Final Terms of Reference (TOR)

for preparing an
Environmental Impact Statement (EIS)

MOORVALE COAL PROJECT

October 2001

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The function of the executive summary is to convey the most important aspects of the Moorvale Coal Project to the reader in a concise and readable form. The structure of the executive summary will follow that of the Environmental Impact Statement (EIS) and will address the following matters:

- The name of the proponent.
- The title of the proposal.
- A summary description of the proposal, its purpose and identification of the study area.
- The location of the proposal in a State, regional and local setting.
- The objectives of the proposal.
- The project schedule for construction, operation and decommissioning and rehabilitation.
- In summary, the background to, alternatives to and the need for the proposal.
- A summary of the major components of the natural, cultural heritage, social and economic environment of the study area.
- A summary of the adverse and beneficial impacts of the proposal, including the elements of the Environmental Management Overview Strategy which will give effect to the management of the impacts of the proposal.

1. INTRODUCTION

The function of the introduction is to explain why the EIS has been prepared and what it sets out to achieve. In particular the level of detail of information required to meet the level of approval being sought will be addressed.

It should also define the audience to whom it is directed, and contain an overview of the structure of the document. Factual information contained in the document should be referenced wherever possible.

1.1 Project proponent

Provide details regarding project proponents including details of joint venture partners.

1.2 Project objectives and scope

A statement of the objectives which have led to the development of the proposal and a brief outline of the events leading up to the proposal's formulation, including alternatives, envisaged time scale for implementation and project life, anticipated establishment costs and actions already undertaken within the project area.

1.3 The EIS process

The important aspect of this section is to make clear the objectives of the environmental impact assessment process under the *Environmental Protection Act 1994*. This section should include a description of the impact assessment process steps, timing and decisions to be made for relevant stages of the project. In particular, this section should outline mechanisms in the process for public input and the public release of an EIS which will specify all responses to stakeholder submissions.

The information required in this section is to ensure:

- the relevant legislation is addressed;
- awareness of the process to be followed; and
- stakeholders are aware of the any opportunities for input and participation

1.3.1 Objectives of the EIS

This section should provide a statement of the objectives of the EIS. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. It should become clear to the reader that the purpose of the EIS is to:

- Provide public information on the need for, and likely effects of, the project;
- Set out acceptable standards and levels (both beneficial and adverse) on environmental and social values; and
- Demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values.

1.3.2. Role of the EIS in the assessment process

The reader should be able to distinguish the EIS as a key environmental document providing advice to decision makers considering approvals for the project. The role of the EIS in providing the project's Environmental Management Overview Strategy (EMOS) and Environmental Authority (EA) licence conditions for ongoing regulation should also be discussed. There should be an outline of the EIS process as adapted to the project requirements with approximate time lines included.

1.3.3 Submissions

Interested and affected persons should be made aware of how submissions regarding the draft EIS will be taken into account in the decision-making process.

1.3.4 Public consultation process

The public consultation process should identify broad issues of concern to the local community and other interested persons. The four key objectives of the consultation should be:

- to inform the different interest groups about the project proposal;
- to seek an understanding of interest group concerns about the proposal;
- to explain the impact assessment research methodology and how the group's input might influence the final recommendations relating to the project; and
- to seek direction on how to conduct more detailed consultation pertaining to each interest group.

The consultation process should continue from the planning stages of the project through commissioning, operations and final rehabilitation. This section should outline the methodology that was and will be adopted to identify and mitigate any identified adverse environmental and socio-economic impacts that may arise through the project development.

A public consultation program should be incorporated into the EIS. This public consultation program should make interested persons aware of on-going opportunities for involvement and education. The identification of interested stakeholders should be undertaken with a broad invitation to community individuals and interested groups not only to targeted agencies and

stakeholders. Extensive and culturally appropriate engagement with indigenous interest groups is essential.

1.3.5 Relevant legislation and policy requirements

This section should explain the legislation and policies controlling the approvals process. Reference should be made to the *Environmental Protection Act 1994*, *Water Act 2000*, *Mineral Resources Act 1989*, *Water Resources Act 1989,* and other relevant Queensland laws. Any requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* should also be included.

In particular, this section should highlight requirements of the *Environmental Protection Act 1994*, such as "ecologically sustainable development" (ESD), "best practice environmental management", and the "general environmental duty" and any relevant Environmental Protection Policies.

Local government planning controls, local laws and policies applying to the development should be described, and a list provided of the approvals required for the project and the expected program for approval of applications.

This information is required to assess how the legislation applies to the proposal, which agencies have jurisdiction, and whether the proposed impact assessment process is appropriate.

2. PROJECT NEED AND ALTERNATIVES

2.1 Project socio-economic justification

The justification for the project should be described, with particular reference made to the economic and social benefits, including employment and spin-off business development, which the project may provide. The status of the project should be discussed in a regional, State and national context.

2.2 Alternatives to the project

This section should describe feasible alternatives (including technological alternatives such as mining/processing and rehabilitation methods), to the proposed project including discussion of the consequences of not proceeding with the project. Alternatives should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others. Reasons for selecting the preferred options should be delineated in terms of technical, commercial, social and natural environment aspects, in particular the principals of ESD should be detailed.

The interdependencies of the proposal components should be explained, particularly in regard to how each of any industrial developments, or various combinations of industrial developments and any infrastructure requirements relate to the viability of the proposal. This section should include a description of the proposed water supply, power, transport and/or storage infrastructure and rationale for such infrastructure.

3. DESCRIPTION OF THE PROJECT

The objective of this section is to describe the project through its lifetime of construction, operation and decommissioning. This information is required to allow assessment of all aspects of the life of a proposal including all phases of the proposal from planning, construction, operation to decommissioning. It also allows further assessment of which approvals may be required and how they may be managed through the life of the proposal.

3.1 Project site

A full description of the proposed site, present land uses and zonings, nearby industry and other land uses should be given. A plan showing the site in relation to its surrounding land should also be included.

3.2 Resources

This section summarises results of studies and surveys undertaken to delineate the coal resource. A description of the location, tonnage and quality of the coal resource should be made. Coal seams that are stratigraphically higher or lower than those being mined, or seams located under infrastructure should be identified.

In addition, maps should be provided showing the general location of the project area including:

- the location of the resource;
- the location and boundaries of mining tenures, granted or proposed, to which the project area is or will be subject;
- the location for mine excavation(s);
- the location of any proposed buffers surrounding the working areas; and
- the location and boundaries of the plant site.

3.3 Mining methodology

The description of the mining methodology should include:

- areas and depth of mining, including a plan that shows mining areas for various phases of the project;
- the location of any final void to be left at the cessation of mining; and

- the proposed mining method, including details of:
  - pre-stripping;
  - overburden removal;
  - overburden placement; and
  - coal loading and haulage.

The reasons for the preferred operational option should be made clear to the reader.

3.4 Construction phase and materials

A description of the construction phase of the development should be provided, including:

- construction methods;
- construction timetable, including anticipated start up dates for the various components of the construction phase and other milestones, as well as anticipated plant commissioning dates;
- proposed hours of operation;
- the type of equipment to be used;
- the quantity and source of any rock aggregate or other material to be brought onto the site for the construction of roads, dams or other components of the development (and the environmental implications of removal of the material from the source);
- the identification of construction wastes; and
- the extent of surface disturbance during construction.

3.5 Mining schedule

Information should be provided on:

- construction schedule including conceptual and staging analysis of the proposal together with an outline of the time-scale and associated costs involved;
- proposed hours of operation;
- expected life of the operation; and

- any proposals for future expansion of operations, including staging and timing.

3.6 Waste management

This section relates to the generation and management of waste by the project through construction, mining and production processes.

3.6.1 General

The physical and chemical characteristics of all waste material should be provided.

Having regard for best practice waste management strategies and the Environmental Protection (Waste) Policy, the proposals for waste avoidance, reuse, recycling, treatment and disposal should be described. Information should also be provided on the variability, composition and generation rates of all waste generated on the project site.

Provide an inventory of the following per unit volume of product produced:

- the tonnage of ore processed;
- the amount of resulting process wastes;
- the tonnage and volume of waste rock removed to extract the coal; and
- the volume and tonnage of any by-products left from the processing of the coal.

Outline any hazardous wastes that will be produced and describe strategies for their management or disposal.

Schematic diagrams should be provided for each distinct stage of the project (e.g. construction/site preparation, operation and decommissioning) indicating the processes to be used and their associated waste streams (i.e. all waste outputs: solid, liquid and gaseous) including recycling efforts, such as stockpiling and reusing topsoil. The schematic diagrams, or an associated table, should cross-reference the relevant sections of the EIS where the potential impacts and mitigation measures associated with each waste stream are described.

Waste management issues should be identified for each phase of the project, including the following:

- planning and design — make a commitment to reduce waste during all stages of the development and develop a Waste Management Plan; develop and implement strategies to avoid, reduce, reuse and/or recycle waste;
- pre-construction — identify potential wastes and develop and implement strategies for managing waste during the clearing of vegetation and earthworks;
- construction — identify and characterise major waste streams and determine waste avoidance/minimisation opportunities. Alternative methods

for waste treatment, other than landfilling should be considered, and include re-use or recycling of materials and use of alternative materials; and
- operation — identify and characterise major waste streams during operation of the project and develop waste management strategies that include waste minimisation, re-use and/or recycling.

The EIS should also describe the proposed means for the management of wastes produced under circumstances other than as a result of normal operation including:

- wastes from construction activities, such as rainwater run-off from disturbed land surfaces, or chemical cleaning of plant before commissioning;

- industrial wastes liable to result from accidents such as leaks from bulk storage facilities, fires, explosions; and

- wastes produced from plant and machinery maintenance.

Where any wastes are destined for off site disposal, information should be provided on:

- any proposed re-use of material and wastes;

- the location of the facilities to which each waste will be sent for disposal;

- confirmation that each facility can accept the type and quantity of nominated waste and over what period of time; and

- details of the transport of wastes from the plant to the disposal facility.

3.6.2 Solid waste

The proposed location, site suitability, dimensions and volumes of overburden/waste rock and tailings stockpiles or dumps should be described, including their method of construction. Methods to prevent acid formation, seepage and contamination should be given. Measures to ensure stability of the dumps and impoundments should be described.

3.6.3 Wastewater

A description should be presented of the origin, quality and quantity of waste water originating from the project. Particular attention should be paid to the capacity of wastes to generate acid, saline or sodic waste water. A water balance for the mining project and processing plant is required to account for the estimated usage of water.

The EIS may need to consider the following effects:
- groundwater from mine pits and other excavations;
- rainfall directly onto disturbed surface areas;

- runoff from haul roads, plant and industrial areas, and chemical storage areas;
- drainage (i.e. runoff plus any seepage or leakage) from dumps and stockpiles;
- seepage from other waste storages;
- water usage for domestic purposes, process use and dust suppression;
- evaporation;
- domestic sewage treatment - estimates of effluent volumes, design of the sewage treatment plant, disposal of liquid effluent and sludge; and
- water supply treatment plant - disposal of wastes.

3.6.4 Air emissions

Describe the quantity and quality of all air emissions, including dust, fumes and odours, from the project during construction and operation.

3.7 Infrastructure requirements

3.7.1 Site infrastructure

It will be necessary to provide a site layout plan, to a scale convenient for indicating:

- location of plant and equipment;
- materials storage areas;
- site entry and exit locations;
- key plant buildings;
- dams, sedimentation ponds and flood protection measures; and
- each of the stages proposed.

Detailed descriptions of the physical facilities proposed and their arrangement within the site are required, including:

- plant, equipment, buildings, catchment drains, water and tailings impoundments, sedimentation dams and flood protection measures;
- areas to be used for handling, storage, treatment and disposal of wastes; and
- facilities to be used for the transport, handling and storage of processed and raw materials.

3.7.2 Electricity supply

Details are required of electricity supply requirements for the construction and operation of the plant, including anticipated dates for the start of construction, testing of plant and final commissioning. Details should include information on maximum and minimum energy demand and annual energy consumption.

Should any private power generation be contemplated, the EIS report should describe how and in what quantity power is to be generated, the fuel to be used and the anticipated emissions from such generation.

3.7.3 Water supply

A determination of raw and treated water demand should be made for the project, including details of daily or seasonal peak demand requirements, ultimate total annual requirements, and an assessment of the capacity of existing supply to meet such requirements. This assessment should take into account the requirements of the project for fire fighting or other emergency water supply. Details of on-site water storage should be provided.

Water supply options should be assessed in consideration of the Fitzroy Basin Water Resource Plan.

This should include an assessment of:

- the potable water requirements for the project site and for adjacent support and service industries; and

- the necessity for the augmentation of any existing supply and possible sources, such as in-pit water.

3.7.4 Transportation requirements

Information should be provided on the transportation requirements of the proposal for both the construction and operational phases of the project. This information should detail:

- the type and quantities of materials to be transported and the origin and destination of these materials;

- proposals for the transport of dangerous substances;

- assessment of traffic generated by the mine, to a ten year horizon, during the construction and operational phase, including the frequency of trips and types of vehicles proposed for material transport;

- map(s) of the haul route(s);

- the availability and suitability of existing transportation modes and facilities (i.e. existing links, storage facilities, handling equipment and other services);

- the need for new transportation facilities and/or the improvement and maintenance of existing facilities; and

- volumes and routes for workforce traffic.

3.8 Workforce requirements

The EIS report should provide information on the numbers of people to be employed on-site for both the construction and operational phases of the project. This information should be presented according to occupational groupings of the workforce, and for the various components and stages of construction and operation. Information should also be provided on the expected dates when the workforce is required. Information on additional accommodation of various types as well as other social infrastructure facilities that will serve the expected workforce during the construction and operation phases of the project should also be stated.

The EIS should recognise the Nebo Shire Council Transitional Planning Scheme including Strategic Plan objectives, in particular in relation to preferences for location of workforce accommodation. It should include details on the proposed location of workforce accommodation and arrangements for provisions of such accommodation.

4. ENVIRONMENT VALUES AND MANAGEMENT OF IMPACTS

The functions of this section are:

- to describe the existing environmental values of the area which may be affected by the mining activities. Environmental values are defined by the *Environmental Protection Act 1994* and Environmental Protection Policies. Environmental values should be described by reference to background information which may be included as appendices to the EIS;

- to describe the potential adverse and beneficial impacts of the mining activities on the environmental values. Any likely environmental harm to the environmental values of the proposal should be described. Include analysis of any cumulative impacts caused by the proposal; and

- to present environmental protection objectives and the standards and measurable indicators to demonstrate the standards are being achieved.

This section should address all elements of the environment (land, water, air, waste, noise, nature conservation, cultural heritage, social and community, health and safety, economy, hazards and risk) in a way that is comprehensive and clear. To achieve this, the topics to be addressed for each element are:

Environmental values affected: describe the existing environmental values of the area to be affected including areas affected by any cumulative impacts (refer to any background studies in Appendices).

Impact on environmental values: describe quantitatively the likely impact of the proposal on the identified environmental values of the area. The cumulative impacts of the proposal must be considered over time and in combination with other (all) impacts in the dimensions of scale, intensity, duration or frequency of the impacts. In particular, the requirements and recommendations of relevant State Planning Policies, Environmental Protection Policies, National Environmental Protection Measures and Integrated Catchment Management Plans should be addressed.

Environmental protection objectives: describe qualitatively and quantitatively the proposed objectives for enhancing or protecting each environmental value. Include proposed indicators to be monitored to demonstrate the extent of achievement of the objectives as well as the numerical standard which defines the achievement of the objectives (this standard must be auditable).

Control strategies to achieve the objectives: describe the control principles, proposed practical actions and technologies to be implemented that are likely to achieve the environmental protection objectives.

Monitoring programs: describe the monitoring parameters, monitoring points, frequency, data interpretation and reporting proposals.

Auditing programs: describe how progress towards achievement of the objectives will be measured, reported and whether external auditors will be employed.

Management strategies: describe the strategies to be used to ensure the environmental protection objectives are achieved and control strategies implemented.

4.1 Land

A. Environmental values affected

The function of this section is to describe the existing environment of the land area which may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994* and Environmental Protection Policies.

4.1.1 Land use

The EIS should provide a description of current land tenures and land uses, including native title, in the entire proposal area, with particular mention of land with special purposes. The location and owner/custodians of native title in the area and details of native title claims should be shown.

A map at a suitable scale showing existing land uses and tenures, and the proposed mine and plant locations should be provided for the entire proposal area and surrounding land that could be affected by the development. The location of existing dwellings, and the zoning of all affected lands according to any existing town or strategic plan should be included.

Describe the land use suitabilities of the affected area in terms of the physical and economic attributes. The potential environmental harm caused by the proposal on the adjacent areas currently used for agriculture, urban development, recreation, tourism, other business and the implications of the proposal for future developments in the impact area including constraints on surrounding land uses should be described.

Provide a land suitability map of the proposed and adjacent area, and setting out land suitability and current land uses.

4.1.2 Sensitive environmental areas

The EIS should identify whether areas that are environmentally sensitive could be affected, directly and indirectly, by the proposal. Also, areas sensitive to environmental harm caused by the proposal can be

determined through site specific environmental impact assessment processes.

The provisions of the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* should be addressed in particular whether there are relevant national environmentally significant matters.

The proximity of the proposal elements to any of these areas should be identified.

4.1.3 Infrastructure

The location and owner/custodians of all tenures, reserves, roads and road reserves, railways and rail reserves and stock routes covering the affected land should be shown. Indicate locations of power lines and any other easements. Details should be provided of the impacts on environmental values of existing and any new roads, road realignments, or new rail infrastructure.

4.1.4 Topography/geomorphology

The contour information for the proposal site should be detailed at suitable increments, with levels shown with respect to Australian Height Datum (AHD).

4.1.5 Geology

The EIS should provide a description, map and a series of cross-sections of the geology of the proposal area, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance. Properties which may influence stability, occupational health and safety, rehabilitation programs, or the quality of waste water leaving any area disturbed by the proposal should be described. A description of the impact of mining operations on the ability to access underlying coal seams should be included.

The EIS should describe the way in which the proponent will ensure the resource recovery is maximised and that (as far as practicable) other resources are not adversely affected or sterilised by the project or its associated infrastructure.

4.1.6 Soils

A soil survey of the sites affected by the proposed mining proposal should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials which will influence erosion potential, storm water run-off quality and rehabilitation.

Information should also be provided on soil stability and suitability for construction of proposal facilities. A description of topsoil management, including reference to a topsoil management plan. The topsoil management plan would include topsoil stripping depths, criteria of suitability and determination of total available topsoil volumes for project rehabilitation purposes, and management of stockpiles.

Soil profiles should be mapped at a suitable scale and described according to the Australian Soil and Land Survey Field Handbook (McDonald et al, 1990) and Australian Soil Classification (Isbell, 1996). An appraisal of the depth and quality of useable soil should be undertaken. Information should be presented according to the standards required in the Planning Guidelines: the Identification of Good Quality Agricultural Land (DPI, DHLGP, 1993), and the State Planning Policy 1/92: Development and the Conservation of Agricultural Land.

B. Management of impacts on environmental values

The function of this section is to define and describe the objectives for protecting or enhancing land resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

4.1.7 Land use suitability

The potential for the construction and operation of the proposal to change existing and potential land uses of the proposal site and adjacent areas should be detailed. Post mining land use options should be detailed including suitability of the area mined to be used for agriculture, industry, or nature conservation and the factors favouring or limiting the establishment of those options, should be given in the context of land use capability or suitability prior to the proposal. Assess post mining land use options according to Tables 1 and 2 (Suitability for Rainfed Broadacre Cropping/Suitability for Beef Cattle Grazing) of *Land Suitability Assessment Techniques in Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995).*

4.1.8 Land disturbance

A strategy should be developed with a view to minimising the amount of land disturbed at any one time. The strategic approach to progressive and final decommissioning should be described.

The methods to be used for the proposal, including backfilling, covering, re-contouring, topsoil handling and revegetation, should be described.

Where dams and roads and other infrastructure are to be constructed, proposals for the management of these structures after the completion of

the proposal should be given. A contour map of the area should be provided (if relevant). Also, the final drainage and seepage control systems and any long term monitoring plans should be described.

Proposed decommissioning should be described, including consolidation, revegetation, fencing, and monitoring.

A description of topsoil management should consider transport, storage and replacement of topsoil to disturbed areas.

4.1.9 Land contamination

The EIS should describe the possible contamination of land from aspects of the proposals including waste, reject product, and spills at chemical and fuel storage areas.

The means of preventing land contamination (within the meaning of the Queensland *Environmental Protection Act*) should be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land should be outlined. Intentions should be stated concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination on the land, processing plant site and product storage areas after proposal completion.

4.1.10 Soil erosion

For all permanent and temporary land forms, possible erosion rates and management techniques should be described. For each soil type identified, erosion potential (wind and water) and erosion management techniques should be outlined. An erosion monitoring program, including rehabilitation measures for erosion problems identified during monitoring, should also be outlined. Mitigation strategies should be developed to achieve acceptable soil loss rates, levels of sediment in rainfall runoff and wind generated dust concentrations.

The report should include an assessment of likely erosion effects, especially those resulting from the removal of vegetation, both on-site and off-site for all disturbed areas such as:

- the plant site, including buildings ;
- access roads or other transport corridors;
- any waste dumps; and
- dams, banks and creek crossings.

Methods proposed to prevent or control erosion should be specified and should be developed with regard to (a) preventing soil loss in order to maintain land capability/suitability, and (b) preventing significant degradation of local waterways by suspended solids.

4.1.11 Rehabilitation and decommissioning

The strategies and methods for progressive and final rehabilitation of the environment disturbed by the mining activities should be described in the context of the expected final landforms for nominated final land uses. The final topography of excavations, overburden stockpiles, tailings dams sites, and any other wastes should be shown. The post mining land suitability of the various land disturbance types should be described in terms of the physical chemistry of the overburden material and the landform chosen.

The means of decommissioning the project, in terms of removal of plant, equipment, structures and buildings should be described. The methods proposed for the stabilisation of the affected areas should be given. Final rehabilitation of the plant site should be discussed in terms of ongoing land use suitability, management of any residual contaminated land and other land management issues.

Rehabilitation of tailings dams should be described in detail, including consolidation, capping, revegetation, fencing, and monitoring.

Information should be provided regarding decommissioning and rehabilitation of the plant site, removal of processing plant, rehabilitation of concrete footings and foundations, hard stand areas and storage tanks (including any potential for reuse of these facilities).

4.1.12 Transport

The EIS should provide sufficient information for the Department of Main Roads and local government to make an independent assessment of how the state-controlled and local government road networks respectively will be affected. Sufficient information should also be provided to enable Queensland Rail to make an independent assessment of how the rail network (including infrastructure) will be affected.

4.2 Water resources

A. Environmental values affected

The function of this section is to describe the existing environment for water resources which may be affected by the proposal in the context of environmental values.

4.2.1 Surface waterways

A description should be given of the surface water resources and their quality and quantity in the area affected by the proposal with an outline of the significance of these waters to the river catchment system in which

they occur. Details provided should include a description and map(s) of existing surface drainage patterns, flows in major streams and wetlands.

An assessment is required of existing water quality in surface waters likely to be affected by the proposal. The basis for this assessment should be a monitoring program, with sampling stations located upstream (unimpacted) and downstream (impacted) of the mining proposal.

Describe the environmental values of the surface waterways of the affected area in terms of:

- values identified in the Environmental Protection (Water) Policy;
- sustainability, including both quality and quantity; and
- physical-chemical characteristics.

4.2.2 Groundwater

The EIS should review the quality, quantity and significance of groundwater in the proposal area, together with groundwater use in neighbouring areas.

The review should include a survey of existing groundwater supply facilities such as bores, wells, or excavations.

A network of observation points should be developed which would satisfactorily monitor groundwater resources both before and after commencement of operations.

Describe the environmental values of the underground waters of the affected area in terms of:

- values identified in the Environmental Protection (Water) Policy;
- sustainability, including both quality and quantity; and
- physical-chemical characteristics.

B. Management of impacts on environmental values

The function of this section is to define and describe the objectives for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

4.2.3 General

The EIS should describe the possible environmental harm caused by the proposed proposal to environmental values for water.

Water management controls should be described, addressing surface and groundwater quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational)

use of nearby surface and groundwater should be discussed, along with the proposal for the diversion of affected creeks during mining, and the stabilisation of those works. Monitoring programs should be described which will assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the proposal.

Extremes of climate (droughts, floods, cyclones, etc) should also be discussed with particular reference to water management at the proposal site.

4.2.4 Surface water and water courses

The potential environmental harm to the flow and the quality of surface waters from all phases of mining activities should be discussed, with particular reference to their suitability for the current and potential downstream uses. Refer to the Environmental Protection (Water) Policy 1997, *Water Resources Act 1989,* and *Water Act 2000*.

In relation to water supply and usage, and wastewater disposal, the EIS should discuss anticipated flows of water to and from the proposal area. Where dams, weirs or ponds are proposed, the EIS should investigate the effects of predictable climatic extremes (droughts, floods) upon the structural integrity of the containing walls; and the quality of water contained, and flows and quality of water discharged. The design of all water storage facilities should follow the technical guidelines on site water management and minimise mosquito breeding sites.

The need or otherwise for licensing of any dams (including referable dams) or creek diversions, under the *Water Act 2000* should be discussed. Water allocation and water sources should be established in consultation with Department of Natural Resources and Mining.

The Australian and New Zealand Environment and Conservation Council (ANZECC) 'National Water Quality Management Strategy, Australian Water Quality Guidelines for Fresh and Marine Waters' (November 1992) and the Environmental Protection (Water) Policy 1997 should be used as a reference for evaluating the effects of various levels of contamination.

4.2.5 Groundwater

The EIS should include an assessment of the potential environmental harm caused by the proposal to local groundwater resources.

The impact assessment should define the extent of the area within which groundwater resources are likely to be affected by the proposed operations and the significance of the proposal to groundwater depletion or recharge, and groundwater quality. Propose management options available to monitor and mitigate these effects. The response of the

groundwater resource to the progression and finally cessation of the proposal should be described.

4.3 Air

A. Environmental values affected

The function of this section is to describe the existing air environment which may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994,* Environmental Protection (Air) Policy, and National Environment Protection Measure (Ambient Air Quality).

A description of the existing air shed environment should be provided having regard for particulates, gaseous and odorous compounds.

The EIS should describe the air temperatures, wind (direction and speed) and any other special factors (eg temperature inversions) likely to affect air quality within the environs of the mining proposal. Rainfall patterns including magnitude and seasonal variability of rainfall must be considered.

Sufficient data on ambient levels of pollutants should be gathered to provide a baseline for later studies or for the modelling of air quality environmental harms within the airshed.

B. Management of impacts on environmental values

The function of this section is to define and describe the objectives for protecting or enhancing environmental values for air, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

The objectives for air emissions should be stated in respect of relevant standards (ambient and ground level concentrations), relevant emission guidelines, and any relevant legislation.

The proposed levels of emissions should be compared with the National Environment Protection Measure for ambient air quality, and the Environmental Protection (Air) Policy.

The assessment of the proposal's impact on air quality should consider the following matters:

- Features of the proposal designed to suppress or minimise emissions, including dusts, should be detailed; and
- The proposed levels of emissions of dust, fumes and odours should include emissions during normal and upset conditions. Consideration should be given to the range of potential upset condition scenarios including the air emissions that may be generated as a result. Consider nuisance to local inhabitants.

Greenhouse gas abatement

A full assessment of greenhouse gas emissions from the proposal should be provided including:

- an inventory of proposed future annual emissions for each Greenhouse Gas and total emissions expressed in 'CO2 equivalent' terms for each component of the proposal and for the combined total proposal;
- the intended measures to avoid and minimise greenhouse emissions; and
- methodologies by which estimates were made.

Environmental management documents for the proposal should include a specific module to address abatement of greenhouse emissions including at least:

- a listing of specific actions and commitments taken to avoid and minimise emissions;
- consideration of alternatives to the release of greenhouse gases to the atmosphere;
- provision for regular greenhouse audits; and
- consideration of any additional voluntary initiatives consistent with the strategies outlines in the National Greenhouse Strategy or proposals undertaken as a component of the Commonwealth Greenhouse Challenge program.

4.4 Waste

A. Environmental values affected

The function of this section is to describe the existing environment values that may be affected by wastes from mining activities in the context of environmental values as defined by the *Environmental Protection Act 1994* and Environmental Protection (Waste) Policy.

B. Management of impacts on environmental values

The function of this section is to define and describe the objectives for protecting or enhancing environmental values from impacts by wastes, to describe how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives will be monitored, audited and managed.

With reference to the waste streams identified in section 3.6, this section should assess the potential impact of all wastes to be generated and provide details of each waste in terms of:

- operational handling and fate of all wastes including storage;
- methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes;
- level of impact on environmental values; and
- waste minimisation techniques processes proposed.

Having regard for the Environmental Protection (Waste) Policy, the EIS should indicate the results of investigation into the feasibility of using waste minimisation and cleaner technology options during the construction and operating phases of the proposal. The EPA has also released draft guidelines covering aspects of waste management under this EPP, which should be addressed.

4.5 Noise and vibration

A. Environmental values affected

The function of this section is to describe the existing environment values that may be affected by noise and vibration from mining activities in the context of environmental values as defined by the *Environmental Protection Act 1994*, the Environmental Protection (Noise) Policy, and the *Environmental Protection Regulation 1998*.

The results of any baseline monitoring of noise and vibration in the proposed vicinity of the proposal should be described. Baseline monitoring should include a selection of sensitive areas affected by the proposal.

Monitoring methods should adhere to relevant Environmental Protection Agency Guidelines and relevant Standards, and any relevant requirements of the Environmental Protection (Noise) Policy 1997. Specific guidelines and standards should be referenced (e.g. AS1055.1 and AS1055.2 1997 Description and measurement of environment noise, Recognised sleep disturbance criteria; British Standards BS7385: part 2: 1993. Evaluation and measurement for vibration in buildings. Part 2. Guide to damage levels from groundborne vibration, BS6472: 1992 Evaluation of Human Exposure to vibration in buildings (1Hz to 80Hz)).

Comment should be provided on any current activities near the proposal area that may cause a background level of ground vibration.

B. Management of impacts on environmental values

The function of this section is to define and describe the objectives for protecting or enhancing environmental values from impacts by noise and vibration, to describe how nominated quantitative standards and indicators may be achieved for noise and vibration management, and how the achievement of the objectives will be monitored, audited and managed.

Information (noise contours, modelling results) should be submitted on the proposed generation of noise. All noise modelling should include at least a scenario of worst case sound transmission to noise sensitive premises e.g. downwind and temperature inversions. The potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any place of work or residence should be quantified in terms of objectives, standards and indicators to be achieved. Describe the impact on sleep resulting from possible installation of low pitched surface fans, haulage routes (both truck and rail) and rail shunting operations. Timing schedules for operations should be discussed, with respect to minimising environmental harm, including environmental nuisance from noise.

Information should be supplied on blasting that might cause ground vibration or fly rock on or adjacent to the site, with particular attention given to places of work or residence, recreation, worship and general amenity. The magnitude, duration and frequency of any vibration should be discussed. The impact of airblast overpressures from blasting should be estimated. Measures to prevent or minimise environmental harm, including nuisance, should be discussed.

4.6 Nature conservation

A. Environmental values affected

The function of this section is to describe the existing environment values for nature conservation that may be affected by the mining activities in the context of environmental values as defined by the *Environmental Protection Act 1994* and Environmental Protection Policies, and the *Nature Conservation Act 1992*.

Describe the environmental values of nature conservation for the affected area in terms of:

- integrity of ecological processes, including habitats of rare and threatened species;
- conservation of resources;
- biological diversity, including habitats of rare and threatened species;
- integrity of landscapes and places including wilderness and similar natural places; and
- aquatic and terrestrial ecosystems.

A discussion should be presented on the nature conservation values of the areas likely to be affected by the proposal. The flora and fauna communities which are rare or threatened, environmentally sensitive localities, riparian zone, wilderness and habitat corridors should be described. The description should include a plant species list, a vegetation map at appropriate scale and an assessment of the significance of native vegetation, from a local and regional and state perspective.

The EIS should identify issues relevant to sensitive areas, or areas which may have low resilience to environmental change. Areas of special sensitivity include any significant habitat or relevant bird flight paths for migratory species, bat roosting and breeding caves including existing structures such as adits and

shafts, and habitat of threatened plants, animals and communities. The capacity of the environment to assimilate discharges/emissions should be assessed. Proposal proximity to any biologically sensitive areas should be described.

Reference should be made to both State and Commonwealth Endangered Species Legislation.

The Queensland *Vegetation Management Act 2000* and the findings of any Regional Vegetation Management Plan should also be referenced.

The occurrence of pest plants and animals in the project area should be described.

The EPA's guidelines for "Fauna and Flora Assessment in EIA" provide further details.

4.6.1 Terrestrial flora

The terrestrial vegetation communities within the affected areas should be described at an appropriate scale (i.e. 1:10,000) with mapping produced from aerial photographs and ground truthing. Sensitive or important vegetation types should be highlighted, including their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The existence of rare or threatened species should be specifically addressed. The surveys should include species structure, assemblage, diversity and abundance. Floristic information should also include:

- location and extent of vegetation types with a description of each community using a standard system according to Specht (1970), or Walker and Hopkins (1990), or Webb (1978) if rainforest;
- classification of vegetation types in accordance with the Queensland Herbarium for the *Vegetation Management Act 1999* with discussion of any differences;
- comparison of site mapping with mapping produced by the Queensland Herbarium for the *Vegetation Management Act 1999* with discussion of any differences;
- assessment of the habitat value of vegetation communities;
- assessment of the condition of vegetation communities and impacting or threatening processes; and
- identification of vegetation of conservation significance based on regional ecosystem status recognised by the EPA and status under the *Vegetation Management Act 1999* and the *Environment Protection and Biodiversity Conservation Act 1999*, occurrence of species listed as rare, vulnerable or endangered under the *Nature Conservation (Wildlife) Regulation 1994* and the *Environment Protection and Biodiversity Conservation Act 1999*, habitat value and condition.

Flora survey methodology should be stated and should be consistent with current best practice and comparable with methodology used by the Queensland Herbarium.

The existence of important local and regional weed species should also be discussed.

4.6.2 Terrestrial fauna

The terrestrial fauna occurring in the areas affected by the proposal should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. The conservation values of remnant vegetation and fauna habitat should be defined using principles consistent with methodology used by the EPA. Fauna survey methodology should be stated and should be consistent with current best practice. Fauna survey should be carried out in all identified habitat types for the range of vertebrate species potentially occurring. Survey intensity and period should be consistent with the difficulty of locating species listed as rare, vulnerable or endangered under the *Nature Conservation (Wildlife) Regulation 1994* or the *Environment Protection and Biodiversity Conservation Act 1999* that potentially occur in the area.

The description of the fauna present or likely to be present in the area should include:

- species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats;
- any species that are poorly known, but suspected of being rare or threatened;
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement;
- the existence of feral or exotic animals; and
- use of the area by migratory birds, nomadic birds, and terrestrial fauna.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the province where the site of the proposal occurs.

4.6.3 Aquatic biology

The aquatic flora and fauna occurring in the areas affected by the proposal should be described, noting the patterns and distribution in the waterways. Aquatic substrate and stream type, downstream habitat, and any rare or threatened species should be described.

B. Management of impacts on environmental values

The function of this section is to define and describe the objectives for protecting or enhancing nature conservation environmental values, to describe how nominated quantitative standards and indicators may be achieved for

nature conservation management, and how the achievement of the objectives will be monitored, audited and managed.

The discussion should cover all likely direct and indirect environmental harm on flora and fauna particularly sensitive areas.

Measures to mitigate the environmental harm to habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains should be described.

The provision of buffer zones and movement corridors, and strategies to minimise environmental harm on migratory, nomadic and aquatic animals should be discussed.

Weed control strategies aimed at containing existing weed species (e.g. Parthenium and other noxious weeds) and ensuring no new invasive weeds are introduced to the area are required. Specific components of the weed control strategies should be outlined such as washdown procedures, education of on-site staff and reporting mechanisms during construction and operational phases.

Feral animal management strategies should be addressed. The study should develop strategies to ensure that the project does not contribute to increased encroachment of a feral animal species. Reference should be made to the local government authority's Pest Management Plan when determining control strategies.

Rehabilitation of disturbed areas should incorporate where appropriate provision of nest hollows and ground litter.

4.7 Cultural heritage

A. Environmental values affected

The function of this section is to describe the existing environment values for cultural heritage that may be affected by the mining activities in the context of environmental values as defined by the *Environmental Protection Act 1994* and Environmental Protection Policies, the *Cultural Records (Landscapes Queensland and Queensland Estate) Act 1987*, and the *Queensland Heritage Act 1992*.

A cultural heritage study will be required to describe indigenous and non-indigenous cultural heritage sites and places, and their values. In accordance with the above legislation such a study must be conducted by an appropriately qualified cultural heritage practitioner and must include the following:

- liaison with relevant indigenous community/communities concerning:
  - places of significance to that community (including archaeological sites, natural sites and story sites; and

- appropriate community involvement in field surveys;

- any requirements by communities and /or informants relating to confidentiality of site data must be highlighted. Non-indigenous communities may also have relevant information;

- a systematic survey of the proposed development area to locate and record indigenous and non-indigenous cultural heritage places;

- assessment of significance of any cultural heritage sites/places located;

- the impact of the proposed development on cultural heritage values;

- a report of work done which includes background research (e.g. identification of sites in the historic inventory of Nebo Shire), relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations; and

- a permit to conduct the research and survey will be required under the provisions of the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987*.

B. Management of impacts on environmental values

The function of this section is to define and describe the objectives for protecting or enhancing cultural heritage values, to describe how nominated standards and indicators may be achieved for cultural heritage management, and how the achievement of the objectives will be monitored, audited and managed.

The environmental harm to cultural heritage values in the vicinity of the project should be managed under a Cultural Heritage Management Plan (CHMP) developed specifically for the project. The CHMP will provide a process for the management of cultural heritage places both identified and sub-surface at the project sites. It is usual practice for the CHMP to be based on information contained in archaeological/anthropological reports on the survey area and cultural reports and/or information from affiliated traditional owners. The CHMP should address and include the following:

- a process for including Aboriginal/Torres Strait islander people associated with the development areas in protection and management of indigenous cultural heritage;

- processes for mitigation, management and protection of identified cultural heritage places and material in the project areas, including associated infrastructure developments, both during the construction and operational phases of the project;

- provisions for the management of the accidental discovery of cultural material, including burials. Any collection of artefact material will need to be done by an appropriately qualified cultural heritage practitioner holding a

permit under provisions of the *Cultural Records (Landscapes Queensland and Queensland Estate) Act 1987*;

- the monitoring of foundation excavations and other associated earthwork activities for possible sub-surface cultural material;

- cultural awareness training or programs for project staff; and

- a conflict resolution process.

The development of the CHMP should be negotiated with all stakeholder representatives, and where there is a role or responsibility identified for the Environmental Protection Agency, it should be party to the discussions.

4.8 Social

A. Values affected

The function of this section is to describe the existing social values that may be affected by the mining activities.

The amenity and use of the proposal area and adjacent areas for rural and agriculture, should be described. Consideration should be given to:

- community infrastructure and services, access and mobility;
- population and demographics of the affected community;
- local community values;
- number of properties directly affected by the project; and
- number of families directly affected by the project, this should include not only property owners but families of workers either living on the property or workers where the property is their primary employment.

Through the public consultation and participation process, the EIS should identify both the positive and negative impacts (both direct and cumulative) of the project in its developmental and operational stages. The profile of the affected communities should be based on quantitative data (readily available) and qualitative data (which can be gained through the consultation process).

B. Management of impacts

The function of this section is to define and describe the objectives for protecting or enhancing social values, to describe how nominated quantitative standards and indicators may be achieved for social impacts management, and how the achievement of the objectives will be monitored, audited and managed.

The social impact assessment of the project should consider the project's impact, both beneficial and adverse, on the local community through the information gathered in the community consultation program and the analysis of the existing socio-economic environment. The nature and extent of the

community consultation program is to be described and a summary of the results incorporated in the EIS.

Describe the likely response of affected communities and identify possible beneficial and adverse impacts (both direct and cumulative). These impacts should be considered both at the regional and local level during the construction and operational stages. Attention should be paid to:

- impacts on demographic, social, cultural and economic profiles;
- impacts on local residents, current land uses and existing lifestyles and enterprises;
- impacts on local and state labour markets, with regard to the source of the workforce;
- impacts on local residents values and aspirations;
- impact on existing services such as Emergency Services and general human and community services;
- availability of housing during construction and operation; and
- development of local community capacity initiatives in partnership with the local community.

4.9 Health and safety

A. Values affected

The function of this section is to describe the existing community values for health and safety that may be affected by the mining activities.

Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of health and safety from factors such as dust and noise. Assessment of the impacts on health and safety should also consider impacts from any additional road traffic generated by the mine during construction and operation. Health and safety issues relating to onsite first aid and emergency capability and disaster preparedness should also be included.

B. Management of impacts

The function of this section is to define and describe the objectives for protecting or enhancing health and safety community values, to describe how nominated quantitative standards and indicators may be achieved for social impacts management, and how the achievement of the objectives will be monitored, audited and managed.

The EIS should assess the effects on project workforce of occupational health and safety risks and impacts on the community in terms of health and safety from project operations and emissions.

4.10 Economy

A. Values affected

The function of this section is to describe the existing economic environment that may be affected by the mining activities.

The character and basis of the local and regional economies should be described including:

- economic viability (including economic base and economic activity);
- existing housing market, particularly rental accommodation which may be available for the project workforce; and
- potential impacts upon downstream water users arising from associated infrastructure development such as the establishing of a secure water supply.

B. Management of impacts

The function of this section is to define and describe the objectives for protecting or enhancing economic values, to describe how nominated quantitative standards and indicators may be achieved for economic management, and how the achievement of the objectives will be monitored, audited and managed.

The effect on local labour markets should be discussed with regard to the source of the workforce. In relation to the source of the workforce, clarification is required as to whether the proponent, or contractors, are likely to employ locally or through other means and whether there are initiatives for local employment opportunities. The impacts of both construction and operational workforces and associated contractors on housing demand should be addressed. The capability of the existing housing stock, particularly rental accommodation, to meet any additional demands created by the project should be discussed.

4.11 Hazard and risk

A. Values affected

The function of this section is to describe the potential hazards and risk that may be associated with the mining activities.

The EIS will provide details of the environmental values likely to be affected by any hazardous materials and actions incorporated in the proposal. The degree of risk and sensitivity of the environmental values at risk should be detailed.

An analysis is to be conducted into the potential impacts of emergency situations on sensitive areas and resources.

B. Management of impacts

The function of this section is to define and describe the objectives for protecting or enhancing environmental values from hazards and risk, to describe how nominated quantitative standards and indicators may be achieved for hazard and risk management, and how the achievement of the objectives will be monitored, audited and managed.

Details should be provided of:

- safeguards proposed on the transport, storage, use, handling and on-site movement of the materials to be stored on-site;
- the capacity and standard of bunds to be provided around the storage tanks for classified dangerous goods and other goods likely to adversely impact upon the environment in the event of an accident; and
- the procedures to prevent spillages, and the emergency plans to manage hazardous situations.

5. DRAFT EMOS

The Moorvale Coal Project will be required to submit a Draft Environmental Management Overview Strategy (EMOS) with the EIS. The Draft EMOS will be prepared with reference to the EPA Guideline 8 "Preparation of an Environmental Management Overview Strategy".

The general contents of the Draft EMOS comprises:

- The proponent's commitments to acceptable levels of environmental performance, including environmental objectives, i.e. levels of expected environmental harm, performance standards and associated measurable indicators, including progressive and final rehabilitation, performance monitoring and reporting; and
- Control strategies to implement the commitments.

6. REFERENCES

All references consulted should be presented in the EIS in a recognised format.

7. RECOMMENDED APPENDICES

A1. Development approvals

A list of the development approvals required by the project should be presented.

A2. The standard criteria

A brief summary of the proposal's compatibility with ESD policy and other relevant policy instruments such as the Standard Criteria as defined by the *Environmental Protection Act 1994* should be presented. Consideration should focus on The National Strategy for Ecologically Sustainable Development, published by the Commonwealth Government in December 1992 (available from the Australian Government Publishing Service). Each principle should be discussed and conclusions drawn as to how the proposal conforms. A life-of-project perspective should be shown.

A3. Final Terms of Reference for this EIS

A copy of the final Terms of Reference should be included in the EIS. A summary cross-referencing specific items of the Terms of Reference to the

relevant section of the EIS should also be provided. For this purpose the Terms of Reference should be line numbered.

A4. Research

Proposals for researching alternative environmental management strategies or for obtaining any further necessary information should be outlined in an appendix.

A5. Consultation report

A list of referral agencies should be provided in a summary Consultation Report, which should also list the Commonwealth, state and local government agencies consulted, and the individuals and groups of stakeholders consulted. A summary of the issues raised by these groups, and the means by which the issues have been addressed, should be provided in the text of the EIS.

The EIS should summarise the results of the community consultation program, providing a summary of the groups and individuals consulted, the issues raised, and the means by which the issues were addressed. The discussion should include the methodology used in the community consultation program including criteria for identifying stakeholders and the communication methods used.

A6. Study team

The qualifications and experience of the study team and specialist sub-consultants and expert reviewers should be provided.

A7. Glossary of terms

A glossary of technical terms and acronyms should be provided.

A8. Specialist studies

All reports generated on specialist studies undertaken as part of the EIS are to be included as appendices.