	29.3	100.0
Dust	49.3	14.7	26.7	9.3	100.0
Noise	20.0	17.3	33.3	29.4	100.0
Visual	10.7	10.7	37.3	41.3	100.0
Land Use	13.3	16.0	30.7	40.0	100.0
Cumulative Impact	1.3	4.0	29.3	65.4	100.0
Transport	10.7	16.0	24.0	49.3	100.0
Socio-economic	17.3	13.3	32.0	37.4	100.0
No mining at all	6.7	4.0	41.3	48.0	100.0

Note: N/A No answer given

The survey was completed during general conversation with the respondent, rather than in a standardised format where each question is addressed in turn. As a result, there is a high level of non-response as only some of the issues were discussed. Those issues that raised the greatest level of concern included dust, water and noise created as a result of the proposal.

Generally, in response to the issue of no mining at all, respondents were not against mining and realised that they need to co-exist. There was an understanding that mining is inevitable and brings prosperity to the area. However, it was felt that mining operations need to be properly developed so as to minimise impacts on the environment and local communities and people would prefer it to be located further from where they live.

ii. Additional Issues

- ☐ effect on people's livelihood and quality of life especially on people who moved to the area to retire in a quiet, rural atmosphere or who have lived in the area for a number of generations;
- ☐ gas odours;
- ☐ flooding and agricultural capability on the floodplain, such that flooding may increase due to bunds and railway lines;

- ❑ bridge access;
- ❑ boundary issues;
- ❑ land purchase negotiations and uncertainty. Some people felt that the land should be acquired at the onset, rather than when development begins four years later;
- ❑ water quality issues such as dust in tank water; the effects that excavation will have on ground water; and quality of water from co-disposal area;
- ❑ impacts such as dust are already felt from surrounding mines. Concerns that these will increase, as the proposed mine is much closer;
- ❑ uncertainty created as residents decide if they have to relocate and where to;
- ❑ road access and deviations;
- ❑ health issues, mainly as a result of dust;
- ❑ railway link;
- ❑ lighting of site at night. Suggestions included hooded lights and/or movement sensors;
- ❑ uncertainty as to whether job opportunities go to local people or outsiders;
- ❑ the mine is too close to town and there is a need for a buffer zone;
- ❑ effect that the proposed mine will have on tourism;
- ❑ land use after mining operations have ceased;
- ❑ declining property values;
- ❑ workforce traffic at shift change over; and
- ❑ scepticism of all mining companies' claims to control dust.

C.2.4 Resident Interviews (ERM Mitchell McCotter)

Over a period of one week during May 1995, two members of the ERM Mitchell McCotter study team visited approximately 180 households in the study area. A total of 90 surveys were completed. The sample included residents within the site and within approximately a 1 kilometre radius of the site. Over 46 per cent of residents had lived at the same address for over 10 years. A survey similar to that of the community comments form was used.

i. *Level of Concern*

Results of the question where respondents were asked to rate their level of concern are included in *Table C.3*. Over 96 per cent of residents were aware of the proposal to establish mine operations at Mount Pleasant.

Table C.3 LEVEL OF CONCERN

Issue	1 Not Concerned	2	3	4	5 Very Concerned	Not Sure / No Ans.	Total
Noise	17.0	4.5	5.7	8.0	59.1	5.7	100.0
Vibration	17.0	4.5	4.5	10.2	58.0	5.8	100.0
Dust	12.5	1.1	2.3	2.3	76.1	5.7	100.0
Water Quality	20.5	1.1	6.8	3.4	62.5	5.7	100.0
Visual Change	17.0	3.4	11.4	11.4	50.0	6.8	100.0
Flora & Fauna	26.1	2.3	9.1	12.5	44.3	5.7	100.0
Employment Opportunities	28.4	3.4	5.7	8.0	48.9	5.6	100.0
Traffic	23.9	3.4	4.5	5.7	55.7	6.8	100.0
Impact on Locals	17.0	1.1	4.5	5.7	62.5	9.1	100.0
Maintenance of Coal Industry	33.0	4.5	10.2	11.4	23.9	17.0	100.0

Over half of the respondents indicated that they were very concerned about nearly all of these issues. Those that create the greatest level of concern were seen to be dust, water quality, impact on local residents, noise and vibration.

In terms of employment opportunities, the basis for concern was that opportunities would not be offered to locals but rather the workforce would be recruited elsewhere, mainly from other mines.

ii. *Additional Issues*

While the list provided was thought to be relatively comprehensive, a number of additional issues were raised. The most frequently raised concerns included:

- ☐ close proximity of the mine to the township of Muswellbrook and the need for a buffer zone around the town;
- ☐ the diversion of roads and traffic around the site in terms of congestion, inconvenience, travel times and the effects on people's livelihood;
- ☐ flooding and excess water on the floodplain due to levee banks;

- ☐ property values and the effects that the proposed mine may have on the demand for residential land;
- ☐ times of operation in that noise, lighting and traffic may become problems during the night;
- ☐ concerns relating to the rail link primarily in terms of where it will be located;
- ☐ doubt as to whether rehabilitation measures will be implemented and how effective they will be;
- ☐ health concerns in terms of the impact of dust, chemicals and ash fallout on people with respiratory illnesses;
- ☐ destruction of the valley environment, town character and quality of life;
- ☐ emissions from the mine and contributions to the Greenhouse Effect;
- ☐ river pollution;
- ☐ groundwater contamination;
- ☐ rumbling and vibrations from blasting; and
- ☐ odour.

iii. Further Comments, Concerns and Questions

Respondents were asked whether they had any further comments, concerns or questions regarding the proposal. They are summarised as follows:

- ☐ the need for monitoring during the construction and operational phases to ensure that things are being done properly
- ☐ relocation of established residents and families;
- ☐ the process is seen to be totally disruptive to people's lives as they wait to see what will happen and worry about if they will relocate and where to;
- ☐ feeling by some people that Coal & Allied should put back into the community what they are taking; and
- ☐ concern that people's livelihood may be impacted;
- ☐ don't want another mine;
- ☐ effects of dust and chemical fallout from blasting;
- ☐ fish in dams may not survive;
- ☐ at least Coal & Allied are buying people out from the onset;
- ☐ positive reception to community consultation and liaison;
- ☐ there is the need for a summary volume in the EIS;

- ❑ was not impressed with the very low first offer received from Coal & Allied;
- ❑ monitoring is required after the mine begins operation; and
- ❑ the demand for real estate in the area has fallen as people know that a mine is proposed.

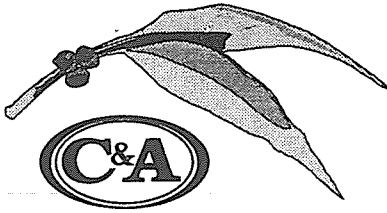
C.2.5 Other Feedback

Issues raised during construction activities undertaken in 1997 were generally similar to those raised in 1995, however some new issues resulted from the relocation of the mine infrastructure and rail loop away from the township of Muswellbrook. While most residents were pleased by the relocation, understandable concerns were raised by property owners, nearer the relocated infrastructure area. Key concerns included living residential amenity, visual impact and the fine rejects emplacement area.

C.2.6 Conclusions

The extent of resident interviews was confined to people living within and immediately surrounding the site while the extent of community consultation included residents of the broader Muswellbrook area.

A number of issues were consistently ranked as causing the most concern: air quality (dust), water quality, noise, vibration, and impact on local residents. Additional issues raised most frequently during discussions at the public display, interviews and written comments include: the impact of closure and deviation of Castlerock Road on residents dependent on that road; close proximity of the mine to the township of Muswellbrook and the impact that will have on quality of life of local residents; ensuring that employment opportunities are available to local people rather than recruiting people from outside the area; the close proximity of the infrastructure area and rail loop to residential properties; declining property values; reduced productivity of agricultural areas; and flooding.



MOUNT PLEASANT PROJECT

Overview of the Planning Process

A number of steps need to be taken before a mine could be approved. These are illustrated overleaf in the diagram entitled "Planning Process".

The first step is to complete the environmental impact statement and place it on public exhibition, at which time written submissions will be invited. The EIS and public submissions will be forwarded to the Minister for Urban Affairs and Planning, who will decide whether or not the mine can proceed and if any changes need to be made to the proposal.

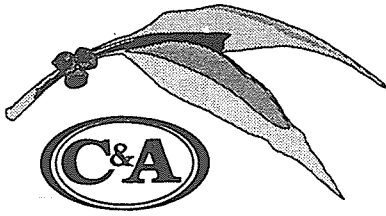
If requested, a Commission of Inquiry will be held where the community will have an opportunity for further comment on the proposal prior to the Minister making a final decision as to whether the project will proceed.

If approval was obtained, the mine infrastructure would be built and mining would then begin. Mining is anticipated to commence in 1999 and could continue for about 20 to 30 years, although the current proposal is to seek mining consent for the first 20 years.

For further information please contact:-

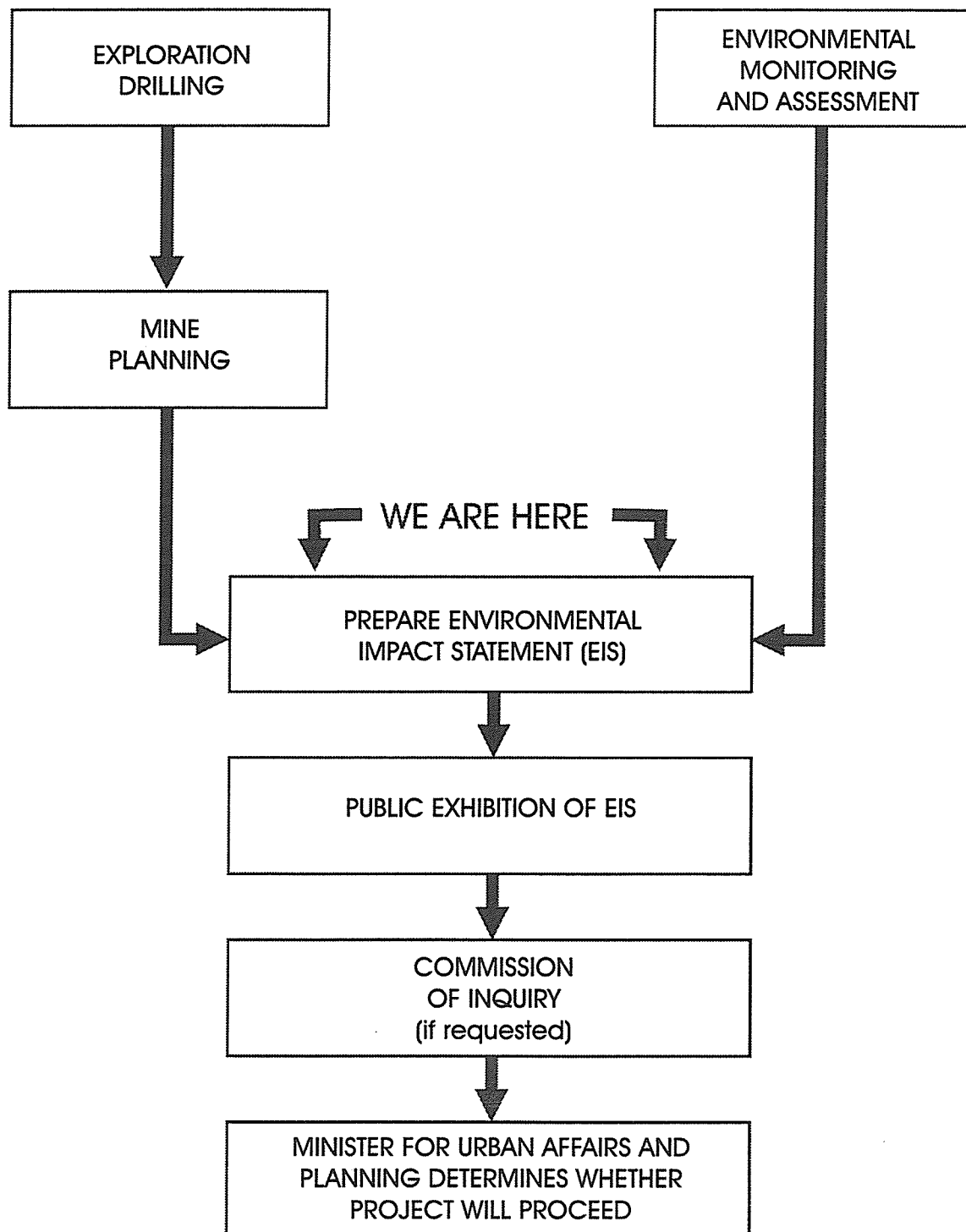
COAL & ALLIED
John Dwyer
Tel: (065) 41 1266
Fax: (065) 41 1277

ERM MITCHELL McCOTTER
Caroline St. Clair
Tel: (02) 9906 1666
Fax: (02) 9906 5375



MOUNT PLEASANT PROJECT

The Planning Process



MITCHELL
McCOTTER

Thank you for attending the Mount Pleasant Project Information Display. Please feel free to write down any comments you have relating to the Project, the environmental impact statement or the display. Your comments will be reviewed by the project team.

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper appears to be a standard notebook or worksheet page.

Caroline St Clair
ERM Mitchell McCotter
PO Box 943
Crows Nest NSW 2065

Mount Pleasant Project Community Comments Form

1. Where do you live? (town, suburb, street)

.....
.....

2. How long have you lived at this address?

.....

3. The environmental impact statement will consider a range of issues. Please indicate your level of concern for each of the following issues.

(For each issue circle a number on the scale from 1 to 5, where 1 is "not concerned" and 5 is "very concerned".)

	Not Concerned			Very Concerned	
a) Air quality (dust).....	1	2	3	4	5
b) Water quality	1	2	3	4	5
c) Flora and fauna	1	2	3	4	5
d) Visual change	1	2	3	4	5
e) Noise	1	2	3	4	5
f) Change in land use	1	2	3	4	5
g) Work opportunities	1	2	3	4	5
h) Traffic increases on local roads	1	2	3	4	5
i) Impact on local residences	1	2	3	4	5
j) Maintain the coal industry	1	2	3	4	5

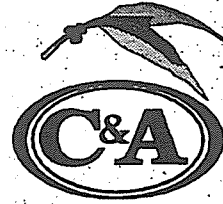
4. Are there any other issues which you think should be considered during the study?

.....
.....
.....
.....

5. Do you have any further comments about the Mount Pleasant Project?

.....
.....
.....
.....
.....
.....

Thank you for your assistance.



COAL AND ALLIED COMMUNITY INFORMATION



Environmental Impact Statement (EIS) for the Mount Pleasant Project

The community is being invited to advise Coal and Allied and its environmental consultants about its expectations and concerns on this project before the EIS is completed. There will be further opportunities to comment on the project once the EIS is complete.

This brochure provides information about the EIS being prepared for the Mount Pleasant Project. It describes: the project; the environmental factors being studied; and the requirements for an EIS.



MITCHELL
ERM McCOTTER

APRIL 1995

BACKGROUND



Coal and Allied Industries Limited (Coal and Allied) is one of Australia's largest producers and exporters of black coal. The company has two large open-cut mines, Mount Thorley Operations and Hunter Valley Mine, each with a coal preparation plant. These can produce up to 11 million tonnes per year for thermal and coking markets around the world.

Coal and Allied is proposing to establish a new open-cut mine near Mount Pleasant, west of Muswellbrook. *Figure 1* shows the location of the Mount Pleasant project area.

Coal mining commenced in the Mount Pleasant area in the 1890s and Kayuga Colliery, a small underground mine, operated from that time until

1930. Over the next 40 years there was little recorded mining or exploration activity. In 1970 interest in the area rekindled when Buchanan Borehole Collieries drilled several boreholes in the area. Over the next 20 years various exploration programs were completed and the Mount Pleasant Authorisation was granted to Coal and Allied in April 1992.

The Mount Pleasant Authorisation covers an area of about 33 square kilometres and is approximately square. The eastern boundary of the Authorisation runs near to Kayuga Road and mine development is proposed to occur west of the road. *Figure 1* shows the Authorisation in relation to Kayuga Road, the Hunter River and Muswellbrook.

WHAT IS THE MOUNT PLEASANT PROJECT?



The Mount Pleasant Project involves a new open-cut coal mine developed in two parts, a northern mining area and a southern mining area, to produce up to 10.5 million tonnes of raw coal a year. Development is planned to commence in the northern area as it offers better coal quality. Material excavated in the initial construction of the mine will be used to construct two bunds for noise and visual screening.

The proposed mining methodology is similar to that at other mines in the Hunter Valley. It involves using a dragline and two electric shovels as the main excavation equipment. A fleet of trucks will transport rock and coal from the mine to emplacement areas and coal preparation facilities

respectively. The overall design concept utilises well established techniques and equipment.

Mine infrastructure includes workshops, administration and employee facilities, a coal preparation plant, coal stockpiles and a railway loading point. The location of these facilities is shown on *Figure 1*.

A key feature of the infrastructure design is the construction of bunding to provide visual and noise screening. These bunds are part of a larger environmental management program that forms an integral part of the mine development.

ENVIRONMENTAL INVESTIGATIONS



An environmental impact statement for the proposed mine is being prepared by the specialist planning and environmental consultants ERM Mitchell McCotter. A range of studies are investigating:

- physical and biological aspects of land capability, flora and fauna, surface and groundwaters;

- potential effects on residential and farming areas such as noise and vibration, air quality and visual change;
- socio-economic interactions such as statutory planning, heritage, change in land use, traffic and the economic importance of the mine.

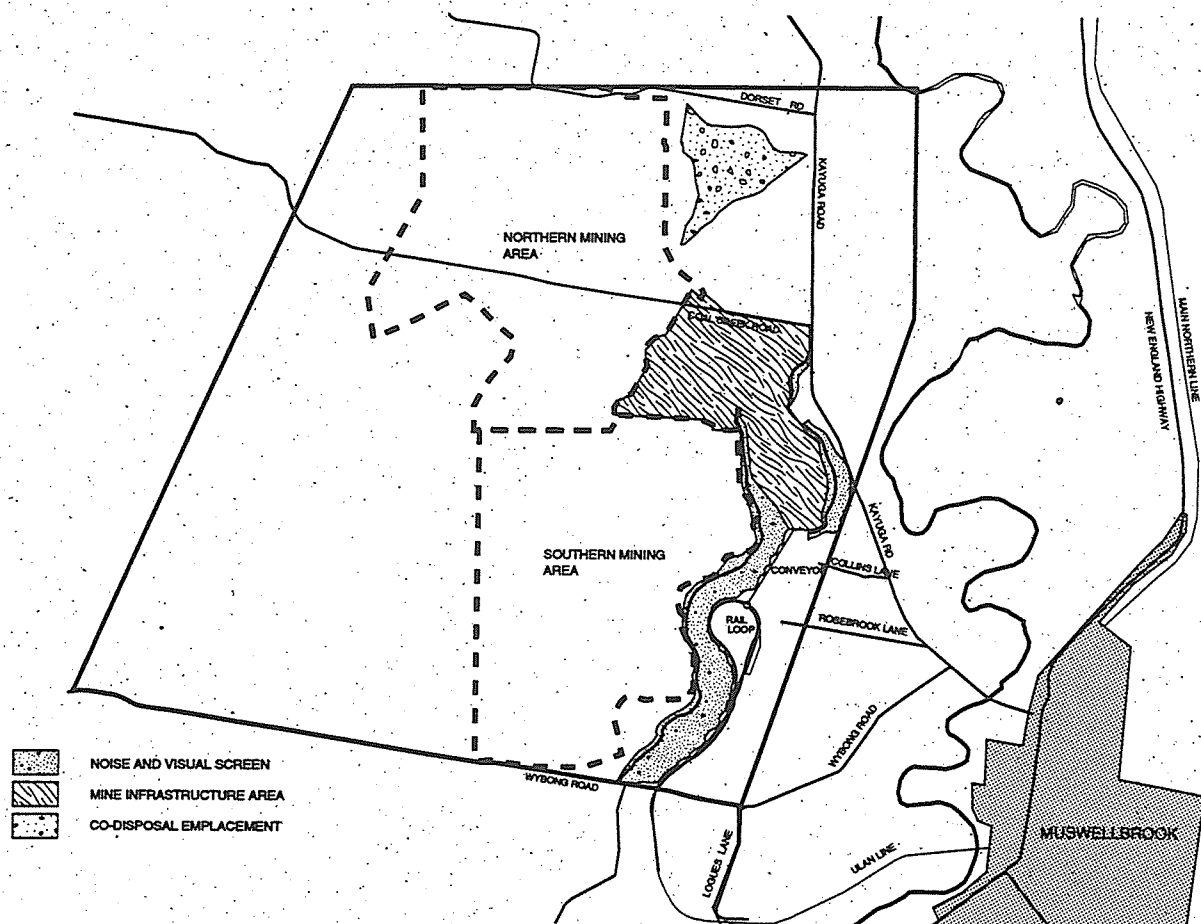


Figure 1

The investigations that have commenced include these key environmental studies:

Background Monitoring

A network of environmental monitoring stations has been operating in the area since September 1992 to collect data on the local climate, air quality, water quality and noise.

Noise and Vibration

A computer model is being developed to investigate various stages of mine development including the initial construction. One factor to be investigated is the effectiveness of the bunding in screening the mine infrastructure (the coal preparation plant, coal stockpiles and workshops).

An important part of the noise study will be an assessment of the cumulative effects of local mining activity.

Air Quality

Computer modelling will also be used to assess the potential effects of mining on air quality. The

model will be used to estimate dust deposition and dust concentration in areas adjacent to the mine at several stages of mine development. Cumulative effects of local mining activity will also be assessed using published data for other mines.

The air quality assessment will also incorporate an analysis of dust by both size and composition. The potential effects of dust deposition on agricultural activity will be reviewed.

Visual Change

An integral part of the Mount Pleasant mine design has been how to minimise both temporary and permanent visual effects. A landscape architect has been working with the mine designers in the development of the mine plan, landform design and building layout.

Two major bunds are proposed to minimise both visual and noise effects. These can be seen on Figure 1. The bunds are designed to replicate natural landforms.

Water Management

The water management study has three main parts: to determine the effects of mining on water quality in downstream water courses; to predict water balances under a range of climatic conditions; and to examine the effects of the mine on local and regional groundwaters.

The cumulative effects of local mining activity on the region's groundwaters will also be assessed.

Soils and Land Capability

The soils of the Authorisation have been mapped and described leading to an assessment of the

area's land capability. More than 94 per cent of the Authorisation is classed as Class IV or lesser capability land which means that it is generally suitable for grazing or pasture, with only occasional cropping.

Socio-Economics

The proposed mine would be a significant new activity both locally and on a regional scale. The socio-economic studies include an assessment of the potential employment base, the effects on local services and infrastructure and the economic importance of the mine.

ENVIRONMENTAL IMPACT STATEMENT (EIS)



The results of the environmental investigations will be published in an EIS prepared under the requirements of the Environmental Planning and Assessment Act. Under that Act, the EIS must be placed on public exhibition for at least one month. During that time individuals, groups and government authorities can make submissions on the proposal and the EIS.

After the exhibition period the consent authority (the Minister for Planning) must consider both the EIS and all submissions in making its decision about the project.

The EIS for the Mount Pleasant Project will go on public exhibition later this year.

COMMUNITY OPINION



Input from the community is now being sought to ensure that the EIS will meet community needs and expectations. Please complete the Community Comments form which is inside this brochure and return it by Monday 22 May. Alternatively, you can send your own written submission or contact a member of the study team to discuss the project.

FURTHER INFORMATION



For further information please contact:

John Dwyer
Coal & Allied Operations
Mount Pleasant Project Office
PO Box 757
Muswellbrook NSW 2333
Ph: (065) 411 266



Caroline St. Clair
ERM Mitchell McCotter Pty Ltd
PO Box 943
Crows Nest NSW 2065

Ph: (02) 906 1666

Alternatively, call into the Mount Pleasant Project Office at Campbells Corner, Brook Street in Muswellbrook.

EIS CERTIFICATE

D

FORM 2

SUBMISSION OF ENVIRONMENTAL IMPACT STATEMENT (EIS)

PREPARED UNDER THE ENVIRONMENTAL PLANNING AND ASSESSMENT
ACT 1979 - SECTION 77

EIS PREPARED BY

Name:

Robert McCotter

Qualifications:

BE(Hons), DipBdgSc, FIEAust, FAICD

Address:

*ERM Mitchell McCotter, Level 1, 24 Falcon Street
Crows Nest NSW 2065*

in respect of:

DEVELOPMENT APPLICATION

Applicant Name:

Coal & Allied Operations Pty Limited

Applicant Address:

PO Box 509

Singleton NSW 2330

Land to be developed: Address

Lot No. DP/MPS, Vol/Fol etc.

Property description attached and figure included in the EIS.

Proposed Development

Mount Pleasant Mine

or

☒ map(s) attached

ENVIRONMENTAL IMPACT STATEMENT

☒ an environmental impact statement (EIS) is attached

CERTIFICATE

I certify that I have prepared the contents of this Statement
and to the best of my knowledge

- it is in accordance with clauses 51 and 52 of the
Environmental Planning and Assessment Regulation
1994, and
- it is true in all material particulars and does not, by
its presentation or omission of information,
materially mislead.

Signature:

Robert McCotter

Name:

Robert McCotter

Date:

4 / September / 1997

ERM MITCHELL McCOTTER

The development application area is shown on *Figure 66* in the EIS. A formal description of the land is listed below. All property is within the Parish of Ellis or Clarincard(*), County of Brisbane.

Property No. ⁽¹⁾	Owner	Property Details	Property No. ⁽¹⁾	Owner	Property Details
8	Dartbrook	Por 114 & Lot 1 DP 505544	63	Bates CF & GP	Lot 4 DP 801249 & Pors 143 & PP 144 & 145 DP 750926
14	Dartbrook	PT Por 12 DP 750926	64	Watson EO & DP	Portions 269 & 270 DP 750926
21	Loneragan J & NM	Pors 73 & 74 DP 750926	65	Scriven GJ	Pors 274, 275, 276, 278 & 279 DP 750926
22	Loneragan JA	Por 28, 45 Lot 1, DP 313392	66	Rosebrook P/L	Part Portion 3 DP 750926
23	Loneragan PJ	Por 21, 268 DP 750926 36, 37, DP 432713	67	Coal & Allied	Lot 16 DP 255048
24	Watts WF & PJ	Portions 41 & 72 Lot 1/2 DP 915913	77	O'Keefe OJ & Others	Lot 21 DP 554140
25	Fell CM	PP 19 DP 750926	78	Thompson K & M	Lot 22 DP 554140
26	Collins GC & KM	Portion 42 DP 750926	79	Riley AJ & A	Lot 1 DP 544039 Lot 2 DP 629491
27	Casey JO	Por 15 & PT 35 DP 750926	81	McKinnon P & B	Part Portion 3 DP 750926
30	Casey EJ & JO	Lots 14 & 15 DP 2770	82	Ellis N & R	Lot 25 Rosebrook Estate
31	Coal & Allied	Lots 238,239,240 DP 750926	83	Hamson L & C	Part Portion 3 DP 750926
32	Coal & Allied	Lot 237 DP 750926	84	Bengalla Mining Co	Lot 27 DP 745895
33	Coal & Allied	Lot 236 DP 750926	85	Lawrence R & M	Lot 3 DP 629491
34	Loneragan PJ	Pors 92, 184, 241 DP 750926	86	Bengalla Mining Co	Lot 1 DP 213293
35	Watts WF & PJ	Portions 44, part Portion 202 DP 750926	87	Bengalla Mining Co	Lot 29 DP 731706
36	Temporary Common	Permissive occupancy 1961/18	88	Reynolds J	Part Portion 3 DP 750926
37	Partridge DJ	Pors 38/39 DP 750926	89	Bengalla Mining Co	Lot 1 DP 629491
38	Loneragan JA	Part Portion 93 & Lot 1 DP 174071	90	Past, Prot. Boad	Crown Reserve 156
39	Coal & Allied	Part Lots 5 & 6 & Lot 7 & closed roads DP 750926	91	Gardiner AL	Pors 6, 263, 264, 265 DP 750926
40	Loneragan PJ	Por 147, 211 DP 750926	92	Bengalla Mining Co	Lot 5 DP 801249
41	Partridge DJ	Por 146 DP 750926	93	Pearce GB	Lot 3 DP 801249
42	Loneragan PJ	Por 181 DP 750926	94	Gamper HJ & JA Ellul	Lot 2 DP 801249
43	Coal & Allied	Por 251 DP 750926	95	Coal & Allied	Lot 1 DP 801249
44	Coal & Allied	Lot 1 DP 634490	100*	McLean & Ors	Part Portion of Lot 1/3 DP 998477
45	Coal & Allied	Lot 1 DP ``1731 Lot 2 DP 634490	103*	Bengalla Mining Co	Part Portion of Lot 8 DP 236668 Lot 92 DP 620639
46	Coal & Allied	Lot 90,91,261,262,251,253,254,256, 273 236-240 DP 750926	104*	Bengalla Mining Co	Part Portion of Lot 7 DP 236668
47	Farrell RM & SD	Lot 1 DP 791576	118	Vacant Crown	Part Portion 27
48	Farrel MJ	Lot 2 DP 791576	121	Skippen SE	Portion 282 DP 750926
49	Mather GA & S	Lot 3 DP 791576	124	Bengalla Mining Co	Lot 261 DP 561919
58	Turner G	Lot 132 DP 558246	126	Coal & Allied	Vol 2802 Fol. 28
59	Blake TJ	Lot 1/7 Section Rosebrook Estate	132	Coal & Allied	Lot 7 DP 749716
60	Blake TJ	Lot 1/3 DP 194043 Lots 8/15 DP 255048	134	Coal & Allied	Lot 6 DP 749716
61	Coal & Allied	Portion 259 DP 750926	136	Budden GB & DM	Lot 5 DP 749716
62	Daniels LGJ & ME	Portion 135, 199, 242 & Part portion 144 DP 750926	137	Budden GG & PE	Part Port 3, Lot 10 Rosebrook Estate
			138	Coal & Allied	Lot 1&2 DP 706645
			216*	Bengalla Mining Co	Part Portion of Lot 97 DP 750919

Notes: 1. Refer to Figure 66 in EIS.

STUDY TEAM

E

This environmental impact statement was prepared by a multi-disciplinary study team from ERM Mitchell McCotter Pty Ltd. Key participants included the following:

Robert McCotter	<i>Project Principal</i>
Mark Gilligan	<i>Project Manager</i>
Stephen Hafer	<i>Project Manager</i>
Rob Bullen	<i>Acoustics</i>
Tony Wellbourne	<i>Acoustics</i>
Girish Bhathela	<i>Acoustics</i>
Dan Dang	<i>Acoustics</i>
Paul Conroy	<i>Acoustics</i>
Tim Brooker	<i>Roads and Traffic</i>
Melissa Doueihi	<i>Roads and Traffic</i>
Jason Rudd	<i>Roads and Traffic</i>
Lisa Mitchell	<i>Ecology</i>
Emma Calvert	<i>Ecology</i>
Caroline St Clair	<i>Community Consultation, Socio-Economics</i>
Jane Gibbs	<i>Community Consultation</i>
Kerrie Forrest	<i>Socio-Economics</i>
Gareth Thomas	<i>Air Quality, Water Management</i>
Allison Smith	<i>Planning</i>
Alison Nightingale	<i>Archaeology</i>
Rachel Morse	<i>Archaeology</i>
Nicholas Valentine	<i>Soils</i>
Carlos Herrera	<i>Word Processing</i>
Helen McFie	<i>Word Processing</i>
Rachel Cumming	<i>Word Processing</i>
Pamela Walker	<i>Graphics</i>
Reita Johnson	<i>Graphics</i>
Alda McManis	<i>Graphics</i>
Sophie Mallick	<i>Project Support</i>

Several specialist subconsultants prepared supplementary reports which are summarised in the EIS. These included the following:

Geoffrey Britton	Visual assessment
Freeman Planning	Visual assessment computer graphics
Pavel Zib and Associates	Air Quality
Lindsay Campbell	Effects of Coal Dust on Plant Growth
Nicholas Kannegieter	Effects of Dust on Grazing Animals
David Douglas	Effects of Dust on Human Health
Elizabeth White	Archaeology
Col Mackie	Water Management

Mine Planning was undertaken by Coal & Allied Operations Pty Ltd in conjunction with CMPS&F. The assistance of the following staff is greatly acknowledged.

i. Coal & Allied Operations Pty Ltd

Rory Gordon	Manager, Environmental Services
John Dwyer	Manager, Projects
Mark Armstrong	Senior Mining Engineer
Neville Sneddon	General Manager, Projects & Technical Services
Darren Hope	Senior Project Geologist
Phillip White	Manager, Coal Technology
Robert Teasdale	Manager, Mining Properties
Lyn Speight	Commercial Officer

ii. CMPS&F

Jim Thrower	Project Engineer
Sarah Love	Civil Engineer
Ron Stone	Coal Process Engineer
Ray Chapman	Infrastructure Engineer - Roads, Bridges
David Morrison	Materials Handling Engineer
Graeme Miller	Project Manager

OTHER LEGISLATION

F

Schedule 2 of the EPA Regulation contains a requirement that an EIS contain a *list of any approvals that must be obtained under any other Act or law before the development or activity may lawfully be carried out*. The proposal examined in this EIS involves an extension of an open-cut coal mine. Key approvals relevant to the environmental effects of the proposal are listed in Chapter Four of the EIS. This appendix contains a list of other legislation which may apply to the project.

- | | |
|---|--|
| ◆ Bush Fires, 1949 | ◆ Noxious Weeds, 1993 |
| ◆ Coal Acquisition, 1981 | ◆ Occupational Health and Safety, 1983 |
| ◆ Coal Industry, 1946 | ◆ Ozone Protection, 1989 |
| ◆ Coal Mines Regulation, 1982 | ◆ Pay-Roll Tax, 1971 |
| ◆ Coal Ownership (Restitution), 1990 | ◆ Public Health, 1991 |
| ◆ Construction Safety, 1912 | ◆ Roads, 1993 |
| ◆ Crown Lands, 1989 | ◆ Rural Lands Protection, 1989 |
| ◆ Employment Protection, 1982 | ◆ Soil Conservation, 1938 |
| ◆ Factories, Shops and Industries, 1962 | ◆ Stamp Duties, 1920 |
| ◆ Industrial Relations, 1991 | ◆ Superannuating, 1916 |
| ◆ Irrigation Act, 1912 | ◆ Survey Coordination, 1949 |
| ◆ Marketing of Primary Products, 1983 | ◆ Survey Marks, 1902 |
| ◆ Mines Inspection, 1901 | ◆ Transport Administration, 1988 |
| ◆ Mines Rescue, 1925 | ◆ Water Act, 1912 |
| ◆ Mines Rescue, 1994 | ◆ Water Administration Act, 1986 |
| ◆ Waste Minimisation and Management Act, 1995 | ◆ Workers Compensation, 1987 |

PLANNING CIRCULAR B37

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DEPARTMENT OF URBAN AFFAIRS AND PLANNING

Governor Macquarie Tower, 1 Farrer Place, Sydney 2000.
Box 3927 GPO Sydney 2001. DX 15 Sydney.
Telephone: (02) 391 2000 Fax: (02) 391 2111.

CIRCULAR NO. B37

Issued 12 October, 1995

Revised 5 July, 1996

All Councils

STATE ENVIRONMENTAL PLANNING POLICY NO. 45 — PERMISSIBILITY OF MINING (*State Environmental Planning (Permissible Mining) Act 1996*)

INTRODUCTION

This circular replaces Circular B37 issued on 12 October, 1995 which introduced *State Environmental Planning Policy No. 45 — Permissibility of Mining* (SEPP 45). The new circular provides an update on the status of SEPP 45.

After a ruling of the Land and Environment Court declared SEPP 45 invalid, the Parliament of New South Wales passed the *State Environmental Planning (Permissible Mining) Act, 1996* in June 1996, to validate SEPP 45. This legislation restores SEPP 45 as an environmental planning instrument under the *Environmental Planning and Assessment Act, 1979* (the Act).

SEPP 45 remains as originally introduced and has effect from the date of its gazettal on Friday, 4 August 1995.

BACKGROUND

The broad objective of SEPP 45 is to promote the social and economic development of the State by ensuring that there are clear planning controls applying to the permissibility and determination of mining projects across the State.

SEPP 45 was necessary because environmental planning instruments applying within certain areas in the State, contained provisions which made it uncertain from the outset whether a mining proposal was permissible or prohibited development. Such provisions required a consent authority to satisfy itself that a proposed mining project complied with various matters, including zone objectives or other criteria, to establish whether the mining was permissible in the relevant zone.

Environmental Planning Policy System	
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Date received	11 JUL 1996
<input type="checkbox"/> refer to verification record	
<input type="checkbox"/> verification not required	
Signature:	Date:
Project Manager	

■ Contact: Assessments and Major Hazards Branch

■ Our reference: S95/01393/001.

■ Telephone: (02) 391 2050/2056

PERMISSIBILITY OF MINING

SEPP 45 applies to development proposals for mines where mining would be permissible in accordance with an environmental planning instrument, but the permissibility, without SEPP 45 being in effect, would be subject first to provisions in that environmental planning instrument being satisfied.

In these circumstances, SEPP 45 provides that mining is permissible on that land without those provisions having to be satisfied. Such provisions have no effect either in determining whether or not mining is permissible on the land, or in the determination of a development application to carry out mining on the land.

The SEPP does not make the mining permissible when it is prohibited unconditionally.

ASSESSMENT OF MINING PROJECTS

Development applications for individual mining projects will still have to be considered on their merits and will need to comply with environmental impact assessment procedures and appropriate conditions imposed on a consent. Under section 90 of the Act, the consent authority must still consider the provisions of any relevant environmental planning instrument. Opportunities for public participation in the decision making process, including the making of submissions on mining proposals which are designated developments, the holding of Commissions of Inquiry, and third party appeals on the merits of a decision, are unchanged.

FURTHER QUESTIONS

The attached explanatory notes are provided to assist with a detailed understanding of SEPP 45. A copy of the original notification of the matters to be specified, relative to SEPP 45, in a certificate issued under section 149 of the Act, is also attached.

For more information on SEPP 45 please contact the Department's Major Assessments and Hazards Branch on (02) 391 2050/2056, or the Regional Manager for the area.



T. Robins
Acting Secretary

**STATE ENVIRONMENTAL PLANNING POLICY NO. 45
— PERMISSIBILITY OF MINING.**

EXPLANATORY NOTES

Development Affected by the Policy

State Environmental Planning Policy No. 45 - Permissibility of Mining (SEPP 45) applies to development proposals for mines where mining would be permissible in accordance with an environmental planning instrument, but the permissibility, without SEPP 45 being in effect, would be subject first to provisions in that environmental planning instrument being satisfied.

SEPP 45 provides that mining is permissible on that land without those provisions having to be satisfied. Such provisions have no effect either in determining whether or not mining is permissible on the land, or in the determination of a development application to carry out mining on the land.

Contents of the Policy

Clause 1 gives the name and number of the Policy.

Clause 2 sets out the aims and objectives of the Policy.

The overall objective of the Policy is to promote the social and economic development of the State by ensuring that there are clear planning controls applying to the permissibility of mining.

The Policy seeks to facilitate development of the State's natural resources, having regard to the value of mining as an export earning industry and generator of significant employment in the State; it does not affect the assessment and public participation requirements contained in the *Environmental Planning and Assessment Act, 1979*.

In order to achieve its broad objective, the Policy makes provisions relative to:

- the circumstances in which mining may be permitted under environmental planning instruments, and
- the determination of development applications seeking consent to mine.

Clause 3 defines mining as referred to in the Policy.

For the purposes of the Policy, mining includes all types of mines and mining, involving mining carried out both at or near the ground surface or underground, and using any method of mining.

When the Policy applies, reference should also be made to any definition of mining in the relevant environmental planning instrument. Mining as defined in that environmental planning instrument would have to be permissible but, in the absence of this Policy, dependent on the satisfaction of criteria or other provisions in that environmental planning instrument.

Clause 4 makes clear the extent of land to which the Policy applies.

The Policy applies to all of the land in the State.

Clause 5 sets out the circumstances where mining will be permissible.

SEPP 45 has effect in those situations where:

- (a) mining is permissible in accordance with an environmental planning instrument, other than SEPP 45, which applies to the land concerned; but,
- (b) the permissibility of the mining (without SEPP 45 being in effect) would be subject first to provisions in that environmental planning instrument being satisfied.

In these circumstances, SEPP 45 provides that mining is permissible on that land without those provisions having to be satisfied. Such provisions have no effect either in determining whether or not mining is permissible on the land or in determining a development application for consent to carry out mining on the land.

For the purposes of the Policy, a reference to provisions in an environmental planning instrument which need to be satisfied to establish that mining would be permissible may include, but is not limited to the following matters:

- (a) provisions in zone objectives; or,
- (b) any particular form of requirement, such as provisions concerning the impacts of the development on: the agricultural use, production, or production potential of land; surface and subterranean water systems; water quality; an alluvial plain; flooding and flood characteristics; the use or potential use of land as an urban buffer; other forms of development; and the neighbourhood of the proposed development.

Clause 6 explains the relationship between this Policy and another environmental planning instrument.

The Policy takes precedence over any existing environmental planning instrument if an inconsistency between their contents should arise, such that the Policy and that environmental planning instrument cannot operate together.

Clause 7 establishes the categories of development applications to which the Policy applies, relative to the time when the development applications were lodged.

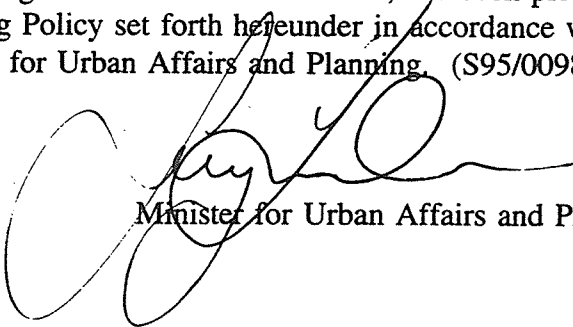
The Policy applies to development applications in both of the following circumstances:

- (a) development applications lodged but not finally determined before the Policy was gazetted and came into effect on 4 August 1995; and,
- (b) development applications lodged after the Policy was gazetted and came into effect on 4 August 1995.

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979
STATE ENVIRONMENTAL PLANNING POLICY No. 45 -
PERMISSIBILITY OF MINING

HIS Excellency the Governor, with the advice of the Executive Council, and in pursuance of the Environmental Planning and Assessment Act 1979, has been pleased to make the State Environmental Planning Policy set forth hereunder in accordance with the recommendation made by the Minister for Urban Affairs and Planning. (S95/00988/001)

Sydney, 2/8/ 1995.


Minister for Urban Affairs and Planning.

Citation

1. This Policy may be cited as State Environmental Planning Policy No. 45 - Permissibility of Mining.

Aims, objectives etc.

2. (1) This Policy aims:

- (a) to promote the economic development of the State; and
- (b) to facilitate the development of the State's natural resources; and
- (c) to facilitate the development of significant export-earning industries for the State; and
- (d) to create significant employment opportunities within the State; and
- (e) to make provision concerning:
 - (i) the circumstances in which mining may be permitted under environmental planning instruments; and
 - (ii) the determination of development applications for consent to carry out development for the purposes of mining.

(2) This Policy removes the effect of certain provisions in environmental planning instruments that might, in the absence of this Policy, be relevant to:

- (a) the determination of whether or not a proposed development for the purposes of mining is permissible with development consent (including provisions that might otherwise require a consent authority to be satisfied as to certain matters before determining that mining is permissible with development consent); and
- (b) the determination of development applications for consent to carry out development for the purposes of mining.

Definition

3. In this Policy:

"mining" includes a mine and any form of mining, including surface mining (whether by open cut or any other method) and underground mining.

Land to which this Policy applies

4. This Policy applies to the whole of the State.

Permissibility of mining

5. (1) If mining is permissible on land with development consent in accordance with an environmental planning instrument if provisions of the instrument are satisfied, mining is permissible on that land with development consent without those provisions having to be satisfied and those provisions have no effect in determining whether or not mining is permissible on that land or to the determination of a development application for consent to carry out development for the purposes of mining on that land.

(2) Without limiting subclause (1), if mining is permissible on land with development consent in accordance with an environmental planning instrument if the consent authority is satisfied as to certain matters specified in the instrument, mining is permissible on that land with development consent without the consent authority having to be satisfied as to those specified matters.

Relationship to other environmental planning instruments

6. In the event of an inconsistency between this Policy and another environmental planning instrument, this Policy prevails to the extent of the inconsistency.

Development applications to which this Policy extends

7. This Policy extends to a development application made but not finally determined before the commencement of this Policy.

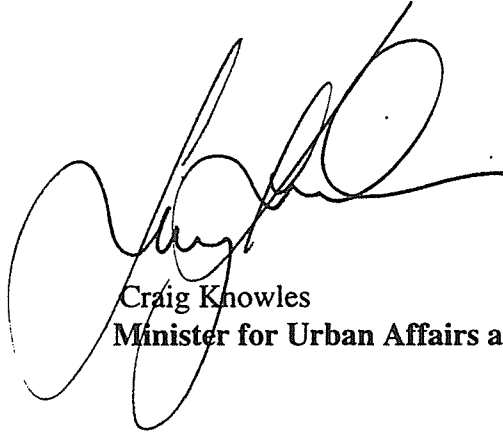
NOTE

TABLE OF PROVISIONS

1. Citation
 2. Aims, objectives etc.
 3. Definition
 4. Land to which this Policy applies
 5. Permissibility of mining
 6. Relationship to other environmental planning instruments
 7. Development applications to which this Policy extends
-

ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION 1994

I, the Minister for Urban Affairs and Planning, pursuant to item (3) of Schedule 4 of the *Environmental Planning and Assessment Regulation, 1994*, notify each council in the State that, in relation to land to which State Environmental Planning Policy No. 45 - Permissibility of Mining applies, it specify the matters in Schedule A below in a certificate issued under section 149 of the *Environmental Planning and Assessment Act, 1979*. (S95/00988/001).



Craig Knowles
Minister for Urban Affairs and Planning

Sydney,

2/10/9

, 1995.

SCHEDULE A

State Environmental Planning Policy No. 45 - Permissibility of Mining applies to all of the land in New South Wales.

This Policy provides that where planning controls only allow mining subject to meeting provisions affecting permissibility in environmental planning instruments, then mining will be permitted without being dependent first on the consent authority having to be satisfied that the proposed development meets those provisions.

This Policy applies to development applications made but not finally determined before the Policy commenced on 4 August 1995 and to development applications made on or after that date.

FLORA AND FAUNA LISTS

H

PLANT AND FAUNA LIST

Table H.1 FLORA SPECIES RECORDED ON SITE

Scientific Name	Common Name
Anacardiaceae	
<i>Schinus areira</i>	Pepper Tree
Asteraceae	
<i>Cirsium vulgare</i>	Spear Thistle
<i>Trifolium sp.</i>	Clover
<i>Silybum marianum</i>	Variegated Thistle
<i>Sonchus oleraceus</i>	Common Sowthistle
Brassicaceae	
<i>Capsella bursa-pastoris</i>	Shepherd's Purse
Cactaceae	
<i>Opuntia stricta</i>	Prickly Pear
Casuarinaceae	
<i>Casuarina luehmannii</i>	Bull Oak
Fabaceae	
Mimosoidae	
<i>Acacia paradoxa</i>	Kangaroo Thorn
Malvaceae	
<i>Sida rhombifolia</i>	Paddy's Lucerne
Myrtaceae	
<i>Eucalyptus albens</i>	White Box
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark
<i>Eucalyptus maculata</i>	Spotted Gum
Poaceae	
<i>Stipa sp.</i>	Spear Grass
<i>Danthonia sp.</i>	Wallaby Grass
<i>Chloris gayana</i>	Rhodes Grass
<i>Cynodon dactylon*</i>	Common Couch
<i>Pennisetum clandestinum*</i>	Kikuyu
<i>Themeda australis</i>	Kangaroo Grass
Solanaceae	
<i>Lycium ferocissimum*</i>	African Boxthorn
Sterculiaceae	
<i>Brachychiton populneus</i>	Kurrajong

Note: * - indicates exotic species

Table H.2 REPTILE AND AMPHIBIAN SPECIES RECORDED IN AND AROUND MUSWELLBROOK

Scientific Name	Common Name
Amphibians	
<i>Adelotus brevis</i>	Tusked Frog
<i>Crinia signifera</i>	Common Eastern Froglet
<i>Lechriodus fletcheri</i>	Fletcher's Frog
<i>Limnodynastes dumerilii</i>	Eastern Banjo Frog
<i>Limnodynastes ornatus</i>	Ornate Burrowing Frog
<i>Limnodynastes peronii</i>	Brown-striped Frog
<i>Mixophyes iteratus</i>	Giant Barred Frog
<i>Neobatrachus pictus</i>	Mallee Spadefoot Toad
<i>Philoria sphagnicolus</i>	Sphagnum Frog
<i>Pseudophryne australis</i>	Red-crowned Toadlet
<i>Pseudophryne coriacea</i>	Red-backed Toadlet
<i>Uperoleia fusca</i>	--
<i>Uperoleia laevigata</i>	Smooth Toadlet
<i>Uperoleia tyleri</i>	Tyler's Toadlet
<i>Litoria booroolongensis</i>	Booroolong Frog
<i>Litoria chloris</i>	Red-eyed Tree Frog
<i>Litoria citropa</i>	Blue Mountains Tree Frog
<i>Litoria dentata</i>	Bleating Tree Frog
<i>Litoria fallax</i>	Eastern Dwarf Tree Frog
<i>Litoria jervisiensis</i>	Jervis Bay Tree Frog
<i>Litoria latopalmata</i>	--
<i>Litoria lesueuri</i>	Lesueur's Frog
<i>Litoria pearsoniana</i>	--
<i>Litoria pearsoniana/phyllachroa</i>	Leaf Green Tree Frog species complex
<i>Litoria peronii</i>	Peron's Tree Frog
<i>Litoria subglandulosa</i>	--
<i>Litoria tyleri</i>	--
Reptiles	
<i>Chelodina longicollis</i>	Eastern Long-necked Tortoise
<i>Chelodina longicollis</i>	Eastern Long-necked Tortoise
<i>Diplodactylus byrnei</i>	--
<i>Diplodactylus vittatus</i>	Stone Gecko

Table H.2 REPTILE AND AMPHIBIAN SPECIES RECORDED IN AND AROUND MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Nephurus levis</i>	Smooth Knob-tailed Gecko
<i>Oedura lesueurii</i>	Lesueur's Velvet Gecko
<i>Oedura robusta</i>	Robust Velvet Gecko
<i>Phyllurus platurus</i>	Southern Leaf-tailed Gecko
<i>Saltuarius cornutus</i>	Northern Leaf-tailed Gecko
<i>Underwoodisaurus milii</i>	Thick-tailed Gecko
<i>Delma fraseri</i>	--
<i>Delma plebeia</i>	--
<i>Lialis burtonis</i>	Burton's Legless Lizard
<i>Pygopus lepidopodus</i>	Common Scaly-foot
<i>Amphibolurus muricatus</i>	Jacky Lizard
<i>Amphibolurus nobbi</i>	Nobbi
<i>Hypsilurus spinipes</i>	Southern Angle-headed Dragon
<i>Physignathus lesueurii</i>	Eastern Water Dragon
<i>Pogona barbata</i>	Bearded Dragon
<i>Tympanocryptis diemensis</i>	Mountain Dragon
<i>Varanus gouldii</i>	Gould's Goanna
<i>Varanus varius</i>	Lace Monitor
<i>Bassiana platynota</i>	Red-throated Skink
<i>Calypotis ruficauda</i>	--
<i>Carlia burnetti</i>	--
<i>Cryptoblepharus virgatus</i>	Wall Lizard
<i>Ctenotus regius</i>	--
<i>Ctenotus robustus</i>	Striped Skink
<i>Ctenotus taeniolatus</i>	Copper-tailed Skink
<i>Cyclodomorphus casuarinae</i>	She-oak Skink
<i>Egernia cunninghami</i>	Cunningham's Skink
<i>Egernia major</i>	Land Mullet
<i>Egernia modesta</i>	--
<i>Egernia saxatilis</i>	Black Rock Skink
<i>Egernia striolata</i>	Tree Skink
<i>Egernia whitii</i>	White's Skink
<i>Eulamprus heatwolei</i>	--

Table H.2 REPTILE AND AMPHIBIAN SPECIES RECORDED IN AND AROUND MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Eulamprus kosciuskoi</i>	Alpine Water Skink
<i>Eulamprus murrayi</i>	--
<i>Eulamprus quoyii</i>	Eastern Water Skink
<i>Eulamprus tenuis</i>	Barred-side Skink
<i>Eulamprus tympanum</i>	Highland Water Skink
<i>Hemiergis decresiensis</i>	--
<i>Lampropholis delicata</i>	Grass Skink
<i>Lampropholis guichenoti</i>	Garden Skink
<i>Lampropholis sp.</i>	unidentified grass skink
<i>Lygisaurus foliorum</i>	--
<i>Niveoscincus coventryi</i>	Coventry's Skink
<i>Pseudemoia entrecasteauxii</i>	Tussock Skink
<i>Saiphos equalis</i>	Three-toed Skink
<i>Saproscincus challengerii</i>	--
<i>Saproscincus mustelinus</i>	Weasel Skink
<i>Saproscincus rosei</i>	--
<i>Tiliqua scincoides</i>	Eastern Blue-tongued Lizard
<i>Ramphotyphlops bituberculatus</i>	--
<i>Ramphotyphlops nigrescens</i>	--
<i>Ramphotyphlops proximus</i>	--
<i>Ramphotyphlops wiedii</i>	--
<i>Morelia spilota</i>	Carpet or Diamond Python
<i>Morelia spilota spilota</i>	Diamond Python
<i>Acanthophis antarcticus</i>	Common Death Adder
<i>Austrelaps superbus</i>	Copperhead
<i>Cacophis squamulosus</i>	Golden Crowned Snake
<i>Demansia psammophis</i>	Yellow-faced Whip Snake
<i>Demansia torquata</i>	Collared Whip Snake
<i>Drysdalia coronoides</i>	White-lipped Snake
<i>Furina diadema</i>	Red-naped Snake
<i>Hemiaspis signata</i>	Black-bellied Swamp Snake
<i>Hoplocephalus stephensii</i>	Stephen's Banded Snake
<i>Notechis scutatus</i>	Eastern Tiger Snake
<i>Pseudechis guttatus</i>	Spotted Black Snake
<i>Pseudechis porphyriacus</i>	Red-bellied Black Snake

Table H.2 REPTILE AND AMPHIBIAN SPECIES RECORDED IN AND AROUND
MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Pseudonaja textilis</i>	Eastern Brown Snake
<i>Rhinoplocephalus nigrescens</i>	Eastern Small-eyed Snake
<i>Suta spectabilis dwyeri</i>	--
<i>Vermicella annulata</i>	Bandy Bandy

Table H.3 BIRD SPECIES RECORDED IN AND AROUND MUSWELLBROOK

Scientific Name	Common Name
<i>Dromaius novaehollandiae</i>	Emu
<i>Alectura lathamii</i>	Australian Brush-turkey
<i>Coturnix chinensis</i>	King Quail
<i>Coturnix pectoralis</i>	Stubble Quail
<i>Coturnix ypsilophora</i>	Brown Quail
<i>Anas gracilis</i>	Grey Teal
<i>Anas superciliosa</i>	Pacific Black Duck
<i>Aythya australis</i>	Hardhead
<i>Chenonetta jubata</i>	Australian Wood Duck
<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck
<i>Stictonetta naevosa</i>	Freckled Duck
<i>Tadorna tadornoides</i>	Australian Shelduck
<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe
<i>Pterodroma externa</i>	Juan Fernandez Petrel
<i>Anhinga melanogaster</i>	Darter
<i>Phalacrocorax carbo</i>	Great Cormorant
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant
<i>Pelecanus conspicillatus</i>	Australian Pelican
<i>Ardea alba</i>	Great Egret
<i>Ardea intermedia</i>	Intermediate Egret
<i>Egretta garzetta</i>	Little Egret
<i>Egretta novaehollandiae</i>	White-faced Heron
<i>Ixobrychus flavicollis</i>	Black Bittern
<i>Ixobrychus minutus</i>	Little Bittern
<i>Nycticorax caledonicus</i>	Nankeen Night Heron
<i>Platalea flavipes</i>	Yellow-billed Spoonbill
<i>Threskiornis molucca</i>	Australian White Ibis
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork
<i>Accipiter cirrhocephalus</i>	Collared Sparrowhawk
<i>Accipiter fasciatus</i>	Brown Goshawk
<i>Accipiter novaehollandiae</i>	Grey Goshawk
<i>Aquila audax</i>	Wedge-tailed Eagle
<i>Aviceda subcristata</i>	Pacific Baza
<i>Circus approximans</i>	Swamp Harrier

Table H.3 BIRD SPECIES RECORDED IN AND AROUND MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Elanus axillaris</i>	Black-shouldered Kite
<i>Erythroriarchis radiatus</i>	Red Goshawk
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle
<i>Haliastur sphenurus</i>	Whistling Kite
<i>Hieraaetus morphnoides</i>	Little Eagle
<i>Milvus migrans</i>	Black Kite
<i>Falco berigora</i>	Brown Falcon
<i>Falco cenchroides</i>	Nankeen Kestrel
<i>Falco hypoleucos</i>	Grey Falcon
<i>Falco longipennis</i>	Australian Hobby
<i>Falco peregrinus</i>	Peregrine Falcon
<i>Falco subniger</i>	Black Falcon
<i>Fulica atra</i>	Eurasian Coot
<i>Gallinula tenebrosa</i>	Dusky Moorhen
<i>Gallirallus philippensis</i>	Buff-banded Rail
<i>Porphyrio porphyrio</i>	Purple Swamphen
<i>Rallus pectoralis</i>	Lewin's Rail
<i>Turnix maculosa</i>	Red-backed Button-quail
<i>Turnix varia</i>	Painted Button-quail
<i>Turnix velox</i>	Little Button-quail
<i>Gallinago hardwickii</i>	Latham's Snipe
<i>Irediparra gallinacea</i>	Comb-crested Jacana
<i>Burhinus grallarius</i>	Bush Stone-curlew
<i>Elsayornis melanops</i>	Black-fronted Dotterel
<i>Erythronys cinctus</i>	Red-kneed Dotterel
<i>Vanellus miles</i>	Masked Lapwing
<i>Vanellus tricolor</i>	Banded Lapwing
<i>Chalcophaps indica</i>	Emerald Dove
<i>Columba leucomela</i>	White-headed Pigeon
<i>Columba livia</i>	Rock Dove
<i>Geopelia humeralis</i>	Bar-shouldered Dove
<i>Geopelia striata</i>	Peaceful Dove
<i>Leucosarcia melanoleuca</i>	Wonga Pigeon
<i>Lopholaimus antarcticus</i>	Topknot Pigeon

Table H.3 BIRD SPECIES RECORDED IN AND AROUND MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Macropygia amboinensis</i>	Brown Cuckoo-Dove
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Phaps chalcoptera</i>	Common Bronzewing
<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove
<i>Streptopelia chinensis</i>	Spotted Turtle-Dove
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<i>Cacatua roseicapilla</i>	Galah
<i>Cacatua sanguinea</i>	Little Corella
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo
<i>Calyptrorhynchus banksii</i>	Red-tailed Black-Cockatoo
<i>Calyptrorhynchus funereus</i>	Yellow-tailed Black-Cockatoo
<i>Nymphicus hollandicus</i>	Cockatiel
<i>Barnardius zonarius</i>	Australian Ringneck
<i>Glossopsitta concinna</i>	Musk Lorikeet
<i>Neophema pulchella</i>	Turquoise Parrot
<i>Platycercus elegans</i>	Crimson Rosella
<i>Platycercus eximius</i>	Eastern Rosella
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo
<i>Cacomantis variolosus</i>	Brush Cuckoo
<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo
<i>Chrysococcyx lucidus</i>	Shining Bronze-Cuckoo
<i>Chrysococcyx osculans</i>	Black-eared Cuckoo
<i>Cuculus pallidus</i>	Pallid Cuckoo
<i>Cuculus saturatus</i>	Oriental Cuckoo
<i>Eudynamys scolopacea</i>	Common Koel
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo
<i>Centropus phasianinus</i>	Pheasant Coucal
<i>Ninox connivens</i>	Barking Owl
<i>Ninox novaeseelandiae</i>	Southern Boobook
<i>Ninox strenua</i>	Powerful Owl
<i>Tyto alba</i>	Barn Owl
<i>Tyto novaehollandiae</i>	Masked Owl
<i>Tyto tenebricosa</i>	Sooty Owl
<i>Podargus strigoides</i>	Tawny Frogmouth
<i>Eurostopodus mystacalis</i>	White-throated Nightjar

Table H.3 BIRD SPECIES RECORDED IN AND AROUND MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar
<i>Apus pacificus</i>	Fork-tailed Swift
<i>Hirundapus caudacutus</i>	White-throated Needletail
<i>Alcedo azurea</i>	Azure Kingfisher
<i>Dacelo novaeguineae</i>	Laughing Kookaburra
<i>Todiramphus sanctus</i>	Sacred Kingfisher
<i>Merops ornatus</i>	Rainbow Bee-eater
<i>Eurystomus orientalis</i>	Dollarbird
<i>Pitta versicolor</i>	Noisy Pitta
<i>Menura novaehollandiae</i>	Superb Lyrebird
<i>Atrichornis rufescens</i>	Rufous Scrub-bird
<i>Climacteris erythrops</i>	Red-browed Treecreeper
<i>Climacteris picumnus</i>	Brown Treecreeper
<i>Cormobates leucophaeus</i>	White-throated Treecreeper
<i>Malurus cyaneus</i>	Superb Fairy-wren
<i>Malurus lamberti</i>	Variegated Fairy-wren
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
<i>Acanthiza lineata</i>	Striated Thornbill
<i>Acanthiza nana</i>	Yellow Thornbill
<i>Acanthiza pusilla</i>	Brown Thornbill
<i>Acanthiza reguloides</i>	Buff-rumped Thornbill
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill
<i>Aphelocephala leucopsis</i>	Southern Whiteface
<i>Chthonicola sagittata</i>	Speckled Warbler
<i>Gerygone fusca</i>	Western Gerygone
<i>Gerygone mouki</i>	Brown Gerygone
<i>Gerygone olivacea</i>	White-throated Gerygone
<i>Hylacola pyrrhopygia</i>	Chestnut-rumped Heathwren
<i>Origma solitaria</i>	Rockwarbler
<i>Pardalotus punctatus</i>	Spotted Pardalote
<i>Pardalotus striatus</i>	Striated Pardalote
<i>Pycnoptilus floccosus</i>	Pilotbird
<i>Sericornis citreogularis</i>	Yellow-throated Scrubwren
<i>Sericornis frontalis</i>	White-browed Scrubwren
<i>Sericornis magnirostris</i>	Large-billed Scrubwren
<i>Smicrornis brevirostris</i>	Weebill

Table H.3 BIRD SPECIES RECORDED IN AND AROUND MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill
<i>Anthochaera carunculata</i>	Red Wattlebird
<i>Anthochaera chrysoptera</i>	Little Wattlebird
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater
<i>Epthianura tricolor</i>	Crimson Chat
<i>Grantiella picta</i>	Painted Honeyeater
<i>Lichenostomus fuscus</i>	Fuscous Honeyeater
<i>Lichenostomus melanops</i>	Yellow-tufted Honeyeater
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater
<i>Manorina melanocephala</i>	Noisy Miner
<i>Manorina melanophrys</i>	Bell Miner
<i>Meliphaga lewinii</i>	Lewin's Honeyeater
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater
<i>Melithreptus lunatus</i>	White-naped Honeyeater
<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater
<i>Philemon corniculatus</i>	Noisy Friarbird
<i>Phylidonyris nigra</i>	White-cheeked Honeyeater
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater
<i>Xanthomyza phrygia</i>	Regent Honeyeater
<i>Eopsaltria australis</i>	Eastern Yellow Robin
<i>Melanodryas cucullata</i>	Hooded Robin
<i>Microeca fascinans</i>	Jacky Winter
<i>Petroica goodenovii</i>	Red-capped Robin
<i>Petroica multicolor</i>	Scarlet Robin
<i>Petroica phoenicea</i>	Flame Robin
<i>Petroica rosea</i>	Rose Robin
<i>Orthonyx temminckii</i>	Logrunner
<i>Pomatostomus superciliosus</i>	White-browed Babbler
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler
<i>Cinclosoma punctatum</i>	Spotted Quail-thrush
<i>Psophodes olivaceus</i>	Eastern Whipbird
<i>Daphoenositta chrysoptera</i>	Varied Sittella
<i>Colluricincla harmonica</i>	Grey Shrike-thrush
<i>Falcunculus frontatus</i>	Crested Shrike-tit

Table H.3 BIRD SPECIES RECORDED IN AND AROUND MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Oreoica gutturalis</i>	Crested Bellbird
<i>Pachycephala olivacea</i>	Olive Whistler
<i>Pachycephala pectoralis</i>	Golden Whistler
<i>Pachycephala rufiventris</i>	Rufous Whistler
<i>Dicrurus bracteatus</i>	Spangled Drongo
<i>Grallina cyanoleuca</i>	Magpie-lark
<i>Monarcha melanopsis</i>	Black-faced Monarch
<i>Monarcha trivirgatus</i>	Spectacled Monarch
<i>Myiagra cyanoleuca</i>	Satin Flycatcher
<i>Myiagra inquieta</i>	Restless Flycatcher
<i>Myiagra rubecula</i>	Leaden Flycatcher
<i>Rhipidura fuliginosa</i>	Grey Fantail
<i>Rhipidura leucophrys</i>	Willie Wagtail
<i>Rhipidura rufifrons</i>	Rufous Fantail
<i>Artamus cinereus</i>	Black-faced Woodswallow
<i>Artamus cyanopterus</i>	Dusky Woodswallow
<i>Artamus superciliosus</i>	White-browed Woodswallow
<i>Cracticus nigrogularis</i>	Pied Butcherbird
<i>Cracticus torquatus</i>	Grey Butcherbird
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Oriolus sagittatus</i>	Olive-backed Oriole
<i>Strepera graculina</i>	Pied Currawong
<i>Strepera versicolor</i>	Grey Currawong
<i>Ptiloris paradiseus</i>	Paradise Riflebird
<i>Corvus coronoides</i>	Australian Raven
<i>Corvus mellori</i>	Little Raven
<i>Corvus tasmanicus</i>	Forest Raven
<i>Corcorax melanorhamphos</i>	White-winged Chough
<i>Ailuroedus crassirostris</i>	Green Catbird
<i>Ptilonorhynchus violaceus</i>	Satin Bowerbird
<i>Sericulus chrysocephalus</i>	Regent Bowerbird
<i>Coracina maxima</i>	Ground Cuckoo-shrike
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike
<i>Coracina tenuirostris</i>	Cicadabird
<i>Lalage leucomela</i>	Varied Triller

Table H.3 BIRD SPECIES RECORDED IN AND AROUND MUSWELLBROOK (Contd)

Scientific Name	Common Name
<i>Lalage sueurii</i>	White-winged Triller
<i>Anthus novaeseelandiae</i>	Richard's Pipit
<i>Neochmia modesta</i>	Plum-headed Finch
<i>Neochmia temporalis</i>	Red-browed Finch
<i>Passer domesticus</i> *	House Sparrow
<i>Stagonopleura guttata</i>	Diamond Firetail
<i>Taeniopygia bichenovii</i>	Double-barred Finch
<i>Taeniopygia guttata</i> *	Zebra Finch
<i>Carduelis carduelis</i> *	European Goldfinch
<i>Dicaeum hirundinaceum</i>	Mistletoebird
<i>Cheramoeca leucosternus</i>	White-backed Swallow
<i>Hirundo ariel</i>	Fairy Martin
<i>Hirundo neoxena</i>	Welcome Swallow
<i>Hirundo nigricans</i>	Tree Martin
<i>Cinclorhamphus mathewsi</i>	Rufous Songlark
<i>Cisticola exilis</i>	Golden-headed Cisticola
<i>Megalurus timoriensis</i>	Tawny Grassbird
<i>Zosterops lateralis</i>	Silvereye
<i>Zoothera dauma</i>	Unidentified Ground Thrush
<i>Zoothera heinei</i>	Russet-tailed Thrush
<i>Zoothera lunulata</i>	Bassian Thrush
<i>Acridotheres tristis</i> *	Common Myna
<i>Sturnus vulgaris</i> *	Common Starling

Note: * - indicates exotic species

Table H.4 MAMMAL SPECIES RECORDED IN AND AROUND MUSWELLBROOK

Scientific Name	Common Name
<i>Ornithorhynchus anatinus</i>	Platypus
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna
<i>Antechinus flavipes</i>	Yellow-footed Antechinus
<i>Antechinus sp.</i>	Unidentified Antechinus
<i>Antechinus stuartii</i>	Brown Antechinus
<i>Antechinus swainsonii</i>	Dusky Antechinus
<i>Dasyurus maculatus</i>	Tiger Quoll
<i>Dasyurus viverrinus</i>	Eastern Quoll
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale
<i>Sminthopsis murina</i>	Common Dunnart
<i>Isoodon macrourus</i>	Northern Brown Bandicoot
<i>Isoodon/Perameles sp.</i>	unidentified Bandicoot
<i>Perameles nasuta</i>	Long-nosed Bandicoot
<i>Phascolarctos cinereus</i>	Koala
<i>Vombatus ursinus</i>	Common Wombat
<i>Trichosurus caninus</i>	Mountain Brushtail Possum
<i>Trichosurus sp.</i>	brushtail possum
<i>Trichosurus vulpecula</i>	Common Brushtail Possum
<i>Acrobates pygmaeus</i>	Feathertail Glider
<i>Cercartetus nanus</i>	Eastern Pigmy-possum
<i>Petauroides volans</i>	Greater Glider
<i>Petaurus australis</i>	Yellow-bellied Glider
<i>Petaurus breviceps</i>	Sugar Glider
<i>Petaurus norfolcensis</i>	Squirrel Glider
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum
<i>Aepyprymnus rufescens</i>	Rufous Bettong
<i>Potorous tridactylus</i>	Long-nosed Potoroo
<i>Macropod sp.</i>	unidentified macropod
<i>Macropus giganteus</i>	Eastern Grey Kangaroo
<i>Macropus parma</i>	Parma Wallaby
<i>Macropus robustus</i>	Common Wallaroo
<i>Macropus rufogriseus</i>	Red-necked Wallaby
<i>Macropus sp.</i>	kangaroo
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby
<i>Thylogale sp.</i>	Unidentified Pademelon
<i>Thylogale stigmatica</i>	Red-legged Pademelon

Table H.4 MAMMAL SPECIES RECORDED IN AND AROUND MUSWELLBROOK
(Contd)

Scientific Name	Common Name
<i>Thylogale thetis</i>	Red-necked Pademelon
<i>Wallabia bicolor</i>	Swamp Wallaby
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat
<i>Mormopterus loriae</i>	Little Freetail Bat
<i>Nyctinomus australis</i>	White-striped Mastiff-bat
<i>Rhinolophus megaphyllus</i>	Eastern Horseshoe-bat
<i>Chalinolobus dwyeri</i>	Large Pied Bat
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat
<i>Chalinolobus morio</i>	Chocolate Wattled Bat
<i>Eptesicus darlingtoni</i>	Large Forest Eptesicus
<i>Falsistrellus tasmaniensis</i>	Great Pipistrelle
<i>Kerivoula papuensis</i>	Golden-tipped Bat
<i>Miniopterus schreibersii</i>	Common Bent-wing Bat
<i>Myotis adversus</i>	Large-footed Mouse-eared Bat
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat
<i>Scotorepens orion</i>	Eastern Broad-nosed Bat
<i>Vespadelus darlingtoni</i>	--
<i>Vespadelus pumilus</i>	Little Cave Eptesicus
<i>Vespadelus regulus</i>	King River Eptesicus
<i>Vespadelus vulturnus</i>	Little Forest Eptesicus
<i>Hydromys chrysogaster</i>	Water Rat
<i>Mastacomys fuscus</i>	Broad-toothed Rat
<i>Melomys cervinipes</i>	Fawn-footed Melomys
<i>Mus musculus</i> *	House Mouse
<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse
<i>Pseudomys novaehollandiae</i>	New Holland Mouse
<i>Pseudomys oralis</i>	Hastings River Mouse
<i>Rattus fuscipes</i>	Bush Rat
<i>Rattus lutreolus</i>	Swamp Rat
<i>Rattus rattus</i> *	Black Rat

Table H.4 MAMMAL SPECIES RECORDED IN AND AROUND MUSWELLBROOK
(Contd)

Scientific Name	Common Name
<i>Rattus sp.*</i>	rat
<i>Lepus capensis*</i>	Brown Hare
<i>Oryctolagus cuniculus*</i>	Rabbit
<i>Canis familiaris</i>	Dingo and Dog (feral)
<i>Vulpes vulpes*</i>	Fox
<i>Felis catus*</i>	Cat (feral)
<i>Equus caballus*</i>	Horse (feral)
<i>Bos taurus*</i>	Cattle (feral)
<i>Sus scrofa*</i>	Pig (feral)

Note: * - indicates exotic species

STATE ENVIRONMENTAL PLANNING POLICY NO. 44

KOALA HABITAT PROTECTION

Assessment

Muswellbrook Local Government Area is listed in Schedule 1 of State Environmental Planning Policy No. 44 - Koala Habitat Protection (SEPP 44) and therefore an assessment site must be made to determine if it constitutes "*potential Koala habitat*". Potential Koala habitat is defined as:

"areas of native vegetation where the trees of types listed in Schedule 2 constitute at least 15 per cent of the total number of trees in the upper or lower strata of the tree component".

White Box (*Eucalyptus albens*) is listed on Schedule 2 of the SEPP as a feed tree species. In parts of the site where this species is present, it comprises more than 15 per cent of the tree component. As a result of this, further investigation was undertaken to determine whether the site comprises "*core Koala habitat*". Further surveys were undertaken and information sought as outlined in the SEPP. This included:

- ❑ examination of the presence of Koalas on the site, details of the extent and nature of identified populations including an estimate of population size, extent of tree use and species utilised, evidence of breeding females and presence of juveniles/sub-adults;
- ❑ vegetation map identifying components of the tree layer and a description of the shrub layer;
- ❑ use of other published or publicly available data relating to fauna of the site;
- ❑ use of standard, reportable techniques of Koala survey.

This information is referred to below.

1. Survey and Results

In order to determine the presence of Koalas on site a number of techniques were employed. These were:

- ❑ spotlighting throughout the study area over four evenings using two observers over a period of two person hours per night;
- ❑ daylight searches for faecal pellets which provide a good indication of Koala presence and history of habitat use; and
- ❑ review of existing information on fauna in the area including records from the National Parks and Wildlife Service's Wildlife Atlas Database.

No Koalas were observed during spotlighting surveys of the site. Little evidence of any arboreal fauna species or nocturnal birds was found during spotlighting. Additionally, no koala scats or scratches indicating current or past use of the site by Koalas was observed. Informal discussions with landowners did not indicate any sightings of Koalas in the area.

Review of other fauna surveys in the area included the Environmental Impact Statement for Bengalla (Envirosciences, 199), Mount Thorley (ERM Mitchell McCotter, 1995), Mount Owen (Resource Planning, 1994) and the Belford Bends Deviation Eight Point Test (ERM Mitchell McCotter, 1996) as well as records from the NPWS. None of the reports reviewed found Koalas or evidence of such during surveys. A number of Koala records are held by the NPWS on the Muswellbrook 1:100 000 sheet. The nearest records were located on the western side of the Hunter River near Aberdeen and on Bells Mountain south-east of Aberdeen. Both records were dated in 1949. Other records in the area are located near the Freshwater Dam south-west of Lake Liddell and two others near Denman. The most recent of these records were dated in 1967.

Details describing the vegetation and habitats available is provided in Chapter Eight of the EIS and mapped on *Figure 30*.

2. Conclusion

From the evidence obtained on site during surveys, the lack of contiguous vegetation which Koalas might use to access the site and review of existing information regarding Koala presence in the surrounding areas it is considered that there are no populations on the site. The information obtained also suggests that there is no means of any local Koala populations (if there are any) accessing the site. Therefore it is considered that the habitat available on site does not constitute "*core Koala habitat*" and a plan of management is not required for the proposed mining activities.

Section 5A of the Environmental Planning and Assessment Act

8 Part Test of Significance

Bothriochloa biloba

- i. *In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

No known populations of this species will be affected by the proposal although suitable habitat is available on site. Grazing and other agricultural practices which have previously and currently affect the site are likely to have disturbed any population which may have been present. Surrounding land of similar ecological value will not be affected by the proposal. It is unlikely that mining will disrupt the life cycle of this species such that any viable local population will be placed at the risk of extinction.

- ii. *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.*

No endangered populations will be affected as a result of the proposed activities.

- iii. *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

Similar habitat to that present on site is available throughout the Hunter Valley. More suitable habitat on the slopes and ridges of the ranges is not subjected to grazing and agriculture at the same intensity as on site. The area of potential habitat to be affected is approximately 1548 hectares which is not considered a significant area in relation to that which is available in the region.

- iv. *Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.*

No known habitat of this species is likely to become isolated from currently interconnecting or proximate areas of habitat as a result of mining.

- v. *Whether critical habitat will be affected.*

No critical habitat has been identified by the Director-General of National Parks and Wildlife as at 26 March 1997.

- vi. *Whether a threatened species, population or ecological community, or their habitats are adequately represented in conservation reserves (or other similar protected areas) in the region.*

This species is not represented in conservation reserves according to Briggs and Leigh (1996).

- vii. *Whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.*

No threatening processes have been identified for this species however it is expected that vegetation clearing and grazing would constitute the greatest potential threat.

- viii. *Whether any threatened species, population or ecological community is at the limit of its known distribution.*

This species is not at the limit of its known distribution in this area.

Bush Thick-knee (*Burhinus grallarius*)

- i. *In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

The Bush Thick-knee (Bush Stone-curlew) inhabits lightly timbered open forest or woodland, typically with a sparse understorey (Marchant and Higgins, 1993) and is sensitive to the removal of this habitat. It is also sensitive to predation by foxes and cats. Given the intensity of existing land use and the areas of suitable habitat to be retained and fenced off from mining, it is not expected that proposed mining activities would disrupt the life cycle of this species should it be found on site.

- ii. *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.*

No threatened populations or ecological communities have been listed on Schedule 1 of the *Threatened Species Conservation Act 1995* thus they are not included in this assessment.

- iii. *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

Proposed mining will require the removal of approximately 561 hectares of open forest/woodland habitat from the site. An additional 190 hectares of existing open forest/woodland habitat will be retained and fenced off from surrounding mining activities. Vegetation remnants similar to those present on site are located throughout the Hunter Valley although these are not necessarily continuous within the site or any other remnants, nor are they provided with additional protection from development.

- iv. *Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.*

No known habitat of this species is likely to become isolated from currently interconnecting or proximate areas of habitat as a result of mining.

- v. *Whether critical habitat will be affected.*

No critical habitat has been identified by the Director-General of National Parks and Wildlife as at 26 March 1997.

- vi. *Whether a threatened species, population or ecological community, or their habitats are adequately represented in conservation reserves (or other similar protected areas) in the region.*

Major conservation reserves are present to the south and south-west of the site. These include Wollemi and Yengo National Parks as well as Aberdare and Cessnock State Forests. Gloucester Tops and Barrington Tops National Parks are located to the north of Muswellbrook. Limited reserves are found in the Hunter Valley with much of the area cleared for agriculture and mining. Remnant forest reserves include the Belford and Ravensworth State Forests. Suitable habitat of varying conditions for the Bush Thick-knee is present in many of these reserves.

- vii. *Whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.*

No threatening processes have been listed by the Director-General of the National Parks and Wildlife Service however this species is sensitive to habitat removal.

- viii. *Whether any threatened species, population or ecological community is at the limit of its known distribution.*

This species is not at the limit of its known distribution in the Hunter Valley.

Glossy Black Cockatoo (*Calyptorhynchus lathami*)

- i. *in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

The Glossy Black Cockatoo is usually found in open eucalypt forests with a sheoak understorey where it feeds mainly on the seeds of *Allocasuarina littoralis* and *Allocasuarina torulosa*. The Glossy Black Cockatoo utilises large tree hollows for nesting (Schodde and Tidemann, 1993).

Neither preferred feed tree species occurs on site and no signs of their presence was observed during field investigations. The NPWS Atlas of NSW Wildlife does not contain any records of this species occurring on site. As the site does not provide suitable foraging habitat for this species, it is considered unlikely that the proposed mining operations will disrupt a population of this species such that it will be placed at risk of extinction.

- ii *in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised,*

No endangered populations of the Glossy Black Cockatoo have been listed in Schedule 1 Part 2 of the *Threatened Species Conservation Act 1995*.

- iii *in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed,*

In the region, major conservation reserves are found to the south and south-west in the extensive Yengo and Wollemi National Parks. Pokolbin and Corrabare State Forests contain suitable habitat to the south-east of the study area while the Goulburn River and Manobalai National Parks provide habitat to the north-west. Barrington Tops National Park, Mount Royal National Park, Chichester and Barrington Tops State Forests which occur in the north-east also contain habitat for this species.

Within the Hunter Valley there are limited reserves of remnant forest with the Belford and Ravensworth State Forests representing the most significant areas of forest contained within reservation areas.

Suitable foraging habitat for this species is not located on site. Therefore, the site is not considered to provide an area of known habitat. Removal of vegetation is therefore not going to result in a loss of habitat for the Glossy Black Cockatoo in the region.

- iv *whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community,*

Vegetation in the study area does not currently link proximate areas of habitat. Removing vegetation from the study area will not result in isolating areas of habitat for the Glossy Black Cockatoo.

- v *whether critical habitat will be affected,*

At present, no register of critical habitat is maintained by the Director - General of the National Parks and Wildlife Service.

- vi *whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region*

The Glossy Black Cockatoo is found in coastal areas of eastern Australia from Mackay in the north to Cocoparra and the Strathbogie Ranges in the south (Schodde and Tiedemann, 1993). Few records of this species exist on the NPWS Atlas for NSW Wildlife for the Singleton area with individuals being observed in the northern, southern and the low lands of the Hunter Valley.

Large areas of suitable habitat occur within Yengo and Wollemi National Parks to the south and south-west of the study area, Pokolbin and Corrabare State Forests to the south-east, Goulburn River and Manobalai National Parks to the north-west and Barrington Tops National Park, Mount Royal National Park, Chichester and Barrington Tops state forests in the north-east. How well conserved this species is within these reserves is however unknown.

- vii *whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process,*

No threatening processes have been listed in Schedule 3 of the *Threatened Species Conservation Act 1995*.

- viii *whether any threatened species, population or ecological community is at the limit of its known distribution.*

This species is not at the limit of its known distribution in the study area.

Powerful Owl (*Ninox strenua*)

- i. *In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

The Powerful Owl is associated with wet and dry sclerophyll forests containing ecologically mature trees. Diurnal roost sites and or breeding sites are provided by large tree hollows and along densely vegetated gullies. The Powerful Owl is considered a habitat generalist, occupying a wide range of tree species communities (Kavanagh, 1990, 1991). It requires tree hollows of suitable proportion for nesting and diurnal roosting sites.

The principle diet of the Powerful Owl is arboreal prey such as possums and gliders (Kavanagh, 1988). To obtain the necessary dietary requirements the owl must forage over a wide area of forest. The home range of a pair of Powerful Owls is estimated to range from 770 to 1000 hectares of forest (Kavanagh, 1988), dependent on the distribution and abundance of arboreal marsupials. Within their home range, Powerful Owls possibly concentrate foraging activity in pockets until they reduce prey numbers to a limit where it is difficult to catch remaining individuals before moving on to another area (Kavanagh, 1988).

It is unlikely that the species would use much of the open forest/woodland available on site due to a lack of suitable roosts and prey species. If the species were to use habitats on site for either foraging or nesting, it is likely that this would be restricted to the more mature forests to be retained on the Mount Pleasant ridge, where potential nest sites or nest sites for prey species are available.

Given the lack of resources available on site for the Powerful Owl, it is not expected that proposed mining activities would disrupt the species such that a viable local population would be placed at the risk of extinction.

- ii. *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.*

No threatened populations or ecological communities have been listed on Schedule 1 of the *Threatened Species Conservation Act 1995* thus they are not included in this assessment.

- iii. *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

Proposed mining will require the removal of approximately 561 hectares of open forest/woodland habitat from the site. An additional 190 hectares of existing open forest/woodland habitat will be retained and fenced off from surrounding mining activities. Vegetation remnants similar to those present on site are located throughout the Hunter Valley although these are not necessarily continuous with the site or any other remnants, nor do they have additional protection from development.

Large conservation regions located within the region which provide known habitat for the Powerful Owl ensure that the area to be modified is not significant in the regional context.

- iv. *Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.*

No known habitat of this species is likely to become isolated from currently interconnecting or proximate areas of habitat as a result of mining.

- v. *Whether critical habitat will be affected.*

No critical habitat has been identified by the Director-General of National Parks and Wildlife as at 26 March 1997.

- vi. *Whether a threatened species, population or ecological community, or their habitats are adequately represented in conservation reserves (or other similar protected areas) in the region.*

Major conservation reserves are present to the south and south-west of the site. These include Wollemi and Yengo National Parks as well as Aberdare and Cessnock State Forests. Gloucester Tops and Barrington Tops National Parks are located to the north of Muswellbrook. Limited reserves are found in the Hunter Valley with much of the area cleared for agriculture and mining. Remnant forest reserves include the Belford and Ravensworth State Forests.

- vii. *Whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.*

No threatening processes have been listed by the Director-General of the National Parks and Wildlife Service however this species is sensitive to loss of hollows used for nest and diurnal roost sites.

- viii. *Whether any threatened species, population or ecological community is at the limit of its known distribution.*

This species is not at the limit of its known distribution in the Hunter Valley.

Koala (*Phascolarctos cinereus*)

- i. *In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

The Koala is generally an inhabitant of forests containing medium to tall trees, often including rainforest genera (Reed *et al.*, 1990). These forests typically occur on high nutrient soils and are characterised by the presence of preferred forage trees. The Koala is sensitive to removal of preferred feed trees from its habitat as well as habitat loss and fragmentation.

The general fragmentation of the site and the unprotected nature of the area suggest that although known feed trees of the Koala are present (*Eucalyptus albens*), the site holds little value for the species. It is considered that the proposed mining activities will not disrupt the life cycle of the Koala such that a local viable population would be placed at risk of extinction.

- ii. *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.*

No threatened populations or ecological communities have been listed on Schedule 1 of the *Threatened Species Conservation Act 1995* thus they are not included in this assessment.

- iii. *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

Proposed mining will require the removal of approximately 561 hectares of open forest/woodland habitat from the site. An additional 190 hectares of existing open forest/woodland habitat will be retained and fenced off from surrounding mining activities. Vegetation remnants similar to those present on site are located throughout the Hunter Valley although these are not necessarily continuous within the site or any other remnants, nor are they provided with additional protection from development.

- iv. *Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.*

No known habitat of this species is likely to become isolated from currently interconnecting or proximate areas of habitat as a result of mining.

- v. *Whether critical habitat will be affected.*

No critical habitat has been identified by the Director-General of National Parks and Wildlife as at 26 March 1997.

- vi. *Whether a threatened species, population or ecological community, or their habitats are adequately represented in conservation reserves (or other similar protected areas) in the region.*

The Koala is known to be conserved in a number of reserves. Major conservation reserves are present to the south and south-west of the site. These include Wollemi and Yengo National Parks as well as Aberdare and Cessnock State Forests. Gloucester Tops and Barrington Tops National Parks are located to the north of Muswellbrook. Limited reserves are found in the Hunter Valley with much of the area cleared for agriculture and mining. Remnant forest reserves include the Belford and Ravensworth State Forests.

- vii. *Whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.*

No threatening processes have been listed by the Director-General of the National Parks and Wildlife Service.

- viii. *Whether any threatened species, population or ecological community is at the limit of its known distribution.*

The Koala is not at the limit of its known distribution in the Hunter Valley.

Regent Honeyeater (*Xanthomyza phrygia*)

- i. *In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction,*

The Regent Honeyeater (*Xanthomyza phrygia*) inhabits temperate eucalypt woodland and open forest, including forest edges, wooded farmland and urban areas with mature eucalypts. It also uses riparian forests of River Oak (*Casuarina cunninghamiana*) (Garnett, 1993). They rely on various box and ironbark eucalypts and occasional banksias and mistletoes for nectar, but they also feed on insects, manna, lerps and fruit (Schodde and Tidemann, 1993). The Regent Honeyeater was not recorded on site.

Narrow-leaved Ironbark is common on site, however, most large ironbarks have been previously logged with only a few large trees remaining. These few remaining individual adult trees are unlikely to produce significant quantities of flowers as food resources to the Regent Honeyeater as some suffer from "die-back".

The Regent Honeyeater is not expected to be significantly impacted by the proposed works as the site does not provide suitable foraging habitat. Therefore, the life cycle of the species will not be disrupted such that a viable local population is placed at risk of extinction.

- ii. *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.*

No endangered populations of the Regent Honeyeater have been listed in Schedule 1 Part 2 of the *Threatened Species Conservation Act 1995*.

- iii. *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

In the region, major conservation reserves are found to the south and south-west in the extensive Yengo and Wollemi National Parks, and Pokolbin and Corrabare State Forests in the south-east. To the north-west is the Goulburn River and Manobalai National Parks, and Barrington Tops National Park, Mount Royal, Chichester and Barrington Tops State Forests in the north-east. Within the Hunter Valley there are limited reserves of remnant forest with the Belford and Ravensworth State Forests representing the most significant areas of forest contained within reservation areas.

The Regent Honeyeater is known from several locations in the Hunter Valley and foraging habitat of the species is found throughout these conservation areas in the Hunter Valley. Therefore the study area is not considered to provide a significant area of known habitat to be removed.

- iv. *Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.*

No known habitat of this species is likely to become isolated from currently interconnecting or proximate areas of habitat as a result of mining.

v. *Whether critical habitat will be affected.*

At present, no register of critical habitat is maintained by the Director - General of the National Parks and Wildlife Service.

vi. *Whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region,*

The areas of major occurrence of this species are in reserves in New South Wales such as Warrumbungle National Park and Munghorn Gap Nature Reserve and in Victoria at Chiltern State Park, Killawarra Forest and Reef Hills State Park (Garnett, 1993). Recent breeding records of the species are known from Capertee Valley on the south-western side of Wollemi National Park. Preferred habitat for the species includes winter flowering eucalypts, such as ironbark species which are utilised during migrations. In the lower Hunter Valley, conservation reserves do not contain adequate representation of this habitat type.

Regent Honeyeaters occur in the Hunter Valley between April and August. They have been recorded in Wollemi National Park, and Chichester, Corrabare, Watagan and Mount Royal State Forests and may occur in Ravensworth State Forest and Mount Royal Management Area. They are known from near Warkworth, Wollombi, North Rothbury, Singleton and Kurri Kurri. Records also exist for upper reaches of the Hunter River, Muswellbrook, Wollemi National Park, Yengo National Park and Cessnock State Forest and in the lower Hunter Valley (Resource Planning, 1994).

vii. *Whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process,*

No threatening processes have been listed in Schedule 3 of the *Threatened Species Conservation Act 1995*.

viii. *Whether any threatened species, population or ecological community is at the limit of its known distribution.*

This species is not at the limit of its known distribution in the Hunter Valley.

Brush-tailed Rock Wallaby (*Petrogale penicillata*)

i. *in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

The Brush-tailed Rock-wallaby inhabits areas with steep cliff faces with abundant ledges, caves and boulders. Steep narrow routes to cliff tops and grassy feeding areas close to daytime refuges are also essential (Short, 1980).

No known populations of this species will be affected by proposed mining activities as no suitable habitat occurs on site. Suitable habitat for this species is contained within Wollemi and Yengo National Parks which occur in the region and records of this species exist within these reserved areas. Mining will not disrupt the lifecycle of this species.

- ii. *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.*

No endangered populations of the Brush-tailed Rock-wallaby have been identified on Schedule 1 Part 2 of the *Threatened Species Conservation Act 1995*.

- iii. *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

No suitable habitat for this species occurs on site, therefore no habitat utilised by the Brush-tailed Rock-wallaby will be modified or removed by the proposed mining operations.

- iv. *whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.*

No suitable habitat for this species occurs on site therefore mining operations will not isolate areas of habitat utilised by this species.

- v. *whether critical habitat will be affected.*

At present, no areas of critical habitat have been identified by the Director-General of the NPWS.

- vi. *whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region.*

The Brush-tailed Rock-wallaby is known to occur in the region and has been recorded in Yengo National Park and Wollemi National Park which lie to the west of the site. Studies on the Brush-tailed Rock-wallaby are currently being undertaken within these conservation areas by the National Parks and Wildlife Service, however at present, information on how well represented they are in reserved areas is unavailable. Large areas of suitable habitat for this species are however well conserved within these reserve areas.

- vii. *whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.*

Key threatening processes have not been identified on Schedule 3 of the *TSC Act 1995* and therefore this factor cannot be addressed.

- viii. *whether any threatened species, population or ecological community is at the limit of its known distribution.*

The Brush-tailed rock-wallaby is distributed in eastern Australia from the coastal region to the ranges, from the Tropic of Capricorn in Queensland to eastern Victoria (Maynes and Sharman, 1991). This species is not at the limit of its known distribution in the study area.

Common Bent-wing Bat (*Miniopterus schreibersii*)

- i. *In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

The Common Bent-wing Bat (*Miniopterus schreibersii*) inhabits moist and dry forest where it forages. It roosts in caves, mines, stormwater channels, under bridges and occasionally buildings and will travel long distances between roosts (Dwyer, 1995). This species has been recorded during the recent survey in the low woodland community in the study area where it was probably foraging.

Foraging habitat of the Common Bent-wing Bat may be removed. However, no significant impacts are expected on the survival of this species since breeding and nursery roosts will not be affected as suitable sites are not available on site. Therefore, the life cycle of the species will not be disrupted such that a viable local population is placed at risk of extinction.

- ii. *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.*

No endangered populations of the Common Bent-wing Bat have been listed in Schedule 1 Part 2 of the *Threatened Species Conservation Act 1995*.

- iii *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

In the region, major conservation reserves are found to the south and south-west in the extensive Yengo and Wollemi National Parks, and Pokolbin and Corrabare State Forests in the south-east. To the north-west is the Goulburn River and Manobalai National Parks, and Barrington Tops National Park, Mount Royal, Chichester and Barrington Tops State Forests in the north-east. Locally there are limited reserves of remnant forest with the Belford and Ravensworth State Forests representing the most significant areas of forest not subject to mining or agriculture.

Foraging habitat of the species is found throughout these conservation areas in the Hunter Valley and therefore the study area does not provide a significant area of known habitat to be removed.

- iv *Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community,*

No known habitat of this species is likely to become isolated from currently interconnecting or proximate areas of habitat as a result of mining.

- v *Whether critical habitat will be affected.*

No critical habitat has been identified by the Director-General of National Parks and Wildlife as at 26 March 1997.

- vi — *Whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region.*

Populations of the Common Bent-wing Bat have been recorded in the Hunter Valley from the northern ranges in the Dungog and Gloucester forestry regions (Shields *et al.*, 1992), the southern ranges at Watagan State Forest (Hoye, unpublished), Pokolbin and Corrabare State Forests and in the central lowlands at Ravensworth State Forest (Hoye, 1994a), Belford State Forest and Mount Arthur (Hoye, 1993a; Resource Planning, 1993), Singleton and Branxton (Resource Planning, 1994).

- vii *Whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process,*

No threatening processes have been listed in Schedule 3 of the *Threatened Species Conservation Act 1995*.

- viii *Whether any threatened species, population or ecological community is at the limit of its known distribution.*

The species is not at the limit of its known distribution in the Hunter Valley.

Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*)

- i *In the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

The Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*) inhabits rainforests, sclerophyll forests and woodlands. They roost alone or with up to ten others in large hollow trees, in buildings or abandoned nests of Sugar Gliders (Cronin, 1991; Richards, 1995). This species was not recorded in the study area, however, suitable habitat exists, and it has been identified in fauna surveys in the central lowlands of the Hunter Valley.

The Yellow-bellied Sheathtail Bat may roost and breed in some of the scattered older trees on site. However older trees found on site are located on the Mount Pleasant ridge which is to be retained and fenced off from surrounding mining activities. It is not expected that the proposed activities would disrupt the life cycle of the species such that any local viable population would be placed at risk of extinction.

- ii *In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.*

No endangered populations of the Yellow-bellied Sheathtail Bat have been listed in Schedule 1 Part 2 of the *Threatened Species Conservation Act 1995*.

- iii *In relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.*

In the region, major conservation reserves are found to the south and south-west in the extensive Yengo and Wollemi National Parks, and Pokolbin and Corrabare State Forests in the south-east. To the north-west is the Goulburn River and Manobalai National Parks, and Barrington Tops National Park, Mount Royal, Chichester and Barrington Tops State Forests in the north-east. Within the Hunter Valley there are limited reserves of remnant forest with the Belford and Ravensworth State Forests representing the most significant areas of forest contained within the reservation systems.

Suitable foraging habitat of the species is found throughout these conservation areas in the Hunter Valley, however, limited records exist for this species (Resource Planning, 1993). Even so, the proposed area of vegetation to be removed from the study site would not constitute a significant proportion of known foraging habitat for this species in the region.

- iv *Whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.*

No known habitat of this species is likely to become isolated from currently interconnecting or proximate areas of habitat as a result of the proposal.

- v *Whether critical habitat will be affected.*

No critical habitat has been identified by the Director-General of National Parks and Wildlife as at 26 March 1997.

- vi *Whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region.*

Limited records exists for this species in the Hunter Valley although it has been found at Mount Arthur (Resource Planning, 1993).

- vii *Whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.*

No threatening processes have been listed in Schedule 3 of the *Threatened Species Conservation Act 1995*.

- viii *Whether any threatened species, population or ecological community is at the limit of its known distribution.*

The Yellow-bellied Sheathtail Bat is not at the limit of its known distribution in the Hunter Valley.

Conclusion

The results of the analysis concludes that the proposal is not on land that is, or is part of critical habitat and is not likely to have a significant effect on threatened species, populations or ecological communities or their habitats and therefore a Species Impact Statement is not required under Section 77(d1) of the EPA Act, 1979.

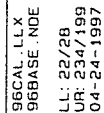
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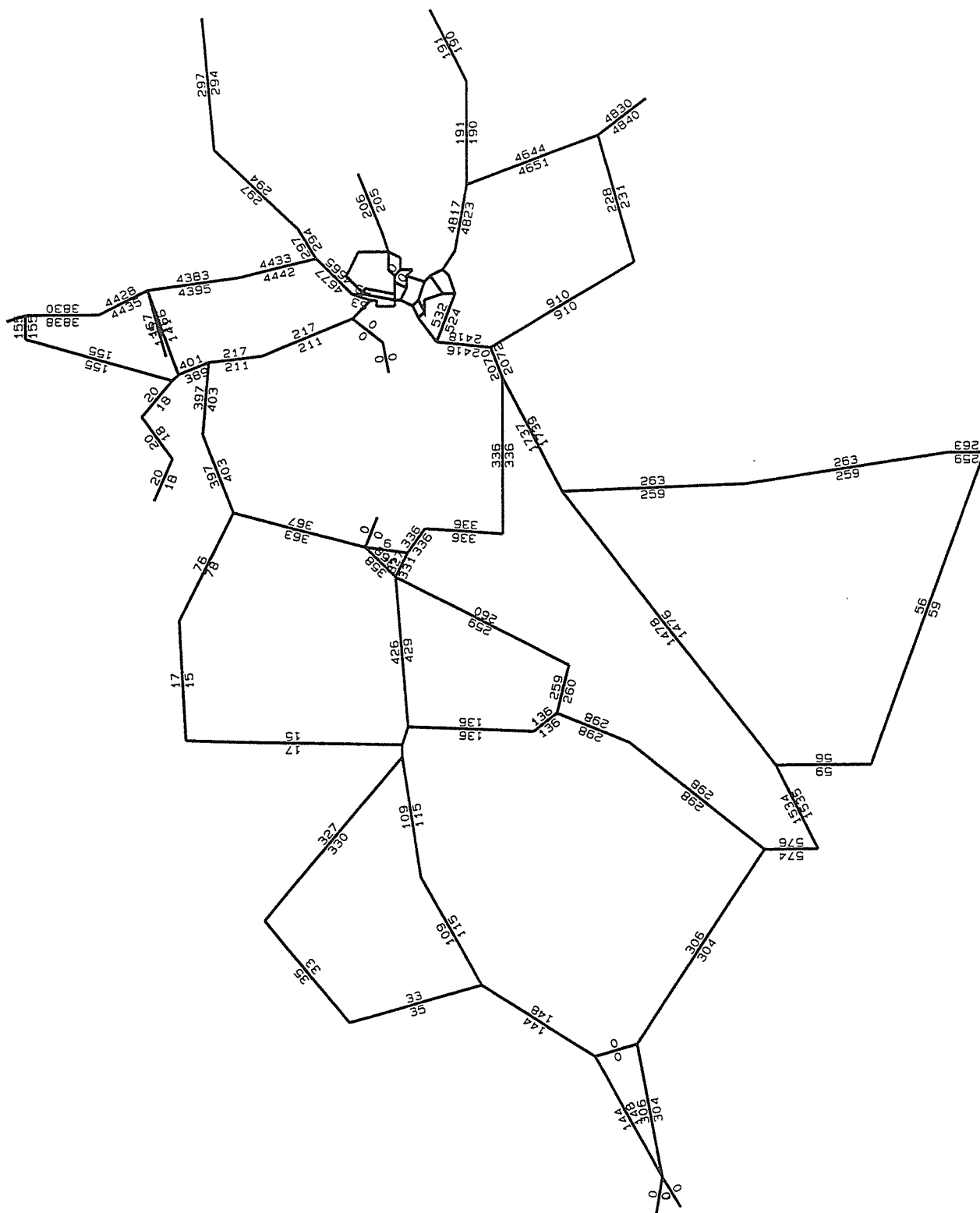
The following pages contain the Muswellbrook Network Traffic Model Rural Roads and Urban Roads summary plots of existing and future traffic volumes for the following situations:

- ◆ (1996 Calibration) 1996 traffic volumes;
- ◆ (1998 Base) 1998 base case traffic volumes with road network changes;
- ◆ (1998 Mount Pleasant) 1998 traffic volumes with Mount Pleasant mine and road network changes;
- ◆ (1998 All Mines) 1998 traffic volumes with Bengalla, Mount Pleasant and Kayuga Mines and road network changes



TEAM MITCHELL MCCOTTER. CROWS NEST, NSW, AUSTRALIA

MODEL 2

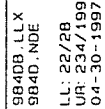


TMODEL 2

Muswellbrook Western Roads Study Modelled Daily Traffic Flows 1998 (Base)

ERM MITCHELL MCCOTTER, CROWS NEST, NSW, AUSTRALIA

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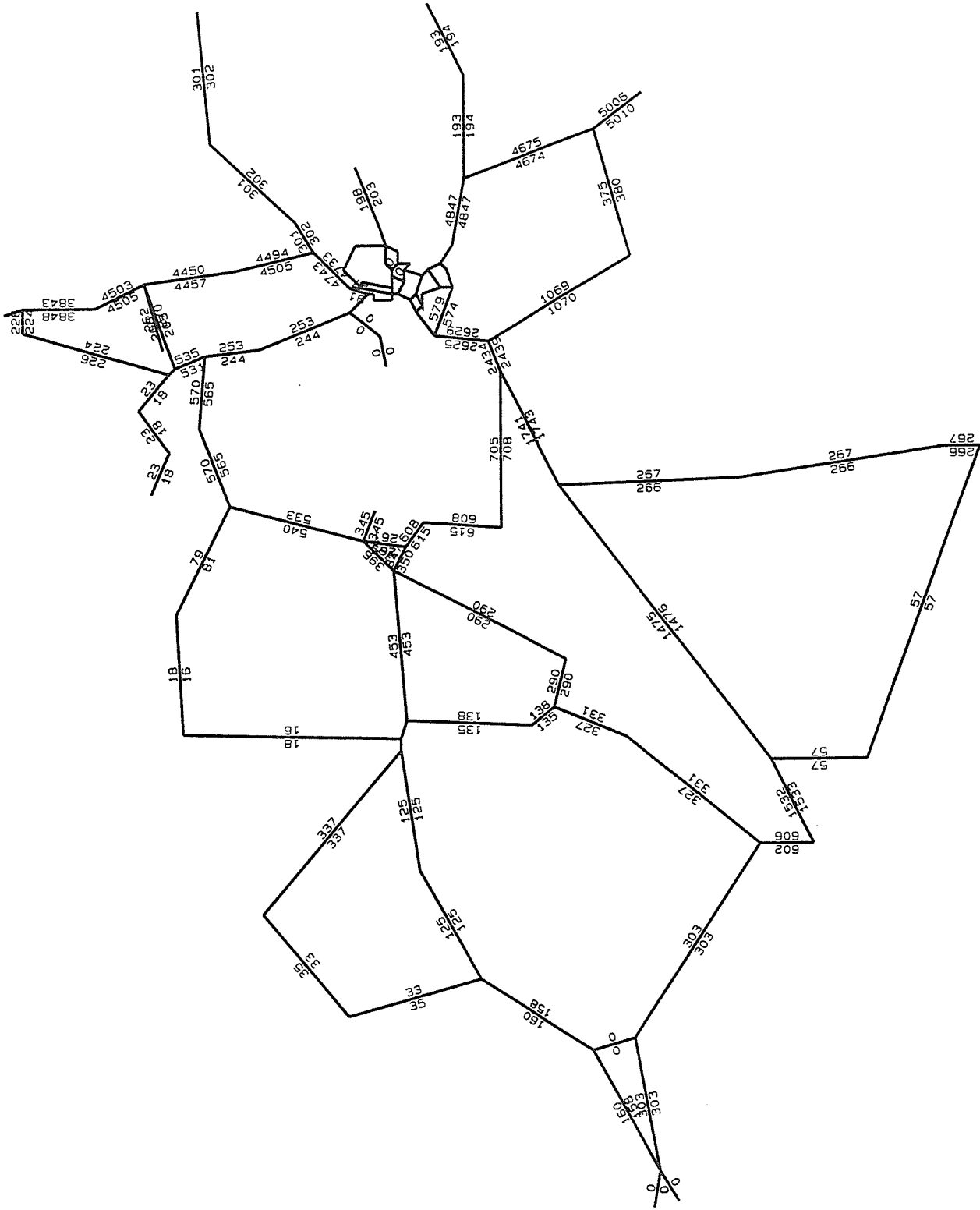
Muswellbrook Western Roads Study

Modelled Daily Traffic Flows 1998 (Mt Pleasant)

ERM MITCHELL MCCOTTER, CROWS NEST, NSW, AUSTRALIA

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MODEL 2

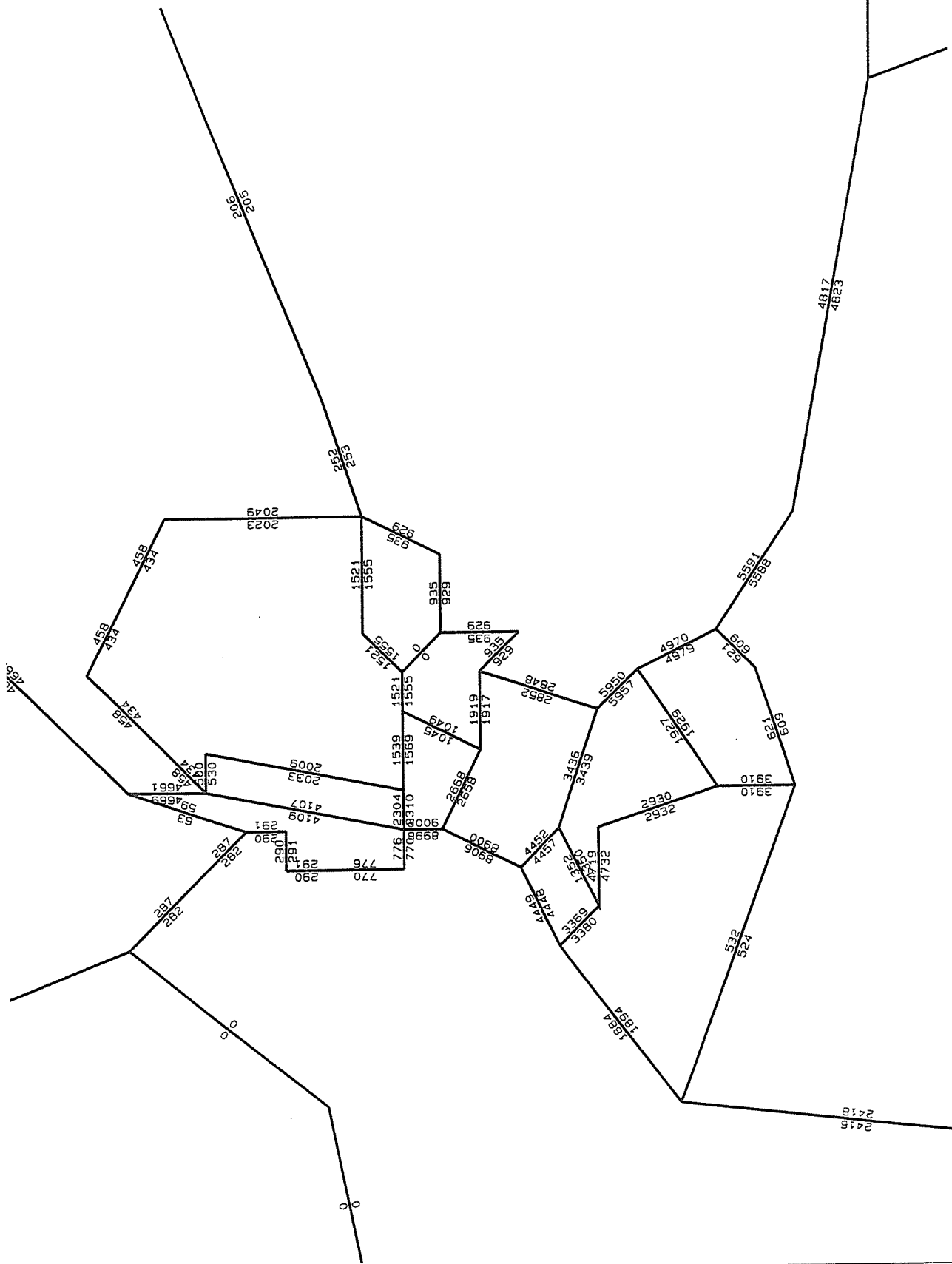


Muswellbrook Western Roads Study Modelled Daily Traffic Flows 1998 (All Mines)

ERM MITCHELL MCCOTTER, CROWS NEST, NSW, AUSTRALIA

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UR: 234/199
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MODEL 2



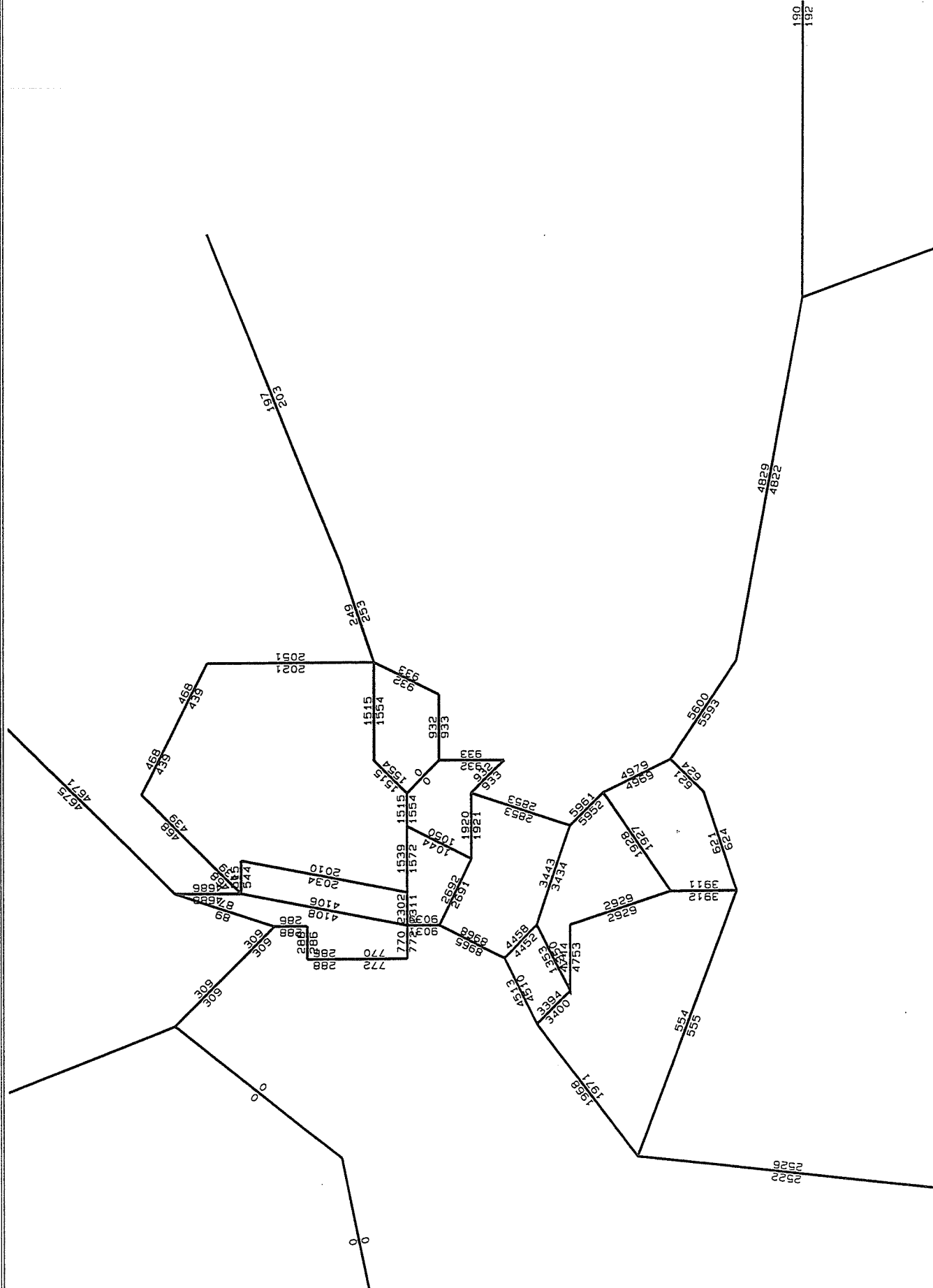
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UR: 207/141
04-24-1997

Muswellbrook Western Roads Study

Modelled Daily Traffic Flows 1998 (Base)

ERM MITCHELL MCCOTTER, CROWS NEST, NSW, AUSTRALIA

MODEL 2

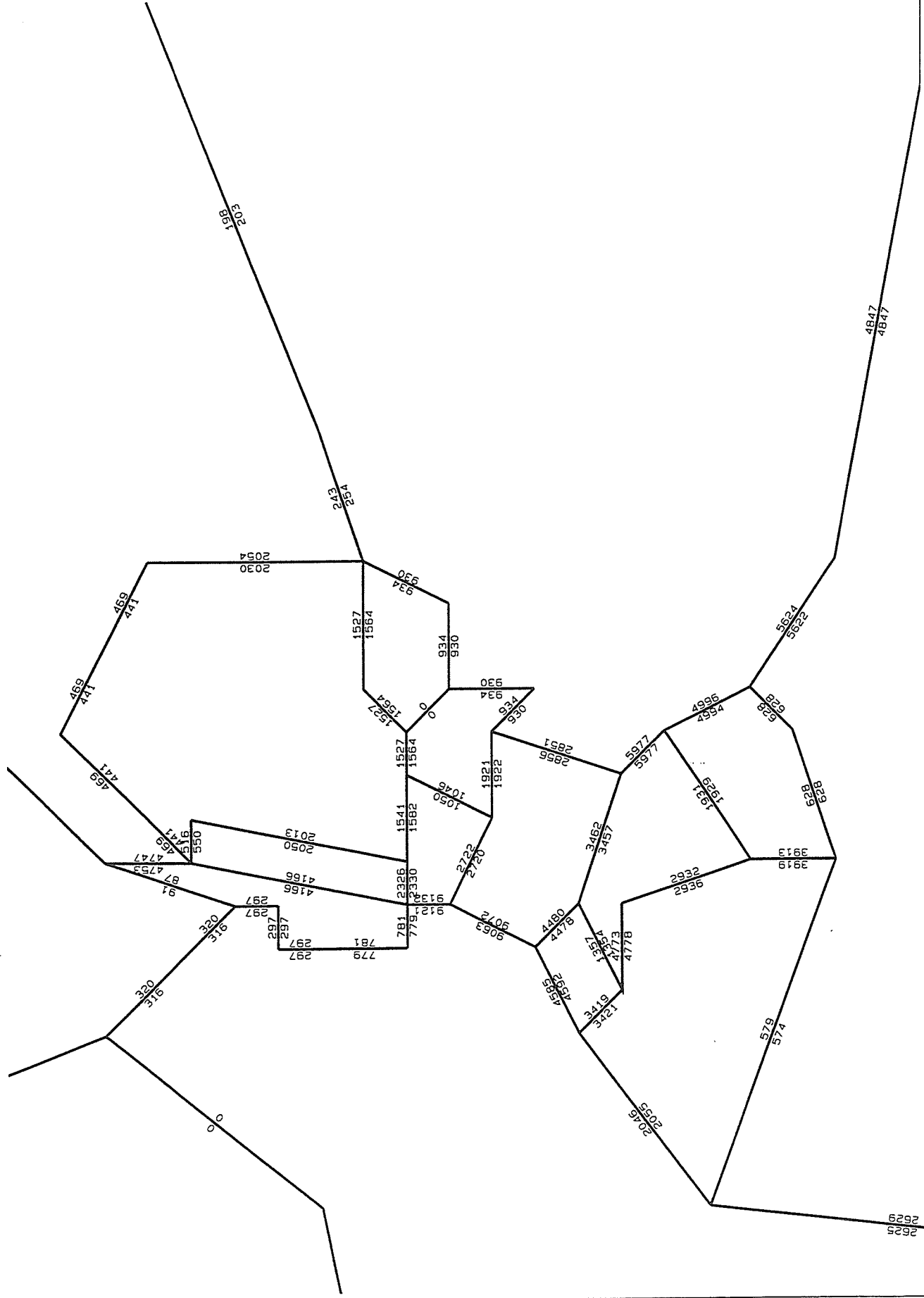


Muswellbrook Western Roads Study Modelled Daily Traffic Flows 1998 (Mt Pleasant)

ERM MITCHELL MCCOTTER, CROWS NEST, NSW, AUSTRALIA

984DB.LLX
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04-30-1997

MODEL 2



9840A.LLX
9840.NOE
LL: 171/119
UR: 204/141
04-24-1997

Muswellbrook Western Roads Study Modelled Daily Traffic Flows 1998 (All Mines)

ERM MITCHELL MCCOTTER, CROWS NEST, NSW, AUSTRALIA

TMODEL™ 2

MINE BARRIER AGREEMENT PRINCIPLES

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THE BARRISTER AGREEMENT PRINCIPLES

MINE BARRIER AGREEMENT PRINCIPLES

This document outlines the matters of principal that exist and are agreed as being of prime importance to the responsible and optimal extraction of coal resources between Mount Pleasant Mine in either its open cut or future underground forms and Mine X.

This document contains three (3) sections;

1 Technical:

2 Meetings Schedule

3 Third Party Adjudication:

1 TECHNICAL

This section contains the formal aspects of the agreement as shown in the table of contents to the current agreement between Mount Thorley Mine and Warkworth Mine. (Attachment A)

This section primarily acknowledges that ;

- 1 It is sensible and responsible to the State Government and to each mining company, to optimise the coal resource extraction at the boundaries of each development.
- 2 Mining activity cannot always be co-ordinated between the operating companies on either side of the boundary owing to operational and marketing activities/needs.
- 3 Depending on which company is more advanced than the other in their coal extraction, access to and activity on the other company's Authorisation Lease and land will be necessary from time to time.

2 MEETING SCHEDULE

- 1 Owing to 2 and 3 above it is not possible to detail the exact nature of the activities over time and this should best be handled by a site based Joint Working Party (JWP) which should meet and plan activities at least on an annual basis.

2 Each Mine is to be represented by a Principal and technical advisor(s) as needed to resolve those technical matters in hand at the time.

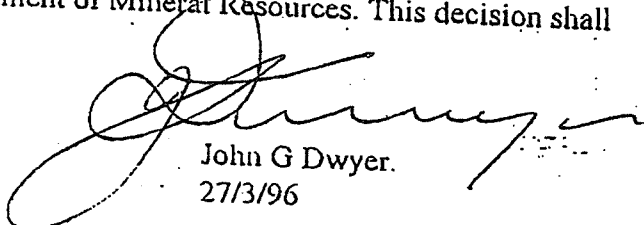
3 Meetings are to be scheduled as agreed by the JWP but in any event shall not be any longer than one year apart.

3 THIRD PARTY ADJUDICATION

1 Should matters not be resolved to the JWP's satisfaction at their regular meetings then the site based General Managers shall become involved to resolve the issue within one month of it being unresolved by the JWP.

2 Should the site based senior executives not resolve the matter within one month then the matter is to be referred to the Chief Executive of each Mine for resolution, also within one month.

3 Should this not lead to resolution then the matter is to be referred to The Director General of the NSW Department of Mineral Resources. This decision shall be binding and final.



John G Dwyer.
27/3/96

LAND ACQUISITION POLICY

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LAND ACQUISITION POLICY

The purpose of this policy is to establish a clear and consistent framework for the acquisition of land for public use. This policy applies to all departments and agencies of the government and to all personnel involved in the acquisition process. The policy is designed to ensure that the acquisition of land is carried out in a fair, equitable, and efficient manner, and that the interests of the public are protected.

The policy is based on the following principles:

- 1. The acquisition of land should be carried out in a fair and equitable manner, and the interests of the public should be protected.
- 2. The acquisition of land should be carried out in a transparent and accountable manner, and the process should be subject to public scrutiny.
- 3. The acquisition of land should be carried out in a timely and efficient manner, and the process should be subject to public scrutiny.
- 4. The acquisition of land should be carried out in a manner that is consistent with the public interest, and the process should be subject to public scrutiny.

The policy is designed to ensure that the acquisition of land is carried out in a fair, equitable, and efficient manner, and that the interests of the public are protected. The policy is based on the following principles:

- 1. The acquisition of land should be carried out in a fair and equitable manner, and the interests of the public should be protected.
- 2. The acquisition of land should be carried out in a transparent and accountable manner, and the process should be subject to public scrutiny.
- 3. The acquisition of land should be carried out in a timely and efficient manner, and the process should be subject to public scrutiny.
- 4. The acquisition of land should be carried out in a manner that is consistent with the public interest, and the process should be subject to public scrutiny.

Coal & Allied Industries Ltd

Land Acquisition Policy

Coal & Allied is committed to ensuring that landowners impacted by the mine will have their interests and reasonable requirements met by the Company. The Company will continue to inform landowners of the extent and timing of the project and its expected impacts on their properties.

The Environmental Impact Statement will identify the extent of impact on properties.

The Company will enter into agreements with the landowners where impacts are identified with the result that continuation of their present use, is no longer suitable.

These agreements with the land owners can be for acquisition, lease or ameliorative measures as may be negotiated with the landowner.

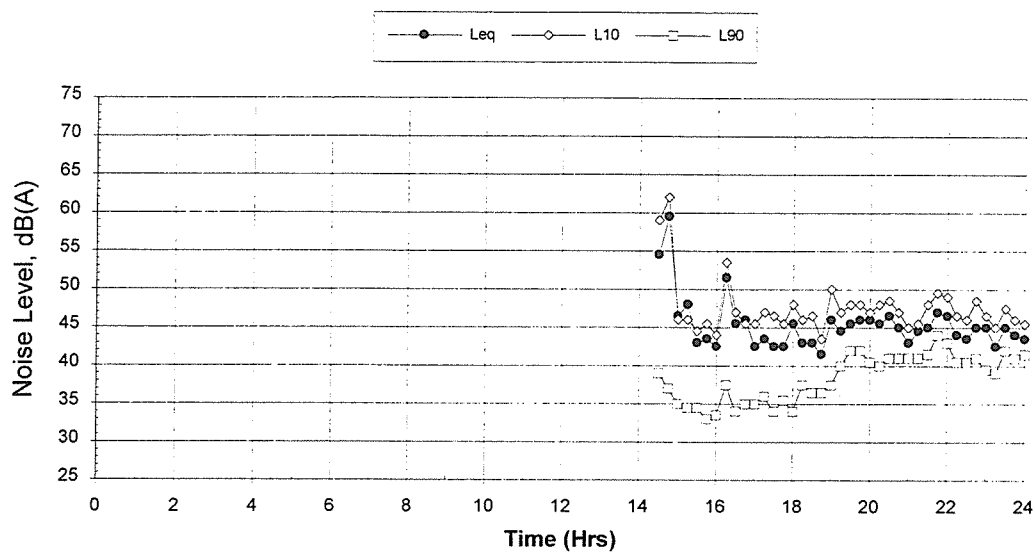
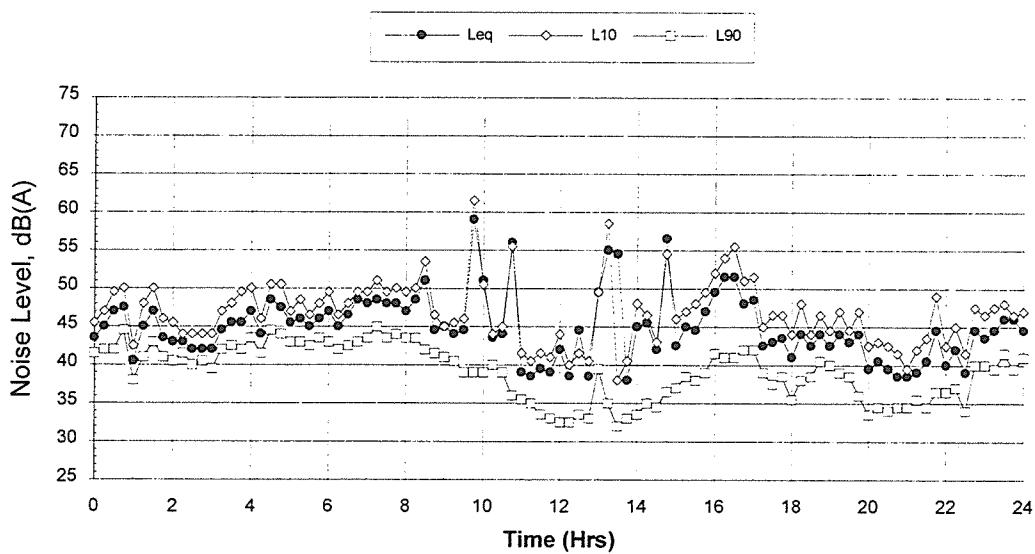
Acquisition of properties will be in accordance with the approval conditions set down in the Development Consent. Those landowners who have not been identified as impacted by the Environmental Impact Statement but consider the impacts to be excessive should contact Coal & Allied.

Coal & Allied will make arrangements for independent monitoring in consultation with the Muswellbrook Shire Council, the Environment Protection Authority, Department of Urban Affairs and Planning and the landowner. If these results are found to be adverse the Company will take ameliorative measures or purchase the property with the landowners agreement.

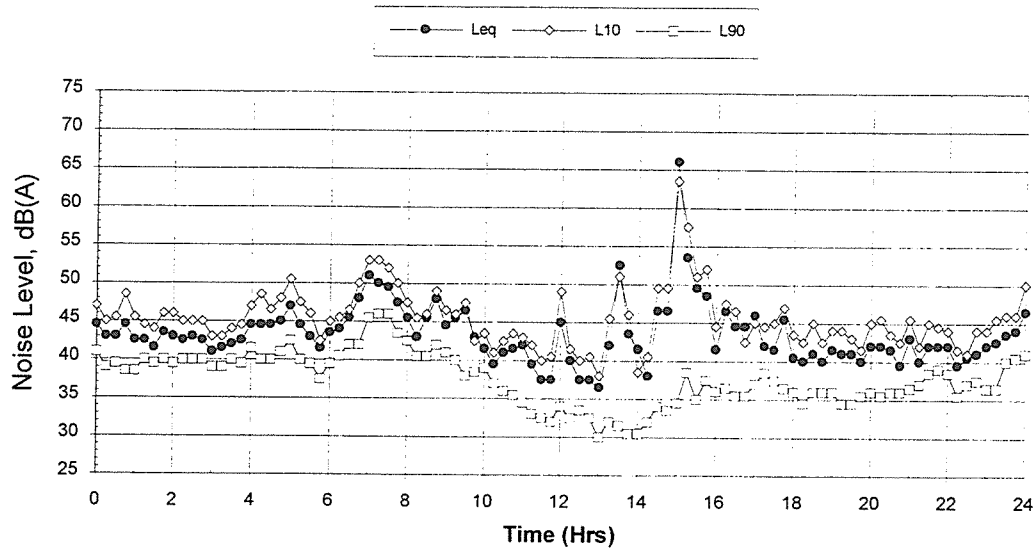
NOISE MONITORING RESULTS

L

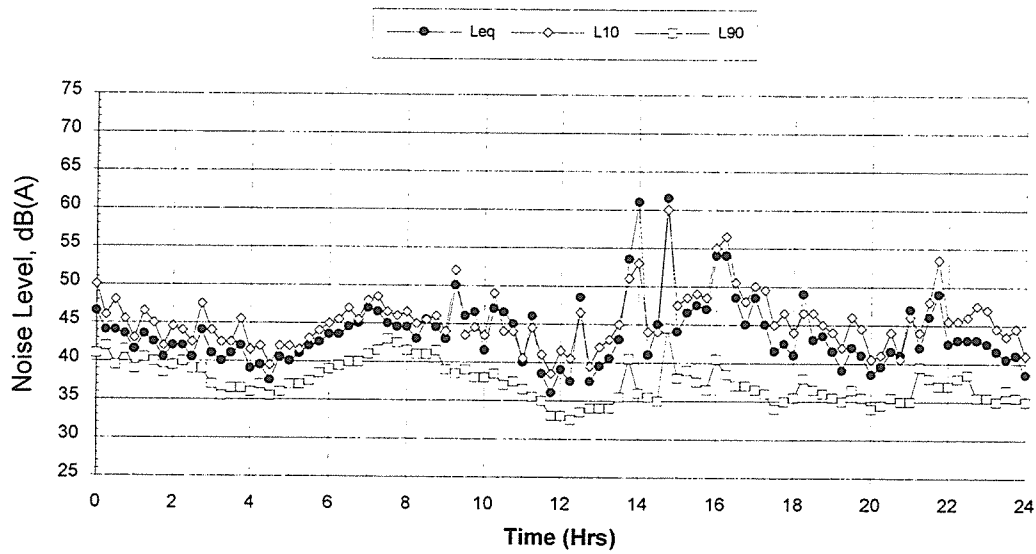
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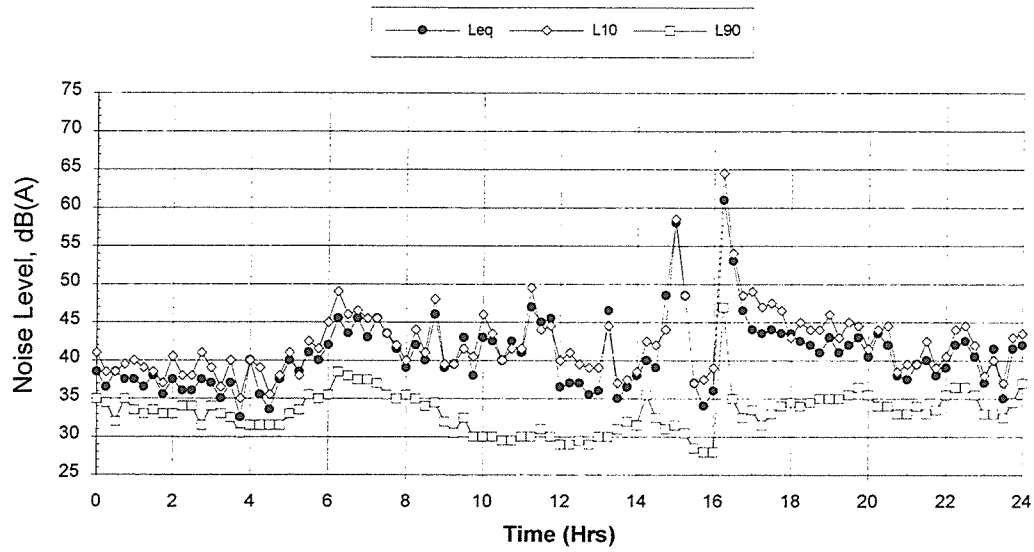
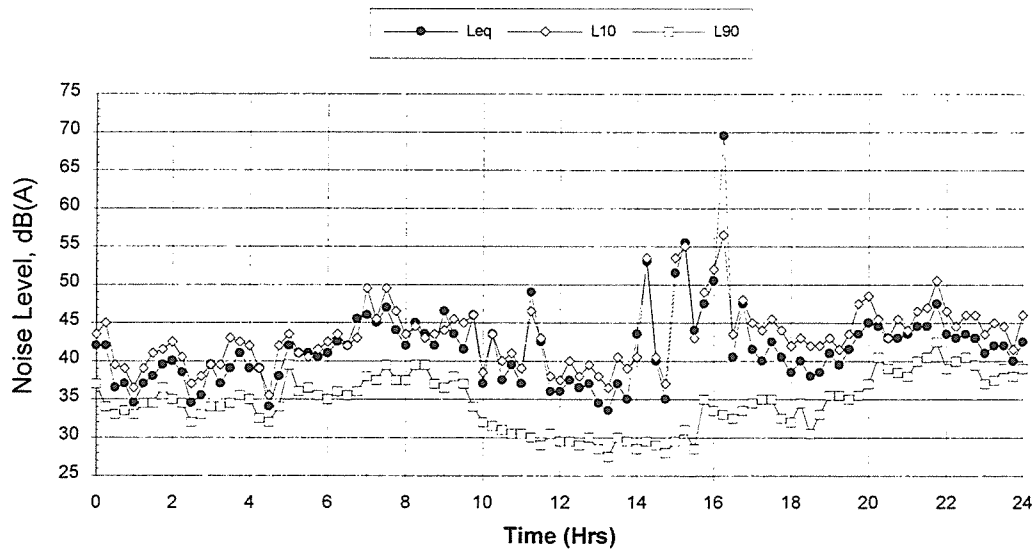
"Fairview", Kayuga Tuesday 4 July 1995**"Fairview", Kayuga Wednesday 5 July 1995**

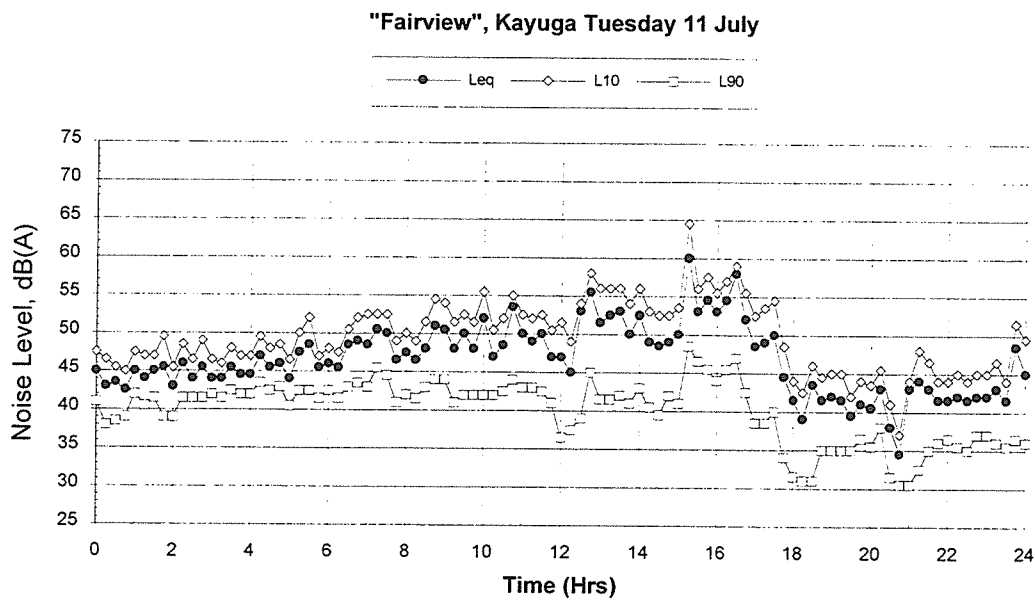
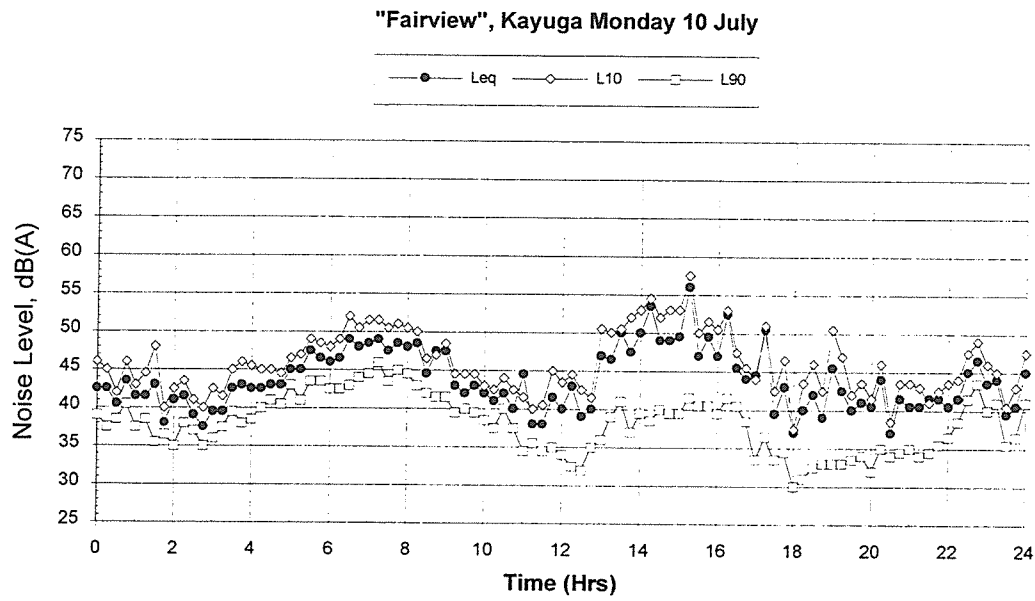
"Fairview", Kayuga Thursday 6 July 1995

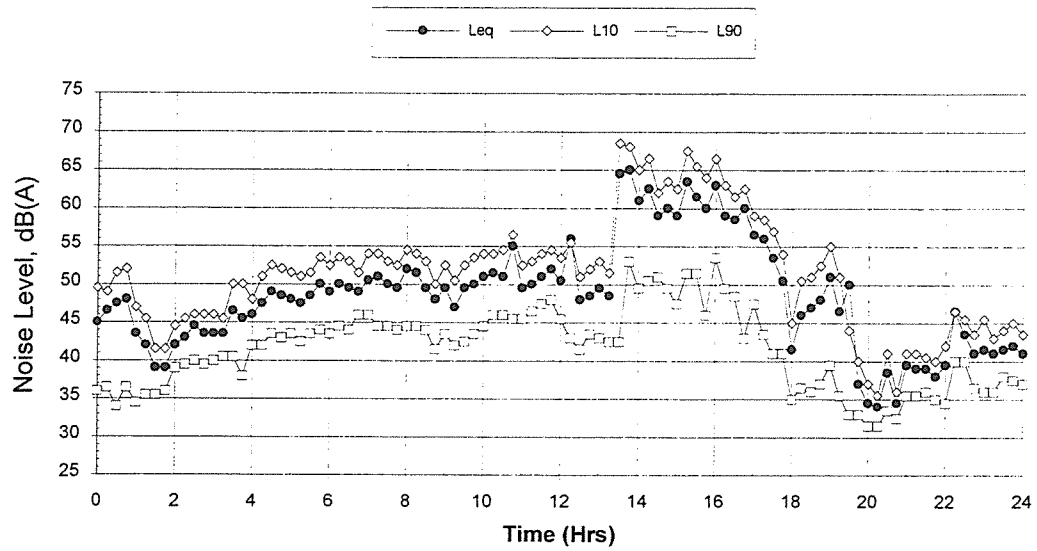
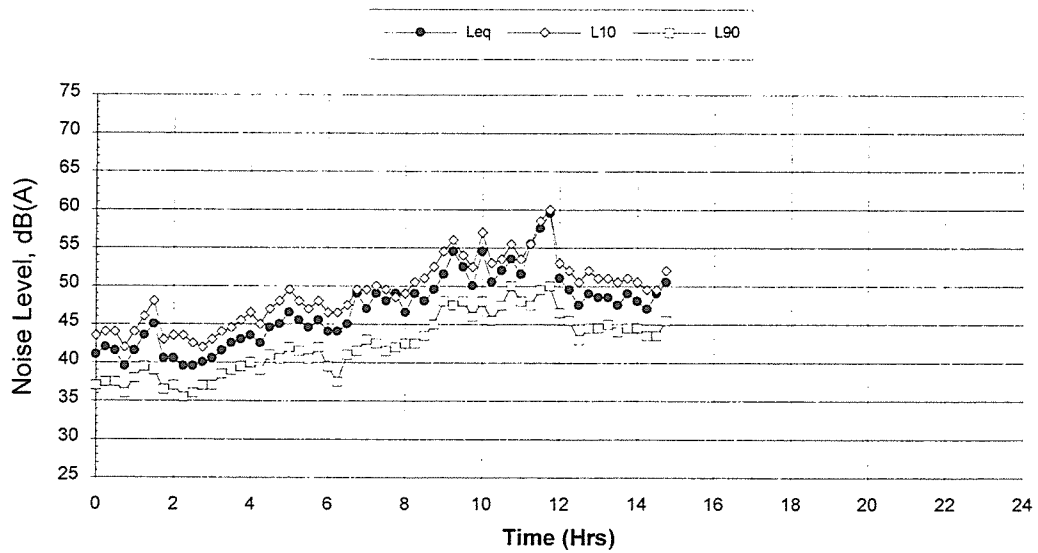


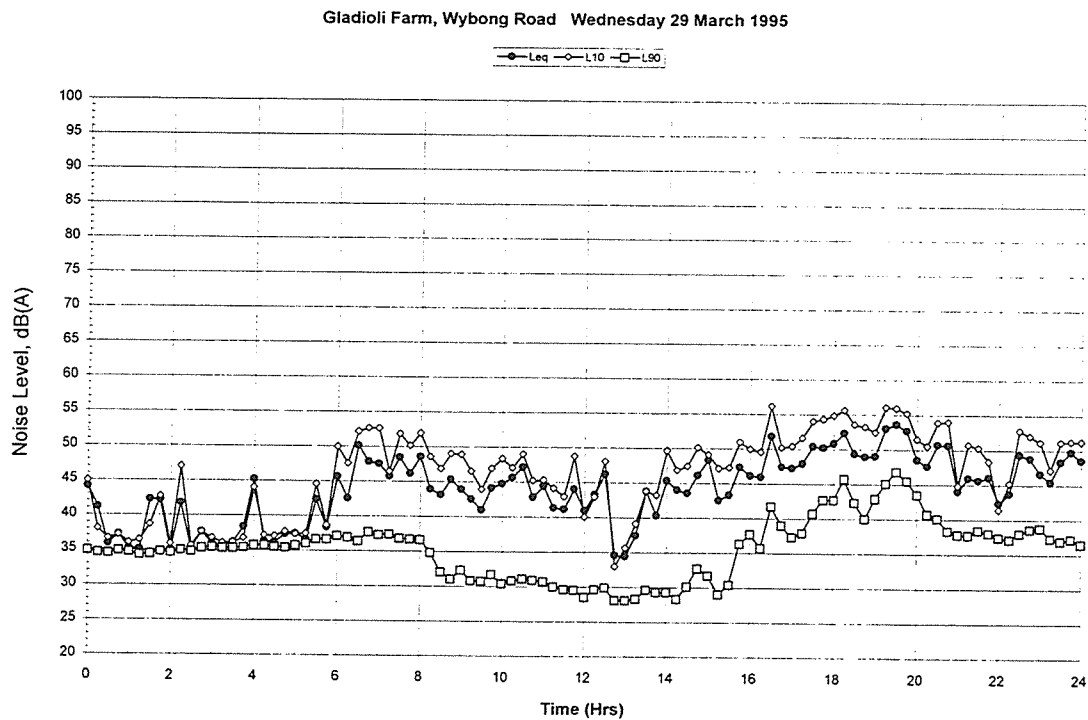
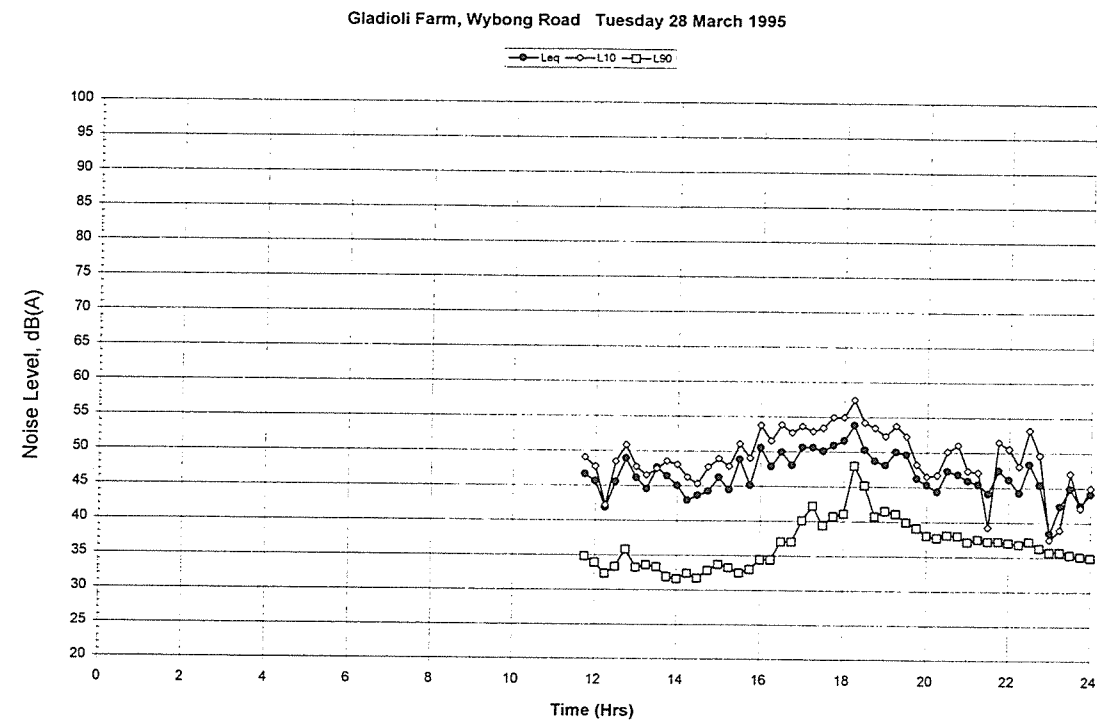
"Fairview", Kayuga Friday 7 July 1995



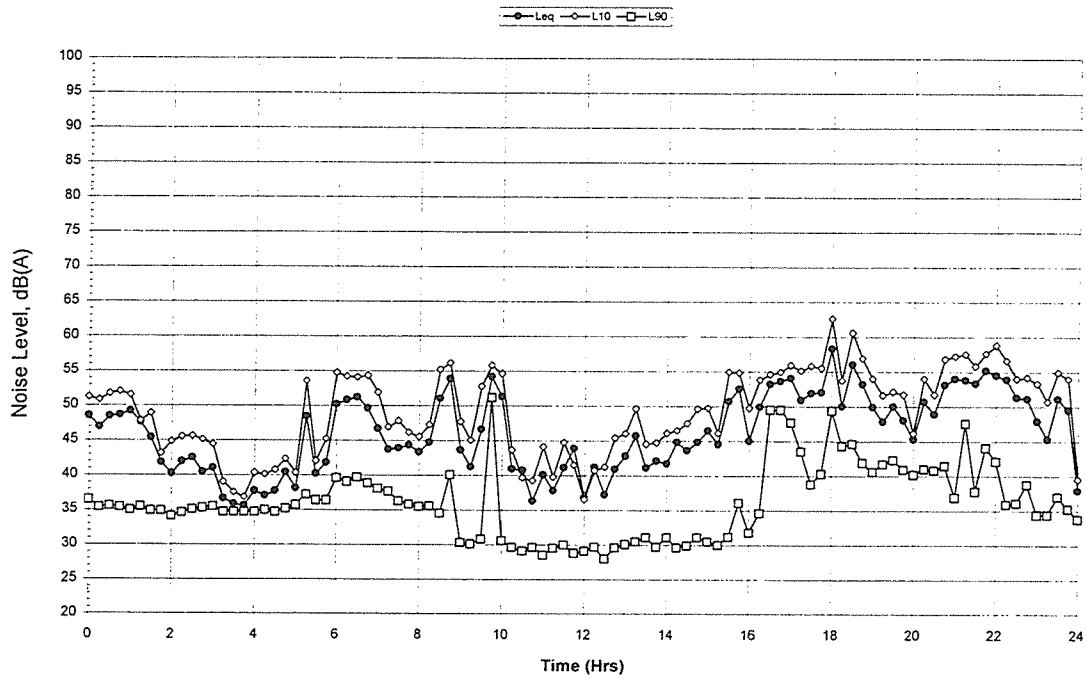
"Fairview", Kayuga Saturday 8 July 1995**"Fairview", Kayuga Sunday 9 July 1995**



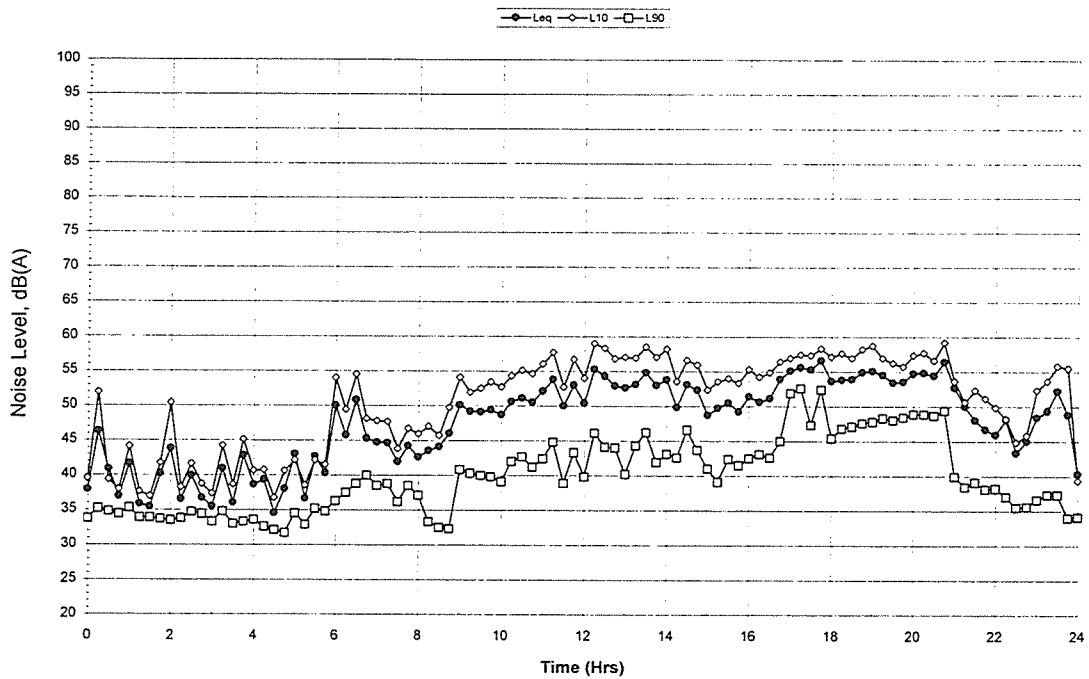
"Fairview", Kayuga Wednesday 12 July**"Fairview", Kayuga Thursday 13 July**



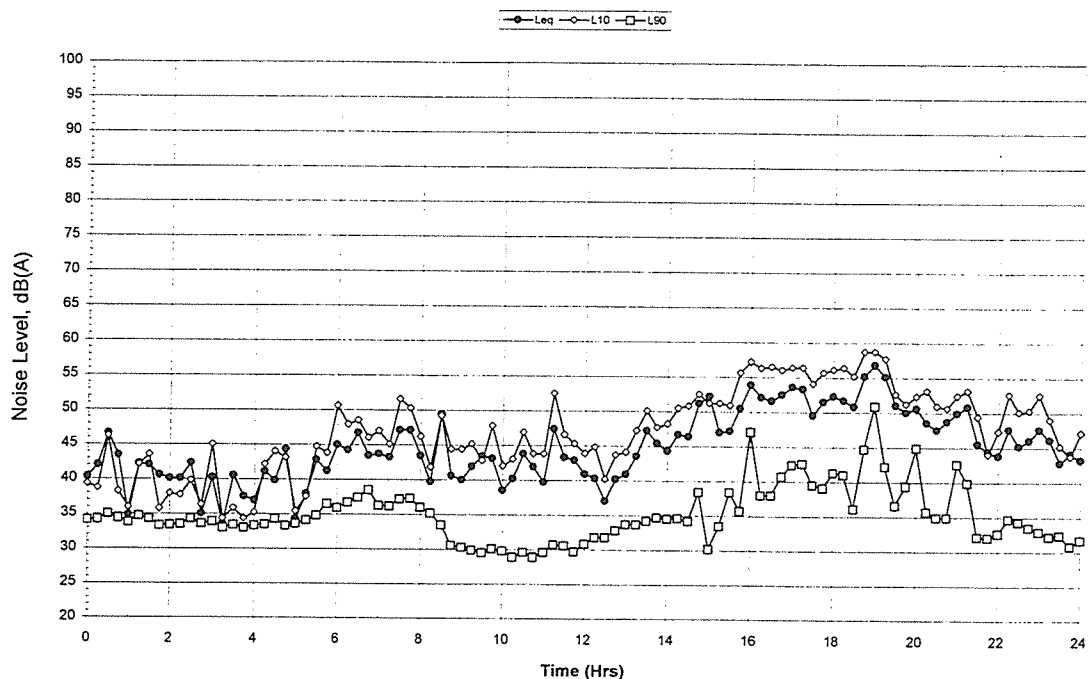
Gladioli Farm, Wybong Road Thursday 30 March 1995



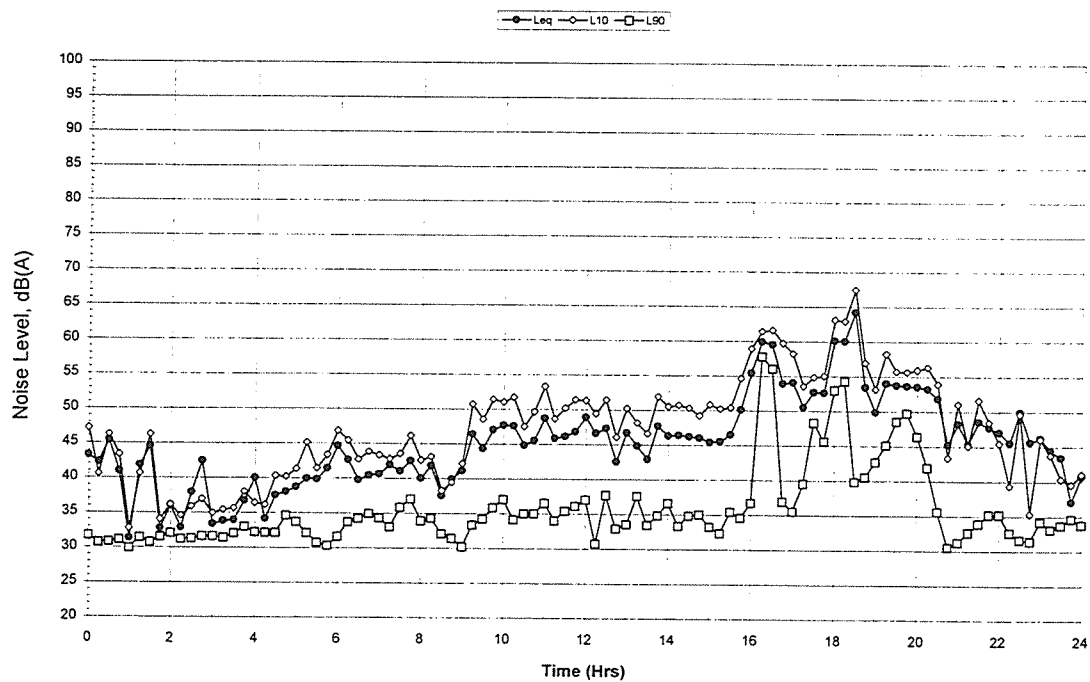
Gladioli Farm, Wybong Road Friday 31 March 1995



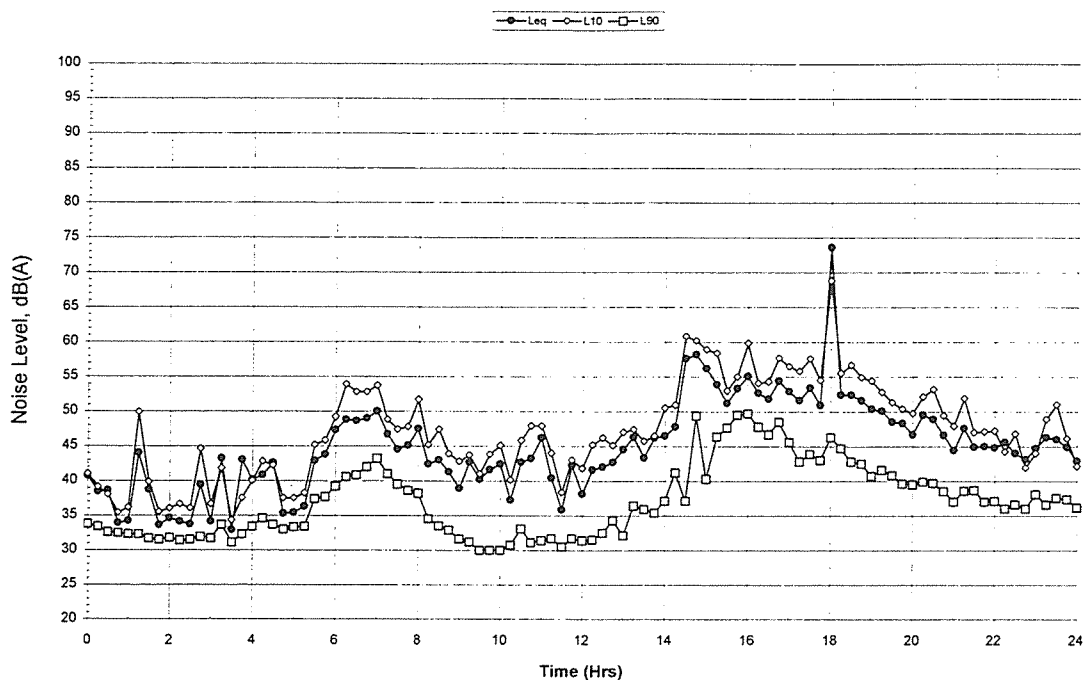
Gladioli Farm, Wybong Road Saturday 1 April 1995



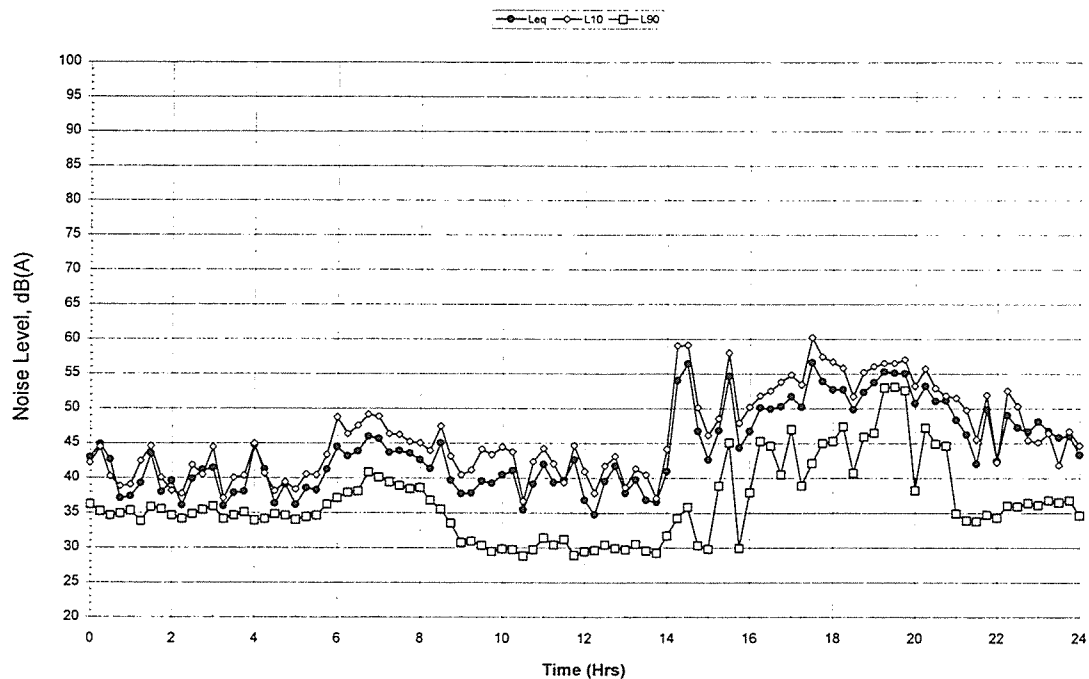
Gladioli Farm, Wybong Road Sunday 2 April 1995

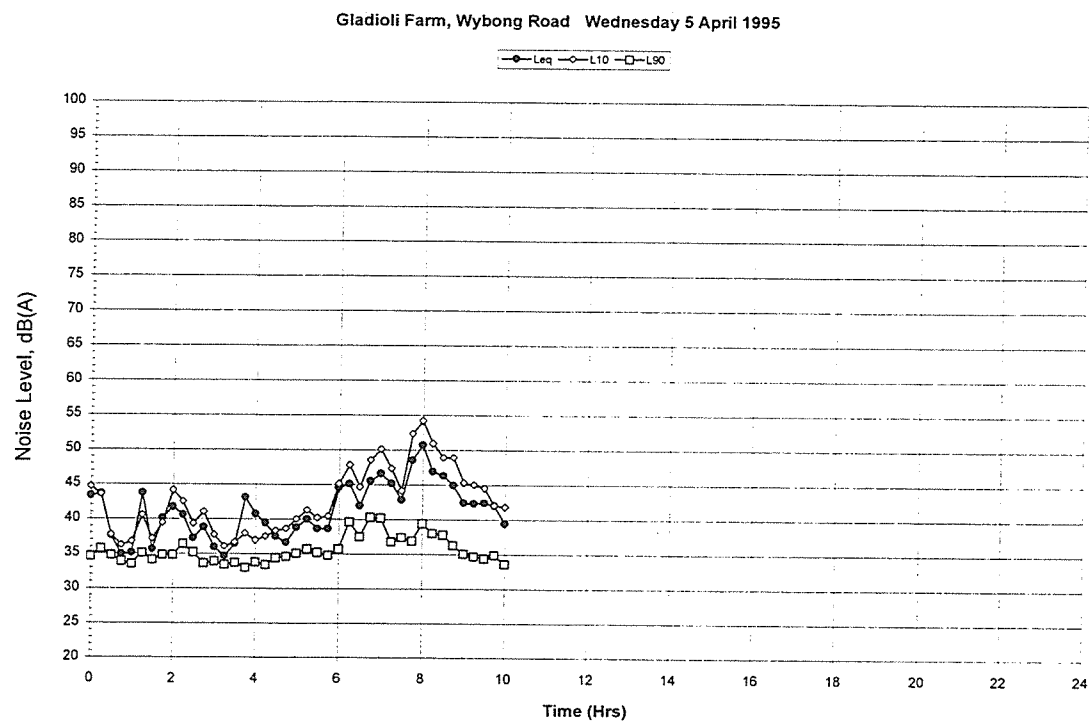


Gladioli Farm, Wybong Road Monday 3 April 1995

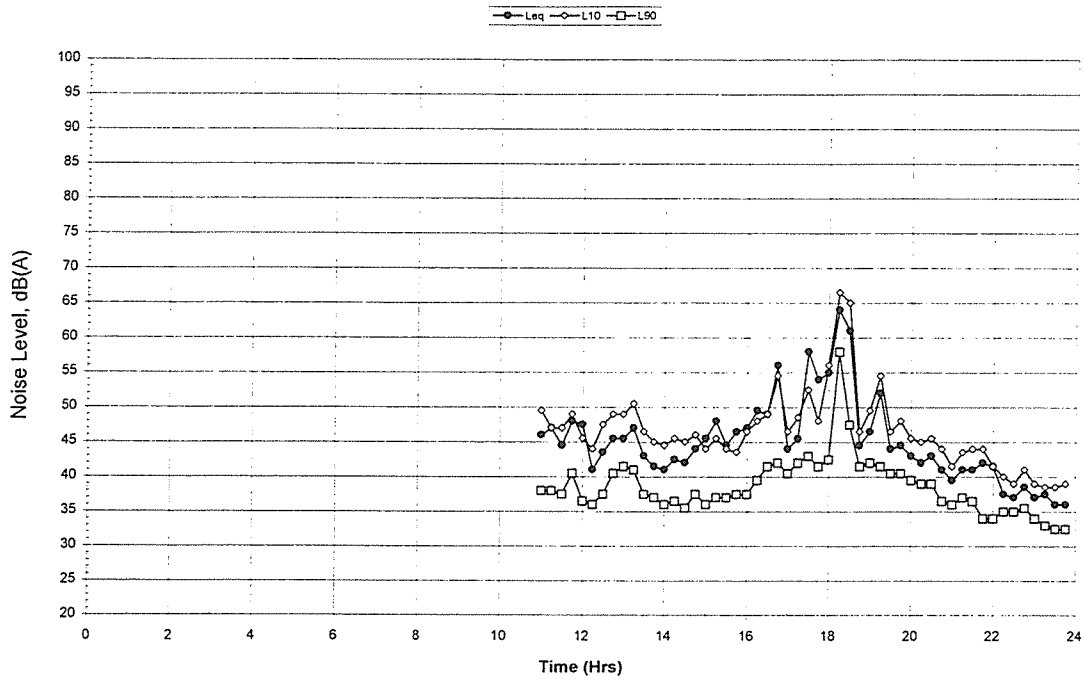


Gladioli Farm, Wybong Road Tuesday 4 April 1995

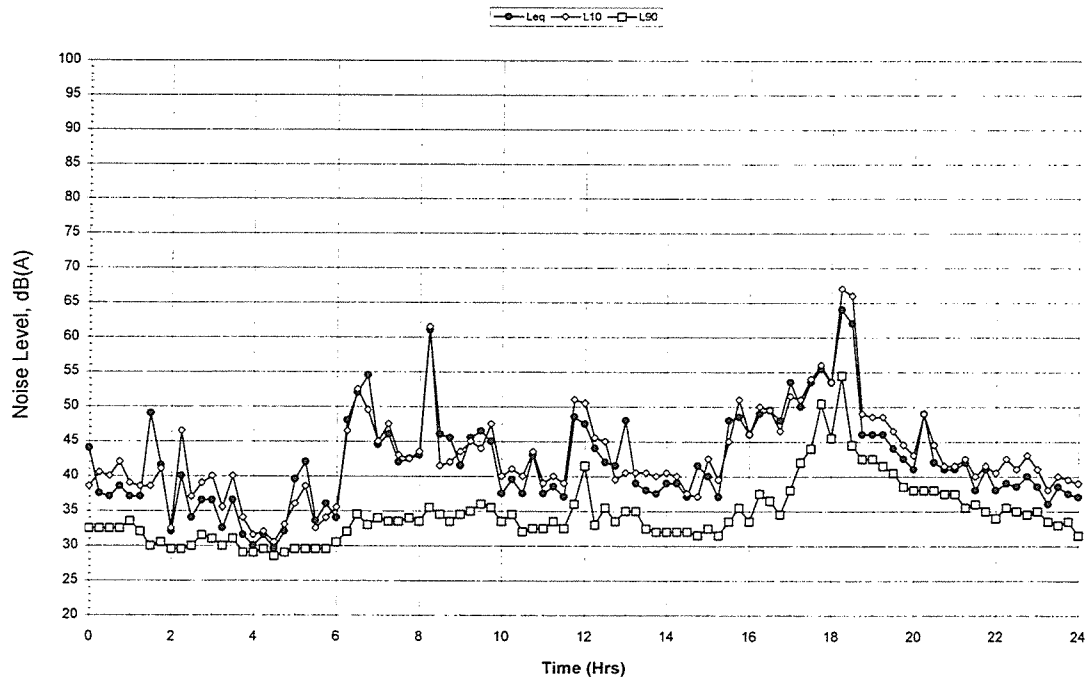




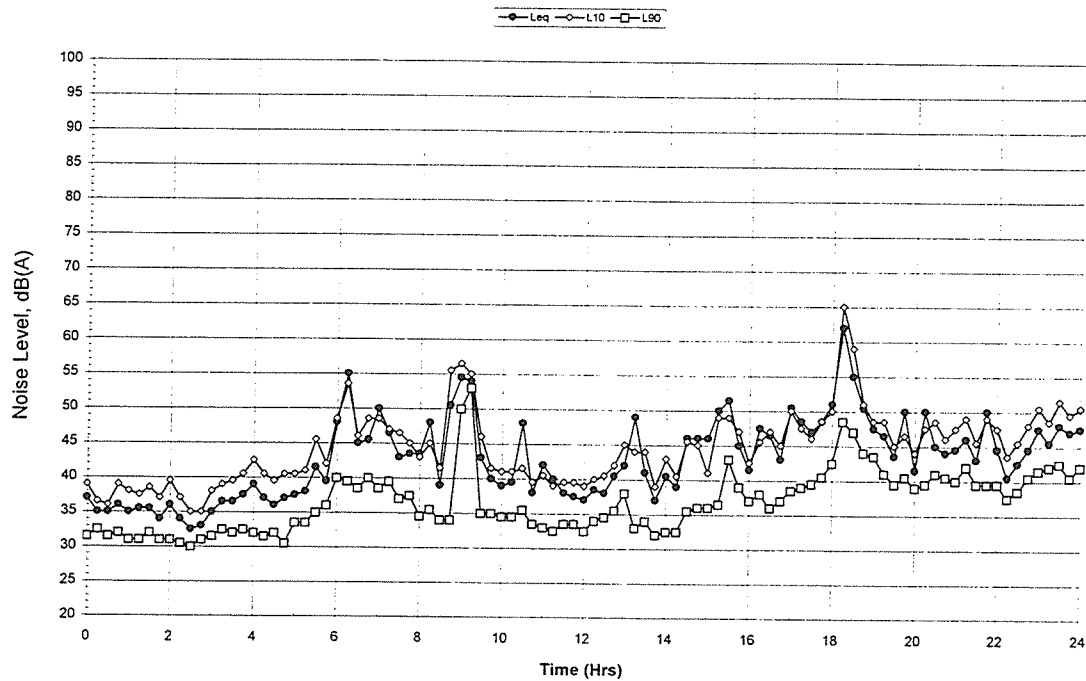
59 Forbes Street, Muswellbrook Tuesday 28 March 1995



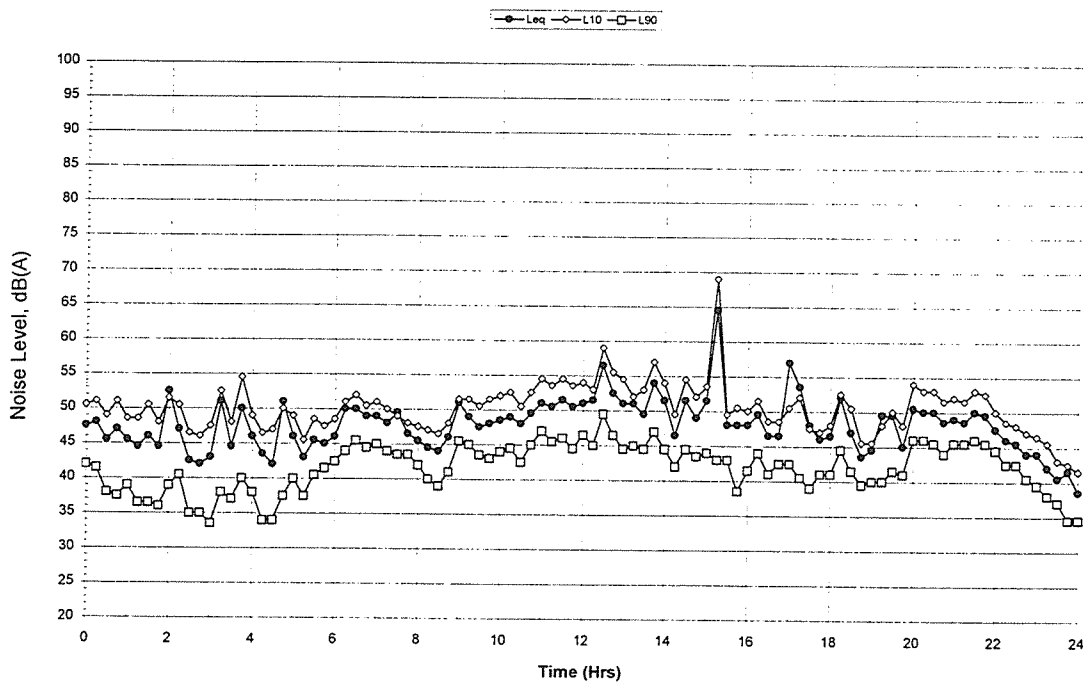
59 Forbes Street, Muswellbrook Wednesday 29 March 1995



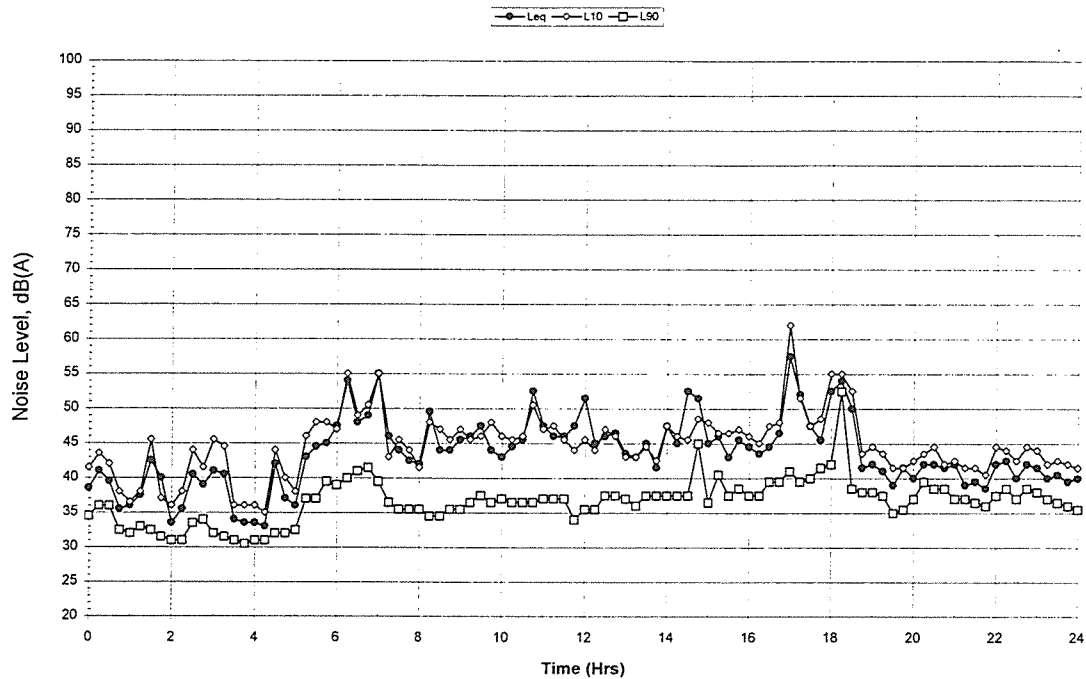
59 Forbes Street, Muswellbrook Thursday 30 March 1995



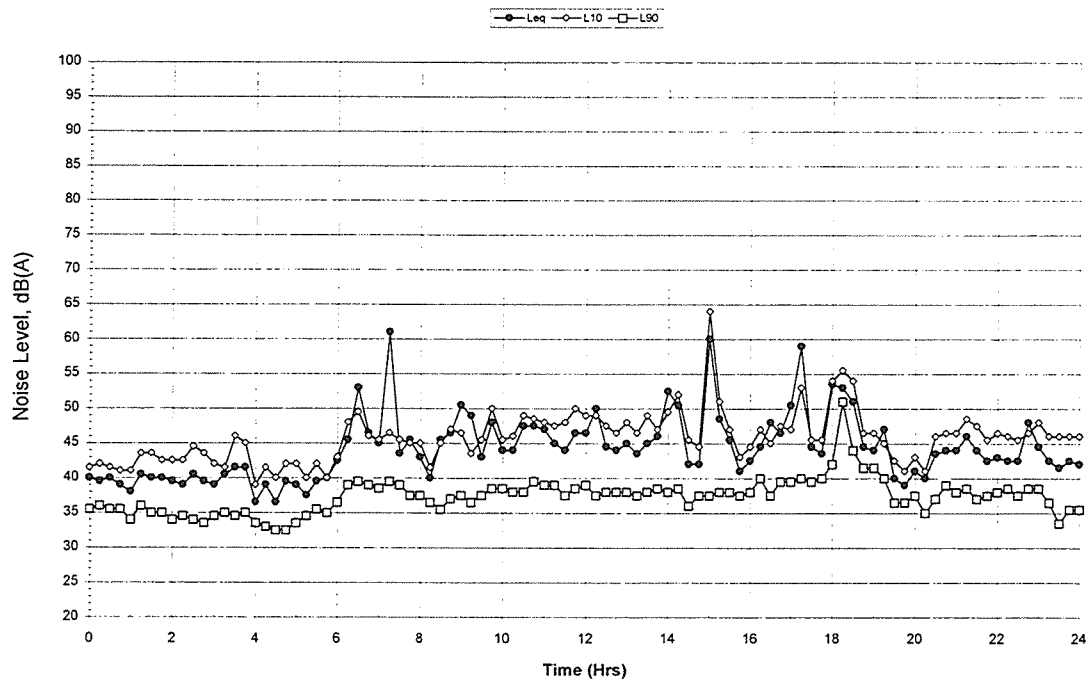
59 Forbes Street, Muswellbrook Friday 31 March 1995



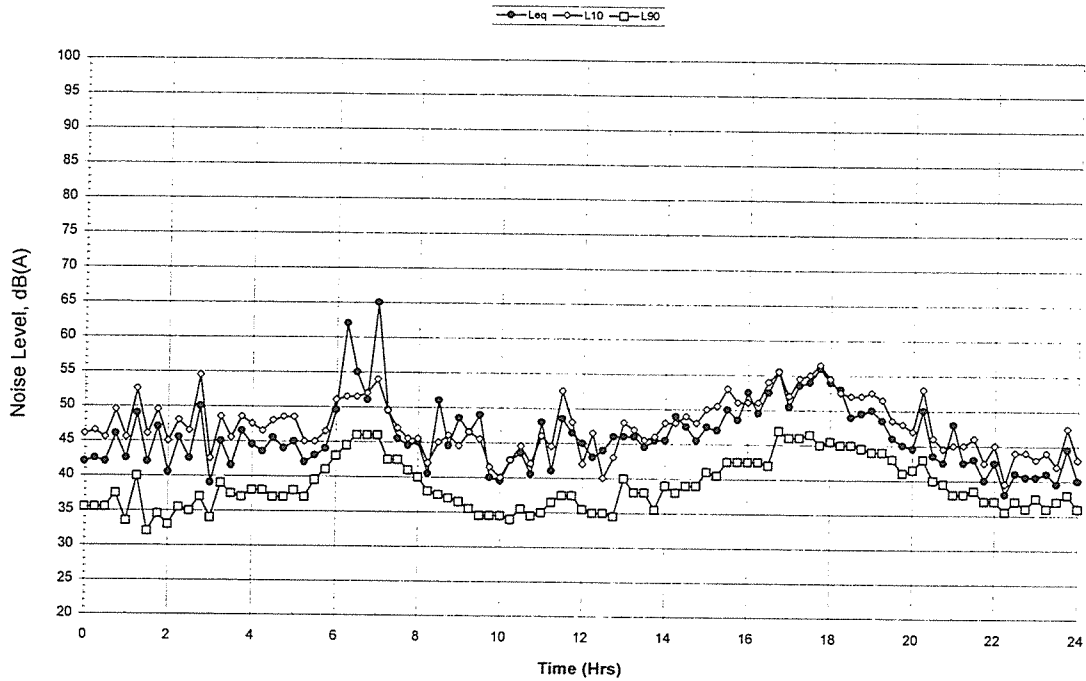
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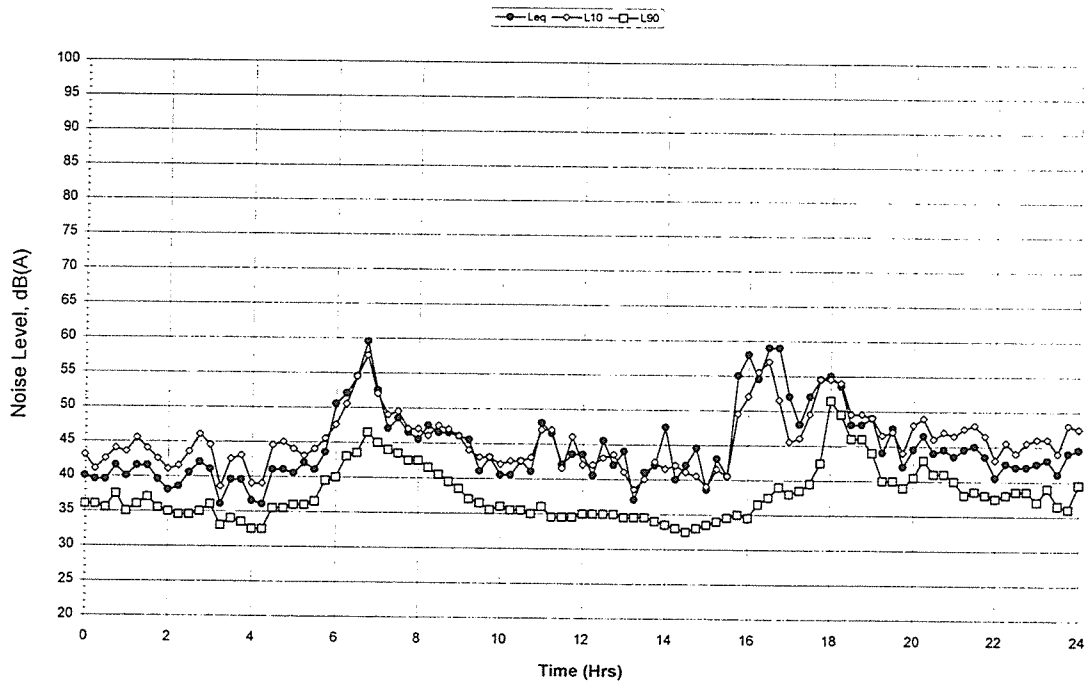
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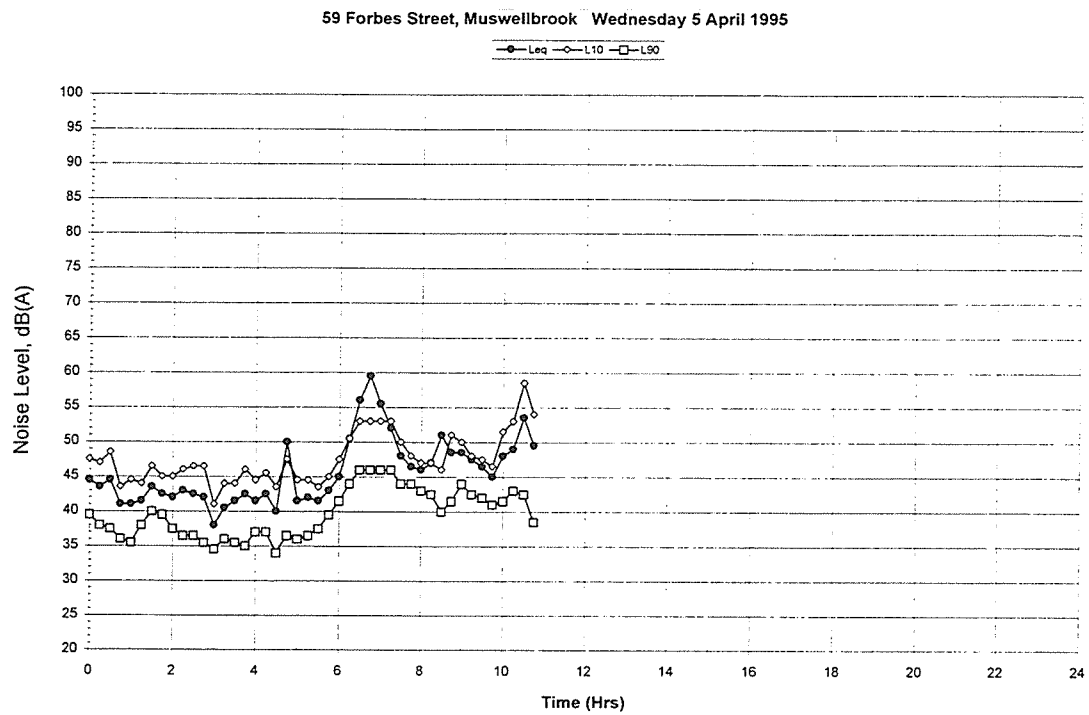


59 Forbes Street, Muswellbrook Monday 3 April 1995

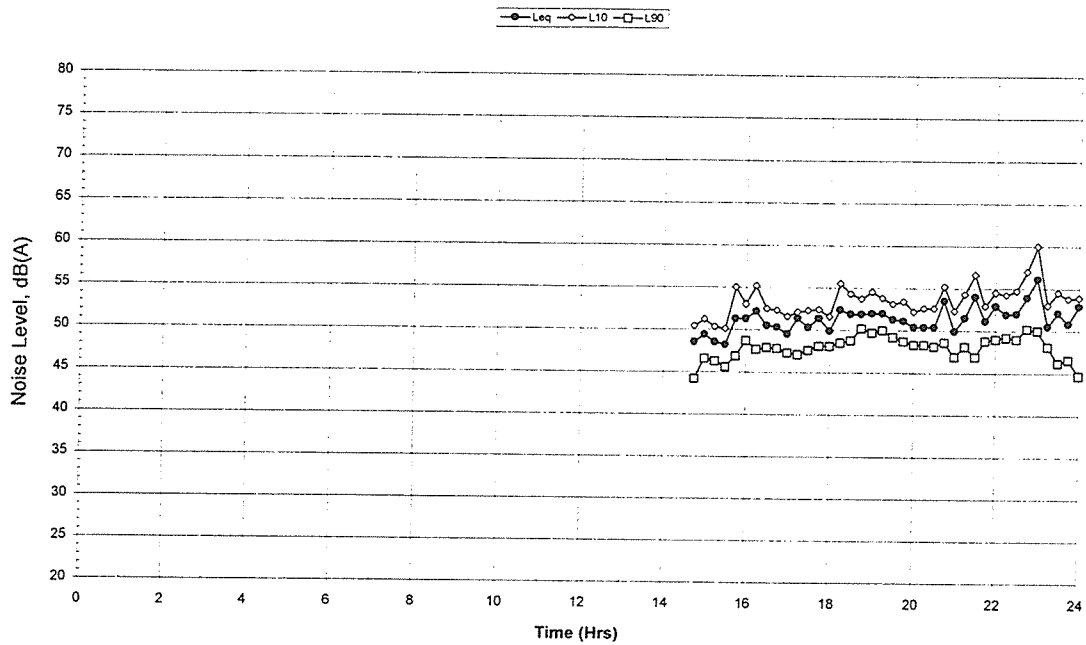


59 Forbes Street, Muswellbrook Tuesday 4 April 1995

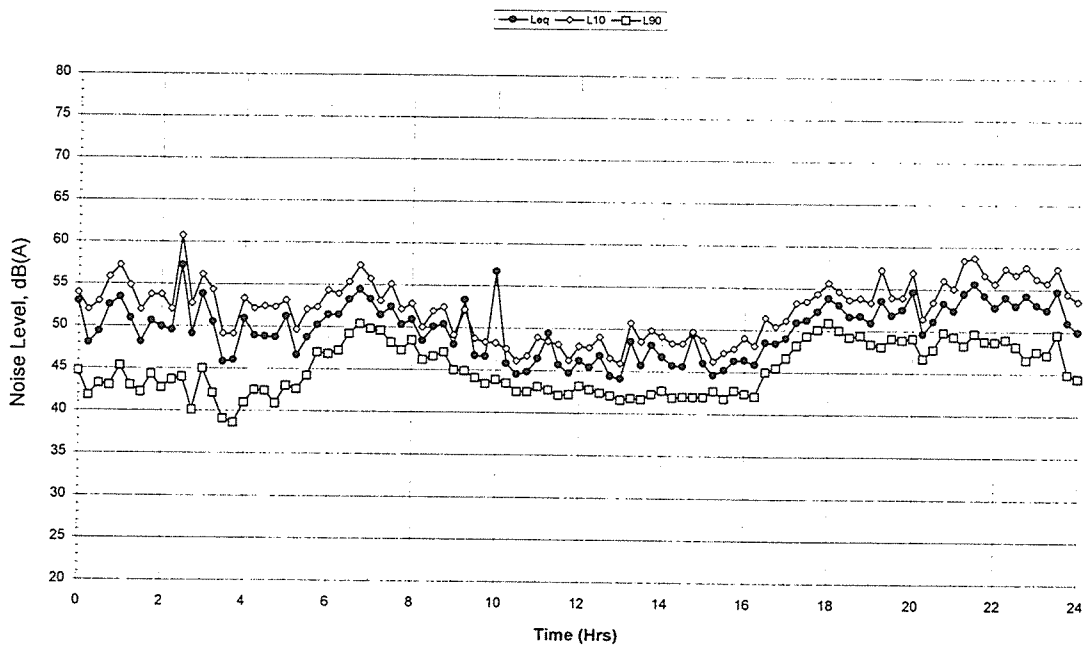




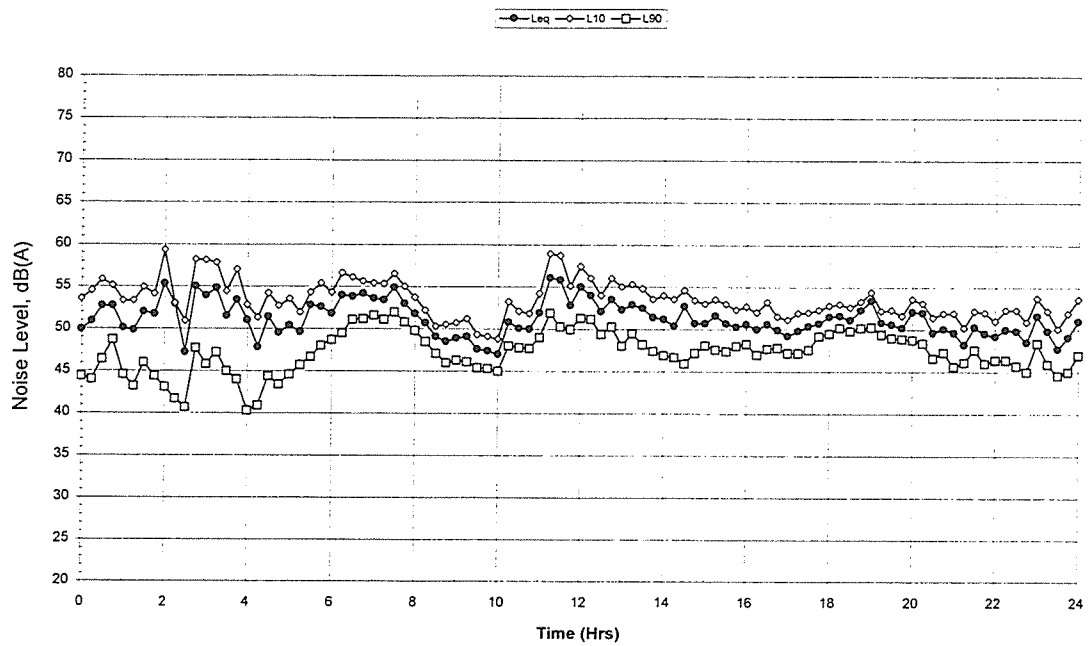
Muswellbrook Pool, Wednesday 10 August 1994



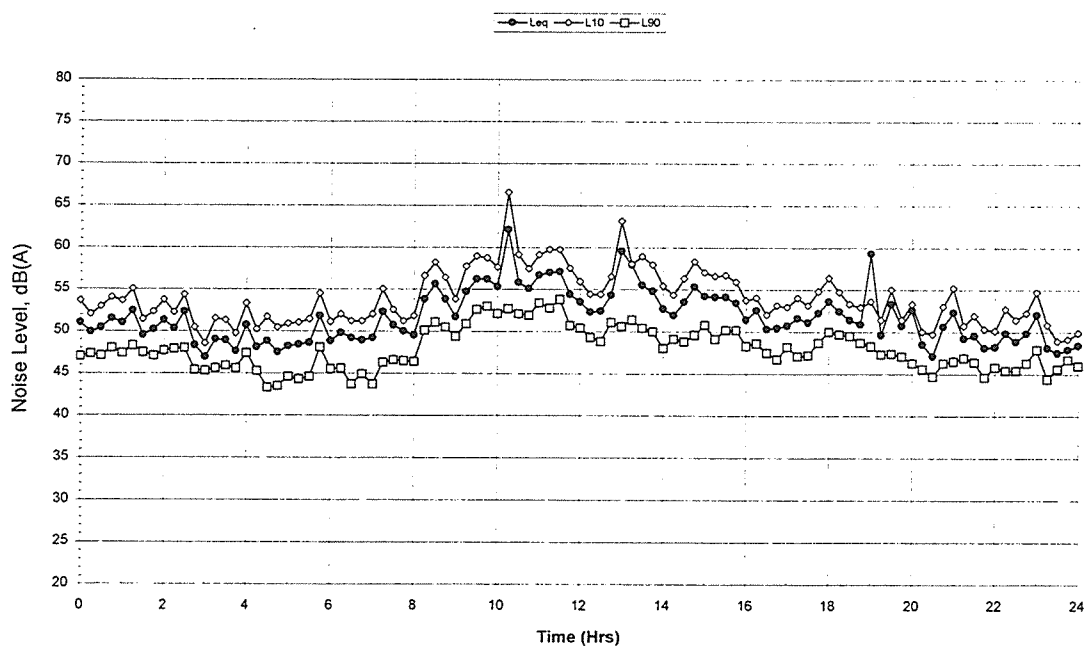
Muswellbrook Pool, Thursday 11 August 1994



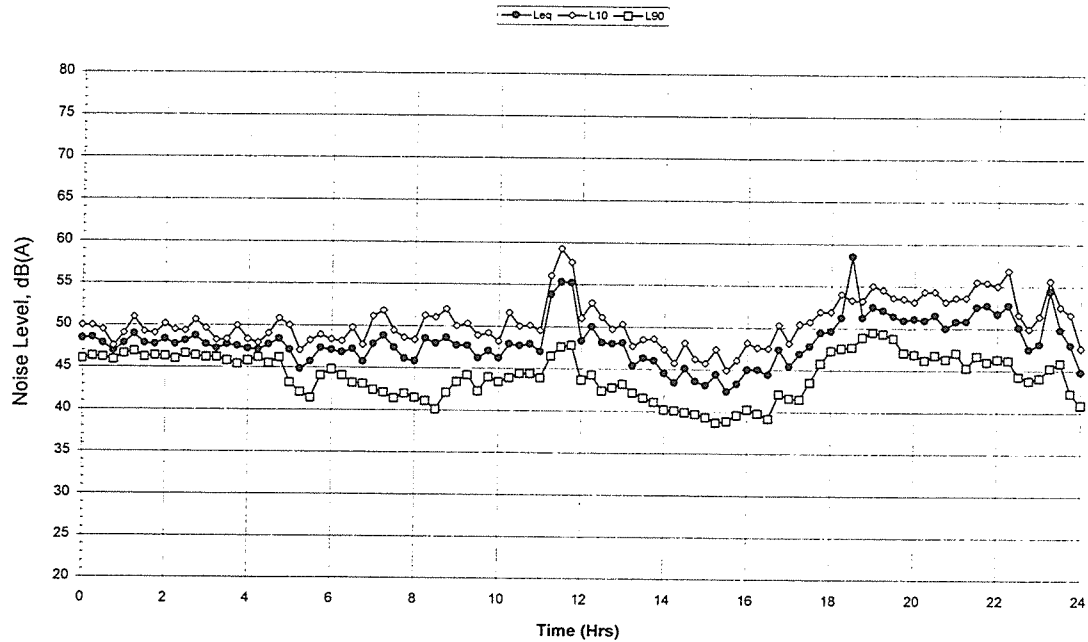
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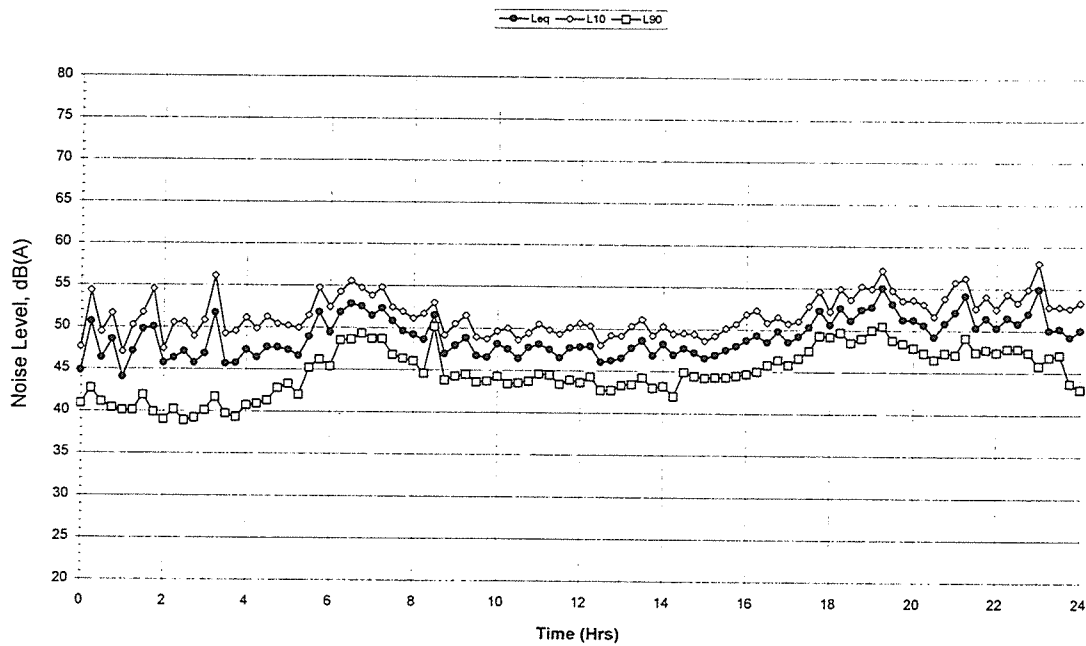
Muswellbrook Pool, Saturday 13 August 1994



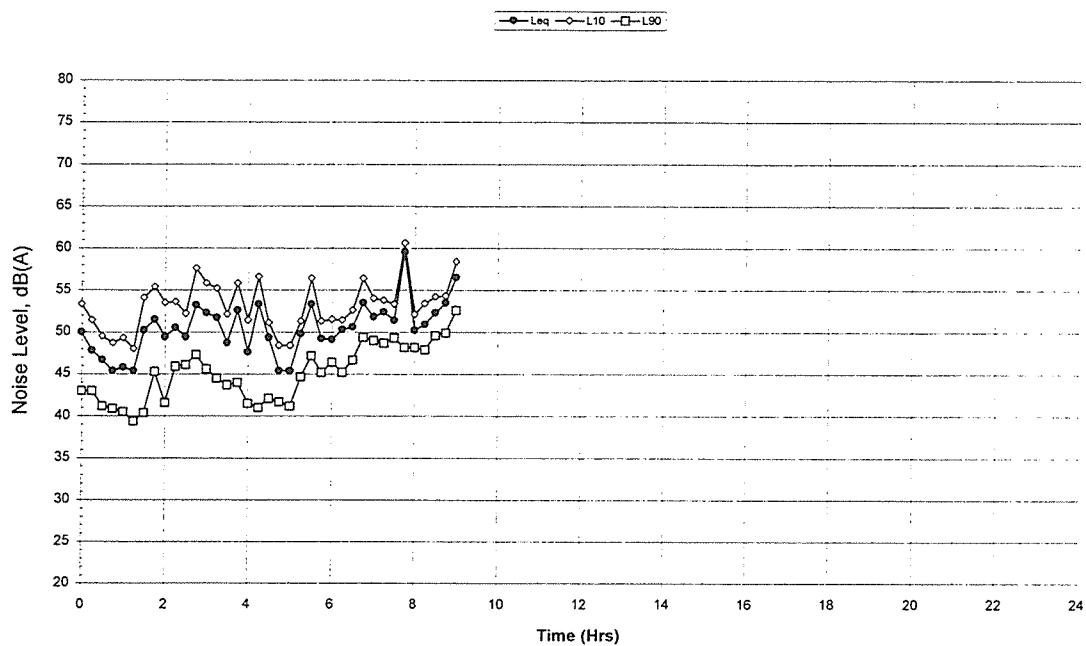
Muswellbrook Pool, Sunday 14 August 1994



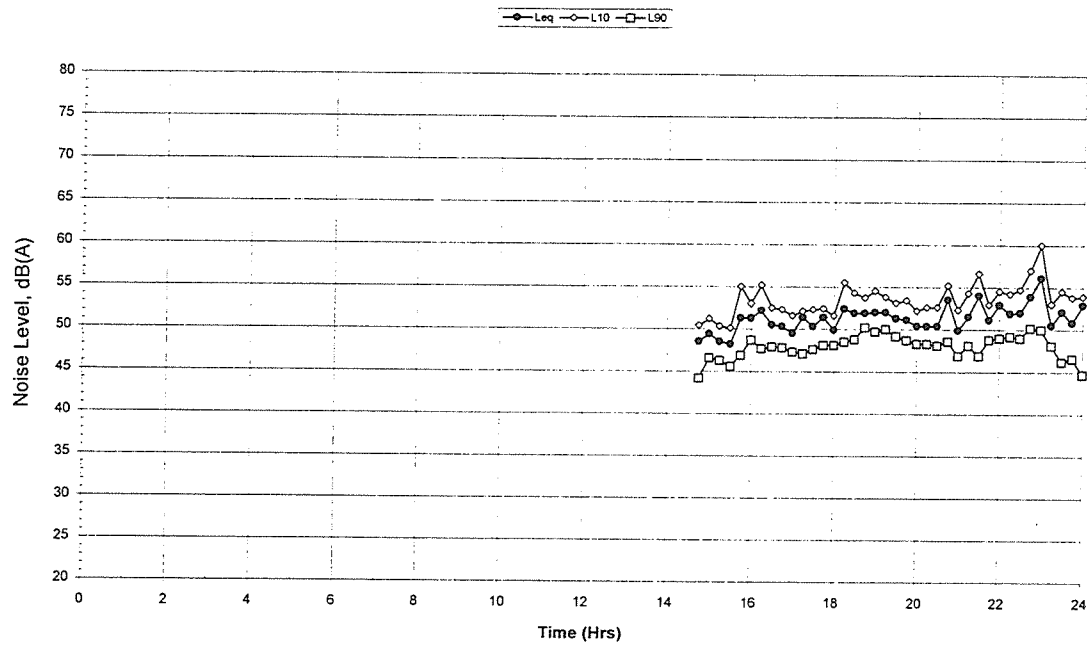
Muswellbrook Pool, Monday 15 August 1994



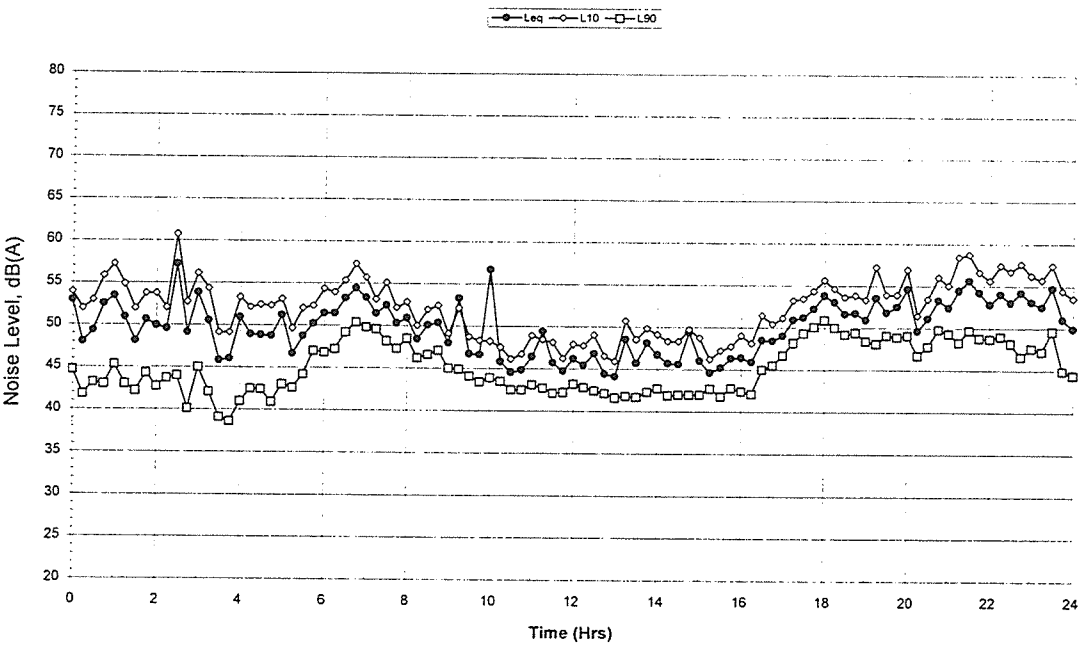
Muswellbrook Pool, Tuesday 16 August 1994



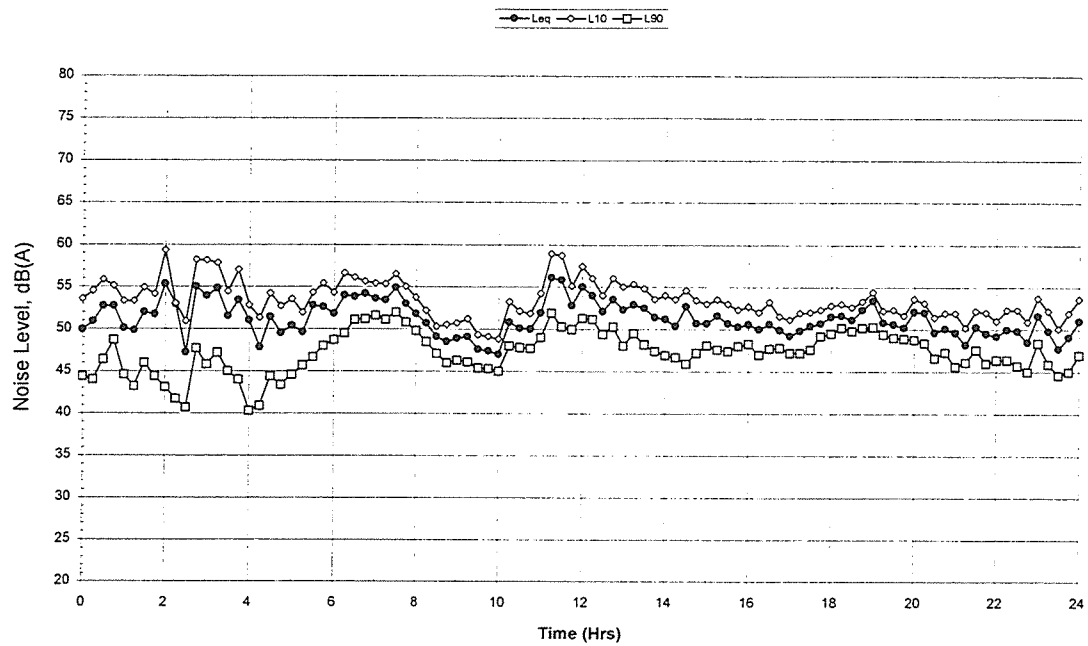
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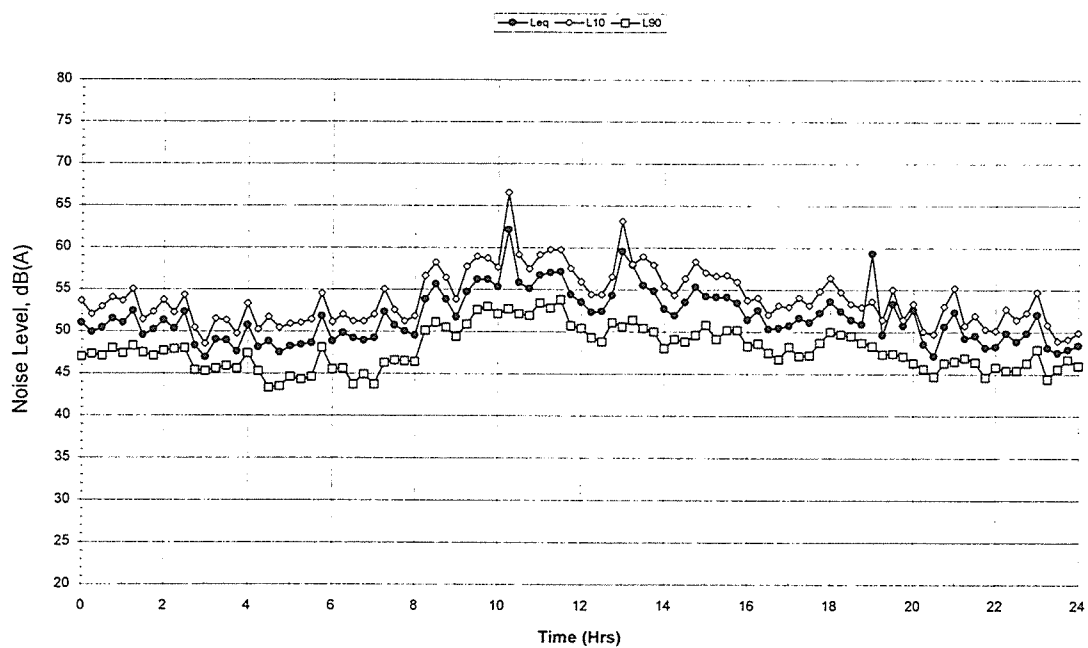
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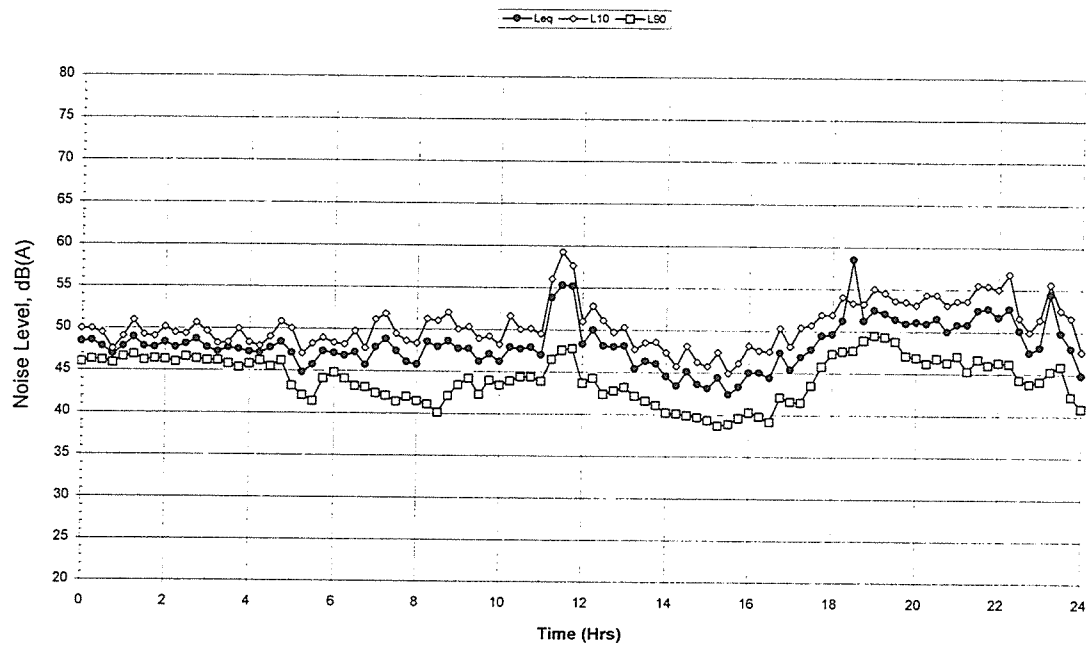
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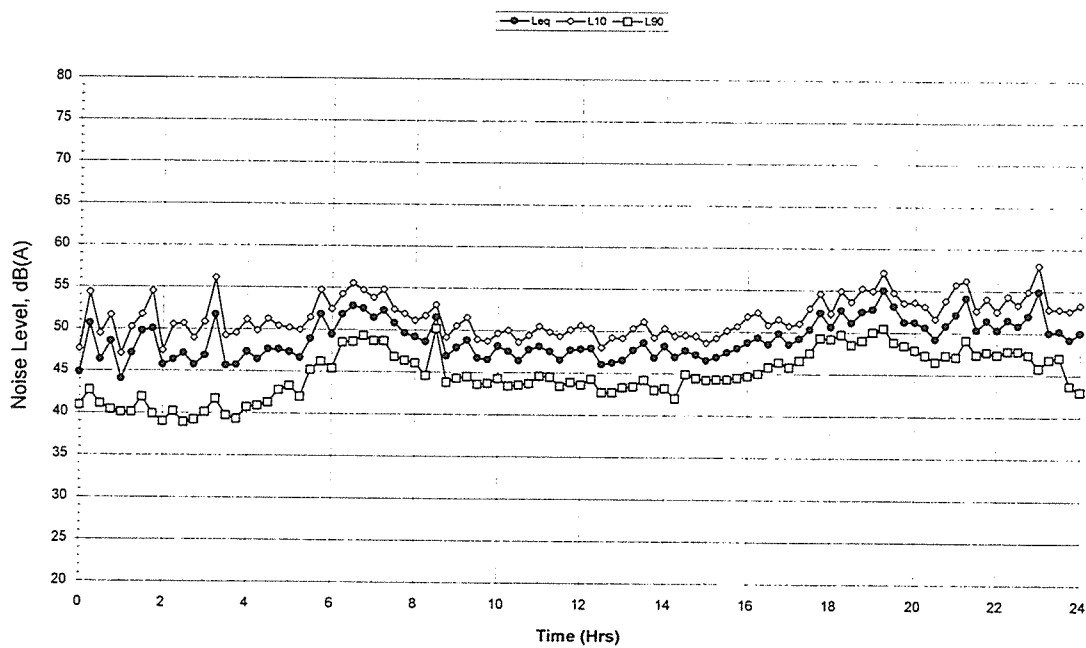
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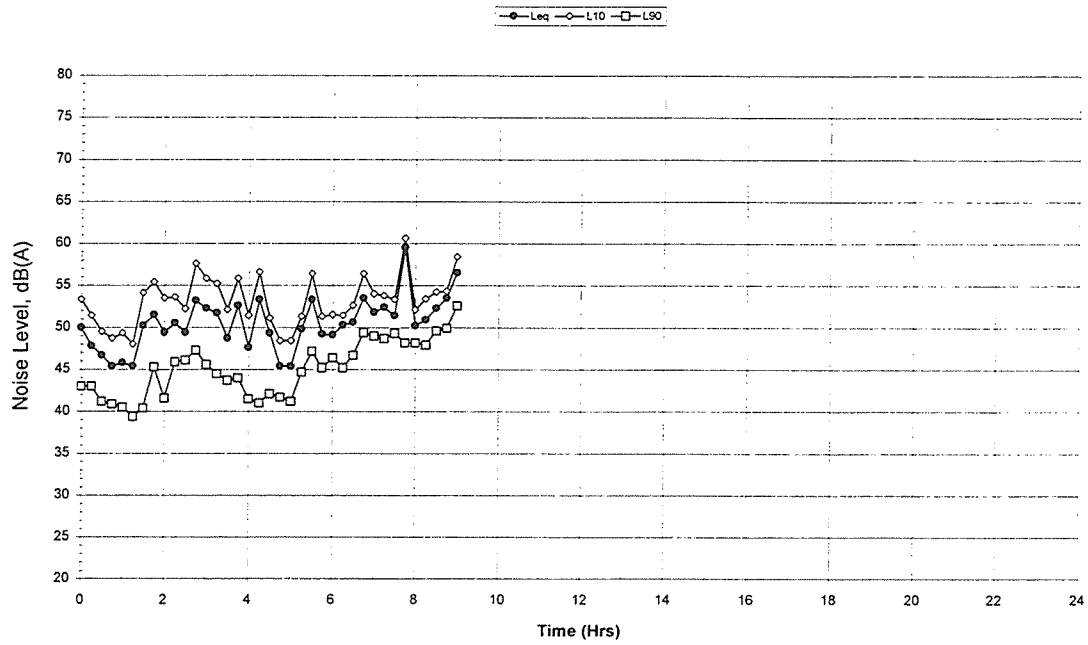
Muswellbrook Pool, Sunday 14 August 1994

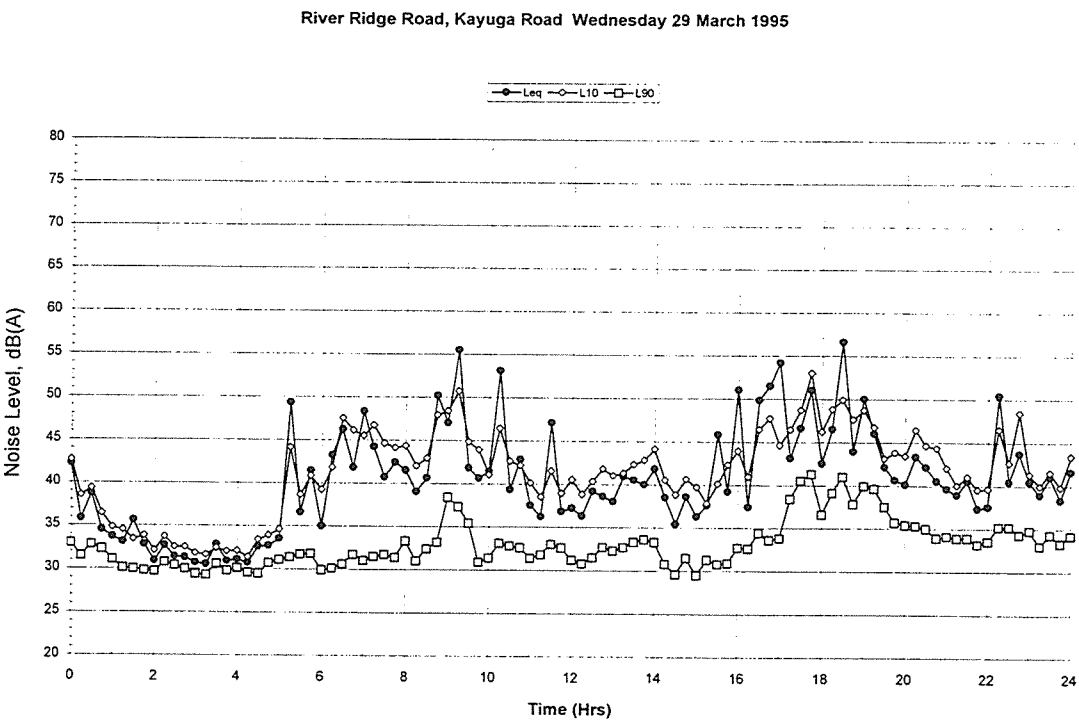
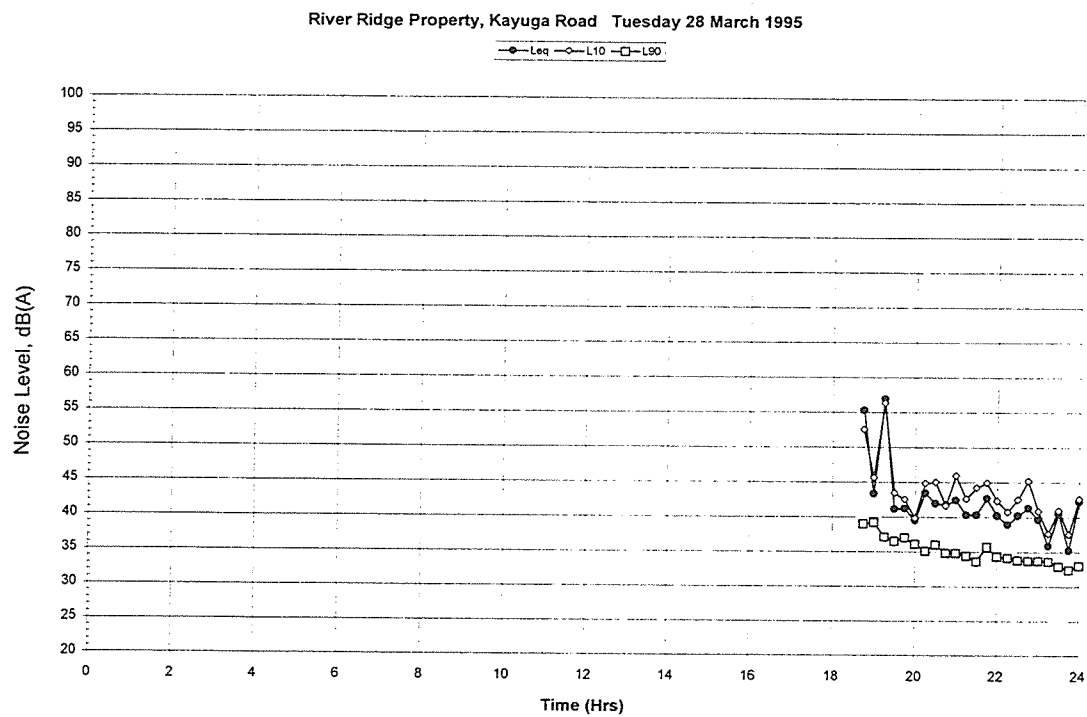


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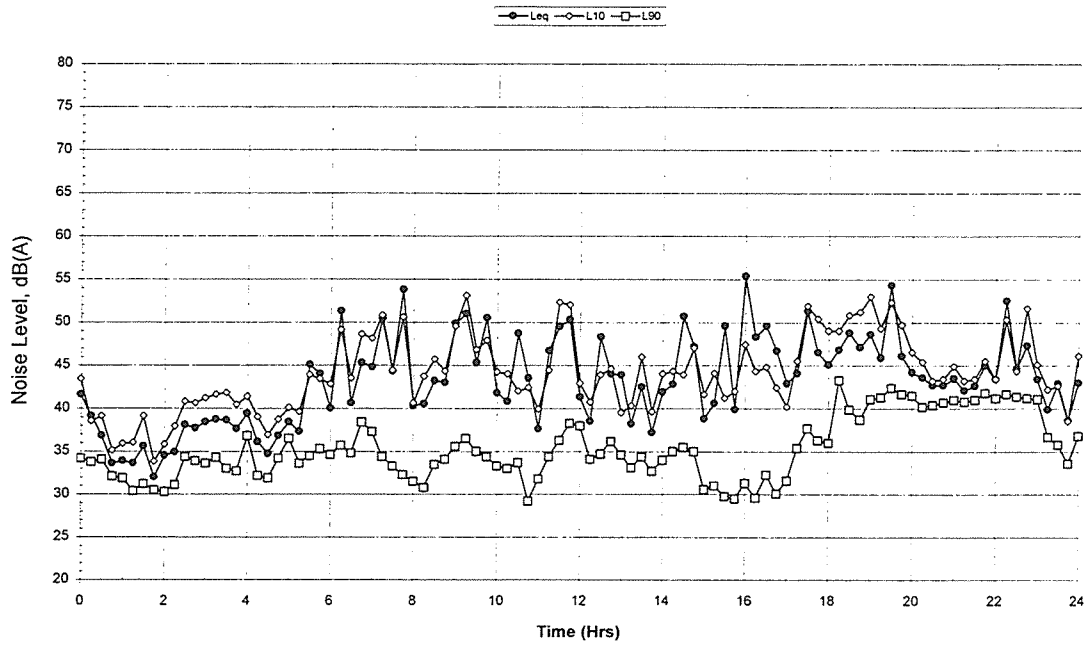


Muswellbrook Pool, Tuesday 16 August 1994

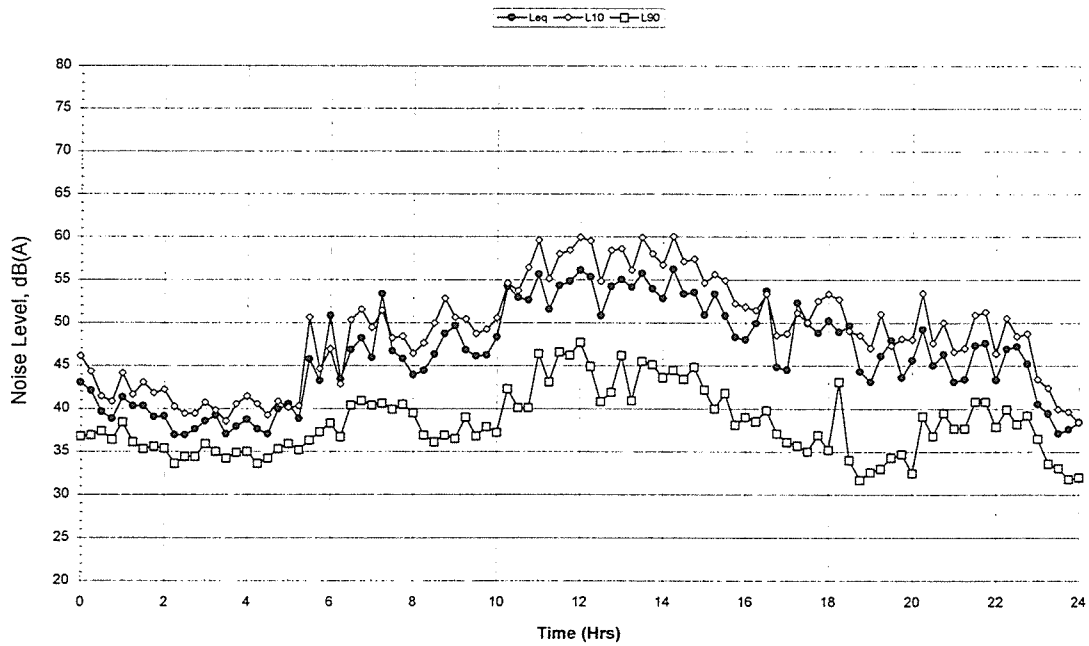




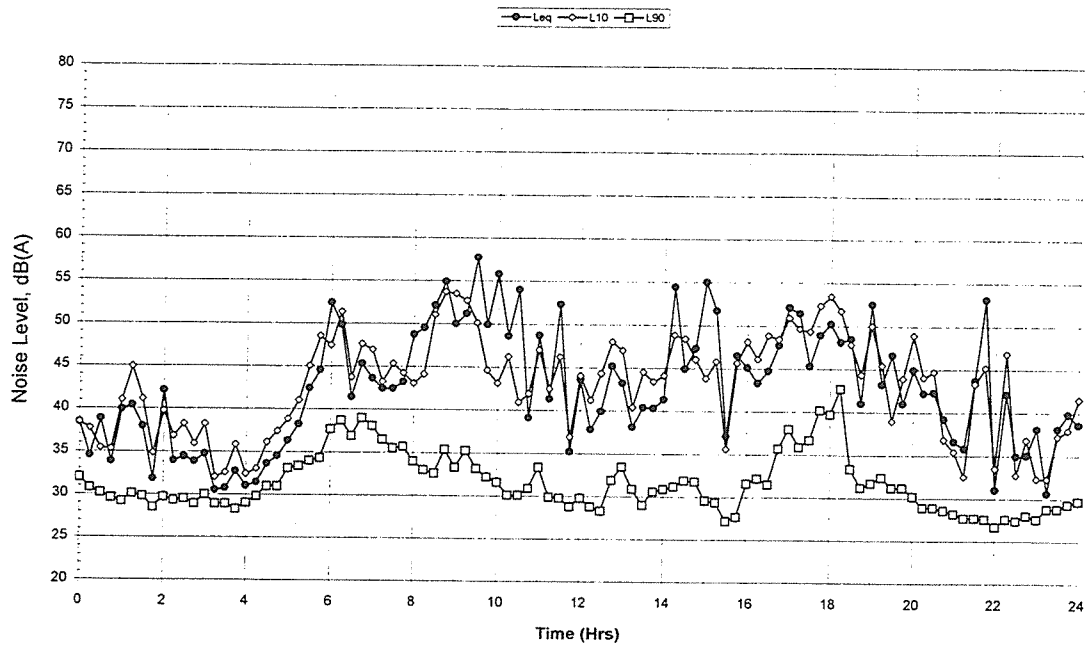
River Ridge Road, Kayuga Road Thursday 30 March 1995



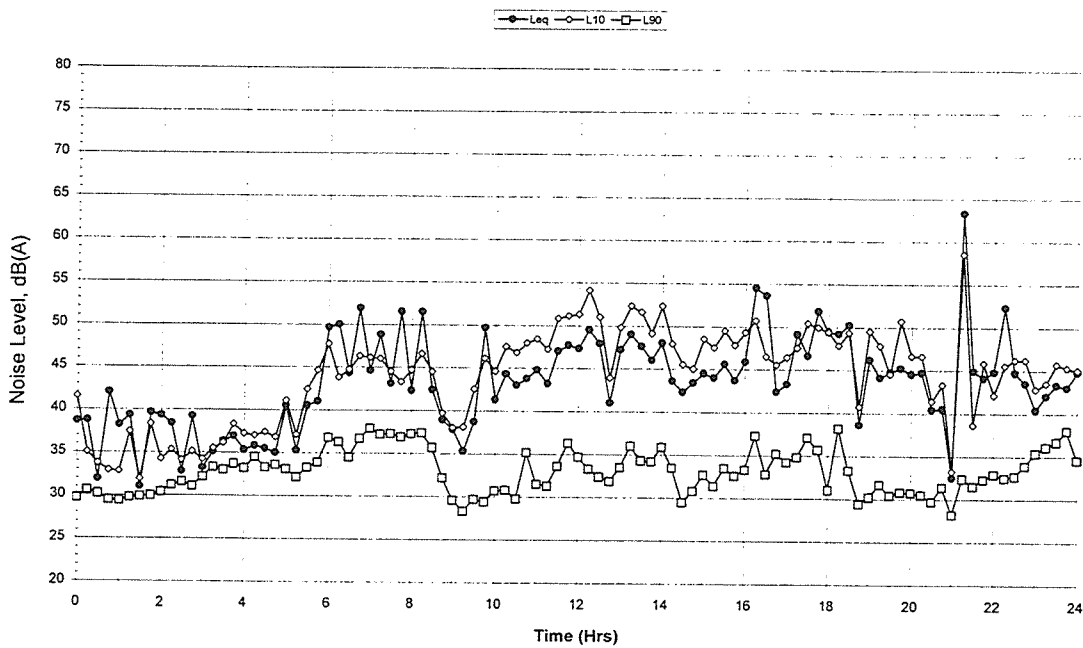
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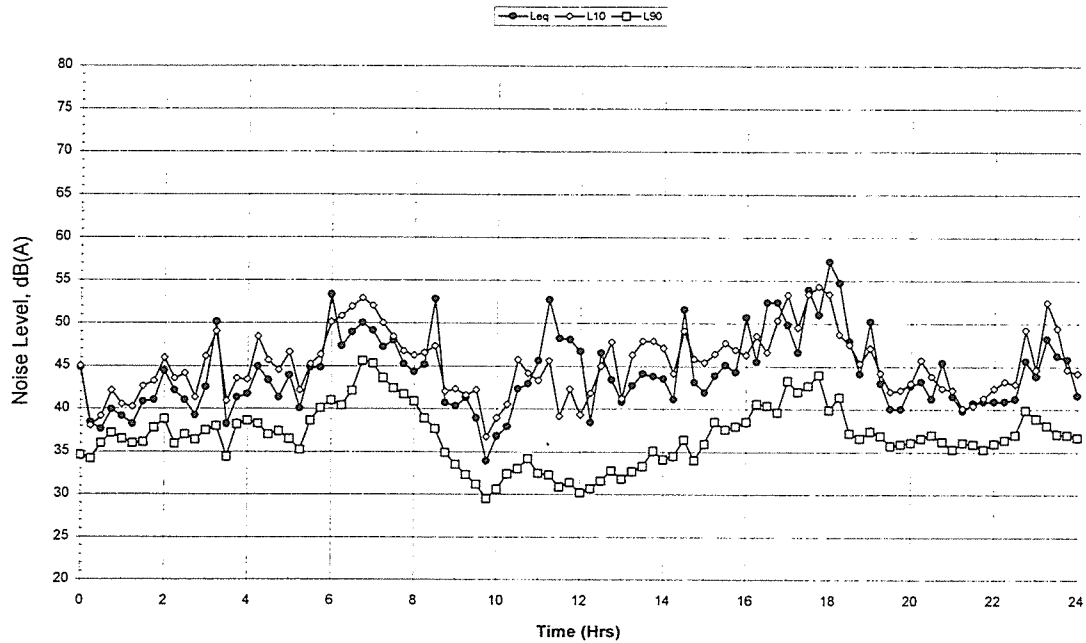
River Ridge Road, Kayuga Road Saturday 1 April 1995



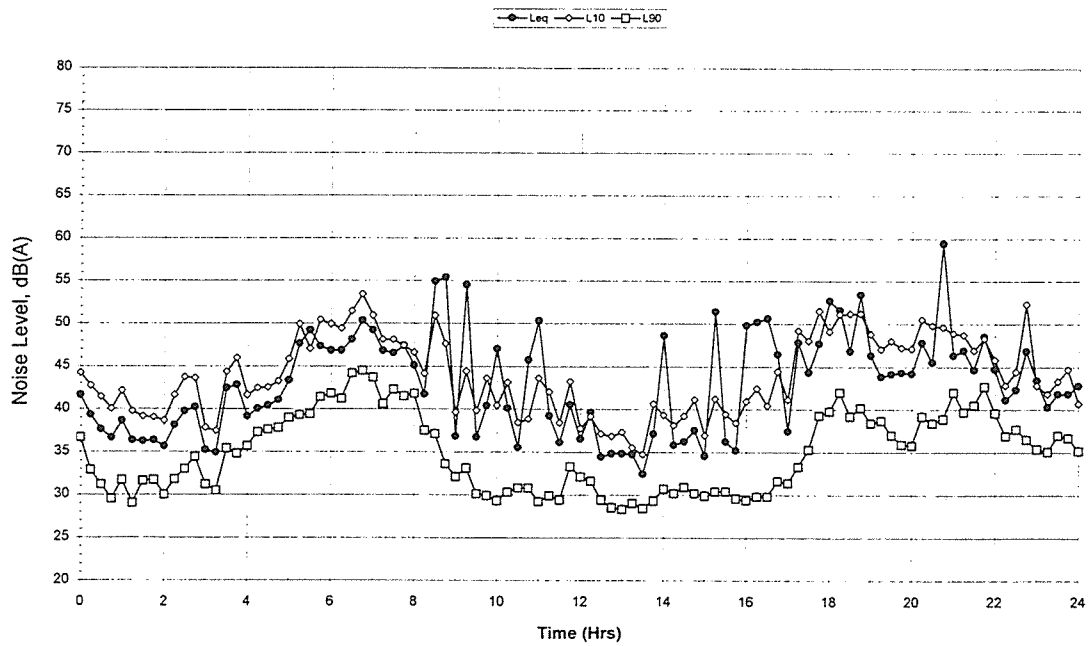
River Ridge Road, Kayuga Road Sunday 2 April 1995



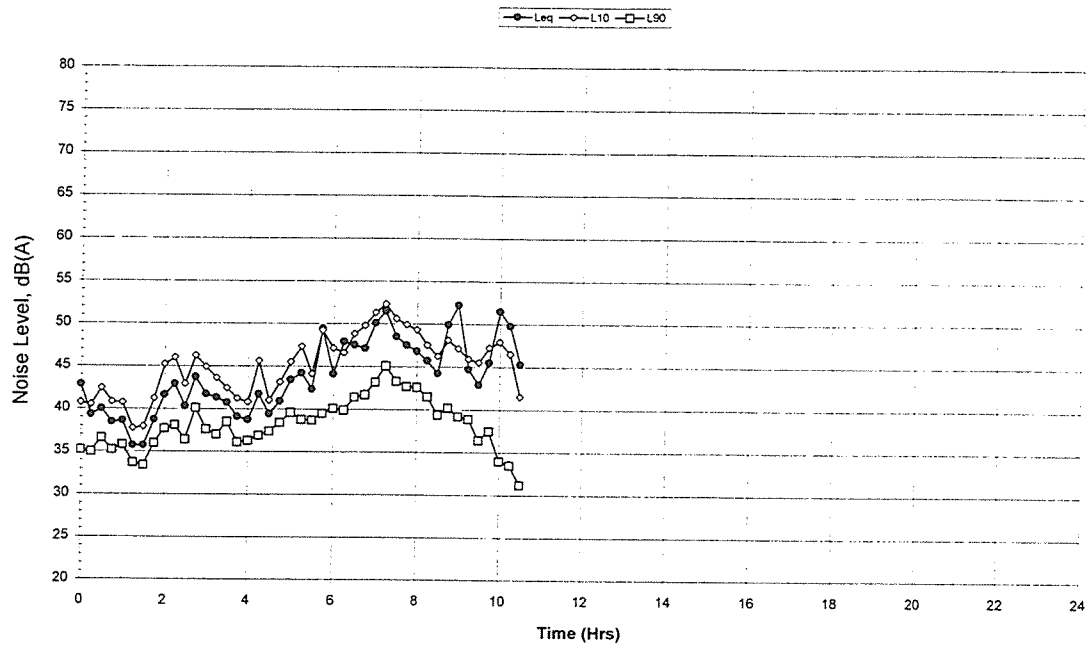
River Ridge Road, Kayuga Road Monday 3 April 1995



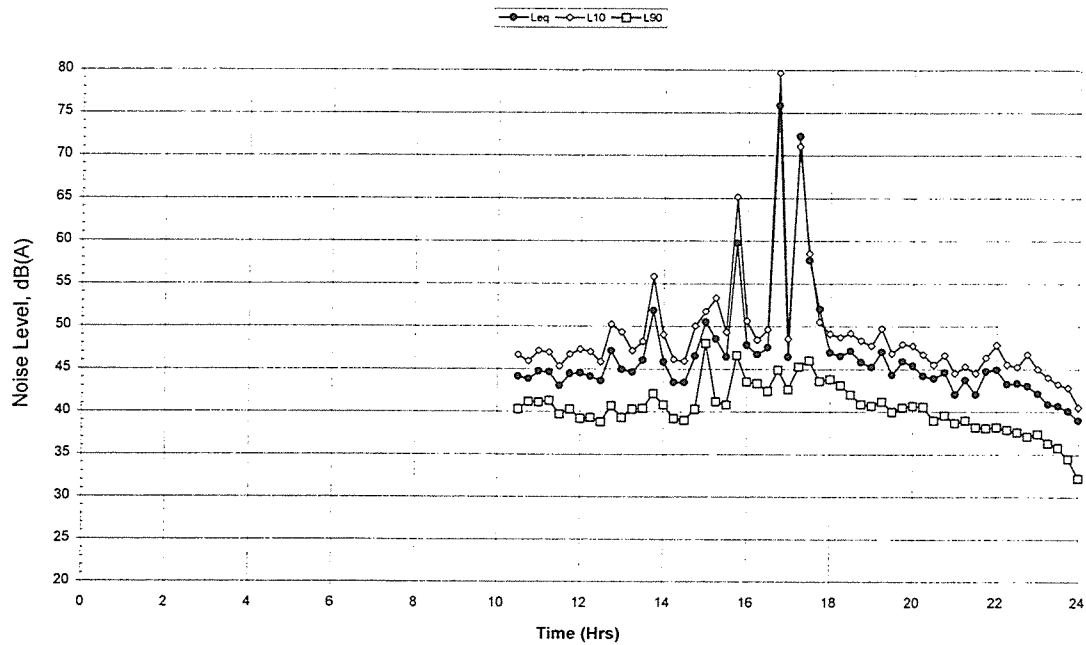
River Ridge Road, Kayuga Road Tuesday 4 April 1995



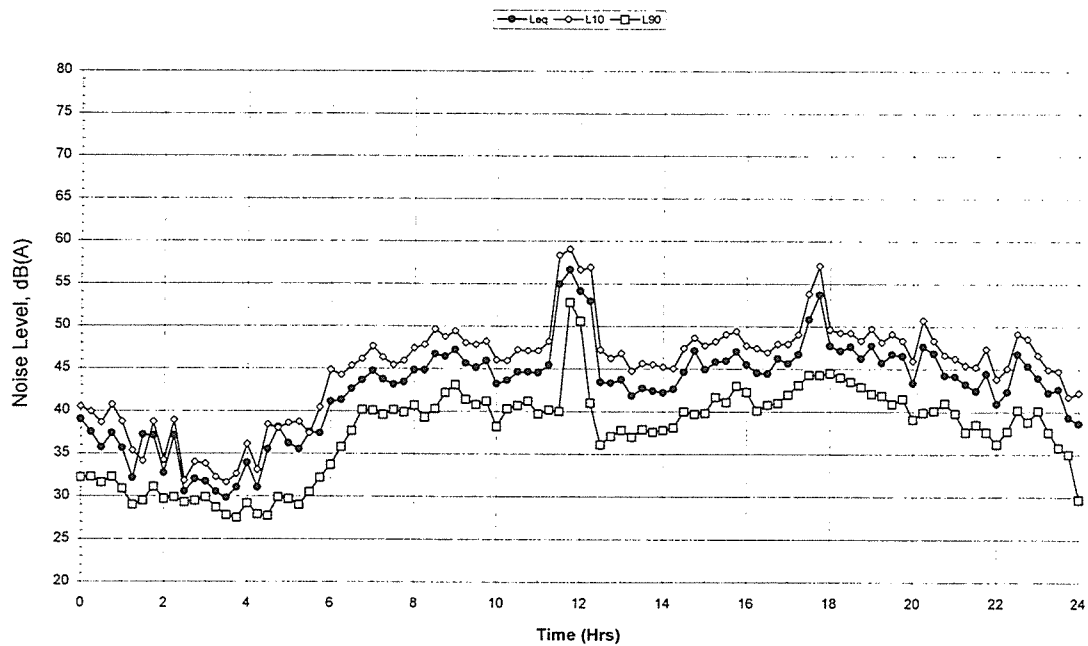
River Ridge Road, Kayuga Road Wednesday 5 April 1995



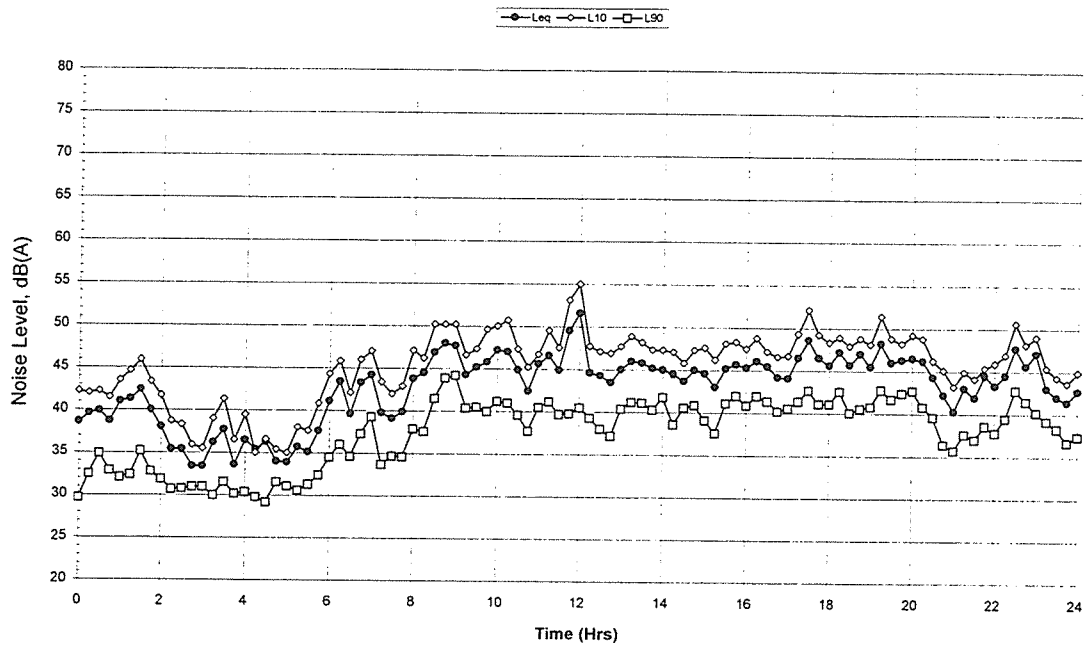
137 Hill Street, Muswellbrook Tuesday 28 March 1995



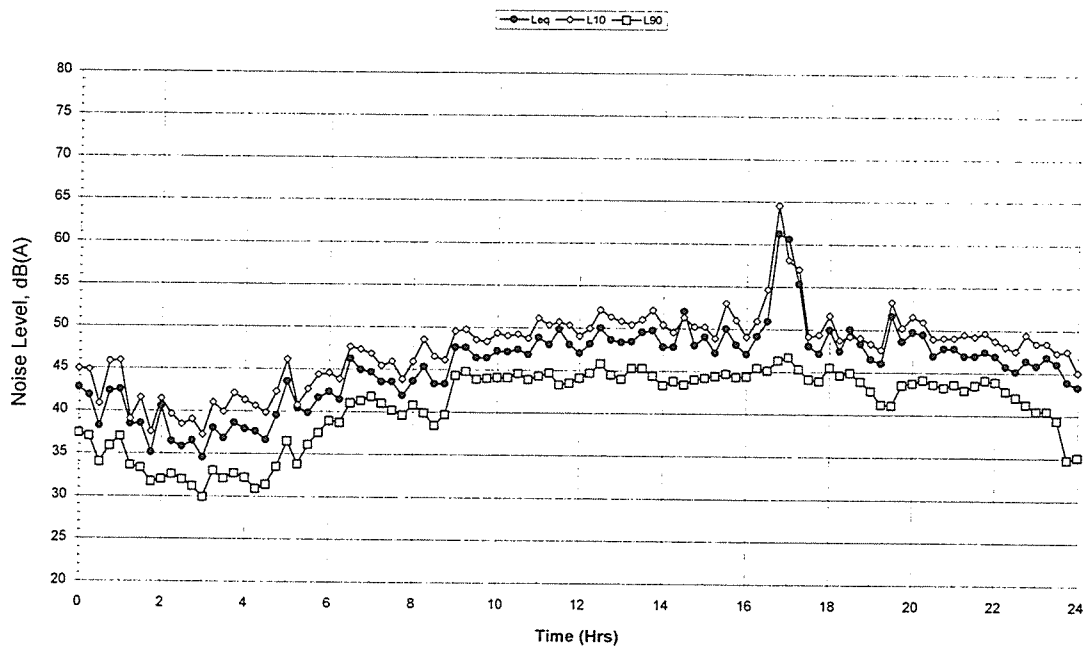
137 Hill Street, Muswellbrook Wednesday 29 March 1995



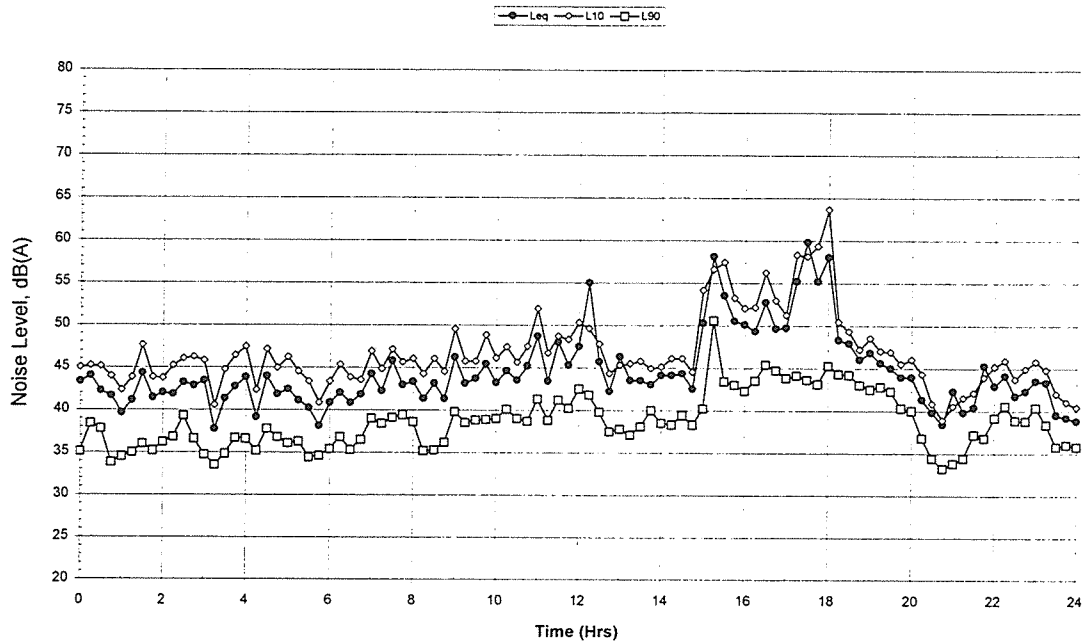
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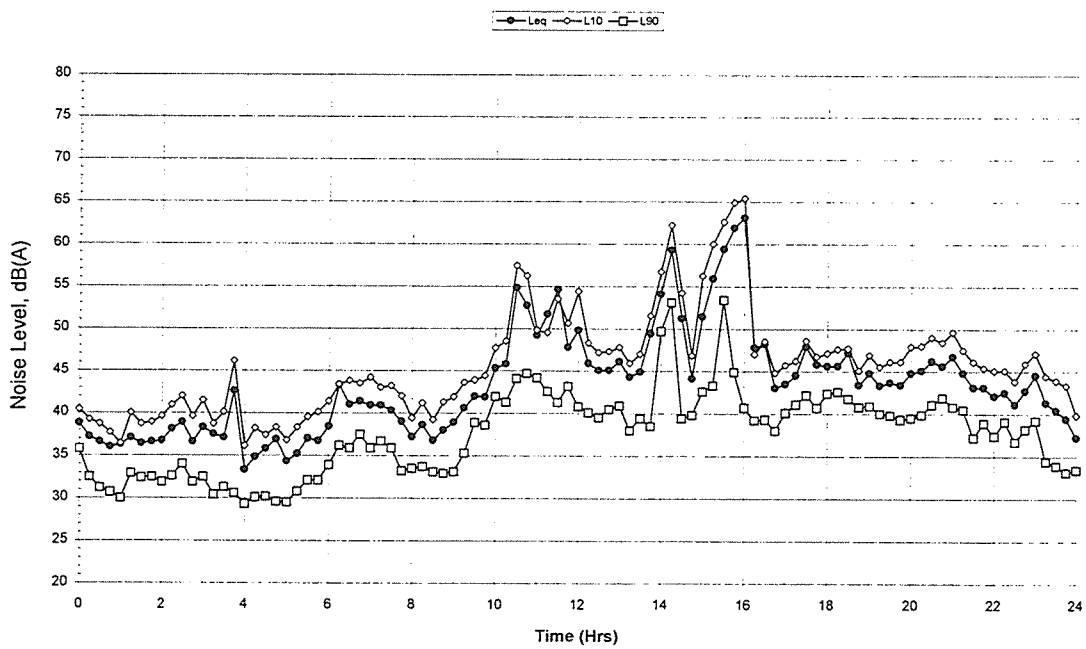
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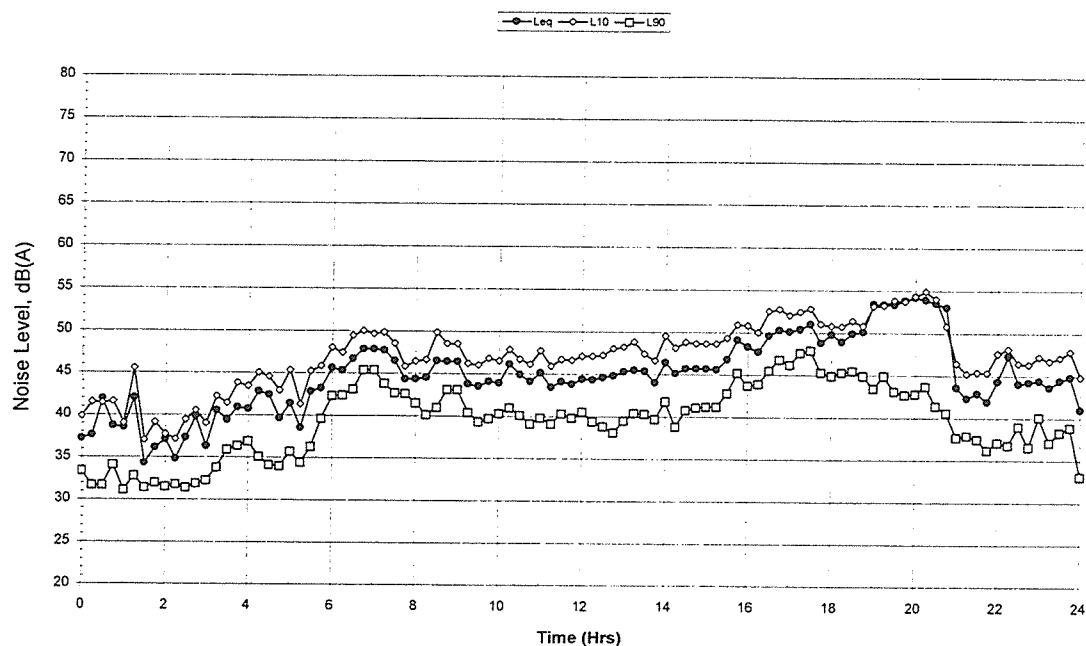
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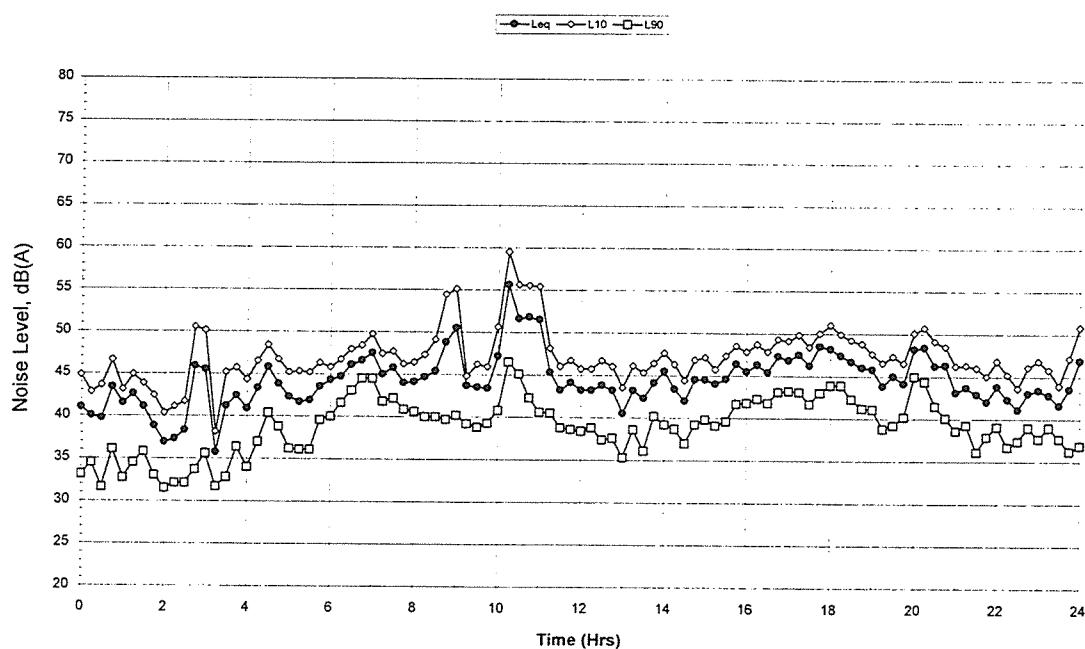
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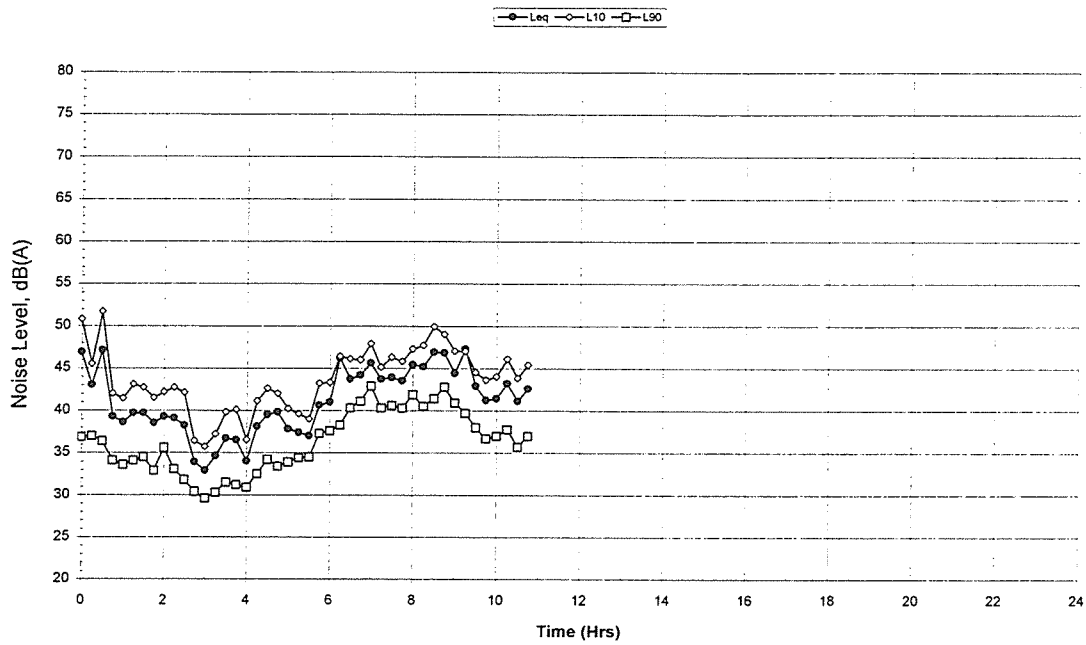
137 Hill Street, Muswellbrook Monday 3 April 1995



137 Hill Street, Muswellbrook Tuesday 4 April 1995



137 Hill Street, Muswellbrook Wednesday 5 April 1995



**DEVELOPMENT CONTROL
PLAN No. 5**

M

DEVELOPMENT CONTROL
PLAN No. 5



MUSWELLBROOK SHIRE COUNCIL

**DEVELOPER CONTRIBUTIONS
SECTION 94**

**REVISION 2
DEVELOPMENT CONTROL PLAN NO.5**

"CONTRIBUTION PLAN SECTION 94"

REVISION 1 - ADOPTED 13TH DECEMBER 1993 (DIV 1)

REVISION 2 - ADOPTED 19TH JUNE 1995 (DIV 1)

e) Child Care

This service is required due to the participation of both parents in the workforce. 1% of workforce required child minding at a cost of \$9,000 per place.

$$= 9,000 \times \frac{1}{100} = \$90.00 \text{ per employee}$$

f) Street Trees

N.A.

g) Bush Fire

N.A.

h) Rural Roads

Assessed under Council's standard on a per tonne basis. Refer Schedule 2. May also be assessed under Section 90.

i) Parking

To be provided in accordance with Development Control Plan 1 "Off Street Carparking" or a contribution of \$5,500 be made in Muswellbrook and \$2,500 be made for development in Denman.

11.5 Coal Mining

Nexus

The pressures placed on a community by expanding resource based industry are different to that by other industries.

Studies carried out by the Association of Coal Related Councils have indicated high multiplier effects in the mining industry. Coalmines produce 1.39 to 2.31 jobs in the private sector for each job directly employed by the coal mine.

The construction phases of a coal mine also places additional pressures on a community. There is a high multiplier effect in the initial construction stage primarily due to migrant workers coming into the area and associated industry involved off site.

a) Passive Open Space

Council requires a Partial Contribution for this under Subdivision and Residential Development. This represents approximately 50% of the total amount. A further Contribution in regard to the remainder can be required industry to offset demand placed by increased unemployment.

eg. a) Muswellbrook \$470 Less previous contribution \$235 = \$235

Adopt \$200

b) Active Open Space

A partial contribution is required under Subdivision and Residential Development. This represents approximately 50% of the total calculated amount. A further contribution in regard to industry is required to offset demands placed by increased employment.

eg.	a) Provision \$535 Less Previous Contribution \$267 =	\$265
	b) Facilities \$850 Less Previous Contribution \$425 =	<u>\$425</u>
		\$690
	<u>Adopt \$400</u>	

c) Social Assets Halls etc

Council is required to provide an adequate standard of social infrastructure for residents and visitors to the Shire. This infrastructure is available to all people. This infrastructure is valued at \$5 million to service 16,000 residents.

Development increases the need for this infrastructure and a demand by its users. A cost per employee or future resident family can be calculated at: $\frac{5,000,000}{16,000} = \312

per person or $\$312 \times 3.4 = \1060 per household.

(Discounted Amount \$900)

d) Libraries

Libraries are used by all the community and Council has incurred a cost in providing these. This cost is approximately \$720 per family unit and can be related to increased demand generated by industry such as coal mining.

(Discounted Amount \$600)

e) Child Care

Using prior calculative and ABS statistics, 2% of the mine workforce require child minding, either preschool or long day care. The cost of providing this is \$5,000 to \$9,000 per place using the map \$9,000 at 2%. The cost per employee is:

$$9,000 \times \frac{2}{100} = \$180.00 \text{ per employee}$$

f) Street Trees

N.A.

g) Bush Fire

N.A.

12.5 **Coal Mining** per employee

Sector	Contribution
a) Passive Open Space	\$200.00
b) Active Open Space	\$400.00
c) Social Assets, Halls etc	\$900.00
d) Libraries	\$600.00
e) Child Care	\$180.00
f) Street Trees	-
g) Bush Fire	-
h) Rural Roads	As per Schedule 2
i) Off Street Parking	
Total per lot	<u>\$2,280.00</u>

13. PAYMENT OF CONTRIBUTIONS

Contribution levied in accordance with this Plan shall be lodged with Council prior to release of a building application if required or prior to endorsement of a plan of subdivision if required or prior to commencement of any works, whichever comes first or as may be varied with the consent of Council.

14. PROPOSED AREAS OF EXPENDITURE

SCHEDULE 1

a) **Passive Open Space**

To be expended on acquisition of passive open space within the Township of Muswellbrook to complete existing pedestrian and cycle links between residential areas in North Muswellbrook and South Muswellbrook.

To carry out works within passive open space areas to improve the amenity to the residents and the expanding population. Such works will include provision of concrete paths and open space, provision of tree planting, lighting and facilities for the Townships of Denman and Muswellbrook.

- Urban Forest East Muswellbrook	100,000
- Cycleways	100,000
- Tree Planting Denman Oval	40,000

b) **Active Open Space**

To acquire and expand a centralised active open space area to facilitate all sports within the Township of Muswellbrook and within the Township of Denman. To continue acquisition of open space to maintain the existing ratios. To enlarge and upgrade facilities and to provide amenities for Active Open Space areas.

Bowman Park Playground and Car Park	80,000
Highbrook Park Playground	50,000
Karoola Park Playground (Hunter St. end)	40,000
East Mbk Sporting Area	500,000
Highbrook Park W/C	20,000
Denman Park W/C Block	20,000

c) **Social Infrastructure Assets**

Monies received in relation to this allocation will be expended on the provision and upgrading of social infrastructure such as halls, baby health centres, Queen Elizabeth Building, community centres, art galleries etc.

Cultural Centre	1,000,000
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d) **Libraries Infrastructure**

Monies received in relation to these will be expended in the Township of Denman or the Township of Muswellbrook in regard to the expansion of library facilities and construction of buildings to service the needs of the population brought about by this development.

Provision of facilities and materials	ongoing
---------------------------------------	---------

e) **Child Care Services**

Child Care	500,000
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f) **Street Trees**

Monies received for the provision of street trees will be expended on the provision of 2 trees per residential block within the immediate area of the development for which the contributions were received.

Muswellbrook	50/block
Denman	50/block

g) **Bush Fire Facilities**

Funds received will be expended on the upgrading of bush fire facilities for which that development making the contribution is wholly within the bush fire brigade area.

Albano
Bowmans Creek
Dalswinton
Edinglassie
Hebden
McCullys Gap
Muscle Creek
Baerami
Martindale

Widden
Yarrawa
Kayuga
Mangoola
Sandy Hollow
Spring Creek
Wybong

h) **Rural Roads Upgrading**

Funds will be expended on the upgrading of the Rural Road between the development and the closest major population centre.

i) **Carparking**

Monies collected in lieu of onsite carparking will be expended in the provision of public carparking in the CBD area of Denman or the CBD area of Muswellbrook depending on where the development takes place.

Main Street Muswellbrook	ongoing
Main Street Denman	ongoing

SECTION 90 CHECKLIST

N

TELEPHONE 44 HOLT 038

Summary of Section 90(1) - Matters for Consideration	Comment
a. Environmental planning instruments Development control plans	Refer to Chapter 4
a1. National Parks & Wildlife Act 1974	Refer to Chapter 8, Appendix H
b. Impact on the environment	Refer to Chapters 7 to 14
c. Effect on the landscape and scenic quality	Refer to Section 13.3
c1. Effect on any wilderness area	The land is not within the vicinity of a wilderness area.
d. Social and economic effect	Refer to Sections 10.2 and 10.3
e. Character, location, siting, bulk ... of development	Refer to Chapter 6.
f. Size and shape of land and siting of buildings	Refer to Sections 1.2 and 6.3.
g. Whether the land is subject to flooding, tidal inundation.	Not applicable to the site.
h. Relationship to adjoining land	Refer to Section 7.1.
i. Vehicular access, parking and loading	Refer to Sections 6.2 and 6.3.
j. Traffic impact	Refer to Section 14.3.
k. Public transport	Not relevant to the case.
l. Utility services	Refer to Section 6.3.9.
m. Landscaping	Refer to Sections 6.3.2 and 13.4.
n. Public authority representation	Public authority representations have been incorporated into the document. Further representations will be submitted at the end of the exhibition period.
o. Amenity	Refer to Sections 10.3.6 and 10.3.7.
p. S87 Submission	Refer to Section 4.4.
q. Circumstances of the case	There are no outstanding circumstances of this proposed development not referred to in other sections of this report.
r. The public interest	The issues raised by the public are discussed in Section 4.3.
s1. Assessment of protected fauna and fauna habitats.	Refer to Section 8.2
s2. Government Coastal Policy	Not applicable to the development.
s3. Impacts on flora and fauna	Refer to Section 8.1 and 8.2.
s4. An assessment of Bushfire Hazard	Refer to Section 7.4.
s5. Disabled access	Disabled access will be provided to the Administration area.

JOINT LAND ACQUISITION POLICY

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JOINT LAND ACQUISITION POLICY

JOINT POLICY FOR CUMULATIVELY AFFECTED BY THE PROPOSED MOUNT PLEASANT AND KAYUGA COAL MINES

Coal & Allied Operations Pty Limited and Kayuga Coal Pty Limited recognise that there will be areas affected by the cumulative activities of the proposed Mount Pleasant and Kayuga Coal mines that will not be impacted by either mine on its own. The companies have therefore prepared this joint policy to assist in the resolution of possible land use conflicts.

- the area jointly affected by the mines will depend on when each begins operations. The exact timing and rate of development for both mines will be determined by market demand and it is likely that the mines will commence at different times.
- the companies believe that the property owners affected by the joint operations of the mines should be treated on a comparable basis to those in the individual areas of affectation.
- It is proposed that once the initial open cut mining approval is lodged for the second mine, the area of cumulative affectation shown in the exhibited Environmental Impact Statements will be assessed in accordance with the exhibited mine plans as assessed in the individual Environmental Impact Statements. Property owners within the area as assessed will then be protected by;
 - * environmental safeguards;
 - * agreements to lease the property;
 - * agreements to provide other forms of compensation for the duration of any cumulative impacts or;
 - * undertakings to purchase under the same terms as apply to those in the individual mine areas of affectation.
- Mount Pleasant and Kayuga Coal will develop a procedure which ensures owners of cumulatively affected properties are dealt with equitably and promptly.
- This objective of this policy is to ensure that the interests of property owners are appropriately safeguarded well before impacts are experienced and that they are given the same level of protection as those closer to and impacted by the individual mines.

PROPERTY OWNERSHIP DETAILS

P

PROPERTY
OWNERSHIP DETAILS

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE

Property Number	Property Owner	Residences				Properties			
		Not Affected by Mount Pleasant Project		Affected by Noise from Mount Pleasant Project		Within Cumulative Effects Envelope (see Figure 52)		Affected by Dust from Mount Pleasant Project	
		from Mount Pleasant Project	Affected by Noise from Mount Pleasant Project	from Mount Pleasant Project	from Mount Pleasant Project	from Mount Pleasant Project	from Mount Pleasant Project	from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)
see Figures 24 & 25									
1.	Kropp R & J		1					✓	✓
2.	Loneragan JA		1						✓
3.	Loneragan WE							✓	
4.	Loneragan JA							✓	✓
5.	Kayuga (1827) P/L							✓	
6.	Dartbrook Joint Venture					✓		✓	
7.	Kayuga (1827) P/L					✓		✓	
8.	Dartbrook Joint Venture	3	3			✓		✓	
9.	Dartbrook Joint Venture					✓		✓	
10.	Ducey JE & MS					✓			
11.	Loneragan J & NM	1				✓			✓
12.	Loneragan J & NM					✓			✓
13.	Dartbrook Joint Venture					✓		✓	
14.	Dartbrook Joint Venture	1	1			✓		✓	
15.	Casey GM					✓		✓	
16.	Casey GM	1	1			✓		✓	
17.	Loneragan JA							✓	
18.	Casey JO							✓	
19.	Loneragan JE & JL							✓	✓
20.	Loneragan JS, JE & NM					✓		✓	
21.	Loneragan J & NM					✓		✓	
22.	Loneragan JA	1	1			✓		✓	

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences				Properties			
		Not Affected by Noise Affected by Dust		Within Cumulative Affected by Noise Affected by Dust		Within Cumulative		Effects Envelope	
		Pleasant Project	Affected by Noise from Mount Pleasant Project	Pleasant Project	from Mount Pleasant Project	Pleasant Project	from Mount Pleasant Project	Pleasant Project	from Mount Pleasant Project
see Figures 24 & 25									
23.	Loneragan PJ					✓		✓	
24.	Watts WF & PJ					✓		✓	
25.	Fell CM		1		1	✓		✓	
26.	Collins GC & KM					✓		✓	
27.	Casey JO		1			✓		✓	
28.	Casey MM								✓
29.	Kayuga (1827) P/L					✓		✓	✓
30.	Casey EJ & JO					✓		✓	✓
31.	Coal & Allied		1		1	✓		✓	
32.	Coal & Allied		1		1	✓		✓	
33.	Coal & Allied		1		1	✓		✓	
34.	Loneragan PJ		1		1	✓		✓	
35.	Watts WF & PJ		1		1	✓		✓	
36.	Temporary Common					✓		✓	
37.	Partridge DJ					✓		✓	
38.	Loneragan JA					✓		✓	
39.	Coal & Allied	1				✓		✓	
40.	Loneragan PJ					✓		✓	
41.	Partridge DJ					✓		✓	
42.	Loneragan PJ					✓		✓	

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences				Properties																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		Not Affected by Noise Affected by Dust by Mount Pleasant Project		Affected by Noise Affected by Dust from Mount Pleasant Project		Within Cumulative Effects Envelope (see Figure 52)		Affected by Dust from Mount Pleasant Project																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences			Properties		
		Not Affected by Mount Pleasant Project	Affected by Noise from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)	Affected by Noise from Mount Pleasant Project	Dust from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)
see Figures 24 & 25							
65.	Scriven GJ				✓	✓	
66.	Rosebrook P/L	2	2		✓	✓	✓
67.	Coal & Allied	1	1		✓	✓	
68.	Coal & Allied				✓	✓	
69.	Schlegel JG & FA	1	1		✓	✓	
70.	Oafox P/L				✓	✓	
71.	Oafox P/L	1			✓	✓	✓
72.	Googe RK & NV			1		✓	✓
73.	McLean MA & RE		2			✓	✓
74.	Horne C & VP					✓	✓
75.	Hugo D & J			2		✓	✓
76.	Bengalla Mining Co	1	1		✓	✓	
77.	O'Keefe OJ & Others	1	1		✓	✓	
78.	Thompson K & M		1		✓	✓	
79.	Riley AJ & A		1		✓	✓	
80.	Scriven GJ		1			✓	
81.	McKinnon P & B		1			✓	
82.	Ellis N & R		1			✓	
83.	Hanson L & C	1	1		✓	✓	
84.	Bengalla Mining Co	1	1		✓	✓	
85.	Lawrence R & M	1	1		✓	✓	
86.	Bengalla Mining Co	1	1		✓	✓	

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences			Properties				
		Not Affected by Noise Affected by Dust		Within Cumulative	Affected by Noise Affected by Dust		Within Cumulative		
		by Mount Pleasant Project	from Mount Pleasant Project	Effects Envelope (see Figure 52)	from Mount Pleasant Project	from Mount Pleasant Project	Effects Envelope (see Figure 52)		
see Figures 24 & 25									
87.	Bengalla Mining Co	1	1		✓	✓			
88.	Reynolds J	1	1		✓	✓			
89.	Bengalla Mining Co	1	1		✓	✓			
90.	Past, Prot. Boad				✓	✓			
91.	Gardiner AL	1	1		✓	✓			
92.	Bengalla Mining Co				✓	✓			
93.	Pearce GB				✓	✓			
94.	Gamper HJ & JA Ellul	1	1		✓	✓			
95.	Coal & Allied	1	1		✓	✓			
96.	Bates B & M				✓				
97.	Moore JB			1	✓			✓	
98.	Smith MJ & ME				✓			✓	
99.	Bengalla Mining Co	1			✓				
100.	McLean & Ors				✓		✓		
101.	Bengalla Mining Co				✓		✓		
102.	Bengalla Mining Co				✓				
103.	Bengalla Mining Co	6			✓				
104.	Bengalla Mining Co				✓				
105.	Bengalla Mining Co				✓				
106.	Bengalla Mining Co				✓			✓	
107.	Bengalla Mining Co				✓			✓	
108.	Bengalla Mining Co		1					✓	

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences			Properties		
		Not Affected by Mount Pleasant Project	Affected by Noise from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)	Affected by Noise from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)	
see Figures 24 & 25							
109.	Yore KJ & GM				✓	✓	
110.	Bengalla Mining Co		1			✓	
111.	Carter FJ DJ & JM		1			✓	
112.	Bengalla Mining Co					✓	
113.	Bengalla Mining Co		1		✓	✓	
114.	Bengalla Mining Co				✓	✓	
115.	Steman LH		2		✓	✓	
116.	McLean D & R		1			✓	
117.	Coal & Allied		2			✓	
118.	Vacant Crown				✓	✓	
119.	Hofman JB & HR					✓	
120.	Bengalla Mining Co	1			✓		
121.	Skippen SE		1	1	✓	✓	
122.	Yore DL	1					
123.	Upton RW & LP	1					
124.	Bengalla Mining Co				✓	✓	
125.	Bengalla Mining Co		1	1	✓	✓	
126.	Coal & Allied		1		✓		
130.	Moore C & JM		1	1	✓	✓	
131.	Moore DL & PA		1	1	✓	✓	
132.	Coal & Allied		1	1	✓	✓	

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences				Properties																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences				Properties			
		Not Affected by Noise Affected by Dust		Within Cumulative Affected by Noise Affected by Dust		Within Cumulative		Effects Envelope	
		Pleasant Project	Affected by Noise from Mount Pleasant Project	Pleasant Project	from Mount Pleasant Project	Pleasant Project	from Mount Pleasant Project	Pleasant Project	from Mount Pleasant Project
see Figures 24 & 25									
155.	Austin C	1		1		✓		✓	
156.	Collins WF	1		1		✓		✓	
157.	Gray RP	1		1		✓		✓	
158.	Coal & Allied	1		1		✓		✓	
159.	Seaby EA & MD	1		1		✓		✓	
160.	Roach FW & YL	1		1		✓		✓	
161.	Coal & Allied	1		1		✓		✓	
162.	Coal & Allied	1		1		✓		✓	
163.	Jazipa P/L	1		1		✓		✓	
170.	Simpson JM			1				✓	
171.	Parkinson RB							✓	
172.	George VC & NA			1				✓	
173.	Coal & Allied			1				✓	
174.	Galvin RJ			1				✓	
175.	Coal & Allied			1				✓	
176.	Coal & Allied						1		✓
177.	Ingam AJ						1		✓
178.	Clark WW								✓
179.	Ellis BR & JM						1		✓
180.	Loergan J & J							✓	✓
181.	Loneragan J		1					✓	✓

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences				Properties					
		Not Affected by Noise Affected by Dust by Mount Pleasant Project		Affected by Noise Affected by Dust from Mount Pleasant Project		Within Cumulative Effects Envelope (see Figure 52)		Affected by Dust from Mount Pleasant Project			
see Figures 24 & 25											
182.	Casey JO								✓		✓
183.	Parkinson RB & SA		1						✓		
184.	Hallet IM										✓
185.	Hallet IM										
186.	Hallet IM										
187.	Loneragan MB and others							1			✓
188.	Estate Late Loneragan V										
189.	Estate Late Loneragan V							2			✓
190.	Estate Late Sneesby JH										
191.	Estate Late Sneesby JH										
192.	Estate Late Sneesby JH										
193.	Estate Late Sneesby JH										
194.	Gaudie MJ										
195.	Gaudie MJ										
196.	Standing P & F										
197.	Hoath C & N		1						✓		
198.	Hoath C & N		1						✓		
199.	Adnum M & R							1	✓		✓
200.	Adnum M & R								✓		✓
201.	Paton G		1						✓		
202.	Paton A & H								✓		✓
203.	Muswellbrook Council								✓		

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences			Properties				
		Not Affected by Mount Pleasant Project		Affected by Noise from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)		Affected by Noise from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)	
see Figures 24 & 25									
204.	Rural Lands Protection Board						✓		✓
205.	Crown								
206.	Loneragan JS & NM								
207.	Loneragan JS & NM								✓
208.	Loneragan JS & NM								✓
209.	Dartbrook Joint Venture								
210.	Dartbrook Joint Venture								
211.	Dartbrook Joint Venture	1							
212.	Dartbrook Joint Venture	2							
213.	Dartbrook Joint Venture	1							
214.	Ducey J & M							1	✓
215.	Ducey J & M	1						✓	
216.	Bengalla Mining Co	1							
217.	Bengalla Mining Co	2							
218.	Bengalla Mining Co (Exchange)	1							
219.	Bengalla Mining Co (Exchange)	2							
220.	Bengalla Mining Co	2							
221.	Bengalla Mining Co	2							
222.	Bengalla Mining Co	2							
223.	Bengalla Mining Co								
224.	Bengalla Mining Co	1							
225.	Bengalla Mining Co								

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences			Properties		
		Not Affected by Mount Pleasant Project	Affected by Noise from Mount Pleasant Project	Dust from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)	Affected by Noise from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)
see Figures 24 & 25							
226.	Bengalla Mining Co						
227.	Bengalla Mining Co (Exchange)	1					
228.	Bengalla Mining Co		1			✓	✓
229.	Jabetin P/L				1	✓	✓
230.	Electricity Commission of NSW	1					
231.	Peabody Bengalla Investments						
232.	Scriven JR						
233.	Webber RN & F						
234.	Reline P/L	1					
235.	Englebrecht BD & J	1					
236.	Ulrich M & D	1					
237.	Gothard IQ & GZ	1					
238.	Lamb JA & LJ	1					
239.	Quinnell RJ & RD	1					✓
240.	Boyle NH				1		✓
241.	Hopmans W & B	1					✓
242.	Hopmans A & C	1					✓
243.	McInerney NBMC	1					✓
244.	Farell PM & Others	1					✓
245.	Pryor C & R	1					✓
246.	Bowen JL	1					✓
247.	McGoldrick MJ	1					✓

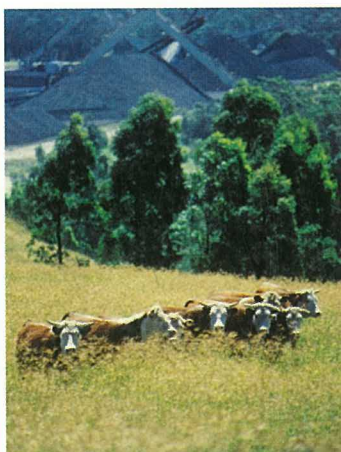
Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences				Properties						
		Not Affected by Noise		Affected by Noise		Within Cumulative		Affected by Dust		Within Cumulative		
		Pleasant Project	from Mount Pleasant Project	Pleasant Project	from Mount Pleasant Project	Effects Envelope (see Figure 52)	Pleasant Project	from Mount Pleasant Project	Pleasant Project	from Mount Pleasant Project	Effects Envelope (see Figure 52)	
see Figures 24 & 25												
248.	Barnett KB & JA	1										
249.	Englebrecht DP	1										
250.	Upper Hunter Racing Club Ltd											
251.	Kayuga (1827) P/L	1										
252.	Kayuga (1827) P/L											
253.	Medhurst GR & EA	1										✓
254.	Dartbrook Joint Venture	1										
255.	Dartbrook Joint Venture	2										
256.	Dartbrook Joint Venture	1										
257.	Day Pty KL & HR	2										
258.	Thompson RL & CE	1										
259.	Neely DG											
260.	Wheatly & Son Pty Ltd	1										
261.	Clifton BW & FG	1										
262.	Power TJ & ML	2										
263.	Page RJ & MR											
264.	Pitnacree (Blairmore) Pty Ltd											
265.	Wattus CS & B											
266.	Devine AL & JA											
267.	Dartbrook Joint Venture											
268.	Collins GW & GM	1										
269.	Lane PG & CM	1										

Table P.1 LAND OWNERSHIP AND RESIDENCES WITHIN AND ADJACENT TO THE MOUNT PLEASANT SITE (Contd)

Property Number	Property Owner	Residences			Properties		
		Not Affected by Mount Pleasant Project		Affected by Noise from Mount Pleasant Project	Within Cumulative Effects Envelope (see Figure 52)		
		Affected by Noise from Mount Pleasant Project	Affected by Noise from Mount Pleasant Project	Affected by Noise from Mount Pleasant Project	Affected by Noise from Mount Pleasant Project		
see Figures 24 & 25							
270.	Hulbert DJ & ET	1					
271.	Knight KP & AJ	1					
272.	O’Brien T	2					
273.	Smith GM & KL	1					
274.	Casey JO						
275.	Lonergan J & N	1					

0
1
-
E
5
0
-
0
1
6
1
-
0
1
-
-
C
2



Cover: Cattle grazing on a rehabilitated area previously mined at Hunter Valley which has been sown with grass and replanted with native trees.