EIS 1572

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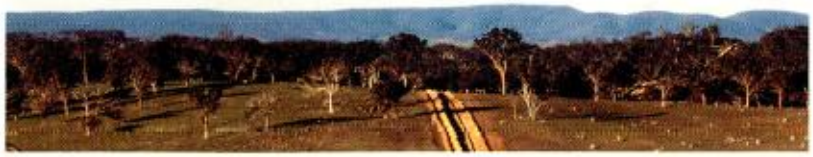
Eastern Gas Pipeline : final environmental impact statement

(Commonwealth), November 1996.



Eastern Gas Pipeline

Final Environmental Impact Statement
(Commonwealth)

BHP

Westcoast Energy

Eastern Gas Pipeline

Final Environmental Impact Statement (Commonwealth)

November, 1996

Published by Eastern Gas Pipeline Melbourne.

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1. INTRODUCTION

1.1. EASTERN GAS PIPELINE PROJECT

The Eastern Gas Pipeline Project involves the planning, engineering, design, construction, commissioning and operation of a natural gas pipeline system linking the existing gas transmission systems of Victoria and New South Wales (NSW). The proposed pipeline will be approximately 740 km in length and 457 mm in diameter, operating at a pressure of 14.89 Mpa. The pipeline will be composed of high tensile steel with a trilaminar polythene coating and buried to a depth of cover of 1200 mm.

The Eastern Gas Pipeline Project will transport gas from the Gippsland Basin in Bass Strait to principal markets in the Sydney, Illawarra and Shoalhaven regions and provide opportunities for service to communities in East Gippsland and south eastern NSW. The pipeline will run from the Longford Gas Plant, south of Sale in Victoria to Wilton, 65 km south west of Sydney.

The Eastern Gas Pipeline Project is a joint venture between BHP Petroleum Pty Ltd (BHPP) and Westcoast Energy Inc. Through their subsidiary companies, BHP Petroleum (Pipelines) Pty Ltd (ACN 006 919 115) and Westcoast Energy Australia (Pipelines) Pty Ltd (ACN 068 570 847) a joint venture entity, Eastern Gas Pipeline Pty Ltd (EGP) (ACN 067 715 646) has been incorporated under Australian company laws to undertake the Project.

Between April and October 1994, BHPP studied the natural gas markets of Victoria and NSW to identify potential customers and opportunities for growth. In December 1994 BHPP and Westcoast Energy commenced detailed feasibility studies of potential pipeline routes. These studies involved specialist consultants and experts from Australia and overseas and investigated the environmental, sociological, economic and broad engineering issues and constraints. From this work EGP selected the preferred corridor.

In April 1995 EGP announced its intention to proceed with a detailed public environmental impact assessment of the Project. The assessment was undertaken to meet the combined legislative requirements of:

- the Commonwealth - under the *Environment Protection (Impact of Proposals) Act 1974*;
- Victoria - under the *Environment Effects Act 1978*; and
- NSW - under the *Environmental Planning and Assessment Act 1979*.

A coordinated approvals process was designed to fulfil the requirements of the above legislation, thereby ensuring that a comprehensive environmental impact assessment was undertaken prior to any approvals being determined.

The Environmental Impact Statement / Environment Effects Statement (EIS/EES) was produced by EGP and specialist consultants from 11 main consulting firms and a further 10 sub-consulting companies. The EIS/EES comprised the Main Report and Background Papers as listed in Table 1. An Executive Summary booklet was also produced.

Table 1 : EIS / EES Background Papers

Paper Number	Title	Paper Number	Title
1	Physical Geology, Geomorphology, Soils and Seismic Stability	11	Landscape and Aesthetics
2	Drainage, Hydrology, Water Resources and Water Quality	12	Traffic and Transport
3	Atmospheric Issues	13	Infrastructure and Services
4	Noise	14	Social Impact
5	Flora, Fauna and Ecology	15	Regional Economic Issues
6	Aboriginal Archaeology and Anthropology	16	Energy Issues
7	Historical Heritage	17	Risk, Safety and Emergency Response
8	Planning and Land Use	18	Climate and Meteorology
9	Agriculture	19	Alternative Corridors - Geotechnical and Environmental Issues
10	Forest Issues	20	Project Mapping

In addition, a Fauna Impact Statement was also produced to meet the requirements of:

- the NSW *National Parks and Wildlife Act 1974*;
- the NSW *Planning and Assessment Act 1979*; and
- the interim provisions of the *Threatened Species Conservation Act 1995*.

The EIS/EES was publicly exhibited from 11 December 1995 to 1 March 1996. During this time EGP issued:

- 5950 copies of the Executive Summary booklet;
- 770 copies of the EIS/EES Main Report;
- 330 complete sets of Background Papers; and
- 30 individual Background Papers.

A total of 53 submissions were received on the EIS/EES.

A joint NSW Commission of Inquiry / Victorian Panel Hearing was established to consider the Project. The Commission/Panel was constituted by the NSW Minister for Urban Affairs and Planning, the then Victorian Minister for Planning and the then Victorian Minister for Energy and Minerals. The Commission/Panel hearings were conducted over the period 10 April to 10 July, 1996 in Melbourne, Sydney, Bairnsdale, Cann River, Cooma, Radcliffe, Nowra and Wollongong. The Commission/Panel issued their report in September 1996. The Commission/Panel found that:

> *"...environmental aspects of the EGP development proposal do not preclude the relevant Ministers granting the sought Permits and Licences pursuant to the respective Pipelines Act 1967 (NSW) and the Pipelines Act 1967 (Victoria) subject to the recommended permits / licences conditions which appear in this report and so recommends."*

Throughout this process no major or significant changes have occurred to the Project as documented in the EIS/EES Main Report and Background Papers. For example, EGP's cost estimates and market forecasts remain similar. The numerous changes (or

clarifications) to the pipeline alignment have been only minor in nature and have been undertaken to reduce potential adverse affects, in consultation with landowners and relevant regulatory authorities. Areas where alignment modifications have been made include the area north of Cann Valley, grassland areas on the Monaro Plains, Welcome Reef and the Illawarra Escarpment. (Refer to relevant sections, herein.) EGP is able to confirm that the pipeline will be installed using directional drilling techniques in the following areas: the Latrobe, Bemm, Snowy and (lower) Shoalhaven Rivers, Bullee Gap and the Illawarra Escarpment. This was suggested as a construction technique for investigation in the EIS/EES, and was recommended by the Commission of Inquiry.

1.2. About This Document

This document, the final EIS, has been prepared by EGP in order to comply with caluse 8 of the Administrative Procedures made under the Commonwealth *Environment Protection (Impact of Proposals) Act 1974*. The final EIS is comprised of two parts:

- part one (particularly Chapters 2 to 20) provides a summary of EGP's response to issues raised in public submissions on the EIS/EES. These have been compiled by subject.

- part two (Appendix 1) provides a summary of submissions cross-referenced to the relevant response contained in part one.

As well as recording any revisions which have resulted from the public submissions on the EIS/EES, the final EIS provides supplementary information to that contained in the EIS/EES and a suitably detailed response to any specific question (or series of questions) raised in the 53 submissions received during public exhibition of the EIS/EES.

2. ASSESSMENT PROCESS

2.1. SELECTION OF THE ALIGNMENT

EGP is committed to a Project which is both environmentally acceptable and commercially viable. It is recognised that the selection of the most appropriate pipeline alignment is a significant component of a sound environmental management strategy and EGP has given highest priority to selecting the alignment within the study corridor which avoids impacts to significant environmental, cultural or social features. EGP has attempted to keep the route as short as possible while at the same time not compromising the environmental acceptability of the alignment. In this regard an iterative approach has been adopted whereby ongoing review and assessment led to both the pipeline alignment and proposed management strategy being progressively refined. The pursuit of a more environmentally acceptable route has, in fact, resulted in an increase in pipeline length to avoid sensitive areas such as Foxground, Lind National Park, the Illawarra State Recreation Area, and sites of biological significance on the Monaro Plains.

In determining the most appropriate location for the pipeline at any given site it was necessary to consider a number of sometimes competing issues. At some areas of significance the pipeline alignment could not be relocated as it would have impacted on an area of greater, or equal value. As a result, areas of high conservation significance have been avoided wherever practicable and the pipeline alignment traverses cleared agricultural land or follows existing cleared easements for approximately 95% of its length.

The size of land holdings or number of landholders did not significantly affect decisions regarding the alignment. Large blocks of land were not selectively avoided unless they contained significant flora and fauna values, had sensitive archaeological or cultural sites, or contained areas of instability or engineering concern.

As the alignment is refined, changes become more minor, although they are still occurring. All deviations proposed in the EIS/EES are documented in Figure 5.1 of the EIS/EES Main Report and were assessed at least at a desk top level prior to the publication of the documents. The bulk of the assessment completed was on the alignment known as the Revision 5 centreline within the study corridor. As a result of ongoing recommendations from the specialist environmental consultants, landowners, and stakeholders, this route was revised to avoid particularly sensitive areas, such as Jackson's Bog and the Foxground area. Environmental consultants were asked to widen their assessment to include route variations in Rev 8.1 (the alignment presented in the EIS/EES). Please note the alignment presented in Background Paper No. 20 was the superceded Rev. 5. Revised mapping was presented to the Commission/Panel.

Alignment changes may occur during construction to avoid sites of environmental significance detected by the Environmental Inspectors or work crews. These refinements will be reviewed by the specialist personnel in consultation with relevant stakeholders as necessary.

2.2. LEVEL OF DETAIL

2.2.1. Assessment Strategy

In general, the level of detail called for in a number of submissions, regarding the potential environmental impacts and their specific managagement, was beyond the scope of the assessment. The aim of the EIS/EES was to assess the Project in sufficient detail to allow decision makers, land managers and the wider community to make informed comment. In this regard EGP considers that the EIS/EES clearly outlines the potential environmental impacts associated with the construction and operation of the pipeline Project.

The assessment recognised that environmental impacts associated with large linear developments can best be managed by firstly selecting the most appropriate alignment and that the development and application of site specific management strategies is an important but secondary phase. As the process for determining a pipeline route is an iterative one and requires continued stakeholder and consultant feedback, the EIS/EES was based on a two kilometre wide corridor with feedback guiding route refinement, Project design and site specific management. It should be noted that the process of progressive refinement and increasing detail is supported by legislation. For example:

- The procedures established under the Pipelines Acts of both States provide for environmental impact assessment to occur prior to the granting of a Permit. Both Acts contemplate that the route may not be finally determined at this stage or may not be the exact route for which a Licence to construct and operate is eventually granted.

- In NSW, an EIS is prepared in order to allow the granting of a Pipeline Permit. Once granted, the holder of a Permit has the right to access land for surveys. That is, an EIS may be prepared prior to conducting detailed site inspection.

The fact that the route of the pipeline may not be finally determined at the stage of the environmental impact assessment has obvious implications for the preparation of the EIS/EES. The document must by necessity be somewhat general in nature when compared to an EIS/EES prepared for a site specific project.

Planning for the final route alignment will continue over the coming months, building on the work to date with the information generated continuing to become progressively more detailed and refined, and enabling EGP to fulfil the commitments made in the EIS/EES and the conditions imposed by the various licences, permits and approvals. The specific mitigation measures that will be adopted at individual sites cannot be determined until the detailed design stage when more technical and site specific information is available. This need for further detailed work subsequent to the EIS/EES is consistent with standard pipeline planning and approval processes across Australia and worldwide.

The result will be the production of an Environmental Management Plan (EMP) and associated documentation including detailed design drawings and alignment sheets, showing the route at a detail scale of 1:10,000. These are being developed in consultation with the relevant stakeholders.

Therefore the two stage process involves the EIS/EES which identifies the potential environmental impacts while the EMP seeks to develop techniques to manage the issues raised in the EIS/EES.

2.2.2. Cummulative Impacts

Consideration of the cumulative impacts of the Project formed part of the Scope of Work for the specialist environmental consultants and EGP considers that the assessment was adequately addressed in the EIS/EES and Background Papers. In addition, the EIS/EES Executive Summary (page vii) provides an overview of areas on the route with the highest social, environmental and economic value.

2.2.3. Other Infrastructure

In terms of infrastructure, the Eastern Gas Pipeline EIS/EES is only concerned with the impacts that directly arise from the installation of the pipeline and associated infrastructures such as the compressor station, meter stations and valves. Facilities such as Esso/BHP's "Site 1" are beyond the scope of the assessment. Impacts that result from the upgrading of existing gas infrastructure in response to the Project will be the subject of separate environmental assessments, should the relevant government regulatory authorities deem that such assessments are necessary.

2.3. CONSULTATION

2.3.1. Government

EGP has undertaken an extensive and comprehensive consultation program. Liaison with all relevant Commonwealth, State and Local Government organisations will continue during the detailed design and construction phases. EGP will work with these groups to determine means to utilise their resources efficiently whilst maintaining their statutory responsibilities.

In most instances Government organisations advised EGP of the preferred contact point. In the case of the Victorian Department of Conservation and Natural Resources (now Department of Natural Resources and Environment) EGP was asked to deal directly with their appointed Project coordinator. All consultation with DCNR in the field and with both the central and regional offices was organised internally by DCNR.

2.3.2. Consultative Committee

As part of the Victorian environmental impact assessment process a Consultative Committee was established early in the process. A draft scope for the assessment was advertised on the 10 June 1995 for public comment prior to the first meeting of the Committee. This enabled the Committee to consider public comments as early in the process as possible. As the Committee still had the opportunity to propose changes to the scope following public comment, the timing of the public consultation is not considered to have disadvantaged Committee members nor unduly affected the assessment process. The Committee provided input to and comment on the draft scope for the specialist environmental studies which formed the basis for assessment.

The Committee was advised at its first discussion of the draft scope for the assessment that should variations to the consultants' briefs be required as a result of changes to the scope this would be done. Subsequently briefs for consultants were amended to take into account scope changes. An important variation to the scope followed the agreement by EGP to include more detailed information regarding the assessment of the alternative routes undertaken during the prefeasibility studies which led to the adoption of the preferred route.

Various versions of the scope, amended to take into account comment received from key stakeholders, were circulated to the Committee for discussion. The scope was formally reviewed at four meetings of the Consultative Committee prior to its finalisation.

2.3.3. Local Community

EGP has conducted an extensive community consultation program since mid 1994. The program has included the production of newsletters, information sheets, special handouts and a 13 minute video. EGP have undertaken direct mailouts of information to stakeholders and conducted newspaper, radio and television interviews. In addition, EGP have conducted two full series of Open Houses at over 30 communities along the proposed route, and have made presentations to numerous community and Government groups.

Property owners have been informed of the nature of the Project, land values, easement acquisition, pipeline construction and operation and will continue to be consulted regarding all relevant issues and possible effects, such as access and noise prior to and during construction.

Issues raised during the community consultation program are summarised in Background Paper 14.

2.3.4. Aboriginal Community

EGP has conducted an extensive and comprehensive program of consultation with the local Aboriginal communities who have been, and will continue to be, consulted and involved in the management of cultural heritage values at all stages of planning, assessment and construction. To assist with this process EGP employs an Indigenous Cultural Heritage Officer who is an elder of the Gunai people, along with 2 dedicated full-time Project team members. EIS/EES Background Paper 6 documents the consultation process and lists the recommendations for continued consultation following installation of the pipeline.

Many meetings have been held with state, regional and local land councils, corporations, cooperatives and communities. Topics discussed include the location of the pipeline, cultural heritage impacts, environmental impacts, impact mitigation methods, native title, land claims, employment and training. At these meetings maps have been provided showing the location of the pipeline route.

EGP has found it most successful to set meetings in accordance with the needs of the communities rather than adopting a more rigid schedule approach. The NSW Department of Aboriginal Affairs has been invited to attend any of the meetings in the State, with the permission of the Aboriginal people. Summaries of all formal meetings are forwarded to the Department.

A two day forum held in Nowra on 18-19 March 1996 was attended by members of all potentially affected Aboriginal communities along the pipeline route. Expenses incurred by community representatives were borne by EGP.

Two series of Public Open Houses have been held at over thirty centres along the pipeline route.

Meetings have been held with all relevant communities including the members of the broader Moogji community (who were involved in meetings and site inspections in the period April - September 1995).

The Project team has held a number of meetings with the NSW Department of Aboriginal Affairs and with Aboriginal Affairs Victoria to advise Project status and the process and details of EGP's consultation program.

The Project's consultant archaeologists, EGP Archaeology, adopted the correct and established procedures for consultation with the Gippsland Aboriginal communities. In the first instance, approaches were made to Aboriginal Affairs Victoria to determine the names and boundaries of the appropriate Aboriginal organisations and the contact officers (Chairpersons and Cultural Heritage Officers). Consultations with each community in Victoria was subsequently initiated through these Officers, firstly by telephone and correspondence introducing the Project and study team, and later through personal meetings.

In no circumstances has archaeological survey work been conducted nor will it proceed without the consent and participation of the relevant Aboriginal organisation. Members of the Aboriginal communities, were employed during, and participated in, the EIS/EES survey. This often involved viewing relevant route sectors by vehicle and walking a substantial portion of the route. The exact route of the pipeline was explained using mapping aids. The impacts of the pipeline to cultural heritage sites were discussed at length with the community representatives and copies of the Aboriginal Archaeology and Anthropology Preliminary Draft Background Paper were circulated to Aboriginal groups for comment.

All suggestions made by the Aboriginal communities are given careful consideration by the Project team and it is EGP's practice to treat all stakeholders in an equitable, fair and consistent manner.

2.3.5. Industry

EGP has had preliminary meetings with a range of local industry representatives including resources (coal, blue metal mining, minerals, forestry), and utility and service groups (electrical, water, telecommunications, rail and road) to assist in the development of design and construction practices which do not compromise local services, resources and infrastructure. Discussions will continue as needed.

2.4. DOCUMENTATION OF RESULTS

2.4.1. Route Sectors

It is proposed that pipeline construction will be carried out in three spreads working simultaneously. For construction issues, therefore, it was necessary to break the route into these components. However, the specialist studies generally divided the pipeline route into sectors appropriate to the subject. For example, the *Atmospheric Issues* and *Climate and Meteorology* Backgound Papers used the three spreads as the basis for assessment because each of the three areas have similar and delineated weather patterns thus providing a suitable overview of the climatic and atmospheric issues as they relate to the Project. The ecology, geomorphology and aesthetics studies each divided the route into sectors based on broad land systems.

2.4.2. Use of Kilometre Points

Where possible, kilometre points have been used throughout the EIS/EES documents to indicate the location of significant features and sites. Where possible, other geographic features are also referenced (eg Shoalhaven River, Morton National Park, Mount Kembla).

3. APPROVAL PROCESS

3.1. SUBSEQUENT APPROVALS

There are numerous subsequent approvals which will be required for the EGP Project following the granting of the Pipeline Permits. EGP will work closely with relevant authorities to ensure that statutory requirements are met and to obtain the necessary approvals, licences or permits.

Comments were made regarding the following specific subsequent approvals.

3.1.1. Stream Crossings

Stream crossings require a range of approvals from regulatory authorities to facilitate construction. For example, EGP recocognises its obligations under legislation such as:

- the NSW *Rivers and Foreshores Improvement Act 1948* regarding water flow and bank stability; and
- the *Fisheries Management Act 1994* regarding the obstruction of fish passage.

In addition EGP recognises the special protection afforded the Mitchell, Snowy and Bemm Rivers under the Victorian *Heritage Rivers Act 1992.*

EGP will apply for all relevant approvals and abide by the legislative requirements and conditions of approval. Applications for stream crossing approvals will be supported by appropriate design detail and site specific plans. Such plans will be developed in consultation with relevant authorities.

3.1.2. Water Quality

EGP recognises that there are specific requirements under the NSW *Clean Waters Act 1970* prohibiting the discharge of hydrostatic test water into the Metropolitan Special Areas managed by the Sydney Water Corporation. EGP also notes the applicability of the *Water Board (Corporation) Act 1994.*

3.1.3. Threatened Species

EGP understands that the Minister for Energy and the Ministers whose concurrence is required for the grant of the pipeline permit under the NSW *Pipelines Act 1967* will be required to consult with the Minister for the Environment as the Minister administering the NSW *Threatened Species Conservation Act 1995.* In addition, EGP will comply with the relevant requirements of this Act including those obligations regarding the harming or picking of species scheduled as threatened.

3.1.4. Borrow Pits

EGP is aware that a subsequent approval will be required to open and/or operate borrow pits for the extraction of sand or gravel. Where possible, existing borrow pits will be used. All necessary approvals will be acquired through the appropriate channels prior to construction commencing.

State significance, in Victoria, is based upon the *Flora and Fauna Guarantee Act 1987* and the *Wildlife Act 1975*.

3.1.5. Noise

Meter and compression stations required at the time of commissioning will be designed to comply with the statutory requirements and appropriate approvals will be obtained prior to operation. Facilities required in the future will be the subject of Government requirements and approval at that time (refer also to section 13.1).

3.2. PUBLIC DISPLAY

The EIS/EES was placed on Public display for a period of twelve weeks (11 December 1995 to 1 March 1996). This far exceeds the legislative requirements and was provided to ensure that sufficient time was allowed for detailed review. It should be noted that under the:

- Commonwealth *Environment Protection (Impact of Proposals) Act 1974* the EIS is required to be on Public display for a minimum of 28 days;
- NSW *Environmental Planning and Assessment Act 1979*, the EIS should be on public display for a minimum of 30 days; and
- Victorian *Environment Effects Act 1978* the display period is usually two months.

4. PROJECT SUBSTANTIATION

4.1. GAS MARKETS AND SUPPLY

4.1.1. Gas Markets

The Eastern Gas Pipeline Project (EGPP) has been designed to service an ultimate market of 90-100 Petajoules/annum (PJ/a). Full life cycle economics of various line sizes and maximum operating pressure were considered in selecting the present EGPP design. While high initial capital charges can have a negative effect on pipeline end users, in the subject case initial costs have been minimised with future capacity requirements provided by additional system compression. Whilst the exact nature, amount and capacity required for start-up and long term financial viability are all propriety EGPP information, in a deregulated and competitive environment the Project must be able to compete with alternative energy supplies.

The impact of the EGPP on gas consumption was estimated on the basis of comparing the Project case with a reference case in which there is no gas inter-connection between the Gippsland Basin and New South Wales. In the reference case natural gas improves its competitive situation through greater availability (expansion of the distribution system), improved efficiency of gas-using equipment and competition reforms in energy markets. The overall impact of these factors is an acceleration of gas demand growth over the period 1995-2010, particularly in the industrial and commercial sectors, but also in electricity generation after 2000.

In the Project case the EGPP stimulates further competition leading to delivered gas price reductions and more aggressive gas marketing compared with the reference case. This leads to further increases in demand in major New South Wales markets and also along the pipeline route. The Project incremental effect is most noticeable in the industrial and electricity generation sectors.

The EIS/EES Background Paper 16 states that the NSW gas load is expected to rise by 72 PJ/a by the year 2009-10 with a further 41 PJ/a due to the presence of the EGPP (p.22). In addition, enroute demand could add a further 6-7 PJ/a for a total potential EGPP system demand of 120 PJ/a by the period 2009-10 (p.18).

EGP intends to serve the BHP Port Kembla steelworks and the Smithfield Cogeneration Plant. The forecast project load at the Port Kembla steel operations represents approximately 10% of EGP market forecast. The Smithfield facility was explicitly considered in the energy modelling analysis and its gas supply agreement forms part of EGP's market plan.

A key factor in the selection of the Nowra Corridor as the preferred pipeline route was the ability to service 20 communities which currently do not have reticulated natural gas. In addition, the pipeline route was intentionally located in proximity to the ACT and Queanbeyan which are subject to supply constraints during periods of peak demand.

It is acknowledged in the EIS/EES (Chapter 15) that provision of gas infrastructure will tend to encourage the establishment of industrial development. It is, however, the function of government regulatory agencies to ensure that the establishment and location of such industries is compatible with existing land uses, and the concepts of ecological integrity and cultural values.

The EGPP Project does not include gas reticulation or connection laterals. However the Project will provide any necessary metering and pressure reduction facilities when required. Reticulation to unserviced communities is likely to be undertaken by third parties subject to separate planning and assessment requirements.

4.1.2. Competition

BHP Petroleum and Westcoast Energy have been participating to the maximum extent possible in the various gas industry reform processes aimed at developing access principles for gas transmission and distribution systems in Australia. The Eastern Gas Pipeline will be operated to conform with the outcomes of those processes. However, more than this, it is intended that the pipeline will be operated according to principles which will form a benchmark for the provision of transportation services in the Australian marketplace. In particular, the pipeline will be operated in accordance with principles which will enhance the attainment of the vision of dynamic, expanding markets for natural gas in both Victoria and NSW. Accordingly, the pipeline will offer a tariff and access regime which will maximise the competitive position of natural gas delivered to customers' premises against other fuels and against competing supplies of natural gas. The following operating principles shall apply:

- The pipeline shall provide transportation services upon request to any customer who is willing to contract for and able to pay for the services requested, subject to the following conditions:
  - physical capability of the pipeline to provide the service;
  - prior sale
  - reasonable notice; and
  - financial viability.

- Tariffs will reflect, as much as is reasonably possible, the cost of providing a service. Cross subsidisation among the various shippers shall be avoided to the extent possible in favour of 'user pays' principles.

- Shippers may be categorised into shipper groups on the basis of the nature of the service or the duration of the services they are seeking. Toll differences between the shipper groups will reflect the character of service and the time at which service contracts are entered into.

- Tariffs will be set to recover all costs associated with owning and operating the pipeline as well as providing a commercial rate of return to the owners of the pipeline.

- The pipeline shall provide ready access to all relevant information relating to conditions of transportation services, their availability on an on-going basis, and the applicable tolls.

- Future pipeline expansions will be considered on the basis of satisfactory project economics, long term transportation contracts and stable fiscal regimes, government policies and regulatory procedures for project approval.

Basin to basin competition is available by negotiated displacement assisted by selection of the most efficient pipeline delivery system which, based on EGP study, is best accomplished by the Nowra Corridor.

4.1.3. Security of Supply

Security of supply is influenced by the number of basins supplying the market and the capacity of the transmission pipelines to meet demand.

4.2. ENERGY IMPLICATIONS

4.2.1. Assessment Methodology

The assessment of environmental impact was conducted in accordance with the scope of work agreed to by the Victorian Consultative Committee and as outlined in the NSW General Director's Requirements.

The energy service concept was recognised by and briefly discussed in the energy issues Background Paper 16. The approach taken by EGP is that energy service (motive power, heating, drying, etc.) demands in the market can be commercially met by utilising gas transported from Gippsland Basin via the preferred route.

It is beyond the scope of the EIS for EGP to assess an economy-wide analysis of options for meeting energy services in the short, medium and long terms.

4.2.2. Energy Demands

The potential short term effects of reduced energy prices on energy efficiency and renewable energy sources were explicitly recognised in the EIS/EES Background Paper 16. In particular, it is considered that the EGPP will contribute to increased demand for natural gas as a lower priced energy source. However, by enhancing awareness of the environmental benefits of using cleaner energy forms, the Project may well stimulate research, development and technology transfer efforts to improve the economic performance of other cleaner energy forms such as renewable energy.

Energy efficiency and research into renewable energy are all proven outcomes throughout the world where competition, correct market signals and low cost forms of energy are provided in the market place.

In addition, by stimulating investment in new, gas-using equipment of higher energy efficiency than the equipment it replaces in water, space and process heating, and in electricity generation (cogeneration, combined cycle gas turbines), the Project will immediately lead to improvements in energy efficiency.

4.2.3. Cogeneration

A typical modern simple cycle gas turbine has an efficiency of approximately 40%, while cogeneration facilities having and efficiency of approximately 78%. EGP suggests that a gas fired power plant can experience efficiencies of approximately 40% (versus 38% for coal firing). These figures are significantly lower than for a gas fired combined cycle non cogeneration gas turbine plant at 55-60%.

4.3. Economic Viability

EGP has great confidence in the economic viability of the Project. Capital cost estimates, which contributed to the viability assessment, were undertaken as reasonable medium to long term pro forma projections having regard to Victorian and NSW market requirements.

EGP recognise that the public acceptability of the Regional Forest Agreements may impact on the development of future and existing hard-wood processing operations in East Gippsland. However, it should be recognised that the commercial viability of this Project is not influenced by the potential consumers in Bombala or East Gippsland.

4.4. Regulatory Framework

4.4.1. Energy Policy

EGP recognises that currently there is no national sustainable energy policy in place. However, the absence of such a policy is not considered an impediment to a decision regarding the Project. That is, the Project is in accord with guiding principles set down in the November 1995 Discussion Paper for a National Sustainable Energy Policy and the goals and objectives of the Council of Australian Government for a de-regulated and competitive natural gas industry. Moreover, it will generate benefits that deserve support from proponents of sustainability in energy policy. The Project will enhance the efficient use of energy through stimulating investment in cogeneration systems and other new efficient technologies and equipment contribute to Greenhouse Gas abatement through displacement of more carbon intensive fuels and promote fair and open competition in the energy sector. EIS/EES Background Paper 16 clearly indicates that the Project is consistent with the current and emerging government policy framework in the areas of competition, energy and Greenhouse Gas reduction. The Project contributes to policy goals in each of these areas.

EGP does not consider that the absence of a national grid plan poses problems for the Project, as it argued that a central planning role would be inconsistent with the policy of removing barriers to trade and investment in gas. The concept of a centrally directed system of least cost integrated resource planning was investigated and rejected by the Industry Commission in 1991 in its reference on reforms to the energy industry. The Commission rejected the concept and it has not been part of the energy industry reform agenda over the past 5 years.

Therefore, in the absence of centrally directed industry planning, the issue of which investments are "necessary" must be left to investors. If investors consider that the pipeline can be made economic, any further regulatory constraint (apart from environmental appraisal) would constitute a barrier to trade and investment.

4.5. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

Schedule 2 of the Regulations of the *NSW Environmental Planning and Assessment Act 1975* defines the principles of Ecologically Sustainable Development as:

(a) The precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

(b) Inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

(c) Conservation of biological diversity and ecological integrity.

(d) Improved valuation and pricing of environmental resources.

The following sections address the degree to which the Project is consistent with each principle.

The Precautionary Principle

As with all concepts related to ESD, the precautionary principle has many definitions. Nonetheless, there is general agreement that the principle requires that the inevitable uncertainty in the assessment of environmental risk should not be used as a reason for not taking appropriate and adequate steps to prevent environmental damage through:

- full consideration of the risk of serious or irreversible environmental damage during planning; and
- design and management that ensures the risk of serious or irreversible environmental damage is acceptable (ie very low).

The precautionary principle does not require that it be shown that serious or irreversible environmental damage is certain to occur, but that the potential risk be fully considered and that, where there is a high likelihood of such damage, appropriate measures are taken as a reason not to act.

Equally, the precautionary principle does not require that it be shown that it is certain that there is *no* risk. The principle is based on a recognition of the inherent uncertainty in our knowledge about environmental consequences. That uncertainty is logically symmetrical: neither the case for certain damage nor the case for zero risk of damage can be made due to the inherent uncertainties of environmental risk assessment.

The Australian Conservation Foundation (Hare 1990), in a comprehensive review of ecologically sustainable development, explains the precautionary approach thus:

> *"Policy decisions should err on the side of caution, placing the burden of proof on technological and industrial developments to demonstrate that they are ecologically sustainable."*

EGP has accepted that burden of proof, and has directly addressed the precautionary principle in the following ways:

- the potential risks have been fully and openly considered through the most complete EIA ever carried out for a pipeline proposal in Australia;
- the response to all risks identified during these studies has been precautionary throughout the environmental assessment and route planning process, as:
  - all areas judged to have an *unacceptably high risk of serious or irreversible damage* have been avoided by route changes or by special construction methods (eg drilling)
  - for those areas on the route where some degree of environmental risk remains, route planning has reduced these risks, so that they are all considered manageable
  - the need to specifically prevent degradation in the areas with some remaining degree of risk is addressed through the Environmental Management Plan, which contains measures specifically aimed at preventing environmental damage.

Thus, EGP has not only demonstrated that the pipeline is very unlikely to cause serious and irreversible environmental damage, it has gone further and addressed even much lower levels of environmental impact with the aim of minimising all levels of environmental impact.

Intergenerational Equity

The principle of intergenerational equity is, simply put, 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.

The energy and Greenhouse impacts of the operation of the pipeline are clearly consistent with this principle. Enhancing economic efficiency through reducing energy costs and improving energy efficiency and overall productivity (lower energy inputs per unit of output, stimulation of investment in higher productivity equipment) will tend to enhance the welfare of future generations. By providing an efficient energy service which has fewer negative environmental impacts than other combustion fuels. The Project will reduce environmental costs, thus increasing the range of both environmental and energy options available for future generations.

In relation to the impacts of construction of the EGPP, intergenerational equity has been addressed by ensuring that:

- there will be no loss of biodiversity at the international, national, state or regional level, and only minor losses at the local level
- soil, water, landscape and other environmental resources will be maintained through good route planning, design, construction and management
- the large amount of environmental data that has been collected is publicly available (in many areas, particularly on private land, the EGP environmental studies have considerably advanced our knowledge of the environmental values present, providing an important opportunity for improved regional and local environmental planning and management to conserve these values into the future).

Conservation of Biological Diversity and Ecological Integrity

The principle of conserving biological diversity and ecological integrity is one of the more straightforward of the ESD principles. It is also one of the most accepted and widely adopted.

EGP has addressed the potential impacts of pipeline construction and management on the conservation of biodiversity in considerable detail through:

- assessment of the potential for loss of biodiversity (ie significant reduction in population size or local extinctions of species) through the identification of the known or likely locations of populations of rare flora and fauna (from existing data, extensive field surveys, and habitat assessments);
- ensuring that, where a potential for biodiversity loss existed, actions were taken to prevent such losses completely (generally by route relocation) or to ensure that losses would be local and without long term or irreversible consequences (through such actions as narrowed construction easements, pre-construction surveys and collection of rare species, revegetation and other actions set out in the EMP);
- assessment of the potential for indirect effects (eg increased access for introduced predators, loss of key resources such as mature trees, etc) to cause biodiversity loss; and
- ensuring that, where a potential for such indirect effects existed, actions were taken to prevent any effect or to ensure that any effect would be local and without long term or irreversible consequences (through such actions as maximal use of existing easements, retention of specific trees and other actions set out in the EMP).

The analyses presented in the EIS/EES show that there are expected to be no losses of biodiversity at the international, national, state or regional level, and minimal short term losses at the local level. Thus the Project is consistent with the maintenance of biological diversity.

EGP have addressed the potential impacts of pipeline construction and management on the conservation of ecological integrity by ensuring that the functioning of ecological systems at both the local and the regional level will be maintained through:

- minimising vegetation and habitat clearance;
- assessing the potential impacts of habitat fragmentation, loss of wildlife corridors, wildlife barriers, edge effects, stream crossings, weeds, feral animals and loss of key ecological resources; and
- ensuring that, where a potential impact existed that might degrade ecological integrity, actions were taken to avoid or reduce the impacts through such actions as maximal use of existing easements, retention of specific trees, reduced clearing at wildlife corridors, revegetation, weed control, a trench entrapment plan for fauna and other actions set out in the EMP.

The analyses presented in the EIS/EES show that there are expected to be no losses of ecological integrity at the international, national, state or regional level and minimal short term losses at the local level. Thus the Project is consistent with the maintenance of ecological integrity.

4.6. GREENHOUSE GAS BENEFITS

The EGPP is not a Greenhouse Gas (GHG) abatement initiative *per se*, but a project which has major GHG abatement as one of its benefits. The Project will facilitate GHG abatement through the enhanced use of gas, a key component of the National Greenhouse Response Strategy. This will be achieved through gas becoming more competitive with more carbon intensive fuels, particularly coal.

In addition, the Project will provide a major infrastructure item that will stimulate a more competitive gas market and therefore promote the enhanced use of gas and improved energy efficiency in electricity generation and sectoral (industrial, residential, etc.) end-use markets. It is in these markets that cost effectiveness should be judged. In this case markets are already judging that substitution of gas for more carbon intensive fuels is cost effective and thus this trend is leading to a significant reduction in Australia's projected GHG emissions. Other contributors to GHG abatement, which are similar to physical infrastructure in their GHG abatement role, are environmental, education and research and development initiatives.

The GHG abatements projected to be stimulated by the Project may be small compared with total energy related emissions, but within the short time available to meet targets set for the year 2000 few other specific initiatives have the potential to make such an impact within the current market framework. It is noted that a problem which has faced governments for over 20 years has been how to cost effectively stimulate the private sector to undertake actions to realise the potential for energy efficiency, renewable energy and cogeneration and, more recently, the potential to reduce GHG emissions. The Project provides a commercial means of reducing trend GHG emissions that is complementary to government programs such as the NSW Sustainable Energy Fund.

Infrastructure items such as pipelines, transmission lines, public transport right of ways, research and development, etc. facilitate GHG abatement actions by energy users. In the case of the Project the cost will be reflected in costs of gas to users who, it is estimated, will find it attractive to substitute gas for more carbon intensive fuels, particularly coal.

EGP's specialist energy consultants, NIEIR, estimate that by the year 2000 the Project would lead to net GHG emission savings of 1.0 million tonnes of CO_2 equivalent (refer to EIS/EES Background Paper 16). One million tonnes represents 50 per cent of the Greenhouse 21C (1995) target of savings from gas industry reform and about 5 per cent of all estimated emission savings by 2000 from Greenhouse 21C initiatives. The estimated GHG reductions stimulated by the Project are net savings which take into account GHG emission increasing effects of the Project. The report compares this reduction to emissions from non-energy industrial process for illustrative purposes only (ie to place the magnitude of this figure in context). Savings are shown to be 25 per cent of the industrial emissions.

In a national context, such reductions are significant.

As a percentage of the estimated total greenhouse gas (GHG) emissions related to energy use in the year 2000, 1.0 million tonnes is about 0.3-0.5 per cent. Relating the savings to total energy-related emissions is not very useful. Initiatives to meet targets in 2000 are more relevant and in this regard the estimated Project's GHG savings are significant.

The following table summarises the estimated emission reductions from "Greenhouse 21C" initiatives.

Initiative	Estimated emission savings by 2000 (millions of tonnes of CO_2 equivalent)
Partnership 21C	
• Cooperative agreements	15.0
Energy 21C	
• Gas market reform	2.0
• Car fuel efficiency labelling and advertising	0.45
Urban 21C	
• Transport impact statements	0.1
• Capturing methane from sewage and industrial processes	0.4
Biosphere 21C	
• One billion trees	2.0
• Labour market programs for expanded tree planting	1.0
• Reducing methane emissions from livestock waste	0.2
Total	21.15

Source: Greenhouse 21C, Commonwealth of Australia, 1995.

EGP did not relate GHG emission reduction to the cooperative agreements (Greenhouse Challenge) program as this is essentially a program for end-users of energy in the industrial sector. As the Project is mainly proceeding because of the gas industry reforms, EGP feels it is more appropriate to relate it to that target (ie 2.0 million tonnes of emissions by 2000).

Options to offset greenhouse and other environmental effects of the Project are outlined in the EIS/EES Background Paper 16 (Section 5.4).

4.6.1. Assessment Methodology

The purpose of using a molecular basis for comparison between methane (CH_4), the major component of natural gas, and CO_2 is to facilitate comparison between burnt and unburnt gas. When one molecule of methane is burnt it produces one molecule of CO_2. The molecular weight of CH_4 is 16 and the molecular weight of CO_2 is 44, therefore, one tonne of CH_4 produces 2.75 tonnes of CO_2 when combusted.

The global warming potential (GWP) of methane is 24.5. When one tonne of methane is combusted to form 2.75 tonees of CO_2, the relative global warming potential of the emission of unburnt methane is about 9 times greater (24.5/2.75) than it would be if that same quantity of gas was burnt to produce 2.75 times weight of CO_2.

EIS/EES Background Paper 3 notes the amount of methane lost through pipe leakage on a weight basis. Therefore conversion to CO_2 equivalent is correctly carried out using the figure of 24.5 GWP (wt/wt) % 50 x 24.5 = 13 000 t (approximately).

EIS/EES Background Paper 3 quotes that leakage of gas could contribute to a GHG emission of 1900 t/CO_2 equivalent. This figure is derived as follows:

a. Combustion of gas yields 2 140 000 t/CO_2. If the lost gas (0.01%) were burned it would yield 214 t/CO_2, which is equivalent to 78 tonnes of unburnt methane. Since the lost gas is not burned, its relative global warming effect is 9 times greater on a mole /mole basis, therefore global warming effect is:

78 t/CH_4 x 24.5 = 214 t/ CO_2 x 9 = 1900 t/CO_2

b. Alternatively

41 PJ per annum gas is used at 0.01% loss so that 4 100 GJ per annum gas is lost.

If the specific energy of gas is 52.9 MJ/kg, then 77.5 tonne/annum gas is lost. The GWP of methane is 24.5 (weight basis), therefore, gas loss is equivalent to 77.5 x 24.5 = 1900 t/CO_2.

4.7. Costs and Benefits

The agreed scope for the EIS/EES required that the overall costs and benefits of the proposal needed to be outlined. All these requirements have been met by Chapter 3 and 4 of the EIS/EES and Background Paper 19.

However, the following provides a summary of key points:

The Eastern Gas Pipeline Project team has identified the Nowra route as the most economically viable route. EGP believes the environmental impacts can be managed during construction and operation and the route promises to deliver real environmental benefits. If the preferred Nowra route were not approved, there would be major negative implications for Victoria, NSW, ACT and Australia.

The key implications of not proceeding with the Project are:

- continuing lack of competition in the energy market;
- continuing higher energy prices;
- less efficient industry;
- less employment;
- reduced GDP, and
- lost opportunities for major GHG emission savings.

An opportunity will be lost to provide the means for an alternative, competitive supply of gas to the Sydney and Canberra regions from that which has historically served these markets. Users in these markets will lose an opportunity to benefit from the introduction of competition into a market where there has previously been a monopoly supplier of gas. The Report of the Hilmer Inquiry into a National Competition Policy in August 1993 recognised that:

> *"The promotion of effective competition .... (is) .... generally consistent with maximising economic efficiency."*
>
> *"Economic efficiency plays a vital role in enhancing community welfare because it increases the productive base of the economy, providing higher returns to producers in aggregate, and higher real wages."*
>
> *"Because it spurs innovation and invention, competition helps create new jobs and new industries."*

The National Institute of Economic and Industry Research (NIEIR) modelling demonstrates that at a national level, cumulative value to GDP in 1995 dollars of between $1.79 billion and $3.57 billion would be lost to Australia's economy if the Project did not proceed. This would be principally due to higher energy costs.

Employment generated as a direct result of construction and maintenance of the Eastern Gas Pipeline would be foregone including 146,000 days of work (1,100 jobs during the peak construction period) during the construction phase and a further 60 permanent jobs in ongoing maintenance of the pipeline. Spin off effects are estimated to generate a further 1,040 full-time positions in related industries.

In addition, in the more remote regions, the opportunity would be lost to support training and provide jobs for some long term unemployed persons, thus providing meaningful work experience.

Maintenance of higher energy prices and limited supply to Victorian and NSW markets along the route would also inhibit regional development opportunities and therefore significant job growth.

Australian industry would become less internationally competitive due to an inefficient energy sector and the resulting high prices they would be forced to pay.

Opportunities for new market penetration and developing new markets would also see natural gas fail to increase its share of the energy market. It would also reduce gas-on-gas competition.

Supply to existing markets in Sydney would be inadequate within five years and is likely to be outstripped by even latent demand in the Sydney market.

Additional supply security for ACT and NSW would not be achieved.

Finally, without the Eastern Gas Pipeline, a major opportunity would be missed to reduce GHG emissions. Last year, the Australian Bureau of Agricultural and Resource Economics predicted that the cost of stabilising greenhouse emissions in developed countries alone would amount to A$107 billion per year by 2020.

Australia is the fourth highest greenhouse gas producer per capita in the developed world, particularly of CO_2 emissions through burning fossil fuels.

The Eastern Gas Pipeline should deliver 100% of the Commonwealth Government's estimate of the reduction of greenhouse gases from Australia's gas market reform and 25% of the total target for emission reductions from all industrial reform.

The Eastern Gas Pipeline will save 2 million tonnes of GHG emissions per year by 2010. This is the equivalent to removing almost 500,000 cars per year from Australian roads in terms of reduced CO_2 emissions.

For NSW, in particular, the implications of not proceeding are significant:

- Opportunities to generate additional export income would be lost. By 2025 this project will generate approximately an additional $268m worth of net exports from NSW. Indeed, major benefits will be realised well before 2025. By 2011 the Project will lead to a net increase in exports of $96m.

- Expansion of gas markets which currently only penetrate 8% of primary energy demand in NSW would be slowed.

- Estimated growth in the Gross State Product of $0.78b by 2025 would not be achieved.

At the regional level in New South Wales, major benefits, including a strong impetus for regional economic development would not be achieved:

- Regional job growth estimated at 685 effective full time positions would be lost.

- New industrial developments such as the proposed ACTEW cogeneration project would not be facilitated.

- Infrastructure necessary to accommodate potential residential demand resulting from future growth especially in the Shoalhaven region would not be provided.

5. ALTERNATIVES

5.1. ALTERNATIVE ROUTES

5.1.1. Assessment Methodology

EGP conducted an extensive feasibility assessment of eight alternative pipeline corridors. This involved a wide range of national and international experts. Chapter 4 of the EIS/EES summarises this work and outlines the environmental, strategic, operational, commercial and engineering characteristics of each corridor. Additional information regarding the engineering and environmental constraints is provided in Background Paper 19.

EGP considers that this work provides a comprehensive assessment of prudent and feasible alternatives, and is far in excess of work completed on similar linear developments. Furthermore, EGP believes that the work undertaken and reported in the above documents fulfils the Scope of Work agreed to by the Victorian Consultative Committee and outlined in the NSW Director General's requirements. This scope required the EIS/EES to assess the potential impacts of the Project and discuss the environmental, social and economic settings of the alternative corridors and the reasons for their rejection. As stated in the EIS/EES, given the nature and size of the Project it was not considered reasonable for an equivalent assessment to be undertaken for each corridor.

The assessment of natural heritage values of each corridor was based on identified values such as National Parks, reserves or heritage listings, vulnerable, rare or threatened species, 'old growth' status etc.

As part of the economic viability assessment, EGP modelled and completely redesigned existing gas transmission systems such that those systems were capable of meeting EGP's view of NSW and Victorian market requirements for the foreseeable future. In addition, full life cycle tolling studies were conducted based on indicative information provided by existing operators. This enabled EGP to judge end user costs for the alternatives.

EGP also conducted full cycle economic evaluation of the alternatives which included all capital, operations and maintenance costs, including those associated with environmental management.

The relative Greenhouse Gas (GHG) benefits of the alternative routes were also considered. The Eastern Gas Pipeline is not a GHG reduction project but a development aimed at providing new and existing markets with an environmentally friendly and low cost energy source. However, by virtue of the energy source delivered (natural gas) the Project will displace less environmentally friendly fuel. In this regard, the Nowra corridor will result in half the CO_2 emissions of the Western corridor and will consume less non-renewable fuel (and thus create less CO_2) than the Marulan Corridor due to lower compression and ongoing operational requirements. As a result EGP submits that a

particular route may not necessarily result in less environmental impact simply because it is shorter.

A decision to proceed with an EIS/EES on a preferred corridor was made in late March 1995 after careful consideration of input from a wide range of stakeholders, environmental, market, engineering and technical factors. The decision to proceed with an EIS was made on 4th April 1995.

The preferred route for the Project was based on a balance of potential issues including potential environmental, engineering, economic and social impacts. The assessment indicated that all potential environmental impacts associated with the Coastal, Nowra, Marulan, Braidwood, and Western corridors could be successfully managed. Therefore, the choice between these routes was influenced by engineering, social, safety and economic considerations.

It is pointed out that EGP is not proposing to construct the pipeline on any other route. The decision to adopt the preferred route was taken in the knowledge that the more detailed environmental assessment process would determine whether the environmental impacts of development could be satisfactorily managed, and the Project would be approved or rejected on these grounds.

5.1.2. Western Corridor

EGP considers that the Western Corridor, when compared to the Nowra Corridor, would:

- be more expensive to construct;
- not provide gas as competitively;
- not service as many customers;
- not provide equivalent Greenhouse benefits;
- have less community benefits.

It is acknowledged that the environmental sensitivities and potential biota effects would be lower on the Western Corridor. However, EGP considers that environmental impacts associated with the Nowra Corridor are manageable and that the technical, social, safety and economic impacts provide significant advantages to EGP and the community.

EGP does not consider the Western Corridor to be the most suitable in the national and public interest, as argued in some submissions. For example, there are approximately 20 communities along the Nowra corridor that currently do not have reticulated natural gas. Without the Project these communities may never receive the benefit of this premium fuel if the Western Corridor is adopted. There are a limited number of communities currently without natural gas on the Western Route. As noted in the EIS/EES the opportunity to service these communities would not change with construction of the Western Corridor. (See also sections 4.7 and 18.1.2, herein.)

EGP considers that natural gas from the Cooper Basin would be available to Victorian markets via the Nowra Corridor on a negotiated displacement basis. The potential commercial constraints associated with this option (eg possible tolls) are based upon the same concerns that EGP has for providing Gippsland Basin gas to Sydney via the Western Corridor.

5.1.3. Marulan Corridor

EGP has selected a preferred route for the pipeline between Hoskinstown (near the ACT) and Wilton which proceeds through Nowra, Port Kembla and Wollongong. The alternative of proceeding from Hoskinstown to connect to the existing Moomba-Sydney pipeline at Marulan was considered. This route would avoid some areas of environmental sensitivity that are traversed by the selected Nowra route. It does not, however, provide an economic alternative.

This conclusion has been reached in consideration of the following community issues:

- The Nowra route will lead to greater competition in the Sydney gas market and hence lower prices, greater security of supply and better service. Maximum independence from existing infrastructure will ensure greater transparency in charges. Also the Nowra route potentially provides new access via dedicated laterals to the Botany industrial complex. Even if that option is not taken up, it is the economic possibility which will enforce competitive behaviour and is the essence of competition;

- The Nowra route will bring low cost energy to new and existing markets *en route*. AGL has chosen not to extend its existing Port Kembla line south and it is presumably uneconomic at present for it to do so. The Nowra route will provide low priced energy to this rapidly growing region. A more competitive market in Port Kembla / Wollongong will contribute to the ongoing viability of the iron and steel complex there which is dependent on competitively-priced exports for continuing viability;

- Benefits available from a more competitive energy market might amount to:

Region	By 2002	By 2010
Nowra	$3 million	$10 million
Port Kembla / Wollongong	$25 -$35 million	$90 million

- The Nowra route traverses Morton National Park, the Illawarra Escarpment and the Sydney Water Catchment. As a whole these are areas of high environmental value, but the pipeline will follow a low sensitivity route where environmental value has been reduced by prior activity. Thus the main measures that will minimise environmental impact are following already disturbed easements (such as the existing road through Morton National Park) and directional drilling. Residual environmental impacts will be appropriately managed. Net costs arising from ongoing environmental disturbance are likely to be small for those areas affected; and

- The Nowra route will produce greater savings in GHG emissions (CO_2) than the Marulan route to the extent that gas prices are lower, and hence more is used, thus displacing higher GHG fuels. For any given level of economic development there will be greater substitution of natural gas in place of more greenhouse-gas-intensive fuels such as black coal in existing industry, and a greater likelihood that new industry will use natural gas. Overall, the CO_2-intensity of energy use in NSW will decline. The reduction in GHG emissions for Nowra/Wollongong over emissions from the energy mix likely in the absence of the pipeline, amounts to about 500,000 tonnes CO_2 per annum.

Therefore, EGP considers that the economic benefits from the selected Nowra route significantly exceed those from the Marulan route. Not only will the Nowra/Shoalhaven region be served for the first time, it (and Wollongong/Port Kembla) provide early loads crucial to the commercial success of the pipeline. The additional competition provided in the Sydney gas market by the Nowra route will add significant net benefits.

The main net costs attributable to the Nowra route are associated with its traversing environmentally sensitive areas. Following the implementation of best practice techniques, residual environmental disturbance and hence ongoing costs should be small.

The selected Nowra route also attracts credits from its greater contribution to greenhouse gas containment.

Accordingly the selected Nowra route is preferred over the Marulan route.

Other route options have been suggested. One, a lateral from Wilton to service Nowra/Shoalhaven is rejected on grounds of cost. The other, continuing the pipeline from Marulan through to Wilton alongside the Moomba-Sydney pipeline, would provide some competition and independence in the Sydney gas market although much less than does the Nowra route, where demonstrable independence extends to Wilton. Also, with capacity in the existing pipeline this option may be considered unnecessary duplication in the initial years.

EGP is committed to the Nowra route. The commercial reality is that, were another route mandated, the Project would not proceed. The early and positive commercial merits of the Nowra route are mainly to do with markets as the costs of the two alternatives (Western Corridor and Marulan Corridor are similar. Early loads are vital for viability and the Nowra route offers several - Nowra/Shoalhaven, Port Kembla/ Wollongong - that would not be available to the Marulan route. Less load means higher unit costs (tolls) for other customers, compromising, and eventually destroying, viability.

5.2. Use of Existing Pipelines

A number of options for the transmission of natural gas were considered by EGP. This included the use of existing pipeline infrastructure. Of particular note are:

- GTC's Longford to Wodonga system;
- EAPL's Young to Wagga Wagga system;
- EAPL's Young to Wilton system;
- AGL's Wilton to Wollongong system; and
- AGL's proposed Wollongong to Kiama extension.

It should be noted that EGP recognises and supports the co-use of existing infrastructure, where viable, as an environmental and commercially responsible option. However, it is the considered opinion of EGP that each of these systems would need significant augmentation, in terms of additional compression and/or the installation of parallel pipelines, to meet the forecast market demands. The extent of such augmentation rendered these options uneconomic.

5.3. OTHER PIPELINE PROJECTS

EGP was aware of the pipeline link between Wodonga and Wagga Wagga proposed by GTC, AGL and EAPL and considered impacts of the EGP Project in light of the publicly available information regarding this proposal. EGP does not see the two proposals as mutually exclusive or "either/or" proposals - there are circumstances where both proposals could go ahead as each has different objectives. In fact EGP believes that both projects should proceed for largely different but complementary reasons.

EGP considers that it is the responsibility of Government to determine the desirability of coordinating the appraisal of two concurrent proposals. The suggestion that the Commission of Inquiry should take the role of an overriding planning authority across the gas infrastructure of Eastern Australia would be inconsistent with the policy of removing barriers to trade and investments in the gas industry. (Refer to Section 4.4.1, herein.)

Finally, EGP considers that it is beyond the scope and resources of the subject Project to provide a comparison with other gas pipeline proposals. Rather, it is the role of the relevant regulatory agencies to assess each of the proposals in the light of existing policies on environmental and economic sustainability.

5.4. ALTERNATIVE ENERGY SUPPLIES

The benefits of the EGP Project were assessed and estimated by comparing the "Project Case" with a "Reference Case" in which energy sources and uses are projected on the basis of available knowledge, current and likely future trends and policies. The Reference Case includes consideration of alternative energy and energy efficiency. That scenario could change if energy market circumstances change, for example by policy changes in the economic and environmental areas which promote or constrain alternative energy and energy efficiency.

Similarly the Project Case could change: gas usage as a result of the Project could be less or greater than that estimated. It is felt that the latter is more likely and this outcome is discussed in the energy issues report (Background Paper 16).

Although the need for research into alternative energy sources is acknowledged, it is beyond the scope of EGP's assessment to provide a detailed examination of these. The appropriate forum for such investigation is at the government policy level.

The concept of energy services was recognised and briefly discussed in Background Paper 16. The approach taken by EGP is that energy service demands of market centres in eastern Victoria and New South Wales can be commercially met by utilising gas transported from Gippsland Basin via the Nowra Corridor.

In regard to demand management programs, EGP consider that such programs are not as effective as they can be, in the absence of projects which bring competition, correct market signals and low cost forms of energy to the marketplace.

In regard to coal bed methane, EGP considers the technical and economic aspects to be somewhat contentious in Australia. More development and analytical work is needed to enable a critical assessment of coal bed methane's potential over the next 30 years. In particular more work is required in market development for such projects.

In addition EGP considers detailed consideration of such issues to be beyond the scope of an environmental impact assessment of the Eastern Gas Pipeline Project.

In regard to the strategy of centralised (rather than regionalised) electricity generation, it widely accepted that energy loss associated with electrical transmission is greater than the fuel consumed with gas transmission. In addition, the environmental impacts of power lines (visual, right of way width, surface restrictions, property value loss, etc) are significantly greater than those for buried pipelines, particularly in forested and populated areas. Unlike pipelines, high voltage power transmission may have associated, yet scientifically unresolved, health problems for those persons living and working in close proximity.

6. CONSTRUCTION

6.1. USE OF EXISTING EASEMENTS

Where practicable the Eastern Gas Pipeline will share existing easements to rationalise infrastructure and reduce potential environmental and land use impacts. The proposed length of pipeline in Victoria is 277 km and of this the alignment utilises existing easements or cleared farmland for 270 km of its length. Only 7 km of forest is traversed away from easements.

Easements are proposed to be utilised only where the resultant impact is predicted to be less than locating the pipeline in the surrounding land. That is, in forested areas easements have been selected where present, but in cleared agricultural land, road reserves or abandoned rail lines often retain significant conservation values and as such have not been selected.

Although additional clearance of vegetation adjacent to existing easements will be avoided if possible, in many cases some additional clearance will be required to allow installation of the pipeline. The extent of easement widening will depend on the existing cleared width, the location of the assets in the easement, topography, the nature of adjacent vegetation and regrowth and the separation distance required. Additional clearance however, will be kept to the minimum necessary to safely install and operate the pipeline and other facility interests. It is estimated that clearing width will vary between 0 m and 14 m.

Given the length of the pipeline, the fact that the centreline had not been completely finalised, and that negotiations with easement authorities were ongoing, it was not reasonable for the EIS/EES to define areas where clearing would be wholly within an existing easement. Once the centreline has been finalised and surveyed, detailed mapping accompanying the Environmental Management Plan will delineate clearing requirements.

Clearing associated with easement widening will be subject to the same management controls as elsewhere. For example, impacts will be mitigated by confining construction to existing disturbance where practicable, minimising additional clearing width, retaining old growth features, revegetating after construction, monitoring regeneration and erosion control.

There are no specific circumstances which compel a developer to utilise existing infrastructure. Society, Governments and the rights of the individual all have legitimate influence. There has been significant cooperation from both utility easement owners (electrical, telecommunication, and transportation) and individual landowners regarding the location of the proposed easement.

It should be noted that easements created for utilities have only certain rights. A landowner still owns the land except for the rights and privileges acquired by the utility. Subject to the terms of the original easement grant, it is feasible for a landowner to grant subsequent easements to other parties over the same land as covered by the original easement.

It is recognised that some easements possess a variety of conservation values. For example, EGP is aware of the heritage values and potential recreational values of the abandoned Bairnsdale to Orbost railway. EGP has undertaken initial discussions and on-site assessments with both DNRE and the public proponents of the Rail Trail project. EGP has had specialist consultants review the alignment of the pipeline through this segment and have identified a number of heritage sites. EGP will work closely with both of these groups to determine how this trail system and the pipeline can co-exist on this section of the abandoned Rail Reserve.

Through the catchments of the Cordeaux and Cataract Dams managed by Sydney Water Corporation it is proposed to follow the existing AGL gas pipeline easement. The existing easement is 24.385 metres wide and the actual pipe is located at the edge of this easement. EGP proposes to construct the pipeline along the opposite edge of the easement. In discussions with AGL a 15 metre separation distance was agreed to for safety reasons. However, EGP and AGL have not reached a formal agreement regarding sharing the easement.

Where vegetation has encroached on the easement it will be cleared to allow installation of the pipeline, however, the work space may be reduced for short distances thereby reducing the extent of clearing necessary. EGP are not averse to encouraging regeneration of the entire pipeline easement with low native shrubs and ground cover plants.

EGP has investigated the option of installing the pipeline along Woolcara Lane (kp 490, approx) and offers the following reasons for not accepting this option. EGP's reasoning has been discussed during a community meeting with local residents:

Council officials concur that the road may be realigned, bigger drains installed and the two telephone cables and powerline poles would require relocation. The service of these utilities could be disrupted during the construction of the pipeline.

The pipeline would be closer to more houses.

The impacts to road users would be greater during the construction.

The construction costs would be higher.

A number of landowners in the area are strongly opposed to the pipeline being located along Woolcara Lane.

EGP has met with the individual landowners and the community on a number of occasions to determine a compromise situation that would balance the rights and concerns of individuals and the community with the economics of the pipeline project. Placing the pipeline within the road easement was not the recommendation made either by the council or by the EIS/EES, did not meet all of the concerns of the individuals who may be affected, and would result in higher project costs.

6.2. Access During Construction

EGP will not be creating new permanent access tracks for construction or operation and will coordinate the use of public land and tracks with the relevant authorities.

Access across rivers and streams during construction may be provided by temporary bridges which are recognised as an effective low impact crossing technique.

Stock may be prevented from accessing on or across the right of way during construction, except at designated sites, or kept off by temporary fencing.

6.3. Construction Schedule

Construction will be timed, as far as practicable, to minimise environmental impacts. EIS/EES Background Papers made recommendations regarding appropriate timing with respect to the particular subject of study. EGP considered the recommendations of specialists in determining the overall project schedule. Generally, construction is scheduled for summer and autumn. Whilst this is the period of high rainfall in some areas higher ambient temperatures lead to higher evaporation rates and the most suitable soil conditions. Wet weather guidelines are being developed for the Project in consultation with the relevant authorities.

'Tie-in' crews are separate from the main construction crew and install stream and road crossings and pre-fabricated units. This provides greater flexibility for managing the timing of sensitive crossings. Construction at any time of the year is likely to impact on part of the life cycle of some wetland or stream dependent fauna. The greatest potential impact is from sediment inputs and this is primarily dependent on high intensity rainfall events. Construction will therefore be timed to avoid these as far as possible and scheduled for periods of low flow in sensitive streams.

The impact of seasonal traffic flows in areas such as Far East Gippsland will be taken into account when scheduling the construction program. EGP is liaising with the relevant authorities to ensure that impacts associated with local road conditions are minimised.

6.4. Easement Width

The easement width for the pipeline is proposed to be 20 metres. This width is required to excavate a trench, stockpile the soil and enable the safe movement of personnel and equipment. In particularly sensitive areas the easement will be narrowed for short lengths to reduce potential impacts. Requirements for the narrowing of work space will be decided in consultation with the relevant landowners and determining authorities and may be undertaken in response to:

- the presence of significant plant species, fauna habitats or archaeological sites;
- the need to reduce fauna movement barrier effects; or
- landuse or landowner issues.

6.5. BLASTING

In some areas blasting is the only practical method to establish a trench in rock. All blasting will be strictly monitored and controlled and appropriate measures will be taken to ensure that risks and disturbance to people, property and ecological effects are minimised. It has been demonstrated throughout the world that blasting is an effective and environmentally responsible construction technique.

Where stream bed blasting is necessary appropriate precautions will be taken to protect aquatic resources. Methods are illustrated in the EIS/EES (Figure 17.1). Consequently, aquatic fauna will be isolated from blasting sites which will mitigate any adverse effects. It is the experience of Westcoast Energy that the effect on the habitat and aquatic life is minimal due to the use of low velocity, staggered charges. Excavators will be used to remove rock that results from blasting. Rock will generally be replaced in the trench during backfilling.

Where blasting is required along the road through Morton National Park, EGP will liaise with the NPWS regarding potential impacts and management strategies for the protection of sensitive or significant species.

In the event of damage to structures as a result of blasting activities, the landowner would be compensated. Westcoast Energy, one of the sponsoring Companies, has had extensive experience in blasting within 3 metres of existing, fully pressurised pipelines and other facilities.

6.6. STREAM CROSSING TECHNIQUES

A total of 1028 stream or drainage line crossings were identified from mapping for this Project. Generally, crossings will be conducted during the driest time of the year to assist in minimising potential impacts. Sensitive streams will be crossed using one or a variation of one of the following methods: dam and pump, fluming, open cut or directional drill.

As detailed in the EIS/EES those streams that do not provide ecological or hydrological constraints will be constructed using conventional construction methods.

Generally wet stream crossings will occur when there is very little, if any, flow in the stream such that crossings can be made very quickly. Conversely, stream diversion crossings will occur when the stream is of high ecological value, is used as a water source downstream, stream flow is relatively strong and the stream will take longer to cross. Decisions concerning the most appropriate crossing method to minimise sediment and other impacts will be made consultation with, and approved by, relevant regulatory authorities.

Specialist hydrological and environmental consultants have been commissioned by EGP to assess each of the streams crossed by the pipeline and is presently investigating directional drilling at a number of major river crossings. This work will contribute to the development of detailed design and the production of specific design crossings drawings.

The crossing of high quality rivers will be undertaken utilising methods such as dam and pump, fluming, directional drilling or open cut. Fluming and dam and pump methods have been successfully used on numerous rivers throughout the world. Waterflow will not be interrupted. The application of such techniques will be dependent upon the final

alignment and licences/permits for stream crossings from relevant authorities. These authorities will participate in the review and approval of crossing permits.

In addition the methods chosen will be contingent upon stream flows at the time of construction. If stream flows are higher than expected, construction at particular crossings will either be delayed until flows decline or appropriate stream diversion methods used.

Concrete coated pipe will be used to protect the pipe at stream crossings. Hydrological engineers are involved in determining the final design including lateral and vertical scour potential and flood levels.

6.7. Directional Drilling

Directional drilling fluid is composed typically of water, high yield bentonite (a naturally occurring clay) and drill cuttings. The water is normally taken from a waterway or municipal source. The volumes of drilling fluid and cuttings expected are dependant on the directional drill profiles of the specific crossings.

No treatment of the excess drilling fluid and cuttings is required. In the past, the fluid has been granted waste disposal consent by the NSW EPA. The wastes will be disposed of at an approved liquid waste site or, to reduce tipping costs, a material such as fly ash is added so that it can be classified as spadable and taken to a solid waste depot.

6.8. Areas of Topographic Constraint

The EIS/EES assessments and geotechnical studies identified a number of areas of higher topographic constraint which may pose problems for pipeline construction and maintenance.

EGP is confident that the range of standard and proven pipeline techniques will allow potential problems to be effectively resolved.

Westcoast Energy has significant international experience in the construction of transmission pipelines in difficult terrain, and has been successful at managing these issues.

6.9. Backfilling Trench

In rocky areas the use of rock jacketed (concrete coated) pipe will allow rocky spoil to be returned to the trench without threatening the integrity of the pipe. In the unlikely event that rocky spoil is surplus, it will be used, where practicable, for erosion control (rip-rap etc). If there is a need to dispose of rocky spoil, it will be undertaken in a manner that meets statutory requirements.

6.10. Hydrostatic Testing

Following construction the pipeline will be hydrotested prior to commissioning. This requires the pipeline to be filled and emptied of water. Hydrostatic testing will be undertaken in strict accordance with legislative and industry code requirements. Relevant approvals for the drawing and discharge of water will be obtained and conditions complied with.

Generally, the quality of test water will be determined prior to being dispersed over land. The water will be released slowly and energy dissipation measures such as geotextile fabric will be used where necessary to prevent erosion. Test water will not be discharged directly into streams.

EGP do not consider that this process poses any threat to community health. The water used for testing will not have any additives, such as biocides or oxygen scavengers.

The water will be sourced from locally approved sites such as rivers, dams or bores. The source will be subject to approval by local authorities and/or the landowner. Details of specific locations, and the quality and quantity of hydrostatic test water will be addressed with a hydrostatic testing procedure developed prior to construction. This will form part of the contractor's working documents.

6.11. Wet Weather

Guidelines for wet weather construction will be developed by EGP in consultation with the relevant authorities in both States and documented in the Environmental Management Plan. The Plan will address prevention and control of soil compaction, erosion, siltation and damage to roads during these conditions.

6.12. Fire Precautions

EGP is mindful of the potential risk of fire when working in forest and grasslands.

A Preliminary Risk Assessment was completed as part of the EIS/EES (see Background Paper 17) and a further risk assessment study will be undertaken prior to construction. This work will form the basis for the detailed Bush Fire Management Strategy which will be included in the Environmental Management Plan. An Emergency Response Plan will also be developed. Fire management will meet Australian standards and all regulatory requirements. The planning will be undertaken in consultation with the relevant State and local authorities.

Project design has incorporated the results of the risk assessment. The location of valves and other infrastructure have been carefully selected. For example, there is no longer a valve proposed in the Morton National Park area. However, it should be noted that a line break valve has no effect on fire suppression but will minimise the volume of gas released.

Project construction procedures will contain details regarding fire prevention, protection and fire fighting.. In addition, such information will be incorporated into EGP's operation and maintenance manuals. During construction the contractor will be required to have appropriate fire fighting equipment and trained personnel on site

During operation an additional fuel reduction zone will not be required as EGP considers that a well maintained easement and a fire hazard management system will adequately protect against wild fire. Fire fighting equipment will be available and maintained at the above ground facilities such as the Compressor station at Longford and the meter station at Wilton. In the event of a bush fire encroaching on the pipeline right-of-way or the pipeline starting a fire, EGP will initiate the Emergency Response Plan which includes agreed site specific procedures and may involve EGP personnel, local authorities and emergency services, as required.

6.13. Construction Camps and Work Sites

At this time EGP proposes only one construction camp which will be located in the Bombala area. This camp and any other that may be required will meet all regulatory and local planning requirements. The need for and location of construction accommodation will not be known until the pipeline construction contracts are tendered.

Ablution facilities for the construction camps and work sites will be via a small number of widely dispersed pit toilets, a septic system, mobile chemical treatment systems or municipal sewage treatment plants. Where it is necessary to establish local facilities such as ablutions blocks they will be sited in accordance with criteria agreed to by relevant authorities.

The rehabilitation of the construction camp and work sites will be the responsibility of the pipeline construction contractor. All wastes shall be handled in accordance with regulatory requirements and industry standards. In addition the contractor will be required to recontour and stabilise any such sites to encourage regeneration as necessary.

7. REHABILITATION

7.1. REHABILITATION STRATEGY

All land disturbed by the construction of the pipeline will, to the extent practical, be reinstated, stabilised and rehabilitated. Significant effort will be made to re-establish plant communities that are consistent with the adjacent terrain or the landholders' wishes. The type of "landscaping" required will vary, dependant upon the combination of pipeline alignment (terrain, landuse, viewshed etc) and construction methodology. However, as standard practice, drainage lines will be returned to their previous contours, erosion and siltation will be minimised, and weed invasion will be controlled. Where the ground cover is re-established after construction, habitat structural elements will also be replaced to the extent practicable. Generally, tie-ins will be rehabilitated with the remainder of the pipeline easement.

Revegetation of the right of way will be assisted by methods that are determined on a site specific basis. For example, in some areas the best method of revegetation will be the use of tube stock while in others hydroseeding, or direct seeding may be used. Issues that will be considered will include the use of indigenous species, local seed collection, the use of seed or tube stock, replanting (or transplanting) of individuals, timing of sowing or planting, use of fertilisers or lime, weed control and monitoring.

In key habitat areas site specific revegetation plans will be developed in consultation with landholders and/or relevant authorities to address potential impacts to vegetation and wildlife values.

To date only Soft Tree-fern *(Dicksonia antarctica)* has been nominated for harvesting and replanting as it is generally the most common in the narrow riparian strips encountered along the existing easements in East Gippsland. This species is also easily harvested and replanted. Rough Tree-fern *(Cyathea australis)* and Prickly Tree-fern *(Cyathea leichhardtiana)* may also occur in this or other areas further north but there removal is more problematic as their root ball must be excavated and remain attached to the trunk for individuals to survive replanting. If large numbers of these species are present on the final alignment, harvesting and replanting would be of ecological benefit and therefore undertaken, but the process would be considerably more time consuming than the process for Soft Tree-ferns.

On lands owned and controlled by the NSW NPWS, seed will be collected from appropriate locations, preferably on site, but should not be restricted to those locations (ie. there may not be a seed source available on site). Sterile grass seeds may also be used to provide environmentally acceptable short term surface stability. Seed will be augmented by plants which may be saved during the initial clearing activities. Other plantings, cuttings and vegetation establishment will be conducted with input and cooperation from the NPWS.

Rocky spoil will be returned to the trench. Excess material (if present) will be used, where practicable, for erosion control (rip-rap, etc). If there is a need to dispose of spoil this will be done in accordance with statutory requirements.

Rehabilitation works will generally be the responsibility of the construction contractor whose environmental record will be considered prior to selection. If jointly agreed, EGP may reimburse the landowner for rehabilitation works.

EGP will generally compensate for crop and pasture loss for a period of up to two years. To protect the integrity of the pipe it is in EGP's interest to ensure that the easement is fully stabilised and rehabilitated. The pipeline easement will be periodically monitored and inspected for the life of the Project. In particular, in the years immediately following construction, the pipeline will be inspected after heavy rainfall, storm, drought and brush/bush fire events and necessary corrective measures taken.

7.2. Extent of Regrowth

Generally the type, height, species and extent of revegetation will be determined by the location of the easement. For example, in farm land the easement will be returned to pasture, or cropping as it was prior to construction. Where it follows existing cleared easement, a grass cover will be re-established and maintained to this end. In sensitive forested areas the understorey of groundcover and shrubs may be permitted over the entire easement. For safety reasons EGP would prefer the easement cleared of mature trees, however, in particularly sensitive areas, full revegetative growth including large trees may be permitted within 3 metres of the pipeline.

7.3. Constraints to Revegetation

EGP is confident that adequate management measures are available to avoid any long term detrimental effects. For example, in areas where the topsoil is thin or where the erosion potential is likely to have an adverse effect on vegetation regrowth, topsoil will be stored and replaced and/or the area will be sown with appropriate cover crop (including sterile grass in ecologically sensitive areas). In addition a range of short term surface protection measures are available, including:

- Straw mulching;
- Chipping and respreading foliage and small branches of vegetation removed from the right-of-way; and
- Use of hay bales on sloping ground and placement of felled tree trunks across the alignment to help divert and disperse runoff within the easement.

EGP considers that the poor nutrient status of the soils of Morton National Park provide a medium for rehabilitation in which native species are likely to be more vigorous than weeds. However EGP will obtain the best available advice on appropriate revegetation techniques in the area to ensure that right-of-way rehabilitation has the best chance of success.

EGP is aware of the difficulties of successful rehabilitation of native grasslands and are reviewing methods of grassland rehabilitation including investigating regeneration methods currently being undertaken in the region.

8. OPERATION

8.1. EASEMENT ACCESS

The rights of public access to the land occupied by the EGP easement will essentially remain unchanged. That is, where the pipeline crosses private land, landowner consent for public access must be secured; where the pipeline crosses public land, the Authority controlling those lands has jurisdiction.

EGP will work closely with land owners and land management authorities to ensure that the Project does not unduly compromise their wishes in regard to public access.

Unauthorised use of the right of way (eg. by trail bikes) will in some cases be difficult to prevent. Options that EGP will adopt where necessary include the installation of fencing, locked gates or the creation of barriers of rocks and wood.

The pipeline is proposed to be installed adjacent to the road through Morton National Park. No new access will be created. Management strategies for pipeline operation through this area will be developed in consultation with NSW NPWS.

The pipeline location will be marked with signs indicating the existence of a buried high pressure gas pipeline. Markers will be placed on the centreline of the pipe, where possible, and will be generally distanced approximately to the line of sight. Generally, there will be no markers defining the width of the easement. The exception is along the roadway through Morton National Park where survey and plan registration require the easement boundary to be marked.

8.2. EASEMENT MAINTENANCE

EGP will adhere to the requirements of the land management authorities with regard to easement maintenance activities such as weed control. Where the easement is shared with other infrastructure EGP will continue to liaise with the owners regarding the method of easement maintenance.

Potential difficulties associated with access for maintenance at the Illawarra Escarpment will be avoided by this section being directionally drilled.

8.3. ODORANT

EGP does not propose to odorise the gas in the pipeline. This is consistent with practices for transmission pipelines elsewhere in the world, including North America, and is not considered a safety risk.

8.4. CORROSION PROTECTION

The pipeline will be protected by a cathodic protection system and a three layer coating system. Saline groundwater will not cause corrosion of the pipeline.

9. DECOMMISSIONING

Subject to legislative requirements, the pipeline will be left in situ should it be decommissioned. The pipeline will not corrode as it will be cathodically protected. Due to the Australian pipeline standard AS 2885, the EGP system has limited alternative uses. Alternative uses will also be limited, if not prohibited, by the terms of the easement.

The EGP easement, either pre or post decommissioning, is not suitable technically to accommodate a proposal such as the 'Very Fast Train'.

10. GEOLOGY AND GEOMORPHOLOGY

10.1. TOPOGRAPHIC CONSTRAINTS

The EIS/EES identifies the areas of drainage and slope stability concern (section 7.2.2, page 7.4). It is to be noted that such constraints are not independent and often overlap as such figures can not be totalled. EGP considers, based on extensive international experience, that such constraints are able to be overcome by sound engineering.

10.2. SEISMIC STABILITY

The evaluation of seismic stability was conducted by experts from the Australian Geological Survey Organisation as well as specialised international consultants. North American literature and experience was referenced as that is one of the most seismically active regions in the world.

10.3. MINE SUBSIDENCE

The assessment of the potential for mine subsidence was made on the evaluation by the Wilton Mine Subsidence District and supplemented by a broad review of coal mining leases along the pipeline route. EGP have held preliminary meetings with the NSW Department of Mineral Resources, the Mine Subsidence Board, and the mining companies and will design the pipeline, in areas with significant mine subsidence potential, in consultation with these groups. No adverse effects on underground mining are expected.

11. SOILS

11.1. SOIL EROSION

11.1.1. Assessment Methodology

The assessment of the potential occurrence of erodible soils was based on land and terrain units identified along the pipeline corridor as a result of detailed aerial photograph analysis, field validation and literature reviews. This rigorous and comprehensive procedure generated 90 land and terrain unit classifications, of which 74 were identified as having moderate to high constraint with respect to erosion.

The level of detail provided was considered by EGP to be appropriate to the scope of the EIS/EES.

Soil dispersion characteristics were determined using the modified Emerson Crumb Test (Emerson and Seedsman Tech. Memo 15, 1981). Interpretation of the rating classes recorded in Appendix B of that reference are as follows:

Class 1M :	materials are highly dispersive and will be prone to erode severely when exposed and in contact with water.
Class 2M :	materials are moderately dispersive and will erode but probably less severely than Class 1M materials.
Class 3M :	materials exhibit slight to moderate dispersion and may be subject to erosion particularly in a remoulded or reworked state.
Class 4/7M :	materials are essentially non-dispersive or only very slightly dispersive.

It should be noted that dispersion characteristics relate both to the chemical and physical attributes of the soil material and on the chemistry of the water which comes in contact with soil. The test procedure adopted utilises distilled or deionised water which is the condition most likely to create dispersion. However, other combinations of soil and water chemistry may give rise to dispersion which may not be apparent for the "indicative" type of testing adopted.

No particle size analyses were undertaken apart from the visual classification of soil texture. The Coarse Fragments column in the borehole logs indicates the occurrence of gravel, stone or weathered rock fragments in the particular soil layer. Where no estimate of coarse fragment is given it comprises only a minor part of the soil composition.

Soil fertility testing will be undertaken, as necessary, as part of the detailed design.

11.1.2. Erosion Risks

The erosion constraints presented by particular land units were rated nil, moderate or high. The soils of the Nerriga / Hoskinstown area have been suggested to pose considerable constraint, however, these soils are no better or worse than many other sections of the pipeline and standard erosion mitigation works and rehabilitation will be employed.

Construction on the proposed alignment will not initiate long term erosion problems and effective control methods will be installed and maintained at the cost of EGP. Where the pipeline impacts existing erosion control structures, such as those installed by the Sydney Water Corporation, they will be fully restored.

11.1.3. Erosion Control

Erosion control measures and construction methods to address erosion hazards will be developed during the detailed design phase in consultation with relevant authorities, and incoprorated into the EMP. Control measures to address wind erosion may include straw mulching to provide surface protection until ground cover re-establishes, the installation of drift control fences or the use of soil surfactants. The erodible soils identified in the Nerriga / Hoskinstown region can be successfully managed using standard pipeline construction techniques and rehabilitation.

Construction is planned to occur during summer months further reducing erosion risk.

11.2. TOPSOIL MANAGEMENT

Topsoil stripping will be required where the existing topography does not permit safe and practical access to and along the right-of way and where it cannot facilitate construction activities. Site specific requirements for topsoil stripping and stockpiling will be developed during the detailed design phase in consultation with landowners and relevant authorities and incorporated into the EMP. Where present topsoil, even of marginal quality, will be stripped, stockpiled and respread following completion of construction to utilise seedstock and micro fauna present in the surficial soil layer. In some areas the entire 20 m will be stripped of topsoil, while in others only the trenchline will be stripped. There will be no importation of topsoil for this Project.

11.3. ACID - SULPHATE SOILS

General areas of potential acid-sulphate soils were identified in Background Paper 2 and soils in potentially affected areas have been assessed in the field. Site specific management measures will be developed in consultation with relevant authorities at the detailed design phase and will be consistent with the EPA and DLWC guidelines.

12. HYDROLOGY

12.1. WATER QUALITY

12.1.1. Potential Impacts

EGP will comply with the legislative requirements of each State with regard to water quality during and after construction of the pipeline.

It is acknowledged in the EIS/EES that the water quality in some streams will decline temporarily during construction. Crossings will be designed to limit siltation effects. Short term impacts are unlikely to affect normal long term hydrological influences not related to the pipeline. Construction can, so far as possible, be timed to minimise coincidence with other water use, floods, seasonal factors etc.

The risk of spills on the right of way will be very low as fuels will not be stored at the construction site or on the right of way. Refuelling procedures will be established prior to construction. During operation the pipeline will transport dry natural gas. In the unlikely event that the pipeline ruptures, the lighter than air gas will rise and disperse. There are no liquid hydrocarbons associated with the gas that could contaminate water courses.

Levels of *E. Coli* in streams is of little relevance to the Project as it is an indicator of faecal contamination by either humans or domestic animals. It is harmless to humans, although indicates that other dangerous pathogenic organisms may be present. The pipeline project will not result in the introduction of pathogenic organisms to streams.

The Molonglo River will be crossed using either the fluming method or the dam and pump method. Both these techniques isolate the river bed from the stream flow, consequently, contaminated sediments in the bed of the Molonglo River (if present) are unlikely to be mobilised by pipeline construction activities. Stream crossing plans will be developed in consultation with relevant authorities.

Potential impact on the Googong and other reservoir catchments has been identified as a concern. Crossings will require consideration of various techniques (such as fluming and sedimentation ponds) that will minimise sediment transport into the reservoir during construction.

It should be noted that the improvement of water quality is not the responsibility of the Project. However, EGP recognises its responsibility to ensure that potential adverse impacts on water quality are mitigated and within acceptable limits.

Once constructed, the pipeline will not alter the quantity of water flowing through a water way, although during construction of the crossing the flow of water may be altered temporarily. This will generally be no longer than a few days.

Water diverted during the course of a stream crossing will not be diverted away from the water course. Water drawn from a river, dam or bore for the purpose of hydrotesting will not be directly returned to the water way. The sourcing of water for hydrotesting will be undertaken in accordance with the requirements of the relevant authorities.

12.2. STREAM CROSSINGS

12.2.1. Assessment Methodology

The EIS/EES looked generally at the hydraulics, geomorphology and ecology of each water course traversed by the pipeline. However, during the detailed design stage, site specific management plans, including crossing points, will be developed by the Project team and its consultants in liaison with the relevant government organisations. The recommendations of organisation such as the Land Conservation Council are recognised and will be implemented where relevant.

Specialist consultants, Dames & Moore, ranked stream crossings according to the potential for mobilisation of sediment principally during construction but also during operation. The ranking methodology is described in EIS/EES Background Paper 1. A number of codes were used in the assessment as follows:

	Materials		*Vegetation*
C	*Clay*	G	*Grass*
M	*Silt*	Sb	*Shrubs*
G	*Gravel*	W	*Woodland*
S	*Sand*	F	*Forest*
B	*Boulders*	R	*Reeds*
RC	*Rock*	T	*Trees*

12.2.2. Streams of Note

Bemm and Cann Rivers

EGP recognises the importance that the Bemm and Cann Rivers play in the supply of town water. It is proposed to install the pipeline under the Bemm River using directional drilling techniques, thus not affecting water quality. Minor route realignments have removed the need to cross the Cann River. Tributaries of the Cann River will be crossed using low impact techniques. Detailed design will be discussed with all relevant authorities including the Land Conservation Council.

Queanbeyan River

The Queanbeyan River crossing is noted in EIS/EES Background Paper 1, Table 14, as moderate constraint for water quality sensitivity.

Lower Shoalhaven River

Geotechnical investigations, conducted after the EIS/EES, have indicated that directional drilling of the Lower Shoalhaven River is technically feasible. EGP proposes to use this technique to install the pipeline at this location.

Macquarie Rivulet

The Macquarie Rivulet will be crossed using either a dam and pump technique or by fluming depending on the flow rate during the time of crossing. Sedimentation in Lake Illawarra will be minimised by use of these techniques.

Kembla Creek

EGP proposes to traverse the headwaters of Kembla Creek, not the creek itself. As such, impacts to water quality will be negligible.

12.2.3. Bank Stability

Care will be taken to minimise impacts to streams and water quality. Banks will be restored and revegetated using native species in preference to "hard" solutions such as rock rip-rap. However, such techniques will be used where necessary.

12.3. SWAMPS AND WETLANDS

The pipeline route avoids wetland areas wherever practicable. The number of wetlands crossed is therefore very low. Site specific mitigation measures will be developed during detailed design. Techniques involve minimising the right of way width, and ensuring that surface drainage is not interrupted during or after the right of way is rehabilitated.

Construction at any time of the year is likely to impact on part of the life cycle of some wetland dependant fauna. The greatest potential impact is from sediment inputs and this is primarily dependent on disturbance levels and high intensity rainfall events. Construction will be timed to avoid high rainfall events as far as possible. (Refer EIS/EES Background Paper 5).

Imported backfill is unlikely to be used in this Project. In some instances, such as some road crossings or in rocky areas, sand padding or gravel may need to be used. However, imported backfill will not be required for any wetland areas traversed by the pipeline.

12.4. GROUNDWATER

12.4.1. Groundwater Quality

The level of investigations carried out into groundwater quality and potential impacts is considered to be consistent with the scope of the EIS/EES.

The groundwater database information contained in EIS/EES Background Paper 1 is a direct reproduction from Victorian and New South Wales government records. The availability of groundwater chemical data in NSW is limited. The apparent increase in groundwater salinity in southern NSW is neither affected by nor adversely affects, the proposed pipeline.

EGP does not anticipate that saline groundwater will be a major issue associated with this proposal. However, consultants have been commissioned to address saline groundwater issues, as well as a range of other issues associated with groundwater. The results of this assessment will be included in the detailed plans for the construction of the pipeline.

12.4.2. Well Point De-watering

Localised and temporary de-watering will be required in certain agricultural areas where the water table is above the level of the trench base. Well point de-watering with a pump system is a standard method used to lower a water table. De-watering and its effects will be minimal, short term and localised. Following pipeline installation the de-watering system will be dismantled and the water table allowed to return to pre-construction levels.

A number of alternative means of de-watering are available. These include shallow well-points or spears which are a series of extraction points driven or jetted into the ground to just below the target level of de-watering. In less permeable soils de-watering would simply involve pumping water from the trench excavation.

Appropriate measures will be taken to minimise turbidity and if filtering is required EGP's preferred choice would be the use of geotextiles.

The Project will employ well point de-watering and/or ditch water pumping as required. Both practices are standards within the pipeline industry.

The EIS/EES identifies the main implication of de-watering as disposal of pumped water into non-compatible receiving waters. EGP will test the quality of groundwater and receiving waters.

In most instances, bores draw water from the lower levels of the water table which still retain water during the dry season. Typical bore depths are greater than 10 metres. Consequently, temporarily de-watering the saturated soils within 2 metres of the ground surface along the trenchline is unlikely to affect neighbouring bores.

12.4.3. Impacts of Groundwater on the Pipeline

The impacts of groundwater on the pipeline have been adequately addressed. The pipeline design allows for any groundwater impacts on the pipeline, including buoyancy and corrosion. De-watering from trenches will tend to temporarily lower the water-table immediately adjacent to the trench, not increase it. The problem of rising groundwater and salinity will not affect, nor be affected by construction, other than the short term disposal of water from de-watering.

12.5. FLOODS

The life of the Project is expected to be a minimum of 40 years. Beyond this time it is very difficult to predict whether the pipeline will still be used. However, the pipeline is being designed to cater for a one in one hundred year flood event. Consultant hydrologists will be working on final design to address potential impacts of storm events.

The weather will be monitored and a flood warning and response plan will be in place to address floodwater management. These will be prepared by consultants with the relevant Bureau of Meteorology, and regional water resources officers.

13. NOISE

13.1. POTENTIAL NOISE IMPACTS

Some construction noise will be unavoidable. However, EGP will work with landowners and the EPA to minimise the noise impacts in residential areas. Where construction is within 300m of a residence all motorised earthmoving equipment will be fitted with residential class mufflers. If proven damages result from disturbance, appropriate compensation will be available.

In regard to the potential noise impacts associated with the construction and operation of additional facilities, EGP advises that the compressor station in NSW is not planned until the year 2004. Meter and compression stations constructed in the future will be subject to Government requirements and approval at the time of construction.

There is no noise associated with either pigging operations or the flow of gas through the pipeline.

14. ATMOSPHERIC EMISSIONS

14.1. LEAKAGE OF NATURAL GAS

There are negligible leaks from a welded gas pipeline. EGP expects the rate to be less than 0.01% for the proposed pipeline. This is equivalent to world best practice and EGP believes the standards to which the proposed pipeline will be built and operated are amongst the highest throughout the world.

14.2. NOX

14.2.1. Assessment Methodology

As listed in the EIS/EES, emissions of NOx from the proposed compressor turbines will be 25ppmv per turbine (at 15% oxygen, 513 degrees Celsius), which is equivalent to approximately 0.052 g/m^3. The emissions quoted for the proposed compressor have been obtained from the technical specifications supplied by the manufacturers of the turbines likely to be used at the proposed compressor station at Longford.

No quantitative information was available on the existing ambient air conditions at Longford. However, it was considered that the ambient levels of NOx would be relatively insignificant and typically well within the Victorian air quality guidelines taking into account:

- the rural nature of the region around Longford and its proximity to the coast;
- the results of the Latrobe Valley Air Monitoring Program (Manins 1988); and
- the location and size of the proposed compressor station with respect to other emission sources. (The Esso/BHP Gas Plant is the only other notable industrial emission source in the Longford region. The major power generating region is located over 40 km to the west).

The emissions associated with the flare at the Esso gas plant would be insignificant with respect to ambient air quality goals based on the comments above.

14.3. DUST

EGP will control dust impacts using a variety of techniques including the use of water trucks and soil surfactants during construction. In addition, work will cease in excessively windy conditions where construction is in close proximity to residences and the application of water has proved ineffective.

14.4. AIR QUALITY

The Project will provide the opportunity for electric power to be generated at load centres. This is preferable to, and more efficient than, power transmission from distant power plants and provides a range of environmental benefits including lower CO_2 and particulate emissions than for coal (see also Section 5.4).

14.5. COMPARATIVE EMISSIONS

The precise figures for emission factors for coal, oil and gas depend on the composition of the fuels. Approximate rounded figures were used for the EIS assessment.

The CO_2 emission factor for a fuel is determined by the formula:
Emission factor = (44 x Carbon content x 1000) / (12 x Calorific Value)

where:

- Emission Factor = kg of CO_2 released per GJ of energy
- Carbon content = mass fraction of carbon in the fuel
- Calorific Value = MJ of energy per kg of fuel

In the EIS/EES assessment no specific fuels were defined, therefore rounded emission factors typical of common fuels were used. Illustrative figures are presented in the following table.

Parameter	Coal	Fuel Oil	Natural Gas
Carbon Content (%) *	81	86	74
Calorific value (GJ/kg) *	33	45	53
Emission factor (kg CO2/GJ)	90	70	51

*Note: * dry, mineral matter free basis*

These values are typical of emission factors used for assessment of Carbon Dioxide emissions from fossil fuels and indicate that combustion of natural gas produces only 56% of the CO_2 emitted from coal and 73% of the CO_2 emitted from fuel oil.

15. NATURAL HERITAGE

15.1. REALIGNMENTS

A number of changes were made to the pipeline alignment during the public exhibition and Commission of Inquiry phases as a result of input from stakeholders. These changes in alignment have been made to reduce potential environmental impact. Further fieldwork will be conducted in consultation with relevant authorities to develop site specific management strategies for sections where the alignment has changed from that assessed during the EIS/EES studies.

15.2. ECOLOGICALLY SENSITIVE SITES

15.2.1. Dowd Morass

EGP recognises the importance of the wetlands in the Gippsland region, particularly the Dowd Morass State Game Reserve. As a result, there has been on-going consultation with the relevant stakeholders, including Department of Natural Resources and Environment, to select the most appropriate alignment through this area. Alignment route changes were made in conjunction with DNRE officers to locate the pipeline on higher ground, thus minimising potential impacts on the wetland area. Care will be taken to avoid downstream effects from construction activities in this area.

Updated Project Mapping was presented to the Commission of Inquiry.

15.2.2. Heart Morass

The current alignment of the pipeline does cross the Heart Morass. Site specific management strategies will be developed at the detailed design phase. EGP will consult with the Australian Heritage Commission regarding the final route and methods of construction in this area.

15.2.3. Coastal Grassy Forest

The conservation value of the coastal grassy forest at Perry River, Victoria, is recognised by EGP. Considerable care has been taken by EGP and its specialist consultants in consultation with the relevant land owners and DNRE to select the least impact alignment through this area. EGP also proposes to reduce the pipeline width to further minimise impact. No rare or endangered flora are threatened by construction in this area.

Providence Ponds Flora and Fauna Reserve is not on the proposed alignment.

15.2.4. Forest Areas of East Gippsland (General)

EGP recognises the high conservation values of the East Gippsland region and have worked closely with DNRE to select an alignment which is environmentally acceptable. To support on-site decisions ecological surveys were undertaken during winter and spring through this area.

Although the pipeline does traverse ten areas of environmental significance (state and national) in East Gippsland, EGP believes that potential environmental impacts have been largely mitigated by locating the pipeline on or adjacent to areas of existing disturbance such as roads, tracks or service easements. Once the right of way has been revegetated in these areas, the aesthetic impact of the pipeline will be no greater than the existing impact of roads, tracks and easements.

The proposed pipeline will not impact Croajingolong National Park which is downstream of the alignment. Coopracambra National Park will also not be affected as the route is west of the Park in a different sub-catchment. The Park and the alignment are separated by the Cann River.

15.2.5. Old Growth Forests

The EIS/EES discusses old-growth forest issues although the subject is not integrated in a separate section. Areas of mapped old-growth were examined and statements made where old-growth was directly affected or adjacent to the proposed route. The community nomenclature from Woodgate et al. (1994) was used as the basis for describing vegetation and old-growth was used to help define sites of biological significance.

EGP and its specialist consultants have worked closely with flora experts from DNRE to reduce the impact on old growth values. The alignment has been re-located where practicable and where such a change does not result in an increase in overall effects. EGP have identified four small localised areas traversed by the pipeline containing old growth features. Measures to protect old growth features, such as retaining hollow-bearing trees, will be incorporated into the Environmental Management Plan.

15.2.6. Colquhoun State Forest

At the recommendation of DNRE officers EGP has relocated the alignment through the Colquhoun State Forest to follow the abandoned Bairnsdale to Orbost Railway. EGP estimates that the average width of additional clearing in this sector is 10m. As such very little native vegetation will be disturbed and no old growth will be disturbed. (Also refer to sections 15.2.6 and 15.2.7)

15.2.7. Bridle Creek

The impact on the Bridle Creek site of State significance will be negligible following realignments made in response to stakeholder inputs. The proposed pipeline now traverses farm land to the south of the site. From this point the pipeline has been realigned on recommendation of DNRE to follow the abandoned railway easement.

15.2.8. Stony Creek

Stony Creek was identified as a site of State significance. In this area the pipeline utilises the existing railway easement although it crosses a wetland where the railway uses a large trestle bridge. This area has been substantially disturbed during construction of the railway and associated bridge and has subsequently regenerated. No significant species were recorded in that immediate area although they may have been cryptic at the time of the survey. There may be some easement widening during construction, but this is expected to be minor. The wetland should recover from the impact, although a narrower construction corridor in this area is recommended to reduce impacts.

15.2.9. Lake Tyers State Park

The proposed alignment does not cross the current boundaries of Lake Tyers State Park.

15.2.10.Nowa Nowa

The pipeline alignment through Nowa Nowa remains on the railway easement. Between Nowa Nowa and Orbost the pipeline route generally follows the Princes Highway, but does pass through about 1.5 km (not 5 km) of forest. The superceded Revision 5 of the route alignment did pass through approximately 5 km of forest.

15.2.11.Newmerella

The pipeline alignment parallels the Princes Highway and optic fibre cable easements through the area of significance west of Newmerella (kp 140-144). Due to the location of existing infrastructure it will be necessary to widen the existing easement.

15.2.12.Mt Raymond

EGP considers that the potential impacts would be greater following the Princes Highway than by using the powerline easement through Mt. Raymond Regional Park. Mt Raymond is managed primarily for recreation and impacts to the aesthetic values of the area will reduced by avoiding clearing at the crest of the easement which is visible from the Highway. Extensive clearing would be required if the Highway were followed in this sector

15.2.13.Bellbird Creek

EGP recognises the conservation values of Bellbird Creek. A proposed pipeline alignment and crossing technique have been developed on site in consultation with specialist consultants and DNRE officers. The pipeline will be installed on the northern side of the power easement and the easement narrowed at the crossing point. The width of clearing will be reduced through this area by maximising use of the existing easement. Trees of note will be flagged for retention and shrubs will be allowed to regrow.

15.2.14.Bemm River

EGP and its specialist consultants in conjunction with DNRE have spent considerable effort selecting the most appropriate crossing of the Bemm River. It is considered that the crossing point proposed minimises impacts to the environmental, social, cultural and heritage values of this area. In addition, geotechnical investigations have shown directional drilling to be viable at this site and currently this is the proposed crossing technique.

15.2.15.Lind National Park

EGP has added considerable length to the proposed pipeline route at a cost of $3.5 million in order to locate the pipeline in a low impact alignment in this area of recognised high sensitivity. Whilst EGP acknowledges the views of groups such as the Land Conservation Council, who wish the pipeline to remain outside the legal boundaries of the Park, it is considered more important to minimise actual environmental impact. This position has been supported by DNRE. The pipeline will be on the powerline easement for 900 meters in Lind National Park and no additional clearing will be required. It is noted that this section abuts an area of forest to the north which has been very recently logged.

15.2.16.Cann River

The proposed pipeline route along the west side of the Cann Valley near Reed Bed Creek has been examined by EGP's specialist ecological consultants, Biosis Research, and geotechnical consultants, Dames and Moore, as well as officers of DNRE, all of whom have concluded that the proposed route is environmentally satisfactory. No recommendations were made to move the alignment from Reed Bed Road to the Cann Valley floor.

15.2.17.Chandlers Creek

The pipeline realignment in the Chandler Creek area is illustrated in Figure 5.1 of the EIS/EES. The specialist environmental consultants have undertaken both a desk top study and ground assessment of this deviation. Joint field inspections have been conducted with DNRE officers aimed at developing site specific alignment and management requirements.

15.2.18.Jacksons Bog

The proposed pipeline alignment has been relocated away from both Jacksons Bog and Duguids Bog. It is proposed that the alignment traverse plantation pine forest in this area in order to significantly reduce the potential environmental impact.

15.2.19.Monaro Grasslands

The EIS/EES, and in particular Background Paper 5, documents all biologically significant native grasslands through which the pipeline traverses. Grassland areas of high habitat potential were identified by survey staff with expertise in this community and the associated fauna species and these sites were intensively surveyed. Other areas of lower habitat quality were not intensively surveyed but they were identified as potential habitat and recommendations made to minimise any potential impact in the EIS/EES. Very little of the habitat was classified as native grasslands. Most of the areas actively searched for significant reptiles were semi-native grasslands.

In general, road reserves adjacent to grazed properties are being avoided through the Cooma grasslands because their habitat value is greater than the adjacent properties. Conversely, in the Michelago region the road easements are generally in much poorer condition than the adjacent private land and as such road reserves have been selected for pipeline construction.

In response to comments received from a range of stakeholders, following release of the EIS/EES, a number of minor adjustments to the alignment have been made. These include:

- the Rock Flat Travelling Stock Reserve where the alignment has been relocated closer to the boundary of the Reserve, thereby avoiding fragmentation of the grassland. The reserve has been intensively grazed and the alignment selected traverses the more disturbed section.
- the North Cooma Tussock Grassland alignment has been adjusted with the resultant impacts to flora and fauna assessed by specialist consultants, Biosis Research, as low.
- the South Michelago grasslands are now entirely avoided.
- the route has been re-aligned since the EIS/EES and FIS to avoid the slope area where the East Michelago grassland is located.
- the alignment avoids the Black Flat Travelling Stock Reserve completely.

All realignments have been assessed by EGP and specialist consultants and have resulted in a lower impact on both flora and fauna. For example, many of the significant grasslands which have been identified as potential habitat for the southern lined earless dragon (*Tympanocryptis lineata pinguicolla*) have been avoided. All remaining areas will be subject to special management measures to reduce impact. All such areas will be monitored during construction and the ameliorative measures outlined in the Fauna Impact Statement for the *T.l. pinguicolla* will be implemented in areas considered to be potential habitat.

EGP is currently investigating specialised rehabilitation methods for native grassland habitats, including the potential for seed collection and propagation.

The guidelines for the control of weeds will be strictly adhered to throughout the Monaro Grasslands. Site specific management plans for the control of weeds in these areas will be developed in consultation with the relevant agencies.

The properties in the Koombalah Estate, which the pipeline traverses, are dominated by sown phalaris grass. While there are individual Poa and Stipa grass species scattered throughout the phalaris, only one property contains a significant patch of *Themeda triandra* close to the pipeline easement. The area is not considered to be habitat for vulnerable reptile species and specialist consultants have determined that this grassland is of low biological quality, too small to be of conservation significance. Despite this, the alignment of the easement will not fragment this patch of *Themeda* and overall impacts on the native grasses through the entire Koombalah Estate will be low.

15.2.20.Hoskinstown area

The pipeline project will have only a very minor effect on the generally good condition of vegetation in the Hoskinstown, Nerriga Hills and Morton Plateau regions. Impacts will be minor and incremental to those of historic and existing land use practices.

15.2.21. Welcome Reef Dam

Issues raised regarding the alignment and potential impacts through the proposed Welcome Reef Dam area included:

- the high potential for soil erosion on the alignment originally proposed;
- potential conflicts associated with the presence of a natural gas pipeline in an area proposed for domestic water storage; and
- potential impacts on the natural heritage values (particularly flora and fauna).
- portion of the area proposed for inundation has been proposed as a future nature reserve.

EGP has realigned the pipeline alignment in response to a request from the Sydney Water Corporation to reduce the length of pipe through areas which may be inundated. This moved the pipeline away from the proposed saddle dam and avoided the high erosion risk areas. In response the NSW National Parks and Wildlife Service expressed increased concerns as the alignment suggested by the Sydney Water Corporation raised the level of impact on the proposed nature reserve. In response, NPWS and Sydney Water agreed on a third alternative which basically ran between the first two options. EGP has stated publicly that each of the three alignments proposed was economically feasible and was prepared to construct any of the three.

However, EGP does not consider that the flooding of the area presents any significant problems for pipeline operation or maintenance as there are thousands of kilometres of underwater pipelines throughout the world. The pipeline would be designed for the conditions and as such maintenance would pose no particular difficulty.

15.2.22. Bullee Gap

Bullee Gap forms the western edge of Morton National Park. It is an area recognised as containing high conservation values because of its geological, ecological and scenic attributes. A number of options were proposed for the alignment in this area including following the existing road, optic fibre cable or power line easements. EGP has undertaken geotechnical studies and currently considers that it is feasible to install the pipeline using directional drilling techniques. This is EGP's preferred option as it would avoid any potential conflict with the conservation values of the area. Should this not prove to be the case, the pipeline would be installed along the edge of the road in this highly sensitive area. Road widening would be minimised and work crews would be prohibited from entering the native vegetation. A pre-construction survey to mark significant flora species would be undertaken and the trench monitored for trapped fauna.

15.2.23. Morton National Park

Issues raised regarding potential impacts on natural heritage values of Morton National Park include:

- possible effects on the conservation value of flora and fauna, wilderness and aesthetic values;
- impacts on Tianjara Falls;
- cumulative impacts associated with easement widening; and
- rehabilitation difficulties associated with low fertility soils.

EGP recognises the sensitivities of this area and will develop strict management guidelines for construction and rehabilitation with input from specialist consultants and in consultation with the National Parks and Wildlife Service. The alignment selected through the Park area is located immediately adjacent to the road and as a result vegetation disturbance will be limited. The width of clearing will be 3 m or less. The physical road is, in places, outside the originally gazetted road reserve. EGP proposes to resurvey the road, to allow Government to create a new road reserve reflecting the actual road's location. This would ensure the pipeline remained outside Park boundaries.

The presence of a road through the Park has caused a major impact on the Park's heritage values. The additional presence of a buried pipeline adjacent to the road will result in only minor incremental impact.

Tianjara Falls will not be impacted. In this area the pipeline will be installed immediately to the south of the bridge and will not be visible from the Falls lookout.

Wilderness values will not be impacted as a result of this development (refer to section 0).

EGP considers the low fertility soils to be an advantage for rehabilitation as this will reduce weed growth. Existing easements provide good examples of native species regeneration even though revegetation techniques have been less than ideal. EGP will obtain the best available advice regarding revegetation techniques and incorporate this into rehabilitation plans during the detailed design phase.

EGP is aware that the road through Morton National Park may be widened and upgraded in the future. Pipeline design will be undertaken in consultation with the Shire and the assumption made that the road will be upgraded. This will ensure that the pipeline integrity is not threatened by future roadworks and there will be no need to re-route the pipeline in the event of road widening. Consequently, encroachment into the Ettrema and/or Budawang wilderness areas will be avoided.

15.2.24.Illawarra Coastal Plains

Background Paper 5 acknowledges the remnant vegetation which exists through the Illawarra Coastal Plains and the Wilton Tablelands. However, the pipeline route through this area will follow existing cleared easements, and as such, will reduce clearing. Through particularly sensitive or valued areas, the easement width may be reduced, or individual trees retained on the section of easement.

15.2.25.Illawarra Escarpment

EGP recognises the natural cultura and social values of the Illawarra Escarpment and has sought to identify an alignment and construction technique that minimises impact. Thirteen alignment options were reviewed as part of the assessment process and extensive consultation undertaken with National Parks and Wildlife Service staff, local residents, Wollongong City Council and special interest groups such as the Illawarra Escarpment Coalition and local developers.

Two main options have been evolved which, with a combination of detailed alignment and the adoption of special management techniques, are considered to adequately address the concerns expressed. For example:

- The State Recreation Area (SRA) will be avoided by deviation and directional drilling. Extensive geotechnical investigation has been undertaken and drilling is considered technically feasible;
- The use of existing easements and cleared farmland has been a priority for EGP to minimise impacts to remnant vegetation through this area. No species of conservation significance were recorded along this section of the proposed route. The vegetation is in a particularly disturbed condition and as such it is unlikely that clearing for the proposed easement would cause disruption to native fauna populations;
- The area is prone to weed invasion. This will be minimised by weed control prior to construction, vehicle and equipment hygiene practices, rapid revegetation and post construction monitoring and control for at least two years;
- Prevention of water and sediment flows along the easement would be necessary to minimise the impact on SRA values. Fire protection was also addressed as an important issue, given the nature of the vegetation types in the area and the proximity to highly populated, high value assets and the obvious high recreation usage of the reserve.
- At the top of the escarpment, the pipeline will follow the existing AGL easement. The easements are expected to overlap and not require a completely new easement.
- The erosion impact can be effectively controlled as the pipeline is not on the steepest sections.
- The visual impact will be minimal as the steepest section is expected to be directional drilled. The other sections follow existing easements.

15.2.26.Cordeaux and Cataract Catchments

The proposed pipeline route crosses the Sydney Water Corporation catchments between the Cordeaux and Cataract catchments and is removed from major water courses. EGP recognises the catchments as an area of sensitivity where careful management is required. Existing easements through this area will be utilised to the greatest extent practicable and as a result, a low to moderate impact is expected. EGP and its specialist consultants will liaise closely with the Sydney Water Corporation in the development of environmental management guidelines for this area. Such guidelines will aim to prevent and control the release of pollutants to watercourses and catchment areas. As a result, the establishment of refuelling and plant maintenance areas will be prohibited in this area.

15.3. FAUNA ISSUES

15.3.1. Fauna Survey

All surveys are a sampling process and it is neither feasible nor necessary to sample every point along the proposed route. An extensive literature review formed a key part of the assessment and in this regard where other sources were limited the NSW National Parks database was utilised as it is believed to be the central database for such information in the state and it is assumed that even relatively recent research and observational data would be lodged with this database.

Grassland areas of high habitat potential were identified by survey staff with expertise in this community and the associated fauna species and these sites were intensively surveyed. Other areas of lower habitat quality were not intensively surveyed but they were identified as potential habitat and recommendations made in the EIS/EES to minimise any potential impact. While only a few sites were trapped for the Striped Legless Lizard, much larger areas along the alignment were actively searched for this species. The extent of pitfall and spider tube trapping conducted was considered adequate by experts in Victoria and the ACT. A total of 18.5 person days were spent surveying in the area, most of which was active searching for Striped Legless Lizards and Southern Lined Earless Dragons. The surveying was found to be far more successful than trapping. Comprehensive information on the sites surveyed and the range of survey techniques used are provided in the Fauna Impact Statements. EGP agrees that it was not the optimal season for trapping. However, further alignment changes have been made to reduce direct impacts to potential habitat for these species.

Whilst the comments made by NPWS regarding optimum survey durations are acknowledged, in the context of this Project the survey effort for owls is considered adequate by the specialist consultants.

Evidence of bat roosting sites was searched for in the field and from existing records. There are no known cave sites along the Project alignment in NSW. Tree roosting bats tend to use mature, hollow-bearing trees. These trees are important for a range of fauna species. Prior to construction such trees will be flagged by suitably qualified personnel for retention where practicable.

EGP and its specialist consultants recognise invertebrates as an important element of the ecosystem. However, invertebrate surveys are not standard practice for an EIS for good reason: They are extremely time-intensive, many species cannot be identified and there is little information on which species may be of conservation significance. The conservation of invertebrates (and other aspects of biodiversity that are difficult to measure) is dealt with through habitat conservation recommendations. One approach is to target a particular group of species such as rare or hill-topping butterflies. The specialist consultants conducted a rapid assessment of these groups at the route selection level of the study and found no records of these along the selected route.

15.3.2. Significant Species

Individual fauna species are discussed in detail in EIS/EES Background Paper No.5 and the Fauna Impact Statement. Guilds were used to group a number of species as this approach enables:

- general impacts to be summarised in an ecologically meaningful way; and
- non-significant but nonetheless impact-sensitive species to be considered.

The following comments address issues raised in submissions regarding particular species:

- Wombats, echidnas, kangaroos and tortoise have not been included in EIS/EES Table 10.5 because they were either -
  - not recorded on the route;
  - there are no known records of them on the route; or
  - they are not classified as significant.

  Wombat burrows will be avoided if detected on the pipeline route.

- In regard to the Brush-tailed Phascogate, Yellow-bellied Glider, Squirrel Glider and Koala, large trees, both standing and fallen, will be protected in key habitat areas whenever practicable. These areas will be identified following approval of the route alignment and tree protection guidelines will be incorporated into the Environmental Management Plan. Koalas are discussed separately to meet the requirements of the NSW SEPP 44.

- In regard to the White-footed Dunnart, Southern Brown Bandicoot, Long-nosed Potoroo and Parma Wallaby further survey work will be undertaken to allow site specific management guidelines to be prepared. In key areas the length and duration of open trenches will be minimised. (It is not practicable to close trenches overnight). Proposed management strategies will be developed in consultation with NPWS.

- Suitably qualified inspectors will be on site on a full time basis during construction. If Brush-tailed Rock Wallaby are detected, work will cease at the immediate location and a management strategy developed in consultation with NPWS.

- Potential habitat for the Little Whip Snake will be surveyed prior to construction. Unless such surveys indicate that the species is more common and wide spread than current data suggests, any located sites will be avoided. Following the survey, any potential habitat adjacent to known sites will be managed as per the amelioration measures proposed outlined in the Fauna Impact Statement.

- All realignments of significant sites have taken into account potential habitat for herptofauna including the Pink-tailed Legless Lizard, Striped Legless Lizard and Southern Lined Earless Dragon. The alignment through the Cooma/Monaro area has been refined to avoid known habitat of the Striped Legless Lizard. As the roaming range of this reptile is thought to be no greater than twenty metres, it has been possible to achieve avoidance with great success. In addition, management procedures are also being developed to ensure the rescue and recovery of any reptiles that becomes entrapped within the trench during construction.

- All stream crossings will be undertaken in a cautious and responsible manner. Trenches adjacent to crossings in key habitat areas will be checked each morning by a suitably qualified inspector. Entrapped animals will be recorded and released. Species of particular note in such areas include the Giant Burrowing Frog, Great Barred Frog, Southern Barred Frog, Red-Crowned Toadlet, Growling Grass Frog and Green and Golden Bellfrog.

The Environmental Management Plan will incorporate appropriate management strategies to address potential adverse impacts on the populations or habitat of nationally threatened species which have been listed as either Vulnerable or Endangered since the publication of the EIS/EES.

International biological significance is treated in both the main EIS/EES document (section entitled "Species Listed Under International Treaties") and Background Paper 5 (section entitled "Effects on Wilderness, Reserves etc") which includes comment on wilderness and World Heritage values and areas on the register of the National Estate.

15.3.3. Habitat Fragmentation

Habitat fragmentation has been recognised as an important issue during the planning of the pipeline route. Consequently, remnant blocks of vegetation (including grassland) have been avoided wherever possible. EGP has maximised the use of existing easements such as roads, railways, tracks, powerlines and optic fibre cables. In addition, in key areas such as the Illawarra Escarpment, Bullee Gap and the Bemm River the pipeline will be installed using directional drilling techniques.

In areas where wildlife habitat is of particular importance shrubs and ground cover will be allowed to regenerate over the entire right of way. Any additional fragmentation or barrier effects are likely to be short term.

15.3.4. Wildlife Corridors

Proposed mitigation measures for corridors are broadly discussed on pages 47-49 of EIS/EES Background Paper 5. Wildlife corridors were considered during the preliminary route selection and if breaks were present in the corridor these areas were selected for the pipeline location wherever possible. In general, where the pipeline easement crosses wildlife corridors the following options exist:

- the easement may be narrowed;
- canopy cover may be retained;
- appropriate vegetation may be replanted;
- shrubs and ground covers may be allowed to regrow over the entire right-of-way.

Management strategies to maintain wildlife corridors will be developed and incorporated into the Environmental Management Plan in consultation with the relevant authorities at the detailed design phase.

15.3.5. Predation

The actual impact of the pipeline easement on feral predators will vary between areas. This is due to a number of factors including the proximity of established populations of introduced predators, the size of the isolate disturbed and the presence of populations of prey species in the newly disturbed area. EGP considers the use of the cleared pipeline easement by predators to be a relatively minor issue which will be further reduced by maintenance/restoration of wildlife corridors and by allowing canopy cover to remain or re-establish. As such does not propose to prepare a management plan to address the issue.

In relation to nest parasitism, the literature now suggests that this is a North American problem due specifically to the very aggressive cowbird which does not occur in Australia.

15.3.6. Entrapment

The issue of fauna entrapment will be addressed as part of the detailed Environmental Management Plan. Trenches will be checked regularly in key habitat areas by a suitably qualified inspector. Entrapped animals will be recorded and released. In areas where, for example, arboreal species are of note branches will be placed in open trenches at regular intervals to facilitate escape.

15.4. FLORA ISSUES

15.4.1. Flora Surveys

Any flora and fauna survey is a sampling process. EGP is confident that the flora and fauna surveys and the use of secondary data were adequately thorough and comprehensive. Notwithstanding this, one of the key principles on which this Project is based in is the principle of Ecologically Sustainable Development to which the precautionary approach is a major factor. Information on the range of survey techniques used and the locations at which they were employed is given in Background Paper 5 (Methods Section) and in greater detail in the associated FIS (Section 4, particularly Figure 5 and Table 6).

Spring surveys of the grasslands were conducted by Biosis Research and the results outlined in Background Paper 5. Subsequent field studies have resulted in further route refinement to avoid most of the significant grasslands (refer section 0).

In any botanical survey there will inevitably be unidentified specimens some of which may represent significant taxa. In the context of a survey it is impractical to identify the location of sterile plants and to relocate them at some later time if and when they flower or mature. If there is a reasonable probability that a specimen is a rare species or, for example, an area was particularly rich in orchids an attempt was made to identify these during the spring surveys.

There is considerable emphasis in the EIS/EES and in Background Paper 5 on habitat conservation. The approach taken is in response to relevant legislation and government policy which generally relates to individual species. The importance of species and associations in different areas was explicitly assessed by rating in terms of national, state, regional or local significance.

Surveys of mosses and liverworts are not routinely undertaken for an EIS. They are extremely time-consuming, many species (especially of liverworts) cannot be identified and there is little information on which species may be of conservation significance. The conservation of lower plants (and other aspects of biodiversity that are difficult to measure) is dealt with through habitat conservation recommendations.

15.4.2. Significant Associations

Information regarding old growth is contained in the EIS/EES Background Paper 5, although it is not integrated in a separate section.

The regrowth forest is structurally simple when compared to mature forest or regrowth after wildfire. There are numerous research reports produced by the Department of Conservation and Natural Resources in Victoria which identify such regrowth as poor habitat for fauna (eg. Loyn (1993)).

The Bellbird Creek area supports a matrix of forest ages, structures and ecological vegetation classes including Rainforest, Riparian Forest, Wet Forest and Damp Forest. While this area supports little old growth forest the values of national significance present (Long-footed Potoroos) are largely dependent on the riparian vegetation which has not been clearfelled. While this species would utilise regrowth forest to some extent, such forest is considered poor habitat. Minimal impact is anticipated in this area as the alignment closely follows the powerline.

All areas of rainforest are identified in EIS/EES Background Paper 5. EGP considers that construction of the pipeline will not conflict with rainforest agreements.

Remnant Gallery Rainforest exists in the drainage systems of Bridle Creek and Stony Creek in the Colquhoun State Forest. The pipeline traverses this area along the abandoned railway and does not bisect the Gallery Rainforest.

Some clearance of riparian vegetation will be unavoidable, although stream crossings have been chosen carefully to minimise both short and long term disturbance. For example, riparian rainforest remnants are located on the banks of the Bemm River. These will be avoided by directionally drilling the river and riparian vegetation. Rainforest remnants at approximately KP 242 have been avoided by following the Cann Highway.

15.4.3. Significant Species

EGP has conducted a joint field inspection with the specialist consultants and has reduced the width of clearing to achieve minimal impact. The final route will be inspected by suitably qualified personnel to ensure that no rare or endangered flora are threatened. Should any rare or endangered flora be encountered, the pipeline route will be altered slightly to avoid impact.

In areas where significant plant species have been identified the route has been realigned to avoid disturbance of these area, or mitigation measures will be adopted during construction, such as narrowing the width of the easement, harvesting replantable species, flagging individual species for avoidance during construction, or restricting vehicle and personnel access to the easement itself.

Only species recorded as occurring within the pipeline corridor by existing databases, published or known unpublished reports or during field surveys for this Project, are listed in the report.

While Tasmanian Cypress Pine *(Callitris oblonga)* may be recorded along the Corang River it was not recorded along the proposed pipeline route by any of the above sources.

Eucalyptus langleyi will not be affected by pipeline construction. The two areas where the species occur within the corridor have been avoided by minor route deviation.

Impact to significant flora such as *Swainsona recta*, *Dodonaea procumbins* and *Prosephyllum petilnm* has been avoided by careful route selection and re-alignment through the Monaro Plains.

The regionally rare plant *Actephila linaleyi* was not found within the two kilometre study corridor surveyed for the pipeline.

In the vicinity of Lake Illawarra, the proposed pipeline route traverses cleared terrain, avoiding patches of remnant woodland. Pipeline construction, therefore, should not have an impact upon the Greenhood Orchid *Terostylis gibbosa*. Should, however, the field environmental officer determine that the orchid is threatened at any point by the pipeline, the route will be deviated slightly to avoid any such threat.

15.4.4. Clearance

Following public comment, the alignment has been subject to a number of minor re-alignments. EGP has undertaken location surveys and based on this data estimates that approximately 300 ha of native vegetation will need to be cleared for construction (note the total easement area is 1485 ha).

It has been possible to reduce the amount of vegetation to be cleared by utilising disturbed areas and existing easements and adopting a more narrow right of way for short distances.

The alignment has generally been diverted around remnant vegetation, particularly isolated stands or individuals.

EGP are aware of the relevant State vegetation clearance guidelines and will take appropriate action to ensure compliance with the necessary requirements.

15.4.5. Weeds

EGP is aware of the problems of weed invasion resulting from construction activity and recognises its responsibilities in this regard. Funds for weed control have already been identified as part of the easement acquisition compensation package. The future weed control may be contracted to the landowner or to a registered weed control contractor. A specialist weed consultant has been part of the Project Team and is liaising with landowners and local authorities and documenting potential problem areas along the route. As part of the Environmental Management Plan, specific weed control measures and guidelines will be developed in consultation with the relevant agencies.

In general, soil disturbance will only result in large scale weed invasion if appropriate control measures are not in place. EGP has committed to a program of ongoing weed control during and after construction.

Management measures will include:

- avoiding areas of known weed infestations;
- restricting traffic, particularly between areas of known weed infestation and largely native sites;
- minimising disturbance in areas;
- manual control of weeds through the use of herbicides;
- undertaking a pre-treatment program;
- initiating vehicle and equipment hygiene measures during the construction phase.

The use of herbicides will be determined in consultation with the relevant land owner and according to the legislative requirements with regard to water quality. Generally, residual herbicides will not be used within 40 metres of a water course.

EGP will monitor the easement after construction for the presence of weeds and initiate weed control measures if necessary.

The EIS/EES records weed species in two sections:

- Agricultural weeds are listed in section 12.5;
- Ecological weeds are listed in section 10.6.2.

While weed species were not broken down by Local Government Area, Shire Weed Inspectors were consulted in the preparation of background data. EGP has, in response to comments, added the following species to its records for the Wollongong and Wollondilly LGA's:

African Boxthorn	Alligator Weed	Bathurst/Noogoora Burr
Californian/Cockle Burrs	Bitou Bush/Noneseed	Coca Leaf
Crofton Weed	Dodder	Giant Parramatta Grass
Gorse	Mist Flower	Parthenium Weed
Rhus Tree	Senegal Tea Plant	Water Hyacinth

15.4.6. Die-back

The spread of die-back is difficult to control as it is dependent on surrounding land management practices. EGP will therefore adopt die-back hygiene practices that are of an equal or higher level to that of the surrounding management. EGP will liaise closely with land management authorities to determine the most appropriate management measures. Known and potential problem areas and site management guidelines will be incorporated into the Environmental Management Plan. For example an area such as the Illawarra Escarpment is likely to be designated a die-back control area where strict die-back hygiene measures will be adopted during the construction of the pipeline to ensure that the risk of further spread of the disease is minimised. General measures are described in the EIS/EES Section 10.6.3.

15.5. AQUATIC HABITATS

15.5.1. Assessment Methodology

The Project required the assessment of hundreds of streams. Such assessments require the selection of appropriate indicators of ecological value. The information available on the conservation status of instream biota is limited and most adequate for fish and crayfish. While this is narrow, it utilises the best available information and in the context of the EIS/EES is considered appropriate.

A detailed site assessment of the hydrological and ecological values of the streams to be crossed by the Project was undertaken at the EIS/EES stage. The methodology and results are detailed in Background Papers 2 and 5.

The stream ecology field assessment of the pipeline route was used to target and ground truth specific streams identified as a result of the extensive desktop assessment and the field work of the flora and fauna teams (where every stream crossed was examined).

Fish sampling was not undertaken due to the technical and logistical difficulties involved in assessing the very large number of streams crossed by the route and the questionable value of once-off point surveys of streams for defining their environmental values. Effort was expended by specialist freshwater ecologists in making a predictive assessment of potential stream values.

The conservation values of terrestrial fauna and flora in riparian situations were considered and utilised to define sites of biological significance (eg. Gallery Rainforest, a rare community found along Bridle Creek in Victoria).

Wild and scenic rivers values are not measurable ecological values but are social and visual values. Impacts on such values have been minimised by selecting appropriate crossing points and utilising existing disturbed easements.

In addition, specialist environmental and hydrological consultants have been commissioned by the Project to assist in detailed crossing design on significant streams.

A further 26 streams, considered sensitive to disturbance, have been assessed in the field. In both field and desktop surveys particular attention has been paid to assessing the likelihood of habitat for significant species.

15.5.2. Potential Impacts

EGP is preparing detailed design and mitigation measures with both hydrological and environmental consultants and believes that all impacts on aquatic and riparian will be minimal and temporary.

While the EIS/EES notes that stream biota in NSW are more susceptible to increased sediment loads that those in Victoria, it also states that in NSW the route will mainly traverse stream headwaters rather than lower catchment areas. Species richness tends to be lower in such headwater areas. The effect of increased sediment loads in headwater streams should be lessened by the time flow has reached the middle and lower reaches of the catchments and the turbid water is dispersed with that of other tributaries.

Due to the differing life cycles of in stream biota it is very difficult to determine appropriate windows for construction.

Basically construction at any time of the year is likely to impact on part of the life cycle of some wetland or stream dependant fauna. The greatest potential impact is from sediment inputs and this is primarily dependent on high intensity rainfall events. Construction will be timed to avoid these as far as possible. In addition, any blasting would be conducted in conjunction with stream diversion such that the bed of the stream will be dry. Nektonic fauna will therefore be physically separated from blasting operations.

Blasting is expected to result in a similarly low level of impact on aquatic life comparable to other construction techniques.

15.6. WORLD HERITAGE

There are no World Heritage listed areas along or near the proposed pipeline route, but there have been proposals to list the Australian Alps in Victoria and the Blue Mountains in NSW.

Australian Alps

DEST (1995) discusses the following implications of World Heritage listing that are considered relevant to the EGP proposal:

- listing does not affect ownership rights;
- there is no impediment to existing land uses unless they threaten the outstanding universal natural and cultural values of the property (and that "...experience shows that listing does not necessarily limit the range of activities which can be carried out on a property");

- in meeting the heritage management objectives of World Heritage properties, due regard is given to -
  - ensuring the provision of essential services to communities within and adjacent to a property;
  - allowing provision for use of the property which does not threaten the World Heritage values and integrity.

The EGP proposal is likely to result in minor and localised impacts on natural values. Given the nature of existing infrastructure and landuse in the region and the generality of World Heritage criteria, EGP concludes that the pipeline proposal will have no impact on the success or otherwise of any future World Heritage nomination.

It is notable that the 11 Australian properties currently on the World Heritage List contain a broad range of infrastructure, including roads, towns, tourist resorts, airports and grazing properties. The proposed area for nomination for the Australian Alps, as set out by Mosely (1988) would include major water storages, water pipelines and aqueducts, hydro-electric power stations, high and low voltage transmission lines, a vast road network, ski resorts and other tourist related infrastructure.

Blue Mountains

The southern section of this proposed area includes Morton and Budawang National Parks. The pipeline route closely follows the existing road easement through this sensitive area.

The whole Blue Mountains area has been assessed by James (1994) as satisfying all four criteria for inscription on the World Heritage List as a natural property. There is very extensive infrastructure within the region but James concluded that the area had high integrity (a World Heritage criterion) and that the fact that anthropogenic disturbance was largely restricted to specific areas related to accessibility, transport, the disturbance of fertile soils and other factors had contributed to this. Her report specifically discusses Morton National Park and surrounding areas at some length but raises no concerns about the impact of Turpentine Road and adjacent infrastructure on World Heritage values and noted, in relation to high tension powerline easements, that while such powerlines had impacts on natural values, they were mostly local and thus did not significantly affect World Heritage values. She also noted that powerlines had regional visual effects, which could impact on World Heritage values - such long distance visual effects will not be an issue with the EGP which is below ground and will not create new easements in this area.

15.7. WILDERNESS

As discussed in the EIS/EES Section 12.4, the Project will leave negligible visual effects on the wilderness areas. The visual effects are largely mitigated by the distance from the wilderness areas and the existing visual effects of the roads and easements that the pipeline follows.

The proposed route of the Eastern Gas Pipeline passes near two areas identified as wilderness. These wilderness areas are in the area of the Morton National Park. The indicators used to define the wilderness areas are several factors that influence remoteness and naturalness. These are :

- remoteness from settlement - remoteness from settled (cleared) land or, within natural areas, points of permanent occupation;
- remoteness from access - remoteness from constructed vehicle access routes;
- aesthetic naturalness - the degree to which the landscape is free from the presence of the permanent structures of modern technological society;
- biophysical naturalness - the degree to which the natural environment is free of biophysical disturbance caused by the influences of modern technological society.

Where the proposed pipeline route passes near wilderness areas, the route either follows an existing easement or is further from the wilderness area than an existing easement. The pipeline route will therefore not diminish the wilderness quality of the Budawang and Ettremma wilderness areas.

The corridor through which the pipeline would run through Morton National Park and between the Budawang and Ettremma wilderness areas currently contains:

- a major two lane, all weather unsurfaced road;
- an optic fibre cable (Telstra) running parallel and often outside the road verge;
- a 330 kV high tension power line on pylons and running through a largely cleared easement 30 -50 m wide parallel but generally well separate from the road;
- the cleared farmland and associated infrastructure of the Sassafras area.

The pipeline is proposed to be placed either under the road, within the existing road verge or very close to the road with full revegetation to occur. The area has high potential for successful revegetation due to its low nutrient status soils (naturally inhibiting weed invasion) and the flat topography along the bulk of the proposed pipeline route. Given these factors, the pipeline adds only incrementally and to a relatively small degree to the level of disturbance and physical intrusion to the area and thus would have minimal effects on existing wilderness values.

The pipeline is not considered to be a high-grade feature. Other than small and well spaced easement marker signs (of similar dimension to the white marker posts marking the road edge), there would be virtually no evidence of the pipeline above ground.

The Australian Heritage Commission used the National Wilderness Inventory to simulate the effects of placing the pipeline along the road and assumed that the resultant level of infrastructure would constitute a higher grade impact. Even then, they found only a minor impact would occur which would be reduced to zero if the pipeline were moved south a few tens of metres.

15.8. National Estate Values

National Estate values were considered for places on the Register or the Interim Register of the National Estate that occur along or near the proposed route. In most cases the route avoids these areas.

Where this has not been possible, a range of management measures have been developed to ensure that impact on these areas will be minor. No impacts are expected in areas on the Register of the National Estate that are not directly on the pipeline route, but which have still been identified in the EIS/EES.

A detailed Regional Assessment of National Estate values in East Gippsland has recently been undertaken by the Australian Heritage Commission and the Department of Natural Resources and Environment (DNRE). That study provides a detailed regional overview of the National Estate values in East Gippsland and would allow a more complete analysis of the potential for the pipeline to impact on those values. Unfortunately, the study is not yet a public document. Nonetheless, DNRE used much of the same base information to define sites of significance for the East Gippsland Forest Management Plan and EGP was able to analyse the local impacts on these listed sites and to report same.

It is acknowledged that cultural perception of forest values is a valid addition to the traditional scientific approach to assessing heritage values. When planning the pipeline route however, EGP adopted the view that all forest areas were valuable and, wherever possible therefore, attempted to minimise impacts on all forest areas by following existing roads or service easements and minimising the amount of additional clearance that would be necessary. It is likely, therefore, that an assessment of cultural heritage values would have added little to EGP's appreciation of the issues, the route selected and the impact mitigation strategies adopted.

EGP recognises the importance of national estate values for all forest regions traversed by the pipeline and will continue to liaise with the Australian Heritage Commission and other relevant agencies regarding this matter.

16. ABORIGINAL HERITAGE

16.1. ABORIGINAL SITES

16.1.1. Assessment Methodology

The EGP investigation employed a staged and graded methodology which began with an initial 100% assessment of the proposed easement using less intensive methods such as vehicle and helicopter inspection, together with topographic mapping and aerial photography. This allowed the identification of sections of the easement where a comprehensive survey would provide little or no result for a variety of reasons. These include: obliteration of archaeological remains due to high levels of landuse disturbance (such as urban or industrial estates), nil surface visibility due to dense ground cover and/or vegetation, and the destruction or superimposition of pre-agricultural land surfaces due to historic sedimentation. The comprehensive surface survey of such contexts would be a waste of resources and is inconsistent with a professional standard.

The survey methodology adopted by the investigation was discussed at length with NSW NPWS archaeologists, prior to, and during the EIS/EES investigation. During these discussions it was agreed that 100% of the easement would require assessment, but that this did not mean a requirement for 100% comprehensive survey. It was conceded by the Service that a comprehensive survey in conditions where, for example, no appreciable ground surface visibility existed was pointless. In conditions of negligible visibility, sub-surface testing of areas of significant potential was agreed to be a better investigative strategy. Areas requiring this form of investigation are specified in Tables 11, 14 & 17 of Background Paper 6.

Given the EGP commitment to survey all moderate and high potential areas of the finalised easement, and the testing of low potential areas, it is concluded that a requirement for 100% comprehensive survey is unnecessary and would be counterproductive.

Predictive site models were provided for each of the landscape systems traversed by the Eastern Gas Pipeline. Sites located during the field surveys generally conformed to the criteria provided in the site models. The survey results have been quantified relative to the criteria provided in Background Paper 6.

In relation to sites located on the Monaro Tablelands:

- 100% conformed to at least one of the criteria in the predictive model
- 53% conformed to only one of the criteria
- 24% conformed to two of the criteria
- 24% conformed to three of the criteria

Of the thirty nine sites recorded in this landscape, 100% were either artefact scatters, isolated finds or quartz procurement sites. Thirty nine percent of sites were located on well drained ground adjacent to water, 10% of sites were located in close proximity to major fluvial corridors or lake basins, and two sites were located near sources of useful rock (specifically quartz). No sites were located on elevated sand bodies in valley floor contexts, however one site was located in a sand body on the side of a low spur.

In relation to sites located on the Southern Tablelands:

- 100% conformed to at least one of the criteria in the predictive model
- 11% conformed to only one of the criteria
- 18% conformed to two of the criteria
- 32% conformed to three of the criteria
- 35% conformed to four of the criteria
- 4% conformed to five of the criteria

Of the twenty eight sites recorded in this landscape, 93% were either artefact scatters or isolated finds. Other site types included grinding grooves and a shelter with deposit. Thirty two percent of sites were located in rolling terrain on meta-sedimentary bedrock, 14% of sites were located on well drained locally elevated ground and 14% of sites were located adjacent to a permanent water source. Over half the sites (58%) were located away from areas of possible cold air drainage, with 25% of sites situated on flattened ridge tops or knolls. Fifty percent of sites in this landscape occurred in clusters and 18% were located within a large or small valley.

In relation to sites located in the Southern Ranges and Basins:

- 98% conformed to at least one of the criteria in the predictive model
- 2% did not conform to any of the criteria
- 9% conformed to only one of the criteria
- 55% conformed to two of the criteria
- 30% conformed to three of the criteria
- 4% conformed to four of the criteria

Of the fifty one sites recorded in this landscape, forty nine (96%) were either artefact scatters or isolated finds. Other sites types recorded include a scarred tree and a quartz procurement site. Thirty seven percent of sites were located on well drained locally elevated ground adjacent to water, 6% of sites were located in close proximity to major fluvial corridors or lake basins, 30% were located away from areas of possible cold air drainage and 55% were located in probable access corridors such as major valley or ridgeline.

In relation to sites located on the Plateau Lands:

- 100% conformed to at least one of the criteria in the predictive model.
- 53% conformed to only one of the criteria
- 24% conformed to two of the criteria
- 24% conformed to three of the criteria

Thirty four sites were recorded for this landscape. Site types included shelter sites, scarred trees, artefact scatters and isolated finds. Fifty six percent of sites were located in probable access corridors on ridgelines, and 12% were located on level ground on ridgeline crests. Sixty eight percent of artefact finds comprised single artefacts or low numbers of artefacts, while quartz was the dominant raw material in 18% of the artefact scatters. One grinding groove site (3%) was located in close proximity to water. One site (3%) was located at an

ecotone on the edge of a small boggy wetland area and two sites (6%) were located in the escarpment and terraces fringing the Shoalhaven River estuary.

In relation to sites located on the Coastal Plains and Adjacent Ranges:

- 100% conformed to at least one of the criteria in the predictive model
- 20% conformed to only one of the criteria
- 40% conformed to two of the criteria
- 20% conformed to three of the criteria
- 20% conformed to four of the criteria

Five sites were recorded for this landscape. Site types included a scarred tree, artefact scatters and artefacts with deposit. Eighty percent of sites were located close to freshwater and 40% were located on level ground on a ridgeline crest. One site was located close to an ecotonal area in an estuarine environment. One site was located on a bedrock ridgeline on a possible access route between the coast and hinterland. Two sites (4%) were located on sandy or non rocky soil.

Section 13.1 of Background Paper 6 provides not only a list of types of significance, but also a summary of how particular features may influence potential significance ratings. Under scientific significance, for example, elements such as the low levels of disturbance, assemblage size, density and diversity, and site rarity are listed as possible justifications for scientific significance. The process of assessing significance involves the comparison of the known or potential characteristics of a site with the stated elements used to describe the listed significance criteria. This process is inherent in the provision of the criteria used for assessment. In Tables 18, 19 & 20 Background Paper 6, the significance ratings of all sites are provided, together with a summary on the key factors on which the assessment is based.

Given the expected large number of sites which would be investigated in the EGP investigation (195 sites in Background Paper 6, 156 sites within NSW), it was mutually agreed by both the consultants and NSW NPWS archaeologists, that the most appropriate form for presenting the results of the investigation was in summary tables. This avoided the unnecessary provision of extensive site description (which is provided on the NSW NPWS Site Cards) and of repetitive assessment discussions. It also meant that information which may jeopardise the conservation of the sites was not presented in a public arena.

Most archaeological consulting reports do not include a substantive analysis of the investigation methodologies used in previous studies nor do they include a 'discussion or analysis of the coverage achieved by the previous investigations'.

Given the number of previous studies cited in the EIS/EES, (over 100 survey reports for the NSW sector of the route), it would have been a major undertaking to produce a substantive analysis of the investigation methodologies used in previous studies. It becomes an even bigger undertaking if this analysis was then to be related to the effectiveness of an archaeological model. Irrespective of the scope of such an analysis, the quality and amount of information provided in the reports could not be effectively applied in a 'substantive analysis'. The majority of reports reviewed for the Project sites contained minimal information relating to 'investigation methodologies'. Where provided, the documentation was generally limited to brief and generalised descriptions, was not consistent in scope or methodology and would therefore be impossible to effectively quantify in a comparable form.

The term 'fine-grained' is used twice in the predictive model. In both instances the term is used in relation to rock types - 'fine and coarse grained stone' and 'fine grained sandstone'. In the former it is used as a part of a broad description of stone artefact raw material types, and in the latter it is used to describe a type of sandstone suitable for grinding purposes.

The term 'close proximity' is used four times in the predictive model. On all occasions it is in relation to proximity to a 'water source'. It is correct to point out that the application of this criteria is limited by the absence of a specified distance, such as 50 m or 100 m. However, this absence is due to the quality of the data used to formulate the model, rather than an oversight of the consultants. The NSW NPWS site register, which lists all previously recorded sites, was the data source used for recorded site locations. As is frequently acknowledged by the NPWS, the accuracy of the records from the register are highly variable and grid references obtained from the database may vary from the true site location in the order of hundreds of metres or more. Given this level of inaccuracy it was not possible to provide a reliable quantified distance from water.

Keeping 'close proximity' as a relative term was the most appropriate and accurate presentation of this site location criteria.

Gender issues were taken into consideration regarding the Yuin Areas of Power'. Discussions between the Aboriginal consultants, both male and female, and EGP consultants were undertaken prior to the 'Areas of Power' investigation, in order to ensure that there was no requirement for a male anthropologist, and that a female anthropologist would be appropriate.

16.1.2. Confidentiality

Consultation with the local Aboriginal communities is essential to identify the location of mythological and contemporary Aboriginal sites. Such consultation was undertaken during the course of the archaeological surveys, and with the exception of the Newmerella Corroboree Ground, EGP Archaeology was not informed of the location of any such sites along the proposed pipeline easement.

Should any sites of cultural significance be revealed through further surveying, procedures for the recording and documentation of such information will be determined at the outset, in consultation with the individuals providing the advice. The concerns of the individuals and the local Aboriginal community will be respected.

Neither EGP or its specialist consultants have released details of the location of sites of specific mythological, traditional or contemporary significance to Aboriginal people. Archaeological sites discovered during survey were not identified by kilometre point in Public documents for reasons of confidentiality. It is to be noted that the details of many archaeological sites are available for public access through the Aboriginal Affairs Victoria sites register. However, Aboriginal Affairs Victoria maintains details of mythological significance on a separate, restricted access register, for which the permission of the relevant Aboriginal community representatives must be obtained prior to the release of any information.

16.1.3. Site Protection

EGP has adopted a strategy of avoidance of archaeological sites. However, the decision to relocate the proposed alignment on archaeological grounds needs to made in consideration of the resultant impact on other environmental, social or cultural sensitivities. As such, relocation due to an archaeological site of low significance may not be warranted where such action unduly impacts upon other elements of the environment.

One hundred and thirty six sites were located in Spreads 2 and 3 in the course of field surveys for the Eastern Gas Pipeline in NSW and 20 previously recorded sites were noted as occurring within or near the defined easement. Of this total of 156 sites, salvage was recommended in the first instance for only 6 sites.

Salvage of archaeological sites has only been recommended where it is considered that the archaeological resource is such that salvage would result in useful archaeological information being retrieved, or in the case of collections, where artefacts are of a rare or unusual type.

Subsurface testing was recommended for 10 sites which were considered to have archaeological potential. Testing was recommended for sites where the presence, nature and extent of subsurface material was not clear from surface indications, and where there was some potential for the easement to impact the site in the absence of this further clarification. Testing was also recommended in areas where it was considered possible that subsurface archaeological deposits may be present, and knowledge of this sort was necessary to prevent or mitigate potential impacts.

The Background Paper 6 recommendations for both salvage and sub-surface testing are consistent with the policies of the NSW NPWS.

In addition other mitigation measures to be employed by the Project with respect to significant Aboriginal sites are clearly outlined in Background Paper 6 and Chapter 17 of the EIS/EES.

The assessment of the impact of the proposed pipeline upon the cultural heritage environment of East Gippsland has been thoroughly investigated and documented within Background Paper 6.

An elder of the Gunai community was a member of the Victorian Consultative Committee and therefore all relevant information would have been forwarded to this person for their review prior to the Consultative Committee meetings, and therefore was a part of the process.

In assessing potential impacts upon the unpredicted archaeological resource (ie areas in which the 'nature and quality of this impact is unknown') conservative management strategies have been adopted. These include the use of pro-active strategies for the assessment of Potential Archaeological Deposits and monitoring strategies to address the limited potential for skeletal remains.

The presence of the Clydebank Bridge Scarred Trees Aboriginal Area was noted by EGP Archaeology. The location of the Aboriginal Area in relation to the proposed pipeline route was examined through assessment of the Australian Heritage Commission's Register of the National Estate (RNE) records, Aboriginal Affairs Victoria site records, and detailed topographical mapping of the proposed pipeline route.

It was established that the scarred trees comprising the RNE place are located further than one kilometre east and south of the proposed easement, and therefore will not be impacted in any way by installation of the pipeline. Hence, these Aboriginal scarred tree sites were not included within Volume 6, Table 3. No other places listed in the Aboriginal environment of the RNE occur within the two kilometre wide pipeline corridor.

EGP acknowledges that the Welcome Reef Nature Reserve would conserve a complex of Aboriginal sites. This is because the conservation of a significantly sized and minimally disturbed area containing a representative sample of topographic variation will also probably conserve a suite of archaeological sites related to the exploitation of those environments. However, little is known about the likely archaeological resource within the proposed reserve. Only small portions have been surveyed as part of the Welcome Reef Dam and EGP archaeological assessments, mostly in lower valley contexts.

When compared to the total area of the Nature Reserve (some 6700 ha), the total area of the proposed easement is approximately 14 ha. If it is assumed that the whole of this portion of the EGP proposed easement is located within the proposed Reserve boundaries, then it would represent 0.2% of the total area. When it is further considered that all notable archaeological sites, such as those having moderate or high significance ratings, will be avoided by amending the easement location, there is little potential for the proposed easement to significantly impact the archaeological resource within the proposed Reserve area.

EGP will endeavour to preserve, where possible through avoidance or rehabilitation after construction, plants which are of medicinal and food value to the Gunai/Kurnai people.

16.1.4. Discovery of Skeletal Remains

In the event that human skeletal remains are uncovered by any works conducted by EGP, attempts will be made to contact both the NPWS Service/Aboriginal Affairs Victoria and the Police as soon as possible after the time of discovery. NPWS/AAV will not be contacted if the remains are clearly not Aboriginal. Appropriate actions will be taken to facilitate a coordinated approach between the two authorities.

16.2. ABORIGINAL CULTURE

Background Paper 6 defines Aboriginal significance as 'the cultural values of a place held by and manifest within the local and wider contemporary Aboriginal community' (p. 109). 'Cultural values' is a broad term, encompassing the full spectrum of human dynamics which is recognised as human culture.

Currently, the East Gippsland area is a largely integrated system of ecological linkages and frameworks, which have arisen, in part, due to the activities of the Aboriginal people in the area over thousands of years. Concerns were raised by Aboriginal people that the proposed pipeline would cut people off from the land. This might allow damage to and destruction of archaeologically and culturally sites, but also further fragmentation of the land as a whole. Both concern Aboriginal people.

The proposed gas pipeline will in no way cut Aboriginal people off from the land and preclude their future involvement in decisions concerning it. The local Aboriginal communities have been consulted and involved in the management of cultural heritage values at all stages of the EIS/EES process and will be consulted during the pre-

construction and construction phases. In addition, the majority of the lands through which the pipeline traverses consist of private property and electricity transmission line easements, in which indigenous people have previously been excluded from a role in management.

Similarly, the operation of a pipeline will not cause any disruption to hunting or fishing rights. However, during the construction phase there may be restricted access to the work site for safety reasons for short periods of time. For water crossings this will be in the order of one day to one week. Construction on the entire route is expected to take approximately seven months. As the pipeline is being constructed largely along existing easements, which may already create a barrier to movement for some small species, the pipeline is not expected to impact greatly on the native game.

Background Paper No. 6 focuses on cultural heritage sites (including archaeological sites with physical manifestations of evidence, and sites of mythological, traditional, or contemporary Aboriginal significance) for several reasons:

- it establishes methodology, in which decades of numerous and strong precedents have been set, involves management of the cultural heritage resources through a site-specific approach, and
- notes requirements for methodology and reporting to the State organisations responsible for cultural heritage management (NSW National Parks and Wildlife Service and Aboriginal Affairs Victoria).

Adopting a site-specific management approach does not preclude the assessment of cultural landscapes or Aboriginal usage of the environment as a whole (Background Paper 6, p1). There is however, no legal basis for the protection of areas for which there is no physical evidence of Aboriginal occupation, nor for which there is no evidence of particular significance to Aboriginals in accordance with Aboriginal tradition. Any landscapes/areas identified which are of particular significance in accordance with Aboriginal tradition would be treated as an 'Aboriginal Area', as defined under the Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, and management recommendations formulated in the same manner as for sites of traditional Aboriginal significance.

The importance of Aboriginal archaeological sites to contemporary Aboriginal communities has been recognised throughout the investigation. At no stage does the report (Background Paper No. 6), either explicitly or implicitly, convey or attempt to convey the impression that authentic Aboriginal people are from the distant past and contemporary Aboriginal people are removed from that past.

Background Paper No. 6 refers to 'Nelly Hamilton, commonly known as Queen Nelly, the last of the people living a traditional lifestyle in the Canberra/Queanbeyan region, died on 1 January, 1897' (Section 8.3).

This is a description of how Nelly Hamilton was commonly known at that time of her death in 1897. She has also been variously referred to as the last of the local Ngunawal tribe, the last surviving full-blood member of the local tribe, the Queen of Queanbeyan, and a Queen without subjects (Gillespie 1991, pp36, 118, 186, 216).

These are not the opinions of the consultants and the description in the noted Background Paper was not presented a such. The description is presented as an historical reference to 'Queen Nellie'. Its inclusion within the Anthropological Background section

was useful in providing a rough date by which traditional forms of Aboriginal occupation were perceived by the white community to have ended in this region. This relates to the age of sites such as artefact scatters and scarred trees.

16.3. NATIVE TITLE

EGP is fully aware of the status of Crown Land in regard to Aboriginal land claim issues, is working closely with the relevant authorities, local Aboriginal communities and carefully monitoring the situation. EGP recognises the need to have such issues appropriately addressed prior to the granting of the Pipeline Licence.

EGP is aware of the Native Title Claim C00143 (Bryant family, Gunai people), which involves Stoney Creek and Boggy Creek near Nowa Nowa. The Project Team is communicating with the legal representative, Victorian Aboriginal Legal Service, for the claimants.

16.4. COMPENSATION

EGP has, and will continue to adopt the practice of avoiding disturbance to sites of cultural heritage significance. Existing systems of approval will be followed where sites of lesser significance to the Aboriginal community are present on the proposed easements. EGP will continue to work closely with the Aboriginal community to resolve the issue of compensation for disturbance of such sites.

17. HISTORICAL HERITAGE

17.1. ASSESSMENT METHODOLOGY

The primary emphasis of the historical heritage investigation was to assess potential impacts of the Project. As part of this process physical evidence of historical sites has been documented and management strategies developed for their protection. The historical heritage assessment was not intended to be a detailed research project on aspects of local history such as personalities and events. It is important to note that no previous major development projects in East Gippsland have considered historical heritage as part of an environmental mitigation strategy.

As part of the assessment process the specialist consultants liaised directly with local groups and landowners and reviewed relevant sources from the abundant historical documentation available regarding the East Gippsland area. It was not possible nor warranted to contact every community member considered to be a potential source of historical data. It is considered that this approach satisfied the aims of the project. Where possible the consultant verified oral information with documentary research.

Prior to the commencement of field studies, EGP conducted an extensive community consultation program in regard to the Project and the proposed assessment. This included media exposure, newsletters, open houses, and community meetings (refer also to Section 2.3). In regard to local heritage EGP considered this work to have been sufficient general consultation, and so concentrated efforts on specific local historical societies and the landowners through whose properties the pipeline passed.

17.2. SENSITIVE SITES

17.2.1. Bairnsdale - Orbost Railway

EGP acknowledges that selecting the most appropriate alignment through areas where a variety of sensitivities exist requires a considered, balanced approach. One such areas is the Bairnsdale - Orbost railway line through the Colquhoun Forest. This area contains sites of natural and cultural heritage value. In response to submissions EGP's specialist consultants have undertaken further fieldwork to select an alignment which does not unduly compromise either of these values. This work has been conducted in consultation with the relevant authorities (refer also to Sections 15.2.6, 15.2.10 and 18.3.5).

17.2.2. Club Terrace Cemetery

The Club Terrace Cemetery is located 200m south of the proposed pipeline alignment, on a hillslope to the west of the existing township. The cemetery site will not be affected by the pipeline, which follows a powerline easement along the crest of the ridge. This section of the route has been subject to severe disturbance through clearance and construction of the electricity transmission line, the bulldozing and maintenance of numerous access tracks, two fibre optic cables and an extensive saw milling complex. On

the basis of a field inspection of this area, it was apparent that no historical cultural remains would be affected by further disturbance of the powerline easement.

17.2.3. Jack Lang's Selection

EGP will conduct additional documentary research and liaison with relevant local historians regarding the location of the selection site of Jack Lang (former NSW Premier). No further field inspection is considered necessary, unless the location is affected by the proposed pipeline alignment. A field inspection of the proposed pipeline alignment at the Princes Highway crossing west of Bairnsdale indicated that no standing structures, ruins or visible surface indicators of historical sites (eg. fruit trees, earthworks etc.) would be in the path of the pipeline construction.

17.2.4. Mount Kembla Ring Track

A number of sites in the Mount Kembla area were identified during the EIS/EES field surveys as being potentially affected by pipeline construction. Since this time the pipeline route has undergone a series of proposed realignments in an attempt to avoid or reduce impacts to sensitive sites. Sections of the Mount Kembla Ring Track would have been affected to a minor extent by construction on the original alignment. Revisions have avoided such impacts.

The historic Southern Coal Company mine site on the south eastern side of Mount Kembla, in the vicinity of the Mount Kembla Ring Track is sufficiently removed from the proposed alignment (original and revised) to ensure no damage will occur to the mine or associated relics.

17.3. SITE PROTECTION

Heritage sites are protected under a range of legislation including:

- the NSW *Heritage Act 1977*
- the NSW *National Parks and Wildlife Act 1974* (for sites in National Parks);
- Local Environmental Plans and Development Control Plans protect sites of natural heritage value in NSW;
- the Victorian *Archaeological and Aboriginal Relics Preservation Act 1972*; and
- the Victorian *Heritage Act 1995*.

In NSW, local councils may apply for items worthy of conservation to be protected in accordance with the *Heritage Act 1977* and planning instruments made under the *Environmental Planning and Assessment Act 1979* may contain provisions restricting development on such sites. The Australian Heritage Commission is also required to maintain a register of natural and cultural sites of national significance under the Commonwealth *Australian Heritage Commission Act 1975*.

EGP will be required to apply for and obtain all necessary approvals regarding the disturbance of any site, regardless of the type of feature, age or state of preservation.

18. SOCIO-ECONOMIC ISSUES

18.1. ECONOMIC IMPACTS

18.1.1. Assessment Methodology

The economic impacts discussed in EIS/EES Background Paper 15 (Tables 1.1 and 1.2) are based on estimated net energy outlay savings due to energy cost savings and estimated incremental gas usage. Incremental gas usage and price reductions might well be higher as indicated in the Energy Issues Background Paper 16 which also stated that if the estimated price impacts (not incremental gas usage) were lower benefits would be lower.

Table 1.1 in Background Paper 15 details the reductions in gross domestic product due to the investment expenditure stimulated by the Project (given as gross investment cost) and the estimated increase in gross operating benefit resulting from the construction and operation of the pipeline. The costs and benefits have been discounted at a rate of 8 per cent to reflect the net present value of the costs and benefits. The data presented for each year in Table 1.1 is cumulative from 1998.

The findings in Table 1.1 suggest that nationally gross domestic product will be $3.6 billion higher over the period to 2025 (gross operational benefit $4.9 billion less gross investment cost $1.3 billion). In New South Wales the net increase in gross state product over the period is $1.5 billion.

Similarly the effects on real household disposable income are calculated. This is the income available to households including wages, salaries, investment earnings and other income less taxation. The additional disposable income over the life of the period is $1.6 billion nationally and $0.6 billion in New South Wales.

The estimates are based upon estimated net savings in energy outlays due to lower energy costs, plus the impacts of incremental activity due to greater competitiveness of industry due to expected price reductions. Incremental gas usage may well be higher as is indicated in Background Paper 16 leading to higher economic benefits than reported in Tables 1.1 and 1.2. But it was also stated that if the price impact were lower then so would be the economic benefits.

Table 1.2 is based upon a similar methodology to Table 1.1, but it presents the non-discounted annual impact of the Project on a range of major macro-economic indicators. Thus the impact on the items of greatest significance to economic policy makers and the general public are highlighted.

The impact of the pipeline construction was evaluated by estimating the direct expenditure of likely employment within each statistical sub-district. These estimates were drawn from the Projct engineering costs, with an estimated cost per kilometre of pipeline being calculated. The likely direct employment impacts were calculated by pro-rating the expected employment over the component statistical sub-district.

Once the direct impacts had been allocated these were incorporated into the NIEIR Regional IMP models of those particular areas. The Regional Institute Multi-Purpose (IMP) models use an input-output framework to allocate the direct impacts across industry sectors while estimating the flow as expenditures. These second round expenditures may flow directly into the local economy, surrounding sub-districts or elsewhere in New South Wales, Victoria or Australia.

The impacts detailed in EIS/EES Tables 15.2, 15.3 and 15.4 reflect the results of this modelling.

The increases in net regional product and employment were calculated by using the NIEIR regional IMP model. At the core of the modelling methodology is the construction of regional input-output tables. From these tables, estimates of the flow-on effects of direct expenditures are calculated.

The NIEIR Regional IMP model has been used in the past two years to estimate regional growth for customers such as the Victorian Department of Planning and Development, Telstra, the New South Wales Department of State Development and Coles-Myer. Discussions are continuing with these clients for further work, thus indicating those customers' confidence in the modelling approach used.

Gross domestic product (GDP) is made up of a number of components, some of which are presented in Table 1.2, all of which however are taken into account in NIEIR's IMP model. Hence, the GDP estimates cannot be calculated solely on the basis of the indicators presented in Table 1.2. The ones presented are, however, key component indicators.

Other components are, for example, industry investment and residential investment. Also, the GDP estimate is GDP(P – production based) or the GDP measure formed by summing real value added by industry.

The NSW Sustainable Energy Fund (SEF) indicates that maximum annual cost effective energy efficiency potential in New South Wales is equivalent to about 86 PJ. While this is a significant figure, being a little less than current annual gas use in New South Wales, past experience with realising energy efficiency potential in Australia and overseas indicates that without market stimuli from initiatives such as the Project, working in concert with SEF-type initiatives much of the potential will not be realised.

Two points are made on the above assertion:

- it is not the role of EGP to evaluate all potential energy investments in Australia before reaching private sector investment decisions; and
- the modeling does take into account energy efficiency investments undertaken by energy users as a result of the Project.

EGP believes the energy and regional economic issues papers clearly set down the methodologies and assumptions used.

18.1.2. Community Benefit

A large project such as the Eastern Gas Pipeline, which is designed to benefit the public in general, may have some impact on individuals. It is true that for small communities benefits to individuals would be difficult to evaluate. However, if a slightly wider community view is taken (incorporating a region such as Queanbeyan, Hoskinstown, and

Bungendore) then there are definite, positive benefits. These benefits would be felt immediately during the construction of the pipeline in terms of jobs, and the supply of materials and services. The benefits would extend into the future with the availability of a reliable, new, clean-burning, environmentally acceptable energy source which could provide heating and cooling to existing and future residents and industries. The availability of this economical energy source, established services, an educated and skilled population, and land made available for development, will also make the area attractive. A healthy, sustainable community could result in an increase in the market value of the land in local areas as well as increase services for the wider general area.

From a nationwide perspective the pipeline will introduce gas-to-gas competition promoting cost reductions, provide the potential to reduce CO_2 emissions, create significant employment opportunities, contribute positively to the Gross Domestic Product, and expose over 20 communities to the benefits of natural gas.

EGP does not support the comment that the pipeline would produce damage and losses to all residents. The compensation available to the residents directly affected by the pipeline has been determined. The construction of the pipeline will cause temporary disruption of some traffic, some localised disturbance from dust and noise, but little that could be described as damage and losses to all residents.

The energy and economic issues papers clearly point to significant benefits to communities on the proposed route, particularly those in Gippsland (Victoria) and eastern New South Wales where gas is not currently available.

In these communities gas is supplied by LPG, at up to twice the cost of natural gas, and reliance is also placed on oil products and electricity, energy forms more expensive than natural gas. To date even in the Shoalhaven/Nowra area, where potential demand for gas is high, the New South Wales distributor has not extended spur lines into that area which EGP expects to be served from the Eastern Gas Pipeline.

The specific impacts of the pipeline upon the Shoalhaven communities was estimated in two parts - the construction impacts which were detailed in the NIEIR report and the longer term impacts of the availability of natural gas. This latter issue was reviewed in detail by ACIL in a report to EGP.

Specifically the longer Project benefits for the Shoalhaven region are significant. The major industrial companies in the area, Manildra (Shoalhaven) Starches, Australian Paper and Australian Co-operative Foods, currently use some 4.6 PJ of energy per annum. Approximately two thirds of this is used by Manildra who currently burn coal and some LPG. The company indicated its preference for gas over coal. Australian Paper and Australian Co-operative Foods are more ambivalent about converting to gas.

In the three years from 1991 industrial gas usage increased 746 per cent to 167,500 GJ per annum in the Shoalhaven region. The average price per GJ paid by these customers was $8.36. As the current average natural gas price in New South Wales is $5.17 per GJ, considerable savings are likely to be generated with provision of a competitively priced source of gas to these customers. Estimated savings for industrial customers alone could be greater than $0.5 million per annum.

18.1.3. Employment

As stated in the EIS/EES it is estimated that at the peak of construction the Project will create 1,100 jobs. The duration of employment will vary from four to eight months. In addition 960 "spin off" jobs will be created by the Project, outside the immediate pipeline construction.

EGP has employed an Aboriginal Employment and Training Adviser and an Indigenous Heritage Adviser to assist in meeting the specific employment needs of the Aboriginal community. With reference to environmental protection this Project will employ Aboriginal advisers during construction to assist in protection of cultural sites.

18.1.4. Carbon Tax

To the extent that an economy is based on less carbon intensive fuels a given carbon tax will have less impact (on prices, investments, growth and distribution) than it would on a more carbon intensive economy. The Project contributes to a reduction in carbon intensity of the economy and thus contributes to reducing the impacts of a possible carbon tax. Although a carbon tax would have the aim of contributing to the internalising of greenhouse gas externalities a range of studies indicate that such an approach to societal greenhouse gas abatement targets has deleterious impacts on carbon intensive economies.

18.2. LANDOWNER ISSUES

18.2.1. Dispute Resolution

EGP did not provide explicit details of landowner rights in the EIS/EES, because this is not considered an appropriate medium in which to address such matters. The document is a broad planning approval document. Landholder rights and compensation are more appropriately dealt with in consultation with individual landowners and in the standard documentation with which they are provided.

The Project staff and personnel dealing with the public and landowners have been selected because of their experience and their sensitivity in negotiating under potentially difficult situations. EGP has compiled notes regarding each contact with individual landowners. When specifically requested, landowners are informed that EGP will likely be given the rights to acquire land once the Project has been approved. However, they are also advised that at this stage in the project's development, EGP is seeking to reach agreements through negotiations.

The acquisition of lands for the pipeline will be pursuant to the Pipeline Acts of Victoria and NSW. In addition, the compensation paid will be pursuant to the relevant portions of the Land Acquisition Acts of these two states. Avenues for dispute resolution are identified in these acts. Under the Easement Agreement a landowner may have the document reviewed by a legal adviser, at EGP's expense.

EGP recognises the important role that landowners play in the safe and efficient operation of a pipeline system and will work diligently to maintain a good and cooperative working relationship with all landowners along the pipeline route.

18.2.2. Easement Agreements

Each easement document incorporated a sketch plan which shows the approximate location of the pipeline easement on private or public property. In certain situations, usually where a location survey has not been completed, the sketch plans are marked preliminary and the landowner is informed that there may be some movement of the easement location once the survey is complete. In most cases movement of the easement on the property is the result of negotiations and discussions with individual landowners. Project location is also preliminary because at present the Project does not have government approval to proceed. Any re-location will be discussed with the landowner.

The Pipeline Permits and Licences that EGP seeks from State Governments will be for the transportation of natural gas and not for crude oil or liquids. However, there is often evidence of other substances which enter pipeline systems, from time to time, as a result of the processing and compression. It is the existence of these gas by-products, including some lubricating oils from the compressor units, which has required EGP to include the terms "artificial gas, oil and other gaseous or liquid hydrocarbons and products or by-products of those substances" into the Option Deed.

The Project's EIS/EES process commenced before the land acquisition program. That is, environmental and engineering studies for the EES/EIS and location surveys started in the first quarter of 1995. The acquisition of easement commenced in the third quarter of 1995 in areas of recognised lower sensitivity or contention.

18.2.3. Land Value

The location of the pipeline will be determined in consultation with the relevant landowner or authority. Placement of the pipe across any land will be such that the impact to the value of the land will be minimised.

During the course of acquiring the easement rights for Project there have been six properties on the pipeline route which have sold. In four of the sales, the new owners were aware of the location of the proposed pipeline easement, and in the other two, the owner was unaware. In each case, the existence and location of the easement did not affect the sale, nor did it have a negative impact on the sale price. On five of the blocks, the pipeline was the only easement.

EIS/EES Background Paper 10 addresses the potential impacts of the pipeline on commercial forests through which the alignment traverses. The EIS/EES still recognises the importance of the Sydney Water Corporation catchments and whilst not quantifying the economic value of this area for water catchment purposes (which is beyond the scope) appropriate measures will be taken to minimise the impact on such values.

18.2.4. Compensation

All landowners crossed by the pipeline, private and Crown, will be given an easement document which spells out the following:

- the rights that are to be acquired;
- the compensation paid for these rights;
- a commitment that EGP will compensate for damages caused by the construction and operation of the pipeline system;
- the restrictions that are made over the easement strip;
- the rights of the landowner; and
- the dispute resolution mechanism available in the event that there is disagreement.

Private property has been valued by an experienced, licensed, local and independent valuation company using established valuation techniques and undertaken in accordance with the relevant legislation in each State. Each landowner is provided with a copy of the easement document, the valuation summary, and an explanation of the rights that are to be acquired.

EGP has been generous in its compensation for easement acquisition. The level of compensation is equal to or above the level of compensation for pipeline easements in Australia.

The Taxation implications of compensation for easements, especially those which may be taken involuntarily, has not been clearly determined by the Australian Taxation Office. EGP is acquiring certain rights over property for which the Company is prepared to compensate the landowner. The rights acquired may be considered, for tax purposes, as a reduction in the value of the property. In addition, EGP is prepared to compensate the landowner for damages to crops or property. In its determination of compensation, EGP does not want the landowner to profit or lose from the grant of the easement or from any damages caused by the construction or operation of the pipeline. Because EGP will never know the exact tax position of individuals crossed by the pipeline, or how the payment of compensation may influence this position, the Right of Way Agents have been instructed to inform the landowner that if they are concerned whether any payment from EGP may be at risk of Capital Gains Tax that they may want to consult with their accountant. EGP is not in the position to recommend that they see their accountant or to review or advise individuals in the preparation of their tax returns.

It is not anticipated that property owners will be required to de-stock to facilitate construction. EGP will however, pay compensation for the movement of stock to facilitate the construction of the pipeline.

18.2.5. General Landowner Issues

EGP does not intend to unnecessarily invade the privacy enjoyed by the landowners and will respect their property rights. During the planning phase of this project, EGP has attempted to make personal contact or notify each of the landowners before any Project personnel or consultants entered their property.

Once the pipeline is operational, EGP has a responsibility to operate and maintain the pipeline system safely. EGP takes this responsibility very seriously. This will mean that aerial patrols will be undertaken to monitor the condition of the easement. It is estimated that access to or on the pipeline easement will occur approximately once or twice a year

unless specific problems are identified. If monitoring work involves entering or crossing private property, EGP crews will endeavour to make prior contact with the landowner.

During the short construction period only the pipeline easement, and other agreed areas, will not be available to the landowner.

Property specific issues are being agreed with each landowner. Issues such as minimising impacts to planted trees form part of such discussions, where relevant.

18.3. LANDUSE

18.3.1. Local / Regional Planning

The pipeline alignment has been selected in consultation with the relevant government agencies and all regional environmental plans, local government planning policies and town planning requirements were considered when determining the centreline.

EGP will consult directly with groups such as the Land Conservation Council regarding land management recommendations to ensure that, wherever possible, the objectives of such groups are not compromised by the Project.

18.3.2. Forestry

EGP has selected alignments through forest areas in consultation with the relevant land management authorities, with the aim of minimising losses in productive timber. Suitable compensation is being provided to all affected land owners with regard to the loss of trees. The timing of construction needs to take into account a range of issues, the most important being the ability to actually construct the pipeline. This may not coincide with the optimum time for wood salvage. This will be taken into account in the compensation for those landowners.

In regard to commercial forest operations, EGP will continue to work closely with authorities regarding the sale, disposal of residue, and payment of timber royalties.

The *Code of Forest Practice for Timber Production* does not directly or legally apply to the EGP Project. It is, however, appropriate that some of the principles embodied in the Code be applied to some pipeline construction activities. Where relevant these will be incorporated into the Environmental Management Plan.

EIS/EES Background Paper 10 specifically deals with commercial forest issues. Water catchment management issues were not part of this consultant's brief.

18.3.3. Agriculture

Current property market prices are considered when paying for easement agreements and should reflect alternative use values. The easements will not be fenced and can continue to be used for agricultural and other similar activities, except that permanent structures cannot be built on the easement. Thus there will be little medium to long term impact on agricultural production.

18.3.4. Conservation

Where areas of high conservation value forest are traversed, the pipeline route generally makes use of existing disturbed areas such as roads or service easements. Consequently, installation of the pipeline will have only a minor incremental effect on the conservation value of the forest areas it traverses and will not create new fragmentation. It is therefore unlikely that the Project will result in foreclosure of reserve options in any areas.

18.3.5. Recreation

Three areas of current or future recreation potential were raised in submissions:

- the Bairnsdale to Orbost Rail Trail;
- the Newmerella Showgrounds Reserve; and
- the Illawarra Escarpment Walking Trail.

In each case EGP will continue to liaise with local authorities and interested parties to ensure that pipeline construction and operation does not unduly affect future recreation potential. The aim will be to develop strategies whereby the pipeline and recreation proposals can co-exist and if possible, for EGP to complement these land uses.

18.3.6. Visual Amenity

EGP and its specialist consultants, EDAW, considered the aesthetic impact (or views) of the pipeline and associated above ground facilities (EIS/EES Section 12.6 and Background Paper 11). This information has contributed to the route alignment process. Generally the pipeline will not be built in a totally straight line of sight. The route alignment moves and bends with geographical and geotechnical requirements, landowner requests and environmental sensitivities. During construction the easement will initially present an area of soil disturbance, however, within a reasonable time the vegetation will regrow and the easement will be concealed from general observation.

Three areas of particular sensitivity were raised in submissions:

- Mount Raymond Regional Park - where it has been decided to traverse the reserve utilising the existing powerline easement. This avoids the high visual effect associated with the alternative route along the Princes Highway. At the crest of the easement through the Park no vegetation will be cleared, which will result in a moderate visual impact.

- Turpentine Road (or Main Road 92) through Morton National Park and Sassafras - where the pipeline follows existing easements or cleared land. The visual sensitivity of the Endrick River escarpment will remain unaffected as EGP proposes to install the pipeline using directional drilling techniques. In addition, the pipeline will be installed on the south side of the bridge over the Tianjara Creek and as such will not be visible from the lookout at the Falls. Other visual impacts will be temporary and further mitigated by revegetation.

- The Illawarra Escarpment - where visual impacts will be significantly reduced by directionally drilling the steepest and most visible section of the route through this area. Revegetation will be rapid in this area, further reducing impacts.

18.3.7. Crown Land

The extent and location of Crown Lands affected by pipeline are identified in the "Schedule of Lands" document which was submitted to Government in December 1995 as part of the application for a Pipeline Permit. This document provides a full status of all lands crossed by the pipeline. In addition, meetings and field inspections have been held with the lead Crown Land Management authorities in both States.

Valuation of Crown land will utilise many of the same valuation techniques that are followed for private property. EGP will adopt the valuation estimates provided by the Valuer General.

18.4. TRANSPORT

The movement of Project vehicles (including transport contractors) will be conducted in accordance with relevant regulatory requirements and will meet all appropriate safety standards. Strategies for managing potential problem areas, such as increased numbers of heavy vehicles during peak public use periods in East Gippsland, will be developed in consultation with local authorities.

18.5. INFRASTRUCTURE

18.5.1. Roads

No additional roads will be constructed by the Project. In some places temporary bridges will be constructed to cross water courses. The impacts of these bridges will be temporary and minor. Plans and designs will be developed during the detail design phase in consultation with relevant authorities. Stream crossings and associated temporary bridges will need to be approved by relevant regulatory authorities.

EGP will maintain roads and bridge infrastructure that will be used during construction and ensure they are left in the same condition as prior to the commencement of construction. EGP will only maintain the right of way after construction. It should be noted that pipeline crossings of all sealed roads will be bored, not open cut, resulting in minimal effect.

18.5.2. Railways

EGP will work with DNRE regarding environmental issues which may affect the railway reserve between Bairnsdale and Orbost. Where the pipeline parallels the abandoned rail line between Bruthen and Nowa Nowa it has been reviewed with personnel from the DNRE as well as the organisation planning the Rail Trail. Where applicable, the pipeline will be designed and constructed in accordance with the Railway Code of Australia. EGP is determining the applicability of the Code in areas where the railway has been abandoned or where the Crown has specifically requested that the pipeline route follow the rail reserve.

18.5.3. Optical Fibre Cables

EGP will continue to liaise with the relevant communications companies regarding the location of the proposed pipeline in relation to the assets of such companies. Where practical, EGP will endeavour to notify communications companies when there has been a change of property ownership which may affect their assets.

EGP mapping and design drawings will be submitted to communications companies for their review. Site inspections, involving communications company personnel, will be undertaken prior to construction of the pipeline near such company's assets. EGP will also enter into an agreement with communications companies regarding the inspection and monitoring of their assets during the construction period.

Unless there has been a specific request made by a landowner, EGP will not be planting trees within the pipeline easement. There may be some instances where trees will be planted or allowed to encroach upon the pipeline easement, but it is not anticipated that would occur in the vicinity of the communications company's assets. EGP will work with communications companies in the control and management of vegetation growth along communal sections of respective easements.

EGP will prepare and maintain a list of contact names and phone numbers which will include communications companies. The list will identify those parties requiring notification prior to any work occurring near cables or other assets.

18.5.4. Electricity Distribution

EGP will prepare written agreements with distribution companies regarding easement management.

EGP will continue to liaise with electricity distribution companies regarding easement access and management issues. Comments provided by distribution companies regarding management requirements (such as parking, garbage, refuse, timber, explosives, and flammable liquid) have been incorporated into the design, alignment and construction considerations.

Copies of the design drawings will be submitted to distribution companies in those locations where the pipeline will parallel or cross their assets. Where requested, site visits will be arranged to identify and remedy specific areas of concern. In addition, during construction of the pipeline, the appropriate office of distribution companies shall be advised, in advance, of any work being undertaken on their transmission line easements.

18.5.5. Water Pipelines

EGP has met with Shoalhaven Council regarding the location of the proposed Albatross water storage area and associated pipeline. EGP proposes that the gas pipeline be designed to remain buried beneath the storage reservoir. EGP plans to bury the pipeline to a depth (of cover) of 1.2 meters, but are prepared to modify this depth at the location where it would cross the water pipeline. EGP will seek further details regarding the proposal, such as the Project schedule, elevations and drawdown, from the NSW Department of Public Works and Services.

19. RISK ASSESSMENT / SAFETY

19.1. Risk Assessment

A Preliminary Hazard Analysis (Background Paper 17) was completed for EGP in accordance with the requirements of the NSW Department of Urban Affairs and Planning. This study addressed risk and safety issues for the entire pipeline and established guidelines to be used for the assessment of site specific issues.

It should also be noted that the pipeline code (AS 2885) provides a range of safety features and has been the basis for the successful construction and operation of gas pipelines in Australia for many years. EGP has committed to additional design, construction and management features which will ensure that there is no significant increase in risk exposure to individuals. Such measures include the use of heavy wall pipe, the adoption of appropriate separation distances in residential areas, and the use of buried marker tape and community awareness programs.

19.2. Emergency Response Plan

Background Paper 17 outlines the proposed content of the Emergency Response Plan (ERP) for the pipeline and associated facilities. The ERP will be developed in consultation with landowners, local authorities and local emergency services and will address each phase of the Project (construction, commissioning and operation). It will incorporate procedures that are both emergency specific and site specific. Such procedures will include containment of the incident, notification of residents and evacuation. A Bushfire Management Plan is also being prepared and includes procedures to be followed in the event of a fire started by construction or a bush fire encroaching on a work site. Local emergency services will not be required to operate EGP equipment, however, information and familiarisation with EGP operations will be provided to ensure coordinated responses in the event of an emergency.

In the unlikely event that a gas release does occur, ignition would not normally be expected and as such, a gas explosion is not a credible scenario. If a leak were to occur pipeline instrumentation will detect a change in flow velocity or drop in pressure and alert the Gas Control Centre. Automatic line break valves will close or be closed, isolating sections of pipeline and limiting the volume of gas released to atmosphere. The Gas Control Centre will activate the ERP as soon as it becomes aware of an incident.

19.3. Safety Measures

EGP will prepare a Safety Management System (SMS) which will address risk management and control of all activities associated with the pipeline including construction, commissioning, normal operations and abnormal and emergency situations. The SMS and Bushfire Management Plan will specifically address the controls necessary to minimise risk due to fire during construction activities.

20. ENVIRONMENTAL MANAGEMENT SYSTEM

20.1. CORPORATE COMMITMENT

EGP is committed to responsible environmental management and will proceed with planning and implementation in a logical, pragmatic fashion. EGP will endeavour to fulfil all commitments made in the EIS/EES, including the development and implementation of an auditing program for both construction and operation.

20.2. ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan presented in Chapter 17 of the EIS/EES provides the framework within which EGP proposes to manage environmental aspects of the Project. The detailed EMP is currently being prepared in consultation with the relevant authorities and will form part of the detailed design documentation. It will be based upon the principles and objectives outlined in the EIS/EES.

Site specific details, including impact mitigation measures for flora and fauna, weed control, soil and water management, bushfire management and easement maintenance, will form part of the standard construction documentation. The EMP is considered to be a 'working document', essential to the achievement of EGP's environmental responsibilities.

20.3. INSPECTION

EGP will employ three full-time, on-site Environmental Inspectors during construction of the pipeline (one per construction Spread). In addition, specialist consultants will be involved on-site as necessary. Approximately 30 suitably qualified and experienced task or trade inspectors (eg welding inspectors) will also be employed.

Environmental Inspectors will supervise all relevant site works to ensure construction activities comply with the agreed environmental management measures for rehabilitation, sediment and erosion control, drainage and creek crossings, and soil constraint matters.

Inspectors will report to the Environmental Coordinator who will in turn report to the EGP Land and Environment Manager. Weekly reports will be prepared and instances of significant non-compliance will be reported promptly to the authorities.

Government regulatory agencies may also provide independent appraisals of environmental management standards. Regular liaison between EGP and regulatory authorities will provide a balanced approach to environmental management of the Project.

20.4. Environmental Monitoring

The entire pipeline easement will be regularly inspected, monitored and periodically audited. The post-construction monitoring program will be undertaken to ensure, in particular, that erosion control measures are effective, revegetation is satisfactory and the weed control program is working effectively. Regular monitoring will enable early detection and remediation of environmental problems. In particular areas such as biologically and hydrologically sensitive stream crossings, monitoring programs will continue for an appropriate period after construction. The recommendations made by specialist EIS consultants regarding the monitoring of stream crossings will be adopted.

20.5. Environmental Auditing

Environmental auditing programs will form part of normal pipeline construction and operation. Suitably qualified auditors will periodically check the standard of environmental management and the performance of erosion control and other site works against set criteria. Criteria will be developed during the detailed design phase and incorporated into the construction contracts. (Chapter 17 of the EIS/EES also outlines general environmental management criteria).

20.6. Responsibilities of EGP and Contractors

Compliance with the environmental procedures as described in the EMP, construction specifications, detailed design drawings, alignment diagrams and the line list will be a contractual requirement for the construction contractors. Should construction companies be in breach of the EGP environmental procedures, they will be required to rectify the problem to the satisfaction of the Company. Payment to construction companies may be withheld until EGP is satisfied with the quality of construction work.

The Pipeline Acts and Regulations of New South Wales and Victoria clearly outline the accountability for damage due to pipeline construction and operation by a pipeline licensee. In the event of such damage occurring repair would be the responsibility of EGP.

Sub-contractors are responsible for any damage they create and are required to perform reasonable repairs. In addition all contractors, sub-contractors and the owner must have specified or adequate insurance coverage. The extent of liability is determined by parties involved, including Government, and the court system if necessary.

20.7. Performance Bonds

EGP does not consider performance bonds to be necessary. Construction contractors will be required by contract to guarantee their work for a minimum period of one year after completion of construction and the construction contract will outline the required performance criteria. In addition, maintenance and operation of the pipeline will be subject to ongoing approvals through the provisions of the Pipelines Acts.

EGP and its contractors are required to comply with all legislation. Furthermore, the Energy Ministers of both States can withhold or cancel the pipeline licence if the Company is in breach of its conditions.

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APPENDIX I

ABORIGINAL AFFAIRS VICTORIA

Issue No.	Issue	Response reference
1	The Background Paper correctly states that, in accordance with the Coroner's Act 1985, the police are to be notified in the first instance should human skeletal remains be discovered. However, I note that in your letter you state that police need only be notified if the human remains are likely to be non-Aboriginal origin. Please note that the police are to be notified in the first instance, whether the remains are thought to be Aboriginal or not. In addition, in accordance with the Aboriginal and Torres Strait Islander Heritage Protection Act 1984, anyone who discovers suspected Aboriginal remains must notify the Director of Aboriginal Affairs Victoria.	Sec 16.1.4

AGL (A)

Issue No.	Issue	Response reference
1	Effects on the Trunk Main System between Unanderra and Wilton: 1(a) The proposed EGP route shows details of a substantial number of crossings and overlaps of AGL's pipe by the EGP within the existing AGL easement. To locate a 20 metre wide pipeline right of way or easement (re Item 5.4) in AGL's easement would be excessive. AGL's suggestion, for easement sharing purposes, would be a 6 metre wide easement for the EGP with allowance for a temporary working area of up to 10 metres wide during pipeline construction. Furthermore, aboveground EGP pipeline facilities (re Item 5.5), including the fenced areas of such facilities, would not be permitted on AGL's easement. It will be necessary to establish a formal agreement between EGP's Proprietor and AGL in respect of the technical and commercial conditions of sharing AGL's easement. The principles of easement sharing and the protection of the integrity of each pipeline must meet with the concurrence of the Department of Energy of NSW. There are two AGL operational facilities located on the properties in the vicinity of the proposed route: at Mount Keira (near junction of Mount Keira Road and Link Road) and at Ashwood road in Wilton. If the EGP is to traverse either or both of these properties it will be necessary to establish a six metre wide easement over each of these properties with appropriate technical and commercial agreements. No aboveground EGP facilities would be permitted within the mentioned AGL properties.	Sec 6.1
2	Effects on the Distribution Main System: AGL's Distribution Main System in the South Coast of NSW currently extends from Bulli in North Wollongong to Shell Harbour to the south (and shortly to Minnamurra and Kiama). This system comprises steel and plastic reticulation mains mainly in gazetted roads. If an EGP easement is to be established over any part of the Distribution mains (or for that matter any service pipes supplying AGL customers), prior consultation with AGL will be essential and appropriate conditions in an easement agreement must be in place to ensure AGL's rights are protected.	Sec 6.1

Issue No.	Issue	Response reference
3	Issues common to both the Trunk and Distribution systems: 3 (a) Re Item 9.3.4: Odour Impacts - The EIS/EES assumes that the EGP will transport unodorised gas. If that is so the presence of an unodorised pipeline system in close proximity to AGL's odorised system could give rise to safety issues during operational and/or maintenance procedures. It is our understanding that common natural gas practise world-wide is to odorise gas in pipe systems located in, or adjacent to, closely settled areas. Furthermore, the odorisation level after any EGP sales connection (presumably including an EGP Wilton Meter Station) will have to comply with the requirements of the Gas Act of NSW. Close liaison regarding the compatibility of odorant and odorisation levels will be essential. 3(b) Issues such as odorisation, cathodic protection system compatibility, slope instability and the impact of mine subsidence, as well operational and maintenance matters will need to be substantially addressed in the detailed stages of the project. Close liaison between EGP's project team and AGL will be essential.	Sec 8.3

AGL (B)

Issue No.	Issue	Response reference
1	A pipeline linkage between NSW and Victoria has the potential to increase the level of competition between the producers and to provide traders and consumers with increased options for gas supply. It is therefore important when assessing the economic benefits of a pipeline link between the states to evaluate the extent to which a particular proposal may bring these benefits to the market in comparison to alternative proposals. One concern is the degree of vertical integration which the EGP would provide to BHP as gas producer, pipeline owner, gas consumer and even supplier of line pipe. The EGP may provide the opportunity for BHP to capture the economic benefits of downstream reform initiatives which would otherwise flow to consumers. The producer involvement in the EGP is of particular concern because the Bass Strait producers are not required to make gas available at the outlet of the treatment plant at Longford. Unless regulation is brought to bear, bundled prices only will be offered to sites in Victoria and at locations in and around Sydney. These prices would then reflect the ability of customers at these locations to pay for gas and would maximise the field price netback for the producers. In this way, the Bass Strait producers would be able to use the EGP not to link the NSW and Victorian markets but to keep them separate and impede competition that would come from interaction between the markets.	Sec 5.1 Sec 5.3
2	The EGP built in the Nowra Corridor would not provide the opportunity for the Cooper/Eromanga Basin producers of either SA or SW Queensland to compete in the Victorian market that would occur if the Western Corridor route was chosen. If the EGP is built along the Nowra Corridor the Cooper Basin producers and the Bass Strait producers may then only compete effectively at the Sydney city gate. The EGP may not only fail to deliver the potential market benefits of connecting NSW and Victoria but actually hamper the development of a competitive market between producers.	Sec 5.1.2
3	The Western Corridor has been promoted as the 'logical link'. The EIS/EES acknowledges that it is environmentally the best route. The arguments above support the proposition that the Western Corridor would also promote competition to a greater extent than the Nowra Corridor. The remaining major issue is whether the Western Corridor or the Nowra Corridor has the lower cost and therefore the greater potential to provide lower tariffs.	Sec 5.1.2

Issue No.	Issue	Response reference
4	The statement in the EIS/EES (section 4.5.3 of the Main Report) that the Western Corridor will have higher transmission costs than the Nowra Corridor is based on capital estimates whose accuracy is crucial to the conclusions. A superficial evaluation would suggest lower rather than higher capital costs for the Western Corridor than the Nowra Corridor. Also, the capital expenditure for the Western Corridor could be spread over the period of load growth thus further reducing the potential tariffs. The government agencies evaluating the EIS/EES are urged to ensure that capital estimates for the Western Corridor are obtained direct from East Australian Pipelines Ltd and Gas Transmission Corporation as proponents of that project and an independent comparison is made. Given that the Western Corridor is acknowledged to be superior on environmental grounds, the economic benefits argument assumes centre stage and should receive appropriate scrutiny.	Sec 5.1.2

AUSTRALIAN CONSERVATION FOUNDATION (SHOALHAVEN BRANCH)

Issue No.	Issue	Response reference
1	The construction of two gas pipelines between Victoria and Sydney, one by AGL and the other by BHP & Westcoast Energy appears an unnecessary duplication. We are concerned that there has not been a 'gas taskforce' or some similar overriding planning authority to bring the total planning for gas distribution in eastern Australia together. While we agree with the need for competition in the gas industry, we do not agree that duplication of major pipeline routes is good planning or environmentally acceptable. ACF Shoalhaven will not be supporting your proposal in the absence of any attempt at overall planning for the gas distribution industry. We are writing to the Federal government about this matter, together with the relevant Ministers in both Victoria and New South Wales.	Sec 5.3 Sec 4.4.1
2	As far as supply of gas to the Nowra area is concerned, a pipeline already exists as fas as Wollongong, and is planned for Kiama, with the possibility of extension to Nowra via a coastal route. We cannot support your pipeline proposal in terms of supply of gas to Nowra area, particularly without the benefit of comparative data (with the AGL route) on needs for the Nowra area, environmental and economic costs.	Sec 5.1.3
3	A cost-benefit analysis which includes environmental cost has never been attempted for this project, and certainly not as a comparison with the no pipeline case, or the alternative pipeline case. ACF Shoalhaven cannot support this proposal in the absence of such necessary comparisons.	Sec 4.7

AUSTRALIAN HERITAGE COMMISSION

Issue No.	Issue	Response reference
1	The Commission is, however, concerned about the Aboriginal Archaeology and Anthropology Background Paper which fails to note the presence of the Clydebank Bridge Scarred Trees Aboriginal area located adjacent to the pipeline route along the banks of the Avon River in Victoria. This place is listed in the Register for the National Estate (File No.2/09/261/0009) for its Indigenous heritage values and is particularly significant because of the large number of generally well-preserved and varied scarred trees within a small area. While the scarred trees appear not to lie within the proposed pipeline easement area, the Commission is concerned that the place is not identified in the list of Aboriginal sites in the AAV Register occurring within an approximately 2 km wide route corridor (Vol.6: Table 3). Many of the trees lie well within the corridor and are listed in the AAV Register as Sites 83214/93-109. The report also states that no places listed in the Aboriginal environment of the Register of the National Estate are traversed by the proposed pipeline route in Victoria (Vol. 6:41), presumably within the same corridor. This oversight is of concern to the Commission as it indicates the possibility of other places of national estate significance having been overlooked. The Commission does note, however, that the Clydebank Bridge Scarred Trees were identified in the earlier feasibility study for the various routes (Vol 19:25, Table 4.6) and is satisfied that the present alignment avoids this place.	Sec 16.1.3
2	There seem to be inconsistencies between the main EIS document and Papers No. 5, 19 and 20 on the precise location of the pipeline corridor with respect to Dowd Morass State Game Reserve which is listed in the Register of the National Estate.	Sec 15.8 Sec 15.2.1
3	The Commission is concerned that the pipeline will cross Heart Morass, another important wetland. It is part of the Gippsland Lakes area which has been nominated for inclusion in the Register and has been assessed as having significant national estate values. Surprisingly, the Biosis report did not identify Heart Morass as a site of biological significance. However, comment is made in Paper No. 19 that Heart Morass cannot be avoided and that a specific plan of management is required. The Commission is unsure whether the chosen alignment follows an existing easement and wishes to be consulted further on the final route and method of pipeline construction for the Heart Morass area.	Sec 15.2.2
4	Monaro and mountain valley grasslands Two significant grassland sites may be affected by the construction of the pipeline. These are Rock Flat and Black Flat Travelling Stock Reserves on the western side of the Monaro Highway, 6 km north of Nimmitabel. Both are significant remnant grassland sites and should be avoided. The Commission advises that the proponents and their consultants seek the advice of the Queanbeyan Office of the NSW National Parks and Wildlife Service in order to avoid these and other potentially significant grassland sites on the Monaro.	Sec 15.2.19
5	Tianjara Falls area and the south-western approach to the Park have high aesthetic values and the construction of the pipeline could result in scarring on the escarpment and an adverse impact on the national estate values. The Commission recommends avoiding this area.	Sec 15.2.23 Sec 18.3.6

Issue No.	Issue	Response reference
6	Illawarra Escarpment has been nominated to the Register of the National Estate for its landscape values, particularly its aesthetic qualities. The nomination is currently being upgraded to include other natural values. The Eastern via Nowra route could impact severely on national estate values by cutting a corridor through sensitive escarpment forest (dry sclerophyll on the ridges with a mix of dry rainforest and sub-tropical rainforest in the gullies). Removal of forests from this area will be highly visible from the coastal plain. Although the report suggests that directional drilling may be an option, the Commission is concerned that the pipeline corridor would have to remain clear of vegetation and so have a long-term visual impact. The Commission recommends that the proponents consider alternative options such as using existing corridors. It supports the recommendation by Biosis (Background Paper No.5, p69) that use of the existing AGL gas pipeline or its easement be investigated to reduce the impact on fauna in this section of the route.	Sec 15.2.25 Sec 15.8
7	Illawarra coastal plain Only 8% of the original vegetation of the coastal plain remains. The Commission recommends avoiding all remnant vegetation sites.	Sec. 15.2.24
8	The Commission is concerned that high grade features, such as the pipeline, may have a more significant impact over a greater distance than a lower grade feature, such as a mine or unsealed access road, even though the road may be closer to the wilderness area.	Sec 15.7
9	It is not possible to be conclusive as the exact route of the pipeline was not clear from the documentation received. If the pipeline follows the Nerriga - Nowra road easement, there would be an impact on the Ettrema wilderness area. However, this would be relatively minor. If the pipeline could be rerouted south of this road and north of the powerline easement, there should be no impact on the wilderness areas.	Sec 15.7
10	The Commission has just released Draft Conservation Management Guidelines for Wild Rivers which may also assist the Eastern Gas Pipeline Project and would be pleased to provide further assistance in relation to Wild Rivers as more information becomes available.	Sec 15.5.1
11	In this context the proposed pipeline route through forest areas must be considered in the light of the possibility of foreclosing reserve options in addition to assessing any direct impacts.	Sec 18.3.4
12	Additionally the construction of the pipeline should minimise the impact on national estate values for all the forest regions traversed. To this end, the Commission would welcome the opportunity to liaise with the proponents regarding the values to be studied in the NSW Comprehensive Regional Assessment.	Sec 15.8
13	However, it is disappointing that a closer analysis of the national estate values identified has not been able to be undertaken. The forest of East Gippsland are of considerable conservation significance and many national estate values have been identified.	Sec 15.8
14	The Commission is concerned that a number of issues have not been addressed as fully as we would have anticipated. The absence of discussion on old-growth forest from Volume 5, Flora, Fauna & Ecology issues appears to be a significant oversight. The Study of Old Growth Forests of East Gippsland (Woodgate et al 1994) has been available for some time.	Sec 15.2.5
15	Similarly the Commission considers for a project of such magnitude an assessment of social or community heritage value should be included. The national estate assessment project undertaken has included such an assessment and areas thus identified will be impacted by the proposed pipeline route.	Sec 15.8

Issue No.	Issue	Response reference
16	The Commission strongly recommends that alternative corridors for the pipeline be reconsidered. In its view, the Western route would have least impact on natural heritage values as it follows a major highway/pipeline corridor. From this perspective, the next best option would be the Eastern route via Marulan which would avoid Morton National Park and parts of the Illawarra escarpment.	Sec 5.1
17	The EIS states that "the most appropriate and cost effective method of achieving the environmental objectives will be selected" (Chapter 10.7.4) but does not specify who will be involved in making these vital decisions. The Commission strongly urges that the proponents consult closely with appropriate state agencies and communities with particular knowledge of the local environment. It also supports the measures, particularly the monitoring program, recommended by Biosis (Background Paper No. 5, page 87) to minimise the impact of pipeline construction on streams.	Sec 2.2.1

AUSTRALIAN NATURE CONSERVATION AGENCY

Issue No.	Issue	Response reference
1	The adequacy of the flora and fauna surveys and subsequent identification and management of threatened species habitat may need further work. Would it be possible to arrange a meeting with the proponent to clarify the following points: - adequacy of the flora and fauna surveys, exact locations where nationally threatened, RAMSAR and JAMBA and CAMBA species were encountered, whether potential habitat for the above species was also identified, proposed management actions to ameliorate any impact on these species in known and potential habitat and; amount of woodland clearing and grassland disturbance in non-reserve areas or 'shared easement and disturbed areas'.	Sec 15.3.3

BARRACLOUGH, L.

Issue No.	Issue	Response reference
1	My main concern is the lack of consideration of the whereabouts of the Club Terrace Cemetery. My understanding is that it is somewhere in the vicinity of the Club Terrace rubbish tip, the whereabouts of which I am uncertain. My only knowledge of it is that it was discovered by Shire of Orbost employees undertaking bulldozer work to extend the tip some time in or before 1984. It was mentioned at that time in the Shire of Orbost minutes, a copy of that page only being forwarded to me at the time by Bruce Evans. Enquires at that time indicated burials about 1900 and 1907, and further details can be found in East Gippsland Cemeteries: A Guide for the Genealogist, Barraclough & Squires. Bairnsdale, Vic: Kapana Press, 1984. It is a concern that East Gippsland has a number of unmarked graves, so I am glad to see there appears to have been some consultation with people such as Phyllis Quick at Cann River, who may have been able to point them out. However I am more than a little surprised to see that Graham Dyce of Orbost , a Club Terrace/Combienbar historian does not seem to have been consulted, nor has reference been made to our work above, or the more recent and even more extensive Lonely Graves of the Gippsland Goldfields and Greater Gippsland by J. G. Rogers and Nelly Helyar. Moe, Vic: J G Rogers, 1994. The locality guide lists a number of graves at Noorinbee, Cann River and similar areas.	Sec 17.2.2

Issue No.	Issue	Response reference
2	Of a concern, but only slightly, is whether the pipeline goes anywhere near the Whelan selection in the vicinity of its crossing with the Princes Highway west of Bairnsdale. This was the boyhood home of Jack Lang, a very significant NSW Premier. Both he and Henry Lawson (given your accent, which I may have mistakenly taken as American, do I need to tell you he was a very significant Australian poet?), married Bredt sisters from Bairnsdale, and any associations with this grouping need careful consideration. Unfortunately at this time I am not totally aware of the exact whereabouts of this selection, but possibly more effective local consultation with practising historians such as Neil Cox would lead to its location.	Sec 17.2.3
3	However I do have a number of general concerns about how the local consultation has been carried out, given that the Background Papers now become part of the reports on which any further heritage surveys are based. There have not been full surveys of the former shires of Rosedale, Avon, Bairnsdale, Tambo and Orbost, through which the pipeline will pass, and it is hoped these will occur in the future. As such I feel the Eastern Gas Pipeline, through its consultant (whom we cannot even locate from the information in the paper), have a responsibility to get it right. These concerns are evidenced by: • There does not appear to have been any consultation with the Centre for Gippsland Studies, Monash University, who hold unpublished works on the era, and are much better equipped than the Royal Historical Society of Victoria, to advise as to appropriate working historians in the area for consultation. • An incorrect impression of validity may have been given by the designation of Adrienne Leith as a professional in the field of East Gippsland local history. She is actually a Museum Development worker, and has absolutely no knowledge of East Gippsland local history. She has advised me that her only memory of any consultation is that she was rung by someone who indicated that they would make an appointment to see her, but did not ring back. • An Albie Clothier appears on the consultation list. This appears to be Albie Pearce, approximately 96 years, who the consultant met at the museum at Bairnsdale with Tim Gibson. He is a delightful man, but is losing his memory. A comment from him that he cannot remember anyone or anything in the Munro Plains, is just an indication of that, not that there was no one there. • Tim Gibson is a relatively recent arrival in Bairnsdale, and his area of expertise is the Bairnsdale town area. He has advised me that a comment attributed to him for far East Gippsland is totally out of his area of expertise, and was only a throwaway comment as he as searching for parish plans for the consultant. I only have personal knowledge of one site listed, apart form the hop kilns, and that is a complex on the bank of the Mitchell near the Bairnsdale lime kiln. It is an 1800s complex, not one from the 1900s, as suggested by the consultant. A major articles on the lime kilns at Sale, as published by us in Gippsland Heritage Journal No. 17 by Jane Harrington is not cited. This appears in the same issue as one cited for the lime kiln at Bairnsdale, so possibly should have been considered by the consultant. I acknowledge that he appears to have had access to unpublished work by Jane Harrington, but since this is not on public record, and there are concerns regarding other consultation, this possibly could not be viewed with great confidence. The consultant appears to have consulted the Omeo Historical Society (for reasons I cannot understand), but not the Tambo Historical Society, who were responsible for the restoration of the hop kilns at Mossiface, and who have made an extensive study of the railways, especially around Nowa Nowa. If the consultation with the Omeo Society was in an attempt to consult as widely as possible with all historical societies in the area, even though the pipeline does not pass through their area, it seems strange that Maffra Historical Society was not consulted.	Sec 17.1

Issue No.	Issue	Response reference
	The two major works on the history of the former Shire of Orbost have not been cited in the bibliography, so I assume they were not consulted. They are Mary Gilbert's Personalities and Stories of the early Orbost District (Orbost, Vic: various publishers, first published 1972, currently available) and Denis O'Bryan's Pioneering East Gippsland (Gisborne, ;Vic: the author, 1983). In conclusion, it is unfortunate that before compiling a work of this nature, that advertisements were not placed in the local press in order to seek information from locals, historians and residents alike. There seems to be an assumption that historians are only to be found by writing to local historical societies, and this is far from correct. Wellington and East Gippsland are fortunate in having a number of very active historians who do not work within historical societies. Many of us would have been delighted to have spent time in assisting the consultant in order to ensure that documents such as this on the area are correct.	

BIRD OBSERVERS CLUB OF AUSTRALIA

Issue No.	Issue	Response reference
1	BOCA was also shocked to be informed that the Wildlife Branch of the Department of Conservation and Natural Resources had not been formerly consulted in relation to this development, but rather the proponents relied on the advice of regional staff of the DCNR. Without diminishing the expertise of the regional staff involved, it seems absurd that the major fauna research unit of the Government department which has management authority over a large proportion of the land traversed by the pipeline has not been consulted.	Sec 2.3.1
2	A key aim of the EIS/EES outlined in the Introduction is to provide an understanding of the environmental, strategic, operational, commercial and engineering characteristics of alternative routes. The EIS/EES fails to achieve this aim.	Sec 2.2.1
3	The BOCA believes that alternative routes have not been given adequate attention and it appears that the decision to site the development along Nowra corridor has been based predominantly on the economic factors, and that environmental considerations have not been fully taken into account.	Sec 5.1.1
4	At times the EIS/EES contradicts or ignores a significant body of scientific evidence, making assumption which cannot be substantiated.	Sec 2.2.1 Sec 15.3.1
5	The decision to site the pipeline along roads and disused railway reserves in a number of areas may potentially have serious impacts on remnant habitats along the route.	Sec 15.2.19
6	Section 10.2.4 Significant Plants Species and Communities is non-specific and lacks detailed information.	Sec 2.2.1
7	Section 10.2.7 concludes that "impacts on significant plant species and community structure will be localised, due to the restricted nature of their distribution". This appears to be a contradiction in terms. If the distribution of a species is restricted any impacts from the development may affect a significant proportion of the population.	Sec 15.4.1 Sec 15.4.2 Sec 15.4.3
8	Will this detailed assessment be done during construction?	Sec 2.2.1 Sec 15.3 Sec 15.4

Issue No.	Issue	Response reference
9	The proponents do not detail whether there will be botanical experts involved in the construction phase. The proponents suggest that revegetation of the right of way will be promoted. It is unclear whether they intend to revegetate the site using direct seeding or tube stock planting, or whether in fact what the proponents actually mean is the easement will be allowed to regrow 'naturally'.	Sec 15.4
10	The mitigation of the impacts on significant plant species include the exclusion of machinery from these areas. Will this exclusion zone be maintained after construction has finished, to prevent destruction of the significant species by ongoing maintenance activities such as the removal of overstorey species?	Sec 17.2
11	What mitigation measures will be employed to control less direct impacts such as altered hydrological regimes, siltation, increased nutrients liberated through the decomposition of organic material re-spread over the easement, weed invasion and alterations to the microclimatic conditions?	Sec 7.1 Sec 12.1.1 Sec 15.4.5
12	The proponent have not fully examined the potential impacts on fauna. The use of phrases such as "only a few may be significantly affected by the pipeline" (page 10.14) when discussing significant fauna species raises more questions than it answers and highlights the lack of information in relation to the impacts of the project on flora and fauna.	Sec 2.2.1 Sec 15.3 Sec 15.4
13	Many of these species are significant of the basis of limited distribution or specific habitat requirements. By grouping species together into broad guilds the proponents have overlooked important issues and have failed to consider the ecological requirements of individual needs species.	Sec 15.3.2
14	These two species, although closely related cannot be lumped together with a range of other species and assume that environmental impacts of the pipeline construction will produce the same results for all species in the guild. This may particularly be the case for example with increased predation along the easement. Increased predation may have serious impacts on small isolated populations of the Long-footed Potoroo, but have little influence on the more widespread Long-nosed Potoroo.	Sec 15.3.2
15	It is also difficult to understand how the proponents have singled out an area of habitat of one individual species (the Koala, page 10.17) of the 76 significant fauna species recorded in the corridor for special attention. An area of habitat of this species will be by-passed. Why is this not the case with areas of habitat of the other 75 significant, but perhaps lesser known, species.	Sec 15.3.2
16	The proponents also state that the pipeline may create a barrier to the movement of small terrestrial mammals, but enough individual would be able to cross to prevent the isolation of populations. Is there trapping data for all of the small terrestrial mammal species concerned to support this statement? A similar statement is also made about the movement of reptiles, again is there adequate trapping data to support these claims?	Sec 15.3.1 Sec 15.3.3
17	The sections outlined under section 10.5 of the EIS/ESS are broad ecological principals, the discussions are non-specific and do not outline the effects of these issues on specific species. This section fails to address the issues of changes in community composition following fragmentation.	Sec 2.2.1
18	There has also been considerable researched conducted into the influence habitat fragmentation on nest predation and nest parasitism. In general nest predation increases near edges as the fragmentation of habitat allows greater access to predators. Many predatory birds favour edge habitats. The impact of this phenomena may be minor on common species, but for significant species which have a limited distribution or population size increased nest mortality rates may have major impacts on population dynamics and structure.	Sec 15.3.3 Sec 15.3.5

Issue No.	Issue	Response reference
19	We believe that these impacts have not been adequately assessed and there must be further detailed investigation before this development is allowed to proceed. A 'see as we go along' approach is not appropriate considering the potential for environmental impacts and the number of significant species involved.	Sec 2.2.1
20	The potential for the spread of weeds and Cinnamon Fungus Phytophthora cinnamoni represent a serious threat to the ecological integrity of large areas surrounding the pipeline. This also represents an ongoing threat as any further maintenance or in the advent of catastrophe will promote further weed invasion and/or dieback.	Sec 15.4.6
21	The proponents suggest that weed invasion in sensitive areas will be minimised. How will this be achieved?	Sec 15.4.5
22	Again there is insufficient detail provided in the EIS/EES to accurately assess the impacts of this development and therefore the development should not proceed until this aspect of the environmental impact is fully investigated.	Sec 2.2.1
23	Considering the scale and potential environmental impacts of this development the BOCA believes the display period has been inadequate to allow sufficient detailed analysis of the Eastern Gas Pipeline EIS/EES.	Sec 2.2.1
24	The EIS/EES document fails to adequately address a number of important issues and lacks sufficient detail to allow accurate assessment of the potential environmental impacts of this development.	Sec 2.2.1
25	The BOCA believes that this project should not proceed unless it follows the Western Corridor route.	Sec 5.1.2
26	The proponents suggest that revegetation of the right of way will be promoted. It is unclear whether they intend to revegetate the site using direct seeding or tube stock planting, or whether in fact what the proponents actually mean is the easement will be allowed to regrow 'naturally'.	Sec 7.1

BURRA LANDCARE GROUP

Issue No.	Issue	Response reference
1	Biosis have not surveyed invertebrates; these are at the basis of the food chain for many vertebrates and are intimately involved in sustainability of ecosystems through the recycling of nutrients etc. and their omission is of serious concern.	Sec 15.3.1
2	PBS has an undue focus on single species rather than on natural ecosystems and associations. Only by conserving the habitat can we achieve ecological sustainability and the preservation of common as well as rare native species. Because a habitat is not known to support any rare or endangered species, it should not follow that this habitat should be put at risk, particularly as we know so little about the composition of the plant and animal associations in such habitats. The surveys conducted by the consultants may not have always demonstrated the presence of rare and endangered species, but neither can they prove their absence.	Sec 15.3.1
3	Rarity. Because a species or ecological association is well represented in some parts of the area crossed by the pipeline but rare in others, eg. a species or habitat that was common say at Nimmitabel but rare at Burra, this should not diminish the conservation value of this species and its habitat in Burra which would be of considerable value to local interests.	Sec 15.4.1

Issue No.	Issue	Response reference
4	Conservation value of easements. It is implicit in the statements of the newsletter distributed by the pipeline authority and in the EIS summary report that easements are of limited conservation value because trees have been removed or are routinely cut back, so it is considered an advantage if easements can be followed by the pipeline. This implies that if native trees are removed for power lines or roads then the remaining community has no ecological value. This impression is also gained from the consultants' paper on flora and fauna. I would dispute this conclusion as many easements comprise native vegetation, especially in woodlands and forest but also in natural grasslands and these may have an extremely rich and varied shrub and flora and an equally rich fauna. Every effort should be made to conserve and rehabilitate these habitats with minimum disturbance.	Sec 15.2.19
5	Roadside easements are also a major refuge of native vegetation in the Monaro and elsewhere where adjacent farmland has been ploughed and sown with exotic grasses and legumes. If a roadside easement comprises native vegetation and the adjacent farmland is exotic pasture then the pipeline should be placed in the farmland. This would be much easier to rehabilitate.	Sec 15.2.19
6	As stated elsewhere, the floral and faunal survey could hardly detect all species of significant interest in such a short time-frame, especially the rarer species and active members of the fauna, and a cautionary approach should always be adopted for all native vegetation habitat whether trees have been removed or not.	Sec 15.4.1
7	The survey omits reference to the lower plants, such as mosses and liverworts etc and to all invertebrates. There are increasing numbers of invertebrates regarded as threatened. In the ACT there are two rare grasshoppers restricted to patches of native grassland (Perunga ochracea and Keyacris scurra) and these will almost certainly be confined to similar habitats over the border in New South Wales. Since we do not know what is under threat in these groups the cautionary approach is the best one to minimise disturbance of native habitat.	Sec 15.3.1 Sec 15.4.1
8	Further studies of the potential threats to invertebrates living in native habitats that will be modified by the pipeline should be commissioned.	Sec 15.3.1
9	In the original proposals concerning the methods the Pipeline Authority proposes scalping the soils to a distance of 20 m to one side of the trench pushing the soil back and then relaying this and resowing this with exotic pasture seed. This is totally inappropriate for conserving native vegetation, including native grassland, and this is supported by the consultants paper on p. 54. In our view all native vegetation should be left undisturbed and or cut back by slashing, trees and shrubs cut to a stump to allow regrowth and the pipe-laying machinery run on top preferably when conditions are dry ie. summer. Then much of the vegetation can regrow. The use of tramlines could also be considered. The worst scenario would be to "rehabilitate" an area of native vegetation by establishing a strip of exotic pasture, although possibly some farmers would like this option.	Sec 7.1
10	Where any trees are to be removed completely, ie. along the pipeline trench itself, appropriate numbers of replacements should be planted in the adjacent easement which is being allowed to regenerate.	Sec 7.1 Sec 7.2

Issue No.	Issue	Response reference
11	Weeds. St John's Wort. Not detailed in the papers. The Burra valley is infested with St John's Wort at its northern end and the Urila Valley is becoming progressively infested along roadsides through seed transported on vehicles. With the increased movement of traffic through Urila Valley to service pipe laying across the Queanbeyan River, every effort should be made to decontaminate vehicles as they leave the Urila/Tinderry road to prevent spread of seed along the route of the pipeline especially in the period February to June when seed of St John's Wort is being dropped. St John's Wort is a severe problem because of its capacity to invade native grassland. Patterson' Curse is already present in pastures in the Urila Valley and removal of vegetation cover could assist its establishment and spread.	Sec 15.4.5
12	East Michelago grasslands. The Dry Shrubby Grasslands vegetation type found to the east and south of Michelago (p15, 45) is of high biological diversity and is a potentially important habitat for reptiles and invertebrates and should not be disturbed. We support the proposal by the consultants (p. 80 KP 457-) that the pipeline be realigned as near the road as possible to avoid disturbing this community.	Sec 15.2.19
13	We also support the consultant's recommendations for sections KP 461.2 to 481.3 to avoid forestry fragmentation. As far as possible no routes should be taken through existing woodland in the Urila/Burra Valleys and should follow improved pasture paddocks wherever possible. Where tree removal has to take place then equivalent numbers of trees of the same provenance must be replaced adjacent to the pipeline.	Sec 15.3.3 Sec 7.1

CADMAN, T.

Issue No.	Issue	Response reference
1	The EGPP will have a major impact on the natural environment. The project should only go ahead if there is a genuine community need, not anticipated growth. Gas provision should be off set by a provable reduction in greenhouse gases from other power generators (ie. no net greenhouse increase). The route should NOT traverse any areas of high to moderated conservation value, and should be restricted to areas where the displacement of natural vegetation and fauna populations in high (ie. adjacent to freeways, etc.).	Sec 2.1

CAPTAINS FLAT BUSHFIRE BRIGADE

Issue No.	Issue	Response reference
1	Our concern is that in the case of a fire, do they have their own resources, or would our Brigade be called upon to assist. If we are likely to be called out to extinguish a fire would any special training be required beforehand.	Sec 6.12
2	After installation, in the unlikely event of an explosion, what then would the scenario be as regards to a fire being fed by natural gas, eg evacuation, shutting off the gas etc. would this fall under the responsibility of our Brigade - being closest to hand - with the same question raised regarding special training.	Sec 19.2

CHADWICK, B. A.

Issue No.	Issue	Response reference
1	The major objection to the project is that a network of pipelines (AGL's), already in place in NSW, from the Queensland/SA gas field extends as far as Wollongong and is planned shortly to reach Kiama. Depending on appropriate pipe sizing, it could easily be extended to Nowra. The Eastern Gas Pipeline project proposes 740km of pipe-laying, in some instances through difficult and environmentally sensitive terrain. For example " the pipeline route crosses approximately 400 watercourses, of which 98 are potentially hydrologically significant".	Sec 5.2
2	The Western Corridor via Melbourne and Albury/Wodonga was rejected as an option. This was assuming that the entire route from Longford, Vic to Wilton, NSW was a necessary requirement. AGL is proposing a pipeline extension from Wagga to Albury /Wodonga. It would seem a folly to accept a duplication of separate network routes when it is possible to make provision for sharing the conduits for distribution. Why could not the Eastern Gas Pipeline via the Western route terminate at Albury/Wodonga and feed into the AGL line at this point? No doubt it would be argued that AGL lines, in some sections, would require an increase in capacity to meet demand. However once an easement is established, upsizing is surely much easier than embarking on creating new easements for, in this current proposed route, a total of 740km.	Sec 5.1.1 Sec 5.1.2
3	While BHP and Westcoast Energy appear to have been thorough in appraisal of problems to be solved over the route chosen, it is impossible to assess how environmentally successful they will be in particularly sensitive locations such as river and smaller creek crossings, eg in the Morton National Park section. At present the existing road through the park is a minor route and many, including myself, would hope it would remain so for a long time. Other proposals are for this to become Route 92, a future highway linking Braidwood with Nowra. If this came about, how would a gas pipeline "immediately adjacent to the existing road" be accommodated? Would this mean wider encroachment into the Ettrema and/or Budawang wilderness areas?	Sec 15.2.23 Sec 15.7
4	I urge the Director General, Department of Energy NSW and the Director, Energy & Minerals, Victoria to consider seriously whether a co-ordinated agreement between B.H.P and AGL could not achieve a less costly and environmentally preferable result which would still meet the needs of the public and important industry.	Sec 5.2

COMMONWEALTH DEPARTMENT OF ENVIRONMENT, SPORT AND TERRITORIES

Issue No.	Issue	Response reference
1	The proposal has left open the future provision of reticulation infrastructure to cities and towns along the proposed route: it is unclear whether this will be accomplished through existing facilities or further major new construction will be necessary. The proponents advise that existing reticulation systems will be used. The Reports, however, do not say how this will be achieved and appear vague on this aspect.	Sec 4.1.1
2	However, the economic advantages to communities on the proposed route, in the short term at least, are unclear.	Sec 18.1.2 Sec 18.1.3
3	As BHP appears to be the primary beneficiary, it is reasonable to argue that the bulk of the costs (including restoration and weed management identified below) should be borne by the proponents of the project.	Sec 15.4.5

Issue No.	Issue	Response reference
4	The proposed route fortuitously takes it close to major populations centres, including the ACT, before returning to the coast at Nowra and moving northwards through relatively populous coastal hinterland ending just north of Wollongong.	Sec 4.1.1
5	It will nevertheless traverse and impact directly on some of Australia's prime pastoral and agricultural regions. The study fails to adequately address this area of concern but only considers in aggregate terms the economic benefits to be derived in GDP of the proposal.	Sec 18.1 Sec 18.3.3
6	The construction of a trench some 740 km in length is bound to have significant effects on the natural environment of the region well beyond the economic life of the project. Background paper 9 has raised a number of issues in relation to physical, management and financial impacts of the corridor. It identifies significant, and far reaching problems including sub-soil contamination, compaction of soils, alteration of drainage patterns, production losses and the likelihood of creating an excellent environment for the proliferation of invasive weeds as has already occurred on existing easements in the Monaro.	Sec 7.1 Sec 11.1.3 Sec 15.4.5
7	In these circumstances it would seem reasonable to expect that the proponents would pay for rehabilitation of the easement for the entire 740 km not just for the immediate post construction period but for the length of time deemed necessary to re-establish pastures both improved and unimproved along the length and breath of the easement.	Sec 15.4.5 Sec 18.2.4
8	This would also raise concerns in relation to compensation for the income forgone in destocking and impact of higher stocking in other areas while work is in progress.	Sec 18.2.4
9	Although the report suggests that such impacts will be minimal a more proactive response (regarding predation) would be for a plan of management to address such concerns.	Sec 15.3.5
10	It will be important to implement management practices to minimise spread of dieback at all sites of potential infection.	Sec 15.4.6
11	This could be considered tantamount to land clearance for agricultural production and would need to be addressed by the respective state legislation on land clearance matters.	Sec 15.4.4
12	The aspect of clearing of remnant vegetation along the proposed pipeline corridor and the associated biodiversity aspects deserve far greater consideration than the minimal impact that is suggested in the Reports.	Sec 4.5
13	The proponents should be aware of the relevant state vegetation clearance guidelines and take appropriate action to ensure compliance with state legislation.	Sec 15.4.4
14	It is also proposed that there should be no requirements to restore native vegetation on a site that was already weedy (p 10-26). This proposition, however, ignores the fact the spread and incidence of weed infestation may be greatly enhanced after soil disturbance has occurred along the entire pipeline. Given that natural areas will be diminished by the proposal, rehabilitation of existing weedy sites to improve values after the pipeline is installed would be appropriate in some locations.	Sec 15.4.5
15	The report (no1, p 8-10) gives little attention to the impact of groundwater on the proposed pipeline. It does not address the problem of rising groundwater and increasing levels of salinity is a problem which is expected to increase in coming years. There is consequently an urgent need to address this issue before construction commences.	Sec 12.4.3
18	The pipeline, however, regardless of these strategies, will have an impact on several catchments (eg Googong) and will therefore, unavoidably, place further pressure, at least in the short term, on the quality of surface water runoff in the area traversed.	Sec 12.1.1

Issue No.	Issue	Response reference
19	It is imperative that controls are in place to mitigate erosion and sedimentation in relation to streams and catchments crossed by the pipeline.	Sec 12.1.1
20	There is, no indication if the pipeline will be salvaged when it is no longer required or if it will be left in place to potentially cause contamination of groundwater and subsidence in the surrounding soil profile with possible longer term implications on drainage patterns.	Sec 9
21	The preference of the consultants (noted in Book 3 "Atmospheric Issues" - AGC Woodward Clyde Pty Ltd) for using a molecular weight comparison between methane and CO2, rather than using the Global Warming Potential (GWP), in relation to greenhouse issues, is challenged.	Sec 4.6.1
22	Therefore it is considered that the second sentence quoted above is irrelevant and misleading.	Sec 4.6.1
23	"In the context of Greenhouse gas emissions, where a molecule of methane is equivalent to about 9 molecules of CO2,..." and this is again considered to be misleading.	Sec 4.6.1
24	However, if a molecular weight comparison to derive their "1900 tonnes" figure has been used, as is implied, then the final sentence of the first paragraph of 6.2.3 should read "If a leakage rate of 0.01% is assumed then leakages could contribute a Greenhouse gas emission equivalent of about 5,360 tonnes of CO2 per annum".	Sec 4.6.1
25	Some further confusion surrounds Section 6.2.3 "Methane Losses from Natural Gas Systems" , paragraph 2, with reference to " .... about 13,000 tonnes of CO2". In this Section the appropriate GWP factor has been used rather than molecular relativity.	Sec 4.6.1
26	It is suggested that quoted emission factors in general, for the referenced fossil fuels, be confirmed.	Sec 4.6
27	On p 30, Section 5.2. last paragraph should read "2 million tonnes" not "2,000,000 million tonnes".	Sec 4.6
28	Similarly at p 32, Sect 5.4, point (ii) "equivalent accounts" should read "equivalent amounts".	-
29	The report does not adequately address the cumulative environmental effects.	Sec 2.2.2
30	Total figures such as the number of hectares to be cleared is not available. This unfortunately detracts from the value of the report as a policy evaluation and decision making tool.	Sec 15.4.4
31	There appear to be a major substantially unanswered risks to the integrity of surviving remnant native vegetation and native species.	Sec 4.5 Sec 15.4.4
32	The impact on surface and groundwater is likely to also be significant at a time when these resources are showing signs of over exploitation and widespread contamination.	Sec 12.1.1 Sec 12.4.1
33	Of greater importance however is the "assumed leakage rate of 0.01%" (see reference at Book 3, Section 6.2.3). In view of the high pressure specifications of the pipeline, it is recommended that it be written into any construction approval that this leakage rate to be set as a maximum, or alternatively, insert a leakage rate equivalent to world's best practice, which ever is the lesser.	Sec 14.1
34	Does not provide adequate answers and guarantees concerning the longer term ecological sustainability of the project in terms of its overall impact on the land and water resources over which it will transverse and its vicinity.	Sec 4.5

CONCERNED RESIDENTS OF EAST GIPPSLAND

Issue No.	Issue	Response reference
1	CROEG do not support the project because the Commonwealth Government do not have a Sustainable Energy policy in place to provide an appropriate frame-work for this project. CROEG is asking that this project and other possible Gas distribution proposals be delayed until a comprehensive Sustainable Energy Policy and the frame-work for a National Energy Grid System is in place.	Sec 4.4.1
2	CROEG may support the project if Point 1 was clarified and more relevant economic data was available. Our research suggests that the project may not be economically viable until Point 1 is clarified.	Sec 4.3
3	Our research suggests that the project may not be economically viable until Regional Forest Agreements are in place. Some of the suggested potential consumers, ie. the CSR plant in Bombala, further processing of hard-woods in East Gippsland will depend on the public acceptability's of the Regional Forest Agreements.	Sec 4.3
4	CROEG believe we cannot adequately assess this projects' economic and environmental sustainability without a comparison and an appropriate model to make the comparison with other gas pipeline proposals.	Sec 5.3
5	The pipe-line should be constructed along the existing easement of the S.E.C. and OPTUS / Telecom Cables. We believe this easement is wide enough, no more trees should be permitted to be fallen. If the location of cables on the easement is a problem then OPTUS / Telecom should be held accountable, not the trees sacrificed. The existing easement is already an ugly intrusion on the landscape without adding to it.	Sec 6.1
6	The pipe-line should be constructed along the cable easement used by Telecom through the Cann Valley.	Sec 6.1
7	The West side of the Cann Valley should not be used: (a) The creek systems are more natural than the Cann River, which is a very denuded system. (b) The risk of 'erosion' and 'blow-backs' after heavy rains, thunder-storms and floods would be a serious environmental issue in the creek systems. (c) The Reed Bed area is a sensitive eco-system as are the remnant rainforest along the creek systems. (d) The forest along the Reed Bed road is accessible for tourists, the West Cann road/ Reed Bed road is a tourist route, advertised in the tourist brochure of the Noorinbee Valley. (e) Many orchids and wild-flowers grow in the area along Reed Bed road. (f) Concerns about the erodability of the soils along the Reed Bed road / Cann Valley highway.	Sec 12.2.2 Sec 15.2.16
8	CROEG believes the compensation for land-holder is dubious and unclear. Only a land-holder who is articulate and able to seek legal advice will be appropriately compensated.	Sec 18.2.4
9	The EIS/EES does not address the issue of a land-holders rights to refuse the projects requests, nor how to compensate some-one who does not want their land disturbed.	Sec 18.2
10	CROEG estimate only one more land-holder would be affected by using the Cann Valley Telecom Cable route as opposed to the Reed Bed road/ West Cann road route.	Sec 15.2.16

Issue No.	Issue	Response reference
11	CROEG believe a pipe-line Code of Forest and Private Land Practise, should be written, and each area signed off the Pipe-line Project, the Public Land Managers and /or the Private Land-Holders and where appropriated the Koori community. This process would ease some of the publics concern over accountability for damage.	Sec 20.6
12	CROEG believes the data on Transport / Traffic may not be adequately reflect local conditions. The impact on seasonal traffic flows in far East Gippsland would impact on Pipe-line Project activities. CROEG believes the data on climate may not adequately reflect local conditions. The impact of thunderstorms in Far East Gippsland would impact on Pipe-line Project activities.	Sec 18.4
14	Rainforest agreements on Public Land would appear to be in conflict with the pipe-line construction. Remnant rainforest exists along the route of the pipe-line in Far East Gippsland. It would appear that the pipe-line would breach the management procedures for Rainforest protection - in such areas as the Bemm River, Lind National Park, and along the creek systems	Sec 15.4.2
15	CROEG is concerned about the attitude and conduct of some of the Pipe-line Project Officers. The threat of forced acquisition of land, and the projects right to move the pipe-line anywhere once the proponents have approval, makes a mockery of the process. The signing of agreements with Land-holders, before the EES/EIS process has given people a great deal of unease. The management of the project to date leaves a lot of questions to be asked about the rights of individuals and communities against a major corporation.	Sec 18.2

COOMA-MONARO SHIRE COUNCIL

Issue No.	Issue	Response reference
1	No major changes are suggested only support for the project as submitted and conveyed in the Environmental Impact Statement. The only major view that this Council had in regard to the Environmental Impact Statement was that of the transport of noxious weeds from one area to another when the pipeline was laid. This view has been expressed to personnel carrying out the EIS and these have been addressed within the document.	Sec 15.4.5

COPLEY, C.

Issue No.	Issue	Response reference
1	I have some concerns over the effects of the pipeline on flora and fauna along roadsides, for example, north of Cann River (off the highway). Also I feel similarly about creeksides.	Sec 15.2.16 Sec 15.2.19
2	I understand an inspector will be present at most stages. I feel that independent inspection is required. Therefore, I recommend that rather than double up inspection, that at all 3 locations of simultaneous construction independent inspectors be present. There could be one inspector travelling to all three locations in the day if this were feasible. I recommend at least 2/3 funding by government instrumentalities for this/these monitoring inspectors.	Sec 20.3

EAST AUSTRALIAN PIPELINE LIMITED AND GAS TRANSMISSION CORPORATION

Issue No.	Issue	Response reference
1	Introduction (page 2) - " It is not intended in detail on the environmental impact of the alternatives as this is covered at great length in the EIS/EES and the conclusion reached by the Project Proponents is that the Western Corridor is the superior alternative. The submitters concur with this conclusion."	Sec 5.1.2
2	Project Objectives (Page 2) - "One of the Project Objectives described on Page 1.1 of the EIS/EES is to provide an alternative gas supply source for the Victorian market." The submitters believe that due to the impact of distance on tariffs, the choice of the Nowra Corridor as the preferred option fails to achieve this objective. Delivery of Cooper Basin gas to markets in the Melbourne region, or even Gippsland, via Wilton and the East Coast would not be an economically viable proposition. The additional distance of more than 600km to Melbourne, compared with the Western Corridor, would add substantially to the haulage tariff and preclude Cooper Basin gas from being competitive in the Victorian market. It would also be more commercially difficult to arrange due to the increased number of parties involved. "There will be significant competition benefits from an interstate connection, particularly with respect to gas wellhead pricing, but the haulage of gas to the Victorian market via the Nowra Corridor would be a "third-best" solution from the standpoint of cost-effective transportation. In a situation where there are finite reserves of gas in Cooper and Gippsland Basins, the option which is the most cost effective and provides the maximum supply flexibility should be preferred. The submitters would be prepared to develop these matters further should the regulatory authorities consider it necessary.	Sec 4.1.2
3	Consideration of alternatives (page 3) - The guidelines for a Commonwealth Environmental Impact Statement require the Proponents to " examine any feasible and prudent alternatives to the proposed action". Similar requirements exist for a NSW EIS and a Victorian EES. The EIS/EES submitted by the Proponents for the Eastern Gas Pipeline fails to give any serious consideration to the option of entering into a haulage contract with EAPL and GTC as an alternative to building a new pipeline. No evidence is presented to indicate whether any discussions have taken place with these parties and why this option has been rejected as not being feasible.	Sec 5.2
4	Implications of Not Proceeding (page 3) - Section 3.9 Implications of Not Proceeding fails to consider other means of supplying gas to the identified markets. It ignores the proposed project announced by EAPL and GTC to connect their transmission systems via a pipeline between Wodonga and Wagga Wagga, which would have the capacity to deliver a similar quantity of gas to NSW markets at a much lower capital cost. This joint project would capture all of the national economic benefits claimed for the Eastern Pipeline but with a significantly reduced environmental impact compared with the proposed Nowra Corridor.	Sec 5.3

Issue No.	Issue	Response reference
5	Corridor Feasibility Assessment (page 4) - The EIS/EES evaluates corridor alternatives according to the following criteria: - Technical/Economic Viability; Environmental Impacts; Community Safety; and Community Benefits. The submitters believe the EIS/EES is seriously flawed in its assessment and selection due to the use of the following incorrect information and assumptions with respect to the rejected Western Corridor option: (A) On page 4.11 the capital cost estimate for the Western Corridor is based on an assumption that 835km of new pipeline will be required to transmit 90PJ/a to Wilton. EAPL and GTC have conducted detailed system modelling of their proposed projects and this indicates that to supply 90PJ/a of gas to Wilton only 470km of pipeline looping is required plus 146km of new pipeline between Wodonga and Wagga Wagga. (B) On page 4.12 it is claimed that, by Year 9, 5 new compressor stations with a total of 17 compressor units will be needed for this option. Current system planning for a 90PJ/a load indicates a requirement for only 3 new compressor stations with a maximum of 6-7 new units operating at any one time. (C) On page 4.11 the capital cost for the Western Corridor is estimated by the Project Proponents to be $618 million. EAPL and GTC own estimates are that the capital required to extend the existing EAPL/GTC infrastructure to deliver 90PJ/a to Wilton is less than $350 million. The wrong assumptions and data with respect to pipeline length and the number of compressor stations would only explain about $140 million of this differential. It is not clear how the Proponents can justify an estimate of $618 million for an assumed 835km of pipeline when their estimate for 740km of pipeline via Nowra is only $442 million for a route with far more difficult terrain and no existing pipeline easements. In view of the note at the foot of page 4.2 indicating an additional 37km being required for the Nowra Corridor it is questioned whether the capital cost for this option is correct. (D) On page 38 of Background Paper No. 16 Energy issues, a capital cost of $300 million is quoted for a 70PJ/a pipeline using the Western Corridor. This would appear to be inconsistent with the $618 million figure quoted earlier. The consequence of these errors and incorrect assumptions when used to evaluate the Western Corridor option are discussed below under the assessment criteria headings.	Sec 5.1.1 Sec 5.1.2
6	Technical/Economical Viability (page 4) - In Section 4.5.3. Economic Viability, the preference for the Nowra Corridor was premised on the capital costs for the Western Corridor being $618 million compared with $442 million for the former. On this basis it was concluded that the Western Corridor was "the least economically viable alternative". As part of their assessment of the Wodonga to Wagga Wagga interconnect project, EAPL and GTC have prepared initial capital estimates to expand the total transmission infrastructure between Longford and Wilton to carry 90PJ/a of gas. This estimate of less than $350 million, referred to above, would make the Western Corridor the most economically viable alternative in terms of both initial capital cost and toll charges. The assessment of economic viability in the EIS/EES also totally ignores an important advantage of the Western Corridor, which is not enjoyed by any of the other options. The use of existing infrastructure by this option enables capacity to be added in stages to match the anticipated build-up in demand that is forecast in the EIS/EES. For example. a capacity increment of 20PJ/a for delivery to the NSW market would only require a Drouin to Longwarry Loop, a Wollert to Tallarook Loop, the interconnect pipeline of 146km and two new compressor stations. There would be commensurate benefits in terms of initial capital costs and environmental impact.	Sec 5.1.1 Sec 5.1.2
7	Environmental Impacts (page 5) - background paper No. 19 describes in detail the geotechnical and environmental impacts of the alternative corridors and concludes that the Western Corridor is ranked as the least sensitive from an environmental view point. This was notwithstanding the incorrect assumption on the number of compressor stations. Hence its rejection in favour of the Nowra Corridor was not based on environmental considerations.	Sec 5.1.1

Issue No.	Issue	Response reference
8	Community Safety (page 5) - The comparison of the alternative corridors in terms of Community Safety is also distorted by the use of wrong information for the Western Corridor. Its ranking was based incorrectly on an assumed longer length of new pipeline and a higher number of compressor stations and units. The assessment also assumed that a 100km loop between Pakenham and Wollert would be necessary. This pipeline would only need reinforcement at loads above 65PJ/a and only for a very short section. If the correct data was used in the assessment, the Western Corridor would be superior to other alternatives.	Sec 5.1.1 Sec 5.1.2
9	Community Benefits (page 5) - This assessment is based on relative achievement on the following objectives: Supply of gas to currently unserviced regions - The submitters concede that the Western Corridor will serve a smaller number of new residential consumers along the route, and population centres such as Cooma may not be served if this option is chosen. However, the EIS/EES appears to overstate this differential and ignore opportunities to serve the Murray Valley towns. Additionally, some of the regions that are claimed would be supplied by the Nowra pipeline could also be serviced by expansion of the EAPL, GTC and/or AGL systems. For example, Nowra could be serviced by a 48km lateral from the Moomba-Sydney pipeline with a relatively small diameter pipe. This extension is currently under consideration by EAPL. To put this point in context, and using figures contained in the EIS/EES, the expected demand along the route from currently unserviced regions represents only 6-8% of the ultimate capacity of the pipeline. The social and economic benefits of serving a small number of new locations along the route tend to be overwhelmed by the benefits to all existing consumers in Victoria as a result of introducing competition in this market through access to Cooper Basin gas.	Sec 4.1.1 Sec 5.1.1 Sec 5.1.2 Sec 18.1.2
10	Security of Supply - this aspect has been viewed in terms of the degree to which pipeline operate independently and the number of gas basins supplying the market. With the planned changes to the regulatory environment ensuring open access to pipelines, the key factor affecting security of supply will be the number of basins supplying the market. This will be the same under each alternative. Once the regulatory regime is in place the only issue affecting the security of supply will be available pipeline capacity. EAPL and GTC have announced their intention to meet demands for new gas supply in the NSW market by the expansion of existing facilities.	Sec 4.1.3 Sec 5.1.1
11	Contribution to regional development opportunities - The preference for the Nowra Corridor is premised incorrectly on the assumption of lower tolls. In making comments about lower tolls for the Nowra Corridor, the EIS/EES fails to provide any information on the likely level of tolls for each option that would allow a sensible comparison with those available in the market or which could be derived from other sources. As indicated earlier, the Western Corridor will deliver lower tolls when compared to the Nowra Corridor due to the significantly lower capital costs involved. EAPL and GTC have recently provided one of the Proponents with indicative tariffs for delivery of gas to Wilton that should confirm this assertion. EAPL and GTC have received expressions of interest for substantial volumes of new gas supply, including for co-generation plants, and these developments will be more competitively serviced by the Western Corridor. These co-generation plants are most likely to be located adjacent to major population and/or industrial centres which have existing gas transmission or distribution infrastructure and hence would be readily supplied by the Western Corridor.	Sec 4.2.3 Sec 5.1.1 Sec 5.1.2 Sec 18.1.2

Issue No.	Issue	Response reference
12	Reliance on public funds - The negative assessment of the Western Corridor is based on two wrong assumptions: it depends on Government funding; and the net benefit of the project to Victoria could not be demonstrated. Whilst in the short term GTC may choose to use Government finance for the initial increment of planned capacity, it is well known that the Victorian Government has privatisation on its agenda for GTC. It is expected that participation in the proposed interconnection project with EAPL will enhance the attractiveness and the value of GTC when it is privatised. In addition, the Victorian Government at ministerial level has expressed strong support for the project based on the demonstrated benefits of the joint EAPL/GTC project.	Sec 5.1.1
13	Promotion of energy efficiency and minimisation of atmospheric emissions - The EIS/EES claims the Western Corridor will use up to 1.7PJ per annum more gas in compression than the Nowra Corridor. This is based on an incorrect assumption with respect to the number of compressor stations and units required for the Western Corridor . With lower tolls than the Nowra Corridor, the Western Corridor is more likely to encourage new gas-fired power and co-generation projects and thereby make a positive contribution to both energy efficiency and atmospheric emissions. In summary, if the Western Corridor option was re-evaluated using accurate data and assumptions, and a complete assessment of its relative advantages, it could become the preferred option using the criteria for corridor selection discussed in the EIS/EES. In contrast to the claims in the EIS/EES, the Western Corridor would: result in more competitive gas prices than other alternatives due to the significantly lower tolls required; involve capital costs which are at least 20% below the Nowra Corridor, provide potential to service new markets along the route including new co-generation facilities, involve similar energy demands for compression to the Nowra Corridor, provide a greater potential for a net reduction in Greenhouse gas emissions due to the increase competitiveness of gas-fired power and co-generation projects that will flow from lower tolls, provide a similar level of supply security and provide significant environmental advantages over all other alternatives.	Sec 5.1.1
14	Energy Issues - Background Paper No. 16 - energy issues on page 38 discusses the competition effects of the Western Corridor route. Concerns are raised about negotiating access to transmission and distribution with AGL controlled pipeline companies, which seem to reflect those of BHP as a gas producer rather than as a pipeline operator. Given the current trend of national competition policy and the CoAG reforms to apply from 1 July, 1996 these concerns about access and pricing would appear to be unfounded. In its recent Report, the Gas Council of NSW has recommended a state-based third-party access regime that will include provisions to regulate prices and to oversee dealings between related companies. It is expected that these recommendations will be adopted by the NSW Government and hence access to the AGL distribution system will be assured. A similar regulatory framework is already being implemented in Victoria as part of its gas industry reforms that will ensure third party access. EAPL has already made its tariffs available to prospective customers and regulatory authorities. GTC's tariffs will become public in March, 1996 as part of the review of its undertaking under the new regulatory regime. Both companies are committed to non- discriminatory open access. Of more concern to the submitters and to gas consumers generally will be the market power of BHP if it is to become a pipeline operator. It would then be completely integrated from gas production in Bass Strait through to gas consumption at its steel mills in NSW. This would deliver enormous market power to a single company. The EIS/EES fails to address how BHP will behave in this situation to ensure that other pipeline operators and gas distributors are protected from abuse of this market power and how the benefits of competition will be passed through to gas consumers.	Sec 4.1 Sec 4.6 Sec 5.1.1

Issue No.	Issue	Response reference
14 (cont)	There is no commitment to unbundling of prices and other protection mechanisms. It will be recalled that when the Moomba to Sydney pipeline was privatised, the pipeline operations of EAPL were "ring-fenced" from the gas distribution activities of AGL to ensure effective competition. This prohibition from buying and selling gas also applies to GTC in its enabling legislation. Background Paper No. 16 presents the following conclusions if the Western Corridor option were constructed instead of the Nowra Corridor: (i) there would probably be lower energy price reductions, particularly in major New South Wales energy markets - This conclusion is inconsistent with the information presented above which indicates that the tolls between Longford and Wilton will be lower for the Western Corridor. (ii) There would be fewer along route consumers getting lower energy prices - Elsewhere in the EIS/EES it is predicted that along the route demand will only be 6-7 PJ by 2005 and therefore represents a small component of the total new demand. In addition, some of this demand could be serviced by expansions to the EAPL and GTC systems. (iii) There may be overall fewer negative environmental impacts but there would be less displacement of coal and hence less Greenhouse gas abatement - As discussed earlier, this conclusion is inconsistent with the predicted levels of toll for the Western Corridor, which will be significantly lower than for the Nowra Corridor, and hence provide greater encouragement for the development of gas-fired power and co-generation facilities. (iv) there would be significantly lower economic benefits, particularly in New South Wales - with the lower tolls for the Western Corridor, the economic benefits to New South Wales will be higher than for the Nowra Corridor. There is also a greater probability that gas-fired co-generation, with its Greenhouse gas benefits, will be more viable as a consequence of these lower tolls. There will be some offsetting reduction in benefits due to the lower capital spending but the net benefit is predicted to be much higher.	

EASTERN ENERGY

Issue No.	Issue	Response reference
1	Further discussions will be required with the two companies in regard to the exact location of the pipeline for design coordination and construction practices to be used in the pipeline vicinity.	Sec 6.1 Sec 18.5.4
2	It should be stressed that where there is any alteration to a relocation of our electrical distribution network or if our network assets require bolstering during construction, then the companies involved are expected to pay appropriate compensation including any reinstatements.	Sec 18.5.4

EAST GIPPSLAND SHIRE COUNCIL

Issue No.	Issue	Response reference
1	Upon commencement of construction activities, Council seeks continued consultation on specific issues such as: • management of stockpile locations (pipe and spoil); • identification of and minimising impact upon buried infrastructure (stormwater drainage etc); • potential traffic disruptions resulting from earthworks and pipeline related vehicular movements	Sec 2.3.1 Sec 18.4

Issue No.	Issue	Response reference
2	Where additional clearance of vegetation adjacent to existing easements is required, all efforts should be made to minimise the width of the construction easement so as to reduce the impact upon ecological values of the adjacent flora and fauna communities. Subsequent revegetation should be carried out promptly and the success thereof monitored.	Sec 6.1 Sec 15.4.4
3	Council cannot over emphasise the need to minimise erosion and dispersion of sediment during both construction and operation of the pipeline. All possible measures should be adopted to prevent adverse impacts, including timing construction to coincide with the most favourable climatic conditions (low rainfall etc) and the use of stabilising mediums (ie geotextile fabric) on potentially unstable slopes. the off-site impact of increased sedimentation resulting from surface run-off and transportation, particularly to surrounding private agricultural land, could have adverse effects on productivity and / or viability of the land.	Sec 11.1.3 Sec 11.2
4	Ongoing monitoring and management of easement revegetation and other construction sites (pipe dumps etc) will be required to ensure prompt detection and amelioration of erosion that may occur after completion of the construction phase.	Sec 20.4
5	The potential for spreading of weeds (including dieback, Phytophthora cinnamomi) during construction works should not be underestimated. All necessary precautions should be adopted, particularly if trench fill material is imported. Ongoing monitoring after completion of construction phase should be undertaken to ensure subsequent invasion does not compromise success of revegetation programs.	Sec 15.4.5 Sec 15.4.6
6	Flash floods will need to be planned for during construction activities, with particular emphasis on monitoring the upper catchments of the Snowy and Mitchell Rivers, and to a lesser extent the Bemm and Cann Rivers.	Sec 12.5
7	If pipeline life expectancy is considered to be greater than 100 years, then pipeline design will need to cater for flood events and resulting river bed scour of greater magnitude that 1:100 year, (8.2.6 on page 8.8 and 8.2.7 on page 8.9).	Sec 12.5
8	Should the project proceed, the proponents will be invited to have ongoing representation so as to ensure aspects relating to disaster planning for the Eastern Gas Pipeline are incorporated into the Plan.	Sec 12.5
9	Council wishes to highlight that the proposed pipeline route traverses the Newmerella Showgrounds Reserve (1209 A17D/SC) at kp 149) which is managed by a Committee of Management on behalf of the East Gippsland Shire Council. Inspection indicates the route lies immediately south of the existing buildings and facilities, however, future facility improvement works may be affected by the present pipeline location. Council encourages continued liaison to ensure minimising potential impact and disruption.	Sec 18.3.5

GUNAI/KURNAI CULTURAL HERITAGE LAND COUNCIL

Issue No.	Issue	Response reference
1	The descendants of the Gunai peoples have maintained a continuous custodial duty to ensure that the equilibrium preserved by their ancestors for so long is not disrupted. The effect upon the environment through forest clearance and the traversing by the pipeline of swamp areas or water courses are clearly matters which the Gunai Kurnai Cultural Heritage Land Council views with great concern. While the Land Council does not purport to speak on behalf of the Far East Gippsland Aboriginal Corporation (see Assessment Report No 6: 104) it is suggested that one of the reasons for the widespread opposition to the proposed Eastern Gas Pipeline is the fact that there was not sufficient effort devoted to recognising the correct protocol for seeking permission to enter Gunai lands and for initiating consultation and discussion. Gunai communities are no longer willing to agree to development proposals where they are not consulted until after their land has been surveyed.	Sec 2.3.3 Sec 16.2
2	Since the proposed pipeline route traverses both forest within national parks and crosses a significant number of waterways, there is considerable concern in the GKCHLC that the activities of the pipeline might lead to a disruption of hunting and fishing rights. Specifically, it is suggested that the route of the pipeline may have an impact upon the habitat of native game that will either deplete the resource or cause the native game to re-locate.	Sec 16.2
3	The Gunai/Kurnai Cultural Heritage Land Council is concerned that these resources should be preserved as part of the heritage for future generations of Gunai people.	Sec 16.1.3 Sec 16.2
4	Although the BHP/Westcoast Assessment of the proposed route relies upon "predictive assessments" by archaeologists to assess whether excavations are likely to disturb artefacts that GKCHLC is concerned that there can be no guarantee that spiritually significant sites or skeletal sites will not be disturbed. The BHP/Westcoast report itself concedes that; Mythological sites or sites of traditional significance to Aboriginal people, can occur in any location, but often coincide with natural landscape features. The location of sites of contemporary significance to Aboriginal people (such as places of contact or confrontation) are also difficult to predict. (Report No 6: 58) In the event that culturally significant sites are either disclosed or unearthed as part of the survey, there needs to be extensive discussion concerning the methods by which the confidentiality of such sites could be safeguarded. It is clearly not acceptable that such sites should be recorded in any way that might make them accessible to consultant archaeologists or other companies in the future. This would safeguard against the location of culturally significant sites being cited in the same manner as occurs in Assessment Report No 6 (at p.39, for example).	Sec 16.1.1 Sec 16.1.3 Sec 16.1.4
5	Despite the assertion in the BHP/Westcoast report that the GKCHLC was "extensively consulted" (Report no 6: 10) and the fact that certain members of the community have assisted in field investigations, this organisation believes that negotiations between the parties are only at a preliminary stage.	Sec 2.3.3 Sec 16.1.1
6	(a) The expectation that Gunai communities will be asked to share sensitive information regarding sites without any assurances regarding outcomes.	Sec 16.1.2
7	(b) The issue of compensation. This can be taken to include two separate issues, namely; (i) payment for the use of Gunai/Kurnai lands or the negotiation of royalties from the pipeline.	Sec 16.4

Issue No.	Issue	Response reference
8	(ii) The issue of compensation where there is disturbance of sites. (This point is acknowledged in the Assessment Report No 6 at p104).	Sec 16.4
9	(c) The employment of members of the Gunai community by the proposed pipeline if it is approved - both on the pipeline as workers and also in the capacity to oversee works to ensure that the environment is not damaged and sites are correctly identified and protected if they are disturbed.	Sec 18.1.3
10	In the event that the consultation process is revived and agreement is reached between BHP/Westcoast and the Gunai communities of Gippsland as to the construction of the pipeline it is suggested that the BHP/Westcoast group might examine the possibilities of an agreement with the Gunai people.	Sec 16.1.3

HAWKESBURY NEPEAN CATCHMENT MANAGEMENT TRUST

Issue No.	Issue	Response reference
1	The development should comply with the following policy on water quality, relating to both surface and ground water: • if the quality of the water emanating from the site is satisfactory, then the development should not result in a decrease in this quality; and • if the quality of the water emanating from the site is not satisfactory then the development should result in an improvement in this quality.	Sec 12.1.1
2	The key elements of the EIS should be based on the principles of Ecologically Sustainable Development, as adopted in NSW.	Sec 4.5
3	The EIS should provide a more dispassionate assessment of the project within the context of a wider energy strategy to ascertain whether this proposal is in the best interests of the community.	Sec 18.1.2
4	There is a lack of information from which to evaluate the comparison of the routes to determine a "feasible and prudent alternative". There is no gauge of the relative significance of, and impact of the pipeline on, the environmental resources along the alternative routes. The projected costs do not address the difficulties of construction and additional works required to overcome environmental and other difficulties. The real costs of the Marulan alternative which has a lesser environmental affect than the chosen route are not limited to the length of the pipe and the number of compressor stations.	Sec 5.1.1
5	The EIS is silent on whether there is any spare capacity in the Wilton - Wollongong pipeline which would allow avoidance of further disturbance of the Illawarra Escarpment.	Sec 5.2
6	Cumulative Impacts Assessment has been inadequately addressed, particularly in critical environment areas.	Sec 2.2.2
7	Reference should be made in those parts of the EIS that refer to the Wilton area (kp 721 to end) to the way in which the development will satisfy the relevant provisions of Sydney Regional Environment Plan No. 20.	Sec 18.3.1
8	The Environmental Management Plan should form the key section in the EIS, but it is not considered to be adequate.	Sec 2.2.1
9	The initial options review appears to be weighted by economic rather than environmental issues, a lack of detail makes it difficult to compare relative impacts.	Sec 2.2.1

Issue No.	Issue	Response reference
10	Stream Water Quality: note that maintenance of the quantity of water should also be an objective.	Sec 12.1.1
11	Community consultation: Information should be available on the gist of community comments and the way in which these are addressed. Table A2 tells only part of the story, of the way in which Table A1 is set out.	Sec 2.2.1 Sec 2.3
12	The proposal is treated in isolation without reference to other gas projects and little reference to a strategic policy. The EIS should be more than a justification for the project, it should dispassionately address the issues including the merits of the proposal in the wider energy strategy, eg. is there likely to be a move by power generating authorities from coal to gas as stated (p3.5)?	Sec 4.4.1 Sec 5.3
13	The assessment of alternatives in the EIS and paper #19 lacks a common gauge of the relative significance of, and impact of the pipeline on, the environmental resources along the alternative routes. Consequently it fails to present a clearly drawn comparison of the relative value of the environments affected, the degree of that effect and the likely success and costs of remedial action. The assertions in the Conclusions are not adequately justified.	Sec 5.1.1
14	There is a general statement (p.3.7) concerning the capacity of the existing pipeline. This needs to be qualified in terms of specific links, eg. that between Wilton and Wollongong so that the availability of other opportunities to reduce costs and impact can be properly canvassed.	Sec 5.2
15	The relative costing of the alternatives is similarly ill-defined. It does not appear to take into account the additional costs of operating in the manner recommended in the EIS to conserve a more sensitive environment in certain areas, eg. additional strengthening of the pipe, directional tunnelling or boring under trees.	Sec 5.1.1
16	Table 4.4 Criteria - should include issues such as number of minor creek crossings, length of pipe requiring greater depth or protection, distance where reduced width of easement is required for environmental and heritage protection, the comparative sensitivity of significant environments and hence the level of protection required, all of which add to the real cost.	Sec 2.2.1 Sec 5.1.1
17	Fig 5.5 indicates a depth of trench of 1.2m rather than a depth of cover of 1.2m as elsewhere recommended.	Sec 1.1
18	Apart from a sketch there is no substantiation of the need for a 20m reserve. Such a generous width would have a significant impact and consideration should be given to its reduction. Some specification is required for the circumstances in which the reduction in width is proposed to be implemented.	Sec 6.4
19	Development of selected sites out of sequence is a cause of concern since these are likely to be environmentally sensitive sites and the construction work will remain unfinished for some (unspecified) time. There are no development parameters set for these sites.	Sec 7.1
20	"Grading": The method of grading appears to engender the maximum environmental impact and does not accord with the diagram fig. 5.2 where the topsoil is shown accommodated on the reserve. Why is it necessary to grade the full 20m? The EIS should address the impact of this method and ascertain any "feasible and prudent alternatives". This section conflicts with the measures in Section 17.5.2.	Sec 6.4 Sec 11.2
21	The Background Paper No.18 indicates that construction may well coincide with the worst conditions for each area and that the schedule of construction should take climatic features into account. The EIS does not indicate that this aspect will be a consideration except as an indicator for potential problems.	Sec 6.3

Issue No.	Issue	Response reference
22	Erosion potential: the measures proposed do not tally with the Project description (p5-6) requirement for scraping the width of the easement. Which is the correct scenario? Is the construction to be scheduled for dry conditions?	Sec 6.3 Sec 11.2
23	More thought should be given to use of the rocky spoil, particularly the appropriate circumstances for depositing it.	Sec 6.9 Sec 7.1
24	The Background Paper requires a summary of erosion and sedimentation controls and approaches recommended for various situations. Similarly regarding mitigative measures for fault crossings (p56), some comment is necessary on decision making regarding applicability of the measures to a given situation.	Sec 10.2 Sec 11.1.3
25	Since there is little or no information available at this stage, the EIS should set out clear design performance criteria against which the contractor may compare the measures at a particular site. An ad hoc approach will not be adequate.	Sec 20.5
26	The Key Issues in the hydrology chapter are broader than those specified and should include change in water quantity, maintenance of habitats and particularly the cumulative impact of this and other factors on the ecological system as a whole.	Sec 12.1.1 Sec 15.5.2
27	The EIS should address the effect of changing the bed by blasting and use of rock rip-rap and discuss methods of the removal of debris from shallow blasting.	Sec 6.5
28	In consideration of erosion and sediment control and restoration of the trench across the watercourses, particularly in the Wilton area, cutting a trench across the highly erodible banks of the creeks is likely to exacerbate the potential for further gullying. Specific measures should be defined to address these potential problems, including revegetation of the creek crossings; diversion of run-off water away from the pipeline's final profile to minimise potential of erosion along and downslope, eg. diversion banks; creeks should not be crossed near or in significant water holes or control structures, eg. rock ripple zones.	Sec 6.6 Sec 12.2.3
29	The EIS indicates that more detailed assessments are necessary before construction takes place in difficult areas. These assessments should be exhibited for comment and revision before work commences. In addition to the above, issues to be addressed include the long term protection to be given to creek bank crossings from disturbance by stock and consequent erosion, depths of directional drilling and removal of extracted material, effect of "dewatering' on the water table generally. The assessment should consider storm events, not just the average rainfall.	Sec 2.2.1 Sec 6.7 Sec 12.2.3 Sec 12.4.2
30	More assessment is required on cumulative impact on natural heritage and a comparison of real potential effects; the mitigation measures should be accompanied by a description of the criteria to be achieved, otherwise the measures are only platitudes.	Sec 2.2.2
31	A number of significant issues raised in Background Paper No.5 have not been included in the EIS, eg. Table 8, management recommendation for different habitat types (p70) and the need to protect the Koala habitat of the Cumberland Plain Forest (p44).	Sec 15.3.2
32	Clarification is necessary of the type and size of revegetation to be allowed in the corridor.	Sec 7.2
33	Indicate management requirements for the use of herbicides, particularly in keeping them out of the watercourses.	Sec 15.4.5
34	The Trust considers that water should be returned as far as possible to the stream, not just the catchment from which it is obtained. Both the quality and quantity of water flow in the creeks is important. If there is proposed to be a variation in flow, a more detailed assessment will be necessary.	Sec 6.10 Sec 12.1.1

Issue No.	Issue	Response reference
35	Forest Issues: Cumulative impact should be addressed; decisions on routes do not promote the mitigation measures set out (Background Paper No.10, p12); nor has the recommended timing (Background Paper No.10, p13) been implemented in the proposed development schedule.	Sec 2.2.2 Sec 18.3.2
36	There would seem that no good economic reasons exist for reducing the width of the easement through the forests, there is no consistency in description of the minimum width free of trees, 3m either side of the pipe trench (7.1m), 7-8m or 10m.	Sec 7.2
37	The impact of clearing forest and construction of a dam should be addressed.	Sec 6.1 Sec 6.10 Sec 15.2.4 Sec 15.3.3 Sec 15.4.4
38	Conservation Reserves and areas of high conservation significance should be avoided, not "where possible", as the pipeline can be relocated.	Sec 2.1
39	"Key Issues" should include views; the objective should be to avoid any adverse effects in the environmentally significant areas.	Sec 2.1
40	Agriculture: The EIS should refer to monitoring of the regrowth and the time span of this monitoring; there is concern over the proposed importation of topsoil, the EMP should set some criteria for its quality.	Sec 11.2 Sec 18.3.3 Sec 20.4
41	Landscape & Aesthetics: more emphasis should be given to the type of landscaping appropriate.	Sec 7.1
42	In sensitive areas this reserve should be at the minimum width even though it will be more awkward to work.	Sec. 6.4
43	The assessment of alternatives does not give full value to the greater visual impact of route 8.8 over route 5.2.	Sec 2.2.1 Sec 15.1
44	Difficulty in crossing the Illawarra escarpment should prompt closer investigation of use of the existing pipeline.	Sec 5.2 Sec 15.2.25
45	The EIS should address the capacity of existing pipelines and the principle of maximum use of existing resources.	Sec 5.2
46	Removal and disposal of rubbish should be addressed.	Sec 6.13
47	The EMP should be the key section in the EIS, but is considered to be of significant weakness.	Sec 2.2.1
48	As the EIS is intended to provide "relatively general guidelines" it should include performance criteria particularly with regard to achievement of environmental results. "...reasonably maintain..." (p17.3) means little without some clear parameters.	20.5
49	Route alignment: should also include criteria for change to reserve width as required by local conditions.	Sec 6.4
50	Waste Management: the Trust would request regular removal of material so that the stockpiles do not build up.	Sec 6.13
51	Access: the prevention of access for trail bikes is likely to be a problem. There should be physical indicators to define the width of the easement and access track.	Sec 8.1

Issue No.	Issue	Response reference
52	Clearing and Grading: there is a discrepancy between the project description which implies shaving the width of the reserve and this description of the project. Performance criteria are required and a rewording of the project description.	Sec 11.2
53	River crossings: details of the river and wetland crossings should be provided for public comment before a decision is made on the construction.	Sec 2.2.1 Sec 6.6
54	Wetland crossings: will the integrity of the wetland be prejudiced by the laying of imported backfill material?	Sec 6.9
55	Rehabilitation: the EIS should expand on rehabilitation methods in the bushland areas and address the timing and treatment of out of sequence works.	Sec 7.1

HORTON, M.

Issue No.	Issue	Response reference
1	There is particular reference to mitigation methods for watercourse crossings at a number of levels and conditions, however I would like to see a more concerted effort on the major crossings to utilise the directional drilling method. In addition is the method of diversion adequate to not disrupt the soil consolidation of the diverted watercourse and the subsequent rehabilitated (original) course?	Sec 6.6

ILLAWARRA ESCARPMENT COALITION

Issue No.	Issue	Response reference
1	At the Public Exhibition it was stated that option three is BHP's preferred option. The Escarpment Coalition totally opposes option 3, which would cut a twenty metre corridor through sensitive Escarpment forest. This area is highly visible from the coastal plain and major tourist viewing points and is part of a proposed heritage listing currently being pursued by the Coalition. Logic would suggest to us that option 1 which uses existing infrastructure and existing corridors and is the least environmentally destructive should be the preferred option.	Sec 15.2.25 Sec 18.3.6
2	This section of the proposed pipeline runs along the Escarpment foothills between point A and point B as marked on Map 1. Our concern with this section is that it transverses land that may in the future be considered under Wollongong City Council's Fair Trading Policy. The environmental degradation that may occur during the construction of the pipeline and later during corridor maintenance could prejudice the value of the area for Fair Trading. The outcome could be that urban development encroaches more closely to the Escarpment and the Escarpment foothills than would be the case without the pipeline.	Sec 18.3.1

Issue No.	Issue	Response reference
3	This section runs between point B and point C on Map 1. The EIS prepared for BHP (Forest Issues, Vol 10, Sept 1995) does not identify this area as an area of concern. This may be because the consultants may have not been aware that the Core Escarpment Park extends eastwards beyond the State Recreation Area as mapped in the EIS. This extension was gazetted in October 1993 (see attachment 3 for extract). As a consequence of this extension the proposed pipeline would cut through Core Escarpment Area for a distance of about 1.5 kilometres. This area is forested with dry sclerophyll on the ridges blending into a mix of dry rainforest and sub tropical rainforest in the gullies.	Sec 15.2.25 Sec 18.3.2
4	The pipeline route runs adjacent to the Mount Kembla Ring Track (a regionally important walking track) for about 0.5 kilometres and passes very close to an historic mine site which has cultural and heritage value.	Sec 17.2.4
5	Fragmentation and loss of native habitat - The Illawarra Core Escarpment supports unique and diverse flora and fauna. The Core Escarpment has been established to protect this valuable natural heritage. The construction of a twenty metre corridor over 1.5 kilometres would have a major impact on the habitat values of this area and would negate Council's initiative in extending the Core Area.	Sec 15.2.25
6	Steep topography and high rainfall. These characteristics mean that there are risks of soil erosion and resulting sedimentation of local creek systems both during pipeline construction and ongoing. It is likely that using heavy earth moving equipment in this area will cause severe soil disturbance and may even result in slope instability.	Sec 10.1 Sec 11.1.3
7	Slope instability - It is widely acknowledged that the Illawarra Escarpment is affected by slope instability. We are concerned about the implications of locating a gas pipeline on unstable land, near forests with a high fuel loading, and adjacent to urban areas. If the gas pipe is breached due to land instability, it is possible a major bush fire could occur. Escarpment rainforests could be destroyed and fringes of urban development between Mount Kembla and Sutherland may be threatened.	Sec 15.2.25
8	Visual impact - The proximity of the pipeline to the Walking Track would detract from the natural bushland experience that the Track currently provides. The gas pipeline corridor in this section would be highly visible from the coastal plain. It would also be clearly visible from tourist vantage points including Mount Kembla Lookout, Robinson's Lookout, and Mount Keira Lookout, degrading the overall amenity of these views.	Sec 15.2.25 Sec 18.3.6
9	Introduction of exotic weeds and feral animals - The construction of the pipeline may increase weed infestation in the area through disturbance of existing canopies and the carrying of weed propagules on earth moving equipment and workers shoes and clothing. Domestic and feral animals are likely to use cleared corridors to predate small native animals which must cross the cleared area to find food and potential sexual partners.	Sec 15.2.25 Sec 15.4.5
10	Increased human impacts - A maintained cleared corridor is likely to attract further human activities that could have a negative impact on the quality of Core Escarpment Bushland. For example: trail bike riders, rubbish dumpers, horse riders, stolen car stripping and burning, campers, and arsonists.	Sec 8.1 Sec 15.2.25
11	Risk of infection by Phytophthora cinamomi - At the moment the Escarpment forests are free of Phytophthora. An earthworks project such as the proposed pipeline carries with it the risk of infection which could then spread along the whole Escarpment, north to the Royal National Park and south to the Morton National Park. The increased human activity which would occur in the permanently maintained corridor could also increase the risk of Phytophthora infection.	Sec 15.2.25 Sec 15.4.6

Issue No.	Issue	Response reference
12	Proportionally large impact - In this area the State Recreation Area is long and narrow in its configuration. It is only about two kilometres wide. The impact of the proposed pipeline is magnified because it cuts diagonally right across the conservation area. This may create a type of "Berlin Wall" effect for native animals, who must risk exposure to predators to move from west to east or vice versa.	Sec 15.2.25 Sec 15.3.3
13	Problems with ongoing maintenance - The EIS states that this area is in part so steep that vehicle access for maintenance purposes is not practicable. We question the feasibility of being able to adequately manage the rapidly growing rainforest vegetation in this area by carrying in hand tools, on foot.	Sec 8.2 Sec 15.2.25
14	Illawarra Escarpment Walking Trail - Illawarra Councils are cooperating through the auspice of the Illawarra Region of Councils (IROC) to establish an Illawarra Escarpment Walking Trail which on completion will extend from Helensburgh to Kiama. This Trail in time may become a major feature of the region, attracting many visitors and bringing economic benefits. The proposed pipeline route in this section appears to run very close to the likely location of the Walking Trail. This would detract from the natural and aesthetic value of the future Trail.	Sec 15.2.5 Sec 18.3.5
15	This section runs north of point F as marked on Map 1. Our concern with this section is that in some areas the proposed pipeline departs from existing service corridors. Given the sensitive nature of the area which is largely water board catchment and has quality natural values, we believe the pipeline should be contained within existing corridors to minimise disturbance.	Sec 15.2.26
16	The EIS suggests a maximum length of disturbance would be about 1 kilometre. From our assessment of the proposal we believe this distance is closer to 3 kilometres.	Sec 15.2.25

KOOMBAHLAH ESTATE COMMUNITY

Issue No.	Issue	Response reference
1	General comments made regarding safety, health, transport, nuisance during construction and flora, fauna and ecology,	-

LAND CONSERVATION COUNCIL

Issue No.	Issue	Response reference
1	A general matter is that not all of the EES reports were up-to-date or clear with regard to route revisions. For example, the detailed maps in Background Paper No.20 do not show the numerous changes resulting from Revision 8, and hence the precise locations and km-distances of many places, and impacts on values, cannot be evaluated with certainty.	Sec 2.1

Issue No.	Issue	Response reference
2	All public land in the Victorian section of the proposed pipeline corridor is subject to recommendations made by the Council. The recommendations are contained in the following published Final Recommendations reports: • South Gippsland Area District 1 • Gippsland Lakes Hinterland Area • East Gippsland (Review) Area • Rivers and Streams Special Investigation For each of these investigation areas a Descriptive Report, Proposed Recommendations and Final Recommendations have been produced. However of the eight relevant Descriptive and Final Recommendations Reports, only two are listed in the main EES bibliography. This suggests that these recommendations have not been comprehensively considered in developing the EES.	Sec 18.3.1
3	Table 12.3 (p.12.10) lists Dowd Morass, indicating the pipeline route crosses its north-west corner. The route has apparently been changed at this point, from outside the reserve to inside. This change may need reconsideration.	Sec 15.2.1
4	The proposed pipeline route crosses the park at 119.9-122 km from Longford. It would be preferable if it were diverted along the Princes Highway north of Lake Tyers State Park.	Sec 15.2.9
5	The pipeline route cuts across Mt. Raymond Regional Park, apparently following an Eastern Energy electricity pole-line easement. In principle, locating the pipeline through the park is inappropriate, given the renewed disturbance of the easement surface during construction, and ongoing maintenance associated with the pipeline. This is particularly so when the Princes Highway is outside the park only a short distance to the north. Following an existing easement accords broadly with another LCC principle, however in this case following the existing road reserve outside the park would be preferable.	Sec 15.2.12 Sec 18.3.6
6	The pipeline route crosses the Bemm River Scenic Reserve at Boulder Creek Road. Biosis has described this area, 193-193.5 km from Longford, as being of State significance, particularly for the recorded presence of two rare owl and three amphibian species. The proposed route follows an Eastern Energy easement. Comments apply as for Mt. Raymond Park above.	Sec 15.2.14
7	The pipeline route apparently follows an Eastern Energy easement in Lind National Park however this crosses the park near the junction of Hill Track and Lind Park Road. As above, it would be preferable for the pipeline to remain outside the park.	Sec 15.2.15
8	Particular values to be protected along The Mitchell, Snowy and Bemm Rivers are listed in the LCC's Recommendations Report, and disturbance of these should be avoided. The recommendations, and the provisions of the Heritage Rivers Act 1992, should be recognised and implemented wherever relevant.	Sec 3.1.1
9	Twenty-five river and stream crossings identified as being of the highest conservation value by Biosis (not in LCC recommendations) are listed in Table 9 of Background Report No.5. Of these, 20 are in Victoria, including the above three rivers. Particular care should be taken at these 20 stream crossings to prevent environmental and water quality impacts, and at all other crossings, to minimise such impacts. Note that most of the 'sensitive stream crossings' are wrongly located on the detailed maps in BHP/Westcoast's Background Paper No.20.	Sec 2.1.1 Sec 6.6 Sec 12.2.1 Sec 15.5
10	The EES emphasis that the pipeline will require a large number of stream crossings - a total of 1028 in both states. These are key areas where there is potential for damage to riparian environmental and landscape values, bed and bank erosion, and initial and continuing water quality impacts.	Sec 2.1.1 Sec 6.6 Sec 12.2.1 Sec 15.5

Issue No.	Issue	Response reference
11	Particular care will be required to minimise impacts on flora and fauna habitat, indigenous vegetation, scenic landscape, cultural heritage features and recreation opportunities at such pipeline stream crossings. The substantial potential for bed and bank erosion and adverse water quality effects will also need to be specifically addressed.	Sec 2.1.1 Sec 6.6 Sec 12.2.1 Sec 15.5
12	Chapter F of the Rivers and Streams Recommendations Report lists specific guidelines and policies, including those for utilities and survey (including pipelines), and for the protection of recreation, nature conservation, cultural heritage and scenic values, and water quality. These recommendations should be recognised and implemented wherever relevant.	Sec 3.1.1
13	The Colquhoun Forest contains several places of high natural or cultural significance along the proposed pipeline route. The Bridle Creek (95-98.5 km) and Stony Creek (109-111.5 km) areas have been described by Biosis as being of State significance, for their floral and fauna values. Disturbance should be avoided, where possible.	Sec 15.2.6 Sec 15.2.8
14	Biosis has recommended, and DCNR has requested (Table 5.1), that the pipeline route through this forest be re-located along the disused Orbost railway line, to reduce the need for new clearing through the forest, and it is noted that Revision 8 to the route does this. However it is not only the natural values of the forest that require protection - this railway alignment also has some notable heritage values, and has been proposed for a recreational 'Rail Trail'.	Sec 15.2.6 Sec 18.3.5
15	EGP's proposed buffer of 5-10 m between the pipeline and Stony Creek and other important railway bridges may be inadequate, and could put their integrity at risk. It is inconsistent with the 30 m buffer around other historical features. Presumably the narrow buffer in forested areas is to avoid any clearing of vegetation. A compromise may be required, permitting some clearing, where necessary to allow an adequate buffer beside important heritage structures.	Sec 15.2.8 Sec 17.2.1
16	The heritage consultant comments that 'much of (the) revised section ... has not received any field assessment as part of this study' (p157). Accordingly the site descriptions and recommendations for impact mitigation are incomplete. The consultant states 'It is imperative that a further archaeological assessment of this section is conducted to ascertain the feasibility of a route through this sensitive zone and the precise impact of the development on the railway and its associated sites and structures' (p157). Further, the consultant recommends that this railway, among other sites, 'should be the subject of heritage studies conducted by multi-disciplinary teams ... as soon as possible ...' Those comments are strongly supported, and the consultant's specific recommendations 6 and 7 in particular should be implemented.	Sec 17.2.1
17	The options identified by Biosis to minimise the potential effects on various State Forest areas in East Gippsland should be implemented.	Sec 15.2.4
18	Biosis has identified the following areas as having at least Regional significance: Yeerung River West Branch (179-179.8 km), Combienbar Road (230-231.1 km), Neilson Creek (235.1 km) and Mt. Canterbury (272.9-273.5 km). Biosis' management options should be implemented for these sites also.	Sec 15.2.4
19	The proposed pipeline route traverses the Bemm River and Cann River special water supply catchment areas, identified under the Catchment and Land Protection Act 1994. These catchments provide domestic water supply to the townships of Cann River and Bemm River. Under Section 5 (1) (c) of the Land Conservation Act 1970, the Council has a role to advise on land use policy in water supply catchment areas. Particular attention should be paid to preventing water quality impacts in these catchments.	Sec 12.2.2 Sec 15.2.14 Sec 15.2.16

LANGSTON, MR A.

Issue No.	Issue	Response reference
1	It seems unlikely that if reseeding of habitat (FIS - 2.6.1.7, EIS Ch 17.) occurred many of the forb species typical of native grasslands would be regenerated. It is also unlikely that the nature of the grassland structure (shown to be important for T.l. pinguicolla) would also be maintained in such a regeneration program.	Sec 15.2.19 Sec 15.3.2
2	Avoidance of habitat areas is suggested as the prime amelioration measure for this species (FIS - 6.7.2.7) as well as a number of other measures which I fully support. Avoidance of the native grasslands would also diminish the difficulties of implementation that may arise from a NSW environmental planning policy which may restrict the clearance of this particular vegetation type.	Sec 3.1.3 Sec 15.2.19 Sec 15.4.4
3	A number of route realignments were suggested in the FIS and EIS. The current status of these recommendations is unclear in these documents especially where the resolution of map figures is insufficient to differentiate spacing between sites and the pipeline. Have these route alignments been accepted ? Clarification is required for the following sites. Monaro Grasslands (KP 390-392) was recommended for complete avoidance but appears to have the pipeline passing through one corner of the site. North Cooma Grasslands (KP 397.7-401.5) was also recommended for complete avoidance by realignment of the pipeline to the Monaro Highway. According to the FIS Figure 4 this has not happened. Is the South Michelago Grasslands (KP 449.8-450.6) avoided by the current alignment, as suggested by EIS Paper 5. East Michelago Grasslands (KP 455-455.9) is said to be of state significance. EIS Paper 5 suggests that the current pipeline route has little impact on the site. What does this mean and where is the current pipeline alignment?	Sec 15.2.19
4	FIS Table 7 lists the efficacy of the survey for T.l. pinguicolla as adequate. This is clearly not the case. Three sites were specifically identified in EIS Paper 5 as being potential habitat for T.l. pinguicolla (KP 379-384.2, KP 390-392, KP 455-455.9) yet only two were trapped using a method suitable for the species (spider tubes). EIS Paper 5 pages 79-80, also lists a number of lightly grazed grasslands between KP 370 and KP 457 which were not surveyed for T.l. pinguicolla. This species has been showed to co-exist with livestock grazing. Light grazing may well contribute to the structural diversity of grasslands (an important factor for T.l. pinguicolla). Sites were trapped in late October - early November. This is appropriate time to survey for other reptile species such as Delma impar, however, surveys for T.L pinguicolla at this time are only 20% as effective as surveys performed in March. Also the site where the single T.l. pinguicolla was found was given almost twice as much trapping effort as the other trapped site (240 burrow days versus 130). By comparison 3600 trap days yielded only 8 captures in Oct-Nov at the most significant site for the species in the ACT (1 capture / 450 trap days). Clearly the effort given to the survey of T.l. pinguicolla was insufficient to reliably identify its presence along the pipeline route.	Sec 15.2.19 Sec 15.3.1

Issue No.	Issue	Response reference
5	Some errors are present in the background information for the species that were provided in the FIS. The species are restricted to the Monaro Plains (NSW), Jerrambomberra (NSW & ACT), and Majura Valleys (ACT). It is not distributed across the Southern Tablelands of NSW (FIS - 6.7.2.1). The description of preferred habitat refers to only one of several studies (FIS - 6.7.2.4). See the section in this submission titled "Additional information relevant to the proposal" for a complete description of habitats of known sites. The reference to the lack of "intensive agriculture" at most known sites for the species is both ambiguous and misleading. Most sites in the ACT have been grazed continuously for many years. Two sites were previously ploughed and sown to crops. Another site is mown at least annually. This means three of the eight known sites in the ACT area have suffered significant disturbances. The statement that relatively undisturbed temperate grasslands are now considered uncommon (FIS - 6.7.2.3) understates the true case. This vegetation type is represented by less than 0.5 percent of its pre- European distribution and has been described as " Australia's most threatened ecosystem".	Sec 15.2.19 Sec 15.3.1 Sec 15.3.2
6	When an avoidance strategy for grassland sites is not adopted consideration should be given to timing and operations of trenching activities. Beyond agreeing with measures outlined in the EIS regarding minimisation of site disturbance and reduction of easement with other considerations should be applied. I agree that trench inspection should take place during construction (FIS - 5.6) however due attention should be paid to the cryptic nature of the species. Concerted effort should be applied to these inspections to ensure the lizards are found. These inspections should also take place when pipeline construction occurs adjacent to suitable habitat, especially during animal dispersal periods (April - June). During winter months the lizards will be in torpor. Any earth moving or grass clearing activities during this time will probably result in individual deaths. If not crushed by soil movement lizards would be subjected to the typically sub-zero temperatures of the region and would die from exposure. Earth moving activities during late Spring and early Summer will result in exposure of egg sites resulting in a loss of juvenile recruitment. Such a loss would be critical for this short lived species as it relies on high numbers of juveniles to quickly replace adults. Where sites are disturbed outside of this time surface cover must be accurately restored prior to the next winter season. Burrows, rocks imbedded at specific depths and tussocks with high basal areas all provide essential over-winter habitat for the species and must be replaced exactly as found. I agree with the FIS's recommendation that pre-construction surveys for rare reptile species should occur prior to construction. Further I suggest that these studies also occur in more marginal habitats adjacent to prime habitat. This is especially true where prime habitat has been bypassed to avoid impact on the species. It should not be overlooked that the species may exist on both the prime habitat and the marginal habitat the pipeline has been redirected through. The appropriate time for survey of T.l pinguicolla is during February and March when juvenile numbers are highest. This ensures maximisation of survey success. The EIS Background Paper 5 section "Potential Impacts on Other Areas" (pages 79-80) lists a number of disturbed grasslands sites along the Monaro that may require special attention during pipeline construction. These areas may represent marginal habitat for T.l pinguicolla. Comments made in previous paragraphs regarding trench inspections and timing of activities should also be applied to these sites if the precautionary principle for T.l. pinguicolla (EIS) is to be successfully implemented.	Sec 6.3 Sec 15.2.19 Sec 15.3.6

MARTIN, C

Issue No.	Issue	Response reference
1	General comments were made and are noted by the Project Team of EGPP.	-

MARTIN, K.

Issue No.	Issue	Response reference
1	All this is also less than the recommended 200m from my home on both sides.	Sec 19.1
2	(A) 200M away is a public easement suitable for such purposes & our local council have no objections for Woolcara Lane, to be used. (B) Just why the best arable land in the area & not the already existing easement has been chosen for a pipeline is not clear & should be more thoroughly investigated.	Sec 6.1
3	We are not able to cope with the additional burden of a gas pipeline & its possible hazards.	Sec 19.1
4	Most blocks affected have not been developed to their full potential & the pipeline inhibits further activities. An easement of 20M wide with a pipeline in, or/above devalued our blocks should we decide to sell. It also effectively reduces our chances of a sale at all, as most people will not buy blocks with easements.	Sec 18.2.3
5	Invasion of our privacy is also another factor not taken into account. Checking & rechecking, for subsidence, weeds, pasture return & so on mean that the area will be traversed. Our ability to utilise our ground during construction is also halted. The noise & dust further hamper our day to day activities.	Sec 18.2.5
6	The birdlife and wildlife being encouraged in our area by tree planting & dam building & leaving pastures to return to native grasslands have also not been taken into consideration.	Sec 18.2.5

McCubbin, Dr J.

Issue No.	Issue	Response reference
1	Emissions: The consultants report indicates that emissions of oxides of nitrogen (NOx), will be in the 0.1 - 0.3 g/m3 range. They also state that no information is available for existing conditions at Longford. It must be assumed that they are only guessing at the emissions from the existing compressor station. Since their other predictions are based on modelling using "state of the art" compressor technology, it seems likely that these figures have been arrived at by simply trebling the figures for one compressor. The existing compressor at Longford is old enough to be somewhat less than "state of the art". If its emissions are significantly higher than predicted then the emissions from the completed project may well be above the allowed levels. Particularly since it is indicated that acceptable levels of NOx may be tightened. In addition, the other activities at the Longford Gas Plant such as flaming off which are already a significant concern, don't appear to have been factored in to the equation. It is my view that it is incumbent upon the proponents to provide adequate data about the existing conditions before we go accepting additional pollution. As a local I would like to see independent analysis over at least 12 months, covering all seasons and including data from night and weekends when existing activities are certainly more obvious. It is not unusual to see a huge red glow in the sky which is sometimes accompanied by a rumbling sensation through the ground, felt several kilometres away.	Sec 14.2.1
2	Natural Heritage: A major defect in this document is that invertebrates are completely ignored. It is conceivable that some of these lifeforms will be very significantly affected during construction. Rare species may be wiped out while others might tend to plague proportions. Some, may be inadvertently introduced into areas where they could cause new agricultural pest problems or secondarily damage fragile native ecosystems. Whilst it may be a daunting task, I believe that sources such as DCNR, NSW NPWS, CSIRO and state and national museums would already hold significant data which could be used to delineate problem areas and suggest mitigation measures. I do not believe that such a significant part of any ecosystem can be treated as if it does not exist!	Sec 15.3.1

National Parks Association of NSW

Issue No.	Issue	Response reference
1	The groups however are adamant that the Commission of Inquiry not take place until the East Australian Pipeline Ltd (EAPL) proposed Wondonga to Wagga Wagga EIS is released and comments from the community in Victoria and NSW are submitted. Both the BHP/Westcoast Energy proposal and the EAPL proposal must be considered simultaneously at a Commission of Inquiry so that an opportunity is provided for comparative comment on the environmental impacts of each route and the community can fairly assess the implications of the different proposed routes.	Sec 4.4.1 Sec 5.3

Issue No.	Issue	Response reference
2	At two meetings initiated by BHP in late 1994, NSW environment group representatives informed BHP representatives that we were opposed to five of their six proposed corridors. The 'Western Corridor' was the only route that appeared to be the least environmentally damaging. We were informed that the groups would be consulted on the selection of a preferred route, so it was with surprise that in late January to early February 1995, after the BHP's announced alliance with Westcoast Energy (6/12/94), to be told that a preferred route had been chosen. The groups played no part in the choice of corridor alternatives or the preferred route.	Sec 5.1.1
3	We have consistently stated the alternative Western Route appears on preliminary appraisal as more likely to be an environmentally responsible route. The Western Route is the least disruptive to the natural environment and involves only 124 km that is not along a pre-existing pipeline easement.	Sec 5.1.1 Sec 5.1.2
4	We have requested and urged that a detailed and comprehensive environmental assessment of the Western Route be included in the EIS. However this has been to no avail, with the proponents only willing to present their preferred route in the EIS as a fait accompli.	Sec 5.1.1
5	We are appalled at the EIS which is a superficial, insufficient document and which does not contain specific descriptions of what the proponents will do at any particular point. The data presents only a generalised baseline from which to judge the subsequent damage to be caused by the pipeline construction and operation.	Sec 2.2.1
6	Site-specific field studies are still needed before the most suitable excavation methods and river crossing points can be decided. These have apparently not been carried out. There are constant references to the need for detailed work on many of the crossings. There is no statement of the specific impact on the environment of any drainage crossing, as the method of crossing has not been decided, nor has the location of any specific crossing point been decided.	Sec 2.2.1 Sec 6.6
7	The hydrology study was carried out on a superseded route (Route 5), and although the later route (Route 8.1) is even outside the two-kilometre wide corridor in places, and crosses drainage lines not considered by this study, no revisions have been made.	Sec 2.1
8	Several statements to the effect that the shortest distance should be the primary control on the route indicates a mind-set that is at odds with the mitigating damage to the environment and often with economic reality.	Sec 2.1
9	Excavated material from several hundreds of kilometres will be disposed of on the surface of the easement and its surrounds. Spreading raw clay, sand and rubble indiscriminately along the pipeline route is deplorable.	Sec 11.2

Issue No.	Issue	Response reference
10	(a) Every 15-35 km grease-laden water with metals and chemicals from welding will be allowed to soak into the ground, unless it can be poured straight into the river system. (b) The proposed route will result in serious disruption and damage to flora and fauna on and near the route. The route cuts through a particularly wide range of habitats and communities and there is not a suitably comprehensive faunal study of the pipeline route. On the basis of the information given in the Background Paper No. 5 only some of the most intact or obviously promising sites were assessed briefly for fauna. Almost no information is given on which sites were selected for more detailed faunal study, or of the range of survey techniques employed at particular sites, or of the duration's over which particular sites were assessed. The implication of what is stated in the Background paper No. 5 is that the faunal survey was a best patchy and incomplete in its coverage. There is a high probability that some and possibly many areas providing faunal habitat for species significant at the regional, state or national levels remain undetected. A possible example exists in the Primrose Valley and Molonglo River Floodplains (MV) where a sometimes modified flora occurs over what were previously lowland grasslands. These areas provide possible habitat for Delma impar, the nationally vulnerable Striped Legless Lizard. Given the current impoverished state of knowledge of Australia's ecological resources, reliance on external sources is unlikely to have filled in much of the missing data. On the basis of existing information in the Background Paper No. 5, there is a high probability that construction of the pipeline will lead to undetected and sometimes major impacts on populations of significant faunal species.	Sec 6.10 Sec 15.3.1 Sec 15.3.2
11	The route will also impact on the Illawarra Escarpment which is nominated for listing on the Register of the National Estate.	Sec 15.2.25 Sec 15.8
12	The proposed route crosses extensive areas where moderate to severe construction and maintenance problems will be encountered.	Sec 6.8
13	An aggregate length of over 290 km (at least 294.3 km) of the currently preferred route will experience severe geotechnical problems ('areas of severe constraint'); in addition a total of 493 km of the route will have originally stable slopes or moderately severe drainage problems. This equates to 548 km of the route with moderate to severe drainage and slope stability problems. In addition for 310 km the soil and rock removed from the pipeline trench may be unsuitable for use as backfill, and will be dumped.	Sec 6.9 Sec 10.1 Sec 15.2.21
14	The proposed pipeline would apparently be flooded for seven kilometres by the Welcome Reef Dam if this proposal was to be considered.	Sec 15.2.21

Issue No.	Issue	Response reference
15	The structure of the energy sector in Australia is currently in the process of restructuring. The process has so far consisted of the development of a competition policy. What is lacking at both State and Federal levels is a real energy policy with a framework of effective policy and regulations. Cheap power is of particular concern to businesses that are massive power users. Dr George Wilkenfield, a Sydney energy consultant (Australian Financial Review 14 June 1995) points out that market research shows that greater energy efficiency, less pollution and greater use of renewable forms of energy are the real issues of the 1990s. In Western Australia proposed regulations covering gas distribution have two guiding principles covering economic efficiency (Gas Distribution Access - Outline of Principles Dec 1995 p4). The tariff and provisions should be economically efficient to ensure: 1. Others are not encouraged ... to build unnecessary pipelines: and 2. customers are not encouraged ... to site their operations in sub-optimal locations. In this context the current pipeline and the preferred route of BHP/Westcoast Energy is primarily to supply the energy-hungry steelworks at Port Kembla with the cheapest possible power, and at the same time must be examined in the context of the industrial battle between BHP and EAPL for control of the lucrative Victorian and New South Wales gas market.	Sec 4.4.1
16	The construction of a private pipeline on a completely new alignment is not in the interest of either the environment or the community.	Sec 4.7
17	We are very concerned that there is not yet an appropriate regulatory and planning framework in place to cater for energy infrastructure. National sustainable energy and gas grid policies must be in place before a Commission of Inquiry can assess this proposal. Without a framework in place there are no rules for planning, placement, maintenance and responsibility.	Sec 4.4.1
18	The late establishment of the Victorian Consultative Committee and release of the Draft Scope prior to their first meeting, meant that the committee played no part in the decision making process for the proposed route. Hence, the choice of corridor alternatives and determination of the contracts for specialist studies was made solely by the proponent.	Sec 2.3.5
19	Regrettably, the attitude of the proponent is that it is only interested in building a pipeline on it's preferred route - the Eastern Corridor. Even though this route poses unacceptable impacts on the environment it is somewhat shorter than other options, providing a number of advantages for the proponent. Thus, there is a strong possibility that all alternatives were not seriously examined and that assessment was sub-standard. Experience has shown that a proponent preferred option is not always the best. For example, the route adopted for the Moomba to Sydney gas pipeline was not the one preferred by the company. Conservation groups believe the gas pipeline should follow the existing easement on the Hume Corridor, minimising environmental impacts. The proponent has failed to adequately examine alternative and viable routes as part of the EIS. Joint peak groups believe the alternative western route is a more environmentally responsible route as it is likely to cause less damage to natural environments and pose the lest management difficulties. However, this can not be determined unless substantive research is done through this area to ensure suitability and would not be recommended by environment groups until this time.	Sec 5.1

Issue No.	Issue	Response reference
20	To build the gas pipeline, along the route proposed, a 20 m clearway would be needed through East Gippsland forests, Morton National Park, 1,000 water courses, 9 rivers, 530 private properties and Sydney's water catchment areas south of Sydney. Additionally, there are 300 archaeological sites on the route and 27 streams of high ecological value that are susceptible to ecological disturbance.	Sec 12.1.1 Sec 15.2.4 Sec 15.2.23 Sec 15.2.26 Sec 15.5.2 Sec 16.1.3
21	There is also a potential impact associated with construction activities, like spread of weeds and dieback along the pipeline route.	Sec 15.4.5 Sec 15.4.6
22	Moreover, some areas require blasting to bury the pipeline.	Sec 6.5
23	Concerned residents of East Gippsland fear the proposed pipeline will put a cheap and abundant energy source into this far eastern corner of Australia, where presently there is no adequate energy infrastructure to support a large industrial or mineral development. The proponents preferred route clearly compromises ecological values and opens up the green corner of Victoria to further exploitation. Alternative routes are available and the proponent has failed to include a detailed assessment of these as part of the EIS currently in place.	Sec 4.1.1
24	There is insufficient detail concerning the management of impacts on the proposed route. The proponent claims that all environmental problems are 'manageable' but they are yet to spell out what they perceive to be the problems and exactly how they are going to be managed. Furthermore, the EIS does not define the exact and final alignment of the pipeline or describe how each stream crossing will be engineered. The details, as argued by the proponent, will only be sorted out once approval for the pipeline is granted.	Sec 2.2.1
25	There is a lack of an agreed national sustainable energy policy and the lack of a policy or a plan for a national gas pipeline grid. Clearly the proposal has the potential to affect the use and development of other energy sources. Hence, we are very concerned that there is not yet an appropriate regulatory and planning framework in place to cater for energy infrastructure which could burgeon under the new national electricity and gas grids.	Sec 4.4.1
26	The BHP/Westcoast consortium may also have a hidden agenda in that the pipeline proposed has the potential to carry up to 90 petajoules of gas, almost as much as Sydney's current total gas consumption, and will have some 20 offtakes along it. Consultants say the Sydney gas market will grow to 50 petajoules per year over the next decade but as BHP have already stated the preferred route will supply 90 petajoules - where is the extra 40 petajoules going.	Sec 4.4.1
27	Furthermore, the BHP/Westcoast proposal is strongly linked to pulpmill/MDFG plant development along the route - eg. a mill at Orbost based on the so-called residual roundwood of East Gippsland forests. This pipeline could also supply gas to BHP's own steelworks at Port Kembla as well as CSR's new wood plant at Bombala and elsewhere, as it will put a cheap and abundant energy source into the far eastern corner of Australia where there is not at present adequate energy infrastructure to support large industrial or mineral development.	Sec 4.1.1
28	EAPL/GTC say their proposal is the "logical link" using much existing pipe and highly competitive tolls. Both proposals should be considered simultaneously so options for minimising any adverse impacts can be properly assessed and opportunity provided for comparative comment on the environmental impacts of each route. In turn, this may allow for joint use of a single pipeline wherever technically feasible to be enforced rather than installation of multiple pipelines.	Sec 5.3

Issue No.	Issue	Response reference
32	The majority of the flora survey was conducted at a time of year when many seasonal plants were dormant below the soil surface. Dried remains and immature buds of some species were found but additional species would be found if the entire route were surveyed in spring. Areas such as the Monaro Plains are dominated by grassy ecosystems which contain a wide array of annual and/or seasonal species. Thus, it is likely that this proportion of the route would contain more plant species than the survey recorded. Moreover, the plains are still recovering from a severe drought and are heavily grazed.	Sec 15.4.1
33	The majority of the fauna survey was carried out over short time-frames during winter when amphibians, reptiles and bats are rarely encountered and migratory species may not be present. Additionally, the spring surveys only targeted specific locations.	Sec 15.3.1
34	All stream ecology assessment occurred over only one week during the middle of winter. Identification of streams to be affected by the pipeline route relied entirely on the 1:25,000 topographic and supplied GIS maps. The conservation value index was derived with an emphasis on fish and crayfish only, as these are the taxa for which information on conservation status is adequate and the general public are familiar with them. Derivation of the approach hazards index involved a range of features of the pipeline route approaching stream crossings. Variables such as bank slope are susceptible to weaknesses as slope features of the immediate stream bank can be overlooked due to lack of detail on the examined map. Likewise, the extent of the catchment in near pristine condition was estimated by examining aerial photographs and topographic maps. A homogeneous forest canopy was taken to be the best indication of near pristine conditions even though disturbance could be present under the canopy.	Sec 15.5.1
35	There were major gaps in the coverage of information on soil erodibility and acidity. Some of the information was primarily focused on landforms and lithology with soil erodibility failing to be specifically addressed. Furthermore, substantial sets of turbidity data were available for only 29 sites along the pipeline route, some of which were not even located on streams which intersected the route and hence only provided and indicated an indication of stream conditions in areas near the route.	Sec 2.1 Sec 2.2.1 Sec 11.1 Sec 11.3
36	On the Gippsland coastal plains the route passes through a relatively intact isolate of Coastal Grassy Forest.	Sec 15.2.3
37	Substantial lengths of the route between Bruthen and Nowa Nowa pass through native Gippsland coastal forests not adjacent to an existing track where old-growth forests are rare and restricted.	Sec 15.2.10
38	Between Nowa Nowa and Orbost approximately 5 km of native forest, including relatively undisturbed areas, are traversed and at the Reed Bed Creek crossing the proposed corridor passes through relatively intact and floristically diverse native vegetation.	Sec 15.2.16
39	Soil disturbance in the Mountain Valley along the route usually results in massive weed invasion and often a significant reduction in native species richness.	Sec 15.4.5
40	Reference to the maps provided in the Fauna Impact Statement indicates that the field survey was unable to provide 100% coverage of the route. It is therefore considered important that sites considered to provide potential habitat are also protected wherever feasible.	Sec 15.3.1
40	Following this the greatest impact on the vegetation of the Mountain Valley region has been subdivision into small blocks, a likely impact of the proposed pipeline corridor.	Sec 15.3.3

Issue No.	Issue	Response reference
41	Much of the vegetation and hence habitats in the Hoskinstown - Nerriga Hills and Morton Plateau and slopes regions are considered to be in good if not excellent condition, a facet that is unlikely to remain if this project goes ahead.	Sec 15.2.20
42	Much patchy remnant vegetation exists on the Illawarra Coastal Plains and Wilton Tablelands which still contain plant species of conservation significance, yet the proposed easement passes right through these areas.	Sec 15.2.24 Sec 15.2.26
43	The route frequently crosses the upper catchment areas in NSW creating possible adverse implications for downstream areas.	Sec 12.1.1 Sec 15.5.2
44	Re-routing is often an adequate method of reducing impacts, however the exact position of the re-routing has not been specified.	Sec 2.1 Sec 15.1
45	Controls to minimise sediment inputs into streams are still primarily theoretically based and hazards may be elevated in situations where valuable stream features, such as productive riffles or beds of aquatic plants, are a short distance downstream of crossing points.	Sec 2.2.1 Sec 15.5.1
46	However, there appears to be no available data on these two crossing techniques, and so it is very difficult to make effective assessments of either.	Sec 6.6 Sec 6.7
47	Thus, the impact cannot be properly assessed until such time.	Sec 2.2.1
48	The proposed route of the Eastern Gas Pipeline passes near three areas identified as wilderness - ie. areas remote from settlement and access with a significant degree of aesthetic and biological naturalness. There have been proposals to list both the Victorian Alps and the Blue Mountains as World Heritage areas, both of which exist along or near the route corridor. The pipeline route also transverses the headwaters of some streams which later flow into the Croajingolong National Park.	Sec 15.7
49	The proposed route for the pipeline also encounters 14 areas listed on the Register of the National Estate by the Australian Heritage Commission. These are areas considered to have a national importance because of their high conservation significance and certain features which are considered of importance to the Australian Community as a whole.	Sec 15.8
50	The report shows every sign of being a rushed job. There are constant references to the need for detailed work on many of the crossings. Only seven days were spent in site visits, and no measurements were made, or samples taken. Only five rainfall stations were used for the whole route.	Sec 2.2.1
51	As no chemical analysis of groundwater in NSW appear in the report, there is no consideration of upland saline groundwaters, become more common in southern New South Wales.	Sec 12.4.1 Sec 12.4.3
52	When the report was written, in November 1995, the proposed route would be under the site of the possible Welcome Reef Dam for seven kilometres.	Sec 15.2.21

Issue No.	Issue	Response reference
53	Information on groundwater was collected from three sources: • geological maps at scales of 1 : 250,000 and 1 : 3 million! • water bore data bases - all bores within one kilometre of the route (see note on Appendix below) • NSW State groundwater quality map - 1: four million, and groundwater pollution risk map (1 : 2 million) p.21 "No assessment of the potential impact resulting from the construction of the proposed pipeline on groundwater was made during the field survey. The data obtained were, in some cases, insufficient to define specific aquifer characteristics such as groundwater depths and quality." p22 "Site specific data on the depth of groundwater, substratum permeability and recharge rates are not available".	Sec 12.4.1
54	This presents information calculated for each drainage crossing. Unfortunately, while most of the codes can be understood, there is no key, or explanation of code letters such as CM, R, G, S, or T.	Sec 12.2.1
55	This consists of a print-out of water bore information for Victoria and NSW. None of the waterbores tabulated for NSW contain any information on the chemical composition of the ground water. There are numerous cases where the same borehole is allocated to two separate parts of the pipeline route, in apparent duplication. There is no explanation of many of the categories listed. Several of the water bore data sheets contain apparent errors in the date of drilling. There appears to have been little or no checking of this data. In addition, none of the bore are specifically referred to in the text of the report.	Sec 12.4.1
56	The information does not report the environmental impact of the pipeline.	Sec 2.2.1
57	An aggregate length of over 290 km (at least 294.3 km) of the currently preferred route will experience severe geotechnical problems ('areas of severe constraint'); in addition a total of 493 km of the route will have marginally stable slopes or moderately severe drainage problems. This equates to 548 km of the route with moderate to severe drainage and slope stability problems. In addition for 310 km the soil and rock removed from the pipeline trench may be unsuitable for use as backfill, and will be dumped.	Sec 10.1
58	The danger of mine subsidence is based solely on the presence of a formally notified 'Wilton Subsidence Area', and no reference has been made to any publications or mapping by the NSW Department Minerals and Energy. As the any coal mining will take place underground, the report claims that a surface pipeline would not sterilise any resources.	Sec 10.3
59	It is disturbing that of the 25 references quoted by the consultant, only one refers to soil properties, and that is a 25 year old guide identifying Australian soils. No subsequent work on soil behaviour, particularly with regard to the erodible soils of southern NSW appears in the list of technical references.	Sec 11.1.1
60	The only examples are three pre-1990 earthquakes from the US, and one from the Northern Territory. Fourteen of the 25 references quoted are to US publications dealing with earthquake risks.	Sec 10.2
61	It would also avoid time-consuming and expensive negotiations with private, corporate and government land owners, involved in a totally new route.	Sec 5.1.1 Sec 5.2

Issue No.	Issue	Response reference
62	World heritage values are the highest possible values of significance for conservation. Their nature is defined in the World Heritage Convention and the criteria for identification, inscription and management are found in operational guidelines. The Draft EIS refers to world heritage values but does not state what they are, does not identify the extent of the world heritage proposals and does not assess the impact of the pipeline against these considerations, less than half a page of comment in the Flora, Fauna and Ecology Report (No. 5) and a subheading in the Draft EIS. This is transparently inadequate.	Sec 15.6
63	The proposed pipeline affects several East Gippsland parks including Lind, Coopracambra, and Croajingalong.	Sec 15.2.4 Sec 15.2.15
64	These include Morton National Park and Woronora Plateau (Sydney Water Board Catchment), both proposed to be traversed by the pipeline.	Sec 15.2.23 Sec 15.2.26
65	3.1 The brief reference to world heritage in 12.4 (Draft EIS) is highly deficient in that it does not: • accurately identify the proposed world heritage areas (eg. the Woronora Plateau is not mentioned). • analyse the likely impact in terms of the approved world heritage criteria. 3.2 As a result of such obvious shortcomings, glib statement like 'within Victoria the pipeline has --- no visual impact on world heritage values' and 'impacts on world heritage values in Victoria will be nil', have no value.	Sec 15.6
66	3.3 A proposed realignment of the pipeline at Chandlers Creek (see Table 5.1) has been recommended to reduce exposure to ground instability but there is not even an acknowledgment that it will increase the exposure of world heritage values in Coopracambra National Park.	Sec 15.2.4 Sec 15.2.17 Sec 15.6
67	3.4 The proponents have misunderstood the Kirkpatrick review. His main brief was limited to the Alps section. He was agreeing with the government position that the East Gippsland parks would strengthen the nomination, not proposing its extension for the first time.	Sec 15.6
68	3.5 There is no more detail in Report No 5 than in the Draft EIS. The major relevant document by Busby is not referred to. What this suggests is that the revision of the Draft Scope to require Biosis Research (author of Report No. 5) to make amendments has not been treated seriously. International biological significance is entirely missing from the report's analysis.	Sec 2.2.1 Sec 15.3.2
69	Both the Revised Draft Scope for the Environment Effects Statement, Victoria, and the NSW Director General's Requirements requested that the World Heritage impacts be assessed. These requirements have not been met. It is obvious that if the proponents do not understand the world heritage values affected they are in no position to assess the impacts. Clearly, in this instance, ignorance reigns supreme and the comments made in the Draft EIS are worthless.	Sec 15.6

Issue No.	Issue	Response reference
72	The draft EIS has misrepresented and overstated the Greenhouse benefits of the project. The benefits of the project, both to energy consumers and economy-wide, as well as ESD benefits in general, are likely to have been misrepresented by not having adequately assessed alternative energy investment options, particularly in the area of energy efficiency and demand management. The draft EIS has estimated that the proposed pipeline will lead to a net annual reduction of 2.4 million tonnes (Mt) of CO2, due principally to the displacement of coal combustion in power stations. While the displacement of coal combustion is desirable, a key issue which needs to be examined is whether the gas pipeline development represents the most appropriate and cost-effective means of achieving Greenhouse gas emission reductions.	Sec 4.6 Sec 4.6.1
73	The 2.4 Mt savings estimate is difficult to verify due to insufficient data on intended uses for the gas.	Sec 4.6 Sec 4.6.1
74	Even if the estimate is correct, it is inappropriate to attribute pipeline-related emissions to 'industrial processes'. The combustion of natural gas is, for the purposes of the National Greenhouse Gas Inventory, an energy-related activity. Energy-related Greenhouse gas emissions were 282 Mt in 1990 and are projected to increase by 57 Mt to 339 Mt by 2000. 2.4 Mt therefore represents only 0.9% and 0.7% of 1990 and 2000 energy-related emissions respectively	Sec 4.6 Sec 4.6.1
75	The emission savings from the gas pipeline will not be fully realised until 2010, some years after current target periods.	Sec 4.6
76	Mitigation costs for the Eastern Gas Pipeline of 160 $/tonne are based on the investment costs, outlined in the draft EIS, of $383 million to achieve total annual emission reductions of 2.4 Mt. By contrast, mitigation costs for alternative CO2 reduction options were assessed by consultants for the NSW Sustainable Energy Fund Working Group (SEFWG 1995). The consultants concluded that annual emission savings of approximately 2.4-3.0 Mt of CO2 could be achieved at between 5 and 36 $/tonne, significantly lower in all cases than the gas pipeline. It is notable too, that in all cases, the outlays recommended by the consultants on the various emission reduction options (energy efficiency, renewable energy and co-generation) would represent only a fraction of the cost-effective resource potential of those options.	Sec 4.6 Sec 4.6.1
77	The Eastern Route, particularly during the construction phase. Moreover, the Greenhouse benefits of a pipeline established via the Western Corridor are likely to be as great or greater than the Eastern Route, albeit at an, arguably, higher cost.	Sec 5.1.1 Sec 5.1.2
78	Energy sector and economic implications of the Eastern Gas Pipeline have been assessed in Background Paper 16 and summarised in Chapter 3 of the draft EIS. It is argued that the framework used for this assessment is flawed.	Sec 4.2.1 Sec 18.1.1
79	Increasingly, it is being recognised that the focus of energy planning needs to be on energy service provision (including demand management/energy efficiency) and not simply fuel expansion and substitution to meet preordained energy demand projections. A thorough energy sector assessment, therefore, requires examination of the full range of options available to meet Australia's and NSW's current and future energy service needs, including an analysis of the most cost-effective option(s) on a long term, economy-wide basis. This is the essence of integrated resource assessment, something which the Energy Issues paper did not attempt.	Sec 5.4
80	Discussion is focussed on only two options for meeting NSW's future energy service needs: the 'pipeline' option or the 'no pipeline' option.	Sec 5.1 Sec 5.2 Sec 5.3 Sec 5.4

Issue No.	Issue	Response reference
81	Claims in the draft EIS (sections 3.5 and 3.64) that the project will help to stimulate energy efficiency and research into renewable energy are dubious at best. In the absence of specific programs to this end by the project proponents, the reduction in both gas and electricity prices resulting from the project, as claimed in the draft EIS, will have the opposite effect.	Sec 4.2.2
82	Assessment of the costs and benefits for energy consumers of the project has failed to take into account benefits which might accrue to consumers from investments in other energy service options such as demand management programs.	Sec 5.4
83	Modelling of the macroeconomic implications of the project has failed to take into consideration the opportunity cost of investments foregone in alternative energy investments such as energy efficiency. The last two points are particularly relevant in lieu of the findings of consultants for the NSW Sustainable Energy Fund Working Group who have determined that the maximum annual cost-effective resource potential for energy efficiency in NSW is 23,800 gigawatt-hours across all sectors. This is equivalent to approximately 86PJ and therefore represents about double the 'resource' potential of the pipeline. It is likely that a series of strong demand management programs, designed to fully capture this energy efficiency potential would have greater economic benefits, lower environmental costs and represent a larger energy resource than the pipeline. In other words, demand management and energy efficiency represents a more appropriate option from an ESD perspective than the proposed Eastern Gas Pipeline.	Sec 4.2.2

NATIVE FOREST NETWORK

Issue No.	Issue	Response reference
1	The EGPP will have a major impact on the natural environment. The project should only go ahead if there is a genuine community need, not anticipated growth. Gas provision should be off set by a provable reduction in greenhouse gases from other power generators (ie. no net greenhouse increase). The route should NOT traverse any areas of high to moderated conservation value, and should be restricted to areas where the displacement of natural vegetation and fauna populations in high (ie. adjacent to freeways, etc.).	Sec 2.1 Sec 4.5 Sec 4.7

NSW DEPARTMENT OF ABORIGINAL AFFAIRS

Issue No.	Issue	Response reference
1	The Department of Aboriginal Affairs (DAA) expressed concerns about the draft EIS, which still apply. I feel the following matters should be addressed. It is still unclear from the information provided in the EIS if the Aboriginal Archaeology and Anthropology Background Paper was circulated to all relevant Aboriginal groups for comment. It is also still unclear if the classification of Aboriginal sites on the basis of high and low significance was decided in consultation with the relevant Aboriginal groups. Only Aboriginal people would be equipped to determine this, and it is their view that should be paramount.	Sec 2.3.3 Sec 16.1.1

Issue No.	Issue	Response reference
2	The proponents were earlier advised that the definition of 'Aboriginal Significance' should be expanded to include cultural heritage, social and spiritual values and interests of a place held by the local and wider contemporary Aboriginal community, rather than being limited to merely cultural values (refer para 5.7). Given that the appropriate definition may not have been applied in undertaking research, it may be necessary for the current identification and assessment of Aboriginal sites to be reconsidered.	Sec 16.1.1 Sec 16.2
3	The DAA has strong concerns about the degree of reliability placed on the academic studies and models used to identify and assess Aboriginal archaeology and anthropology. Consultation with Aboriginal communities and organisations is essential here to ensure traditional Aboriginal interests and values are properly identified, assessed and protected.	Sec 16.1.1
4	In addition to the above, the DAA is very concerned about the consultation with the relevant Aboriginal people regarding native title. All Aboriginal people whose native title rights or interests that might be potentially affected by the proposed pipeline should be properly informed. The DAA is trying, with the cooperation of the proponents, to monitor this but the proponents do not appear to be entirely forthcoming by providing the information as requested.	Sec 2.3.3 Sec 16.3
5	The proponents state that they want to be seen as acting 'equitably and fairly' and have 'consistent principles' towards Aboriginal people and landowners. This Department would like to be assured that this is in fact the case.	Sec 2.3.3

NSW Department of Land and Water Conservation

Issue No.	Issue	Response reference
1	1a. The mitigation measures for protecting stream banks and river beds from erosion are inadequately described. Details of the type of crossing proposed for each stream are not identified in the EIS. Only some streams have a crossing type nominated that may be used. The EIS does not contain adequate details about the rehabilitation of the disturbed stream banks at the point of crossing. Neither are sufficient details provided about additional works such as holding ponds for flumes or points of entry for draining good quality bore water. 1b. Several brief references are made to the use of geotextile fabric to stabilise stream banks at the pipeline crossing. Such measures may not be sufficient. It will be necessary to consider the whole reach as to its stability. Water impounds will be necessary where flumes are to be used during trenching stream beds and for settling bore water before releasing it into surface waters. 1c. Site specific management requirements will be developed in consultation with relevant authorities and incorporated into detailed designs which will be submitted in draft form to these authorities for review and comment. 1d. Land application is nominated for the disposal of hydrotesting water however no mention is made of how the water will be treated in the case that the water contains anti-corrosives or weld fragments. The location of the land to which the water will be applied is also not described, its capability and suitability for water application or the method of application. In addition, the acres of land and the volume of water are not identified.	Sec 2.2.1 Sec 6.6 Sec 6.10 Sec 12.2.3

Issue No.	Issue	Response reference
2	A rock jacket is proposed to protect the pipeline in some places but may not adequately achieve this end. The EIS does not consider the shifting and highly mobile nature of the Numeralla, Bredbo and Molonglo Rivers. The mobile nature of these river beds is likely to present problems for the integrity of the proposed pipeline as the upstream sections of these rivers are progressively stabilised. Further details are required about activities that are likely to affect the quality of the water supply. Details that should be addressed include: surface water runoff from equipment clearing (for vehicular hygiene) and refuelling areas, wastes from construction sites and construction camps, leachate from acid sulfate soils around the Illawarra and Shoalhaven areas. The EIS does not describe adequate safeguards to minimise the entry of pollutants, nutrients and sediments into the water catchment area.	Sec 2.2.1 Sec 6.6 Sec 6.13 Sec 11.3 Sec 12.1.1 Sec 12.2.3
3	No mention is made of how the impact of stream bed blasting on aquatic life will be determined.	Sec 6.5.15
4	The EIS mentions, but does not describe, the use of fallen trees for temporary bridges. Because of the high sedimentation and turbidity risk usually associated with temporary log bridges and their associated works, this technique is not acceptable.	Sec 6.2
5	No consideration is given to the impacts that lowered watertable will have on neighbouring bore holders. Measures should be considered for mitigating those effects, such as providing an alternate water source.	Sec 12.4.2
6	The EIS notes that 27 wetlands including a site of "biological significance" will be crossed but does not provide adequate details of those wetlands or mitigation techniques to assess the potential impact on each of those areas. Mitigation measures listed for these areas should be applied to all water crossings to prevent degradation.	Sec 2.2.1 Sec 12.3
7	Mitigation measures listed for these areas should be applied to all water crossings to prevent degradation.	Sec 2.2.1
8	The tight timing of construction (described in background paper No 8 Planning and Land Use) allows little flexibility for avoiding critical breeding and nesting periods for wetland dependant fauna.	Sec 15.5.2
9	The basis upon which the conservation status of the streams and catchments were assessed appears narrow, focusing primarily on fish and crayfish as indicators. The diversity of aquatic and terrestrial fauna and flora, water quality and the wild and scenic river values were not considered.	Sec 15.5.1
10	No mention is made of : a flood warning system and action plan for flood response, contingency maintenance plan should the pipeline be damaged by floodwaters during and/or after construction.	Sec 12.5
11	The EIS does not identify the contaminated sediments in the river bed and floodplain of the Molonglo River. The origin of these contaminated sediments is the Captains Flat mines. They are liable to be disturbed and mobilised by trenching the river and if floods occur during trenching across the floodplain.	Sec 12.1.1

Issue No.	Issue	Response reference
12	No details approximating an erosion and sediment control plan are included in the EIS. Extensive lengths of the pipeline traverse extremely dispersible soils. Fewer areas are identified as dispersible than reconsidered dispersible by professional soil conservation officers at the local DLWC district offices.	Sec 11.1.3
13	No reference is made to straw mulching as a revegetation technique of difficult sites such as shallow soils and steep slopes, nor has the extensive need for sediment fencing been noted.	Sec 11.1.3
14	The topographic constraint categories are not considered characteristic of the typical classes of erosion hazard, as follows: • Topographic Constraint ; Slope Class (DLWC) ; Slope Class (EIS) • Nil or low constraint ; 0 -10% ; <20% • Moderate constraint ; 11 - 20% ; 21 - 30 % • Severe constraint ; .20% ; .30% Some question is thrown on the laboratory soil tests as follows: • The dispersion test is not familiar to any of this Department's soil testing laboratory staff or local field staff. The units on the dispersion test are also unfamiliar and no explanation is given in the text. • The particle size analysis is too crude for use in estimating the erosion hazard or planning revegetation. It adds no further information to the hand texturing carried out in the field • No information is given about the fertility of the soil, which is used for revegetation planning.	Sec 11.1.1
15	The EIS nominates the excess rocky spoil is to be blended with materials on the easement and surrounding area. Insufficient detail is provided about how this will be done. Where it contains coarse fragments (>2mm mean diameter) it may increase the erosion hazard of the site and reduce the capability for revegetation.	Sec 6.9
16	Issues of concern not addressed by the EIS are: • construction measures to address the extreme erosion potential of the dispersive soils and subsoils found on Ordovician Metasediments (not only granite areas mentioned in the EIS) in the Mountain Valleys section of the proposed pipeline; • the wind erosion potential of the aeolian sands that dominate many of the topsoils; • soil chemical status as related to revegetation; • wet weather trafficability over the entire pipeline; • subsoil waterlogging; • accurate assessment of subsoil dispensability; • the poor capacity for vegetation regeneration between the NSW border and the Nerriga Hills due to nutrient poor soils, cold temperatures and low rainfall.	Sec 2.2.1 Sec 11.1.1

Issue No.	Issue	Response reference
17	A large volume of laboratory and field assessment data available in Braidwood, Michelago and Cooma Soil Landscape reports has not been referenced in the report at all. The presentation of soil data is also lacking in clarity. No graphical representation of the data is made, nor are soil sampling sites shown to be relevant to the proposed pipe location. Indeed, the sampled sites are next to main roads that are not indicative of general soil conditions along the route. No data is presented from known areas of erosion along the route. The soil data should be presented in S1 or at least Australian standard units as used in the Australian Soil and Land Survey Handbooks or Charman and Murphy (1991). The unit M for dispersibility is not a well-known unit, nor is any explanation of the test provided in the text. The importance of using widely recognised test for soil dispersibility is based on its significance for erodibility, trafficability, rehabilitation, water quality and other issues arising from these matters.	Sec 11.1.1
18	The techniques for revegetation are not given in sufficient detail. Local native species should be used on riparian strips, wetlands, State Forests, National Parks and other areas currently dominated by native vegetation, to minimise the impact on the local ecosystem and increase the persistence of the ground cover. The mitigation measures for achieving fire protection and optimum market values for timber involves timing commitments that conflict with those given in background paper No. 8 Planning and Land Use.	Sec 2.2.1 Sec 7.1
19	Areas next to the Corang River are known to contain the rare and endangered plant species, Calyptras oblonga (Tasmanian Cypress Pine). Although the Department will be required to address the project's impact on plant communities such as this, the documents fail to recognise this significant plant species within the Braidwood district.	Sec 15.4.3
20	The EIS does not include checks of vegetation cover in the maintenance planning. If revegetation were to occur "in the most appropriate season", as one part of the EIS nominates, the work site would be a barrier to movement of small and poorly mobile fauna. It would also be open to wind and water erosion and weed invasion for up to six months. The amelioration guidelines described throughout background paper No. 5, Flora, Fauna and Ecology, are recommended.	Sec 6.3 Sec 7.1 Sec 15.3.3 Sec 15.4.5
21	Instructing construction personnel to avoid damage to trees next to the easement to avoid spread of forest diseases and weeds is unconvincing as a measure to adequately protect the vegetation. Specific disincentives should be included in contracts with construction companies.	Sec 20.6
22	No details are given about waste management at the employee camps proposed for remote areas along the pipeline route. How will effluent and solid waste be dealt with? Where will these facilities be located along the pipeline? What are the capability and suitability of these sites for supporting the camps?	Sec 6.13
23	The mapped pipeline route passes through steep land mapped as Category A Protected land, and crosses many prescribed streams mapped as Category B Protected Land. The EIS does not acknowledge the Category A lands and makes limited reference to the Category B lands. No mention is made of the Soil Conservation Act's (1938) requirement for authority to damage trees or shrubs in these areas. Some of these areas have been mentioned in the EIS as "highly constrained" for pipe installation.	Sec 11.1.1

Issue No.	Issue	Response reference
24	This Department has a statutory responsibility to maintain water flow and bank stability under the Rivers and Foreshores Improvement Act, 1948. Where the proposed pipeline is to cross protected land and/or protected waters the EIS contains insufficient detail about excavations and construction techniques for water course crossings to satisfy this Department that these permits can be granted to the proposal.	Sec 3.1.1
25	Works to mitigate the impact of the proposed pipeline are often expressed in noncommittal terms. Phrases such as "may be used", "will be considered" and "should be used" are used in reference to amelioration measures. These phrases introduce a degree of uncertainty about whether mitigation works will be used at all.	Sec 20.1 Sec 20.6
26	The EIS gives a general indication of the amount of Crown land that will be affected by the proposal but it does this to identify the specific status of these areas. A full status search will be required before DLWC can make an accurate assessment of the proposal.	Sec 18.3.7
27	Where the proposed pipeline affects the development potential of Crown land and reduces the value of the land, full compensation will be claimed by the Department.	Sec 18.2.4 Sec 18.3.7
28	The document does not acknowledge that areas of Crown land along the proposed route are presently subject to claims under the NSW Aboriginal Land Rights Act, 1983. This issue should be addressed prior to the granting of a licence under the Pipelines Act, 1967.	Sec 16.3
29	The proponent is responsible for reinstatement of any lands damaged or deleteriously affected by the pipeline licence.	Sec 7.1 Sec 20.6
30	A detailed Soil and Water Management Plan must be completed by EGPP and approved by the DLWC prior to any site disturbance. The Soil and Water Management Plan should be prepared for each of the five discrete sections of the pipeline corridor, including waterway crossings, contraction camps/depots and access tracks on both private and public lands. It should include a detailed erosion and sediment control plan. DLWC can be contacted for a list of requirements for such a plan.	Sec 3.1.1 Sec 11.1.3
31	A full-time environmental officer must be present to supervise all site disturbance works, vegetation management and restoration, sediment and erosion control, drainage and creek crossings, soil limitation matters and to ensure that contractors adhere to the environmental management plan.	Sec 20.3
32	A remedial action plan should be completed to the satisfaction of this Department, for the event that the water quality of the ground water to be discharged is incompatible with receiving water.	Sec 7.1
33	A flood warning system and flood response action plan should be in place prior to any construction works commencing.	Sec 12.5
34	The location of the pipeline and ancillary works on Crown lands is to be in consultation with State Lands Services to ensure that any reduced value to the land is minimised.	Sec 18.2.3 Sec 18.3.7

NSW DEPARTMENT OF MINERAL RESOURCES

Issue No.	Issue	Response reference
1	The areas where coal seams are deemed likely to be mined will be affected by surface subsidence if mining takes place. The impact of this subsidence on the pipeline has yet to be determined. The primary concern of this Department is the apparent assumption made in the Dames and Moore report, within the section Land (Mining) Subsidence, that the only portion of the route beneath which mining-induced subsidence is likely is within the proclaimed mine subsidence district. This is not correct as the majority of this area currently held under mining lease is within Water Catchment land and hence not within a subsidence district. In addition to this, the report on Planning & Land Use Assessment states on page 80 that the impact of mining-induced subsidence can be minimised by locating the pipeline close to an existing service easement. This is an incorrect assumption as this easement has already been undermined in part and there is a strong likelihood that it will be undermined again, particularly within Cordeaux Colliery where mining operations are about to commence in the Wongawilli Seam which underlies the existing Bulli Seam workings. The design of the pipeline should allow for post-mining subsidence following extraction of the Wongawilli Seam within the present Kemira, Cordeaux and South Bulli collieries along with the section from the western boundary of South Bulli Colliery to Tower Colliery. Within Tower Colliery design should allow for the extraction of both the Wongawilli and the Bulli seams. Variations in depth and thickness of the mined seam/s along with local geological structures will determine the degree of vertical subsidence, tilt and strain affecting the surface. The required geological information can be obtained from the Coal and Petroleum Geology Branch of the Department.	Sec 10.3

NSW DEPARTMENT OF PUBLIC WORKS AND SERVICES

Issue No.	Issue	Response reference
1	Reference is made to the Department's letter dated 30 June 1995 where concerns were raised regarding the gas pipeline route near Nowra, NSW, and to which no reply has yet been received. Concerns relating to the gas pipeline route conflicting with the proposed water supply pipeline and the Albatross storage area, and as there is no scope to move the proposed Albatross storage, the gas pipeline was asked to be relocated in this area.	Sec 18.5.5

NSW DEPARTMENT OF FISHERIES

Issue No.	Issue	Response reference
1	From a fisheries perspective the Marulan Corridor would be a better alternative since it involves a lesser number of stream crossings.	Sec 5.1.3
2	The department is disappointed that much reduced survey and sampling effort appears to have been expended upon fish populations than for other fauna groups. While hundreds of trap nights, hair-tube nights and spotlight hours have been expended upon mammals, birds, reptiles and amphibians, no specific sampling was undertaken for fish. Such an approach is inconsistent at best, and potentially misleading in practice.	Sec 15.5.1
3	The department believes that it is imperative that the very best erosion control measures be put in place both during the construction phase and subsequently, and that they be regularly maintained and managed. Whilst a range of mitigation options are proposed the effectiveness of these depend upon how they are implemented in practice. At present it is not clear how adherence to erosion measures will be monitored and controlled. Further detail in this regard needs to be provided.	Sec 6.6 Sec 11.1.3 Sec 12.2.3 Sec 20.6
4	Inadequate detail is provided about individual crossings for the department to comment at this stage. It is noted that the intention is to prepare detailed crossing plans for each stream crossing when the final detailed design is completed (p.87 of Report No.5). NSW Fisheries request that we be given the opportunity to comment upon these plans when they are completed, and before they are implemented.	Sec 2.2.1
5	Crossing sites should obviously be rehabilitated to the maximum extent possible immediately upon the cessation of works. The department requests that the emphasis in rehabilitation be placed upon the use of revegetation with native species rather than the use of "hard" solutions such as rip-rap.	Sec 7.1 Sec 12.2.3
6	Please note that the approval of the Minister for Fisheries is required under the Fisheries Management Act 1994 for any obstruction to fish passage. Detailed proposals should be referred to the department before they are implemented so that approval can be arranged. Failure to do so could result in prosecution.	Sec 3.1.1
7	Finally the department is concerned at the potential for the spread of undesirable introduced fish species within waters used for hydrotesting. Three particularly problematic species, being Oriental Weather Loach, Gambusie and Carp could potentially be transferred from infected waterbodies to uninfected waterbodies. To guard against this possibility, all water should be screened - not just that from bodies which are thought to be fish holding, and there should be no transfer of water from one catchment to another (eg. Murrumbidgee to Shoalhaven).	Sec 6.10

NSW ENVIRONMENT PROTECTION AGENCY

Issue No.	Issue	Response reference
1	In particular the Marulan Corridor would appear to warrant further investigation with a benefit - cost analysis being undertaken, in which environmental attributes and costs of environmental management and controls are valued.	Sec 5.1.3
2	Issues such as impacts on meeting Greenhouse targets between the routes also needs clarification.	Sec 5.1.1
3	In particular all methodologies and assumptions used in assessing the economic impacts of the pipeline need to be outlined so that it is possible to verify the results.	Sec 18.1.1

Issue No.	Issue	Response reference
4	Further input from the proponent is necessary with regard to clarification as to what percentage of the Federal Government's target for greenhouse emission reductions will be achieved as a result of this project and how issues such as altered competitiveness of renewable energy resources and potential increased gas supply from other sources affects this estimate. Additionally, firm proposed actions with regard to measures necessary to counter negative Greenhouse impacts of the project are necessary and should be quantified.	Sec 4.6 Sec 4.6.1
6	There is a need for "a firm proposed pipeline route".	Sec 2.2.1
7	Erodibility of soils along the route based on soil type, slope, pipe alignment to slope and expected rainfall conditions.	Sec 2.2.1 Sec 11.1.1
8	Generic minimum erosion control measures based on relevant factors such as soil types, expected rainfall conditions, slope and aspect of the pipeline.	Sec 11.1.1 Sec 11.1.3
9	Specific erosion control measures that will be necessary in particular areas due to the constraints of that area.	Sec 2.2.1 11.1.3
10	The extent of topsoil scalping proposed is unclear.	Sec 11.2
11	Approvals that may be needed with regard to borrow pits.	Sec 3.1.4
12	Assessment of the individual ecological characteristics of the streams proposed to be crossed are needed. This will necessitate each watercourse being inspected and assessed for issues such as the likelihood of providing habitat for "significant" aquatic species.	Sec 2.2.1 Sec 15.5.1
13	A more detailed ecological ranking system is needed to determine which streams are particularly sensitive.	Sec 15.5.1 Sec 12.2.1
14	A more detailed hydrological ranking scheme or alternatively more stringent "minimum erosion controls" for stream crossings are needed.	Sec 12.2.1 Sec 6.6
15	A linking of ecological and hydrological ranking systems is needed to determine which streams require the greatest protection.	Sec 15.5.1 Sec 12.2.1
16	Details of how individual sensitive streams are proposed to be crossed, and how environmental impacts will be mitigated, are needed.	Sec 2.2.1
17	An assessment needs to be made of the potential of finding "significant species" in each stream and then a further assessment made as to whether particularly sensitive life stages can, or need to be, avoided through appropriate scheduling of pipeline construction.	Sec 2.2.1 Sec 15.5.2 Sec 6.3
18	Scheduling of stream crossings for low flow conditions should be assessed for the Nowra area.	Sec 6.6 Sec 6.3
19	Further consideration needs to given to the preparation of action plans which could be implemented "in the field" if localised water logging or draining occurs as a result of piping activities in water charged ground.	Sec 12.4.2
20	Details of "special measures" to guard against corrosion caused by saline groundwaters need to be outlined.	Sec 12.4.3
21	Clarification as to whether Jackson's Bog is proposed to be crossed and if so, how environmental degradation will be overcome.	Sec. 15.2.18

Issue No.	Issue	Response reference
22	Information as to what type of bog (peat bog etc) Duguids Bog is, and how environmental degradation will be overcome.	Sec. 15.2.18
23	Areas where acid sulphate soils are likely to be impacted need to be detailed	Sec 2.2.1 Sec 11.3
24	More detail is required as to possible discharge locations and quality and quantity of hydrostatic test waters.	Sec 2.2.1 Sec 6.10
25	More details with regard to volumes, quality, treatment and disposal of liquid wastes as a result of drilling operations are needed.	Sec 6.7
26	In relation to noise issues, most can be covered by conditions of consent except the need for more information associated with the release of gases from compressor stations (and perhaps meter stations) and the need for consultation with the National Parks and Wildlife Service concerning the effects of blasting noise on endemic fauna in the Morton National Park area.	Sec 3.1.5 Sec 13.1 Sec 6.5
27	Air issues are generally adequately covered with the exception of additional information needed with regard to emission estimates from pipeline leaks as well as possible odour impacts as a result of gas discharges in the vicinity of dwellings.	Sec 14.1 Sec 14.4 Sec 8.3
28	Alternative options which have been considered to avoid fragmentation of remnant vegetation communities.	Sec 2.1 Sec 15.3.3 Sec 15.3.4
29	Sufficient information on all areas of terrestrial ecological significance and ways proposed of avoiding or mitigating damage to these areas.	Sec 2.2.1
30	Individual site specific details of significant fauna populations possibly impacted by the pipeline route as well as mitigating measures proposed, would be desirable.	Sec 2.2.1
31	More information on wildlife and habitat corridors is necessary, and in particular possible impacts to each individual corridor and proposed methods for mitigating damage should be provided.	Sec 2.2.1 Sec 15.3.4
32	Should the above more detailed investigations reveal significant environmental attributes where damage from the pipeline will be high, then the alternative routes should be reassessed and a benefit-cost analysis be undertaken where environmental attributes and costs of mitigating impacts are valued.	Sec 2.1 Sec 15.1
33	The EMP needs to be regarded as a working document for contractors on site and thus there is a need for specific details to be addressed on certain sensitive sections of the pipeline route, as well as specific generic details of environmental protection measures to be incorporated based on particular conditions.	Sec 2.2.1
34	The EMP needs to be reviewed by an independent organisation and there needs to be put in place a regime of regular inspections, audits and reporting based on the requirements of the EMP.	Sec 20.2 Sec 20.3 Sec 20.4 Sec 20.5
35	A key issue to be addressed, prior to examining environmental impacts in detail, is whether the preferred route is, in fact, the best outcome in environmental terms.	Sec 5.1.1 Sec 4.7

Issue No.	Issue	Response reference
36	Table 10.7 of the EIS lists sites of national, state and regional biological significance. Of the 19 sites/areas noted along the NSW section of the pipeline, 12 are located in the Hoskinstown to Nowra deviation, some of which maintain a high impact even after mitigation measures are implemented. These sensitive sites could be avoided by using the Marulan route.	Sec 5.1.3
37	The Marulan Corridors share existing pipeline easements for 120 kilometres of its length whereas the Nowra Corridor only shares corridors for 20 kilometres of its length.	Sec 5.1.3
38	The issue arises as to whether a pipeline should traverse a national park/wilderness area, albeit on the edge and along an existing road alignment. This issue could be avoided through the selection of the Marulan route.	Sec 5.1.3
39	The soils between Hoskinstown and Nowra are highly erodible, particularly in the area between Nerriga and Hoskinstown. The Marulan route may avoid these highly erodible soils.	Sec 11.1.2
40	The rocky foundation material in the Morton National Park area may necessitate significant blasting in this sensitive area. The National Parks and Wildlife Service (NPWS) should be consulted to determine whether sensitive species in this area will be affected by blast and other construction noise.	Sec 6.5
41	The Nowra Corridor would warrant the pipeline being constructed in an area which one day may be covered with the backwaters of the Welcome Reef Dam. It is believed that Sydney Water have expressed some reservations about this situation as this route could obviously cause maintenance difficulties to the pipeline in the future.	Sec 15.2.1
42	Costs are noted as being high for the Marulan Corridor when compared to the Nowra Corridor mainly due to the imposition of tolls associated with the use of other company's pipelines. In relation to the Nowra Corridor, it is however noted that for the Wollongong to Wilton section, which runs through an existing pipeline easement, that pipelines are not to be shared but that a separate pipeline will be constructed for the project. Accordingly, the proponent needs to assess whether a separate pipeline could be constructed parallel to the existing pipeline from Marulan to Wilton and thus largely overcome this problem. This would need clarification from the proponents.	Sec 5.1.3 Sec 5.2
43	Direct drilling underground to avoid damage to the environmental attributes of the Bulee Gap area which is adjacent to the Morton National Park.	Sec 15.2.22
44	Direct drilling underground to cross the Lower Shoalhaven River upstream of Nowra.	Sec 12.2.2
45	Construction in this area will probably be time consuming and costly.	Sec 12.2.2
46	Additionally, the rocky foundation material suggests that the spoil may be unsuitable for pipeline bedding. Accordingly, bedding material would need to be imported from existing quarries, obtained from borrow pits or crushed on site. It is suggested that borrow pits would not be allowable in national park/wilderness ares and thus the importation of suitable bedding and padding material or crushing of spoil on site, combined with the sensitivity of the receiving environment, would be an added cost.	Sec 6.9
47	The erodible and dispersive nature of the soils along this section of the route will necessitate greater controls for erosion mitigation works and consequently the costs of installation and maintenance would be considerably more for this section of the pipeline route as compared to the other sections on a per kilometre basis.	Sec 11.1.2

Issue No.	Issue	Response reference
48	It is noted on page 4.1.6 that the Marulan route would miss the opportunity of serving the domestic and industrial Illawarra and Shoalhaven markets. Table 4.4 notes that the length of pipeline for the Nowra route is 703 kilometres whereas for the Marulan route it is less at 666 kilometres. It is suggested that the pipeline could continue from Wilton (in the opposite direction) to Bomaderry and thus serve the Illawarra and the Shoalhaven industrial sector north of the Shoalhaven River. The vast majority of gas usage, in this area, would be by two industrial premises on the northern side of the river and perhaps the smaller market on the southern side of the river could be serviced by smaller mains which could attach to the Shoalhaven River Bridge and thus avoid the expensive direct drilling under the river.	Sec 5.1.3 Sec 5.2
49	Based on the above, the EPA suggests that on the evidence available to date, the Marulan Corridor, with an extension to Nowra, warrants more detailed investigations to determine if it is the best environmental outcome. In particular there should be a benefit-cost analysis and comparison of the two routes, in which environmental attributes and costs of environmental management and controls are valued. It is suggested that when determining economic viability it may be more instructive to include recurrent costs as well as capital costs (and include these in a revised Table 4.6).	Sec 5.1.3 Sec 5.2
50	The information presented in section 14.5.5 suggests that the construction phase of the project will generate an increase in employment equivalent to 960 full time jobs. It is unclear how this estimate relates to the 1100 peak workers referred to in section 14.5.1. It is also unclear what is the average duration of these jobs generated by the project.	Sec 18.1.3
51	There appears to be insufficient explanation of Tables 1.1,1.2 of Report 15 to enable a robust review of this work. It is noted that only the high estimate of the value of energy savings is included in these tables and this may exaggerate the benefits of the pipeline. This issue should be addressed.	Sec 4.2.1 Sec 4.7
52	It appears that the data in the last two columns of Table 1.1 may be in the wrong order. As they presently appear, gross operating benefits for NSW are higher in Australia.	-
53	Finally, it is difficult to know how the final column in Table 1.2 (GDP) has been calculated from its components in the preceding columns.	Sec 18.1.1
54	It is unclear how the numbers in Tables 15.2, 15.3 and 15.4 of the EIS dealing with construction impacts of the EGP, have been derived. More detail is required on the economic impact analysis generally, and specifically as detailed below.	Sec 18.1.1
55	The section on regional impacts in Report 15 provides a snapshot of production and employment in the regions, as well as a discussion of industry development in the region and possible impacts of the pipeline on the latter. Again however, it is not possible to ascertain how this analysis has been used as an input to the macroeconomic modelling results contained in Tables 1.1 and 1.2 of Report 15.	Sec 18.1.1
56	In Report 15 no information has been supplied on how the estimates of impacts of the pipeline construction phase (increases in net regional product and employment creation) were calculated and thus it is difficult for the EPA to comment on these sections.	Sec 18.1.1
57	It is also unclear why section 3.2.7 does not specifically discuss the impacts of the pipeline on the Shoalhaven communities, as is done for other areas. This too should be addressed.	Sec 18.1.2

Issue No.	Issue	Response reference
58	In section 3 of Report Number 16 (Energy Issues) the second last dot point on page 12 suggests that a benefit of the project could be a reduction in the impact of a possible carbon tax. It is assumed that the document is referring to the lower price impact on the consumer in the event of increased competition. This is not in fact a benefit of the project, but rather a distributional issue. A carbon tax, if implemented, would be a correction of an existing market distortion, and in this sense is beneficial to society.	Sec 18.1.4
59	Accordingly to the analysis in section 4.2 of Report 16, consumption of natural gas in NSW is likely to increase in the future. This is attributed to increased competition stimulated by the project and National Competition Policy reforms such as third party access (access to services provided by significant infrastructure facilities including pipelines and electricity transmission grids). It is unclear whether the estimates of potential new growth of natural gas use in major NSW markets (Table 4.2) reflects both sources of growth or just the incremental impetus given by the project. Comments are needed from the proponent on this issue.	Sec 4.1.1 Sec 4.2.1
60	However, the basis for the estimate in the EIS and Report No 16 - Energy, that this figure comprises 25% of the federal government's target for emission reductions from industrial processes is unclear and should be rigorously substantiated.	Sec 4.6.1
61	The Commonwealth Report, Greenhouse 21C, forecasts a reduction of 15 million tonnes of CO2 equivalents by 2000 from its industry cooperative agreements program. Assuming this statistic was the basis for the calculation, the gas project would represent 13% of this reduction. Comment is needed from the proponent on this.	Sec 4.6.1
62	Further, it should also be noted that the achievement of this 2 million tonnes is expected to be reached in 2010, at which time Australia may be expected to reduce its 1990 emissions by over 20%, which makes a savings of 2 million tonnes seem less significant. The energy sector's share of emissions in 1990 was about 53% of 571 million tonnes (305 million tonnes). The project would therefore likely contribute of the order of 0.4% towards the 2005 objective for overall emission reductions from this sector. Comment from the proponent is needed on this.	Sec 4.6 Sec 4.6.1
63	There are also uncertainties in the derivation of the 2 million tonne figure itself. In comparing the project benefits to a coal dominated scenario, the EIS and supporting materials do not account for potential economic and environmental benefits of increased market share by renewable energy sources in the medium term, nor of the potential adverse impacts of the project on the competitiveness of these technologies as a result of lower gas and overall energy prices. The proponent obviously acknowledges this impact but the effects do not appear to have been quantified (eg. page 3.5 of the EIS): • "Improvements such as the move from coal to gas may well enhance the public's awareness of the environmental benefits of using cleaner fuels, which should stimulate research on renewable sources, and result in future competitiveness of renewable energy sources" This issue needs to be quantified by the proponent.	Sec 4.6 Sec 4.6.1
64	The potential for increased gas supply from coal-bed methane resources also needs to be given more attention. Very little analysis of this potential appears to have been provided in the Discussion Paper 16 (eg p17).	Sec 5.4
65	The impact of the commissioning of the Smithfield Cogeneration Plant on the energy modelling analysis should also be considered (report 16, p.22).	Sec 4.2.3
66	The route selection assessment did not appear to consider Greenhouse issues. This needs to be assessed.	Sec 5.1.1

Issue No.	Issue	Response reference
67	As two consultants co-operated to undertake the Greenhouse analyses (reports No. 3 & 16) a summary table setting out more clearly overall Greenhouse impacts and key assumptions would be a valuable decision aid.	Sec 4.6.1
68	The discussion of mitigation and ongoing monitoring and auditing programs does not apply sufficient attention to Greenhouse impact of the proposal. This needs to be addressed. Additionally, the mitigation options suggested (pp 9-10-9-11) are expressed as options rather than firm proposals.	Sec 4.6
69	It is also apparent from the EIS that there have been a number of route deviations (routes proposed in the EIS but not yet assessed in the field) to avoid sensitive areas, such as the 40 km section from Berry north, and accordingly information on the environmental effects of these deviations are unknown at this stage.	Sec 2.1
70	Prior to the Commission of Inquiry a firm proposed route along with probable environmental impacts at each major watercourse or other sensitive area will be needed.	Sec 2.2.1 Sec 2.1
71	Specific details will be needed of each sensitive area (such as wetlands) proposed to be crossed by the pipeline, along with detailed justification as to why such areas cannot be avoided. The EPA's strongly preferred position is that all wetlands and other sensitive ecosystems be avoided.	Sec 12.3
72	In these sensitive cases site specific erosion control measures should have been included in the EIS.	Sec 2.2.1 Sec 12.3
73	Unless specific minimum requirements are stipulated in relevant documents, insufficient controls are likely to be installed.	Sec 20.6
74	Due to the sensitivity of the route it is felt that these details need to be assessed at the EIS stage.	Sec 2.2.1
75	These details should then be transferred to an Erosion and Sediment Control Plan (ESCP) which needs to be incorporated into the Environmental Management Plan (EMP).	Sec 11.1.3 Sec 20.2
76	The categories for an ESCP should be determined in conjunction with the Department of Land and Water Conservation (DLWC) and EPA.	Sec 20.2
77	The type of details the EPA require include: Installation techniques and distance between sack (velocity) breakers in exposed trenches. 2. Distance between unexcavated sections of the trench for erosion control purposes, as well as to facilitate stock or wildlife crossing. 3. Installation techniques and distance between contour banks. Location and method of discharge of water from same should be detailed. 4. Installation techniques and location of water diversion drains. Location and method of discharge of waters from same should be detailed. 5. Installation techniques and location of erosion control measures like silt fence or straw bales (for example, around spoil stockpiles, down the contour, etc). 6. How often breaks in the "low crown" over the trench line should occur. 7. The design and location of all sediment ponds.	Sec 2.2.1
78	A mechanism needs to be put in place so that there is a minimum of one individual per "spread" who is directly responsible for erosion control work to ensure that erosion control works and other environmental controls are installed.	Sec 20.3

Issue No.	Issue	Response reference
79	The EMP should outline a regime for EGP staff to regularly inspect sections of the pipeline both under construction and after construction with a view to: a. Establishing maintenance and rehabilitation requirements for erosion control works on the corridor. b. Undertaking maintenance and rehabilitation as is required. This inspection regime should be developed in consultation with DLWC and EPA.	Sec 20.3
80	The EMP should outline a regime for external auditors to periodically check the performance of erosion controls and other works on site. This could include individuals seconded for the length of the project from organisations like DLWC.	Sec 20.5
81	A mechanism should be put in place to secure performance bonds so that contractors have a financial incentive to install and maintain the necessary erosion control measures.	Sec 20.7
82	There is a degree of uncertainty in the EIS as to which areas the topsoil will be stripped and stockpiled (eg page 5.6 infers that stripping may only occur in agricultural areas where as on page 17.7 it infers that the stripping will occur in basically all areas).	Sec 11.2
83	Specific details are needed as to when stripping and stockpiling of topsoil will occur as well as reasons why this decision has been arrived at. Generalisations must be avoided in this response with the specific details being provided.	Sec 11.2
84	It would appear form the information presented in the EIS that there has not been a detailed on-site assessment of the ecological attributes of each stream/wetland crossing along the route. This level of investigation is needed to be presented at the EIS stage to that authorities can make a confident assessment of the probable environmental impact.	Sec 2.2.1 Sec 15.5.1
85	An attempt was made in the EIS to rank streams and rivers along the route of the pipeline corridor in relation to their conservation status. Table 10.9 shows the results of this ranking. The EIS notes that over 1,000 water/drainage courses would be crossed by the pipeline and on the basis of the ecological assessment 25 "sensitive streams" are found along the entire route, with only five of these within NSW. Examination of the ranking system (discussed below) reveals that it is not sufficiently detailed to be appropriate for this EIS. Page 10.27 notes that the conservation value of streams and catchments were assessed on the basis of: • existing lists of significant streams/catchments; • the diversity of fish and of crayfish which are of national or state conservation value; • the "naturalness" of the fish/fauna (indicated by the number of introduced fish species); • the diversity of fish which are of high recreational value; and • the importance of areas for scientific research.	Sec 15.5.1

Issue No.	Issue	Response reference
85 (cont)	The EIS does, however acknowledge that there is a less comprehensive knowledge of stream biota in NSW compared with Victoria and NSW does not, in fact, have a comprehensive list of fish of state significance (one of the selection criteria). Additionally it is believed that the existing data with regard to issues such as "naturalness" of fish/fauna is less than complete. It would appear form the EIS that there have been no aquatic flora and fauna field surveys carried out for the streams to be crossed on the route. Thus, it appears that the ranking has been based on a paucity of information. There does not appear to have been an attempt made to rank watercourses based on their individual environmental attributes and the likelihood of providing habitat for significant species (for example, Australian Grayling, Platypus, etc). This is an important deficiency and will need to be addressed for the EPA to assess the environmental impact of the proposal. As evidence of this deficiency in the ranking of watercourses page 10.27 of the EIS notes that "the most marked feature of the existing water quality in streams along the pipeline route that is relevant to ecological functioning are the high turbidity levels in Victorian streams compared to NSW streams". On page 10.30 the EIS notes that "...stream biota in NSW appear to be more susceptible to increased sediment loads than those in Victoria." This information and local knowledge would suggest that there are more than five very sensitive streams along the NSW section of the corridor, and other more detailed methodology will therefore need to be used to assess which streams require the greatest environmental protection (for example, assessment of individual stream attributes to determine the likelihood of finding habitat suitable for "significant species").	
86	Thus, it would appear that only the streams ranked as "high constraint" are proposed to receive controls greater than "conventional trenching methods" ("conventional trenching methods" does not appear to have been defined making assessment of the controls proposed difficulty).	Sec 6.6
87	An assessment by the EPA of some of the creeks on the route that did not receive a high water quality sensitivity constraint would appear to indicate that unless special precautions are taken in these streams too, then erosion and subsequent turbidity and sedimentation problems would arise.	Sec 15.5.1 Sec 12.2.1
88	It would therefore appear that there is a need for the proponents to detail their methodology for hydrological ranking of streams, with a view to consultation occurring with relevant authorities such as EPA and DLWC to establish a more appropriate ranking methodology.	Sec 15.5.1 Sec 12.2.1
89	Trench dewatering will be inevitable somewhere throughout the lifespan of the project. A number of soil types along the route are known to be dispersible and thus the elevated turbidity of trench waters may not be removed by filtering through vegetated areas. Accordingly the EMP should denote these areas and outline alternative treatments (for example, flocculation with gypsum in the trench prior to dewatering, filtering through geotextile, etc). These measures will need to be approved by EPA and DLWC.	Sec 12.4.2
90	The issue of saline ground water needs specific attention in an expanded EMP. Areas where saline waters are expected to be encountered should be detailed and mapped. The likely conductivity and sodium absorption ratio of these waters should be noted as should the details of the soils in the location where trench waters are likely to be disposed of. If dispersible clays are present specific action plans may be needed. All details of procedures for assessing the localised impacts of saline water disposal, and the management procedures that will be adopted to minimise impacts should be included in the EMP and should be reviewed by the EPA and DLWC.	Sec 12.4.3 Sec 12.4.1

Issue No.	Issue	Response reference
91	Trenching in potential and actual acid sulphate soils is likely along the length of the pipeline, particularly with the easterly deviation between Berry and Lake Illawarra. Soils in potentially affected areas need to be assessed and checked on site, and then action plans prepared. All details should be outlined in the EMP, and should be consistent with EPA and DLWC guidelines and should include specific methodologies and precautions for pipe laying in these areas (if they cannot be avoided).	Sec. 11.3
92	More detail is required to be supplied in regard to hydrostatic test waters. Approved sources and disposal routes for hydrostatic test waters will need to be included in the EMP.	Sec 6.10
93	Details of ablution facilities proposed for temporary construction camps should be provided. Details of proposed rehabilitation of construction camps are also needed. These details should be outlined in detail in the EMP. Details of storage requirements for fuel and other hazardous chemicals should also be provided, and detailed in the EMP.	Sec 6.13
94	For residences within 300 metres of the proposed route, the Proponents should advise such property owners at the commencement of the project, of the general nature of the project including its potential to cause temporary noise impact. In addition, at least one week prior to construction in that area, of the time and duration of the work and indicate a contact person and telephone number whom residents/landowners can contact. Details of the streams proposed to be monitored as well as the timing of monitoring and the parameters proposed to be tested should be outlined.	Sec 13.1 Sec 2.2.1 Sec 20.4
95	Where construction is within 300 metres of a residence all motorised earthmoving equipment must be fitted with residential class mufflers.	Sec 13.1
96	Where construction activities occur within 500 meters of a residence, construction hours must be limited to Monday to Friday 7.00 am to 6.00 pm and Saturday 7.00 am to 1.00 pm unless prior agreement has been obtained from the landowner/resident that other extended hours may be worked.	Sec 13.1
97	That areas and sites: (i) where construction activities are likely to be of an "extended" duration (ie longer than the expected few hours to a day noise exposure from the progressive construction activities) and; (ii) are within 500 metres of a residence; be identified early in the construction planning phase for the pipeline and advised to the EPA, and that, as a minimum, the normal EPA construction noise criteria apply in such circumstances unless prior agreement to other (less stringent) criteria is obtained from the EPA and landowner/resident.	Sec 13.1
98	Where blasting is required, the additional landowner advise/consent requirements outlined in Background Paper 4 "Noise" be strictly adhered to, and that blasting be designed to meet EPA criteria for maximum blast noise level and peak particle velocity (viz Table 3.4 of Background Paper 4 "Noise").	Sec 13.1 Sec 6.5
99	All (Future) compressor and meter stations shall be located and designed to ensure that the LA10 noise level from such facility does not exceed 30 dB(A) or the LA90 (Background) noise level, whichever is the greater, when measured at a point 30 meters from the facade of any residential premises on the most noise-exposed site.	Sec 13.1 Sec 2.2.3

Issue No.	Issue	Response reference
100	Where compressor and meter stations are to be constructed and cannot achieve a noise level of 30 dB(A) at the boundary, the zone of noise influence equivalent to 30 dB(A) or the LA90 (Background) noise level, as a result of these stations, must be established on a plan in the form of a noise contour. Further, a noise warning on the title of all affected land, advising against building a dwelling in the noise affected area, must be created pursuant to section 88B of the Conveyancing Act.	Sec 13.1 Sec 3.1.5
101	Additionally as noted under the "Justification of Preferred Corridor Route" section, the rocky foundation material in the Morton National Park area may necessitate significant blasting in this sensitive area. The National Parks and Wildlife Service (NPWS) should be consulted to determine whether sensitive species in this area will be affected by blast and other construction noise. Dust - The EIS recommends the following methods to control dust, which are considered generally acceptable to the EPA: • watering of exposed areas and unsealed roads, • restricting dust generating activities during unfavourable meteorological conditions (ie high winds), • prompt rehabilitation of the disturbed areas.	Sec 6.5 Sec 15.2.23 Sec 14.3
102	All flaring of emissions as a result of the pipeline operations must be the subject of an appropriate EPA licence.	Sec 14.4
103	The quantities of non methane hydrocarbon releases expected as a result of fugitive emissions from leaks has not been determined. The EPA request that emission estimates for this source be provided for assessment.	Sec 14.1
104	Details of any impact of odorous discharges are necessary. In particular the zone of odour influence of such discharges should be estimated.	Sec 14.1 Sec 8.3
105	More detailed information on all the identified areas of ecological significance and ways of avoiding or mitigating damage would be desirable. For example, Rock Flat Travelling Stock Reserve and Grasslands 1 (kp414) are proposed to be avoided by relocating the route yet the impact remains high after relocation.	Sec. 15.2.19
106	The EIS notes (page 10.17) that weed invasion along disturbed areas of Victorian remnant vegetation is widespread. This, and the potential for dieback transmission along the corridor, would appear to suggest the need for measures in individual situations to be detailed for assessment.	Sec 2.2.1 Sec 15.4.5 Sec 15.4.6
107	Detailed information to mitigate impacts on endemic flora and fauna should be detailed in the EMP so that it can be a useful "working document".	Sec 2.2.1

NSW FIRE BRIGADES

Issue No.	Issue	Response reference
1	A comprehensive fire safety study should be prepared and submitted for perusal. The study should address: Detail all proposed fire prevention/protection, fire fighting measures and ancillary equipment. Outline all proposed emergency plans/procedures. Compliance or otherwise with the relevant Australian Standards applicable to the proposed development.	Sec 6.12 Sec 19.2

NSW National Parks And Wildlife Service

Issue No.	Issue	Response reference
1	The EIS is based upon a "preferred corridor assessment". This means that the final alignment is still being defined within the preferred corridor. Whilst this does allow for impact mitigation on the basis of avoidance of sites of significance, it also makes it difficult for the Service to make definitive statements on potential impact. Such definitive comments cannot be made in some cases until the "line list" stage.	Sec 2.2.1 Sec 2.1
2	Further refinement mean that the EIS will need to be supplemented by further assessment as the project proposal is further developed. The Service will require further opportunity for comment on the refined proposal and additional assessments prepared.	Sec 2.1
4	On the basis of court precedent and despite the provisions of s.153(1) of the NPW Act, the Service considers that the proposal by BHP/Westcoast to establish a gas pipeline within the boundaries of Morton National Park or Illawarra Escarpment SRA is not appropriate and for that reason, alternative routes should be considered.	Sec 15.2.23 Sec 15.2.25
5	The Service's major concern about the proponents preferred Nowra route is the proposal to locate the pipeline within the existing boundaries of Morton National Park.	Sec 15.2.23
6	Regardless of the outcome of the proposal to amend the boundaries, the Service has significant concerns regarding the establishment of the Turpentine Road as a major utility corridor between Canberra and Nowra.	Sec 15.2.23
7	Each new development on the Turpentine Road contributes incrementally to diminish natural and cultural values. Such a utility corridor is clearly in conflict with the natural and cultural heritage conservation attributes of a National Park.	Sec 15.2.23
8	Additional clearing of vegetation for the pipeline to 10m from the road centre line will magnify the corridor which already splits the wilderness. A further increase in infrastructure in the corridor will incrementally diminish perceived wilderness quality.	Sec 15.2.23 Sec 15.7
9	While the project in itself is considered unlikely to significantly impact on endangered fauna within the reserve, the Service considers it will incrementally increase the barrier effect of the existing easements.	Sec 15.2.23
10	The scope for impact on native fauna and flora will be much greater in the national park environment as opposed to a cleared agricultural landscape which is predominant on the alternative route.	Sec 5.1.3
11	The Service is also concerned about the real threat of introduced species of weeds invading the area either directly via construction vehicles, or indirectly via additional disturbed areas. Any weed invasion is significant as the EIS flora survey found there was almost a total absence of weeds at present.	Sec 15.4.5 Sec 7.3
12	Whilst none of the sites which may be disturbed inside Morton National Park are considered to be of major significance, the Service has considerable concerns regarding the destruction of sites inside any reserve. The reserve system provides an important sample of sites in their natural landscape setting. Additionally, being located inside a national park, they are also afforded additional protection to those located outside.	Sec 14.2.11

Issue No.	Issue	Response reference
13	The Turpentine Road is an important scenic route and the pipeline may impinge, in both the short and long term, on the route's aesthetic qualities by increasing the width of the disturbed area. Of special concern are the main western approach to the park from Endrick River to Bulee Gap, where the road and proposed pipeline traverse the western escarpment, and the Tianjara Falls area. Both areas are environmentally sensitive and visually significant parts of the route. The crossing of Tianjara Creek upstream of the falls, adjacent to bridge, could conflict with visitation to the falls area. As trees will not be permitted to regenerate on the central area of the cleared pipeline easement it would remain a permanent scar for the life of the pipeline.	Sec 18.3.6
14	From an engineering perspective, the Bullee gap area along the road reserve poses significant environmental problems. This is on a sandstone escarpment consisting of cliffs and "beehive" rock formations. The torturous narrow road alignment, with very steep gradients between rock outcrops, and high nature conservation significance of the area pose significant constraints on the pipeline construction in this area. The EIS findings of low impact of pipeline within the road reserve would seem unobtainable. The proponent has raised the possibility of directionally drilling in this area. If this were to be carried out the potential for slumping would have to be thoroughly investigated.	Sec. 15.2.22
15	Throughout Morton National Park the shallow soils and high instance of exposed bedrock would result in blasting for considerable stretches of the pipeline to enable adequate "bedding". Blasting, while only associated with the construction phase, would have a number of direct and indirect impacts. Close to sensitive geological areas such as Tianjara Falls and Bulee Gap other construction methods should be investigated that would avoid the potential impacts that blasting may have.	Sec 6.5 Sec 18.3.6 Sec 15.2.23
16	Morton National Park has generally poor soils with very low fertility. The restoration and rehabilitation programs of the locally endemic vegetation, which would be mandatory given the location, have very low success rates.	Sec 7.3
17	The EIS shows a line break valve at the 604 km mark just outside the existing park boundary near Tianjara Falls. This Yarramunmun area is proposed National Park and is included in the Ettrema Identified Wilderness additions. This will be an additional hazard to be considered in fire suppression and control in this area.	Sec 15.7 Sec 6.12
18	The EIS and supporting documents do not provide detailed information on the proposed route through Illawarra Escarpment SRA. Indeed both the EIS (p12-1) and the supporting document "Planning and Land Use" (p75) do not even list the Illawarra Escarpment SRA as being a conservation reserve managed by the Service. The lack of emphasis on this part of the route does not reflect the potential impacts on the area. The proposed pipeline route is located along an alignment which is presently undisturbed, and which is managed for the protection of its outstanding scenic qualities. The Service considers that substantially more site specific assessment is required for this part of the route.	Sec 15.2.25
19	The lack of information makes it very difficult for the Service to adequately determine what areas of the SRA are to be impacted. This is further complicated by recent information obtained from the proponent which indicates that the proposed route in this area has been amended from that shown in the EIS. The Service considers that the EIS should have assessed the proponent's final proposed route, not an earlier version.	Sec 15.2.25
20	The proponents are now also proposing that part (but not all) of the route through the SRA be directionally drilled. This is the section immediately above Kembla Heights. Once above the steep pinch however, it is proposed to construct the pipeline in the normal way. It is important to note that these areas do not have existing disturbance, and the full 20 metre wide easement will need to be cleared.	Sec 15.2.25

Issue No.	Issue	Response reference
21	The additional information provided by the proponent does not indicate whether or not it is proposed to construct the pipeline through the Mt Kembla portion of the SRA. This point needs to be clarified.	Sec 15.2.25
22	It should be noted that the maximum depth of the SRA is 15.24 metres below the earth's surface. If the full length of the route through the SRA were directionally drilled below this depth, then it would actually be outside the SRA. This is the only method the Service considers appropriate for this part of the route, as it is the only way of eliminating visual impact and avoiding impacting on the SRA.	Sec 15.2.25
23	The Illawarra Escarpment SRA Plan of Management refers to the objectives of the SRA to protect the outstanding scenic character of the Illawarra Escarpment and wildlife habitat/corridors. The Service believes that any above ground pipeline route through the SRA would be inconsistent with these objectives, and therefore not permissible.	Sec 15.2.25
24	Not withstanding the issue of permissibility, the activity has the potential to cause significant erosion impacts, visual impact and loss of habitat within the SRA. The significance of these impacts is likely to be high given the steep slopes and presence of cliff-lines on the escarpment, its high visual catchment within the Illawarra and the importance of the escarpment as a moist forest habitat corridor. None of these impacts have been assessed to a level warranted by the significance of impact.	Sec. 15.2.25
25	As a result of the AGL line there has been weed infestation, particularly by exotic grasses. The easement is now distinguishable from the air as a ribbon of weed proliferation through the Park, and provides an uncontrollable seed stock of weeds for invasion into the surrounding native vegetation.	Sec 15.4.5
26	As a result of the AGL line there has been uncontrolled access. This results in many indirect effects, including bush-rock removal, rubbish dumping, firewood and flower collection and inappropriate recreational vehicle use.	Sec 8.1
27	Fire hazard management. Within Marramarra National Park a fuel reduction zone is located along the pipeline, increasing the area of impact. The AGL pipeline is an additional hazard to be considered in the fire suppression and control equation.	Sec 6.12
28	Catchment Management. The pipeline generally follows ridgetops across Marramarra National Park. Disturbance of soil following clearance of the easement and easement maintenance activities has resulted in sedimentation of numerous sensitive gullies and streams.	Sec 12.1.1
32	The proposed nature reserve is located north of the junction of the Braidwood and Turpentine Roads, east of Morton National Park. The Service considers that construction of the pipeline in this location is likely to have both short and long term adverse impacts on the habitat values of the proposed nature reserve similar to the adjacent Morton National Park in many respects.	Sec 15.2.23
33	An additional rare and threatened plant species in the area is the undescribed mallee on the nationally Vulnerable list, Eucalyptus langleyi. The report states that no individuals of Eucalyptus langleyi will be affected if the pipeline is placed on the West side of the Braidwood Road. NPWS officers know of numerous individuals of E. langleyi extending west from the edge of the road pavement at this locality.	Sec 15.4.3
34	The proposed Nature Reserve is located on the southern tablelands near the upper section of the Shoalhaven River. It is about 30 kilometres north of Braidwood and is approximately 6 700 hectares in area. The Eastern (Nowra) route passes through the southern section of the proposed area, between KP 548 and KP 555.	Sec 15.2.21

Issue No.	Issue	Response reference
35	The vegetation within the proposal is mainly Eucalyptus rossii, E. mannifera woodland with E. dives and E. macrorhyncha. E. sieberi is found on the rocky hills, with a sedgeland of Restis spp. and Juncus spp. in seasonally inundated areas. The communities present are an interesting mix of tableland and western slope species and are poorly represented in existing reserves. The proposal also includes a number of fresh water swamps and their catchments.	Sec 15.2.21
36	The proposal also protects a complex of Aboriginal sites. The natural and cultural conservation values of this area are of considerable importance. The Service therefore opposes any alienation or development proposals for the area.	Sec 15.2.21 Sec 16.1.3
37	The Yarramunmun additions are located on the area of vacant Crown land east of the current boundary of Morton National Park, north of the Turpentine Road. These lands are also the area identified for addition to the Ettrema Wilderness. The comments above on the impact on Morton National Park and Ettrema Wilderness also apply to this area.	Sec 15.2.23 Sec 15.7
38	Reference to Appendix 2A suggests that literature and personal communication with other researchers was not utilised for sections 4 to 6 (NSW/Victorian border to Endrick River).	Sec ?
39	However, the Service is concerned that the consultants may not have given proper consideration to the potential significance of the realigned route. It is noted that the realigned route across the southern Illawarra coastal plain was only given a desktop assessment. Other areas of concern are outlined in Grasslands on the Monaro and Mountain Valleys, below. As a general rule, the Service would prefer that significant realignments were subjected to field inspection, to confirm that they will indeed result in a reduction of impact.	Sec. 2.1 Sec 15.2.24 Sec 15.2.19
40	Reference to the maps provided in the Fauna Impact Statement indicates that the field survey was unable to provide 100% coverage of the route. It is therefore considered important that sites considered to provide potential habitat are also protected wherever feasible.	Sec 15.3.1
41	The stated intention to employ Environmental Inspectors during the construction phase should provide a means of identifying and minimising impact on additional as yet unidentified sites.	Sec 20.3
42	Whilst the Service supports the consideration given to threatened species, the EIS should also give weighting to impacts on other native fauna in determining the detailed alignment of the route. This would result in a greater emphasis being given to routing across cleared agricultural lands.	Sec.2.1
43	There are, however, some concerns relating to the coverage and thoroughness of the field survey work undertaken so far, and more detailed work will be needed in many sections prior to the final pipeline alignment being determined. The first concerns the reference in the EIS to some sections of the proposed easement which were not surveyed for their biological significance due to refusal of access. Unfortunately it is not stated in the EIS exactly where these sites are located and what length of easement is involved The Service requests that detailed surveys of such areas be undertaken before the final alignment is determined and that any additional sites of biological significance be avoided.	Sec 15.3.1
44	Secondly, the failure to undertake the main surveys in grassland and grassy woodland habitats in spring, when most seasonal perennials would be evident, is also of concern, as this may have led (as acknowledged in the EIS) to a failure to identify species of conservation significance.	Sec 15.3.1

Issue No.	Issue	Response reference
45	So long as areas of medium to high quality grassland and grassy woodland habitat are avoided (as has been recommended in the EIS), then this shortcoming may be significantly lessened. Where such habitats are to be impacted, then a re-survey of the native forbs on such sites in spring seems essential before the final alignment is determined.	Sec 15.3.1
46	A third concern is that a number of sterile specimens of reportedly uncommon species, eg some species in the families Epacridaceae and Orchidaceae, have not been precisely identified. Re-collection of these in fertile condition to enable positive identification is highly desirable, as some of these may well be of conservation significance in view of their observed 'uncommonness' during the pipeline botanical surveys.	Sec 15.4.1
47	Certain doubts are also raised about the thoroughness of the surveys when, for example, only 4 individuals of the nationally rare tree species, Eucalyptus triflora, are reported to have been found near the pipeline easement at Bulee Gap. NPWS officers and independent sources advise that many tens of trees of this species occur at this locality adjacent to the pipeline easement.	Sec 15.2.22 Sec 15.4.2
48	Thorough and detailed survey is thus urged at the Line-Planning stage for all sections of the pipeline going through native vegetation. This will enable detection of biologically significant sites and enable relatively minor realignment of the pipeline easement to avoid habitat damage.	Sec 2.1
49	The EIS also contains some errors relating to the conservation significance of certain species. For example, Dodonaea procumbens is recorded as only being of State significance, however it is now a nationally Vulnerable ROTAP species. On the other hand, Eucalyptus ligustrina is not a ROTAP species. There are some inconsistencies in Appendix 1 regarding the source and date for the ROTAP codes given for nationally significant species - some codes cited are from a 1988 listing, whilst others are the most recent (Briggs & Leigh, in prep. (now in press). For example, Thesium australe is now coded nationally Vulnerable, rather than Endangered.	Sec 15.4.3
50	It is also important to note that all of the nationally threatened plant species encountered and discussed in this EIS are now listed as either Vulnerable (Schedule 2), or in a few cases Endangered (Schedule 1), under the recently introduced NSW Threatened Species Conservation Act (1995). Since the EIS was prepared prior to the introduction of the Act, the EIS does not discuss the significance of this situation. The Service believes that the listing of these species on the current NSW legislation does place additional onus, albeit moral not legal, on the proponent and the determining Minister to ensure that the pipeline construction avoids damaging any populations or habitats of these species.	Sec 3.1.3
51	As described above, the Service is concerned about the lack of reference to secondary data sources and/or personal communication with researchers for the Monaro grasslands. The Service has established a database of surveyed grassland sites in the Southern Tablelands and Monaro which shows that a number of significant grassland sites have been identified that are within 2 km of the pipeline route on the Monaro. Information from this database may be of assistance when decisions to re-route are made. The database is a compilation of material from Jones (1995), Benson (1994), Rowell (unpublished) and Rehwinkel (in prep).	Sec 15.3.1
52	The EIS did not mention the occurrence of Psoralea tenax, a species considered to be of local significance, at Rock Flat TSR (KP 380.1-380.4).	Sec 15.4.3 Sec 15.2.19

Issue No.	Issue	Response reference
53	A significant site through which the pipeline route passes was identified by Rehwinkel in 1996. This site, Black Flat TSR, on the western side of the Monaro Highway, 6 k north of Nimmitabel (KP 366) has grassland values equivalent to those of the Rock Flat TSR to its north. It is recommended that the pipeline route be diverted away from this site, as well as from the TSR opposite, which has not had its values assessed.	Sec 15.2.19
54	The pipeline has been slightly diverted at a site at KP 415-417 containing a population of Dodonaea procumbens (NSW Threatened Species Conservation Act, 1995, Schedule 2). The Service does not consider that this diversion will take the route outside the area occupied by the population of this species; indeed the diversion apparently goes upslope, which is likely to be better habitat for this species. It is felt that the pipeline easement would be better placed alongside or on the road easement which at this point carries a degraded community of no conservation value (see general comments on roadside easements, below).	Sec 15.4.3 Sec 15.2.19
55	Grassland values have also been identified at KP 480-500 (Molonglo R. Floodplain), KP 503 - 523 (Hoskinstown) and KP 5280 - 532 (Manar Ck. Floodplain). No surveys were undertaken at these sites in the EIS. Preliminary survey of the Hoskinstown site indicate it is of medium high conservation significance (R. Rehwinkel pers. comm.). Further work should be undertaken by the proponent prior to the final determination of the route.	Sec 15.2.19
56	The northern Illawarra Coastal Plain is highlighted in the EIS as having only eight percent of its original vegetative cover remaining (Mills, 1983 cited in EIS). The Service considers that this figure has been further reduced in recent years. As a result all remnant vegetation in this area is considered high conservation value, and should not be disturbed by the pipeline. Even those areas considered partly disturbed (such as the woodland west of Lake Illawarra) have species of regional significance. Agricultural lands and disturbed easements should be used to locate the pipeline in this region.	Sec 15.2.24
57	Of particular concern to the Service is the location of Lespedeza juncea var. sericea on the proposed route of the pipeline. This species is only known from one other site in the whole of the Illawarra and since it was discovered in the region in 1993, the population has been reduced by about 50% due to roadworks and farm activities on the road verge (M. Robinson pers. comm.). The pipeline should be re-routed to avoid this species.	Sec 15.4.3
58	The dry rainforest alliance Ficus spp. Streblus-Dendrocnide-Cassine is considered by Floyd (1990) to be inadequately conserved, and it is not represented in any conservation reserves in the Illawarra. Areas where it occurs (between Albion Park and Jamberoo as well as in the foothills of Mt. Kembla) should be considered of significance.	Sec 15.2.25 Sec 15.4.2
59	Two populations of the nationally endangered Zieria granulata were not identified. One population is in a rainforest remnant north of Carwacrok Creek (near Fountaindale road). The remnant also includes the nationally endangered Cynanchum elegans and Daphnandra sp. C. The second Z. granulata population occurs on the ridge near "Tullimbar" (map sheet 52).	Sec 15.4.3
60	The roadside verge at Fountaindale Road possesses remnant vegetation assemblages which include regionally significant populations of Maytenus silvestris, Elaeocarpus reticulatus and Trochocarpa laurina.	Sec 15.4.3

Issue No.	Issue	Response reference
61	Whilst the report discusses, in considerable detail, a significant portion of the body of previous archaeological research, it does not provide any substantive analysis of the investigation methodologies used in the previous studies and there is no discussion or analysis of the coverage achieved by the previous investigations. This would be important in determining which areas, and as a result, which environmental types, have been adequately covered and which have not. Without this information the strength of the archaeological model is undermined.	Sec 16.1.1
62	Also of concern is the use of unnecessarily subjective language in the model itself. Terms such as 'fine-grained' and 'close proximity' would require interpretation in the field and as a result the usefulness of the document may be restricted.	Sec 16.1.1
63	The results of the survey did not include any assessment of the factors that affected visibility, and hence the ability to detect Aboriginal archaeological sites. This assessment would be an important component in determining the validity of the model.	Sec 16.1.1
64	The report appears to provide little testing of the proposed model for Spreads Two and Three. The text claims that sites located during the survey conformed to the predicted site location models for each of the two spreads within New South Wales, however, the report presents no quantified assessment of this claim.	Sec 16.1.1
65	The assessment of the significance of sites previously recorded and those located during this investigation lacks any methodology. The report describes the various types of significance that can be attributed to Aboriginal sites but does not define a process whereby the sites were assessed. A table is provided stating the significance of each site and it would appear that the reader is asked to simply accept the consultants assessment without any justification. Whilst the Service is not disputing the assessed significance of the sites per se, it is concerned that there is no provision of a means to objectively assess the validity of the significance assessments presented. This has a considerable bearing on the recommendations as it is the assessed significance that is used to determine the management of individual sites.	Sec 16.1.1
66	The Service believes that rather than preservation of selected sites along the proposed pipeline alignment, it would be more appropriate to pursue a strategy of impact avoidance for all sites. A considerable body of additional archaeological investigation related to the 'salvage' of selected sites is recommended by the report. Salvage of archaeological sites would only be supported by the Service where the archaeological resource to be impacted upon had a demonstrated potential to yield important information and where it was impossible to avoid impact to that site. If a strategy of avoidance were to be pursued, additional investigations would still be required to determine site boundaries. The testing, and subsequent avoidance of sites, would have considerably less impact on the archaeological resource.	Sec 16.1.1 Sec 16.1.3
67	The Service endorses the recommendation that additional survey is required in those areas incorporated into the route as part of the most recent alignment. Given the achieved coverage of approximately 70% (Revision 5.1/2), the Service recommends that the entire remaining alignment be surveyed.	Sec 16.1.1 Sec 2.1
68	In respect to the discovery of skeletal remains, the Service's position is that unless the remains are clearly not Aboriginal, the procedure should be that the Service and the Police are contacted simultaneously. Each should be informed of the others involvement so that a coordinated response can be facilitated.	Sec 16.1.4
69	The Service accepts that the Aboriginal consultative process for this project is adequate. However the Service trusts that the stated brief written reports commissioned from each Local Aboriginal Land Council on the South Coast of NSW, documenting their views in relation to the results of the surveys and draft recommendations, will be forwarded to the Service prior to determination of the matter.	Sec 2.3.3

Issue No.	Issue	Response reference
70	The Service's comment regarding Section 8.3 Local Aboriginal Culture, centres on the notion expressed in the EIS of 'the last people living a traditional lifestyle'. Some anthropologists (Fanon 1967:180-181; Beckette 1988) have argued that colonising cultures construct idealised, historic images of the indigenous cultures they subjugate. Through controlling the definition of what is essentially characteristic of the subjugated culture, they reserve the power to distinguish authentic and unauthentic aspects of the living culture. Hence, if Aboriginal people argue political demands by reference to their culture, the government(s) of the day are quick to adjudicate what is genuine in such claims. Thus, the use of the phase 'the last people living a traditional lifestyle' should be seen as an example of the elite culture's scholarly study of pre-colonial Aboriginal society. Certainly, the living folk who are the repository of the Ngunnawal culture and the modern population who are its heirs, would support such a comment. The statement 'the last people living a traditional lifestyle' is of little relevance to the surviving Ngunnawal people today.	Sec 16.2
71	The 'Areas of Power in Yuin Country' (EIS p.11-8) introduces the notion of 'revealing by concealing'. The Service accepts the stated process of consultation and documentation, adding that Aboriginal groups and communities should also consider not disclosing the location of cultural sites to outsiders, but instead identifying areas where development activities can occur. The Service would be happy to discuss this notion further with any interested groups and communities.	Sec 16.2 Sec 16.1.1
72	The Service assumes that the 'Areas of Power' are not effected by gender typology, given that the anthropologist is female, with the Yuin informants being all male.	Sec 16.2
73	The comments on mitigation measures relate to the proponent's preferred route to Hoskinstown, then the Marulan route to Wilton. The Service does not consider that the impacts from the pipeline between Hoskinstown and Wilton via Nowra can be adequately mitigated.	Sec 5.1.3
74	The proposed ameliorative measures to reduce the impact of the proposal appear soundly based. However, more detailed guidelines will be required to adequately manage site specific issues.	Sec 2.2.1 Sec 20.2
75	This plan gives general guiding principles but lacks specific detail. These are proposed to be prepared as a Line List following finalisation of the pipeline route when approval for the project has been obtained. Whilst the reasoning for this is understood, the absence of detail in the ameliorative measures proposed in the EIS does not allow for an assessment of their adequacy. The Service will provide further advice and comment when the Line List has been prepared.	Sec 2.2.1 Sec 20.2
76	That a suitably qualified experienced regenerator (belonging to the Australian Association of Bush Regenerators) be employed to implement any restoration strategy. The overall supervision of soil conservation works and revegetation should be carried out by the Soil Conservation Service within the Department of Land and Water Conservation.	Sec 7.1
77	Where a groundcover/shrublayer (as per EIS recommendations) is re-established, other habitat structural elements (eg rocks, logs) be placed back.	Sec 7.1
78	That seed be collected from specimens that are on site prior to construction, and used in regeneration of the easement.	Sec 7.1
79	That transplantable species be removed and re-planted, and soil be replaced so as to ensure any soil seed bank can be utilised.	Sec 7.1

Issue No.	Issue	Response reference
80	As previously outlined, the sensitivity of high quality native grassland means that any disturbance in such grasslands will have a detrimental effect. It is therefore recommended that those areas occupied by significant grassland communities be avoided so as not to jeopardise the remaining grassland sites, many of which have yet to be assessed for their values.	Sec 15.2.19
81	Realignments, however, need careful consideration, firstly to ensure that they do not place the route into other areas of significance.	Sec 2.1 Sec 15.1
82	Secondly, the potential for rehabilitation of the site also needs to be considered. Conditions on the Monaro are such that rehabilitation attempts on particular landforms may fail, or at least be very slow. Rocky ridges on basalt substrates support shallow lithosols and are particularly exposed to harsh climatic conditions (frost, wind exposure and low soil moisture). It is felt that such combinations of conditions would not be conducive to the rapid re-establishment of a rehabilitated community.	Sec 7.1
83	Additionally, in some cases such sites tend to support a more diverse grassland community and provide refugia for herpetofauna. Therefore careful thought should be given prior to realigning the route upslope of significant sites.	Sec 15.2.19
84	A more effective realignment in such cases may be placed lower in the landscape, where the soils are deeper, the climatic conditions not as harsh and where in some cases the grassland community is not as diverse, indeed in areas where past land use may have modified the grassland in varying degrees. However, these considerations need to be balanced by the fact that such sites may be better potential habitat for certain fauna species (in this example for Tympanocryptis lineata pinguicolla and Delma impar).	Sec 15.2.19 Sec 15.3.2
85	For example the Service does not consider that the realignments at KP 390-392 in order to divert from the significant site with reptile habitat and grassland values, have been properly thought out. The realignments have been placed upslope, rather than downslope of the significant site. In this section of the route the preferred realignment would be downslope along the disturbed road easement.	Sec 15.2.19 Sec 15.3.2
86	Alignments or realignments along roadside easements also require careful consideration. As a general rule, grassland and grassy woodland vegetation remnants along roadsides in the area south of Cooma are in a good condition. Generally, where roadside remnant vegetation exists, this may contain species that do not occur within adjacent paddocks because of past grazing history. Such remnants therefore have local or regional conservation values. It is recommended that such roadside reserves be avoided by alignment of the pipeline route in the adjacent paddocks for the area south of Cooma.	Sec 15.2.19
87	By contrast, the roadsides north of Cooma, with some significant exceptions, tend to be degraded due to weed spraying and past physical disturbance. The roadside easements in the area between Cooma and Michelago are felt to be generally more suitable than the adjacent paddocks for the placement of the gas pipeline easement.	Sec 15.2.19
88	The Service has particular concerns regarding the potential for weed invasion in natural grassland communities on the Monaro, particularly from African Love-grass Eragrostis curvula, Serrated Tussock Nassella trichotama, St John's Wort Hypericum perforatum and Chilean Needle-grass Stipa neesiana. The measures outlined in the EIS in Pest Plants Amelioration Guidelines, particularly regarding the cleaning of equipment and use of local soil materials, must be rigidly adhered to in order to ensure that the above weed species do not spread further in these areas.	Sec 15.4.5
89	In the rehabilitation of these grasslands and grassy woodland understoreys, it is recommended that local seed sources be used as much as possible.	Sec 7.1

Issue No.	Issue	Response reference
90	The Service considers that the wider nature conservation values of the route through the Nerriga-Shoalhaven area and Illawarra coastal plain and escarpment are significantly greater than the alternate Marulan route, and therefore recommends that the proponent reconsider using the Marulan route option.	Sec 15.2.24
91	Should the proponent's still consider that access to the Shoalhaven markets is required, a spurline could be constructed down from Wilton. In such a case the route should be amended from that shown in the EIS in order to avoid Illawarra Escarpment SRA. This could be achieved by following the same route as the AGL pipeline from Wilton to Wollongong, also ensuring no further areas of nature conservation significance are disturbed. The Service's comments regarding impact on the northern Illawarra Coastal Plain (s. 4.3 above) would still apply.	Sec 15.2.25
92	From this point north the Service objects to the proponents preferred route and instead considers that the Marulan route should be used. This position is on the basis of the impact of the Nowra route on: • Morton National Park; • Illawarra Escarpment SRA; • the proposed Welcome Reef Nature Reserve; • the proposed Parma Creek Nature Reserve; and, • remnant vegetation on the Illawarra coastal plain. Of particular concern is the appropriateness of locating the pipeline within the existing boundaries of Morton National Park and Illawarra Escarpment SRA. On the basis of several recent Court decisions, the service is of the opinion that a gas pipeline does not constitute the appropriate use of the national park or SRA.	Sec 5.1.3
93	The Service is also concerned about the cumulative impact of development along the Turpentine Road, which forms the only barrier between the Ettrema and Budawang wilderness areas, in Morton National Park. This road is increasingly being used as a utility corridor between Canberra and Nowra. Each development along this route further weakens the link between the two wilderness areas and increases the momentum for further development.	Sec 15.2.19 Sec 15.7
94	In the Illawarra Escarpment SRA the service is concerned about the proposal to construct a new easement in an area not previously disturbed, and the lack of assessment of this in the EIS.	Sec 15.2.25
95	In comparison, the Marulan route crosses mainly open pastoral land of low conservation values. Although there are a few sites along this route which will require careful routing to avoid impact, the overall environmental impact will be much less. The Service considers that this route provides the best balance between environmental and economic considerations.	Sec 5.1.3
96	The Service considers that under Schedule 7 (Savings, transitional and other provisions) of the TSC Act, the minister for Energy, in his capacity as the Determining Authority for this project, will be required to consider the provisions of the TSC Act in making a decision on the permit application. It is the Service's view that this could necessitate additional information being required by the Determining Authority to enable threatened flora species to be assessed in such a manner as threatened fauna species have been addresses in the Fauna Impact Statement, as is required in a Species Impact Statement (Heads of Consideration).	Sec 3.1.3
97	The FIS had failed in its ability to demonstrate clarity of its intentions, thereby making it difficult for an assessor to make an informed and accurate judgement. The assessor is left with substantial uncertainty regarding the details of the proposal especially in the subject of mitigation of impact.	Sec 2.2.1

Issue No.	Issue	Response reference
98	The treatment of amelioration measures is, in general, cursory and imprecise.	Sec 2.2.1
99	The FIS appears to defer such detail to the Line List which will be prepared in the future. Whilst deferral to that time may not be the most suitable for the proponent, such an action does not meet the requirements of the FIS nor does it allow accurate assessment of the potential impacts on the species.	Sec 2.2.1
100	Detailed information is required for such matters as the design of wildlife crossing breaks. This should include details on how the location of such crossings will be determined, how wide the crossings will be and how often will such breaks be provided.	Sec 2.2.1 Sec 15.3.4
101	The FIS places a strong reliance on revegetation to minimise impact. A detailed revegetation strategy should thus have been provided to allow the reader to assess the effectiveness of this approach. This is particularly the case if, as expected, revegetation of native grasslands is problematic. The revegetation strategy should also detail how rehabilitated areas will be protected from damage by full time maintenance crews.	Sec 7.1
102	The authors were required by the Director-General of the NPWS to provide detailed information on any measures to reduce entrapment within the pipeline trench and any proposals to rescue entrapped endangered fauna. However, whilst the authors have acknowledged the substantial potential for entrapment, insufficient detail on how this problem is provided.	Sec 2.2.1 Sec 15.3.6
103	The identification and classification of sites of conservation significance for fauna is endorsed. However, the document does not describe how these sites will be affected by the proposed activity except in the two instances (out of 12). This is particularly concerning and requires addressing. The Service is of the strong view that; (I) the impact of the activity on each of the sites should be considered in detail, (ii) options for avoiding disturbing each site should be provided and (iii) at he very least all sites of National Significance and sites KP 379-384.2, KP 455-455.9, and KP 507-508 should not be disturbed. The latter three sites were regarded as of State Significance by the authors and are known or likely to support those species most likely to be significantly affected by the activity. The Service does not support the view of the authors (page 37) that only site KP 390-392 should remain undisturbed.	Sec 15.2.19
104	The identification of wildlife corridors is also endorsed. More details on how the corridor study was conducted would be useful. Of particular concern however, is that the document does not describe how these sites will be affected by the proposed activity. This is a substantial omission that requires correction.	Sec 2.2.1 Sec 15.3.4
105	Given all of the above it is difficult to accurately evaluate the adequacy of the surveys conducted for this study.	Sec 2.2.1
106	The service is of the view that the surveys were of insufficient intensity for at least some of the groups of fauna. Of greatest concern were those conducted for the nationally vulnerable Striped Legless Lizard (which is also a species which could be regarded as likely to be most significantly affected by the carrying out of the proposal).It also appears that insufficient surveys were conducted for the southern Lined Earless Dragon (Tympanocryptis lineata pinguicolla). The Service does note however, that as this species was not officially listed as Endangered in NSW, the conduct of such surveys were not mandatory, only highly desirable.	Sec 15.3.1 Sec 15.3.2

Issue No.	Issue	Response reference
107	A further example relates to the need to carry out surveys at the same site at an intensity which gives a reasonable level of confidence in the absence results. In the case of surveys for large forest owls only a single night of playback was generally conducted. However, Debus (1993) has demonstrated that several nights of surveys at the same site are required to have a reasonable level of confidence that the species are absent. Similarly pitfalls were not opened for a sufficient period of time to have a high level of confidence that Striped Legless Lizard were not present at the three potentially suitable sites where it was not recorded (the ACT parks and Conservation Service advises that pitfalls should remain open for 28-30 days).	Sec 15.3.1
108	The authors of the FIS presented their assessments for the efficacy of survey for each species in tabular form. They regarded the surveys to be adequate for all species with the exception of those conducted for species of bats. No discussion of the basis of these assessments was provided. This is concerning omission particularly given the doubt expressed by the Service as to the adequacy of the surveys in general.	Sec 15.3.1
109	The failure to provide such information also makes it impossible to make accurate assessments of the adequacy of the surveys for other groups such arboreal marsupials and diurnal birds. The Service suggests that provision of such information may allay some of the concerns regarding survey intensity.	Sec 15.3.1
110	The Service agrees with the decision to not conduct major surveys for flying bats and instead to concentrate effort on identifying areas supporting potential roost sites. However, no detail is provided by the authors on how such sites were identified and indeed whether any such sites were located.	Sec 15.3.1
111	The lack of precise detail on the route is highly problematic as it does not allow precise assessment of the environmental impact of the proposal.	Sec 2.2.1
112	The FIS also states that further alignment recommendations have been made by a number of specialist consultants an that these will be investigated at a later date. Given that adoption of such recommendation may have an impact on the conservation of Endangered fauna, the Service is of the view that such alignment recommendations should have been investigated prior to the production of the EIS and FIS.	Sec 2.2.1 Sec 15.1
113	In considering the potential impacts of the proposal, the authors make conclusions based on very general statements such as "the expansion of existing easements will therefore be avoided where possible". "Loss or damage to such trees (resource-rich species) will be avoided where possible", "the number of trees that will be removed will be very small..." (all quotes from page 31 of the FIS). Whilst such statements may well be accurate and may well result in the proposal having minimal impact on endangered fauna, the lack of detail regarding the actual extent of habitat damage would appear to make it impossible for the determining authority to make an informed decision (on the basis of this document) regarding the true potential impact of the proposal.	Sec 2.2.1 Sec 20.6
114	(i) The data provided in Table 8 appears to be inconsistent with the maps of ecological vegetation classes (Figure 3). The maps pictorially demonstrate that a very substantial proportion of the vegetation along the route was not classified.	Sec 15.4.1
115	(ii) The unit "Anthropogenic habitats" includes the ecological vegetation class "Semi-native pasture". Such pastures may provide habitat for Striped Legless Lizard, Pink-tailed Legless Lizard (Aprasia parapulchella) and possibly Southern Lined Earless Dragon. However, no surveys appear to have been conducted in this vegetation class.	Sec 15.2.19
116	As implied by the authors, it would be overly simplistic to assess the significance of environmental impact based purely on the extent of the area affected. A relatively small area of native vegetation may in some circumstances be vital for the conservation of a species.	Sec 4.5

Issue No.	Issue	Response reference
119	The authors provide a summary of actions that can be taken by the proponents to reduce fragmentation and barrier effects. However, no detail is provided as to how the actions will be achieved nor is a clear commitment given to implementing the actions.	Sec 2.2.1 Sec 15.3.3 Sec 20.6
120	The authors of the report were specifically required to address the issue of the impact of the proposal on predation by feral animals on native fauna (see Director-general's of the NPWS requirements). The FIS provides a cursory account of this issue and concludes that where the pipeline easement creates a new clearing within unroaded forest, critical weight range species may be affected. However, no estimation of the extent or significance of this impact is provided. The consideration is thus of little value.	Sec 2.2.1 Sec 15.3.5
121	The treatment of impacts related to wetlands, aquatic habitats and stream crossings is similarly cursory and uninformative. A conclusion of minimal impact is provided however, no rationale for this conclusion is given.	Sec 2.2.1 Sec 15.5.1
122	The FIS refers to the implementation of weed and dieback control strategies. Again no details are provided. The effectiveness of such strategies cannot be assessed nor can it be assessed whether such strategies may have an effect on Endangered fauna themselves (for example use of herbicides may pose a significant threat to amphibians). The FIS should also consider the environmental impact of these control strategies. In addition, the environmental impact of the proposed tree suppression techniques (mentioned in the EIS should be considered. This would particularly be the case if the proponent intends to use herbicides.	Sec 15.4.5 Sdec 15.4.6
124	Tiger Quoll - the proposal is likely to have minimal impact if large trees, both standing and fallen are protected.	Sec 15.3.2
125	Brush-tailed Phascogale - the proposal is likely to have minimal impact if large standing trees are protected.	Sec 15.3.2
126	White-footed Dunnart - Entrapment in trenches is likely and requires management. A detailed entrapment management strategy is required.	Sec 15.3.2 Sec 15.3.6
127	Southern Brown Bandicoot - Due to its precarious status in NSW further consideration is essential. All likely habitat should be surveyed at least using hair-sampling tubes prior to construction. Located sites should be avoided and dense ground cover should be provided in areas surrounding known habitat. a detailed entrapment management strategy is required.	Sec 15.3.2
128	Yellow-bellied Glider - Any hollow-bearing trees that must be felled should be subjected to nocturnal survey to ensure they are not being utilised for denning by the species. Any tree to be felled should be inspected for characteristic V shaped notches. No trees bearing these marks should be felled. large trees o species known to be utilised for nectar feeding by this glider should not be felled.	Sec 15.3.2
129	Squirrel Glider - All likely habitat should be surveyed by a biologist experienced in the identification of the species. Clearing width should be minimised at nay located sites and trenches should not remain open overnight as entrapment followed by predation may occur.	Sec 15.3.2 Sec 15.3.6

Issue No.	Issue	Response reference
130	Koala - These threats should be managed through minimisation of clearing width within all potential habitat, strict and permanent vehicle speed limits in such areas and regular patrols along open trenches within such areas searching for entrapped koalas (at least three times nightly). Tree removal should be avoided within all potential habitat. If this is not possible all trees to be removed should be inspected for characteristic claw marks or dung of the koala. Any tree with such evidence should not be removed and clearing width should be kept at an absolute minimum within 200m either side of the tree.	Sec 15.3.2 Sec 15.3.6
131	Long-nosed Potoroo - All likely habitat should be surveyed at least using hair-sampling tubes prior to construction. Locates sites should be avoided and dense ground cover should be provided in areas surrounding known habitat. a detailed entrapment management strategy is required.	Sec 15.3.2 Sec 15.3.6
132	Brush-tailed Rock Wallaby - This and any potential site should be thoroughly surveyed if any vegetation is to be cleared. Alternatively no clearing of vegetation, bee it native or introduced, should occur at potential sites.	Sec 15.3.2
133	Parma Wallaby - If located work should cease immediately and the NPWS should be notified.	Sec 15.3.2
134	Little Whip Snake - All potential habitat for the species should be surveyed prior to disturbance due it the potential negative impacts identified by the authors and the uncertainty as to whether habitat can be rehabilitated. Unless, such surveys indicate that the species I s more common and wide spread than current data suggests, any located sites should not be disturbed. Following the survey, any potential habitat adjacent to known sites should be managed as per the amelioration measures proposed in section 6.5.2.7.	Sec 15.3.2
135	Pink-tailed Legless Lizard, Striped Legless Lizard, Southern Lined Earless Dragon - All of the above species are extremely rare in NSW. The authors of the FIS predict that all three species would be negatively affected by the proposed activity (although the former species has not yet been recorded on the proposed alignment). The authors further point out that all have a low recovery potential and that the regional viability of the later two species may be affected by the proposal. Given this, further surveys for these species are vital. The Service thus strongly recommends that further surveys be carried out in all potential habitat prior to construction. The objective of the survey should be to determine the conservation status of t the species in the area and thus the significance of the known sites. If the three species are found to be widespread, then management by ameliorative prescriptions rather than exclusion of the activity may be appropriate. In making this recommendation the Service advises that the period for survey of all of these species is confined to the warmer months and thus the construction of the pipeline in these area may be delayed as a result.	Sec 15.3.2
136	Heath Monitor - Clearing width should be minimised at any known or likely sites and trenches should not remain open overnight as entrapment may occur. Alternatively, trenches adjacent to known or likely habitat should be inspected for entrapped monitors at least once per day.	Sec 15.3.2
137	Giant Burrowing Frog - Clearing width should be minimised within a certain distance of any located sites the appropriate distance has not yet been determined by the Service but may be in excess of 500m. Trenches adjacent to known or likely habitat should be inspected for entrapped frogs at least once per day.	Sec 15.3.2
138	Great Barred Frog, Southern Barred Frog - Crossings up stream of known sites should also be avoided Further surveys should be conducted at any potential habitat along the route prior to construction . Trenches adjacent to known or likely habitat should be inspected for entrapped frogs at least once per day.	Sec 15.3.2

Issue No.	Issue	Response reference
139	Red-Crowned Toadlet - further surveys should be conducted at any potential habitat along the route prior to construction. Trenches adjacent to known or likely habitat should be inspected for entrapped frogs at least once per day.	Sec 15.3.2
140	Growling Grass Frog - Crossings upstream of known sites should be avoided. Further surveys should be conducted at any potential habitat along the route prior to construction. Trenches adjacent to known or likely habitat should be inspected for entrapped frogs at least once per day.	Sec 15.3.2
141	Green and Golden Bellfrog - the FIS indicates that the species has not been recorded on or near the alignment. However, it does not state whether the alignment contain the habitat suitable for the species. This should be ascertained. If suitable habitat is present surveys for the species should be undertaken. If the presence of the species is confirmed then further consideration should be given to the species' management.	Sec 15.3.2
142	It is not valid to regard all easements as supporting highly altered habitat types. Some rail, road and travelling stock reserves contain intact habitat with highly significant species of flora such as Swainsona recta, Dodonaea procumbens, and Prasophyllum petilum. In some instances the highest quality habitat can be found within such easements.	Sec 15.4.3
143	Information on the habitat quality of such easements should therefore be provided.	Sec 2.2.1 Sec 15.2.19
144	The proposed projects appears to have a strong reliance in ongoing liaison (which will presumably include site inspections) with Public Authorities. While continued liaison will be necessary and is endorsed by the Service, given the nature and size of the project, such liaison may impact upon the ability of such Public Authorities to meet their obligations in other public duties. The proponents should consider how best to utilise the resources of Public Authorities and provide for some form of financial assistance such that the other public responsibilities of the authorities are maintained.	Sec 2.2.1
145	The intention to continue to modify the route throughout the construction phase to minimise impacts is commended. However, the resulting difficulty in providing detailed site-specific impact information before the exact route is finalised places a level of uncertainty on the accuracy of the assessment conclusions presented in the FIS.	Sec 2.1 Sec 15.1
146	The failure of the FIS to provide specific details regarding the amelioration of impact is a serious flaw and casts some doubt as to whether the requirements of the Director-General have been met. This has in turn restricted the ability of the Service to provide any more than general comments at this stage.	Sec 2.2.1
147	The Service acknowledges that the proponent intends to prepare a detailed Line list prior to the construction of the pipeline. Whilst this may allay many of the Service's concerns the Service does not regard this as an appropriate sequence of environmental assessment. Nevertheless, if the Determining Authority deems that preparation of a Line List meets the requirements of Part V of the Environmental Planning and Assessment Act 1979 the Service requests that it be consulted to ensure that the intent if the Threatened Species Conservation Act 1995 is met.	Sec 2.2.1
148	The Service seeks a role in establishing the minimum qualification requirements for these positions, as well as the design of their procedures and reporting arrangements.	Sec 20.3

Issue No.	Issue	Response reference
149	The Service is of the view that, along with disturbance to sites of Significance and wildlife corridors, the most concerning impacts of the proposed activity will be those related to barrier effects, fragmentation of habitat and populations and entrapment of individuals.	Sec 15.3.3 Sec 15.3.4 Sec 15.3.6
150	The Service is particularly concerned about impact upon Striped Legless lizards. This species is believed to avoid crossing open spaces and roads are suspect to be effective barriers to movements (David Shorthouse, pers. comm. 1995).	Sec 15.3.2

OPTUS COMMUNICATIONS

Issue No.	Issue	Response reference
1	OPTUS Communications would like to make the following comments towards your options: - any changes to property ownership should be undertaken ensuring that the new owner/s has been informed of the OPTUS Communications assets - any development of the area mentioned would require OPTUS Communications input so as to ensure the integrity of the OPTUS Communications assets - any trees to be planted would need to be of an unintrusive root system, as well as not planted within the vicinity of the asset alignment - prior to any activity taking place it would be appreciated if contact was made with OPTUS Communications (Ph 188 505 777) so as to ensure the security of the OPTUS Communications assets.	Sec 18.5.3

PACIFIC POWER

Issue No.	Issue	Response reference
1	While accepting that the concept of a pipeline from Bass Strait to New South Wales is desirable, the benefits of increased energy market competition are dependent on competitive gas haulage being provided by the pipeline. Competitive haulage requires non-discriminatory access by all pipeline users, together with a non-discriminatory haulage charges. The terms of access and haulage charge methodology are at present unknown, and the level of competition to be provided by the pipeline is therefore open to question.	Sec 4.1.2
2	Transmission pipelines, such as the proposed pipeline, are natural monopolies. To ensure that excessive rent is not taken from the pipeline, the capacity of the pipeline and the start up date need careful substantiation. An oversized pipeline, or a too early constructed pipeline can result in excessive capital charges being borne by pipeline users, thus increasing the price of gas supplied through the pipeline and lessening energy competition. The substantiation of the capacity and the start-up date of the Eastern Gas Pipeline are not clearly addressed by the EIS. However, as indicated above, it is uncertain what level of substantiation is required in a competitive market environment.	Sec 4.1.1 Sec 4.2.2 Sec 4.3

Issue No.	Issue	Response reference
3	However, environmental problems arise when co-generation is located in the Sydney Air Basin. Any increase in the use of fossil fuels in the Sydney Air Basin will have a detrimental effect on air quality in that area which already has very significant air quality problems. There are no coal fired power stations in the Sydney Air Basin, consequently displacement of coal based electricity with co-generation will increase pollution in the Sydney Basin where it will create problems and reduce emissions in power station locations where the emissions are relatively harmless. However, power developments are now arising which are called co-generation, where only a small part of the waste heat produced (and hence the gas burnt) is used for steam generation. Such developments are basically an electricity generation project using co-generation as a name tag. In these types of developments, only a small part of the primary fuel is used at the high efficiency and the remainder is burnt with the efficiency of a gas turbine (around 30%). This fuel could be burnt more efficiently in existing power station boilers, at 38% efficiency, without the negative local environmental impacts. The environmental solution to the above problem is to burn the minimum amount of gas within the Sydney Air Basin. This would require using gas to produce only steam or heat within the Sydney Air Basin (ie. no fuel burnt for electricity generation and the generation of electricity by natural gas fuelled combined cycle plan located outside the air basin.	Sec 4.2.3 Sec 14.4 Sec 14.5

PUBLIC TRANSPORT CORPORATION

Issue No.	Issue	Response reference
1	The Public Transport Corporation (PTC) advises that it gives its principal approval to your proposal subject to Minerals & Energy Victoria (M & EV) entering into a licence with the PTC for the use of the reserve in the described locations, construction of the pipe within the rail reserve being in accordance with the Railway Code of Australia, all fees and costs outlaid by the PTC to be paid by M & EV and the licensee consult with the Department of Conservation and Natural Resources (DC&NR) on environmental issues which may be affecting the reserve.	Sec 18.5.2 Sec 18.3.5 Sec 15.2.6
2	In relation to the use of the Bairnsdale to Orbost rail reserve, the PTC advises that it is in the process of surrendering the land to the crown. The PTC understands DC & NR are in advanced stages of planning for a Rail Trail along the reserve. The PTC suggests M & EV consult with DC & NR on their proposal to use the reserve. The PTC would expect that the land surrender should be completed prior to M & EV entering into an agreement with PTC.	Sec 18.5.2 Sec 18.3.5 Sec 15.2.6

RIZZA, V. AND M.

Issue No.	Issue	Response reference
1	Esso/BHP have consistently proven their lack of concern for property, environment and the property owners.	Sec 2.2.3
2	Furthermore, the EES does not mention how the Eastern Gas Pipeline will impact on site 1 or the area between site 1 and Longford. We have already had to endure the laying of optical fibre on our property and the installation of a 50 metre tower on site 1. It is quite clear that site 1 is being upgraded in anticipation of the establishment of the Eastern Pipeline, however, no mention has been made in the EES regarding this matter.	Sec 2.2.3
3	BHP and ESSO have a cavalier attitude in relation to property owners as shown in our particular case, Esso/BHP have entered into a legally binding agreement with a third party that would have the effect of reducing the value of our property.	Sec 18.2
4	It is of utmost concern to us that other landholders are not treated in the same manner as ourselves and therefore urge the panel to consider means whereby landholders have an avenue for rectifying the problems without enduring court action.	Sec 18.2
5	Furthermore, it is most likely that the upgrading of site 1 is due to the extra capacity of gas needed for the Eastern Gas Pipeline therefore we feel an EES should also encompass this area.	Sec 2.2.3

STONEY CREEK GREENWAYS STEERING COMMITTEE

Issue No.	Issue	Response reference
1	This committee therefore asks that the other options, particularly that of using gas fired electricity generators at source, be now developed and a thorough comparison be made in terms of energy efficiency, resource use, Greenhouse emissions and environmental impacts.	Sec 5.4
2	This committee seeks assurances that any reticulation system would be fully integrated, and not duplicative of, alternative suppliers of natural gas, in line with the national frameworks that are in place for microeconomic reform of infrastructural developments.	Sec 4.1.1
3	It is the consumer who will pay for burying huge amounts of steel piping, for a limited life. Perpetuating the community's dependence on non-renewable resources, through major infrastructure, is once again , directing resources away from the critical research for more viable alternative energy sources, which companies such as your own need to be embracing, in line with genuine Ecologically Sustainable Development.	Sec 18.1.2 Sec 4.7 Sec 4.5

4	The proposed 731 kilometres pipeline route cuts through a particularly wide range for habitats and plant communities. It is a massive job to adequately survey the length of the proposed pipeline for flora, fauna and ecological and heritage values. On the basis of the information given in the Background paper, there is little reason to believe that Biosis has achieved the necessary level of detail within the time frame of the study. Only some of the most intact or obviously promising sites were assessed briefly for fauna. Almost no information is given on which sites were selected for more detailed faunal study, or of the range of survey techniques employed at particular sites, or of the duration over which particular sites were assessed. The implication of what is stated in the background paper is that the faunal survey was, at best, patchy and incomplete in its coverage. There is high probability that some and possibly many areas providing faunal habitat for species significant at the regional, state or national levels remain undetected. As possible example exists in the Primrose Valley and Molonglo River Floodplains, where a sometimes modified flora occurs over what were previously lowland grasslands. These areas provide possible habitat for Delma impar. the nationally vulnerable Striped Legless Lizard. Given the current impoverished state of knowledge on Australia's ecological resources, reliance on external sources is unlikely to have filled in much of the missing data. On the basis of the existing information in the background paper, there is high probability that construction of the pipeline will lead to undetected and sometimes major impacts on populations of significant faunal species. There is therefore a clear need for the proponents to commit major additional resources to suitably comprehensive faunal study of the route. There is also a need for experts to undertake checks, prior to each section being disturbed and to provide advice on the most appropriate, immediate rehabilitation and follow up management needs.	Sec 2.2.1 Sec 15.3.1 Sec 15.4.1
5	Invasive Plants - past experience with such easements (eg along the highways on the Monaro Plains, east of Cooma) has shown that the disturbance ushers in a full suite of invasive plants and the easements become a permanent source of infestations for adjacent and more distant areas. The arrangements that are proposed to be developed with landowners and managers along the proposed route must take the long term management needs into account, ie to provide ongoing means to prevent weed species taking hold, through the introduction of native grass species and other appropriate and ecologically sustainable forms of control	Sec 15.4.5
6	River Crossings - The project will, as proposed, unfortunately ford a great many rivers and streams. Much care would be needed to ensure, not just that disturbance is minimised and sedimentation is avoided, but that the possibility of fish or spawning is not disturbed, particularly native species. In the case of the upper Queanbeyan and Molonglo Rivers, for example, Macquarie Perch may be spawning in gravel beds. For each crossing, inquiries need to be made at the time to seek the most appropriate advice, as to the risks involved and steps to mitigate or avoid damage and disturbance.	Sec 12.1.1 Sec 15.5.2

SYDNEY WATER CORPORATION LTD

Issue No.	Issue	Response reference
1	The EIS describes the pipeline location, impacts and construction/operation mitigation measures etc, very generally. As a result, understanding the precise nature of these issues is very difficult. As there is a legislative requirement upon Sydney Water to ensure, amongst other things, the ecological integrity of its Metropolitan Special Area (water supply catchments) it is essential for Sydney Water to thoroughly understand such issues so it can provide cogent comments and satisfy the various legislative requirements upon it. Therefore, the level of detail in the EIS provides little confidence on the prediction of impacts in Sydney Water's area of operations.	Sec 2.2.1 Sec 15.2.26

Issue No.	Issue	Response reference
2	Whilst discussions have taken place on relocating the proposed pipeline route which traverses through the Welcome Reef Dam area, no such commitment is found in the EIS. Therefore, Sydney Water does not support the route through this area because it prejudices Sydney's future drinking water supply.	Sec 15.2.21
3	Sydney Water does not support the use of its Metropolitan Special Area to locate the proposed pipeline because of the importance of maintaining at all times safe drinking water within this area. However, as an existing AGL pipeline is within this area, Sydney Water may support the pipeline being located only within this existing easement (25 metres). Additional clearing would not be supported.	Sec 15.2.26
4	Greater detail on water quality, flora and fauna impacts, reduction in species diversity, maintenance of easement, mitigating weed invasion, cumulative impacts, etc, must be provided before Sydney Water will entertain another pipeline being located within the Metropolitan Special Area.	Sec 2.2.1 Sec 2.2.2 Sec 15.4.5 Sec 15.2.21
5	Within Farnborough area where there is an existing easement there are concerns relating to remnant rainforest, a regionally rare plant Actephila linaleyi, (this is a very rare species in New South Wales and should be protected) as well as identified fauna species which are listed on the former Schedule 12 of the National Parks and Wildlife Act 1972.	Sec 15.4.3
6	The maps identifying the alternative pipeline routes are difficult to read in terms of their precise location. Accordingly, it is difficult to tell what habitat is likely to be effected, what environmental impacts are likely to occur, or what Sydney Water infrastructure may be effected (eg. pipelines and reservoirs). Nevertheless, the easterly route would appear to miss threatened species, rainforest patches and Sydney Water infrastructure. The more westerly route appears to traverse through good forested escarpment habitat where threatened species (plants) are known to occur.	Sec 15.2.25 Sec 15.2.26
7	It is within the water supply Special Area, that the construction and operation of the proposed pipeline would have the greatest potential for pollution of the Corporation's new water supply.	Sec 12.1.1
8	Minimal disturbance within the Metropolitan Special Area areas may be entertained provided the proposed pipeline is located within the existing AGL easement. Within that 25 metres easement only 9 metres should be disturbed. Furthermore, no roads adjoining the easement will be permitted following construction.	Sec 6.1
9	The potential impact of the project on the Sydney Water catchments should have been listed as one of the principal environmental issues. The Flora, Fauna and Ecological Studies recognises that the section of the proposed route through Sydney Water's catchments is "the largest area of high sensitivity along the route".	Sec 15.2.26
10	The Water Board (Corporation) Act 1994 should have been included as a piece of NSW legislation that is applicable to this project.	Sec. 3.1.2
11	Neither the Project Description nor chapter 17 comment on planning for environmental protection or the implementation of erosion and sediment control works prior to construction commencing. Section 8.2.4 recognises that siltation and degraded water quality is most likely to occur during the construction phase. Environmental protection works must be planned, described and implemented prior to construction commencing.	Sec 11.1.3 Sec 20.2

Issue No.	Issue	Response reference
12	It should be noted that receiving waters in the Metropolitan Special Areas are classified as Class S under the Clean Waters Act, 1970. Therefore, all creeks and drainage pathways have high constraints with respect to water quality. That is to say, no discharge of any waste, including waters used in the testing and cleaning of the pipeline are permitted to these waters.	Sec 3.1.2 Sec 12.1.1
13	Table 8.2 indicates that for Kembla Creek which drains to Sydney Water's Cordeaux Reservoir there is a nil or low constraint with respect to the "water quality sensitivity". Sydney Water's catchment management and water supply concerns have not been documented and addressed in the EIS.	Sec 12.2.2
14	Figure 8.1 is unclear but appears to show the Corporation's Metropolitan, O'Hares and Woronora Special Areas as vacant Crown land. The lands along the proposed pipeline route through the Metropolitan Special Area are mostly freehold lands owned by Sydney Water. Figure 12.1 is also indecipherable, a different map scale would be more appropriate for figures 8.1 and 12.1.	-
15	Chapter 10 should be expanded to clearly delineate those parts of the pipeline route where the pipeline and associated clearing will be contained wholly within an existing easement.	Sec 6.1 Sec 6.4
16	Through the EIS and in a number of the Environmental Studies the term "... following existing easements..." is used in a way to imply that this activity will minimise environmental disturbance. Does "following an existing easement" mean the new pipeline easement will sit beside the existing one in which case no environmental protection benefit is necessarily gained, or does it mean the new and the old easement overlay each other? The EIS is not written in such a way so this issue is understood.	Sec 6.1 Sec 6.4
17	To assist the future evaluation of the pipeline proposal and the development of appropriate environmental protection works quantitative data is required of the total area of native vegetation to be cleared over each section of the proposed route. This information will also be an essential input to assess the effectiveness of the Environmental Management Plans described in Chapter 17.	Sec 6.1 Sec 6.4 Sec 15.4.4
18	Table 10.7 clearly recognises the ecological significance of the Corporation's water supply catchments and states that the "mitigation measures" in the catchment should be to "restrict pipeline construction to the existing easement". Within the water supply catchments all construction clearing, trenching and other associated pipeline activities should be wholly contained within the already cleared portions of existing easements.	Sec 6.4 Sec 6.1
19	Since all weeds within the water catchments are a concern to Sydney Water the list of weeds in section 10.6.2 should be expanded to at least include all declared noxious plants within the Wollongong and Wollondilly Local Government areas.	Sec 15.4.5
20	To place the pipeline in a whole catchment context there should have been a section of the EIS that describes the areas along the proposed route of highest cumulative social, environmental and economic value.	Sec 2.2.1 Sec 2.2.2
21	Table 10.7 describes Potential Impacts, Mitigation Measures and Resultant Impacts on sites of Biological significance. In the areas identified of significance within Sydney Water's area of operation describe the impacts as low to high, possibly similar, impacts high away from existing easement. There is no discussion on what this means. The description of impact is so general it is difficult to adequately describe any concerns.	Sec 15.2.26

Issue No.	Issue	Response reference
22	This section states that "once the pipeline has been tested the water will be spread over nearby vegetated areas...". An absolute statement such as this is quite inappropriate in considering the environmental issues over the length of the pipeline route. Section 8.2.4 does however recognise the differing implications of the NSW Clean Waters Act 1970. Section 4.1.3 of the Hydrology Drainage Study also recognises the implications of the NSW Clean Waters Act 1970.	Sec 6.10
24	It is stated that "the EMP (Environmental Management Plan) addresses potential environmental issues which may be encountered during the construction and operation of the Project." Sydney Water understands this to be the function of the EIS. It is most important that the environmental issues be addressed in the EIS so as to allow for an informed critical evaluation of the various pipeline routes prior to final approval. To consider the environmental issues after approval may devalue the importance of environmental protection to the wider community. Such action would also be contrary to the pipeline route selection process which as stated in the draft EIS used the environmental issues as one of the initial route selection criteria.	Sec 2.2.1
25	The objectives and management commitments are described in terms that could be interpreted in a number of ways depending on the circumstances. The use of clear unambiguous terms is necessary through all stages of this project to ensure proper accountability and auditing of activities achieved.	Sec 2.2.1 Sec 20.6
26	Appendix 5 of Background Paper No.10 suggests that because there are no commercial forest issues on lands controlled by Sydney Water and that the most important concern with respect to the proposed pipeline through the water catchment is the possibility of causing a wildfire. This statement indicates an apparent lack of knowledge of Sydney Water's legislative responsibilities.	Sec 18.3.2
27	Section (i) of Background Paper No.10 states that the existing AGL easement would need to be widened by at least 10 metres in most places in order to accommodate both pipelines. This is contrary to the specific recommendations of a number of other Studies.	Sec 6.1
29	The risk criteria used in this document relates to personal and social injury near the pipeline mostly as a result of an infrastructure failure. The risk criteria does not cover downstream pollution of community drinking water supplies since there is a clear and recognised link between community health and an uncontaminated drinking water supply.	Sec 19.1 Sec 12.1.1
30	This document also states that there should be a 15 metre separation between the AGL and Eastern Gas Pipelines between Wollongong and Wilton. Sydney Water does not support this unless such separation is possible within the existing easement without a further clearing of native vegetation. Further, there is no confirmation in the EIS that AGL has agreed to utilising its easement.	Sec 6.1
31	Section 4.1.8. The statement that sedimentation will be restricted to the period of construction is unacceptable to Sydney Water. There should be an aim for nil impact on downstream water quality within the Corporation's water supply catchments and planning commenced to achieve this.	Sec 12.1.1
32	In light of the study findings and the recommendation to avoid increasing the width of existing easements and tracks, Sydney Water seeks from the Eastern Gas Pipeline Project team an undertaking that there will be no clearing of native vegetation within the water supply catchments during the surveying, construction and operation of the pipeline.	Sec 6.4 Sec 15.4.4

Issue No.	Issue	Response reference
33	Section 5.6.3 of Background Paper No.11 states that a new easement will be established from 724 km to 726.5 km most of which would be within the "Corporation's water supply catchments. Accordingly, there is little discussion on what impacts will result from this additional clearing on vegetation and species diversity, as well as downstream water quality.	Sec 12.1.1 Sec 15.5.2
34	The map of the pipeline route from Wollongong to Wilton, figure 3.1 of Background Paper No.13 is not discernible.	-
35	Section 2.1 of Background Paper No.10 discusses the economic values of the forests that are affected by the proposed pipeline route, however the concept of "value" appears to be viewed in a very narrow wood production sense. The catchments are an integral part of Sydney Water's collection, storage and treatment of raw water and as such they have a very real economic value.	Sec 18.3.2
36	Table 4.10 of Background Paper No.14 indicates that bushwalking is an allowed recreation activity in and around Cordeaux Dam. This is not the case, picnicking is allowed at the Sydney Water's Dam but the catchments are generally closed to recreation as a management tool to protect water quality.	-
37	Background Paper No.6 indicates many significant sites in or near the proposed route through the Metropolitan Special Area. However, no mitigation of impacts are described.	Sec 15.2.26
38	One of Sydney Water's concerns regarding the proposed pipeline is the route between chainage 541 km and 554 km, in the vicinity of the Shoalhaven River, where the pipeline route crosses a number of gullies in highly erodible soils. The Corporation has spent considerable funds in past years on stabilisation works to limit the spread of gully erosion in this area and a pipeline trench along the original alignment in this area of highly dispersive soil would initiate further severe and long term erosion problems.	Sec 15.2.21
39	The original alignment traverses land which would be inundated by construction of Welcome Reef Dam and intersects the alignment of a planned, saddle dam embankment. While Sydney Water would prefer the pipeline route to be completely clear of the potential water storage area and associated infrastructure, the cost to the company of substantial route deviations is appreciated. It is understood from discussion with a project surveyor that a compromise route deviation proposed by Sydney Water, which avoids the highly erodible, gullied land and minimises the extent of potential pipeline inundation and impact on water storage options, is acceptable to the company. Written confirmation of this is requested.	15.2.21
40	The EIS does not adequately cover the highly erodible nature of the soils through Welcome Reef Dam.	15.2.21
41	Sydney Water has concerns for the impacts the proposal will have on land degradation of its property holding resulting in possible loss of viable agricultural land, deterioration of water quality, introduction of weeds, etc. The consultants "Limitation" supports this view.	Sec 18.3.3 Sec 18.2.3 Sec 15.4.5
42	Despite the statements contained in the EIS concerning remedial works, mitigation measures etc, Sydney Water is likely to incur significant additional land management costs. This comment is made following experience with similar projects. Consequently, Sydney Water seeks from the proponent a committed undertaking in the form of a memorandum of understanding for ongoing land management within Sydney Water's property holdings.	Sec 20.1 Sec 20.6

THE COUNCIL OF SHELLHARBOUR

Issue No.	Issue	Response reference
1	The exact method to be used for crossing of Macquarie Rivulet and the implications for sediment input into Lake Illawarra	Sec 12.2.2
2	To ensure that every effort will be made to have transportation of equipment associated with the project occur outside peak times.	Sec 18.4

THE WILDERNESS SOCIETY

Issue No.	Issue	Response reference
1	The aim of an EIS/EES is to "ensure that decisions are taken following timely and sound environmental advice". However, the draft report neglects to adequately address environmental issues on all fronts. In many instances, the report has been padded out with tables and graphs, yet clear, scientific analysis of the issues is missing. The lack of substance makes it impossible to comment on many aspects of the report, beyond a critique of lack of data, knowledge of issues being considered, and inappropriate methodology. The report deals with these issues in only half a page - totally inadequate given the potential for impacts on these values. The report states, without evidence, that there will be no visual or actual impact on proposed World Heritage areas in Victoria. It neglects to deal with the global biological significance of sites or even to accurately identify proposed areas. Despite a NSW requirement that impacts on world heritage be assessed, this has been ignored. Unfamiliarity with the issue is obvious, making comments on world heritage in the report useless. The proposed 'Australian Alps' and 'Blue Mountains' world heritage areas, with potentially higher ranking than four existing listed sites in Australia, will be affected by the pipeline.	Sec 2.2.1 Sec 15.6
7	The report ignores the national energy usage/infrastructure planning framework (much of which is still to be decided). Planning that pre-empts outcomes makes assessment of the project on this level impossible. National energy policy and gas grid regulation will have significant consequences for this project.	Sec 4.4.1
8	A gas pipeline along the Western route (which is shorter, with less environmental problems) is currently being proposed. The environmentally and economically costly eastern route may unnecessarily duplicate infrastructure.	Sec 5.1.2
9	The public consultation process effectively offered no say in the choice of corridors, by not providing the degree of information for these routes.	Sec 5.1.1
10	Roading and bridging for vehicles will need to be constructed for the pipeline, yet environmental impacts of roading have barely been touched on in The Draft EIS.	Sec 6.2
11	Benefits of the planned project have been overstated and misrepresented by ignoring alternative energy and energy efficient scenarios.	Sec 5.4
12	The report wrongly claims natural gas use will reduce Greenhouse gas by 25%. Simple calculations show this would be closer to 0.8%.	Sec 4.6 Sec 4.6.1
13	The report claims the pipeline will stimulate research into renewable energy and increase energy efficiency, thereby reducing the price of gas and electricity and meeting ESD objectives. This logic is flawed. The pipeline would more likely have the opposite effect.	Sec 4.2.2

Issue No.	Issue	Response reference
14	Lack of site detail, and on-going modification of the planned route make it impossible for the public to meaningfully participate in the process. Assessment of impacts on the environment and techniques to limit damage are very unclear, and not site specific.	Sec 2.2.1
16	The report does not detail methods of stream crossings or outline how it would protect water quality. Given that East Gippsland has some of the most intact river systems in Victoria, and is a high rainfall area with highly erodible soils, this is not acceptable. In addition the report mentions only the major rivers.	Sec 2.2.1 Sec 12.2.1 Sec 15.5.1
17	The Draft EIS has no data or discussion on E. coli levels for streams, crucial information where those streams supply water for human consumption.	Sec 12.1.1
18	The report talks of the "cost effective methods of achieving environmental objectives". East Gippsland has very high environmental values, and concerns to minimise costs to the proponents should not occur at the expense of the environment. This concern is accentuated by the lack of explanation as to what these "cost effective" methods are.	Sec 2.2.1
19	The draft EES gives conflicting figures as to the amount of regrowth that will be permitted to return.	Sec 7.2
20	It is impossible for the public to comment adequately on the effects on National Estate as the reports on the joint AHC/CNR studies on National Estate in East Gippsland are yet to be released. These reports will contain a lot of very relevant information. This proposal should be delayed until these are available.	Sec 15.8
21	Due to the lack of information as to the whereabouts of existing cables along easements, it is proposed that a new swath of forest be removed next to this to accommodate the pipeline. This is unacceptable.	Sec 6.1
22	Construction along the Western route (or Hume) corridor would have less environmental impact than the Eastern route. The report acknowledges that two gas pipeline infrastructures would create more Greenhouse gases.	Sec 8.1.2
23	The line would be cut through 110km of State forest and 8km of reserves and parks in Victoria alone. It is planned to enter 12km of designated and protected HCV forest and a further 7km of Special Management Zone for natural values. The report does not deal with specific sites but makes general and inexplicit statements as to environmental impact.	Sec 15.2.4
24	Erosion, revegetation, and the non-compliance with environmental regulations applied to forestry activities are all serious concerns. On-going pressure on the surrounding ecology, fragmentation of the forest, loss of diversity and weed and disease (phytophthora) invasion are extremely serious issues which have been dealt with in a trivial fashion.	Sec 2.2.1 Sec 15.3.3 Sec 4.5 Sec 15.4.5 Sec 15.4.6
25	The lack of specific commitment to any route, engineering or damage limitation methods, means there could be vast alterations to all of these during the construction phase to suit the proponents.	Sec 2.2.1
26	The gas pipeline would pass through at least 10 areas of environmental significance (state and national) in East Gippsland. Alternative routes would be impossible in some instances as it would cause equal damage to areas of equivalent value. East Gippsland is simply unsuitable for establishing a gas pipeline infrastructure.	Sec 15.2.4
27	If environmental damage is caused by a subcontractor during construction or maintenance, who will be liable, and how will the extent of liability be determined? Will the damage be repaired?	Sec 20.6

Issue No.	Issue	Response reference
28	Will the public have access to the easement during construction of the pipeline to monitor impacts, or will the easement be 'private property' with the proponents doing their own monitoring?	Sec 6.2
29	If erosion, landslip, or weeds emanate from a common easement, who bears the cost of damage and repair?	Sec 20.6 Sec 15.4.5
30	The pipeline easement would be part of the broader cultural landscape and therefore its significance needs to be considered on a broad range of cultural heritage and native title issues rather than as a lineal site.	Sec 2.1
31	To date there have been insufficient consultation with, and involvement of Aboriginal people who would be directly affected by the plan. They too have been denied accurate information as to the exact location of the line, environmental and cultural heritage impacts, and if it would cause any economic changes to their situation.	Sec 2.3.3
32	Construction of the pipeline would have the potential to continue the alienation of Aboriginal people from their lands and culture, and therefore these issues need to be realistically assessed.	Sec 16.1.3 Sec 16.2
33	The Draft EIS/EES has enormous gaps and omissions and there is nothing in it to dissuade conservation groups from the view that East Gippsland is simply unsuitable for establishing a gas pipeline infrastructure.	Sec 2.2.1 Sec 15.2.4
34	Draft EIS refers to world heritage values but does not state what they are, does not identify the extent of the world heritage proposals and does not assess the impact of the pipeline against these considerations. Whole reports are devoted to historical heritage (report #7) and landscape and aesthetics (report #11). However the issue of world heritage is dealt with in under half a page of comment in the Flora, Fauna and Ecology Report (No. 5) and a subheading in The Draft EIS. This is transparently inadequate.	Sec 15.6
41	Kirkpatrick and other world heritage analysts have drawn attention to the importance for a future world heritage area in the region. This would link the existing conservation reserves to provide spatial continuity and greater biological integrity. The route of the proposed corridor cuts right through such a linkage.	Sec 15.6
44	New regulations such as access to easements would directly impact on the environment, while economic issues, although having indirect effects, could be on a greater scale. These issues have not been given due consideration.	Sec 5.2 Sec 6.1
45	Easement Issues - Some of the issues needing to be dealt with regarding common use of easements are: which user would have priority (if any), and under what circumstances should the developer be compelled to use an existing infrastructure?	Sec 6.1
46	1.2 It is suggested in the EIS/EES (Report 13 Ch.3.1) that due to uncertainty of the existing cables, the easement will have to be widened to accommodate the pipeline. This is a totally absurd and unsatisfactory solution.	Sec 6.1
47	Duplication of Infrastructure - The proposed Eastern Pipeline may be an unnecessary infrastructure because the existing Hume corridor pipeline, once connected through to Wagga Wagga, is being proposed by EAPL and may be able to satisfy the Sydney market. We argue that the two proposals should be considered together, not least because the implications of the Eastern Gas Pipeline not proceeding are countervailed by the EAPL proposal.	Sec 5.3

Issue No.	Issue	Response reference
48	Roading Impact Not Covered - Roading and bridging for vehicles will need to be constructed for the pipeline yet relevant anticipated environmental impacts have barely been touched upon. The environmental impacts are likely to be far greater than those caused by pipeline placement.	Sec 6.2
49	Lack of Essential Detail - Final alignment of the pipeline and engineering of stream crossings specific to a location have not been detailed. This makes impact assessment impossible. If the proponent claimed environmental considerations are to be taken seriously, such crucial information is essential.	Sec 2.2.1
50	Decommissioning - If the pipeline is constructed, it may be decommissioned or converted to another use in the future. These possibilities and the implications they have for the environment, have been overlooked. There is concern that the unpopular proposal for a VFT along the eastern route is still lurking behind other plans.	Sec 9.0
51	The draft EIS has misrepresented and overstated the greenhouse benefits of the project	Sec 4.6 Sec 4.6.1
52	The benefits of the project, both to energy consumers, the public, the economy, as well as ESD benefits in general, are likely to have been misrepresented by not having adequately assessed alternative energy investment options, particularly in the area of energy efficiency and demand management.	Sec 4.5 Sec 5.4
56	On the question of whether the gas pipeline represents an appropriate and cost-effective means of achieving Greenhouse emission reductions, the draft EIS is notable for its failure to address the matter. Preliminary examination would suggest that on both environmental and economic grounds the proposed pipeline is far from being the most desirable option for reducing Greenhouse gas emissions from the energy sector in NSW.	Sec 4.6 Sec 4.6.1
58	As admitted in the draft EIS, the preferred (Western) pipeline route of environmental groups is likely to have significantly lower non-Greenhouse environmental impacts than the Eastern route, particularly during the construction phase. Moreover, the Greenhouse benefits of a pipeline established via the Western Corridor are likely to be as great or greater than the Eastern route, albeit at an, arguably, higher cost.	Sec 5.1.3
60	(a) Sector analysis in the Energy Issues paper is based on the assumption that total future energy demand projections for NSW are essentially a 'given'. (b) Claims in the draft EIS (section 3.5 and 3.64) that the project will help to stimulate energy efficiency and research into renewable energy are dubious at best.	Sec 4.1.1 Sec 4.2.2
64	It is likely that a series of strong demand management programs, designed to fully capture this energy efficiency potential would have greater economic benefits, lower environmental costs and represent a larger energy resource than the pipeline. In other words, demand management and energy efficiency represents a more appropriate option from an ESD perspective than the proposed Eastern Gas Pipeline.	Sec 5.4
65	The Consultative Committee, developed to assist with advising on the preparation and context of the EIS/EES, was not in place, and hence played no part, in the consideration and choice of corridor alternatives or the preferred route. The Committee also had no say in the determination of the contracts for specialist studies undertaken. Indeed, the Draft Scope was released for public comment before the Consultative Committee had met.	Sec 2.3.5

Issue No.	Issue	Response reference
66	This unacceptable situation has been further compounded by the fact that planning for this pipeline has taken place at a time when there is no agreed national sustainable energy policy and a lack of overall planning for a national gas pipeline grid. The proposal has the potential to affect the use and development of other energy sources and there are clearly a number of alternative options, competitors (some with infrastructure already in place) and proposals which need to be similarly assessed.	Sec 4.4.1
69	It is understood that the actual route will be subject to continued modifications. However, it should be noted that this lack of site detail and process of on-going change has made it very difficult for the community to comment and participate constructively in the pipeline planning process. The route as identified in the documents for public comment, actually differs within those documents (EG compare Figure 10.1 in the EES to Volume 20). It is known that in a number of areas, the actual route has been changed again from that depicted in the documents	Sec 2.1
70	It is clearly possible that route re-alignment will continue to occur well beyond the public inquiry stage, ensuring that the decisions are made well away from the public domain and with limited relevance or linkage to the original EES.	Sec 2.1
71	As such, the impact documented by consultants in the EES and amelioration techniques proposed are somewhat unclear and imprecise, especially where one cannot be certain that the pipeline will be actually taking the route assessed. In this context the capacity of the planning process, and quality of the EES as a document for alerting the public to the possible impacts of the proposal, must be strongly questioned.	Sec 2.2.1
72	Perry River : Strong concern exists that this may entail additional disturbance in an area of national significance, and re-alignment to the north of the area is recommended. We are aware of a large population of new holland mice and white footed dunnart in the Reserve and efforts should be made to ensure any re-alignment avoids this area as well.	Sec 15.2.3
73	Perry River : The EES states in Table 10.7 that the route has been altered although a small area of this community would be cleared leaving the potential for loss of significant species It classifies the impact as low to moderate. No clear definition of these impact measures have been provided, and it is recommended that these significant areas be avoided altogether.	Sec 15.2.3
74	Bellbird Creek (KP 182): This area is mostly a special management zone with a special protection zone around the creek. The report claims that here the pipeline will run through a 20m wide existing easement. Again, the concern relates to the possible impact of easement widening.	Sec 15.2.13
75	Dowd's Morass (KP 7): The pipeline plans to cut through the reserve and the EES talks of localised "well point dewatering" being required where the ground water is relatively shallow. Further details are required as to where this will occur, how it will be done and possible implications, as coverage of this issue in the EES is inadequate.	Sec 15.2.1
76	Bridle Creek (KP 95): Described as a significant area "to be avoided by following abandoned railway or construction corridor to the minimal at stream crossing" (Table 10.7). The Project Mapping report does not show the pipeline following the railway line as recommended although we have been advised that the route will now follow the Tambo Upper Rd and railway easement. Route clarification and impact of this proposed variation needs to be assessed.	Sec 15.2.7

Issue No.	Issue	Response reference
77	Lake Tyres to Newmerella (KP 110-142): Biosis report states (page 71) that "given the significance of the biological values present, the presence of special management zones, special protection zones, a conservation reserve.... it is recommended that the proposed route be aligned with the existing easement as closely as possible". It is understood that the pipeline will now follow the railway easement through the first of these areas of significance (Stony Ck KP 110) although the impacts of this change are unknown.	Sec 15.2.6
78	It is understood that the pipeline will not run through an easement at KP 120 (to avoid homes east of Nowa Nowa). An alternative route should be taken to avoid cutting through this area of State significance.	Sec 15.2.10
79	The alternative use of the railway easement around KP 129 to avoid an area of State significance is supported, however, the impacts of such a change and movement back off the rail easement at around KP 132 needs some discussion.	Sec 15.2.6 Sec 17.2.1
80	Similarly, clarification is required as to the extent of easement widening required through areas of significance near Newmerella (KP 140-144). Efforts should be made to amend routes or to demonstrate that the least sensitive option will be taken here. Again it is not clear as to the extent of easement widening required, if any, and associated impacts.	Sec 15.2.12
81	Report 10 - Appendix 1 page 5, claims the pipeline will traverse, or abut, the Lake Tyers State Park in the north east area. This statement and its impacts need to be clarified.	Sec 15.2.9
82	Report 10 - Forest Issues Appendix 1 - page 2, points out that a section of Lind National park may be intersected by the pipeline but provides no clarification of prescription for treatments. This report also states that the pipeline may run on the existing high voltage powerlines easement on the eastern boundary of the park or "adjacent to it" (page 5). If adjacent, what implications exist for the park?	Sec 15.2.15
83	It also states that 2.8km of Mt Raymond regional park will be traversed but mostly on an existing easement. This appears to be unclear and requires clarification, again will the easements be cleared within park boundaries?	Sec 15.2.12 Sec 18.3.6
84	This area highlights how unsuitable much of the Gippsland area really is for the construction or placement of such infrastructure. It is impossible to choose a satisfactory route without incurring significant damage to surrounding areas of equivalent value.	Sec 15.2.4
85	It is evident that in many locations in the vicinity of Reed Bed Creek the soils are very thin and highly prone to erosion. We anticipate significant difficulty with revegetation and major problems associated with erosion along the pipeline in this area.	Sec 15.2.16
86	Chandler's Creek (KP 249-256): The Biosis report states that road widening would be required in this area which would "impact on populations of significant plants" and "result in the loss of old growth features" (p.73). Alternative options would result in loss of some old growth features. It is understood that the more northerly route will now be taken. This route has not been assessed in the studies and requires further examination before comments can be provided.	Sec 15.2.17
87	Kelly Creek-Central/Buldah old growth (KP 260-268): The location of the pipeline along this route will require widening of an existing road and some substantial loss of old growth. Again details to as the extent of the widening of this presently narrow road need to be provided.	Sec 15.2.4

Issue No.	Issue	Response reference
88	The uncertainty as to the final location of the pipeline and the real lack of opportunity for adequate participation and comment on the proposal given this lack of information.	Sec 2.1 Sec 2.2.1
89	The lack of certainty as to whether existing easements can be used, whether they need to be widened and the lack of details surrounding such widening and associated impacts.	Sec 6.1 Sec 15.4.4
90	The pipeline will not comply with the Code of Forest Practices. For example, crossing of streams, gullies and filter strips-activities not permitted by timber production.	Sec 18.3.2
91	Ultimately, a large number of significant sites will be impacted on with attendant on-going pressures on the ecology from fragmentation, loss of diversity, exposure to potential weed and disease such as phytophthora.	Sec 4.5 Sec 15.3.3 Sec 15.4.5 Sec 15.4.6
92	Treatments such as directional drilling "may" be used on these waters. The EES needs to discuss what will happen to rivers of "non reported" high quality and limited or no downstream usage. Will they receive any treatments, will water flow be interrupted for any periods of time?	Sec 2.2.1 Sec 6.6 Sec 6.7 Sec 12.1.1
93	The EES is not clear at all on which rivers will receive crossing treatments although it discusses a number of possibilities (Eg: Latrobe and Bemm Rivers (Ch 8.8)).	Sec 2.2.1 Sec 6.6
94	In Chapter 10.7.4 of the EES (in relation to stream crossings) the report states that "the most appropriate and cost effective method of achieving the environmental objectives will be selected". This statement does little to illustrate in advance to the public how decisions will be made in relation to crossings. There appears to be no environmental ground rules for the use of treatments and it is of concern that at this stage of the project the proponent cannot provide further details as to where such treatments, or what treatments, will be used.	Sec 2.2.1 Sec 6.6 Sec 20.6
95	Chapter 12.4.5 refers to possible siltation effects when rivers are crossed in the Lind National Park, Lake Tyres State Park, Ewing Morass State Game Reserve and Croajingolong area. It refers to a discussion of impacts and measures for their amelioration in Chapter 10, but this chapter contains generalised statements and no specific discussion of siltation in these sensitive areas.	Sec 2.2.1 Sec 12.1.1
96	Elevated crossings are discussed in the EES, but again it is unclear if, and where, they will be used. This needs to be clarified.	Sec 2.2.1 Sec 6.6
97	Chapter 17.5.3 states that blasting in waterways will be conducted at a time which "minimises impact on aquatic life". Biosis have pointed out that due to the varying nature of biological cycles, the scheduling of activities to minimise susceptible times for stream biota is not a recommended mitigation measure.	Sec 6.5 Sec 15.5.2
98	The above statement also applies to the comment at 17.5.6 that "construction of river crossings will be timed for the period when aquatic species populations are considered least sensitive to disturbance".	Sec 6.3
99	It is understood that where the pipeline goes through Crown lands the Crown shall be compensated for the loss of productivity or value of the resource and will receive compensation for the easement rights. The approximate value of such compensation should be made available to the public at the EES stage to assist in the calculation of the overall cost/benefit of the project to the community.	Sec 18.2.4 Sec 18.3.7

Issue No.	Issue	Response reference
100	Biosis - p.86 recommends that an experienced stream ecologist and fluvial geomorphologist be involved in the detailed design phase. Does the proponent intend to accept this recommendation?	Sec 6.6
101	Biosis sets out a framework for general stream mitigation measures (refer page 87) including the need for a statistically valid impact monitoring program set in place prior to construction and continuing for 5 years after. Will the proponent follow these mitigation measures and instigate such studies?	Sec 20.4
102	Once the pipeline is constructed, what will be the process for the public access to the route to assess the impact of such?	Sec 8.1
103	The proponent has confirmed that all tree ferns within the width of clearing will be harvested and replanted. One species of tree fern can only be successfully transplanted through complete removal (with root ball). Will this be undertaken?	Sec 7.1
104	The EES provides differing views as to the extent regrowth (trees & shrubs) will be permitted over the actual pipeline. This varies from a 5-6m band in the Biosis report (p.52), 6-8m in the EES (chapter 10.24) and 10m in the Forest Issues report (p.11). How will this be decided?	Sec 7.2
105	It is understood that narrowed or uncleared corridors will be left for wildlife crossing and the key corridors have already been identified. How frequent are the points, how many involve directional drilling or boring?	Sec 2.2.1 Sec 15.3.4
106	Chapter 12.3.2 indicates that dams may need to be constructed in forest areas where water supplies are more distant. There is keen interest to ensure that the impact of construction and associated activity (eg. roads, dams) is minimised. Further details of such activities need to be made available.	Sec 6.2
107	Issues raised within the Wilderness Society Submission have also been forwarded by the Moogji Aboriginal Council East Gippsland Inc.	-
111	The proponents have used pre-existing easements to a degree but also transgress many established conservation reserves when an alternative is available (ie, Reed Bed Creek near Cann River).	Sec 6.1 Sec 15.2.16
112	A thorough energy sector assessment, therefore, requires examination of the full range of options available to meet Australia's and NSW's current and future energy service needs, including an analysis of the most cost-effective option(s) on a long term, economy-wide basis. This is the essence of integrated resource assessment, something which the Energy Issues paper did not address.	Sec 4.2.1
113	In terms of non-Greenhouse environmental impacts of the various alternatives presented above, only the co-generation projects have potentially significant impacts (air pollution). This contrasts with the Eastern Gas Pipeline which, as discussed elsewhere in this submission, is likely to have significant biodiversity, wilderness and water quality impacts.	Sec 4.2.3 Sec 14.4 Sec 4.5 Sec 15.7 Sec 12.1.1
114	It is notable too, that in all cases, the outlays recommended by the consultants on the various emission reduction options (energy efficiency, renewable energy and co-generation) would represent only a fraction of the cost-effective resource potential of those options.	Sec 5.4
115	However, where this occurs, there is no clear recognition in the EES that additional clearing may be required to avoid existing infrastructure, even on some of the larger easements.	Sec 6.4 Sec 15.4.4

Issue No.	Issue	Response reference
117	The existing pipeline planning easement crosses both the Providence Ponds Flora and Fauna Reserve.	Sec 15.2.3
118	Issues raised as part of the Wilderness Society are also raised by the Gunai/Kurnai Cultural Heritage Land Council.	-
119	Colquhoun State Forest: This area is claimed in the EES to be one of the few areas of native vegetation where substantial lengths of the proposed pipeline route do not fully utilise existing easement or roads.	Sec 15.2.6

TRANSGRID

Issue No.	Issue	Response reference
1	In this regard, it is advised that the rare and endangered Illawarra Greenhood Orchid (Pterostylis gibbosa) has been identified as growing on TransGrid's Dapto Substation grounds (Yallah Road, Yallah). The original range of the orchid included the Cumberland Plain and the Lower Shoalhaven, as well as the Illawarra Coastal Plain. However, the orchid now appears to be confirmed to a few small patches of relic and regrowth woodlands around Lake Illawarra. TransGrid's Dapto Substation site being one of those areas. As a consequence of the orchids status, it is listed for protection on Schedule 1 of the new Threatened Species Conservation Act, 1995. Originally a plan of management was prepared for the orchid, however, this has now been replaced by the National Parks Threatened Species Recovery Plan. Although the proposed route of the gas pipeline does not transverse any identified sites of Pterostylis gibbosa, it does traverse some woodland areas which are potential orchid habitat sites. Therefore it would be prudent to contact the National Parks for their comment. Alternatively the pipeline could be re-routed along open ground between existing woodland areas. Copies of Survey Plans P9037 and P7263, showing the subject lots, are attached for your information.	Sec 15.4.3 Sec 15.2.24

Issue No.	Issue	Response reference
2	Further to all the above, TransGrid wishes to restate requirements for our transmission lines and their easements. In this regard, TransGrid has no objections to the proposed pipeline affecting TransGrid easements subject to the following conditions: 1. Excavation work or other alterations to existing ground levels shall not be carried out within the easement area without the prior written approval of TransGrid. Approval will not normally be granted for such work within 16 metres of any supporting structure. 2. Obstructions of any type shall not be placed in the easement area within 15 metres of any part of a transmission line structure. 3. Vehicles, plant or equipment having a height exceeding 4.3 meters when fully extended shall not be brought onto or used within the easement area without prior TransGrid approval. 4. The parking of vehicles within the easement area shall be limited to types whose height when fully extended does not exceed 4.3 meters. Where vehicular access or parking is within 16 metres of a transmission line structure, adequate precautions shall be taken to protect the structure from accidental damage. 5. Garbage, refuse or fallen timber shall not be placed within the easement area. 7. Explosives shall not be used within the easement area without the prior written approval of TransGrid. 8. Flammable liquid carriers, caravans and other camping vehicles shall not be parked within the easement area. Further it would be appreciated if the relevant TransGrid Regional Office could be advised in advance of when the construction staff are expected to be working on TransGrid's transmission line easements within their area. For further information or clarification regarding TransGrid transmission lines and/or easements, please contact Mr Peter Logue (Yass Regional Office) on (06) 226 9666, or the Mains Enquiry Office (Central/Metropolitan Regional Office) on (02) 620 1150.	Sec 18.5.4
3	It is also reminded that where any part of the proposed pipeline is located adjacent to a TransGrid High Voltage Substation, it may be subject to earth potential rise related hazards in the event of an earth fault. Where a significant part of the pipeline is paralleled in close proximity by TransGrid's High Voltage Transmission Circuits, it may be also be subject to induced voltage hazards in the event of an earth fault associated with transmission circuits. In this regard, it is requested that TransGrid's Substation Earthing and Power CO-Ordination Engineer, Mr Mel Quach, be contacted on (02) 284 3392 for advice on earth potential rise and induced voltage hazards.	Sec 18.5.4

VAN HERCK, A AND C. WRIGHT

Issue No.	Issue	Response reference
1	We do not support the project at all as it stands, since it does not bring anything at all positive to the area, but only damage and losses to all residents.	Sec 18.1.2
2	We would tolerate the pipeline if a real effort towards compromise with the residents was made by placing the pipeline on the local road easement as recommended by the council and the EIS, or if proper compensation (including permanent land depreciation and loss) was paid to us if the proposed route was maintained.	Sec 6.1 Sec 18.2.4
3	We note that no account whatsoever is taken in this proposal of the great financial losses that will be incurred by landowners whose land the easement will cross because of land depreciation on the real estate market due to most rural land buyers not wanting that sort of installation on or near their properties.	Sec 18.2
4	We note that the EES/EIS has not mentioned the presence of native grasses in this area. Our block has a lot of Kangaroo grass on it that we would like to keep.	Sec 15.2.19
5	We believe more safeguards should be adopted regarding noise and fire danger during construction and permanent risk to residents after construction.	Sec 6.12 Sec 19.2 Sec 19.3
6	Safety: Possible damage to our dams, water tanks and house structures following blasting during construction which will have to be quite heavy because of the presence of a lot of granite on the proposed route. We suspect that BHP will not consider avoiding little private properties like ours and crossing the vast expanses of uninhabited land on each side of the valley, because it's easier for them to fight little landowners than local or state authorities. Where they would have to cross forested areas, the easement could be used as a fire break and would thereby protect the remainder of the forest. We strongly support the sealing of Woolcara Lane if the pipeline has to be placed in our area. It would be totally irresponsible to install such a dangerous structure and only have this bad to extremely bad (according to when the last upgrading took place and what the weather was like in between) access in and out of the subdivision in the event of an emergency. The road would have to be upgraded anyway after construction because the increased traffic on it and the heavy trucks would simply destroy it. So one might as well do a final job with it.	Sec 6.5 Sec 19.3 Sec 2.1 Sec 6.1
7	Health: We particularly dread the constant noise that will invade the valley during the weeks of construction. We have chosen to move out here at great cost (petrol and time cost for commuting to town) because we wanted to be able to enjoy the peacefulness of the countryside and we would suddenly find ourselves in the middle of a construction site. Sounds carry very far in this valley and the slightest banging is heard miles away. Something which would be normal and accepted in town is totally contrary to our way of life out here. We may accept noises of tractors, mowers and animals because they are necessary to country life and bring something to us or our neighbours, but we are not prepared to accept such an amount of noise for something that is of no interest to us whatsoever, except if Woolcara Lane gets sealed. If the disturbance is unavoidable, we should get proper compensation for it.	Sec 13.1
9	We think that it would be very hard to replace and to avoid the massive growth of weeds because of our own experience of what happens when a bit of land is disturbed. Weeds take over very fast. We doubt that BHP will have enough maintenance teams along the pipeline to prevent that, and it will be left to us to do the work if we want to avoid their spreading to the rest of our property.	Sec 15.4.5

Issue No.	Issue	Response reference
10	Since we acquired this property 5 years ago, we have made a great effort, at great cost in time and money, to improve the environment. Colin Wright works on it full time. We planted thousands of trees and tried to attract the native wildlife back that disappeared from bare blocks of land. Several of our neighbours do the same. We have been partly successful, but it is a long process. That is why we resent all the more the interference of a big private company like BHP who, for their own profit, are going to set our efforts back several years. If they are allowed to go through our private property against our will, it will make a big joke out of the concept of "greening Australia" and we will despair of ever convincing other people to match our efforts when they can be so easily negated.	18.2
11	A compromise would be to make the pipeline use the existing easement, Woolcara Lane, which represents a disturbance to wildlife already. But we suspect that BHP will not consider using the existing easement because of the expensive upgrading and works that would be involved. We feel that BHP should not be allowed to damage the environment as they wish just to save them a bit of money when they are going to reap huge profits out of this pipeline project.	Sec 6.1
12	Apart from the consideration of conservation and protection of the environment, we are concerned that the pipeline, if it does not follow the road easement, will go into a totally unnatural straight line which will constitute a real eyesore in the valley. We know by experience (digging to put irrigation pipes for instance) that it takes a very long time to erase the scar left in the scenery by such soil disturbance. Some say up to 10 years. Since one of our reasons for settling here is also because of the beauty of the valley, we are very concerned about the fact that it is going to be spoilt for a very long time, without mentioning the first year when the scar would be at its worst. Again, construction along the road easement would avoid such damage and should be enforced.	Sec 18.3.6 Sec 6.1
13	Considering the amount of nuisances caused by the proposed pipeline that have been listed in this submission and the community submission, the fact that the area would be regularly disturbed by maintenance and control measures for quite a number of years, without mentioning the possibility of renewed digging, and the fact that the pipeline does not bring anything to the local community, unlike electricity, telephone or road easements which can be much more readily accepted because they are directly useful, we feel that our objections should be taken into account and the pipeline moved to the road easement. We feel the community would then be adequately compensated for all the nuisances and disturbances if Woolcara Lane was sealed as far as Woolcara Station.	Sec 18.2

Issue No.	Issue	Response reference
14	No one will want to buy a block of land with the prospect of a battle against BHP attached to it! So this year and the coming year, we seem to be stuck here and whatever plans we could have made to move have gone down the drain. Once a decision is made to install the pipeline along the road, fine we may be able to sell normally provided the interested parties are not deterred by the risks of a gas pipeline in their vicinity. We could then argue that the road has been sealed which was not the case before. But if the pipeline should cross our property, even for just a short distance, and the mention of an easement with very restricted use is added to our title, we have no chance of selling, and if at all, never at the price we could have asked before. No one will choose to buy a block with an easement when there is a large choice of properties around that have not got one on them. That seems rather obvious. For our property the depreciation due to the easement could be anything between 20 000 and 40 000 dollars, if we're lucky to find a customer. The total compensation offered up to now is a ridiculous 2 000 dollars. We know that by law, and we do not understand why the law defends such a position, BHP is not obliged to compensate us for that. Yet it is the greatest loss that the pipeline would mean for us. Why do we get compensation for lost grass and not for land depreciation? I assume because it would cost those companies too much. So in fact, through our losses, we would be subsidising BHP's profits. We certainly do not want to be stuck for ever in this place, however beautiful it is (we do not like the cold climate), because we cannot sell, and we do not want to lose up to 40 000 dollars in the interest of BHP who have been putting pressure on us already to sign their one sided agreements. We have worked very hard on this place for 5 years and do not want to see all our work and time annihilated in financial terms by this project. So we will keep on strongly objecting to the proposed pipeline route until it is moved to the road easement or until we are offered due and proper compensation adequate to our prospective losses.	Sec 18.2
15	Safety: Background - if the pipeline is constructed along the currently proposed route through Koombahlah Estate (Woolcara/Koombahlah rural residential subdivision), BHP should be required to assess the specific risks to the community and develop an appropriate strategy based on the property and topographic layout. Issues include evacuation in an emergency during construction, evacuation following construction, reducing fire hazard. We feel that BHP, or their representatives, should provide all the residents with adequate training to respond to an emergency, should it arise. Fire risk reduction must be addressed, especially during construction, as the latter is planned to take place during high summer. Recommendations include general issues regarding an Emergency Response Plan.	Sec 6.12 Sec 19.2 Sec 19.3
16	Health: The community has at least 3 serious asthma sufferers living within 200 m of the proposed line. During construction care must be taken to ensure attacks are not increased or made worse by additional dust levels. This issue must also be addressed in the Emergency Response Plan. Compensation would be sought in case of a worsening of health conditions. Noise associated with blasting, heavy machinery and general construction site work will severely hamper day to day activities. Recommendations: • BHP must put in place sprinklers and water trucks during construction where the line is within 200 m of houses to dampen the dust effect. • Construction work must be stopped during windy periods. • All machinery must be in good working order with all mufflers to operating standards that meet the recommended decibel level.	Sec 14.3 Sec 18.2.4 Sec 13.1

Issue No.	Issue	Response reference
17	Transport: The current road will not support the significant increase in heavy weight vehicles for extensive periods, which includes extendable semi-trailers transporting pipe for stockpiles and buses to bring the work force in and out, especially in case of wet weather which happens a lot in the summer (2 heavy floods within 2 weeks in January 1995). The community should not be made to suffer the consequences of heavy construction work on its only access road. Recommendation: • BHP must agree to seal Woolcara Lane in consultation with the Yarrowlumla Shire Council.	Sec 6.2 Sec 18.5
18	Apart from the visual impact, the continual noise, machinery movements, diesel fumes and dust, there will also have to be a camp site for meals etc and ablutions blocks. All of this will impact on our community as a whole depending upon site.	Sec 6.13
19	It is obvious that a pipeline construction creates a dramatic disturbance to the local vegetation and wildlife (EIS Vol.5). In the Koombahlah Estate, the disturbance would be on certain properties to a native grass called Kangaroo Grass (Themeda triandra) linked in the EIS (p45) with "a high diversity of reptile species". The EIS notes (p30): "Soil disturbance usually results in massive weed invasion and, often, a significant reduction in native species richness" and further (p50) "All vegetation is of at least local significance for conservation. This is particularly true in areas which have been largely cleared for agriculture where all remnants, from disturbed roadsides to individual trees within paddocks are of ecological value." Other vegetation affected with the building of the pipeline will be the areas used for pipe stockpiling, truck turning and parking, site sheds and encampment base.	Sec 15.2.19 Sec 15.4.5
20	There is a real weed problem in the area, mainly with thistles, and every resident knows that disturbing the soil immediately causes the growth of thistles which are subsequently extremely hard to control.	Sec 15.4.5
21	Taking this into account and the repeated recommendation made by the EIS that the pipeline follow existing easements to minimise disturbance and the "barrier effects" (p. 52, 53), it is surprising that the proposed route does not go along the easement of Woolcara Lane, but runs parallel to it a few hundred meters away, thus building a double barrier to the local fauna. The enclosed petition by the Community to the Council is in favour of the pipeline being built everywhere possible inside the easement of the Lane. Other vegetation affected with the building of the pipeline will be the areas used for pipe stockpiling, truck turning and parking, site sheds and encampment base.	Sec 6.1 Sec 15.3.3
22	Slightly modify the proposed pipeline route so that it aligns with the already existing easement as closely as possible.	Sec 6.1
23	Where native grasses are destroyed, they must be revegetated immediately after construction with local native grasses and the development of weeds must be monitored very closely and regularly.	Sec 15.4.5
24	The areas used for stockpiling, campsites and the like will also have to be repaired and revegetated. These areas are yet to be determined and must be arranged through consultation with the landholder(s).	Sec 6.13
25	The undersigned support the recommendation of BHP developing a risk assessment and giving serious consideration to the sealing of Woolcara Lane and we ask that BHP note the community's earlier petition (attached).	Sec 19.1 Sec 6.1

VICTORIAN ABORIGINAL LEGAL SERVICE CO-OPERATIVE (MOOGJI)

Issue No.	Issue	Response reference
1	It is imperative that the process of approval of the pipeline address this disassociation of the Aboriginal people of the Orbost area from their country, and in a culturally appropriate way.	Sec 16.1.1 Sec 2.3.3
2	Currently, the East Gippsland area is a largely integrated system of ecological linkages and frameworks, which have arisen, in part, due to the activities of the Aboriginal people in the area over thousands of years. The proposed pipeline cuts people off from the area concerning it. This might allow damage to and destruction of archaeologically and culturally sites, but also further fragmentation of the land as a whole. Both concern Aboriginal people.	Sec 16.2
3	There has been insufficient assessment of the impact of the pipeline on the local environment in East Gippsland. Where the nature and quality of this impact is unknown any proposal should be conservatively assessed.	Sec 15.2.4
4	Thus, the proposed pipeline should be one aspect of Moogji economic self-determination. Employment opportunities created in connection with it, and with the land and the environment, should include: • employment opportunities; • funding of cultural development activities; • participation in management of the environment, including co-management of National Parks, and other environmentally important areas.	Sec 18.1.3
5	To date, there has been insufficient consultation with the Aboriginal communities of East Gippsland, who are directly affected by the proposed pipeline. There has been some consultation; however, members of the communities have not been informed, in a culturally appropriate way, of: • the exact route of the pipeline; • its full environmental impact; • its cultural heritage impacts; and • the economic effects it would bring.	Sec 2.3.3
6	Once the views of the community have been ascertained, a full community forum, lasting two days, and involving all Victorian Aboriginal communities across whose country the pipeline is proposed to run, should take place. Once everybody has been fully informed, and a common position reached, a meeting with representatives of NSW communities should occur. These consultations should take place at the expense of the proponent, since it wishes the pipeline proposal to proceed.	Sec 2.3.3
7	Some form of compensation and assistance in economic, land management and cultural development will go some way towards addressing the "legacy of unutterable shame" referred to by the judges in the Mabo case.	Sec 16.4

VICTORIAN DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Issue No.	Issue	Response reference
1	The EMP, together with the Line List which provides detailed, site specific information, are key documents and their importance cannot be overstated. Continuing liaison, negotiation and agreement with the Department over the contents of these documents, where they relate to Crown land, is essential to ensure that, in fact, "impacts are avoided or minimised, as far as is possible."	Sec 20.2
2	The conclusion in the EIS/EES that the project as planned will have a minimal effect on flora and fauna values along the Gippsland route is agreed with, subject to clarifying detailed operational prescriptions at individual sites, wet weather operations and water course crossings and rehabilitation.	Sec 2.2.1 Sec 20.2 Sec 6.11
3	Section 10.3.1 of the EIS/EES refers to the "Victorian Endangered Species Protection Act" 1978. This is presumed to be the Flora and Fauna Guarantee Act 1987 or the Wildlife Act 1975.	3.1.3
4	There is a statement in section 10.3.1 that regrowth forest is "poor habitat for fauna" and that "significant fauna were recorded in all natural habitats except regrowth forest." Both statements are demonstrably false. It may be generally true that the regrowth phase of a vegetation type supports less fauna than the old growth phase, but regrowth may be still good habitat for many species. For example, the area around Bellbird Creek is predominantly regrowth forest and supports, amongst other species, Long-footed Potoroos, and is identified in the EIS/EES as a National Site of Significance.	Sec 15.4.2
5	A section of the proposed pipeline route in the Colquhoun Forest crosses streams that are identified as part of the Native Title Claim (Registration number C00143) which was lodged with the Native Title Tribunal on 20 October 1995 (Bryant family, Gunai people). Relevant processes are identified in the EIS/EES but the issues involved are complex and of a highly legal nature.	Sec 16.3
6	Valuing of Crown land proposed to be used for the pipeline and determining an appropriate fee or rental for its use is a complex matter. The Valuer General has been requested to provide an estimate of valuation to the Department.	Sec 18.2.3 Sec 18.3.7
7	There is scope for an agreement to be negotiated between DCNR and the proponents for assistance in developing the Bairnsdale to Orbost Rail Trail on the section of the rail easement in the Colquhoun forest which is proposed for pipeline use.	Sec 15.2.6 Sec 17.2.1 Sec 18.5.2
8	The issues are well covered but there is concern regarding translating from the "general" to the "specific" comment or recommendation. eg. 1 Clay soils which are "dispersive and tunnel prone" may require incorporating a soil ameliorant such as gypsum in some areas. This will be site dependent and will require local knowledge of soils and dispersion characteristics. eg. 2 The EIS/EES states that native grasses are hard to establish. However, this should not deter attempts in areas where this is important and necessary. Seed availability is a key issue. eg. 3 The EIS/EES states that disturbed areas should be sown as soon as possible. However, the species to be sown will be determined by the time of the year and the prevailing seasonal conditions. During the middle of summer, an initial cover crop of an annual such as Ryecorn should be used on pastures with the expectation of having to resow at a later time with a permanent pasture crop when conditions are suitable.	Sec 2.2.1 Sec 20.2

Issue No.	Issue	Response reference
9	Eleven major rivers (Latrobe, Avon, Mitchell, Nicholson, Tambo, Boggy Creek, Snowy, Brodribb, McKenzie, Bemm and Cann (West Branch), and at least 16 other significant stream crossings are involved in the Victorian section. Specific plans of management will be required to be approved by the Department for these crossings.	Sec 3.1.1
10	Part of the proposed pipeline follows the existing electricity easement which crosses the Mt Raymond Regional Park. Landscape impact is a significant issue where the easement crosses the main ridgeline and at the Princess Highway crossing. Landscape sensitivity at these locations is high and not low as suggested in the Background Paper. On-site discussions have been held between CNR and Project Team staff and further widening of the electricity easement is not proposed to occur where the ridgeline is crossed.	Sec 15.2.12 Sec 18.3.6
11	Issues and possible solutions to any site difficulties have been identified, although formal surveying, mapping and notation of environmental specifications on the Line List by the proponents and possible future DCNR agreement are matters which have not occurred to date. (This is also the situation with other areas of Crown land managed by Forests).	Sec 2.2.1 Sec 20.2
12	The difficulty that the Project Team has had in consulting with the East Gippsland Aboriginal Community (Far East Gippsland Aboriginal Corporation) regarding site and general liaison issues is of concern. There is also apparent ambiguity regarding using the "Consent to Destroy Permit" for Aboriginal archaeological sites. Advice to DCNR from the Aboriginal Affairs Archaeology Section is that the option is to "apply to the relevant Aboriginal Community in Victoria for a Consent to Destroy Permit."	Sec 16.1.1 Sec 16.1.3
13	The EIS/EES inadequately addresses the issue of "wet weather" construction practices. The Code of Forest Practices for Timber Production (DCNR 1996) (currently under review) and the Prescriptions for the Control of Timber Harvesting in Native Forests (Operator Prescriptions) - East Gippsland Forest Management Area (DCNR 1996) identify minimum standards to be observed by licensed Forest Operators to ensure that possible soil compaction, erosion, siltation and damage to roading infrastructure is managed responsibly and is prevented or minimised. This Code and the relevant Prescriptions should equally apply to the EGP Project.	Sec 6.11 Sec 18.3.2
14	The EIS/EES correctly identifies the fire prone nature of the forests of East Gippsland and the increased risk of fire that the Project would bring. A Fire Prevention and Management Plan is proposed which will include all matters relating to preventing and suppressing wildfire during construction. This plan will need to be negotiated with and endorsed by the Department, as DCNR is the organisation responsible for the "prevention and suppression of fire on public land."	Sec 6.12 Sec 19.2
15	The use of and the possible damage to DCNR roading and bridge infrastructure has been identified as an issue in the EIS/EES but a list of all DCNR roads proposed to be crossed by the pipeline and a list of all DCNR roads and bridges proposed to be used during the construction phase for access and transport has apparently not yet been prepared. Preliminary analysis by DCNR indicates that about 42 DCNR roads and tracks are involved. The EIS/EES correctly identifies the DCNR requirement that the EGP Project will be required to maintain these assets both during and following construction.	Sec 6.2

Issue No.	Issue	Response reference
16	Although over 90% of the proposed pipeline easement on Crown land is on existing easements or adjacent to existing forest roads and tracks, minimal additional clearing of these existing easements will be required at many locations. However, the location of and the area of forest involved is yet to be determined. Salvage of the forest products involved from all clearing and the disposal of the residues are significant issues. Timing of such operations to meet a November 1996 start date will be difficult to achieve as the soil and weather conditions in the coastal and mountain forests located on the pipeline route generally require such operations to be conducted during summer and autumn. Matters relating to resource assessment, sale of forest produce, harvesting contractor arrangements, possible sale of residual logs, log grading, payment of royalties, disposal of residues and conforming with the Code of Forest Practices are all matters which need to be negotiated with the Department.	Sec 6.1 Sec 6.4 Sec 15.4.4 Sec 18.3.2
17	The temporary closure of DCNR roads and tracks to the public to facilitate construction will require advance consultation and approval from DCNR.	Sec 6.2
18	The removal of gravel from Crown land will require conforming with relevant legislation and the payment of appropriate royalties.	Sec 3.1.4
19	The method of maintaining the proposed easement on Crown land will require the consent of the Department. The general use of residual herbicides will not be permitted. The use of heavy machinery for slashing on shared utility easements may involve conflicts between Eastern Energy and the EGP Project.	Sec 6.1 Sec 8.2
20	An error occurs in Background Paper No 15, Regional Economic issues, in section 3.1.3 General Industry Development in the East Gippsland Region. In the fourth paragraph, 800,000m3 of residual log material would be supplied from both the Tambo and the East Gippsland Forest Management Areas, not solely Tambo.	-

VICTORIAN NATIONAL PARKS ASSOCIATION

Issue No.	Issue	Response reference
1	The Consultative Committee, developed to assist with advising on the preparation and context of the EIS/EES, was not in place, and hence played no part, in the consideration and choice of corridor alternatives or the preferred route. The Committee also had no say in the determination of the contracts for specialist studies undertaken. Indeed, the Draft Scope was released for public comment before the Consultative Committee had met.	Sec 2.3.5
2	It is the view of the VNPA that the Committee have been presented with a fait accompli with limited serious discussion and examination taking place into alternative options, especially the Western corridor, which has been acknowledged by all as the least environmentally damaging and more manageable route.	Sec 5.1.1 Sec 5.1.2
3	This unacceptable situation has been further compounded by the fact that planning for this pipeline has taken place at a time where there is no agreed national sustainable energy policy and a lack of overall planning for a national gas pipeline grid.	Sec 4.4.1
4	The proposal has the potential to affect the use and development of other energy sources and there are clearly a number of alternative options, competitors (some with infrastructure already in place) and proposals which need to be similarly assessed.	Sec 5.3 Sec 5.4
5	Within this context, the VNPA cannot support a proposal that will impact on significant environments through Victoria and New South Wales when no serious consideration has been given to more sensitive alternative routes or projects.	Sec 5.1.1

6	The VNPA also has strong concerns that the proposed pipeline will impact on the integrity of existing and future areas of world heritage value and national estate value.	Sec 15.6 Sec 18.8
7	The route as identified in the documents for public comment actual differs within those documents (EG compare Figure 10.1 in the EES to Volume 20).	Sec 2.1
8	It is known that in a number of areas, the actual route has been changed again from that depicted in the documents.	Sec 2.1
9	However, where this occurs, there is no clear recognition in the EES that additional clearing may be required to avoid existing infrastructure, even on some of the larger easements. Nor does the EES discuss in any detail the areas where such widening will occur and the possible impacts of such work.	Sec 2.1 Sec 6.1 Sec 6.4 Sec 15.4.4
10	It is clearly possible that route re-alignment will continue to occur well beyond the public inquiry stage ensuring that the decisions are made well away from the public domain and with limited relevance or linkage to the original EES.	Sec 2.1
11	As such, the impacts documented by consultants in the EES and amelioration techniques proposed are somewhat unclear and imprecise, especially where one cannot be certain that the pipeline will be actually taking the route assessed. In this context, the capacity of the planning process and quality of the EES as a document for alerting the public to the possible impacts of the proposal must be strongly questioned.	Sec 2.2.1
12	However, the EES merely states that in Table 10.7 that the route has been altered to follow an existing easement and minor tracks "although a small area of this community would be cleared leaving the potential for loss of significant species" It classifies this potential impact of loss of significant species as "low to moderate". No clear definition of these impact measures have been provided. We are strongly concerned about any disturbance in this area of national significance and urge total re-alignment to the north as recommended by Biosis.	Sec. 12.2.3
13	Any re-alignment must avoid this highly significant area. It is imperative that both these significant areas be avoided altogether by passing through the cleared land between them.	Sec. 12.2.3
14	VNPA's concerns relate to the possible impact of easement widening.	Sec 6.4 Sec 15.4.4
15	Further details are required as to where this will occur, how it will be done and possible implications as coverage of this issue in the EES is inadequate. It is recognised that areas around Sale, Bruthen and Orbost may need such treatment and this topic needs further public assessment prior to commencement.	
16	Colquhoun State Forest (KP 95.5-115): This area is noted (p 71, Report 5 - Flora, Fauna and Ecology) to be one of the few areas of native vegetation where substantial lengths of the proposed pipeline route do not fully utilise existing easement or roads.	Sec 15.2.6
17	Listed under sites of biological significance in Report 5 (p 71), it is omitted in table 10.7 of the EES but certainly contains 2 sites of national significance within it; Bridle Creek and Stoney Creek. The Biosis report notes that use of the railway easement will still have some impact on the Stoney Creek Special Protection zone (but does not expand on how and to what extent this impact is) and probably impacts due to widening of the easement.	Sec 15.2.6 Sec 15.2.8 Sec 15.2.7
18	Route clarification and impact of this proposed variation needs to be assessed.	Sec 2.1
19	.. the impacts of this change are unknown (see also comments above under Colquhoun State Forest Table 10.7 also notes that some of the wetland will be impacted where the railway easement is reduced to a trestle bridge with "high localised impacts".	Sec 15.2.6 Sec 17.2.1

Issue No.	Issue	Response reference
20	It is understood that the pipeline will not run through an easement at kp 120 (to avoid homes east of Nowa Nowa). An alternative route should be taken to avoid cutting through this area of State significance.	Sec. 12.2.10
21	The alternative use of the railway easement around KP 129 to avoid an area of State significance is supported, however, the impacts of such a change and movement back off the rail easement at around KP 132 needs some discussion.	Sec 15.2.6 Sec 17.2.1
22	Similarly, clarification is required as to the extent of easement widening required through areas of significance near Newmerella (KP 140-144). Efforts should be made to amend routes or to demonstrate that the least sensitive option will be taken here.	Sec 15.2.11
23	Report 10 - Appendix 1 page 5, claims the pipeline will traverse or abut the Lake Tyers State Park in the north east area. This statement and impacts need to be clarified.	Sec 15.2.9
24	Again the VNPA is not clear as to the extent of easement widening required, if any, and associated impacts. Report 10 - Forest Issues Appendix 1 - page 2, points out that a section of Lind National Park may be intersected by the pipeline but provides no clarification of prescription for treatments. This report also states that the pipeline may run on the existing high voltage powerline easement on the eastern boundary of the park or "adjacent to it" (page 5). If adjacent, what implications exist for the park?	Sec 6.1 Sec 6.4 Sec 15.4.4 Sec 15.2.15
25	This area highlights how unsuitable much of the Gippsland area really is for the construction or placement of such infrastructure. It is impossible to choose a satisfactory route without incurring significant damage to surrounding areas of equivalent value.	Sec 15.2.4
26	VNPA anticipates significant difficulty with revegetation and major problems associated with erosion along the pipeline in this area.	Sec 7.1
27	This route has not been assessed in the studies and requires further examination before comments can be provided. It is to be hoped this information will be available for public comment and not merely released after the public process is finished.	Sec 2.1
28	Kelly Creek-Central/Buldah old growth (KP 260-268): The location of the pipeline along this route will require widening of an existing road and some substantial loss of old growth. Again details as the extent of widening of this presently narrow road need to be provided.	Sec 15.2.4
29	The uncertainty as to the final location of pipeline and the real lack of opportunity for adequate participation and comment on the proposal given this lack of information.	Sec 2.2.1
30	The lack of certainty as to whether existing easements can be used, whether they need to be widened and the lack of details surrounding such widening and associated impacts.	Sec 2.2.1
31	The pipeline will not comply with the Code of Forest Practices - eg crossing of streams, gullies and filter strips-activities not permitted by timber production. (See Report 10 p.21).	
32	Ultimately, a large number of significant sites will be impacted on with attendant on-going pressures on the ecology from fragmentation, loss of diversity, exposure to potential weed and disease such as phytophthora.	15.3.3 Sec 4.5 Sec 15.4.5 Sec 15.4.6
33	The EES needs to discuss what will happen to rivers of "non reported" high quality and limited or no downstream usage. Will they receive any treatments, will water flow be interrupted for any periods of time?	Sec 2.2.1 Sec 6.6

Issue No.	Issue	Response reference
34	The EES is not clear at all on which rivers will receive crossing treatments although it discusses a number of possibilities (eg. Latrobe and Bemm Rivers (p.88).	Sec 2.2.1 Sec 6.6
35	This statement does little to illustrate in advance to the public how decisions will be made in relation to crossings. There appears to be no environmental ground rules for the use of treatments and it is of concern that at this stage of the project that the proponent cannot provide further details as to where such treatments or what treatments will be used.	Sec 2.2.1 Sec 6.6
37	Elevated crossings are discussed in the EES but again it is unclear if and where they will be used. This needs to be clarified.	Sec 2.2.1 Sec 6.6
38	Chapter 17.5.3 states that blasting in waterways will be conducted at a time which "minimises impact on aquatic life". Biosis have pointed out that due to the varying nature of biological cycles, the scheduling of activities to minimise susceptible times for stream biota is not a recommended mitigation measure.	Sec 6.5 Sec 6.3 Sec 15.5.2
39	The above statement also applies to the comment at 17.5.6 that "construction of river crossings will be timed for the period when aquatic species populations are considered least sensitive to disturbance".	Sec 6.3 Sec 15.5.2
40	The approximate value of such compensation should be made available to the public at the EES stage to assist in the calculation of the overall cost/benefit of the project to the community. Adequate compensation for values such conservation and aesthetic values should also be included - not merely timber (which is substantially under-valued).	Sec 18.2.4 Sec 4.7 Sec 18.1.2
41	Biosis p.86 recommend that an experienced stream ecologist and fluvial geomorphologist be involved in the detailed design phase - Does the proponent intend to accept this recommendation?	Sec 6.6
42	Biosis sets out a framework for general stream mitigation measures (refer page 87) including the need for a statistically valid impact monitoring program set in place prior to construction and continuing for 5 years after. Will the proponent follow these mitigation measures and instigate such studies?	Sec 20.4
43	Once the pipeline is constructed, what will be the process for public access to the route to assess the impact of such?	Sec 8.1
44	The proponent has confirmed that all tree ferns within the width of clearing will be harvested and replanted. At least one species of tree fern can only be successfully transplanted through complete removal (with root ball). Will this be undertaken?	Sec 7.1
45	The EES provides differing views as to the extent regrowth (trees and shrubs) will be permitted over the actual pipeline. This varies from a 5-6 m band in the Biosis report (p52), 6-8m in the EES (chapter 10.24) and 10m in the Forest Issues report (p.11). How will this be decided?	Sec 7.2

Issue No.	Issue	Response reference
46	It is understood that narrowed or uncleared corridors will be left for wildlife crossing and the key corridors have already been identified. How frequent are the points, how many involve directional drilling or boring?	Sec 2.2.1 Sec 15.3.4
47	Chapter 12.3.2 indicates that dams may need to be constructed in forest areas where water supplies are more distant. VNPA is concerned to ensure that the impact of construction and associated activity (EG roads, dams) is minimised. Further details of such activities need to be made available.	Sec 6.2

YONGE, P. D.

Issue No.	Issue	Response reference
1	"The Grantee requires the Easement for the purpose of buying a pipeline to carry, convey and transport natural and artificial gas, oil and other gaseous or liquid hydrocarbons and products or by-products of those substances." If the EIS is to maintain credibility the above paragraph must be altered to refer to natural gas only.	Sec 18.2.2
2	"The Grantee requires the Easement for the purpose of buying a pipeline to carry, convey and transport natural and artificial gas, oil and other gaseous or liquid hydrocarbons and products or by-products of those substances." If the EIS is to maintain credibility the above paragraph must be altered to refer to natural gas only.	Sec 18.2.2
3	Fee, Purchase price and Consideration from the Deed of Option to enter into Easement and maintain "compensation" as the sole term for the payments. Individual landowners should not be required to consult an accountant in this matter. This advice should be common to all taxpayers and must be the responsibility of the Project staff to advise landowners. Failure by the project to warn and assist landowners in this may and if necessary to negotiate with the Australian Taxation Office for tax free compensation could result in severe tax penalties to landowners. It would appear that registration of easements on a land title will require issue of a new title dated 1996 or later. This means that titles dated before September 1955 will cease to be exempted from liability for Capital Gains Tax. This should be advised to all landowners. The tax liability in this case may vary between landowners unlike the general position on compensation mentioned above.	Sec 18.2.4
4	It is suggested that the Queanbeyan River crossing up stream of Googong Dam at approximately 482 kilometres should be added to the major river crossings list.	Sec 12.2.2 Sec 12.1.1
5	The pipeline will pass within 10 metres of stock yards used for commercial horse-breaking on my property. It will also pass under paddocks in which unbroken and nervous young horses must be grazed. Although the pipeline is to be buried, assessment of the noise impact in such a sensitive and dangerous environment is required in relation to gas movement in the pipeline and particularly in relation to passage of pipeline cleaning "pigs".	Sec 13.1
6	Table 10.5 does not include Wombats. This animal produces entrance tunnels on hillsides and creek banks (including Urialla Creek at 447 km). Being nocturnal and hidden below ground, wombats are particularly vulnerable to trenching operations. Other animals present in the Urialla Valley not listed in Table 10.5 are Echidnas, Tortoises and Kangaroos.	Sec 15.3.1 Sec 15.3.2