Wollar to Wellington
330kV Transmission Line

SUBMISSIONS REPORT

A REPORT TO THE
MINISTER FOR PLANNING

PURSUANT TO
Section 75H (PART 3A) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

March 2006

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TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

ACRONYMS

The following acronyms are commonly used in this Report:
Other acronyms used less frequently in the Report, particularly for organisations making representations, are defined in the relevant section of the Report.

CEMP	Construction Environmental Management Plan
DEC	NSW Department of Environment and Conservation
DEH	Commonwealth Department of Environment & Heritage
DOP	NSW Department of Planning
DNR	NSW Department of Natural Resources
DPI	NSW Department of Primary Industries
EA	Environmental Assessment (Part 3A of the EP&A Act)
ECA	Enhancement and Conservation Area
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EP&A Act	NSW Environmental Planning and Assessment Act, 1979
EPBC Act	Commonwealth Environment Protection & Biodiversity Conservation Act, 1999
IHMP	Indigenous Heritage Management Plan
NEC	National Electricity Code
NER	National Electricity Rules
PEMP	Project Environmental Management Plan
SIS	Species Impact Statement
SOC	Statement of Commitments

1 INTRODUCTION

1.1 Outline of Development

The transmission network in the Central West Region of New South Wales is in need of reinforcement to mitigate an ongoing risk to reliability of electricity supply to the region. This risk relates to the duration of possible unplanned outages of the Mount Piper – Wellington 330 kV line, the only 330 kV line presently supplying the region.

In conformance with National Electricity Code (now the National Electricity Rules) requirements, reinforcement options were considered and the most economically efficient option was recommended for construction.

Accordingly, TransGrid proposes to construct a 330kV transmission line from Wollar to Wellington (the Transmission Line) to reinforce the electricity network in the Central West Region of New South Wales. Refer to Appendix 1 for project location.

A corridor selection process was undertaken leading to the identification of the Northern Corridor (Wollar Variation) as the preferred corridor.

The route of the proposed transmission line is detailed in the Environmental Impact Statement (EIS). The transmission line is about 117km in length and utilises free standing steel lattice towers. The line is located on the centreline of a 60m wide easement as described in the EIS. Detailed route maps are provided in Volume 3 of the EIS. These route maps also show the associated access tracks proposed for the construction of the line. The towers are designed to support three twin phase conductors and two overhead earthwires.

As discussed in the EIS, the locations of the structures and access tracks have been determined on site in consultation with property owners. Because the tower structures and their access tracks have been well defined, it has been possible to undertake detailed site-specific environmental assessment investigations for the EIS. This has also enabled an advanced Project Environmental Management Plan (PEMP) to be prepared, and this was included as part of the EIS.

Landowner issues have played a key role in the development of the project including the location of the line structures and identification of access tracks.

1.2 Approval Process

On 1 August 2005, the new Part 3A (Major Projects) of the Environmental Planning and Assessment Act (EP&A Act) came into force.

The Department of Planning (DOP) advised TransGrid that the proposed Transmission Line will be subject to the provisions of the new Part 3A, becoming an applicable project under s.75B(1)(b). To that end DOP has further advised in its letter of 20 October 2005 that the Director-General has decided to adopt the Director–General's Requirements previously issued in March 2004 for this project and to accept the EIS already obtained as meeting the requirements of an Environmental Assessment (or EA) for the purposes of Part 3A.

References within this Report to the EIS therefore should be taken as references to the formally accepted EA.

Following the public exhibition of the EA from 29 August to 30 September 2005, TransGrid provided copies of all submissions to DOP and commenced a detailed review of all submissions and the issues they raised.

This Report (termed the Submissions Report) is prepared pursuant to s.75H(6) of the EP&A Act and details the consideration given to the issues raised in submissions.

To meet the requirements of the DOP concerning the assessment and approval of major projects under Part 3A, this Report also includes, as an Appendix, a Statement of Commitments (SOC). The Statement of Commitments takes into account commitments already made in the PEMP that was publicly exhibited with the EIS, as well as any further commitments or amended commitments made in responses to submissions.

Upon receipt of this Submissions Report, DOP will conclude its assessment with due consultation with the relevant public agencies. DOP will submit its Assessment Report with recommendations to the Minister for Planning (s.75I). The Minister will then make a decision to approve or not to approve the proposed development after seeking advice from the Minister for Energy (s.75J).

1.3 Structure of this Report

As mentioned above, this Report serves to identify all issues raised in submissions to the publicly exhibited documentation, and to detail TransGrid's response to those issues. A total of 44 submissions from 39 parties were received by TransGrid, with approximately half of the submissions from private individuals including one petition, and the rest coming from a combination of private organisations and local, state and federal public organisations. Refer to Table 1 below for a summary of submissions received and the issues they raised.

The key issues and issues raised in individual submissions have been grouped under the two headings Project Justification (Section 2) and Environmental Issues (Section 3), and responses to them have been provided in these two sections. Relevant submissions are listed after each sub-heading in these sections.

The Report then proceeds to address the submissions received from each federal, state and local public and private organisations. Thus, Section 4 covers the Issues Raised By Public and Private Bodies. In this section, if the issue has already been addressed in section 2 or section 3, then the response has not been duplicated. Rather a reference is made to the location elsewhere in the Report where the response is to be found.

A few points in submissions are of a general and non-specific nature. These are addressed in general ways in the Report, without detailed reference.

The Report concludes with Sections titled Preferred Project Report (Section 5) and a Conclusion (Section 6).

1.4 Consideration of the Proposal of Wambo Power Ventures

TransGrid has received (in the form of a submission to the Wollar Wellington EIS) a proposal from Wambo Power Ventures Pty Ltd to provide network support to the west

of the State from a proposed gas fired power station at Cobar, as an alternative means of addressing the abovementioned reliability limitations.

The Wambo proposal also entails the construction of a new gas pipeline to Cobar and a 132kV transmission line from Cobar to Nyngan.

TransGrid is currently assessing the technical and commercial merits of this proposal and is appropriately giving it full consideration as a viable alternative to the Wollar to Wellington 330kV transmission line. A key part of this assessment will be to determine the extent (if any) to which the transmission line proposal can be deferred by the Wambo proposal.

It has been agreed with all parties (and this includes Wambo, Country Energy and the Department of Planning) that until this assessment can be completed, it is prudent and appropriate to continue progressing the application for environmental approval (under Part 3A of the Environmental Planning and Assessment Act) of the proposed transmission line. Lodging this Submissions Report with the Department of Planning is the next important step in that process.

TABLE 1
SUMMARY OF ISSUES RAISED IN SUBMISSIONS AND WHERE ADDRESSED

No.	Name	Status	Issues Raised	Where Addressed
1	Australian Rail Track Corporation	PB	1 Rail crossing needs Master Access Deed	
2	Mine Subsidence Board	PB	1 No objection 2 Not within proclaimed Mine Subsidence District, no formal approval required.	4.2.5 4.2.7
3 & 3.1	Gallanggabang Aboriginal Corporation	PrB	1 GAC has been involved with the project. 2 Concern over roadwork construction that may impact on Aboriginal site. GAC can supply an Aboriginal Site Officer if needed. 3 Request protection for three sites near Towers 273, 271 & 267. 4 The stretch of the line from Tower 262 to 265 crosses a limestone outcrop in which grooving marks and stone artefacts can be found. 5 Support the early submission from Mrs Williams for an Aboriginal person to be present during roadwork construction. 6 Request for a copy of the EIS/SIS in CD-ROM.	3.6.1 3.6.1 3.6.1 3.6.1 4.4.3
4 & 4.1	Beatrice J Thomson	I	1 Impact on woodlands – 97 ha to be cleared including 57.1 ha of EEC and impacts on habitats. 2 Wollar Switching Station not included in the EIS. 3 Cumulative impacts from the new coal mines and the transmission line on parks and native vegetation. 4 Impacts on public roads from the new mines, power station and transmission line 5 Inadequate flora and fauna study 6 Alternative sources of energy should be sourced. 7 Impacts on Aboriginal artefacts	3.3.1 3.9 3.3.3 3.3.3 3.4.1 2.1 3.6.1
5	Pam Hannaford	I	1 No objection 2 Wanted to know the connection of the line at Wollar and Wellington.	3.9 3.9
6	Greg Dollin	I	1 Impacts on the Hunter Catchment Blueprint 2 Alternative energy sources has not been considered 3 Impacts on EEC 4 EMF	3.8 2.1 3.3.1 3.7
7	Goulburn River Stone Cottages	I	1 Inadequate consideration of alternative energy sources 2 Consumption from new mines has not been addressed in the demand growth estimate. 3 Peak demand can be supplied by small gas generators at much lower cost than that of the transmission line. 4 Inappropriate location near residences 5 Impact on 97ha of western woodland vegetation including 57.1ha of EEC. 6 Bush fire risk 7 Cumulative impacts with Wilpinjong mine proposal on EEC.	2.1 2.2 2.1 3.1 3.3.1 3.10 3.3.3

8 & 8.1	Kay Binns	I	1 Difficulty of getting access to the public display of the EIS. 2 Alternative energy sources including renewable should be considered. 3 Impacts on clearing 97ha of native vegetation affecting habitats 4 Ask for independent study of the proposal 5 The EIS has not recognised the Hunter Catchment Blueprint. 6 Loss of Aboriginal cultural heritage 7 EMF and leukaemia 8 Impacts on threatened species. 9 Inadequate flora and fauna surveys. 10 Peak demand can be supplied by small gas generators at much lower cost than that of the transmission line.	3.16 2.1 3.3 & 3.4.2 6 3.8 3.6.1 3.7 3.3.1 & 3.4 3.4.1 2.1
9	Total Environment Centre	PrB	12 issues	4.4.6
10	Brendan Mahony	I	Objects to the line.	6
11	Calvert Makin	I	1 Demand forecast of 2005 is 10% lower than that for 2003, no urgency 2 Peak demand can be supplied by small gas generators at much lower cost than that of the transmission line. 3 Alternative energy sources such as solar and gas should be considered. 4 Impacts on the Hunter Catchment Blueprint 5 Impacts on threatened species 6 Loss of Aboriginal cultural heritage 7 EMF and childhood leukaemia	2.3 2.1 2.1 3.8 3.4 3.6.1 3.7
12	Susan Symons	I	1 Solar energy should be considered 2 EMF and health 3 Photomontages are misleading 4 Interpretation of an Indigenous site on property (MC-OS19, near Tower 80). 5 Concern over the line route going through Ulan, and why was the community alternative route around Ulan discarded? 6 Power stations, coal mines and power lines are a package deal.	2.1 3.7 3.1 3.6.1 & 3.6.2 3.11 2.4
13	Nature Conservation Council NSW	PrB	5 issues	4.4.2
14	Central West Environment Council	PrB	18 issues	4.4.7
15	Heather Graham	I	1 Inadequate vegetation surveys 2 Clearing of 57.1ha of EEC. 3 Cumulative impacts 4 Threatened species 5 Alternative energy sources such as gas-fired generators would cost less than the transmission line.	3.4.1 3.3.1 3.3.3 3.4 2.1
16	Grayson Tuck-Lee	I	No mention of Ulan Power Station.	2.4
17	Leon & Kerrie Hoare	I	1 Why is the proposed line needed as backup? 2 Relationship of the line with future Ulan Power Station 3 Photomontages is misleading 4 Property has visual impact and this is not shown in Fig 7e. 5 Compensation	2.8 2.4 3.1 3.1 3.15

18 & 18.1	Mudgee District Environment Centre	PrB	11 issues	4.4.1
19	Nell Schofield	I	1 Impacts on the Hunter Catchment Blueprint 2 Demand forecast of 2005 is 10% lower than that for 2003, no urgency 3 No mention of Ulan Power Station 4 Demand forecast and spot demands arising from new mines 5 Alternative energy sources such as gas-fired generators would have a lower cost than the transmission line. 6 Other energy sources including demand management should be considered. 7 Wollar Switching Station not included in the EIS 8 EIS incorrectly identifies the Enhancement and Conservation Areas of Wilpinjong Coal Mine proposal. 9 Line route has not been finalised at Ulan because of impact on airstrip. 10 Inadequate soil protection and erosion measures in areas with high erosion and degradation hazards. 11 Cumulative impacts on EEC with Wilpinjong coal mine. 12 Impacts on threatened species 13 Offset Strategies – inadequate information. 14 Loss of Indigenous cultural heritage 15 EMF and childhood leukaemia.	3.8 2.3 2.4 2.2 2.1 2.1 3.9 3.3.3 3.12 3.5 3.3.3 3.3.1 & 3.4 3.4.1 & 3.4.2 3.6.1 3.7
20	James Smith	I	1 Raised comments on four route options – use National Park lands, Undergrounding, Wollar Variation and the proposed route. 2 Proposed line has excessive capacity. 3 EMF and health concern 4 Visual impact and property 5 EMF and organic farming 6 Impacts on regeneration along fence line 7 Relocation of Ulan Rd 8 Future Power Station	3.2 2.1 3.7 3.1 3.7 & 3.15 3.13 3.14 2.4
21	Glenn & Genelle Rogers	I	1 Photomontages are misleading. 2 Visual Impacts and compensation 3 Paint towers and plant screening trees 4 Seek compensation for visual impacts from a verandah viewing point 5 Mapping in Fig 7c fail to show areas of high visual impacts. 6 Delay the construction of the line till the mining operations are over and then locate the line without affecting any resident in Slate Gully Rd.	3.1 3.1 & 3.15 3.1 3.1 3.1 3.15
22	Excel Coal	PrB	4 issues	4.4.8
23 & 23.1	Department of Environment and Conservation	PB	13 issues	4.2.2
24	NSW Heritage Office	PB	6 issues	4.2.6
25	Telstra	PB	3 issues	4.1.1
26	RTA	PB	2 issues	4.2.4

27	Jack & Bromwyn Gibbons	`I	1 Adequacy of flora and fauna survey 2 Impacts on the habitats of threatened species 3 Impacts on wildlife corridors 4 Alternative energy sources should be considered.	3.4.1 3.4.3 3.2.2 2.1
28	Hunter Environment Lobby	PrB	13 issues	4.4.5
29	Di O'Mara	I	1 Impact on Native Vegetation and EEC 2 Flora and Fauna surveys insufficient.	3.3.1 3.4.1
30	Lance Batey	I	1 Impacts on the Hunter Catchment Blueprint 2 Demand forecast of 2005 is 10% lower than that for 2003, no urgency 3 Link with Ulan power station 4 Extend existing five TransGrid transmission lines to meet the massive unspecified development. 5 Alternative energy sources including demand management. 6 Wollar Switching Station not mentioned 7 Underground option costing given as fifteen times that of the proposed line is *prohibitively expensive*. 8 Health issues & EMF 9 Road modifications at Wilpinjong	3.8 2.3 2.4 2.5 2.1 3.9 3.2 3.7 3.14
31	Isabel Higgins	I	1 Use renewable energy sources 2 Impacts on EEC 3 Impacts on habitats.	2.1 3.3.1 3.4 & 3.4.2
32	Wambo Power Ventures	PrB	1 issues	4.4.9
33	Colin Long	I	1 Photomontages are misleading 2 Line should be undergrounded along the eastern side of the ridge in Slate Gully Rd. 3 Impact on property value	3.1 3.2 3.15
34	Mid-Western Regional Council	PB	5 points	4.3.1
35	Department of Natural Resources	PB	7 points	4.2.1
36	Department of Primary Industries	PB	10 points	4.2.3
37	Murong Gialinga Aboriginal and Torres Strait Islander Corporation	PrB	2 points	4.4.4
38	Moolarben Coal Mines	PrB	2 issues	4.4.10
39	Petition	Group	Many general points	4.5.1

Key: I - Individual submission
PB - Public Body
PrB - Private Body

2 PROJECT JUSTIFICATION ISSUES

Many submissions raised similar concerns about the justification for the proposed transmission line. The concerns related to alternative energy sources, demand management, load growth estimation, alleged over-capacity of the proposed transmission line, greenhouse gas emissions, costing, and consultation with code participants and interested parties. This chapter reviews the EIS consideration of the project justification issues raised in submissions and provides TransGrid's updated response to them.

2.1 Alternative Energy Sources and Demand Management

(Submission Nos.: 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 18, 19, 27, 28, 30 & 31)

- Alternative energy sources, not adequately considered
- Dismissal of Gas-fired Generation and Demand Management

The above submissions raised concerns that alternative energy sources such as solar energy, wind energy and also demand management have not been given adequate consideration. A number of the submissions raised gas-fired generation as an option that should be considered. Some of these submissions were more explicit and claimed that peak demand can be supplied cost-effectively by local gas generation. Overall these submissions stated that non-network solutions should be encouraged.

Submission 14 queried the adequacy of the EIS in meeting the requirements of the Director-General with regard to demand management and alternative energy opportunities and their potential for reduced greenhouse gas emissions.

Response

In planning for the proposed transmission line, the possible use of solar, wind and gas power sources was considered, as discussed in Section 3.3 of the EIS.

TransGrid also endorses the desirability of demand management activities. General demand management activity has been proceeding throughout the State but its effect is to reduce rates of load growth generally and this does not address specific supply augmentation needs. Demand management projects can lead to deferral of supply augmentations if a proponent can be found who is prepared to vigorously pursue the option and this was also considered and promoted before the present network augmentation proposal was advanced.

The consideration of alternative energy, gas-fired generation and demand management projects in the development of the current proposal is outlined below.

Alternative Energy Sources

The use of solar photovoltaic systems in sufficient quantity would be prohibitively expensive. Other solar technologies are also substantially more expensive than the preferred option.

Due to its intermittent nature, wind generation is not suited to the need addressed by the proposed transmission line which requires availability at the times of high load.

Wind cannot be relied upon to be available at a specific regional location at the times of high demand when it would be needed. Also, the most prospective wind farm locations broadly in the Central West of NSW are in the hilly areas of Oberon and Blayney, not near Wellington or Dubbo where the terrain is flat. Generation in the Oberon and Blayney areas, injecting into the existing grid, would not be particularly effective in supporting voltage levels at Wellington and areas further to the north-west, compared with generation that might be located in those areas.

Distributed wind farms throughout the region would have an availability that would contribute some capacity to the region, but such distributed wind generation has not been advanced as the wind resource in the region does not favour such wind farm development.

A pilot hot rock generation plant is being developed in the Moomba area. Although this is showing some promise, it is more than 600 kilometres from the transmission and subtransmission networks in the Western area. Successful commercial development will take a number of years and development of other sites closer to the Central West of NSW cannot be expected within the required time frame. This technology is not sufficiently developed to be considered as a feasible alternative at this time.

Gas-Fired Generation

The most feasible local power source would come in the form of one or more gas fired power stations. These use proven technology and can be configured to any capacity from small systems of about 1 MW to large systems of several hundreds of MW. This type of power source was considered as a possible alternative to network augmentation and proposals were invited but none had been proposed when the transmission line option was assessed under the regulatory test, or prior to the release of the EIS.

For the grid augmentation to be deferred, a significant amount of local generation would be required. For example, at least 150 - 180 MW capacity would be required if located in the Wellington/Beryl/Parkes load area. A lesser capacity may be sufficient if located in other areas but significant augmentations to the electricity and gas networks would be required. Local generation would also have to operate for a considerable proportion of the time, not just at short periods around the system peak, because the extent of the network limitation means that there are significant and increasing periods of risk to electricity supply. In the economic analysis carried out in 2003, combination options consisting of gas fired power stations in the range 60-75 MW combined with a delayed network augmentation, were considered. These options were shown at the time to be clearly less cost effective than network augmentations alone. Larger capacity gas fired power stations were not considered because they require extensions to the gas supply infrastructure in the area and possibly large and high cost network augmentations to connect them.

TransGrid has now received a formal submission from a proponent of local gas-fired generation and is assessing the technical and commercial merits of the proposal. Refer to Section 1.4 of this Report.

Demand Management and Combined Options

Combinations of demand management and local generation were considered by both TransGrid and Advance Energy in 2001. An energy consultant (GreenPower Services) was engaged to identify opportunities for demand management and local generation in the Western area that may address transmission system limitations in the area. The

report of that investigation is entitled “Development Options Involving Demand Management and Local Generation in the Advance Energy Area”, is referenced in the EIS and is available on the TransGrid web site on the following page:

www.transgrid.com.au/consultations_completed.htm

Based on this report, six options, the three options in the EIS and three options that were combinations of similar network developments plus local generation or demand management schemes became the subject of a preliminary application of the regulatory test. The conclusions reached after the preliminary application of the regulatory test were that:

- The two combined local generation/network options were significantly less cost-effective than the other options; and
- The combined demand management/network option was the most cost effective option.

The demand management component of the combined demand management/network option was a desktop project based on information from the energy consultant’s report. The report identified a variety of demand management schemes that could, in theory, be included in such a project.

In developing the demand management component, TransGrid, Country Energy and the economics consultant, NERA (National Economics Research Associates), eliminated from consideration schemes that were:

- mainly targeted at reducing electrical demand in off-peak periods; and
- high cost and therefore likely to reduce the cost effectiveness of the option.

They also considered realistic time frames in which the various schemes could be implemented. In the case of the replacement of existing motors by high efficiency equivalents NERA concluded that this would most cost effectively occur over a ten year time frame, to avoid the sunk costs of replacing equipment that had not reached the end of its effective service life.

The result of these considerations was that the peak load reduction due to the demand management component was estimated to reach about 23 MW prior to construction of the network component of the demand management/network option.

As no demand management and/or local generation options were brought forward during the regulatory consultation, the combined options were eliminated from consideration in the final application of the regulatory test.

Of the three remaining network options, the Wollar – Wellington 330kV option was the most cost effective and a technically superior option.

Thus, options using demand management and/or local generation were considered in the planning process. Following the consultation with Code Participants and interested parties, these options were not disregarded but were simply not taken beyond the desk top stage as there were no proponents identified during the regulatory consultation.

Summary

The assertion that TransGrid may have actively discouraged potential proponents of non-network options has no basis and is not accepted. TransGrid undertook a

proactive consultation process that sought non-network solutions. Projects of this nature did not arise in response to the opportunity afforded by the process.

As to the requirements of the Director General in regard to demand management and alternative energy, the EIS in Chapter 3 clearly provided the information sought on this issue. This issue has been further discussed in the preceding section of this Report, whilst the greenhouse gas emissions issue is further discussed in Section 2.6.

2.2 Consumption of the Proposed New Mines

(Submission Nos.: 7, 18 & 19)

The issue of the electricity consumption (spot demand) from the new mines in the load growth forecast for the area was raised by the above submissions.

Response

The planning process under the National Electricity Code or NEC (now the National Electricity Rules or NER) as detailed in the EIS (S 3.1.2) involved both TransGrid and Country Energy in identifying and monitoring emerging limitations in the transmission network supplying the Western area. Based on the limitations identified, TransGrid and Country Energy applied the regulatory test to options for augmenting the electricity supply to the Western area including consultation with power industry participants and other interested parties. The outcome of this process identified the Wollar – Wellington 330kV transmission line and Wollar Switching Station as the option that best satisfied the regulatory test.

The emergence of significant blocks of load ("spot loads") with a short lead time such as mines and industrial centres is recognised as a factor affecting the extent and timing of limitations on the existing transmission network (S3.2.1). Considering global demand for resources, current prices and supply side constraints, the addition of spot loads is expected to continue increasing the load on the underlying 132kV networks.

In projecting the load forecast, potential growth arising from mines and industrial centres is taken into consideration where such developments have been made known. The range of load growth forecasts took account of the uncertainties of spot load timing as discussed in the following sections.

2.3 Rate of Peak Demand Growth

(Submission Nos.: 9, 11, 13, 14, 18, 19 & 30)

These submissions raised concern over:

(a) The peak demand growth figures of the EIS compared with those of the TransGrid 2005 Annual Planning Report (APR). One submission described these figures as "overblown and Inconsistent".

(b) The justification for the proposed line given the slow peak demand (8MW per year) as stated in the 2005 Annual Planning Report.

Response

(a) Overblown and Inconsistent Peak Demand Growth Figures

For the application of the regulatory test in 2003 two load forecasts were considered, a "best estimate" forecast and a "low" forecast. The main difference between the two was the inclusion of a number of "spot loads" (industrial developments) in the "best estimate" forecast.

For brevity, and consistency with previously published information, a table from the 2003 consultation papers for the "best estimate" forecast was included in the EIS with a statement that the current forecast, as published in the APR 2005, is broadly in line with the 2003 forecast and confirms the ongoing need for augmentation of the network.

The current forecast is closely tracking the 2003 "low" forecast. In the consultation paper and final report the need for augmentation of the network was illustrated in a table that compared the "best estimate" forecast against the "ten system minutes" reliability trigger value that was agreed with Country Energy. A corresponding table for the "low" forecast was not included in the consultation paper. However, consideration of the "low" forecast scenario was included in NERA's associated economic analysis

(b) Slow Rate of Peak Demand Growth

The reference in submission 9 to the peak load "exceeding the capacity of the backup line for a few hours per year" appears to be erroneous and based on a misconception. The table on page 15 of the consultation final report clearly showed that the N-1 capacity (this term is explained below) of the network would be exceeded for thousands of hours per year i.e. in the later years for more than 12 hours per day on average. For the current "best estimate" load forecast, the period of risk is less than estimated in 2003, but still applies for a significant percentage of the year, as illustrated in Table 2 below.

Table 2 - Western Area Risk Exposure Profile

	Line 999 Not Uprated			Line 999 Uprated		
Year	Max Load at Risk (MW)	Period of Risk (Hours)	Energy at Risk (MWh)	Max Load at Risk (MW)	Period of Risk (Hours)	Energy at Risk (MWh)
2006	188	1,050	58,900	156	670	32,600
2007	194	1,090	62,100	162	710	35,000
2008	201	1,150	65,700	167	770	37,800
2009	207	1,220	69,600	173	830	40,800
2010	213	1,300	73,800	179	910	44,200
2011	219	1,390	78,300	185	1,000	48,000
2012	225	1,490	83,200	191	1,100	52,000
2013	231	1,600	88,400	197	1,210	56,400
2014	237	1,730	94,000	203	1,330	61,100

Note: Two assessments of Energy at Risk are tabulated due to the thermal rating of Line 999 (Yass to Cowra 132kV) which may in some cases limit voltage support at Wellington for outages of 72 Line.

A slower rate of peak demand growth does not mitigate the need for this project, because the N-1 reliability standard is currently being exceeded, and by a clear margin, as illustrated in the above table and the graphs in Figure 1 below. A similar situation existed in 2003, when the 10 system-minute standard was being exceeded at that time, for the actual loads in the previous few years.

Nevertheless, for the avoidance of any doubt as to what the current load forecast may be, Tables 3 & 4 on the following pages provide details of TransGrid's current peak load forecast at points of supply to Country Energy in the Western area.

This forecast is as per TransGrid's Annual Planning Report for 2005 and is based on information provided by Country Energy. An updated forecast is in preparation, and is expected to result in somewhat higher risk values than indicated in Table 2 above.

The issues raised in these submissions require the following clarification of the development of the reliability standards applicable to electricity supply.

Reliability Criteria

The Department of Energy, Utilities and Sustainability recently issued mandatory license conditions for NSW distribution businesses which, *inter-alia,* set out certain reliability standards for Country Energy's subtransmission and distribution network. These conditions require Country Energy to provide N-1 reliability (defined below) for all parts for its network supplying loads greater than 15 MVA. For Country Energy to achieve this level of reliability, N-1 reliability will also be required for those parts of TransGrid's network supplying Country Energy loads greater than 15 MVA.

N-1 Reliability

N-1 reliability means that the full load can be supplied with any power system element, including the most critical element, out of service. In the case of supply to the Western area of NSW, the most critical element outage is the loss of the Mount Piper – Wellington transmission line no. 72 (This is the only 330kV transmission line supplying the Central and far West of NSW). With this line out of service, as stated in the EIS, the Western area load cannot be supplied for substantial and increasing periods of time each year as indicated in Table 2 above.

Accordingly, Country Energy has requested TransGrid to incorporate N-1 reliability levels into its planning standards and processes.

Ten System Minutes Reliability

In the 2003 application of the regulatory test TransGrid and Country Energy agreed to use a ten system-minutes reliability standard. This standard allows for a risk that some load will be lost (not supplied) during outages of network elements. System-minutes is a way of describing the statistical mean amount of energy (MWh) that the grid may not be able to supply. For the Western area ten system minutes corresponded to about 50 MWh in 2003, or an annual loss of 15 MW (15,000 kW) for 3 hours and 20 minutes as a result of a failure or interruption of the transmission system.

The rationale for using this type of risk tolerant reliability standard was that it may have been possible to include consideration of options that may substantially, but not necessarily completely, eliminate the voltage limitation in the area, but at substantially lower present value cost than other options. In general, such options may have a lower present value cost either because (i) their capital cost is lower than that of other options, or (ii) the construction of higher capital cost options may be delayed beyond the point where an N-1 standard would be satisfied but the risk tolerant reliability standard would continue to be satisfied. For a more detailed discussion of the ten system minute reliability standard refer to page 14 and Appendix 2 of the Final Report, which is also available on the TransGrid web site at:

www.transgrid.com.au/consultations_completed.htm

In 2003, the voltage limitation was already below the ten system minutes trigger value, so possibility (ii) above was not available. One network option (the Yetholme – Kerr's Creek Option) satisfied the ten system minute standard but not an N-1 standard. However this option was not less costly than the Wollar – Wellington option.

Given the lack of any significantly less costly option that may satisfy a ten system minute reliability standard but not an N-1 standard, and Country Energy's request for an N-1 standard, the reliability standard for TransGrid's network supplying the Western area has therefore been changed, from that previously agreed, to N-1.

The now prevailing N-1 reliability standard means that the need for an augmentation of the network supplying the Western area, as soon as practicable, is clearly indicated, as this N-1 reliability standard is not currently satisfied, and by a clear margin. This is illustrated in Figure 1 below, which depicts actual maximum demands, the most recent load forecast, and the approximate load level in the Beryl/Wellington/Parkes area at which an N-1 reliability standard would be just satisfied.

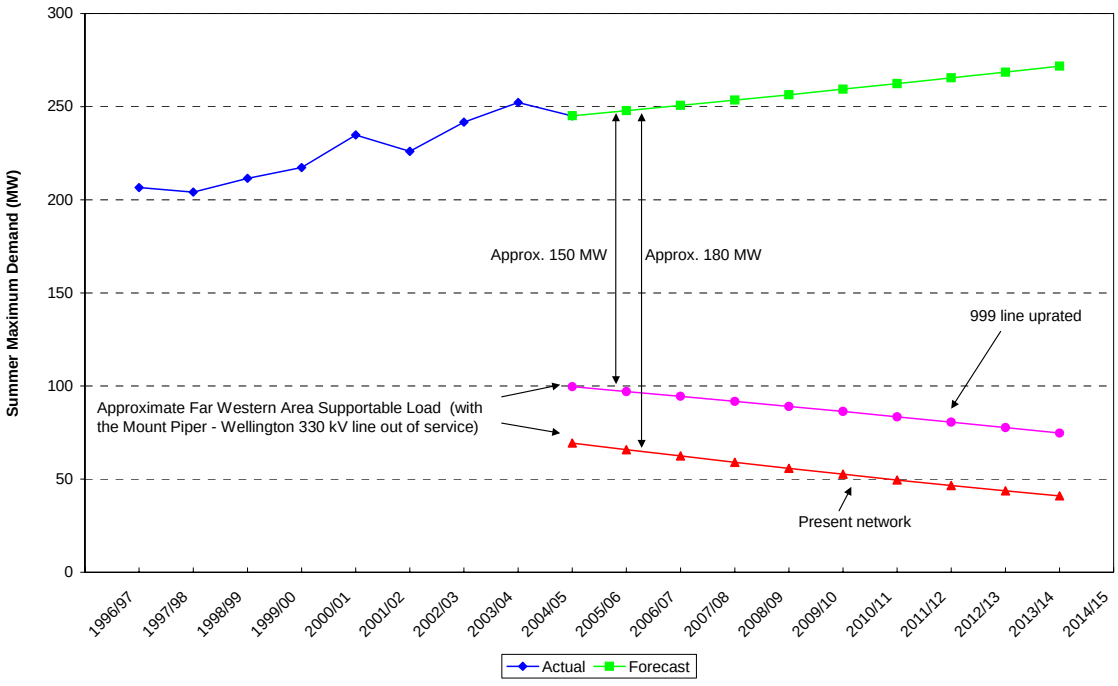

Figure 1 – Far Western Area: Maximum Demand and Supportable Load

The difference between the upper and lower curves is indicative of the amount of generation (at Wellington) that would be required to achieve the N-1 standard, viz. in excess of 150 - 180 MW.

As discussed in Section 2.1 a smaller amount of generation may be sufficient if located in other areas. However, in this case significant augmentations to the electricity and gas networks would be required.

Table 3 - Western Area - Summer Maximum Demand Forecast

Location		2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Beryl	MW	36.0	36.9	37.8	38.8	39.7	40.7	41.7	42.8	43.9	45.0
	MVAr	17.4	17.9	18.3	18.8	19.2	19.7	20.2	20.7	21.2	21.8
Ilford	MW	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.6	16.7	16.8
	MVAr	4.5	4.6	4.6	4.6	4.6	4.7	4.7	4.7	4.7	4.8
Manildra	MW	10.5	10.6	10.6	10.7	10.7	10.8	10.8	10.9	10.9	11.0
	MVAr	5.1	5.1	5.1	5.2	5.2	5.2	5.2	5.3	5.3	5.3
Molong	MW	4.3	4.4	4.4	4.5	4.6	4.6	4.7	4.8	4.8	4.9
	MVAr	2.1	2.1	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.4
Mount Piper	MW	23.8	27.3	27.5	27.6	27.7	27.9	28.0	28.2	28.3	28.5
	MVAr	13.7	15.7	15.8	15.9	15.9	16.0	16.1	16.2	16.3	16.4
Mudgee	MW	20.2	20.7	21.2	21.8	22.3	22.9	23.4	24.0	24.6	25.2
	MVAr	6.6	6.8	7.0	7.1	7.3	7.5	7.7	7.9	8.1	8.3
Orange 66 kV	MW	43.0	43.6	44.3	45.0	45.6	46.3	47.0	47.7	48.4	49.2
	MVAr	28.9	29.3	29.8	30.2	30.7	31.1	31.6	32.1	32.6	33.0
Orange 132 kV	MW	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0
	MVAr	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Panorama	MW	60.0	61.2	62.4	63.7	64.9	66.2	67.6	68.9	70.3	71.7
	MVAr	30.7	31.4	32.0	32.6	33.3	33.9	34.6	35.3	36.0	36.7
Parkes 66 kV	MW	23.0	23.6	24.2	24.8	25.4	26.0	26.7	27.3	28.0	28.7
	MVAr	9.8	10.0	10.3	10.6	10.8	11.1	11.4	11.6	11.9	12.2
Parkes 132 kV	MW	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
	MVAr	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Wallerawang 66 kV CE (Country Energy)	MW	4.2	4.2	4.2	4.3	4.3	4.3	4.3	4.3	4.4	4.4
	MVAr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Wallerawang 66 kV IE (Integral Energy)	MW	24.3	24.7	25.2	25.5	25.7	25.9	26.2	26.4	26.6	26.9
	MVAr	11.2	11.4	11.6	11.8	11.9	12.0	12.1	12.2	12.3	12.4
Wallerawang 132 kV	MW	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	MVAr	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Wellington Town	MW	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.5
	MVAr	3.2	3.2	3.3	3.3	3.4	3.5	3.6	3.6	3.7	3.8
Wellington 132 kV	MW	146.0	146.7	147.5	148.2	148.9	149.7	150.4	151.2	151.9	152.7
	MVAr	29.6	29.8	29.9	30.1	30.2	30.4	30.5	30.7	30.9	31.0

Table 4 - Western Area - Winter Maximum Demand Forecast

Location		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Beryl	MW	37.0	37.5	38.0	38.5	39.0	39.5	40.0	40.5	41.0	41.6
	MVAr	13.4	13.6	13.8	14.0	14.1	14.3	14.5	14.7	14.9	15.1
Ilford	MW	16.0	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	17.0
	MVAr	4.1	4.2	4.2	4.2	4.2	4.3	4.3	4.3	4.3	4.4
Manildra	MW	10.9	11.0	11.0	11.1	11.1	11.2	11.3	11.3	11.4	11.5
	MVAr	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.2
Molong	MW	3.5	3.6	3.6	3.7	3.7	3.8	3.8	3.9	3.9	4.0
	MVAr	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.2
Mount Piper	MW	28.1	27.7	28.1	28.5	28.9	29.3	29.6	30.0	30.4	30.8
	MVAr	15.9	15.6	15.8	16.1	16.3	16.5	16.7	16.9	17.2	17.4
Mudgee	MW	22.0	22.4	22.9	23.3	23.8	24.3	24.8	25.3	25.8	26.3
	MVAr	7.2	7.4	7.5	7.7	7.8	8.0	8.1	8.3	8.5	8.6
Orange 66 kV	MW	62.0	62.9	63.9	64.8	65.8	66.8	67.8	68.8	69.8	70.9
	MVAr	20.4	20.7	21.0	21.3	21.6	22.0	22.3	22.6	23.0	23.3
Orange 132 kV	MW	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0	78.0
	MVAr	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Panorama	MW	72.0	72.7	73.4	74.2	74.9	75.7	76.4	77.2	78.0	78.7
	MVAr	23.7	23.9	24.1	24.4	24.6	24.9	25.1	25.4	25.6	25.9
Parkes 66 kV	MW	22.7	23.3	23.8	24.4	25.1	25.7	26.3	27.0	27.7	28.3
	MVAr	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.8	3.9	4.0
Parkes 132 kV	MW	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
	MVAr	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
Wallerawang 66 kV (CE)	MW	6.0	6.1	6.2	6.4	6.5	6.6	6.8	6.9	7.0	7.2
	MVAr	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.3	2.3	2.4
Wallerawang 66 kV (IE)	MW	29.3	29.9	30.6	31.1	31.5	32.0	32.4	32.8	33.3	33.7
	MVAr	10.8	11.0	11.3	11.5	11.6	11.8	11.9	12.1	12.3	12.4
Wallerawang 132 kV	MW	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
	MVAr	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Wellington Town	MW	9.4	9.5	9.6	9.8	9.9	10.1	10.2	10.4	10.5	10.7
	MVAr	3.1	3.1	3.2	3.2	3.3	3.3	3.4	3.4	3.5	3.5
Wellington 132 kV	MW	146.0	146.7	147.5	148.2	148.9	149.7	150.4	151.2	151.9	152.7
	MVAr	20.8	20.9	21.0	21.1	21.2	21.3	21.4	21.5	21.7	21.8

2.4 Relationship with Future Power Station

(Submission Nos.: 9, 12, 13, 14, 16, 17, 18, 19, 20, 28 & 30)

The above submissions raised concerns that the capacity of the proposed transmission line (stated to be 1000 MW and up to 2000 MW) is well in excess of the need of the area and when the line is upgraded to 500 kV the capacity will further increase. It was suggested that this is an artificial inflation of network revenues. These submissions also claim that the line is to service future power stations or power station expansion and imply that the consequential greenhouse gas emissions from the new power stations or expansion will be massive.

Response

The planning considerations for the Wollar – Wellington line did not include provision for the connection of any power station, along or close to, the route of the line. The line type and conductor selection has been tailored to meet customers' electricity requirements in the Western area and will allow for the transmission of power to the Western area, from all sources of generation, on a competitive basis in the National Electricity Market.

The line has the smallest practicable thermal rating and would not support the connection of a local power station of an appreciable size.

The thermal capacity of the new line is overstated by the Total Environment Centre (Submission 9).

The summer day continuous thermal rating of a 330kV transmission line with twin Mango conductors, as proposed, is 890 MVA. A higher rating of around 1500 MVA is achievable with a single circuit 330 kV transmission line, however larger conductors than those proposed for the Wollar – Wellington transmission line would be required, resulting in a more costly transmission line.

The inference that the thermal rating of the line is in excess of the area's needs is also erroneous and misleading.

The present limitations in the network, if the existing 330 kV line is out of service, relate to voltage drops along the 132 kV lines (resulting in unacceptably low voltages at Wellington) rather than to lines being loaded beyond their thermal ratings.

A higher operating voltage than 132 kV was selected for the existing 330 kV line (which was constructed in the early 1980s) and the Wollar – Wellington line because of the greater capability of 330 kV lines to carry the required levels of power over the distances involved. While 330 kV lines have higher thermal ratings than 132 kV lines, 330 kV was not selected for this reason.

Comparisons involving the thermal rating of the Wollar – Wellington line are not appropriate. The appropriate comparison is the ability to carry power, with adequate control of voltage, over the distances involved (around 200 km from Mount Piper to Wellington, around 300 km from Yass to Wellington and around 120 km from Wollar to Wellington). To achieve this would require a number of 132 kV circuits rather than the single 330 kV line proposed.

As proliferation of 132 kV lines is unlikely to be either economically or environmentally acceptable, TransGrid does not consider this to be a viable option. Consequently it was not included in either the regulatory consultation process or the environmental impact statement.

As a relatively high thermal rating for the Wollar – Wellington line is not necessary, the smallest practicable conductors were selected. Smaller conductors at 330 kV would cause excessive interference to radio and television reception and excessive corona losses on the line.

The towers proposed for the Wollar – Wellington transmission line will have strengths appropriate to the conductor bundle adopted. There is no intention to provide for a future higher capacity requirement.

The proposed Wollar – Wellington 330kV transmission line is not suitable for operation at 500 kV. This would require additional insulation and a bigger conductor bundle with four conductors of a larger size. TransGrid uses a quad conductor bundle for each phase of a 500 kV transmission line, not twin conductors as proposed for this project.

The suggestion of 500 kV operation of the Wollar – Wellington line appears to be based on a misunderstanding. It is the Bayswater to Mt Piper 500 kV transmission line presently operating at 330 kV that is expected to operate at 500 kV in the future. The Wollar – Wellington line will remain at 330 kV. Operation of the Bayswater – Mount Piper line at 500 kV will require the installation of a 500/330kV transformer at Wollar Switching Station, which would be upgraded to a 500/330 kV Substation to maintain supply from the Bayswater – Mt Piper 500 kV transmission line.

2.5 132kV Line Options

(Submission Nos.: 9, 14 & 30)

These submissions assert that:

(1) a 132 kV transmission line option would have a lower cost and sufficient capacity (200MW). They state that this would be a more cost-effective alternative to the proposed 330 kV transmission line,

(2) the proposed augmentation would be likely to have a net present value disbenefit, and

(3) the four case studies provided in Attachment 2 of Appendix E in Vol 2 of the EIS were totally meaningless because there was no description provided in the EIS of the Case 1 scenario.

Response

(1) Lower cost 132kV line options

The statement in Submission 9 stating that *a 132kV line could have a capacity of over 200MW, or 25 years worth of load growth"* is not correct.

It is incorrect in this case to divide the thermal capacity of a new line by the annual load growth to determine the years worth of load growth figure for a 132 kV line. Firstly there is an initial shortfall of transmission capacity when the existing Mt Piper to Wellington

330 kV transmission line is out of service (this is illustrated in Figure 1 above). Secondly this capacity limitation is not related to transmission line thermal ratings.

The need for network augmentation relates to a voltage limitation, which is a property of the entire network in the Western area, not just a property of an individual line or lines. This is discussed, for example, in Section 3.1.4 of the EIS and Section 3.1 of the regulatory approval *Final Report* and Sections 2.3 & 2.4 of this Report.

A single 132 kV line will not improve the voltage limitation of the network sufficiently. Multiple 132 kV circuits would be required, rather than the single 330 kV line proposed.

For this reason 132 kV solutions to the voltage problem were not considered reasonable and were therefore not put forward in the regulatory approval process.

(2) Net Present Value disbenefit

Submission 9 states that the *proposed augmentation would be likely to have a net present value disbenefit of $24 million to $39 million.*

A negative Net Present Value (NPV) is an accepted and common part of cost-effectiveness analyses for reliability augmentations.

The purpose of NPV calculations is to rank options. Consequently costs and benefits, which are common to all options, are usually not included in the NPV calculation. Thus no meaningful conclusions can be drawn, based on the calculated value of the NPV, as to the so called net "benefit" or "disbenefit" of any particular option.

However meaningful comparisons can be made between options based on the relative value of their NPV's when compared with each other. This is the process of "ranking" options in the cost-effectiveness analysis.

Another reason that NPVs for reliability augmentations are often negative is that they include, *inter alia,* the expected (i.e. the statistical mean) value of energy not supplied.

However, the actual cost of energy not supplied can differ significantly from the expected value. This is because the economic cost of electricity supply interruptions caused by outages of high capacity but reliable lines can be very large, whilst their probability of occurrence is low. (These are often referred to as high cost, low probability events.) For example, the economic cost of a single two day disruption to supply in the Central West that could be caused by an outage of the Mt Piper - Wellington 330 kV line, in economic terms, could be around $100 million. The N-1 reliability criterion reflects the community, the Government and Country Energy's view that the risk of such an impact is unacceptable.

(3) Case Studies in Attachment 2 of Appendix E (EIS Volume 2)

The five case studies of load flow studies provided in the referenced attachment to Appendix E of the EIS followed discussion with an affected landowner in March 2005 when some additional load flow studies were undertaken. All cases used TransGrid's 2004 forecast of summer 2004/5 peak load conditions in the Western area, that being the latest forecast available at the time, and the summer period being the latest high load period prior to March 2005. These studies should be read in the context of the questions raised by the landowner and not in the context of the consideration of network augmentation options as implied in Submission 14. The case studies cover the various scenarios of local generation and/or a 132kV line from Wollar to Beryl.

2.6 Greenhouse Gas Emissions

(Submission Nos.: 9, 13, 14 & 28)

These submissions raised concerns about the Greenhouse Gas (GHG) emissions that can arise from the construction activities of the line and the potential increase in energy use resulting from the line. Some submissions consider the EIS statement that "the proposed line will reduce GHG emissions" as misleading because non-network solutions could have significantly reduced emissions through the use of fuels that are less greenhouse gas emission intense and through reducing energy use. It is also claimed that the proposed line will wipe out any incentives for these options well into the future.

Response

These submissions confuse two distinct issues, the GHG emission reduction due to augmenting the electricity transmission network and the GHG emission reductions achievable by changing the electricity generation fuel or energy source.

The proposed development is a 330kV transmission line to augment the existing transmission network in the area. By itself it does not emit any GHG. Rather it reduces GHG emissions.

This is because transmission losses are proportional to the square of the electrical current. At higher voltages, current is significantly reduced for the same power transfer. Current will flow in the new 330 kV line but the current in the existing 330 kV and 132 kV lines in supplying the area will be reduced. The net result will be a significant reduction in total losses.

Based on system load flow studies, the proposed transmission line will reduce electrical losses by about 50,000 MWh/year. This will result in a reduction of CO_2 emissions by about 45,000 tonnes/year.

The EIS did not address GHG emission reductions due to changing sources of electricity generation. This was for two reasons:

1. Lack of any gas-fired generation proposal for the region.

   No gas generation proposal for the region had come forward in response to the Annual Planning Reports over several years, no proposal was advanced in response to the opportunity publicised in the regulatory test consultation process, and no dispute was notified in response to the Final Report *Development of Electricity Supply in the Western Area of NSW* recommending the construction of the new large network asset which is the subject of the present proposal.

2. Alternative sources of generation located outside the region would not affect the GHG emission reductions due to the transmission proposal being assessed.

   Gas-fired generation does have lower GHG emissions than coal-fired generation and renewable generation has even lower net emissions. However, if the optimal locations for these generation alternatives do not support the reliability of supply to the Western Area of NSW the benefits are not relevant to this environmental assessment.

The way in which GHG emissions were addressed in the EIS is therefore appropriate.

This is not to deny that local renewable generation options and demand management options would have GHG emission reduction benefits, and this proposition is further discussed below.

With regard to renewable energy, the *Options Study* provided to TransGrid and Country Energy by Colin Crawford-Smith *et al* indicated that the opportunities for low cost renewable generation in the area are limited – wind farms are restricted to high wind areas, small hydro are restricted to two existing dams and solar photovoltaics are prohibitively expensive. Furthermore renewable generation has a significantly lower level of reliability than gas powered generation and so would not be suitable for providing the reliability support required.

NERA's cost effectiveness analysis of options, provided to TransGrid, identified natural gas as the most viable non-network option and analysed several variations of bundled combinations of gas-fired generation at Wellington and deferred electricity transmission to Wellington. These would result in lower transmission loss reductions in the early years prior to the transmission augmentation and similar reductions after the transmission line was constructed.

The effects of reductions in GHG emissions were considered by NERA in their cost effectiveness analysis (see their report Section 7.3.10 pp 63-67). NERA concluded that the ranking of options was not materially affected by assumptions regarding the assumed value of reducing CO_2 emissions (for example, by possible mandated carbon trading schemes).

NERA did not consider gas-fired generation located at Cobar. The benefits of gas-fired generation displacing part of the current mix of generation (dominated by coal) would be as significant as for any site on the interconnected grid. However the GHG emission benefits for this site would be less than for gas-fired generation at Wellington considered in the NERA report, due to the need for more heavily loaded long-distance 132kV transmission from Cobar to Wellington.

The GHG emissions arising from the construction activities of the transmission line are associated with the emissions from construction vehicles, production of steel for the supporting structure steelwork, core strands of ACSR conductors, earth-wires and counterpoise earthing, production of aluminium for the conductors and production of concrete for tower foundations. Based on expected total tonnage of steel, aluminium, reinforced concrete and vehicle fuels that would be used in the construction of the line, the GHG emissions from these sources have been estimated to be 81,000 tonnes of CO_2. These GHG emissions are once off and will be offset by the reduction of transmission losses (45,000 tonnes/year) within 2 years.

Local renewable or gas-fired generation options and some demand management options would also involve GHG emissions during construction and/or manufacturing. These have not been quantified.

2.7 Costing of Local Generation Options

(Submission No. 9)

This submission expressed concern over estimates of the duration of operation of local generation options and the consequential costing of those options.

Response

On page 36 of their report, NERA describes 3 assumptions regarding generation hours: 0, 12 and 24 hours per day. The 12 hours per day "base" assumption is appropriate having regard to the hours of risk that apply – see for example Table 3.1 on p15 of the consultation *Final Report*. In any event, NERA produced results corresponding to all 3 assumptions (which cover the widest possible range!) and concluded that the ranking of options was robust to variations in generation hours over this range – see page 78 of NERA report.

NERA's modelling also assumed that generation by local generators displaces generation elsewhere in the National Electricity Market (NEM), and therefore fuel costs of these options would be partially offset by fuel savings elsewhere in the NEM. (See the NERA report Section 7.3.8 p 62). These savings increase the cost effectiveness of local generation options but did not displace the transmission line or the preferred option.

2.8 Reliability Standards

(Submission Nos.: 9 & 17)

- Selective use of reliability standards.
- The EIS (Vol 2) has stated that the existing line supplying power to the west is working acceptably and reliably, why then the need for this back-up (17).

Response

The material in Submission No 9 on this issue appears to rely on a confused interpretation of NERA's report.

The reliability standard, used consistently throughout the report, was that "The Expected Energy Not Supplied is not greater than 10 system minutes in any year over a 10 year planning horizon" (See page 6 of their report).

On page 7 of the report, NERA did not suggest that network options would be acceptable even though they failed to meet the reliability standard until 2007. The point being made was that network options (or indeed any option) could not meet the reliability standard until it was completed. In that respect all options were treated equally.

System studies showed that the reliability standard was not being met at the time, and therefore an improvement in network reliability was required immediately (or as soon as practicable). This also explains why the load reduction required to satisfy the standard in 2003 exceeded the annual load growth.

The issue of considering options to meet a reliability standard when the existing network does not currently meet that standard was considered carefully by NERA. For a full discussion see pp 21-22 of NERA's report.

NERA's approach to this issue can be summarised as:

- All options are considered on an equal footing;
- Since the reliability standard was not currently being met, and no options could be constructed immediately, options would be accepted if they met the reliability

standard once constructed, and continued to do so for at least the remainder of the planning horizon;

- Options would be allowed to not fully meet the standard while they are being constructed but reductions in unserved energy occurring during this period would increase their cost effectiveness, compared to options that did not partially meet the standard during their construction period;

Consistent with this approach, NERA considered Option 6, a combination option consisting of an "up front" demand management component followed by a network component that was identical to one of the other (network only) options. NERA's conclusion was that this demand management / network augmentation option had the highest ranked NPV of all options considered (see NERA's report p 82), even though it did not result in an elimination of, or delay in, the need for the network component.

Submission No 17 takes issue with the need to "back up" the existing line to the Western area even though TransGrid agrees that it is working acceptably and has been reliable, as described in Attachment 1 to Appendix E.

This is a reference to the broader issue of whether or not reliability standards, such as N-1 should ever be applied in transmission planning. An N-1 standard (or a more risk tolerant standard such as the 10 system minute approach) is standard practice throughout the world for loads of moderate to large size. As discussed elsewhere in this report such standards recognise community and government concerns that unplanned outages of a particular transmission line, whist they may only occur relatively rarely, can have significant community impacts. The recently imposed requirement on Country Energy to provide and N-1 reliability standard for loads above 15 MVA is an expression of those concerns.

2.9 Consultation Process under National Electricity Code

(Submission No. 9)

This submission raises concern over the consultation with Code Participants and Interested Parties on possible options, including demand side options, under the National Electricity Code (NEC).

Response

The consultation process followed was that required by the National Electricity Code as it was when the consultation for the Western area commenced on 25 January 2002. On this date notice about the consultation was placed on TransGrid's web site. Though the Code requirements for consultation process were changed on 8 March 2002, the Code changes provided (in Clause 5.6.2(a2)), where the consultation commenced before 8 March 2002, for network development procedures to be carried out in accordance with the Code requirements that were in effect immediately prior to 8 March 2002. TransGrid did not contravene the NEC in its handling of the consultation process for this project.

The consultation process as detailed in Section 3.1.2 of the EIS involved:

- Identification of opportunities for demand management and local generation in the Western area in 2001 and completion of an option report;
- Forwarding the options report directly to Sustainable Energy Development Authority (SEDA). SEDA cited this report in their document "Distributed Energy

Solutions" (Feb. 2002, p. 47) published during the Independent Pricing and Regulatory Tribunal (IPART) Inquiry into Demand Management;

- January 2002 – August 2003, - formal consultation by TransGrid and Country Energy with power industry participants and other interested parties on options for the augmentation of supply to the Western area as required by the National Electricity Code including an application of the Australian Competition and Consumer Commission's (ACCC) regulatory test. The formal consultation, which comprised all activities required by the Code and other activities included:

  a) Publishing a "Network Limitations Document" (July 2002);

  b) Publishing a regulatory consultation paper (May 2003);

  c) Publishing the Final Report of the consultation (August 2003)

  d) Including the Western Area network limitations as an item in TransGrid's Annual Planning Report from 1999 to 2003; and

  e) Discussing the Western area network limitations in the APR public forums for these years. In fact this issue was included in a special presentation by Advance Energy in the 2000 forum (Advance Energy is now part of Country Energy).

The consultation process in testing the options has been in total conformity with the processes required by the NEC.

In addition to the above NEC/NER consultation process TransGrid must, from time to time, have its forward capital program reviewed by the transmission regulator for the purpose of establishing its maximum allowed revenue streams for the upcoming regulatory reset period.

The latest such review was carried out in 2004/2005 by the ACCC, with its decision handed down on 27 April 2005 covering the regulatory period from July 2004 to June 2009. On 1 July 2005 the Australian Energy Regulator (AER) took over this review function.

This review was an exhaustive one with, *inter alia,* each of TransGrid's current and future augmentation proposals being individually reviewed by the ACCC for:

- Demonstration of a need for the augmentation against accepted technical and reliability standards;

- Conformance with Code processes including application of the regulatory test, and adequate consideration of alternative options; and

- Demonstration of the ongoing efficiency of the proposal.

The Wollar – Wellington proposal was fully incorporated into TransGrid's allowed revenue stream, demonstrating the ACCC's acceptance of that proposal against the above criteria.

3 ENVIRONMENTAL ISSUES

This chapter outlines the EIS consideration of the environmental issues raised in submissions and provides TransGrid's updated response to them.

3.1 Visual Amenity

(Submission Nos.: 12, 17, 20, 21 & 33)

These submissions raised the following issues:

- Incorrect representation of the transmission towers in the photomontages in the EIS (21 & 33). Photo taken from longer distance (1000m) than from residence (500m).
- 330kV towers shown smaller than 11kV line at Ulan (12)
- Larger corner tower not shown in Montage 5, which is only 30m from front gate (12).
- Properties affected not shown on map (20 & 21)
- Compensation for visual impact (17 & 21).

Response

Visual impacts of a transmission line may arise from the size and visibility of the conductors and structures when they are nearby or prominent in the viewed landscape. Greater visual impacts can arise from a scar across the landscape caused by clearing the easement in forested areas. High impact views along the length of the line can occur at road crossings and similar locations. TransGrid has developed transmission line siting practices that reduce these impacts markedly. A range of mitigation measures will further reduce the impact on visual amenity.

The impact of the proposed transmission line on the visual amenity of the environment is assessed in Section 7.3 of the EIS. The assessment is based on a consideration of the ten factors detailed in the EIS comprising existing visual environment, final visual characteristics of the proposed line, distance, topography, vegetation cover, visual contrast generated, number of viewers, duration of view, angle of view, and visual sensitivity. Photomontages at various locations were provided to illustrate the broad visual impacts of the proposed transmission line and not every impact from individual properties.

Figures 7a-7o of the EIS (Vol 3) illustrate the visual impacts along the proposed line. Along Slate Gully Road, where the visual impact is acknowledged as significant, the alignment chosen (the final alignment) places the line as close as practicable to the vegetated hillside on the western side of the valley.

As indicated in the EIS (S7.3.4), the visual impacts can be reduced by increasing the distance of the line from residences. This mitigating measure has been undertaken at the route selection stage of the proposed line and fine-tuning of the preferred route. The nearest private residence is about 250m from the line.

To further reduce visual impacts, five mitigation measures have been identified in the EIS. These will be implemented where appropriate. At Slate Gully Road, the transmission line has a backdrop of a forested ridge (Crown Reserve) and the towers will be painted green to blend with the backdrop.

Photomontages are used to illustrate the appearance of the line from the points the photos were taken. The appearance of the tower as shown in the montages is based on the height of the tower and distance from the point the photos were taken. The photomontages presented in the EIS very accurately depict the height that the line will be once constructed. The height of each tower shown on the photomontages was determined using helium balloons raised to the proposed height of the towers and located at the survey pegs.

The purpose of the montages was to provide a general view of what the line would look like throughout particular areas, not to depict the view from each individual house along the line, or the closest residence to every single structure. Arising from this process, the visual impacts in the Slate Gully area were assessed to be potentially high and consequently the additional mitigation measure of painting the towers green has been included in the proposed scope of work. TransGrid will also consult with residents of Slate Gully Road about the potential of using screening plantings.

It is recognised and undisputed that properties along Slate Gully Road would potentially experience a relatively high visual impact as a result of the proposed Wollar to Wellington transmission line. This was made very clear in the detailed visual catchment mapping for the EIS. While it is unfortunate that some properties fall on the edge of a map, it is not possible to have an extensive coverage of the entire line. For this reason, there is an adequate level of overlap between successive pages along the line. No attempt has been made to hide or mislead the degree of impact that the proposed transmission line will have on these properties.

Montage 5, views from Ulan, shows a distribution line (possibly 11kV) at a medium distance with the 330kV further away. It does not show a 330kV tower smaller than an 11kV line. Montage 6, the view looking west from Blue Springs Road, shows the nearest structure of the existing 132kV wood pole line larger than the nearest proposed 330kV tower. The montage is correct. The wood pole structure looks larger because it is much closer to the viewing point – the road.

In regard to the matter of seeking compensation arising from visual impact, there is no legal basis under the Land Acquisition (Just Terms Compensation) Act 1991 for such compensation to be paid to owners of properties that are not crossed by the easement of the proposed line.

3.2 Underground Options

(Submission Nos.: 20, 30 & 33)

These submissions raised the issue that underground options should be considered.

Response

Whist it is technically possible to construct an underground cable for a 120km route, it is also considerably more expensive and environmentally far more damaging, except where the cable trench is located in roads where the impact of the installation works on road traffic would be considerable.

There is no basis for the implication in submission 20 that the overhead line is more of a health hazard than an underground cable. Neither alternative would constitute a health hazard – see section 3.7.

Submission 33 suggests undergrounding to overcome structure stability issues due to mining. In reality underground cables would be far more vulnerable to any ground movement due to mining activities and could not be placed in any area affected by underground mining or nearby open cut which leads to ground strain. The cable would have to be more remote than from the proposed open cut mines than the roads. This would necessitate the cables running cross private properties. Indeed it is not clear that an acceptable underground cable route could be found through the Ulan area. Alternative routes would have to be considered such as through Munghorn Gap, Cooyal, Home Rule, Guntawang and Two Mile Flat. Any such alternative would constitute a major disruption to local residents.

Submission 30 finds it hard to believe that an underground cable alternative would be prohibitively expensive. The costs and impacts of undergrounding are further addressed below.

The cost of an underground cable alternative depends much on the specifics of the project itself. However, TransGrid has considered this question many times over recent years and has consistently found that an underground cable would cost considerably more than its overhead transmission line alternative, in the order of anything from 5 to 20 times more expensive.

Over the distance involved, the cable would have to be DC (Direct Current) rather than AC (Alternating Current), which would involve the additional cost and impacts of converter stations at both ends of the underground cable. The cost of the converter stations alone would be greater than the cost of the proposed transmission line. Extra high voltage underground cables require insulation, armouring and protective servings. Complex jointing procedures are required with major joint bay installations. In comparison an overhead line is air insulated and has simple joints. The cost of an underground cable option for this project would be at least $200 million more than the cost of the proposed overhead line development. This would not be a viable development.

Other issues related to cost include the higher maintenance costs of cables when compared to overhead lines, the considerably higher line losses with cables which translates to poor transmission efficiency and a poor greenhouse gas rating.

The environmental impact of an underground cable is continuous from one end of the project to the other. A trench has to be excavated for the full length for the cable to be installed and backfilled. The construction work would be protracted and more disruptive. The cable route would sterilise its easement for purposes other than grazing, unless it were placed in existing roads. Where the cable route is not in a road, watercourses must be negotiated, and groundwater issues addressed. The full length of the cable route must be kept clear of vegetation, which in itself creates a potential visual impact as well as flora and fauna impacts. To these impacts must be added the full range of environmental impacts of the converter stations at each end.

Overall it is TransGrid's conclusion that a well-designed and properly located overhead transmission line is a far more acceptable solution against all considerations than is an underground cable.

3.3 Clearing of Native Vegetation

3.3.1 Impact on Ecologically Endangered Communities (EEC)

(Submission Nos.: 4, 6, 7, 8, 13, 14, 15, 18, 19, 29, 31 & 34)

The above submissions raised concerns over the impacts of the proposed development on the Endangered Ecological Communities (EEC) in the South West Slopes bioregion. Several submissions claim that only 400 hectares of relatively intact White Box - Yellow Box - Blakely's Red Gum Woodland remains in NSW, and that the loss of 57.1 ha of the EEC out of 97ha of vegetation to be removed will be significant. They submit that any further loss of mature or regrowth EEC in the South West Slopes bioregion is unacceptable and irreplaceable (14).

Response

The extent of clearing of vegetation within the bioregion was clearly recognised in the EIS/SIS *viz.* 97 hectares including 57.1 ha of the grassy woodland EEC communities. This extent is the end result of an extensive process undertaken to arrive at the preferred corridor and then progressively to identify the preferred alignment for the transmission line. This process alone has been responsible for minimising impacts on woodlands especially areas of major conservation significance.

It is recognised that only a small proportion of relatively intact White Box Yellow Box Blakely's Red Gum Woodland remains in NSW. However, focusing attention on the small area of "relatively intact" woodland is misleading.

The areas of remaining woodlands in this EEC that will be affected by the project have been extensively disturbed in the past by land clearing and grazing. Much of the woodland to be cleared has a highly altered understorey and ground stratum and also consists of small young regrowth trees that lack tree hollows.

It is important to note that the 57.1 hectares of grassy woodland to be cleared is only a very small proportion of the total area of the six grassy woodland EEC communities found within the aerial photomaps 6a to 6o in volume 3 of the EIS. These amounted to over 2300 hectares. The photomaps themselves covered just a small proportion of New South Wales and the 57.1 hectares of grassy woodlands to be cleared represent only 2.4% of the photomap recorded woodlands.

Notwithstanding the substantially impaired quality of the woodland to be cleared, the EIS/SIS has prescribed measures to ensure that the loss of woodland including the EEC grassy woodlands as a result of the construction and maintenance of the transmission line will be fully compensated. This is detailed in Sections 3.4.3 & 4.2.2 of this Report, where details of the commitment to purchase and reserve an appropriate property as compensatory reservation offset is also outlined.

3.3.2 Impacts on Regional Corridors

(Submission No 14, 27 & 35)

These submissions raised concerns over the impacts of the proposed line on the two regional corridors identified, especially that between Tower 162 & 176 and on significant remnant woodland patches in the region.

The EIS suggestion that "planting or retaining native shrubs and grasses where possible and retaining hollow trees by killing them and removing the crown will maintain a vegetated movement/sheltered corridor" is totally inadequate as the easement will be maintained by slashing.

Response

Some clearing of woodland vegetation will be required. This is predicted to not significantly disadvantage movement of fauna within the locality/region. Much of the woodland exists in patches and has been highly disturbed by agriculture and past land clearing.

The section of transmission line between towers 162 and 176 largely traverses cleared lands with only a few short crossings of remnant patches of open, generally low quality woodland. At span 164 – 165 the line route has been selected to avoid traversing a large patch of woodland that could be considered to form a significant regional corridor. Only a short edge of this woodland will be affected over about 300 m. The largest and best quality woodland crossed in this area is in spans 174 to 177, a crossing of approximately 760 metres of woodland that forms part of a north – south corridor. The clearing for the transmission line at this location will not be substantially different to the existing clearing on the south side of the nearby Gum Gully Road.

The predominant Threatened Species that occur in the locality are relatively mobile species such as birds and bats that are able to disperse across the cleared easement.

Whilst the majority of the easement will be maintained by slashing, selected areas along the transmission line will have native vegetation retained to form fauna corridors. Within the fauna corridors, hollow-bearing trees will be retained as fauna habitat, where these do not interfere with the safe and secure operation of the transmission line. These selected areas include gullies that can be spanned over by the transmission line and a number of specially selected sites as mapped in the SIS, where there are special requirements to allow for dispersal of some species. Shrubs will be retained to provide fauna shelter across the easement in these corridors. At suitable locations with more substantial conductor height over the ground, trees may also be retained.

TransGrid agrees that "restricted and selective clearing" (see below) be applied to a section of the span east and/or west of structure 175 and/or 176 totalling not less than 150 metres. Shrub vegetation will be established on the cleared portions of easement in this area.

Over the whole line, restricted and selective clearing will be applied to sections of the following spans that have potential to allow vegetation that will not infringe on the conductor clearance to be left intact to provide fauna shelter across the easement:

- Structure 91 (threatened plant *Goodenia macbarronii* – see section 7.5 of SIS)
- Structure 172 – 173

- Structure 174 – 176 (revegetation with low growing shrubs to protect the highly dispersible soil
- Structure 177 – 178
- Structure 196A – 197
- Structure 200 – 201
- Structure 206 – 207 (threatened fauna recorded – Stripe-faced Dunnart)
- Structure 207 - 208
- Structure 210 – 211
- Structure 217A – 218
- Structure 224 – 225
- Structure 226 – 227
- Structure 266 –267.

Restricted and Selective Clearing is clearing that is restricted in area and selective in vegetation removed, as set out in TransGrid's internal procedure *Maintenance of Easements and Access Tracks,* document no. GM AS L1 002 as amended. Where "restricted clearing" is applied, the area cleared is less than the full width of the easement in sections of spans (closer to structures) where the conductor blowout (lateral swing under strong transverse or oblique winds) plus required safe electrical clearance does not require clearing to extend to the edge of the easement. Selective clearing is clearing that involves the removal only of tall-growing species that could infringe the safe electrical clearance to conductors due to regrowth between maintenance cycles or in the event that the tree falls towards the conductors. Selective clearing always involves retaining vegetation throughout the easement (except on the access track and the maintenance zone around the tower) whose mature height is less than 4 metres. This height is increased where the terrain or the conductor height allows.

In summary, the impacts arising from the proposed transmission line easement clearing have been recognised in the EIS/SIS. Areas have been defined where restricted and selective clearing will be applied to alleviate the impacts on fauna movement and these include impacts on regional corridors. Furthermore environmental offset strategies as detailed in the EIS (S 5.4.6) and in this Report (Section 3.4.4) are proposed to offset against the loss of habitat.

3.3.3 Cumulative Impacts

(Submission Nos.: 4, 7, 14, 15, 18, 19, 23 & 28)

These submissions raised concerns over the impacts of the proposed transmission line on the Wilpinjong Coal proposal for an Enhancement and Conservation Area (ECA) as part of that company's proposed coal mine development.

The cumulative impact on 104.1 ha on the EEC (47 ha from Wilpinjong development and 57.1 from the proposed transmission line) has not been identified.

Towers 37 – 40 fall within a proposed ECA of the Wilpinjong Coal Mine proposal.

Submission 19 commented that the ECA has been wrongly identified in the EIS.

Response

The Enhancement and Conservation Area in question (ECA-B) is a proposal by Wilpinjong Coal Pty Limited to use the area for vegetation enhancement and conservation. Part of ECA-C is zoned 7(b) environment protection – nature conservation in the Mudgee LEP (see page 2.8 of the TransGrid EIS for details of the zoning) and is set aside for conservation purposes in that plan. Wilpinjong intends to apply for rezoning of the ECAs for nature conservation, presumably as zone 7(b). Activities that are not incompatible with the objectives of any neighbouring National Parks Estate are permitted in zone 7(b).

As mentioned in the EIS (S7.2.1), TransGrid has undertaken detailed discussions with companies with mining interests (Ulan Coal, Excel Mining and White Mining with regard to the location of the line in the Ulan to Wilpinjong coal belt and the proposed alignment as shown in the EIS has been agreed with these mining interests. In particular, TransGrid's proposed route in this area, agreed with Wilpinjong, lies in the corridor that includes Wilpinjong Creek, the Ulan-Wollar Road and the railway. It does not traverse any lands zoned 7(b), however transmission lines are permitted within zone 7(b) should ECA-B be rezoned 7(b) in the future.

The transmission line enters the nominated ECA-B (marked blue on Figure 5.2 of Wilpinjong's EIS Main Report) where the transmission line route crosses Wilpinjong Creek east of Tower 36A on sheet 7 of the transmission line route plan (sheet 6c of the existing environment plan) and exits ECA-B west of tower 39. The route alignment traverses approximately 1.3 km of ECA-B. Of this, 720 m of the alignment (including towers 38 and 39) crosses cleared land nominated to be the ECA-B extension south of Wilpinjong Creek. To the east of this section, some 827 m of the alignment lies very close inside or outside of the boundary of the ECA with towers 36A and 37A just inside the boundary of the ECA. There is no riparian vegetation at this section of Wilpinjong Creek and TransGrid will permit vegetation enhancement that does not infringe the required clearances.

Tower 40 lies within an area earmarked by Wilpinjong for eventual regeneration (yellow on Wilpinjong's Figure 5.2). Plantings of appropriate shrubs will be permitted on the easement in this area by agreement between Wilpinjong Coal and TransGrid's Regional Manager or in accordance with the easement agreement as applicable.

The transmission line will slightly constrain about 1.5% of the total area of Wilpinjong's proposed 480 hectares of ECAs. At present the area comprises substantially cleared rather than vegetated land so there is ample room for enhancement of the easement in this area.

As mentioned in the submission from Excel Coal (see section 4.4.8), Excel has asked for vegetation of restricted heights to be allowed within the transmission line easement. TransGrid is negotiating with Excel over the terms of the grant of easement that will include, amongst other considerations, provision for the ECA. Vegetation of mature height up to 4 m will be permitted within the easement and taller vegetation, by agreement, at locations where the conductor height above ground allows.

Whilst there are cumulative impacts arising from the transmission line and the Wilpinjong Coal Project, it is considered that these are small and can readily be compensated. The coal mining proponent has added off-site reservation of appropriate White Box Shrubby and Grassy Woodlands to its proposal to improve its package of offsets and that proposal has now been approved (see Minister's approval dated 1 February 2006 and the associated Director-General's Report). TransGrid will address the mitigation and/or compensation of impacts arising from its own proposal, including measures to mitigate the cumulative impacts. TransGrid is proposing a strong package

of offsets for the impacts of the proposed transmission line and it is considered that the cumulative impacts will be effectively mitigated and compensated.

In regard to the EIS reference on the ECA (S4.4.3 of the EIS), the area identified is the area shown as ECA-B (Fig 3 and Fig 5.2 of the Wilpinjong Coal Project EIS). It is noted that the fauna corridors proposed to be established in the future by Wilpinjong Coal are additional to the ECA's. Restricted and selective clearing will be applied by TransGrid to the future fauna corridors (see section 3.3.2 above).

3.4 Threatened Species

(Submission Nos.: 8, 11, 14, 15, 19, 23, 27 & 31)

The above submissions raised concerns over the destruction of habitats of threatened avifauna species, hollow dependent mammals and the Stripe-faced Dunnart which was recorded in the survey.

The most pronounced impacts would be on the Brown Treecreeper, Speckled Warbler, Diamond Firetail, Regent Honeyeater and Swift Parrot.

Response

Whilst some clearing of habitat is required, this is not predicted to significantly impact on the habitats of threatened species. Threatened species such as the birds and bats are relatively mobile and are able to disperse across the corridor. The majority of the woodland patches affected consist of young trees without hollows, which are widespread in the locality. For this reason, the EIS/SIS does not predict a major loss of habitat for hollow dependent fauna.

Acknowledging that the young trees would in time develop hollows and provide habitats for such species, the EIS/SIS has provided for the reservation of regenerating woodland areas, plantings and the installation of nesting boxes at selected locations.

3.4.1 Adequacy of Flora and Fauna Survey

(Submission Nos.: 4, 8, 14, 15, 18, 27 & 29)

These submissions raised concerns over:

- the adequacy of the field surveys,
- timing of the surveys and its long term impacts of the proposal,
- patch analysis using aerial photos,
- lack of recent broad scale vegetation mapping and
- habitat analysis occurring over 10 days in early summer to mid autumn, with 2ha surveyed for tree hollows and mammal trapping over approx 5ha.
- no riparian corridor survey.

Response

Adequacy of Field Surveys

The flora and fauna surveys conducted are considered comprehensive and provide sufficient information to accurately assess the potential impacts of the project.

The fauna surveys, undertaken by highly trained and experienced ecologists included:

- Spotlighting at key locations
- Using call back tapes at key locations
- Trapping using hair tube traps, with a total of 2,380 trap nights completed
- Use of Anabat ZCAIM bat detectors
- Establishing bird survey plots
- Separate reptile survey

The flora surveys were undertaken by specialist ecologists and botanists and included:

- Aerial Photograph and Map Interpretation
- Flora Field Surveys
- Extensive Habitat Assessment and Weeds Survey
- Vegetation Plots
- Random Meander
- Threatened Flora Species Surveys

A total of 65 days of professional time was dedicated to actual flora and fauna field investigations. This does not include time spent on air photo interpretation, literature researches, vegetation mapping, assessment of impacts and report preparation. The time allocations reflected in the EIS and SIS text refer to specific tasks required by DEC.

The Department of Natural Resources has commented in its submission (Section 4.2.1) that the EIS (Chapter 5) has *detailed extensive flora investigations of the proposed route utilising an adequate level of on-ground surveys.*

Timing of Surveys

In regard to the timing of the surveys, the surveys were undertaken in early summer and autumn. Although no spring survey was possible due to property access negotiations, it is considered that the survey timing was sufficiently representative to achieve a comprehensive species identification for the area. This was combined with literature and data base searches, and the results of long term fauna monitoring work undertaken by Ulan Coal and recent surveys undertaken by Excel Mining. In accordance with the precautionary principle, species not detected but which could reasonably be assumed to be present, were included in the SIS and impact assessment. Review of existing literature and analysis of databases that capture many years and seasons, overcome to a large extent the limitations of field survey conditions. The impacts of the proposed line on threatened species can be predicted with a high degree of confidence.

Patch Analysis

Aerial photography was used as it was detailed (at a scale of 1:4,000) and could cover the entire length of the transmission line. It also provided a wide enough field of view to see woodland within approximately 1 km on either side of the transmission line. This provides a good indication of the impacts of the project upon woodland patches

Broad Scale Mapping

Although no recent broad scale mapping of the area is available, this limitation was overcome by an ecologist ground truthing woodland patches along the route of the line, and by the use of recent aerial photographs.

Habitat Analysis

Habitat analysis was undertaken across the transmission line route. In addition the entire transmission line route, with the associated access track routes, was traversed by an ecologist. Notes were made about tree hollows along the entire route. The detailed tree hollow counts for nine (9) representative areas were quoted as examples.

Mammal trapping grids were limited in scope and applied where needed. They were also supported by hair tube sampling, spotlighting and database analysis.

Riparian Corridors

Examination of the watercourses including creeks and drainage lines traversed by the proposed transmission line shows that majority of the lands where the creeks and drainage lines are crossed have been cleared as detailed in Section 4.2.2. Where the proposed line crosses the major watercourses such as the Wilpinjong Creek, Moolarben Creek, Stubbo Creek and Molly's Creek, the lands have been cleared. The proposed line will inevitably traverse some vegetation adjoining a creek or drainage line. However, as shown in Section 4.2.2 of this Report where the vegetation communities at the crossings are detailed, the impacts on riparian vegetation will be low.

3.4.2 Fauna – Impacts on Habitats

(Submission Nos.: 8, 14 & 31)

These submissions ask about the rationale for the tree hollows study. They suggest that only 12 towers out of a possible 50 in vegetated areas were studied. Towers 85, 87, 89, 90, 103, 176, 190 & 208 located in denser vegetation patches should have been included in the study.

The submissions queried the basis for the choice of 16 nesting boxes near Towers 56, 83 – 89, 91 – 100 & 174 – 176 for Squirrel Glider, Eastern False Pipistrelle, Greater Long-eared Bat, Yellow-bellied Sheath-tail Bat and Glossy Black Cockatoo and for the provision of 16 nesting boxes at Towers 15, 164 – 165, 198 & 209 for the Brown Treecreeper? These differences need to be explained and why the sites were chosen.

<u>Response</u>

Results of the tree hollow survey as detailed in Table 4.2 of the EIS/SIS (Vol 2) show *the vegetation occurring within the study area does not provide ideal habitat for large forest birds or for arboreal mammals, that require large hollows for nesting, except for the microchiropteran bats* (S4.2.1).

Owing to the need to remove trees with hollows, TransGrid has provided for 64 nesting boxes to be placed at selected locations along the line, targeted at particular threatened fauna known or considered likely to occur within the area.

The selected species are Glossy Black Cockatoo, Brown Treecreeper, Squirrel Glider and Microchiropteran Bats (EIS Table 5.1) and 16 boxes (4 at each of four locations) will be provided for each species. The allocation of the nesting boxes is more clearly seen in Table 5 in Section 4.2.2 of this Report in the response to the Department of Environment & Conservation.

The boxes are intended to partially mitigate the loss of habitat due to clearing of trees with hollows through a transitional period of 20 years or so within which additional tree hollows will naturally develop in the surroundings.

The basis for the location of the nesting boxes in Table 5.1 of the EIS is:

- Record of species in the area
- Location within largest patches of contiguous suitable habitat; and
- Location within likely important habitat corridors.

The proposed site selections place the nesting boxes for the Brown Treecreeper in larger woodland patches to provide added security for this species in an appropriate environment.

The bats roost in shallow hollows which are more prevalent in the area.

The sites for the bats, cockatoo and squirrel glider are more flexible as these species are highly mobile. Experience from installation of nesting boxes on the Queensland Interconnection transmission line route showed that nesting boxes in locations with fewer natural hollows have greater usage. Accordingly some boxes are to be located in more generally cleared areas to provide scarce habitat.

The number of boxes for each targeted species is no reflection of the comparative importance of the species for compensatory habitats.

Boxes have to be installed an appropriate height above ground and with suitable aspect considering thermal qualities of the nest boxes.

The proposed installations do not attempt to replace all the hollows that will be removed. There is an ample supply of tree hollows in the National Parks estate and in other large woodland patches in the region. However it is intended to install the boxes promptly following the completion of clearing in a major section of the line to mitigate (to some extent) the impact of the clearing at the selected locations.

3.4.3 Mitigation Measures and Offsets for Flora and Fauna

(Submission Nos.: 14, 18, 19, 23, 31 & 34)

- Providing nesting boxes and revegetation does not provide adequate mitigation measures for the loss of food sources from mature trees;
- No specific programme has been outlined in the Offset Strategies. Inadequate information to justify the sustainability of the project (19)

Response

Mitigation

TransGrid has used avoidance as the primary means of reducing the impacts of the transmission line on flora and fauna. As detailed elsewhere, the line will impact on a much smaller area of woodland and forest than typically occurs in the vicinity of the route.

In addition to the contributions of nesting boxes and revegetation, outlined in the EIS, TransGrid committed to selected retention of vegetation and fauna corridors, as now detailed in Section 3.3.2 of this Report and recognised the need for offset strategies to compensate for the loss of habitat, food resources and impacts on ecologically endangered communities.

Offsets

Specific offset proposals were not detailed in the EIS because it was considered that these should be developed in consultation with DEC and DOP after these agencies had opportunity to consider the EIS and SIS and to understand the impacts for which offsets are required.

Through discussions with the Department of Environment and Conservation (DEC), TransGrid has now defined its offset strategy as discussed in the response to DEC in Section 4.2.2.

3.5 Soil Management

(Submission No. 19, 35 & 36)

Submission 19 considers the EIS discussion on soil protection and erosion control measures (S5.1.5) to be inadequate for the high erosion and degradation hazards identified in the EIS.

Response

Table 5.2 of the EIS identified the erosion hazard of each of the 13 soil landscapes found within the route of the transmission line. The soil erosion potential is related to any disturbance of the soil arising from excavation works for tower foundations, access track construction etc and is higher for erodible soils on steeper terrain.

The EIS recognises the need for soil erosion and sedimentation controls during the construction of the line (S 4.10 & 4.9.2) and this is to be applied in a manner appropriate to the erosion risk at the locality. Erosion control is achievable using well established methods. Soil erosion and sedimentation controls are detailed in Section 3.4 of the PEMP contained in the EIS. These issues are also addressed in responses to the submissions from DEC (Section 4.2.2) and from the Department of Natural Resources or DNR (Section 4.2.1). The control measures are also captured in the Statement of Commitments for the project attached to this Submissions Report.

3.6 Aboriginal and European Heritage

3.6.1 Aboriginal Heritage

1) Continued Participation in Pre-Construction Work

   (Submission Nos.: 3 & 37)

These submissions asked to be involved with the pre-construction archaeological work.

2) Conservation of Aboriginal Heritage

(Submission Nos. 3, 4, 8, 11, 12, 19 & 23.1)

These submissions raised concerns over the loss of Aboriginal heritage in the area.

Response

1) Participation in Pre-Construction work

TransGrid has consulted and will continue to consult the Aboriginal groups who participated in the Indigenous heritage survey, i.e. the Gallanggabang Aboriginal Corporation (GAC), Warrabinga Native Title Claimants Corporation (Warrabinga), and Murong Gialinga Aboriginal and Torres Strait Islander Corporation (ATSIC), and with the Local Aboriginal Land Councils (LALC) at Wellington and Mudgee (subject to their active operation and having identifiable representatives.)

The entire length of the line including access tracks (except for a few properties where the owners declined to consent to the survey) was surveyed by the archaeologist accompanied by representatives of the relevant Aboriginal groups. The few outstanding properties will be surveyed in the same way before construction commences on the properties.

The relevant Indigenous groups will be invited to participate in further site investigations that are to be undertaken under the Indigenous Heritage Management Plan for the project. This does not include any site in the Wellington LALC area. Consultation with the Indigenous groups will be continued in respect of the management of any additional finds.

2) Conservation of Aboriginal heritage

Considering the length of the country crossed by the line, 117 km, the Indigenous sites that will be affected by the construction works will be very few and the impacts will be controlled to a low level.

The identified sites have been assessed by the archaeologist together with the relevant Indigenous groups. Management measures for these sites and any additional artefacts found are subject to endorsement by DEC and sign-off by the relevant Indigenous Groups.

No burial sites, ceremonial sites or scarred trees have been found.

The affected sites are stone artefact scatters. For the most part the artefacts will be recorded and replaced on the site, slightly relocated as negotiated with DEC and the Indigenous groups. The net impact will be additional knowledge of Indigenous heritage in the area.

As recorded in Section 8.3 of the PEMP in the EIS, the study recorded 28 Indigenous sites, of which 13 sites will be directly affected by the works with 6 others requiring control measures to ensure they are not impacted. For management purposes the 19 sites requiring mitigation or control measures have been placed into four groups as detailed in Appendix B of Volume 2 of

the EIS. The management measures for the sites have been considered by the Indigenous groups and endorsed by them. The submission from the Department of Environment and Conservation (No. 23.1) endorses the proposal of Indigenous representatives and the project archaeologist that artefacts recovered on site may be recorded and subsequently "scattered" to defined locations adjacent to the site of their recovery. This strategy will result in no loss of Indigenous heritage, but rather an improved recording of the heritage that is present along the transmission line route.

In the event that an Indigenous group wishes to retain an artefact or artefacts for educational purposes, TransGrid will facilitate negotiation with DEC with a view to the group obtaining a Care and Control Permit for the artefact or artefacts.

The archaeologist has prepared an Indigenous Heritage Management Plan (IHMP) for the project. The updated Project Environmental Management Plan (PEMP) incorporating the relevant measures is attached to this Report (Appendix 3). If any additional sites are identified, the management measures for them will be developed in consultation with the relevant Indigenous group representatives and the DEC, and will be incorporated into the IHMP. The pre-construction investigations and management recommendations for the sites are captured in the Statement of Commitments.

3.6.2 European Heritage

(Submission No 12 & 24)

Submission 12 queried the interpretation of a shard of rocks on the owner's property. The submission states that the stones are not indigenous but were brought to the site in the construction of a road that previously traversed the property.

Response

The site in question is located near Tower No 80. TransGrid notes the landowner's advice concerning the shard of stones. However the Indigenous relics (site MC-OS19) are a scatter of five Indigenous quartz flakes/chips. The site is described on pages 64 and 65 of OzArk's archaeological and heritage report in Volume 2 of the EIS. The Indigenous artefacts are not the shard of stones addressed in the submission.

The submission from NSW Heritage Office (24) also raised issues of European heritage. These are addressed in Section 4.2.6 of this Report.

3.7 Electric and Magnetic Fields

(Submission Nos.: 6, 8, 11, 12, 19, 20 & 30)

A relatively small number of submissions were received that highlighted the possible health effects of exposure to electric and magnetic fields (emf) as an issue of concern.

Those that did raise the issue did so in the following terms in two categories:

Adverse health effects:

- Concern about risk of childhood leukaemia

- Possibility of adverse health effect cannot be ruled out
- Safe distance has not been proven
- Unable to get an undertaking to compensate for any future health problems

Animals, crops and organic farming

- Effect on organic farming accreditation
- Reports of animals aborting their young

Response

Adverse health effects

The issue of impacts of power frequency EMF on health has been addressed extensively in the EIS (Chapter 6) including a review of scientific literature and independent review findings. Based on the findings of the various scientific studies, it has not been established that power frequency electric and magnetic fields in general have any adverse health effects, although the possibility of there being some adverse effect from long term residential exposure cannot be completely ruled out for just one or two rare diseases for which statistical data is weak.

Childhood leukaemia has been identified as a disease for which the statistical data could not preclude the possibility of some health effect. However the statistical problem can be better understood by considering the most extensive study carried out – the UK childhood leukaemia study headed by Sir Richard Doll (recently deceased), the prestigious epidemiologist credited with establishing the relationship between smoking and lung cancer.

The study showed that of typically 500 new cases of childhood leukaemia in the UK per annum the expected number of cases in homes located in the magnetic field “high exposure” group was 2 per annum. In practice the number of cases in that group each year varied between 2 and 4. Consequently it can be seen that 496 to 498 of the 500 cases occurred in homes where the long term average magnetic field was in the “low exposure” group. Doll concluded from his statistical analysis that a reliable statistical association between long term exposure to magnetic field and the incidence of childhood leukaemia could not be established.

If a reliable statistical association had been established, this would still not preclude the association being insignificant and non-causal. Many statistical relationships are observed that are not causal. The true cause can be an unanalysed or uncontrolled factor that is itself associated with the observed parameter, or that may be associated in some studies and not in others.

Notwithstanding the failure of 30 years of intensive scientific research to establish any harmful health effect with exposure to power line EMFs, TransGrid implements prudent avoidance in designing and siting of transmission lines. For the epidemiological studies, the dividing line between “high exposure” and “low exposure” groups was drawn in the various studies at a time-weighted average magnetic field exposure of a few milligauss, 4 mg in the aggregated study done by the non-ionising radiation working group of the UK National Radiation Protection Board (NRPB). This aggregated study resulted in conclusions that nearly all of the previously suspect associations of long term “high exposure” to magnetic fields with various diseases could be ruled out as statistically unfounded. No statistically significant associations with diseases were confirmed.

All of the studies relate to long term exposures, such as occur when people live and sleep in the magnetic field concerned. No studies have indicated that short term exposures to electric or magnetic fields, even at very high magnitudes, are associated with any health effect at all.

As can be seen from Table 6.3 of the EIS, any residence more than 60 m from the centre of the transmission line would be classified as being in the low exposure group according to the NRPB report. The magnetic field at any residence further than about 100 m from the centre of the transmission line would be likely to be dominated by the effects of the house wiring.

TransGrid's route alignment development has ensured that the number of residences close to the line has been minimised. The nearest school is more than 400 m away from the transmission line. At this distance there is no increase in long term average exposure so there can be no basis for concern related to the magnetic field of the transmission line.

Animals, Crops and Organic Farming

The concerns raised in the submissions are based on individual reports that have been publicised, not on expert medico-scientific reviews. Individual reports of incidents of possible harm have in the past been dismissed when proper controlled testing was undertaken. Based on existing knowledge and the conclusions of the scientific reviews, no adverse health effects to humans and no adverse effects on animals or plants will arise from the proposed activity.

Any identification of properties affected by power lines as being unsuitable for organic farming is without scientific foundation. Nearly all properties have some form of electricity supply and there is no basis on which to suggest that any of them are less suitable because of this, whether the power supply is low voltage or high voltage, or whether they are crossed by power lines at low voltage, high voltage or extra high voltage.

3.8 Hunter Catchment Blueprint

(Submission Nos.: 6, 8, 11, 19, 28, 30 & 34)

The above submissions raised concerns over the impacts of the line on the Wollar – Ulan area which has been identified in the Hunter Catchment Blueprint as a high priority area for aquatic health, vegetation and biodiversity, salinity and soil conservation.

Response

The area between Ulan and Wollar lies within the upper reaches of the Hunter Catchment as Wollar Creek and Wilpinjong Creek drain into Goulburn River which is a sub-catchment of the Upper Hunter Catchment. The Hunter Catchment Blueprint identifies environmental issues of concern within the Hunter region and provides a strategic framework and set of goals for the management and improvement of the catchment's natural resources.

Environmental areas being targeted by the Blueprint are aquatic health, soil degradation, native vegetation and biodiversity, and salinity. These issues are similar to the Central West Catchment Blueprint which applies to the majority of the line route.

Through the implementation of the management techniques and mitigation measures described in the EIS and PEMP, the construction and operation of the proposed transmission line will not result in a significant further deterioration of these natural resources.

For clarity, TransGrid's response to these four target areas in both Blueprints, as outlined in the EIS and PEMP, are further addressed and updated below.

Aquatic Health

The potential for water quality impacts is described in Section 5.3.3 of the EIS. Soil management impacts are addressed in Section 3.5 of this Report and also in the responses to DEC (Section 4.2.2) and DNR (Section 4.2.1). Protocols for the management of aquatic health are addressed in the Soil Management Strategy and the Waste Management Strategy included in the PEMP contained in the EIS. The construction contractor's Construction Environmental Management Plan or CEMP will support these strategies.

As described in Section 4.10.2 of the EIS, the construction of the transmission line will in no way alter stream or river flows, or undermine bank stability. No new creek crossings will be established and upgrades to existing crossings will be constructed with due care after consultation with the Department of Natural Resources. Clearing of riparian vegetation to maintain conductor clearance above vegetation will be kept to a minimum.

Given the limited extent of riparian clearing that will be required and the controls to be applied to upgrades of creek crossings, it is anticipated that there will be no impact on aquatic health within the catchment.

Soil Degradation

Extensive erosion and sediment control measures, as described in Sections 4.10 and 5.1.5 of the EIS, and Chapter 3 of the PEMP contained in the EIS, will ensure that there is no degradation of soils as a result of the construction and operation of the line. See also Section 3.5 of this Report.

Native Vegetation and Biodiversity

The impacts and mitigation measures relevant to the clearing of native vegetation and effects on biodiversity are well documented in the Species Impact Statement and summarised in Section 5.4 of the EIS.

With regard to the Wilpinjong Mine Biodiversity and Aboriginal Cultural Heritage Area, the easement for the transmission line was determined through consultation with Wilpinjong Mine, and will parallel existing road and rail easements that currently bisect this area.

Salinity

The effects of salinity as a result of a rising of the water table are well understood. While this issue was not the subject of a detailed assessment in the EIS, it was considered during the development of the project. Salinisation and the resulting loss of productive land generally occurs as a result of inundation with very saline water, or broad scale clearing allowing a rise in the water table, bringing salts to the surface.

Neither of these activities will be carried out by TransGrid during the construction or operation of the transmission line.

Whilst clearing of trees will be required, it must be stressed that trees will generally only be cleared within a 60 m wide easement (and around 6 m or less width in the case of access track construction). The width of this clearing is not sufficient to cause a significant rise in the water table, as surrounding vegetation adjacent to the line will continue to provide sufficient drawdown of the water table.

The only potential for groundwater to be encountered directly may be during the construction of tower sites in low-lying areas or on a perched aquifer. However, it is not anticipated that this water will be brought to the surface or require disposal.

It is considered highly unlikely that any activities, as described in Chapter 4 of the EIS, will result in an increase in salinity or have any impact on groundwater.

3.9 Wollar Switching Station and Wellington Substation

(Submission Nos.: 4, 5, 18, 19, 28 & 30)

- Why is the Wollar Switching Station not included in the EIS?
- How will the line be connected at Wollar and Wellington? (5)
- Concern over lack of public participation in the Mid-Western Regional Council consideration of the Statement of Environmental Effects for the Development Application (DA) for the switching station (18)

Response

The Wollar – Wellington development will benefit the residents of the Mid-Western Council area.

Wollar Switching Station is a development under Part 4 of the EP&A Act requiring development consent from the Mid-Western Regional Council. For that reason the primary assessment of its impacts is contained in the Statement of Environmental Effects submitted to Council with the development application, rather than in the transmission line EIS. The processing of the DA for Wollar Switching Station, including the question of public review, is a matter for the Council.

Council has given consent to Wollar Switching Station and its further development into a 500/330kV Substation. Council granted development consent with conditions.

Notwithstanding that the development of the terminal facilities for the transmission line was not subject to the same approval process, the EIS addressed the Wollar Switching Station in several places, for example:

- Sections 3.4 to 3.11 where development options and routes were discussed
- Section 4.4.1 where the detailed route is discussed
- Section 8.1.2 where cumulative impacts are discussed.

At the Wellington end, the transmission line will be terminated at the existing Wellington 330/132kV Substation. Wellington Substation is currently being strengthened by the replacement of the transformers with bigger ones to accommodate the growing load in

the Central West. Connection of the new 330kV transmission line will involve minor rearrangements and the installation of a new switchbay.

The work at Wellington Substation is consistent with the original development consent and will not significantly change the nature of the development. The work at Wellington Substation is subject to environmental assessment under Part 5 of the Environmental Planning and Assessment Act 1979. Where this assessment is determined by TransGrid to have no significant impacts, no further development consent is required.

3.10 Transmission Line as Bushfire Risk

(Submission No.7)

The above submission is concerned about bush fire risk arising from vegetation removal and encouragement of shrubs that are fire prone.

Response

It is in TransGrid's interest to maintain the easement clear of any fast and tall growing vegetation. With only areas of special ecological significance excepted, the easement will be maintained clear of substantial vegetation by slashing to ensure that the vegetation is kept low. The transmission line will intercept and safely discharge lightning flashes that would otherwise have struck the easement area, preventing lightning from igniting a fire on the easement.

As mentioned in Section 4.16 of the EIS (Bushfire Protection), appropriate control of vegetation in the easement is a key point in TransGrid's maintenance policy which, while minimising any risk of the line starting a fire, also reduces the possible hazard to the electricity system from bushfires travelling across the easement and burning underneath the conductors. The transmission line easement and access will also assist fire fighting.

3.11 Transmission Line near Ulan

(Submission 12)

This submission raises concern that an alternative alignment near Ulan township proposed by the local community has been ignored.

Response

The alternative alignment to which the submission refers traverses lands to the north of the township. This alignment was closely considered by TransGrid during the corridor selection phase of the project that was conducted towards the end of 2003. The northern alternative was not ignored but the preferred corridor finally selected did not adopt this alignment. The Report making this recommendation specifically discussed the relative merits of the alternatives in this vicinity and explained the rationale for the recommendation.

The preferred alignment passes to the south of the township on the other side of the road and railway some 400 metres away.

This decision has been in the public arena for two years now and all EIS investigation work and easement negotiations have proceeded on this basis.

Impacts on Ulan Airstrip

(Submission No 14, 18, 19)

A number of submissions (not from Ulan Coal) have raised concerns over unresolved land use conflicts and conformity with Director-General's requirements in regard to the final alignment of the line near Ulan airstrip.

Response

The proposed alignment, as shown in the EIS, was negotiated with Ulan Coal prior to finalising the document. The alignment proposed avoids sterilisation of coal by closely paralleling existing road and railway infrastructure, taking into account the proposed future realignment of Wollar Road as well as current proposed infrastructure associated with the Moolarben Coal Project. It is noted that development of the proposed Moolarben Coal Mine is itself likely to impact directly on the Ulan Airstrip and require it to be relocated or replaced.

TransGrid is seeking approval for the proposed alignment as shown in the EIS.

3.12 Impacts on Plan for Revegetation

(Submission Nos 20)

This submission is concerned about an area within the property that has been fenced off from grazing to form a tree/shrub corridor from the railway line to a creek.

Response

The transmission line easement crosses the landowner's proposed "corridor" approximately at right angles, some 40 metres from the railway end of the "corridor".

There are a number of scattered trees along and near a narrow fenced "corridor" on and adjacent to the unformed road traversing between the landowner's property (Lot 130 DP755425) and the neighbouring property (Lot 237 DP724588). There is little evidence of plantings in the corridor. The scattered shade trees are predominantly located on the neighbouring property. A fence bisects the 20m wide "paper road" and this is parallelled by a fence on the writer's property.

The "corridor" is very narrow and does not link well with the Crown Reserve (approximately 400m away from the railway end of the "corridor"), or with the timber extending into Goulburn River National Park (some 300m away from the creek end of the "corridor". Trees along the Ulan – Wollar Road about 120m from the "corridor" and along Wilpinjong Creek reduce these separations but do not close the gaps.

The railway and the Ulan – Wollar Road limit the corridor connectivity to the nearest significant vegetation on the existing Crown Reserve to the south. Any impacts on the landowner's future plans to develop the corridor would appear to be modest. TransGrid remains able to discuss with and advise the landowner regarding what mature height of plantings will be acceptable on the easement once the clearance to conductors strung across the corridor is finalised.

3.13 Realignment of Ulan Road

(Submission Nos 18, 20, 22, 30 & 34)

These submissions raised concerns over the impacts of the proposed line on the realignment of the Ulan – Wollar Road as proposed in the Wilpinjong Coal proposal.

Response

TransGrid has consulted Excel Mining, Moolarben Coal and Mid Western Regional Council in regard to the proposed alignment for this section of the line. The relocation of sections of the Ulan-Wollar Road was raised with TransGrid by Excel and Moolarben Coal and has been taken into account in the alignment. TransGrid looks forward to the on-going consultation with all relevant agencies on the development of the new road alignment.

3.14 Impacts on Properties

(Submission Nos. 17, 20, 21 & 33)

These submissions raised concerns about compensation for visual impacts arising from the proposed line location.

Response

The issue of compensation is addressed in Section 7.9 (Property) of the EIS. This indicates that where TransGrid is taking an easement over private properties, the owners will be paid compensation. Compensation is assessed in accordance with the *Land Acquisition (Just Terms Compensation) Act* 1991, and has regard to the actual effect of the transmission line and access requirements on the current market value of the property with an additional allowance for any inconvenience caused by construction activity on the land.

Owners of lands that are not directly affected by the required easement are not entitled to receive compensation. There is no basis in NSW law for compensation to be paid to property owners whose land is not affected by the easement.

A suggestion that the line construction be deferred until mining is completed and then be located across the mined area is unrealistic as it would involve an extremely long deferral that would result in an unacceptable risk of blackouts to the Central West of NSW.

3.15 Public Display and Access

(Submission No. 8)

The submission raises concerns about difficulty in gaining access to the public display of the EIS at the Local Council Shire Offices and Gulgong Library as many live far from these places or work during the available hours.

Response

TransGrid anticipated that some people could have difficulties in visiting the display centres where the EIS documents could be viewed. Consequently, a range of different ways was provided by which people could access the documentation.

As part of its community consultation programme, directly affected property owners were provided with a copy of the EIS when it was placed on public display. Copies of the EIS in CD form or hard copies were made readily available for those interested.

By making use of the 1800 telephone number, interested persons could request copies to be mailed out. The various alternative means of access to the documentation were advertised in local newspapers as part of announcing the display of the EIS.

4 ISSUES RAISED BY PUBLIC & PRIVATE BODIES

This chapter outlines issues raised in submissions from public and private bodies and provides TransGrid's updated response to them.

4.1 Commonwealth Agencies

4.1.1 Telstra (25)

Telstra raised the issues of:

1) Earth Potential Rise (EPR) in relation to 10 spans where the transmission line could come within 40 m of Telstra plant, and sought advice on the value of EPR at each tower location under the worst-case conditions. Telstra requested AMG references of the relevant towers to assist with field checking.

2) Initial calculations by Telstra of the magnitudes of the Low Frequency Induction (LFI) that can be experienced by the various Telstra cables indicate concern over 11 exposures where the induced EMF was above 500 volts. Telstra requested earth fault current values and shielding factor of the proposed line as well as its category rating (A, B or C) for a review of their initial calculations.

3) In the event a protection scheme is required, the cost of the mitigation must be largely borne by TransGrid in accordance with long standing practice.

Response

1) The information concerning EPR will be provided to Telstra. If significant EPR effects arise, necessitating additional earthing or other protective measures by TransGrid or by Telstra, the necessary work will be to TransGrid's cost in accordance with the longstanding Agreement between telecommunications and power authorities.

2) The information for LFI calculations will be provided to Telstra.

3) TransGrid notes that LFI control measures are likely to need to be implemented by TransGrid or by Telstra and that the work may be at TransGrid's cost in accordance with the longstanding Agreement between telecommunications and power authorities.

4.2 NSW Government Agencies and Corporations

4.2.1 Department of Natural Resources (35)

1) Issues Identification

The relevant legislation, policies and issues identified by the Department of Natural Resources (DNR) have been comprehensively listed in Section 1.4.3 and Chapter 2 of the EIS and ensure that the Department concerns are addressed.

Response: Noted

2) Soil and Landscape Issues

The Department supports the use of the two Department of Land & Water Conservation (DLWC) publications "*Soil and Landscape Issues in EIA (DLWC*

2000)" and *"Guidelines for the planning, construction and maintenance of tracks"* (DLWC 1985) for assessing soil issues and assisting in the planning for track construction activities. Additionally, the publication "*Managing Urban Stormwater"* (Landcom 2004) is recommended for information on specific mitigation measures for sediment and erosion control.

In areas of high erosion hazard, the strategies identified in the Soil Management Strategy of the EMP are essential to minimise impacts of soil erosion and structural degradation when installing towers and water crossings and undertaking easement clearing and track construction.

Potential impacts of salinity on the proposed development have not been clearly identified in the EIS. The Goolma Creek catchment and the Wialdra-Cooyal Creek catchments have been identified by the report *"Salinity Risk Assessment of the Central West Catchment"* (Humphries 2000) as having high and very high salinity hazard rating. Salinity may result in degradation of infrastructure, accelerated degradation of tracks and agricultural land combined with degradation of natural resources and reduced habitat availability.

Response

As noted by the Department, the strategies identified in the Soil Management Strategy of the PEMP in the EIS take into account the information from the published DLWC guidelines on soil issues and management. This strategy will be supported by the construction CEMP which will contain site-specific plans.

Potential impacts of salinity on the proposed transmission line are limited to impacts on foundations of the towers. These can be mitigated through increased concrete cover for the reinforced concrete foundation structures and/or use concrete of higher strength. These measures will be considered for the towers located within the two catchments identified by the Department.

See also Section 3.8 of this Report, which addresses the fact that the project is not expected to cause, or exacerbate, salinity problems to any significant extent.

3) Works Near Watercourses

Where towers are located within 40m of watercourses, a permit under the *Rivers and Foreshore Improvement Act 1947* is required to cover excavation activities within the zone. The strategies identified in the Soil Management Strategy will be essential to minimise impacts within these areas.

In regard to the design of causeways and culverts for the water crossings, the Department provided "Minimum Standards" in an attachment and advised issues to be considered in the selection of crossing sites.

Response

The expected impacts of the transmission line on watercourses are small.

Impacts on riparian corridors have been limited by the following design, location and construction measures:

- Existing water crossings would be used and with some being upgraded or replaced with concrete causeways.
- Many of the crossings over creeks and drainage lines are over lands that have already been cleared.
- Only 10 towers will be located within 40m of a named creek.
- Tall trees impinging on the safety clearances will be lopped.

The impacts are summarised in Table 6 included in the response to the Department of Environment and Conservation, Section 4.2.2.

Some existing creek crossings will need to be upgraded for construction access. Soil erosion and sedimentation control measures in line with the DLWC guidelines on construction and maintenance of tracks will be implemented. The services of local Soil Services will be sought to provide advice on any upgrading work.

In accordance with section 75U (within the new Part 3A) of the EP&A Act, a permit under Part 3A of the *Rivers and Foreshores Improvement Act 1948* is one of the authorisations that is not required for an approved project and accordingly the provisions that prohibit an activity without such an authority do not apply.

Notwithstanding that a permit is not required, TransGrid intends that any excavation within 40m of the watercourses will be in line with the Soil Management Strategy incorporated in Chapter 3 of the PEMP. The Department's comments in the submission and the *Minimum standards for works in rivers and lakes,* Attachment 1 to the submission, will be applied as appropriate in developing site specific designs for upgrading of watercourse crossings.

In addition a representative of the Department of Natural Resources will be invited to review on site the proposed works at any tower located within 40m of a watercourse and the upgrading of any creek crossing. Comments will be invited in respect of the proposed works and mitigation measures.

4) Vegetation Management

4a) The Department notes that the EIS (Chapter 5) has detailed an extensive flora investigation of the proposed route utilising an adequate level of on-ground surveys.

Response: Noted.

4b) The Flora and Fauna Management Strategy in the EIS is recognised as a minimum requirement to address the impacts identified in the EIS.

Response

The Flora and Fauna Management Strategy incorporated in the PEMP will be implemented.

4c) Loss of connectivity and habitat component are critical factors and require further consideration in terms of offset strategies and the ability of the construction to minimise impact on key areas of connectivity.

Every attempt should be made to maintain regional and local corridors and enhance adjacent vegetation to achieve biodiversity and connectivity outcomes.

Response

The EIS proposed mitigation and offset strategies as means to compensate for the loss of habitat. Development of the offset strategies has been an ongoing matter between TransGrid and DEC.

Minimisation of impacts on key areas of connectivity has largely been achieved in the selection of the preferred route by:

- avoiding key areas of native vegetation which are in fairly good condition (eg the Crown Land west of the preferred route from Structure No 18 to 28), and
- selecting an alignment for the proposed line parallel with existing corridors (the railway line from Structure 28 to 54 & 62 to 81, existing 132kV transmission lines from Structure 89 to 125, 204 to 235 & 241 to 261).

As stated in the EIS, the project will leave intact those areas of vegetation, where the mature trees can be spanned over without compromising the safety and security of the transmission line. In addition some fauna corridors will be retained where vegetation with mature heights of up to 4 m will be retained and consideration will be given to enhancing such vegetation and fauna corridors with appropriate plantings and allowing additional height where conductor clearances above the mature vegetation heights permit. These areas have been identified in S. 3.3.2 of this Report.

4d) Management of Vegetation

(i) The Department advised sediment and erosion control measures that can be undertaken in areas of steep land, within riparian zones and on soils of poor quality detailed in the submission.

Response:

The measures outlined in the Soil Management Strategy of the EIS and in chapter 3 of the PEMP reflect the Department's published material and will be implemented.

(ii) In regard to other vegetation management measures, the Department outlined the following six points on vegetation management for assessment (by DOP) and development of conditions of approval:

1. Retention of felled timber for habitat value and erosion control;
2. Felled timber on steep land to be aligned with the contour as a stabilising mechanism;
3. If the vegetation is to be destroyed, preferred methods would include chipping and utilising local firewood contractors;
4. Drainage lines should be kept free of felled timber;

5. Stored timber should be located 20 m away from fence lines; and

6. Any burning should be at least 20m from any existing trees and shrubs.

Response:

1. Retention of felled timber is not preferred owing to hazards to patrol staff and risk of bush fires. However felled timber will be retained as habitat in fauna corridors subject to property owner agreement.

2. This approach will be subject to property owner agreement but is not preferred because of the hazards outlined above. Other stabilising measures such as hydro-mulching and seeding with suitable grass species will be implemented at suitable locations (Refer S.3.4.3 of PEMP).

3. Again, the disposition of cleared vegetation is subject to property owner agreement. Chipping is not recommended because of its detrimental effect on ground conditions. Vegetation will be burnt subject to approval from Rural Fire Service (S3.4.4 of PEMP) and in consultation with property owners (S4.9.3). Where *burning is not possible, chipping or mulching will be considered* (S4.9.3).

4. This is TransGrid practice.

5. TransGrid does not intend to store felled timber within the easement because of fire hazards. However, subject to property owner agreement, at appropriate locations that are more than 20 m from fence lines, some timber will be placed at the edge of the easement to provide habitat.

6. The recommendation is noted but may not always be practicable. Sites for stacking and burning will be carefully selected and appropriate separations from trees and shrubs will be maintained.

4.2.2 Department of Environment and Conservation (23 & 23.1)

In a letter dated 30 September 2005 (Submission No. 23), the Department of Environment and Conservation (DEC) made the following representations in regard to flora and fauna, threatened species, and pollution matters:

1) Flora and Fauna and Threatened Species

1a) Recording of *Dasyuridae* (Stripe-faced Dunnart)

Can the species be captured to confirm the presence of the individual(s) at site, in order to determine the potential impact on the population?

Response

The site where the Stripe-faced Dunnart was recorded is near Tower 207 (Section 5.4.5.3 of EIS and section 7.7 of SIS) and is located off the easement of the proposed line. The line is not likely to have an impact on the animal. Nevertheless, the Stripe-faced Dunnart will be targeted in the pre-clearance survey in this vicinity (S5.4.5.1 EIS).

Any individual of this species found will be temporarily removed from site by a qualified person. Any habitat for breeding (cracks in the soil, burrows, grass tussocks, rocks or logs (NPWS)) will be protected during construction by marking the location.

As mentioned in the SIS (S7.7.3) the distribution of the local population of this species is unknown. Whilst the distribution of any local population of this species, if any, is unknown, the protection of its habitat through a *reduced level of understorey management* (S5.4.5.3, EIS) will avoid impact adversely on the habitat of this species.

1b) Habitat Impacts

DEC notes the potential impacts on habitat beyond the clearing of native vegetation.

Response: Noted.

1c) Use of Nest Boxes

Should nest boxes be used, they should be regularly monitored, maintained and replaced over time.

Response

Following completion of the construction clearing for major sections of the transmission line, nesting boxes will be installed as indicated in Table 5.1 of the EIS and the Table 5 below. The nesting boxes represent a transitional habitat provision and it is not proposed to monitor the nest boxes or to maintain and replace them over time.

The design of man-made hardwood boxes and their mounting will enable the majority of the boxes to last in excess of twenty years. Similarly where a suitable fallen tree limb with hollows is modified and used, it would last for such a period.

Table 5 - Nesting Box Allocations against Targeted Species and Locations

Tower Numbers	Patch Number	Boxes for Species			
		Glossy Black Cockatoo	Brown Treecreeper	Squirrel Glider	Microchiropteran Bats
15	2		4		
56	4	4		4	4
83-89	7	4		4	4
91-100	8	4		4	4
164-165	11		4		
174-176	12	4		4	4
198	15		4		
209	16		4		
TOTAL		**16**	**16**	**16**	**16**

The use of the nest boxes is a measure that will provide some sanctuary to targeted species and to other species competing for similar habitat following clearing. It is not intended to provide a permanent replacement

of natural habitat but to ease the transitions and provide medium term habitat during which trees in the neighbouring regenerating woodland will have time to develop further as habitat and local fauna communities can adapt to the new conditions. The boxes will not be replaced.

1d) Replanting / Enhancement of Habitat

Replanting of plant species providing food for Glossy Black Cockatoos is recommended.

In general replanting should be undertaken to replace any components identified as missing from the local habitat (grasses, herbs and shrubs etc)

Response

As discussed in the SIS (section 7.17.3), the loss of habitat arising from the construction of the proposed transmission line is not significant when compared to the large areas contained within local National Parks and Nature Reserves (Goulburn River NP and Munghorn Gap Nature Reserve) and other nearby woodlands along the route of the line.

The recommendation for replacing any components identified as missing from the local habitat is not practical. Offset strategies will be applied to compensate for unreplaced habitat as discussed below.

1e) Riparian Areas

DEC seeks further information on the potential impacts on riparian zones where the proposed line crosses creeks and drainage lines.

Response

In Section 5.3.1 (Existing Hydrological Regime), the EIS identified the named creeks that will be traversed by the proposed line. The condition of these creeks and of the un-named creeks to be crossed can be seen from the maps showing the existing environment (Figs. 6a – 6o). The condition of the existing environment and the expected impacts are tabulated below:

Table 6 – Creek Crossings

Creek Crossing	Existing environment	Impacts
Cumbo Creek (Str 31)	Cleared land. Has existing formed tracks.	No riparian vegetation to be removed.
Wilpinjong Creek (Str 36A, 37A & 38)	Cleared land. Existing non-formed tracks.	No riparian vegetation. New concrete causeways to replace existing crossings.
Wilpinjong Creek (Str 48)	Cleared land. Not crossed by existing tracks.	No riparian vegetation. No track crossing.
Wilpinjong Creek (Str 53)	Cleared land. Existing non-formed tracks cross the creek.	No riparian vegetation. New concrete causeway.
Wilpinjong Creek (Str 55)	Cleared land. Existing non-formed track.	No riparian vegetation. New concrete causeway to replace existing crossing.

Creek Crossing	Existing environment	Impacts
Wilpinjong Creek (Str 56)	Cleared land. Existing non-formed tracks	No riparian vegetation Existing concrete causeway.
Wilpinjong Creek (Str 60)	Cleared land. Not crossed by existing track.	No riparian vegetation. No track crossing.
Moolarben Creek (Str 80)	Cleared land. Not crossed by existing track.	No riparian vegetation. No track crossing.
Hollow Creek (Str 82)	Cleared land. Not crossed by existing track.	No riparian vegetation. No track crossing.
Unnamed creek (Str 91)	Blakely's Red Gum. Crossed directly by line. Existing non-formed access track.	Some vegetation will be cleared with tall trees lopped. New concrete causeway for access track located on the existing Beryl – Ulan 132kV transmission line.
Unnamed creek (Str 109)	Cleared land. Existing track. Line shares common corridor with existing Beryl – Ulan 132kV T line.	No riparian vegetation. Existing crossing.
Unnamed creek (Str 112)	White Box – Inland Grey Box. Crossed directly by the line in close parallel with existing 132 kV line. Existing track with a new radial offshoot.	Tall trees will be lopped. No track will cross the creek.
Stubbo Creek (Str 128)	Cleared land. Existing non-formed track. Crossed directly by the line.	Existing concrete causeway.
Unnamed creek (Str 134)	Cleared land. Existing non-formed track. Needs upgrading.	No riparian vegetation. Track upgrading required.
Unnamed creek (Str 158)	Cleared land. No track crossing.	No riparian vegetation.
Unnamed creek (Str 163)	Cleared land. Existing track.	No riparian vegetation.
Unnamed creek (Str 171)	Cleared land. Existing non–formed access. Upgrading required.	No riparian vegetation. Existing creek crossing (rock).
Unnamed creeks (Str 173 & 174)	Cleared land. Existing track.	No riparian vegetation. Existing crossings.
Mebul Creek (Str 181)	Cleared land. No access crossing.	No riparian vegetation.
Unnamed creek (Str 186)	Cleared land. Existing formed track with rock crossing.	No riparian vegetation. Existing track and crossing.
Goolma Creek (Str 190)	Yellow Box – Blakely's Red Gum. Existing crossing to be upgraded.	Vegetation around Str 190 will be cleared. Upgrading of existing crossing.
Unnamed creek (Str 197)	Yellow Box – White Box community. Access track required.	Vegetation will be cleared for tower location and access track.
Unnamed creek (Str 202 – 203)	Yellow Box – Blakely's Red Gum community. No creek crossing.	Tall trees will be lopped.
Unnamed creek (Str 203 – 204)	Cleared land. No creek crossing.	No riparian vegetation. No access crossing of creek.
Unnamed creek (Str 205 – 206)	Yellow Box – White Box community. Existing access. Parallels existing Wellington – Beryl 132kV Line.	Vegetation will be cleared for tower location.
Molly's Creek	Cleared land. Existing access.	No riparian vegetation.

Creek Crossing	Existing environment	Impacts
(Str 207, 208 & 209)	Existing creek crossing to be restored. Parallel existing Wellington – Beryl 132kV Line.	
Unnamed creek (Str 210 – 211)	White Box community. Existing tracks. Parallels existing Wellington – Beryl 132kV Line.	Vegetation will be cleared for tower location.
Unnamed creek (Str 217 – 218)	Yellow Box – Blakely's Red Gum community. Existing tracks. Existing crossing to be upgraded. Parallels existing Wellington – Beryl 132kV Line.	Towards Str 218, vegetation will be cleared for tower location. Upgrading of existing creek crossing.
Unnamed creek (Str 235 – 236)	Cleared land. Existing track and causeway.	No riparian vegetation.
Mitchell Creek (Str 243 – 244)	Cleared land. Existing track. Parallel existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Unnamed creek (Str 246 – 247)	Cleared land. Existing track. Parallel existing Wellington – Beryl 132kV Line. Existing creek crossing to be upgraded	No riparian vegetation. Upgrading of existing creek crossing.
Unnamed creek (Str 248 – 249)	Cleared land. Existing formed track. Parallels existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Unnamed creek (Str 255 – 256)	Cleared land. Existing track. Parallels existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Unnamed creek (Str 256 – 257)	Cleared land. Existing formed track. Parallels existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Unnamed creek (Str 259 – 260)	Generally cleared land. Some White Box in mid-span. Existing track. Parallels existing Wellington – Beryl 132kV Line.	Tall trees will be lopped.
Unnamed creek (Str 261 – 262)	Cleared land. Existing track.	No riparian vegetation.
Unnamed creek (Str 262 – 263)	Generally cleared land. Some White Box in mid-span. Existing track.	Tall trees will be lopped.
Unnamed creek (Str 266 – 267)	Generally cleared land. Some White Box in mid-span. Existing track.	Tall trees will be lopped.
Unnamed creeks (Str 269, 270 & 271)	White Box & Cypress Pine Existing track.	Tall trees will be lopped.
Unnamed creek (Str 273 – 274)	Cypress Pine. Existing track	TALL TREES WILL BE LOPPED.

Impacts on riparian corridors have been limited by the following design, location and construction measures:

- Existing water crossings would be used and with some being upgraded or replaced with concrete causeways.
- Many of the crossings over creeks and drainage lines are over lands that have already been cleared.
- Only 10 towers will be located within 40m of a named creek.
- Tall trees impinging on the safety clearances will be lopped.
- Some existing crossing access will need to be upgraded. Soil erosion and sedimentation control measures in line with the DLWC guidelines on construction and maintenance of tracks will be implemented. The services of local Soil Services will be sought to provide advice on any upgrading work.

1f) Cumulative Impacts

TransGrid needs to assess, to the extent possible, the cumulative impacts of the proposed transmission line and the proposed Wilpinjong and Moolarben coal mines.

Response

The proposed Wilpinjong coal mine is the subject of an Environmental Assessment prepared under Part 3A of the Environmental Planning and Assessment Act, and the proposal has recently gained Ministerial approval with conditions and a Statement of Commitments. The Moolarben coal mine has no proposal that has been the subject of a public document for public review.

As mentioned in the EIS (S7.2.1) the location of the proposed line has been the subject of detailed discussion with several mining interests including Excel Mining (Wilpinjong Coal Project), Ulan Coal and White Mining (Moolarben Coal Project). The proposed alignment in the EIS has been agreed to by these separate mining interests. The four factors considered in arriving at the proposed alignment are as detailed in the EIS and include minimising impacts on any ancillary activities such as habitat compensation areas.

In regard to impacts on the key environmental elements (threatened species, EEC and Indigenous heritage), the proposed line has avoided the area of open cut mining activities of the three mining companies with interests from Wollar to Ulan. Wilpinjong and TransGrid will provide separate packages of offsets to compensate for the clearing of native vegetation and their respective impacts on threatened species and endangered ecological communities.

The area where the line overlaps with the Wilpinjong mine activities is in their proposed Enhancement and Conservation Area (ECA) “B” coinciding with the line from Structure 36 to Structure 39. This is a presently cleared area used for cropping. The line will not impose additional impacts on the existing use of the lands but would limit the heights of vegetation that could be used for the portion of ECA “B”

affected by the easement of the line, when the ECA is established in future.

1g) Offset Strategies

Offset strategies to compensate for the loss of 97 ha of native vegetation and 57 ha of EEC should be negotiated between TransGrid and the DEC. DEC recommends consideration of 10 requirements for offsets as stated in Attachment One to their submission.

Response

In addition to the contributions of nesting boxes and revegetation, the EIS recognises the need for mitigation and offset strategies that will mitigate effectively or compensate for the loss of habitat and food resources to fauna and impacts on ecologically endangered communities. Specific offset proposals were not detailed in the EIS because it was considered that these should be developed in consultation with DEC and DOP after these agencies had opportunity to consider the EIS and SIS and to understand the impacts for which offsets are required.

Offsets represent compensatory measures to the extent that environmental impacts cannot be avoided or mitigated to zero. The government consultation paper on *Green Offsets* states that "often an even better outcome of net environmental *improvement* can be achieved cost-effectively using offsets." The nature of the offsets is that they must be:

- Enduring – they must offset the impact for the period that the impact occurs;
- Quantifiable – the impacts and benefits must be reliably estimated;
- Targeted – they must offset the impact on a 'like for like or better' basis;
- Located appropriately – ideally they should offset the impact in the same area;
- Supplementary – they should not involve double counting with other schemes; and
- Enforceable – they are to be achieved via auditable commitments.

Through discussions with DEC, TransGrid has further defined its offset strategy as follows:

(a) Reservation of White Box Grassy Woodland EEC

TransGrid will purchase an appropriate property for transfer to National Parks Estate that will enhance the reservation of White Box Grassy Woodland communities. Subject to an acceptable purchase price, the property will be a 130 hectare property contiguous with the Wollemi National Park that has been suggested by the DEC. The property has approximately 90 hectares of the EEC grassy woodland communities predominantly in good condition. In the event that the property cannot be acquired at an acceptable price, TransGrid will provide an alternative compensatory offset selected in consultation with DEC.

(b) Native Vegetation Planting Offset Within the Bioregion

In association with Greening Australia or another suitable body, TransGrid will apply $90,000 of new money to compensate for the clearing of native vegetation for the project. The funds will be applied to compensatory plantings of native vegetation predominantly within the NSW South West Slopes Bioregion.

2) Pollution Control

No environment protection licence is required as the proposed transmission line is not a "scheduled activity" under Schedule 1 of the Protection of the Environment Operations (PEO) Act 1997, or a "scheduled development" and is considered to have no pollution of waters and within acceptable impacts on air and noise.

Response: Noted.

3) Indigenous Heritage

In a letter of 23 November 2005 (Submission No. 23.1), DEC made the following representations in regard to management of Aboriginal objects:

3a) DEC accepts the EIS Aboriginal Heritage assessment.

Response: Noted

3b) In regard to the recorded sites that will be impacted or managed to avoid being impacted by the proposed line, DEC recommends that the General Recommendations (1, 2, 3, 4, 6, 7 & 8) in Appendix B of Volume 2 of the EIS be considered in the SOC.

Response:

Noted.

General recommendation 1 relates to the sites where impacts are not likely provided the sites are fenced off.

General recommendations 2, 3 & 4 relate to sites requiring collection or relocation of isolated finds, sites requiring monitoring of earthworks and sites requiring test excavation.

General recommendation 6 relates to the site CR-OS4 which needs fencing along Uamby Rd as well as along the access to Tower 198.

General recommendation 7 relates to the need to monitor sites with potential for artefacts (Tower Nos.: 30, 32, 35, 41, 46, 51, 80, 128, 134 & 155) and access road creek crossings - Tower 50 (over Wilpinjong Creek) and Tower 134 (over Slapdash Creek).

General recommendation 8 relates to the 24 tower locations where property access was refused and archaeological survey should be undertaken once the access issues were resolved.

These recommendations, broadly endorsed by the Indigenous groups and addressed in the Indigenous Heritage Management Plan (IHMP) of the EIS have been included in the updated PEMP (Appendix 3). The updated PEMP also incorporates General Recommendation 8 for the 24 tower locations where property access was refused.

3c) Collection of Aboriginal Artefacts (Objects)

DEC supports the EIS recommendations that Aboriginal objects should be salvaged for collection or relocation where it is demonstrated that impacts on those objects cannot be avoided. DEC understood that Part 3A does not affect Care and Control Permits requirements.

Response:

In the event that an Aboriginal group requests custody and control of an Aboriginal object, TransGrid will facilitate any application they may make to DEC for a Care and Control Permit.

3d) Relocated Aboriginal Objects

Written reports detailing the objects collected and their new location should be provided to DEC on conclusion of the works.

Response:

Agreed. This has been included in the Statement of Commitments.

3e) Tower locations not surveyed and predicted to be within proximity of Aboriginal objects being close to water.

Based on the strong association between Aboriginal sites and water features along the line easement, DEC recommends the Statement of Commitments incorporate appropriate safeguards. This should include the towers located close to water (Tower 59 – 61, 181 – 183, 190 and 235 – 236), access routes and upgrading of existing tracks along the easement during construction.

Response:

As per General Recommendation 8, an Aboriginal heritage survey will be undertaken at the 24 locations where property access was not available targeting the 9 towers within 200m of water. Following the survey, sites requiring any of the four General recommendations (i.e. General recommendations 1 – 4) will be identified and added to the Indigenous Heritage Management Plan. This undertaking has been included in the Statement of Commitments.

4.2.3 Department of Primary Industries (36)

In a letter dated 18 October 2005, the Department of Primary Industries (DPI) made the following representations:

Specific Concerns:

1) Potential impact of the “Wollar Variation” on underlying coal resources and sterilisation of shallow underground and open cut coal resources arising from electromagnetic induction.

2) DPI's preferred route is the Northern Corridor first proposed in October 2003 which was conveyed to TransGrid in October 2003.

If the "Wollar Variation" is to proceed, DPI sought the following recommendations to be incorporated:

- Orientate the line easement wholly within the Crown Land between Excel Mining tenements and Slate Gully Road valley (Eastern Wollar Variation).

- Locate the transmission line towers immediately adjacent to the eastern escarpment of the Crown Land and not across the centre of Slate Gully Road valley which would sterilise potential coal resources in this area. Suggest this option to be discussed with DPI Senior Inspector at Singleton.

Response (1)

The proposed alignment of the transmission line was developed following consultation with companies with mining interests in the area including Ulan Coal, Moolarben Coal Mine and Excel Coal. The alignment has avoided existing mines and as can be seen in the submission from the mining companies the proposed line is not seen to impose any adverse impacts on the coal resources.

Open cut mining can occur in the vicinity of the transmission line provided sufficient safeguards are undertaken by the mining companies in regard to vibration from blasting and fly rock as well as dust management as indicated in the response to the submission from Moolarben.

Response (2)

The proposed alignment in the EIS best balances the various impacts on the environment.

The proposed alignment in this section of the proposed line was selected following the corridor selection process (October 2003). The Northern Corridor with Wollar Variation and Cadonia Estate Variation was adopted as the preferred corridor.

The Wollar Variation as detailed in the Corridor Selection Report was selected based on consideration of impacts on areas of significant ecological significance (the Crown Land with endangered ecological community) and land uses including mining potential west and east of the Crown Reserve. The selection process involved consultation with the mining interests as well as the local communities.

The recommendation from DPI for the line to be wholly within the Crown Land would place the line entirely within a prominent vegetation corridor with an endangered ecological community (White Box – inland Grey Box, Fig 6c Vol3). This will have adverse impacts on the community and, in balancing all considerations, TransGrid decided that an alignment located as close as practicable to the escarpment but outside the Crown Reserve, was the best compromise.

TransGrid understands that to date, there has been no mining exploration licence issued for the area in question.

General Issues:

3) Soil Management and Rehabilitation

3a) All landowners should be consulted and made fully aware of construction activities and involved with decisions regarding rehabilitation.

3b) Rehabilitation of disturbed sites should aim to restore the land back to a productive capacity and agronomic value similar to that prior to disturbance.

3c) Minimise disturbance to that absolutely necessary for safe vehicular movements and construction activities.

3d) Disturbed areas should be stabilised and rehabilitated as soon as possible.

Response

3a) Landowners have been consulted in regard to the proposed development as detailed in the EIS and will be continually consulted and made aware of the construction of the line.

3b) As mentioned in S4.11 of the EIS, rehabilitation of work sites will proceed as soon as work on each site is completed. The disturbed sites will be restored to pre-existing ground conditions.

3c) Accepted. This is TransGrid's practice.

3d) Accepted. This is TransGrid's practice.

4) Rock Blasting

Landowners should be informed of rock blasting for stock to be moved to a safe distance form the blasting site.

Response: Accepted. This is TransGrid's practice.

5) Stream and Drainage Line Crossing

Concurrence of the NSW DPI Division of Agriculture and Fisheries should be sought under Section 199 of the *Fisheries Management Act 1994* for all stream and drainage line crossings.

Response: Under Part 3A process, concurrence is not required; however TransGrid will liaise with Fisheries to achieve acceptable outcomes.

6) Vegetation Clearing and Stockpiling

Where possible, as an alternative to chipping, mulching or burning, DPI encourages the practice of stockpiling large native trees for future *re-snagging* projects of creeks and rivers.

Response

It is not TransGrid practice to stockpile large trees for future use. If DPI needs these trees, the Department can negotiate with the property owners and relocate them to a compound provided by DPI. TransGrid will facilitate the cooperation of its contractor provided the relocation can be carried out in an appropriate construction "window".

7) Electromagnetic Induction

DPI seeks further clarification on the potential impact of electromagnetic induction on native fish. A monitoring program on the effect of electromagnetic induction on fish health and behaviour is recommended.

Response

TransGrid has numerous transmission lines throughout the state that cross streams and rivers. No concern has previously been raised concerning any impacts on native fish. In the event that a research or monitoring program were to be undertaken, this would best be done at a crossing of a more heavily loaded power line, not this one. In the absence of evidence of any effect, TransGrid would consider any such research program to be the responsibility of others.

4.2.4 Roads and Traffic Authority (26)

In a letter dated 23 September 2005, the RTA made the following representations:

1) The RTA is only responsible for the crossing of the Castlereagh Highway (SH18). All other roads are administered and maintained by either the Mid-Western Regional Council or Wellington Council.

2) RTA advised of applicable procedures under the Roads Act and advised of proposed future road widening plans in the vicinity of the SH18 crossing of the transmission line and sought more detailed information on the tower clearance from the road reserve.

Response

1) Noted.

2) The applicable procedures are noted and TransGrid advises that it will comply with all such relevant procedures, as is normal practice between the organisations. The centreline of Structure 150 (angle structure) has been located approximately 10 metres from the boundary fence of the road reserve. The height of the structures either side of the road has been designed to provide sufficient clearance over the existing road level. The RTA will be provided with detailed plan information of the tower at this location as requested to assist in their assessment, and TransGrid will continue to work with the RTA to achieve a compatible development as is normal practice.

4.2.5 Australian Rail Track Corporation (1)

In a letter dated 7 September 2005, the Corporation made the following representation:

The proposed line crossing over the railway line will need to be the subject of an application to the Corporation under a Master Access Deed together with an application fee.

Response: Agreed.

4.2.6 NSW Heritage Office (24)

In a letter of 30 September 2005, the Heritage Office made the following comments:

1) Flora and Fauna – made several recommendations regarding revegetation and habitat protection including working with Excel Mining in their revegetation programme.

Response

The issues of revegetation and habitat protection have also been raised by the Department of Environment and Conservation as well as Excel Mining. TransGrid will consult Excel in relation to environmental offset strategies for amelioration against adverse impacts on flora and fauna.

2) Aboriginal Heritage – recommends that further community discussions are held with the relevant Aboriginal groups and organizations to determine if there are any additional values of the areas within the proposed development.

Response

This matter is being managed in accordance with DEC guidelines, as reported in the EIS and elsewhere in this Report (See Section 4.2.2 subsection 3).

3) Non-Aboriginal Heritage

3a) The Office notes that proposed works will not occur within the boundaries of any State Heritage Register listed items.

Response: Noted.

3b) Impacts on the 12 non-Indigenous heritage items should include both the impacts on the item as well as the setting of the items. Relocation of Structure 87 should be explored.

Response

Impacts on the 12 sites have been addressed in S 5.5.2 of the EIS with the significance of the sites in S 5.5.2.2. The Stone Cottage located 50m north of Tower 35 (Table 5.17) has been demolished by the mining company. Of the remaining 11 sites, except for the rock shelter at Tower 87, the proposed line will have no direct impact. Where the construction works are in close proximity to the items, these sites will be temporarily fenced off (S5.5.2.3).

The stone shelter near Tower 87 was recorded out of due diligence but is considered unlikely to be of an age to be a relic. Should it have to be destroyed, detailed measurements and drawings will be prepared prior to any impact - see page 8.15 of the Project EMP.

3c) A review of primary sources such as historical documents and maps as well as identification of below ground remains should be considered in the EIS.

Response

Such research would be undertaken if, in the opinion of the archaeologist, there was a reasonable likelihood of impact on below ground remains. In the present survey this likelihood was not identified by the archaeologist.

4) The Office reiterates the obligations of the proponent under S 139 of the Heritage Act 1977.

Response:

TransGrid is aware of its obligation under S 139 of the Act.

4.2.7 Mine Subsidence Board (2)

The Mine Subsidence Board, in a letter dated 8 September 2005, informed that the Board has no objections to the proposed development and no formal approval from the Board's is required as the proposal is not within a proclaimed Mine Subsidence District.

Response: Noted.

4.3 Local Government Authorities

4.3.1 Mid-Western Regional Council (34)

The Council in a letter dated 28 September 2005, raised the following issues:

1) Hunter Catchment Blueprint has not been considered in the EIS.

Response

The area between Ulan and Wollar lies within the upper reaches of the Hunter Catchment as Wilpinjong Creek and Wollar Creek drain into Goulburn River which is a sub-catchment of the Upper Hunter Catchment. The Hunter Catchment Blueprint identifies environmental issues of concern within the Hunter region and provides a strategic framework and set of goals for the management and improvement of the catchments natural resources.

Environmental areas being targeted by the Blueprint are aquatic health, soil degradation, native vegetation and biodiversity, and salinity. These issues are similar (if not exactly the same) as for the Central West Catchment Blueprint which applies to the majority of the line route. Through the implementation of the management techniques and mitigation measures described in the EIS and PEMP, the construction and operation of the proposed transmission line will not result in a significant further deterioration of these natural resources.

For clarity, TransGrid's response to these four target areas in both Blueprints are further addressed and updated in Section 3.8 of this Report.

2) Vegetation clearing and disturbance within the areas of Endangered Ecological Communities (EEC) and Zone 7(b) lands (Environment Protection) should be kept to a minimum. Shrubs and trees below the line that should be preserved.

Response

The 7(b) zone is located between Towers 176 and 177. There is a patch of vegetation in the section of the span from Tower 176 to an unnamed creek. From the creek to Tower 177, the land is generally cleared. The spans from Tower 174 – 176 have more vegetation of the same EEC community (Black Cypress Pine – Red Box, Fig 6j, Vol 3 EIS).

As stated in the EIS (Section 5 of the PEMP), trees and shrubs on the easement will generally be removed to a level where it can be maintained by periodic slashing. Vegetation in gullies where the mature height of vegetation will not infringe on the safe electrical clearance will be retained. At locations selected for vegetation and fauna corridors, restricted clearing practice will be adopted resulting in additional vegetation being retained.

This approach will result in shrubs and trees in Zone 7(b) being cleared. However, restricted clearing zones have been identified as listed in Section 3.3.2 of this Report. These include at least 150 m of the easement located on either side of tower 175 and tower 176. Consequently, restricted clearing will be applied to part of the zone.

3) Loss of vegetation compensation should include annual funding to local groups and regional replacement of vegetation rather than state-wide vegetation.

Response

As foreshadowed in the EIS (S5.4.6), TransGrid has developed a package of conservation initiatives for the project. These are detailed in Sections 3.4.3 and 4.2.2 of this Report. Involvement of local groups can be considered in supplementary environmental initiatives within the region and proposals from interested local groups will be considered. Regional replacement of vegetation consistent with the objective of GreenSweep program or any regional program can be considered.

4) The replanting plan should include collection of seeds from impacted areas and use of locally grown species.

Response

Replanting of cleared areas will be undertaken to stabilise disturbed areas. In particular, understorey will be re-established in spans 174 to 176. In addition, in consultation with landowners, advanced tube stock will be planted to establish screening trees on properties in Slate Gully Road where visual impacts need to be ameliorated. TransGrid will utilise locally collected seeds and tube stock for replanting, subject to their being readily available at reasonable cost.

5) Future road realignments and improvements:

Council asked for consideration of the future major realignments of the Ulan/Wollar road network in the routing of the proposed line and to provide sufficient clearance of tower structures from existing Council roads to allow for minor road realignment and future improvements.

Response

The proposed alignment of the transmission line has been developed in consultation with the Council. TransGrid is confident that the alignment has taken into consideration the information that the Council gave to TransGrid on realignment and improvement of the Ulan – Wollar road.

4.4 Private Organisations

4.4.1 Mudgee District Environment Group (18 & 18.1)

In two letters dated 21 & 26 September 2005, the Mudgee District Environment Group Inc raised the following issues:

1) Forecast of peak electricity demand in Western NSW in the EIS is not consistent with TransGrid's 2005 Annual Planning Report. EIS used a figure of 179.9MW as the average value for Wellington Summer and Winter 330kV for 2006 whilst the 2005 Annual Report figure is 146.7MW. The justification for the project in the EIS is questionable for the above reason.

Response:

The justification for the project is sound. See Section 2.3 (Rate of peak growth)

2) Executive Summary states that electricity demand in the Central West is *increasing steadily* whilst the Annual Report and the 2003 Final Report had the peak demand *growing slowly*. With Annual Report and the 2003 Final Report stating that the peak demand is growing at 8MW per year, the capacity of the new line (1000MW to 2000MW) appear to be excessive. The statement in the Summary about service standard being not satisfied from 2003 onwards needs to be reconciled with the fact that over the last 2 years there have been no indication that the service standards have been compromised.

Response:

The capacity of the new line is not as indicated in the submission and a 132kV line could not satisfy the need. The impact of a major outage of the existing 330kV transmission line could be very large and the risk is considered excessive. See Section 2.3 (Rate of peak growth)

3) In discussing the transmission line limitations the "spot loads" arising from mining proposals in the western area should be considered in the justification for the proposed line.

Response: See Section 2.2 (Consumption of proposed new mines)

4) Other Non-Network solutions involving demand side management and local generation have not been considered in details in the EIS – no attempt to manage the low growth demand forecast or consideration of combination of small-scale or large-scale local generation in addition to demand management programs.

Response:

See Section 2.1 (Alternative energy sources and demand management)

5) The EIS has made no reference to the Ulan power station, a development that would require to be connected to the transmission network.

Response:

Should Ulan power station be constructed it could be connected to the transmission network at Wollar Switching Station. However, the Wollar to

Wellington 330kV transmission line is not related to such a proposal. See Section 2.4 (Relationship with future power station)

6) Impact on Existing Airstrip - the need for public consultation on the impacts of the preferred alignment on the Ulan Airstrip and modification of the preferred alignment to avoid impacts on the airstrip should be resolved.

Response:

There may be an impact on the airstrip from the transmission line and also from the Moolarben Coal Project should it proceed. See Section 3.12 (Impacts on Ulan Airstrip)

7) The proposed Wollar Switching Station should be part of the EIS and its impacts should be included.

Response:

Under Part 4 of the Environmental Planning and Assessment Act, the Wollar Switching Station has been given development approval by Mid-Western Regional Council. See Section 3.9 (Wollar Switching Station)

8) Inadequate flora and fauna surveys arising from limited field survey (5 days on area of 1.68ha out of 724ha), no riparian corridor surveys, seasonality limitation of surveys, limited random meander search, limited habitat analysis with only 2ha surveyed for tree hollows and no recent broad scale vegetation mapping.

Response:

The submission recognises only a small part of the specialist resource deployed. See Section 3.4.1 (Adequacy of flora and fauna surveys)

9) Lack of compliance with Director-General's Requirements Flora surveys were limited to December and April, no spring flora surveys. Fauna surveys were limited to December and March to April, no winter and mid-spring surveys.

Response: See Section 3.4.1 (Adequacy of flora and fauna survey).

10) Cumulative Impacts with Wilpinjong Coal Proposal should be considered. In particular:

10a) Cumulative removal of 104.1ha of the Ecological Endangered Communities (EEC);

10b) The section of the line from Tower 37 – 40 is located within the Enhancement and Conservation Area (ECA) proposed by Wilpinjong and will impact on the offsets identified in the Coal Proposal.

10c) Diversion of the Wollar-Ulan Road

Response

10a) & 10b) See Section 3.3.3 (Cumulative Impacts)

10c) See Section 3.14 (Realignment of Ulan Road)

11) Environmental Offsets as identified in the EIS is inadequate. No specific program has been outlined that will further offset the further loss of 57.1ha.

Response:

See Section 3.4.3 (Mitigation measures for flora and fauna) and Section 4.2.2.

4.4.2 Nature Conservation Council of NSW (13)

In an undated letter, the Nature Conservation Council of NSW (NEC) raised the following issues:

1) The EIS figures for forecast peak demand growth in western NSW are substantially higher than the TransGrid 2005 Annual Report figures.

Response

See Section 2.3 of the Report where this issue, which has been raised by several other submissions, has been addressed.

2) The investment of $67.7m, if spent on demand management (DM), energy savings and renewable resources, would better meet the NSW Government Greenhouse benchmarks scheme under the Electricity Supply Act.

Response

See Sections 2.1 & 2.6 of the Report, where the issues of alternative energy sources and DM and their impact on greenhouse gas emissions has been addressed.

3) The proposed line seems to be more likely associated with the Mt Piper power station expansion and the new power station at Ulan, both of which are not supported by NEC.

Response

The proposed transmission line is not related to possible future power stations. See Section 2.4 of the Report where this issue, which has been raised by several other submissions, has been addressed.

4) Transmission line capacity of 1000MW to 2000MW is well in excess of the requirements of the area.

Response

The capacity of the proposed transmission line is much less than stated in the submission. In any case, the requirement for the line is based on the need to maintain the voltage in western NSW, not just transmission capacity. See Section 2.4 of this Report.

5) No reference is made in the EIS to the Commonwealth Minister's requirements under the Environment Protection and Biodiversity Conservation (EPBC) Act for the proposed transmission line, which has been considered a "controlled action" by the Commonwealth Department of Environment and Heritage (DEH).

Response

The EIS and its supporting volumes (Vol 1, 2 & 3), prepared in accordance with the EP&A Act, constitute an environmental impact assessment under the New South Wales environmental approval process.

The proposed development was referred to the Commonwealth Minister for Environment under the EPBC Act on 3 July 2005. The Minister determined on 19 July 2005 that the proposed development is a "controlled action" and designated TransGrid as the proponent for the action. The Minister asked for preliminary information to be submitted. The preliminary information sought includes the EIS/SIS and other documents relating to the proposed transmission line. These documents have been provided to the DEH.

As DEH prefers to wait for the State process for the EIS approval to be completed before considering the preliminary information, the EPBC process is now paused. Following approval under the NSW Part 3A process, the whole package of the preliminary information, including the State Minister's Instrument of Approval, will be formally submitted with a Section 130 Certificate from DOP to DEH.

4.4.3 Gallanggabang Aboriginal Corporation (3 & 3.1)

Two submissions came from the Gallanggabang Aboriginal Corporation (GAC).

In a letter of 9 September (Submission No. 3), Joyce Williams, Chairperson of GAC, provided the following comments:

1) GAC has been involved with the proposed project in providing Aboriginal Site Officers.

Response

Noted

2) An Aboriginal Sites Officer is recommended to be present during construction of access tracks involving excavation. GAC is able to supply an Aboriginal Sites Officer if needed for the Wellington section of the project

Response

Noted.

In a letter dated 26 September (Submission No. 3.1), Lee Thurlow, Public Officer of GAC, provided the following comments:

3) Referring to Heritage Assessment Final Report (May 2004) by ERM, Mr Thurlow requested the following sites identified in that report should be protected during construction of the line:

   3a) Tower 273 – single artefact, 30m east of transmission tower peg 2AC, grey chert core, not directly affected by construction. Secondary impacts can be avoided by fencing off the location.

   3b) Tower 271 – low density scatter of at least 10 flakes stone artefacts on a saddle landform, between two stone outcrops, over an area of 10m x 20m and likely to include sub-surface deposit. Sites can be avoided by locating tower slightly to the north or south of the site and fencing off the site during construction. Construction access should also avoid the site.

   3c) Tower 267 – low density scatter on northern side of the fence by a concrete water tank. The site has been avoided by the transmission line. Need fencing off during construction for protection.

Response

The ERM Heritage Report (Annex B) was part of the Appendix to the Cadonia Estate Route Selection Recommendation Report produced by Environmental Resource Management Australia (ERM) in June 2004 with respect to Option 4, which was ultimately selected as part of the Preferred Route for the project in that vicinity. Following the adoption of the Preferred Route, the EIS archaeologist for the project, OzArk Cultural Heritage Management, undertook an intensive survey, accompanied by representatives of Aboriginal communities, along the Preferred Route. The survey involved walking and inspecting the whole 60m easement of the proposed line including tower sites 267, 271 and 273 and found no Aboriginal sites within the 60m easement. Nevertheless, these sites will be targeted in the pre-construction search, if they are within the 60m easement or within the vicinity of access track. It is considered unlikely, as mentioned in ERM Report, that these sites are located within the 60m easement. In the event these sites are located in the vicinity of access tracks, they will be fenced off during construction for protection.

4) Towers 262 to 265 – along the length of the limestone outcrop can be found signs of grooving marks and stone artefacts.

Response

As mentioned above, the pre-construction search will target these sites.

5) Support submission from Mrs William above (Submission No. 3) for an Aboriginal person to be present during construction of the vehicle tracks.

Response

Noted.

6) Request for a copy of the EIS/SIS in CD-ROM.

Response

A CD ROM of the EIS/SIS was mailed out to Mr Thurlow.

4.4.4 Murong Gialinga Aboriginal and Torres Strait Islander Corporation (37)

This submission was directed to OzArk Cultural Heritage Management, the heritage consultant who undertook the heritage survey and assessment in the EIS.

The submission recognised the need for the proposed line development. In addition to the four groups of OzArk's recommendation on the 28 identified sites, which is supported by the Corporation, the Corporation seeks some additional recommendations.

Response

The support for the archaeologist's recommendation on heritage sites' management is noted. The additional recommendations sought have been considered and certain undertaking that are compatible with the Part 3A approval process have been incorporated into the Indigenous Heritage Management Plan and TransGrid's commitments (see Section 4.2.2, subsection 3).

4.4.5 Hunter Environment Lobby (28)

The Hunter Environment Lobby raised the following issues in their letter of 28 September 2005:

1) Role of the Minister for Planning

Response: Noted. This is a matter for the Department to address.

2) Communication of their concerns to the Minister

Response: Noted.

3) Wollar Switching Station not included in the EIS

Response

The Wollar Switching Station is a Part 4 development under the EP&A Act and as such was the subject of a development application (DA) to the Council. The Council has approved the DA.

4) Hunter Catchment Blueprint has not been considered in the EIS.

Response: See Section 3.8 (Hunter Catchment Blueprint)

5) The area from Wollar to Ulan is an area of high priority area for aquatic health, vegetation and biodiversity, salinity and soil conservation in the Hunter Catchment Blueprint.

Response: See Section 3.8 (Hunter Catchment Blueprint)

6) Salinity issues have not been addressed in the EIS. The concerns raised are based on: a) assessment requires any soil and groundwater salinity issues to be addressed, and b) the lands of the preferred route have been identified as high salinity hazard, and removal of vegetation will further exacerbate salinity problems.

Response: See Section 3.8 (Hunter Catchment Blueprint)

7) The borehole locations in Table 5.7 of the EIS should be referenced to the structure sites to allow better use of the information from the test bores. Saline water in the Wilpinjong Creek catchment has been referred to.

Response:

It was not practical to cross reference borehole locations to the structure sites in the EIS as some of the structure sites were changed due to route changes (as at the Crown Reserve west of Wollar) or in detailed line design. References used in the EIS refer to the Geotechnical Investigations Report by Parsons Brinckerhoff.

An approximate correlation to the EIS transmission line route plan is tabulated below for boreholes in the Hunter River Catchment. The Parsons Brinckerhoff Borehole Locality Plan is attached in Appendix 1.

Borehole Number	Nearest T/L Structure	Locality Comments
1	Near 1A	Near Wollar Substation
2	10	
3	West of 18	Near Maitland Rd
4	30	North of railway
5	East of 38	Near Wilpinjong Ck
6	46	Near Wilpinjong Ck
8	North of 72	Near Goulburn R & Ulan-Cassilis Rd
9	81	Near Moolarben Creek
10	98	Near extremity of Hunter River Catchment

The soil chemical analysis of samples is given in Table 5.4 of the EIS. Note that BH7 in this table should read BH6. No hole was drilled at the planned BH7 site due to unavailability of access. Due to the small volumes of soil to be disturbed and for reasons outlined in Section 3.8 of this Report, this project is not considered likely to create any adverse salinity effects.

8) Land use conflicts with Wilpinjong Coal Mine proposal. Cited an area near Wilpinjong Creek that has been identified as a biodiversity and Aboriginal cultural heritage offset area for the coalmine proposal.

Response: See Section 3.3.3 (Cumulative Impacts)

9) Cumulative impacts of the proposed Wilpinjong mine proposal and the proposed line.

Response: See Section 3.3.3 (Cumulative Impacts)

10) Hunter Environment Lobby does not support increased use of coal-fired electricity in NSW. Consider the proposed line will encourage larger emissions of greenhouse gases in the future.

Response

Noted. As discussed in the EIS and Section 2.6 (Greenhouse Gas Emission), the proposed transmission line, by reducing transmission losses, will lead to a reduction in greenhouse gas emissions.

The proposed development of a 330kV transmission line from Wollar to Wellington is not related to any power station proposal. Discussion on future power stations is addressed in Section 2.4.

11) The increased network capacity that will arise with the Wollar Switching Station connected to the Bayswater – Mt Piper 500kV transmission line will service the proposed expansion of Mt Piper Power Station. If this is the case, the EIS is misleading by not referring to this possible major function of the new transmission line.

Response: See Section 2.4 (Relationship with future power station)

12) Greenhouse gas emissions – no indication in the EIS that the proposed line will reduce greenhouse gas emission. The statement that “improved

transmission losses" should consider the increased electricity that will be supplied through the new network system.

Response

The transmission line development is not related to possible future power station developments. For the reduction of emissions due to transmission losses see Section 2.6 (Greenhouse Gas Emissions)

13) Demand management measures should be implemented to manage demands as required in the Director-General's Requirements.

Response

See Section 2.1 (Alternative energy sources and demand management).

4.4.6 Total Environment Centre (9)

The Centre raised the following issues in their letter of 22 September 2005, all of which have been addressed in Chapter 2 of this Report. To assist in locating specific responses, the following list of issues and the relevant response Section No. is provided:

1) Inconsistent peak demand growth figures between the EIS and TransGrid 2005 Annual Planning Report.

Response: See Section 2.3

2) Justification for the proposed line based on growing peak demand should be reconciled with the slow rate of peak demand (8MW per year) as stated in TransGrid 2005 Annual Planning Report.

Response: See Section 2.3

3) The capacity of the proposed transmission line (1000MW and up to 2000MW) is well in excess of the needs of the area and, with the intention for upgrading the line to 500kV, the proposed line is intended to provide much greater capacity. The proposed line is an "artificial inflation" of network revenues.

Response: See Section 2.4

4) Failure to consider 132kV line option with lower cost and with a capacity of 200MW can provide for 25 years of load growth.

Response: See Section 2.5

5) Dismissal of gas-fired generation and demand management.

Response: See Section 2.1

6) Failure to encourage proponents of non-network solutions

Response: See Section 2.1

7) A 132kV line option in comparison to the proposed 330kV line offers lower costs of capital, depreciation and operation. It is a more cost-effective alternative.

Response: See Section 2.5

8) The use of reliability standard for demand management in NERA report (100MW of reduction in peak demand in 2003) is biased against non-network options.

Response: See Section 2.8

9) Misleading costing of local generation options

Response: See Section 2.7

10) Flawed consultation with affected Code Participants and interested parties in respect of the National Electricity Code (S5.6.2 (f)) on possible options including demand-side options.

Response: See Section 2.9

11) Capacity of the proposed line is more in keeping with the proposed "Project Waratah" at Ulan.

Response: See Section 2.4

12) The proposed transmission line will remove the "incentive for non-network solutions" and is designed to "serve a new coal-fired power station or expansion of an existing power station". The greenhouse gas emission from the new power generation will be massive.

Response: See Sections 2.1, 2.4 & 2.6

4.4.7 Central West Environment Council (14)

The Central West Environment Council (CWEC) in its letter of 21 September 2005 raised the following issues:

1) The EIS has not made reference to the expansion of Mt Piper Power Station or the proposed new power station at Ulan.

Response

The EIS is an environmental assessment of the proposed 330kV transmission line from Wellington to Wollar by TransGrid.

The justification for the line has been clearly spelled out in the EIS (Chapter 3) and it is driven solely by the need to maintain ongoing reliability and security of supply for electricity consumers in the Central West. The timing of the proposed line, its rating (capacity) or its location has not been chosen to support any power station proposal.

The possible expansion of Mt Piper Power Station does not relate to the present proposal. The possible future development of a Ulan Power Station is not part of the justification for the transmission line. Should a Ulan Power Station be constructed, it could be expected that its connection to the main electricity grid would be via Wollar Switching Station, but separate additional transmission connections would be required. See Section 2.4.

2) Peak demand figures in the EIS contradict the TransGrid 2005 Annual Report figure.

Response: See Section 2.3

3) No serious consideration of alternative generation opportunities with demand management strategies.

Response: See Section 2.1

4) Discounting the combined use of a 70MW generator at Wellington and a new 132kV transmission line from Wollar to Beryl in the four case studies of Attachment No 2 Appendix E.

Response: See Section 2.5

5) Greenhouse gas emissions (GHG) will increase rather than be reduced with the proposed transmission line as the CWEC believes that the proposed line is designed to serve a new coal-fired power station or the expansion of an existing power station.

Response: The CWEC belief is unfounded. See Section 2.4

6) Non-network solutions would have "significantly reduced GHG emissions through use of less GHG emission fuels and through reducing energy use.

Response: See Section 2.6

7) Inadequate consideration of the Director-General's Requirements for GHG emission as there is no quantified description of the expected GHG impacts which should include construction impacts and the potential of the line to increase energy use and consequent GHG emissions.

Response:

Greenhouse gas emission reductions of 45,000 tonnes per annum will offset construction impacts within 2 years. See Section 2.6.

8) Conflicting land use of the proposed transmission lines with Ulan Coal Airstrip and Wilpinjong Coal Proposal.

Response:

See Section 3.3.3 on Wilpinjong Coal proposal and Section 3.12 on Ulan Airstrip.

9) Lack of access to Tower sites (59 –63, 181 – 190 & 234 – 242) constituting 20% of the route of the line has not been assessed for environmental impact.

Response

The properties in question did not grant access to their properties for field assessment work. They accounted for approximately 9% of the line route. Despite the lack of access into these properties, observation from outside the boundaries plus aerial photos, maps, evident land use indicate the impacts on the lands are not likely to be different from the impacts on the adjoining properties.

Impacts on Indigenous heritage are not significant given that there are no recorded sites on the properties and also given the nature of land use.

It is not likely that the environmental impacts on the properties in question would significantly alter the outcome of the environmental assessment.

10) Fragmentation of two regional corridors and significant patches of remnant woodland.

Response: See Section 3.3.2 (Impacts on Regional Corridors)

11) Significant impacts on the White Box/Red Gum Grassy Woodland and Grassy White Box Woodland (EEC) as only 400ha of this EEC is relatively intact.

Response: See Section 3.3.1 (Impacts on Ecologically Endangered Communities)

12) Impacts on Habitats of Threatened species, 18 species were listed. Impacts on regional corridors and remnant patches should relate to the need of specific threatened species in the study area.

Response: See Section 3.4 on threatened species.

Assessments of impacts on threatened species have been related to the local and regional abundance of each species and their habitat requirements. Where a particular local area has significant habitats or records of the threatened species, they have been recognised, for example near Structure 91 (*Goodenia macbaronii*) and Structure 207 (Stripe-faced Dunnart).

13) Referral to the Department of Environment and Heritage (DEH) under the EPBC Act. EIS has not indicated timing for DEH response to the "controlled action".

Response

As the proposed development has impacts on ecologically endangered communities in the Commonwealth EPBC Act, the proposed development has been referred to the Minister for Environment and Heritage. TransGrid has been advised that the proposed development is a "controlled action" which requires the approval of the Minister under the Act. For the purpose of the referral process, the Federal Department of Environment and Heritage has advised that the EIS/SIS will form the basis of the information requirements of the Department. Final approval from the Federal Minister will be considered after the NSW process has concluded.

14) Inadequate Flora and Fauna Survey – issues raised are similar to those raised by the Mudgee Environment Council

Response: See Section 3.4.1 (Adequacy of Flora and Fauna Survey)

15) Significance of clearing EEC, loss of further 57.1 ha, loss of habitats and impact on threatened flora species.

Response

See Section 3.3.1 on EEC, Section 3.4 on threatened species and Section 3.4.2 on habitats.

In regard to threatened flora species, the only recorded species is the *Goodenia macbaronii*, found near initial site of Tower 91, but this has been avoided by relocating the tower.

Impacts on ecologically endangered communities have been addressed in the EIS/SIS (S5.4.2 Vol1 and Vol 2).

16) Rationale for the selection of tower sites used in the tree hollow study should recognize the “replacement value” of regrowth EEC.

Response: See Section 3.4.2 (Impacts on Habitats)

17) Inadequate mitigation measures for the impacts of the line on riparian corridor and fragmentation of woodland patches.

Response: See Section 3.4.3 (Mitigation Measures and Offsets for Flora and Fauna)

18) Inadequate Eight-Part Test:

18a) Inadequate consideration of likely impacts on identified threatened species

18b) Local conservation status of all subject species is unknown;

18c) Allocation of nesting boxes for tree hollow dwellers;

18d) Barking Owl and Masked Owl are known to exist in the study area.

Response

18a) & 18b) The EIS/SIS has identified the threatened flora and fauna species that are likely to be impacted upon by the proposed transmission line. The impacts arise from removal of habitats and clearing of vegetation.

Only one threatened flora species was recorded (*Goodenia macbaronii)* and has been avoided. Threatened fauna species likely to be affected by the proposed line have been identified.

Impacts on each of these threatened species have been addressed in the EIS/SIS.

In applying the eight-part tests, the lack of information on local conservation status of threatened species has been recognised and this is one of reason a Species Impact Statement (SIS) has been undertaken on the impacts on these species.

18c) See Section 3.4.2 (Impacts on Habitats) on choice of nesting boxes and their location.

18d) Noted.

4.4.8 Excel Coal (22)

1) Acknowledges TransGrid has “worked with Excel to ensure coal resources are not sterilised by the proposed line except where such effects cannot be avoided”.

Response

Excel has been consulted in regard to the proposed transmission line development and the proposed alignment of the line is a result of the consultation with Excel and other interested parties.

2) Enhancement and Conservation Area (ECA) - Excel asked for vegetation of restricted heights to be allowed where the proposed line traverses the ECAs.

Response

The proposed transmission line will affect part of the southern edge of ECA B as shown in Figure 5.2 of the Wilpinjong Mine EIS, and will cross it where the ECA extends south of Wilpinjong Creek to come near to the railway/road corridor. The transmission line is located well away from ECA B, except for the section including Structures 36A to 39.

Any vegetation regrowth or regeneration within the transmission line easement would have to be in line with the TransGrid's standard on easement maintenance requirements. In general the extent of clearing within the easement would be to a level where the vegetation can be maintained by periodic slashing. This minimises maintenance costs and reduces risk of bushfire outages of the transmission line. However TransGrid is prepared to consider the ECAs and proposed fauna corridors as special cases where the regeneration of shrub land is permitted. In this regard TransGrid looks forward to discussing with Excel, the revegetation plan for the proposed ECAs that would be traversed by the line. See also the discussion in Sections 3.3.2 *Impacts on Regional Corridors* and 3.3.3 *Cumulative Impacts*.

3) Relocation of Ulan – Wollar Rd. Excel will consult TransGrid on the relocation of the Ulan – Wollar Road that has been sought under the Wilpinjong Coal Project EIS. Excel sought for a "condition to be imposed to ensure that the location of the line does not preclude the relocation of the Ulan – Wollar Road".

Response

TransGrid has consulted Excel and other relevant agencies in regard to the proposed transmission line alignment in this section. The location of the proposed transmission line allows for the relocation of the Ulan – Wollar Road to the northern side of the railway line between structures S41 and S50. TransGrid expects on-going consultation with Excel on the development of the new road alignment.

With the consultative process in place, it is considered unnecessary and not appropriate to impose the proposed condition that the proposed line will not preclude the relocation of the Ulan – Wollar Road. See also Section 3.14.

4) Easement – Excel refers to its letter of 21 April 2005 to TransGrid in which Excel has declined to grant an easement to TransGrid over the lands owned by Cumbo, Excel's subsidiary. Excel seeks a licence agreement instead.

Response

The grant of easement is an essential requirement for TransGrid to construct, operate and maintain the transmission line. It is a policy for TransGrid to seek an easement. A licence agreement is not consistent with TransGrid policy. TransGrid will move to acquire an easement over this land in the same way as other lands affected by the route.

4.4.9 Wambo Power Ventures (32)

1) The submission from Wambo Power Ventures suggested that the proposed line development could be avoided or deferred indefinitely.

Response

The submission from Wambo has resulted in detailed and ongoing discussions with TransGrid aimed at assessing the viability of the proposal and, if viable, the extent to which it would defer the proposed line development. Refer to Section 1.4 of this Report.

4.4.10 Moolarben Coal Mines (38)

In a submission dated 15 November 2005, Moolarben Coal Mines Pty Ltd (Moolarben), supports TransGrid's proposed development, and confirms that the transmission line has been aligned appropriately with respect to the approved Ulan Mine extensions including Underground No. 4. However and the company requests the following matters to be considered by DOP in approving the application from TransGrid:

1) Impacts of vibration and potential fly rock from blasting activities at Moolarben Coal Mines proposed Open Cut No.1, adjacent to the transmission line that will have to be addressed by both parties in design and operational risk assessments.
2) The location of a heavy vehicle access road expected to come off the realigned Wollar Road and of conveyors to and from the open cut mine. Detailed design of the line should provide the required clearances over these services.

The proposed Moolarben Open Cut Mine No.1 is located south of the Ulan mine. In this vicinity, towers 71 to 79 of the Wollar – Wellington Transmission Line would lie in proximity to the railway line to the north of the proposed Open Cut No.1.

Response (1)

Open Cut Mine No. 1 is not part of the approved 1985 development application for the extension to the Ulan Mine. Preliminary details of the proposed infrastructure layout for the open cut have been received by TransGrid with Moolarben's letter of 9 January 2006. TransGrid is aware that these details may be varied or evolve as the mine development proceeds, however TransGrid is taking them into account in the transmission line design.

According to the mine infrastructure layout, transmission line structures 71, 72, 72.1, 73A, 74 and 75 lie within 400 m of the north wall of the proposed Open Cut which takes in the eastern end of the existing air strip which will need to be modified or relocated. The mine proposes to divert the Ulan – Wollar Road around the north-eastern corner section of the proposed Open Cut.

The transmission line design in this vicinity will incorporate features to minimise impacts of the prospective open cut mining operation on the transmission line. In particular, composite long rod insulators with additional creepage length will be installed on the transmission line towers in the vicinity of the proposed Open Cut. Composite insulators, comprising a flexible composite shed material over a fibreglass core strength member,

are more resistant to impacts than porcelain insulators and are easier to replace in the event of damage. The additional creepage length will be selected to resist dust pollution from the mining activities.

There are a range of constraints to the northern extremity of the proposed open cut mine development at present – the Ulan airstrip, the Ulan – Cassilis Road, the Ulan – Wollar Road and the railway line.

As shown in Sheet 12 of the Route Plans, the transmission line between tower 72.1 and tower 77 is located between the railway line and the Ulan – Cassilis Road. Moolarben has proposed that the air strip be relocated, but not the Ulan – Cassilis Road. Moolarben's infrastructure layout places the wall of the Open Cut approximately 100 m from the Ulan - Cassilis Road in this vicinity, and locates a visual bund and a light access road between the main road and the Open Cut. The transmission line would be clear of the Open Cut footprint in this section, but the separation of less than 200 m from transmission line structures 73A, 74 and 75 (immediately to the west of the tee intersection with the Ulan - Wollar Road) may not be sufficient as discussed below.

To the east of the Ulan – Cassilis Road, transmission line from the vicinity of structure 72 to the vicinity of structure 72.1 also appears to be within 200 m of the wall of the proposed Open Cut. Again this separation may not be sufficient, notwithstanding that the proposed Ulan – Wollar Road diversion lies closer to the wall of the Open Cut.

The required separation distance from the transmission line must be sufficient to prevent unacceptable damage or collapse of the transmission line due to the mining activities. The same considerations may well impact on other infrastructure such as the diverted Ulan – Wollar Road.

To avoid unacceptable damage to the transmission line a separation distance must be maintained that will prevent the following potential mechanisms of damage:

- The transmission line tower foundations must not be affected by any potential slip zone or by tensile ground strains that arise around the open cut wall.
- Vibration levels at tower footings and foundations must be within acceptable limits that will not cause damage.
- Fly rock shall not be permitted to impact on towers, conductors or insulators in a manner that could lead to failure.

These mechanisms are further discussed below.

In the event of any damage to the transmission line from the mining activities, Moolarben shall undertake to compensate TransGrid for all costs of repair and all liabilities that may now or in the future arise due to interruptions of supply caused by damage or the need to repair damage to the transmission line resulting from mining activities.

Stability and Ground Strain

A primary concern is on the stability of the high wall of the open cut mine. It is imperative that no ground slip interacts with the foundations of the transmission line. Also, experience with open cut mine operations elsewhere has shown that relaxation of the ground at the top of the high wall can result in tensile ground strains, which could adversely affect the capacity of transmission line towers. Ground strains at any tower would require investigation by TransGrid to verify

continued serviceability of the transmission line. An upper limit of acceptable ground strain could be in the range 0.5 to 2.0 mm/m; however this has to be determined more precisely for the expected conditions and tower and foundation designs and loadings.

Vibration

Experience with mining operations in the Hunter Region, has indicated that the vibration from blasting should be limited to a peak particle velocity of less than 50 mm/sec. Some increase above this level may be acceptable (within limits) however this would require modified footing designs to incorporate additional reinforcing steel and the associated costs would be to Moorlarben's account. If 50 mm/s peak particle velocity may be exceeded it would be advisable for the provision to be made in the transmission line footing designs and Moolarben should request this before TransGrid places a contract for the transmission line works.

Fly rock

Fly rock from blasting can damage the transmission line, particularly the conductors, earthwires, insulators and structures. TransGrid requires that Moolarben take all reasonable steps to minimise the possibility of fly rock damage, and pays all costs to repair any damage incurred. The proposed measures to prevent fly rock damage should be advised to TransGrid before any blasting occurs within 400 m of the transmission line.

TransGrid requires that a geotechnical report be prepared prior to work commencing to assess the effects of mining on the easement area and high wall slopes. Prediction of ground strains on transmission line easement shall be made and monitoring systems be put in place to measure actual ground strains during the works. Where predicted and/or actual ground strains exceed 0.5 mm/m, work should not proceed until TransGrid assesses the effects and the necessary actions are taken to protect the transmission line. Stability analysis of the high wall shall be carried out and include consideration of any adverse effects on the slope stability due to blasting of the overburden.

The deposition of dust on insulators affecting the operation of the line is another impact which needs to be addressed by Moolarben as well as by TransGrid. Moolarben shall undertake dust suppression measures to minimise the dust pollution affecting the transmission line.

Backfilling and rehabilitation of the areas adjacent to the transmission line shall be carried out as soon as mining in the vicinity of the structures is complete. Moolarben should commit to an appropriate backfilling and rehabilitation plan for these areas.

TransGrid considers that conditions should be applied to the Open Cut Mine No 1 approval to prevent unacceptable damage to the transmission line as outlined above.

Response (2)

As discussed above, the preferred alignment of the line has been the subject of consultation with mining interests including Moolarben. Preliminary details of the realigned Wollar Rd and indications of likely conveyor requirements have recently been made available to TransGrid and are being examined.

Moolarben will need to provide precise locations of the haul roads which will cross under the line and the locations and heights of the conveyor line structures. The near edge of the carriageway of a haul road should be located at least 15 m from the closest part of a transmission line tower. It is preferred that the earthworks be designed to protect the transmission line from a truck running off the road. TransGrid would require a minimum conductor clearance of 6 m over plant working or travelling under the line. This clearance applies to any plant operating under the transmission line including 12 m trucks whose tray could be raised. To ensure that the 6 m minimum clearance is maintained on the easement, trucks must have the tray down and height barriers and signage are required.

In the absence of final design and survey information for the mine infrastructure, the design of the transmission line in the area of prospective interaction (Structure 72 to 73A) has been based on the existing ground profile. The line design provides for a minimum of 9 m clearance over ground at maximum operating temperature and at least 10 m clearance over local roads. Due to the catenary sag of the conductors (of the order of 10 to 15 m for spans in the range concerned), substantial additional clearance exists closer to the towers.

For example the span section between the Ulan – Cassilis Road and tower 72.1 to the east of the road would have a conductor height above ground of 15 m to 19 m at distances greater than 30 m from the tower and carriageway. This would allow mine infrastructure passing under the line in that area to be up to 9 m or more, depending on location, above the present ground level with 6 m clearance to conductors maintained.

Based on the information available at this time, it seems likely that the line design as currently proposed will provide sufficient clearances over ground for the mine infrastructure to be located in a manner that achieves the required clearances between that infrastructure and the high voltage conductors. If Moolarben requires greater conductor heights then the company should approach TransGrid.

In the event of a need to relocate the transmission line or to modify it to accept Moolarben development or activity, the cost of such relocation or modification would be to Moolarben's account.

4.5 Groups

4.5.1 Petition with 48 signatures (39)

A petition with 48 signatures was received which objected to the proposed transmission line and requested an independent environmental impact study. The petition outlined its objection briefly as being based on the impacts of the proposed line on protected catchment area, concern over childhood leukaemia, 16 endangered species, 97 Ha of fragile flora and fauna, creek crossings, salinity and soil, ecosystems and Aboriginal heritage.

Response

The issues raised in this petition represent a broad brush of all of the concerns previously raised. All of these concerns have been addressed in the EIS and TransGrid's responses are repeated in this Report.

5 PREFERRED PROJECT REPORT

TransGrid has identified all of the issues raised in submissions to the public exhibition of the Environmental Assessment for this project (comprising an EIS, which included a PEMP) and has detailed its response to all of these issues in the preceding pages of this Report.

TransGrid concludes that none of its responses to any of the issues raised in submissions has constituted a change to the project activity, as described in the Environmental Assessment that is significant enough to warrant the preparation of a Preferred Project Report.

6 CONCLUSION

The EIS for the Wollar Wellington 330 kV Transmission Line was exhibited from 29 August to 30 September 2005 and this resulted in submissions from 39 bodies, comprising 9 from Local, State and Federal agencies, and 30 from private individuals and bodies, including 1 petition.

The agency submissions have broadly supported the thrust of TransGrid's proposals and mitigation measures. Discussions have been held with DEC and a site has been identified for purchase as compensatory reservation of the grassy woodland endangered ecological community.

The majority of environmental management measures and controls proposed are familiar to TransGrid and represent normal practice.

The proposed project has been well defined in the EIS, and the environmental management strategies have been set out in the Project Environmental Management Plan (PEMP). No changes to the scope of the project or the alignment of the transmission line have been found to be necessary as a result of the submissions received. Some additional detail and definition of management measures has been developed and will be incorporated into the PEMP.

A Statement of Commitments has been prepared and is attached to this Submissions Report. It is considered appropriate that the commitments have been spelled out in a concise way with additional detail provided in the PEMP. The documentation is very clear and the commitments are considered to be readily auditable.

TransGrid respectfully seeks the endorsement of the Director-General and the approval of the Minister for this project which is essential to bring the electricity supply to the Central West of New South Wales into compliance with the reliability criterion required by the Minister for Energy, Utilities and Sustainability.

APPENDIX 1

Wollar to Wellington 330 kV Transmission Line

PROJECT LOCATION
(Figure 1 EIS Volume 3)

and

BOREHOLE LOCATIONS
(PB Borehole Overview Locality Plan)

APPENDIX 2

Wollar to Wellington 330 kV Transmission Line

STATEMENT
OF
COMMITMENTS

Wollar to Wellington 330 kV Transmission Line

Statement of Commitments

This document commits TransGrid to undertake environmental protection and control initiatives as set out in the Project Environmental Management Plan (PEMP), in the Environmental Assessment, and some additional commitments made in response to submissions and discussions in the course of the approval process. The commitments made by TransGrid for the construction and operation of the Wollar to Wellington 330 kV Transmission Line are listed in the following table. It is understood that compliance with these commitments will be audited by the Department of Planning.

Commitments that are TransGrid's normal practices, and not specific to this project, are controlled by TransGrid's independently audited Quality Management and Environmental Management Systems and are not necessarily set out in detail in this Statement of Commitments.

Within the table the following abbreviations are used:

CEMP	Construction Environmental Management Plan
DEC	NSW Department of Environment and Conservation
DLWC	The former NSW Department of Land and Water Conservation, now part of DNR.
DNR	NSW Department of Natural Resources
DOP	NSW Department of Planning
DPI	NSW Department of Primary Industries
EA	Environmental Assessment
EEC	Endangered Ecological Community listed under the EPBC Act and/or under the TSC Act.
EIS	Environmental Impact Statement (which for this Project is deemed to be an EA)
EMR	Environmental Management Representative
OEMP	Operation Environmental Management Plan
PEMP	Project Environmental Management Plan
The Project	The establishment of the Wollar to Wellington 330 kV Transmission Line as described in the EIS submitted by R Byrnes of International Environmental Consultants Pty Ltd on 15 August 2005.

Statement of Commitments

Issue	*Commitment*	*Relevant Organisation*	*Implementation Timing*
The Project as a Whole			
1. Project	The Project will be carried out consistently with the procedures, safeguards and mitigation measures identified in the EIS and PEMP, as modified by the Submissions Report and its attachments, and this Statement of Commitments.	DOP	Ongoing for the life of the Project.
2. Obligations	The commitments made in this document do not relieve TransGrid of any applicable legal obligations.	Various	Ongoing for the life of the Project.
Compliance			
3. Notification	TransGrid will notify in writing the Director-General, Mid Western Regional Council, and Wellington Council of the start of the construction and operation.	DOP, Mid Western Regional Council, Wellington Council	Prior to construction and prior to operation
4. Compliance	TransGrid is responsible for ensuring compliance with these commitments.	TransGrid	Ongoing for the life of the Project.
5. Further Assessment	TransGrid will bring to the attention of the Director-General any matters that may require further assessment by the Director-General.	DOP	Ongoing for the life of the Project.
6. Environmental Audit	TransGrid will conduct an Environmental Audit to assess compliance against the EIS, PEMP and associated contractor's CEMP, the Submissions Report and this Statement of Commitments, after 20% of the route clearing work has been completed along with associated access improvement works. Any areas of inadequate practice will be the subject of a targeted return audit after one to two months. The appropriate relevant organisations will be consulted to identify any actions or improvements to the EMPs that may be required in order to eliminate any unacceptable outcomes or to control any inadequately managed environmental impacts.	DOP, DNR, DEC, Mid Western Regional Council, Wellington Council	Once 20% of clearing program is complete.
7. Post construction Environmental Audit	TransGrid will engage an external environmental auditor to conduct an independent environmental audit of the impact of the construction activities, within six to eight months after practical completion of construction works, to verify the environmental impacts against those predicted in the EIS and Submissions Report and to identify any residual impacts arising from non-compliance with the PEMP and the contractor's CEMP. The relevant organisations will be consulted by the auditor to identify any specific areas of concern to those organisations.	DOP, DNR, DEC, Mid Western Regional Council, Wellington Council	On completion of construction.

Statement of Commitments

Issue	*Commitment*	*Relevant Organisation*	*Implementation Timing*
Environmental Management			
8. Project Environmental Management	TransGrid will update the Project Environmental Management Plan (PEMP) contained in the EIS with additional relevant material set out in the Submissions Report and its Indigenous Heritage Management Plan and additional commitments made in this Statement of Commitments, and will implement the PEMP.		• Update prior to commencing construction. • Implement during construction.
9. Operation Environmental Management	(a) TransGrid will prepare and implement an Operation Environmental Management Plan. (b) The OEMP shall be updated in the light of the external environmental auditor's report (commitment 7) and shall incorporate measures to correct any practically remediable impacts that are reported by the auditor as excessive.		• Prepared prior to operational service. • Within 3 months of receipt of the external environmental auditor's report
10. Environmental Management Representative(s)	TransGrid will seek the Director General's approval for the appointment of an Environmental Management Representative (EMR) at least 8 weeks before Construction commences. The EMR will be an appropriately experienced person specifically engaged by TransGrid for the project. The EMR shall have the responsibilities and powers set out in the PEMP. The EMR will report to TransGrid's Manager/Central Region. EMR reports will be copied to TransGrid's relevant environmental managers and shall be made available to DOP and to any appointed external auditors promptly on request. Any person to be appointed as a temporary or permanent replacement EMR during the project shall be promptly nominated to the Director-General for approval.	DOP	Appointed prior to commencement of construction.
Communication and Consultation			
11. Advice of Construction Activities	Before Construction commences, and then at 3 monthly intervals maximum, TransGrid will advise in relevant newspapers the nature of the works proposed for the next 3 months; areas in which these works are proposed and a contact telephone number.	Mudgee Guardian Wellington Times	Prior to and during construction.
12. Consult Property Owners	TransGrid will consult property owners about implementing mitigation measures that affect their property and shall record and implement commitments made.	Property owner or manager	Prior to construction on the property concerned.
13. Complaints Management	TransGrid will develop a *Construction Complaints Management System* before construction commences and will implement and maintain the System for the duration of construction. The *Construction Complaints Management System* will be consistent with AS 4269 "Complaints Handling".		Prior to and during construction.

Statement of Commitments

Issue	*Commitment*	*Relevant Organisation*	*Implementation Timing*
Flora, Fauna and Vegetation Management			
14. Flora and Fauna Management	Flora and Fauna issues will be managed in accordance with the strategies and management measures outlined in the PEMP incorporating the supplementary detail included in the *Submissions Report* and variations reflecting this *Statement of Commitments*. Relevant organisations will be consulted about any variations or changes.	DEC, DNR	Prior to and during construction
15. Hollow Bearing Trees	The Hollow Bearing Tree Management Protocol is applicable to those areas nominated for restricted and selective clearing (not throughout the transmission line route) and will be applied to those areas (see commitment 19).		Prior to and during construction
16. Pre-Clearing Searches	TransGrid will engage an ecologist to identify areas for implementation of protocols detailed in the PEMP, to undertake pre-clearing searches for arboreal fauna and to manage the impacts of the clearing on fauna resident in the cleared vegetation in accordance with the PEMP.		Prior to commencement of clearing works
17. Bioregion Native Vegetation Offsets	TransGrid commits $90,000 additional funding as an extension of the GreenGrid project, being undertaken in partnership with Greening Australia, to compensate for clearing of native vegetation for the project, the funds to be applied to compensatory plantings of native vegetation predominantly within the NSW South West Slopes Bioregion.	Greening Australia	FY 2006/07 and FY 2007/08
18. EEC Compensatory Reservation Offset	TransGrid agrees to purchase a property of approximately 130 hectares of land contiguous with the Wollemi National Park that is predominantly vegetated with grassy woodland EEC communities or such alternative lands as may be agreed with DEC, for transfer to the National Parks Estate.	DEC	Prior to practical completion of the transmission line construction
19. Restricted and Selective Clearing	TransGrid commits to applying restricted and selective clearing practices as defined in the Submissions Report (in Section 3.3.2) to sections of the following spans: near structure 91 to protect habitat of *Goodenia macbarronii,* span 172-173, span 174-175, at least 150m in spans 175-177, span 177-178, span 196A – 197, span 200-201, spans 206-208 including protection of the habitat of the *stripe-faced dunnart*, span 210-211, span 217A-218, span 224-225, span 226-227, span 266-267 and in due course at future fauna corridors established in association with Excel Coal Ltd's Wilpinjong Coal project.	Wilpinjong Coal Ltd	During the line construction period and maintained ongoing

Statement of Commitments

Issue	*Commitment*	*Relevant Organisation*	*Implementation Timing*
20. Nesting Boxes	TransGrid will install 64 natural or fabricated hardwood nest boxes targeted to alleviate transitional impacts on threatened species at suitable woodland patches along the route as set out in Table 5 of the Submissions Report.		During the line construction period
21. Replanting and Rehabilitation	Replanting and rehabilitation will be carried out in accordance with the Flora and Fauna Management Strategy contained in the PEMP. Local seeds and tube stock will be used subject to availability at reasonable prices.		During the line construction period
Weeds			
22. Weed Management	A Weed Management Plan will be developed in accordance with the strategies outlined in the PEMP augmented by details and variations for individual properties determined by TransGrid in the light of consultations with property owners and the relevant organisations. The Weed Management Plan shall be kept up-to-date until the OEMP is submitted for approval and will be subject to ongoing review by the EMR during the construction period.	DOP, DNR, Mid Western Regional Council, Wellington Council.	Prior to and during construction.
Heritage			
23. Indigenous Heritage Management	Indigenous Heritage will be managed in accordance with the strategies outlined in the updated PEMP attached to the Submissions Report.		Prior to and during construction.
24. Supplementary Heritage Surveys	TransGrid will arrange for the archaeologist, assisted by the representatives of the relevant Indigenous groups, to survey the approximately 9% of the route that was not surveyed for the EIS and will develop management strategies for any finds, that are consistent with the strategies developed for the sites identified in the EIS and PEMP. TransGrid will consult with DEC and the participating Indigenous groups concerning the management strategies before incorporating them into the Indigenous Heritage Management Plan.	DEC, MGATSIC, MLALC, GAC, Warrabinga.	Prior to construction
25. Care and Control of Relics	Subject to DEC consent, TransGrid will ensure any relics collected are described and kept secure in interim storage pending advice from DEC as to the appropriate final care and control arrangements.	DEC, MGATSIC, MLALC, GAC, Warrabinga.	During construction
Noise and Vibration			
26. Construction Noise and Vibration	Construction Noise and Vibration, including Blasting, will be managed in accordance with the Noise and Vibration Management Strategy included in the PEMP. Relevant organisations will be consulted by the environmental auditor.	DEC, Mid Western Regional Council, Wellington Council.	Prior to and during construction.

Statement of Commitments

Issue	*Commitment*	*Relevant Organisation*	*Implementation Timing*
27. Construction Hours	Construction will be restricted to between the hours of 7:00 am and 6:00 pm (Monday to Saturday) and at no time on Sundays and public holidays, except for the delivery of materials required outside these hours by the Police, RTA or other authorities for safety reasons or with the agreement of the property owner where the work will not cause a noise nuisance at any nearby residential property, or where it is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm.		During Construction.
28. Construction Noise Exceedances	The Construction noise goals are to manage noise from Construction activities so they do not exceed, at any residential receiver during the day, the adopted Rating Background Level of 30 dB(A), and the Short Term $L_{A10,15min}$ of 50 dB(A), Medium Term $L_{A10,15min}$ of 40 dB(A), and Long Term $L_{A10,15min}$ of 35 dB(A). Recognising that the goals are not always achievable, TransGrid will seek to mitigate the impact by minimising the duration of noise exceedances and ensuring that affected properties are adequately forewarned of the prospective noisy days. In the event of any complaint about construction noise, noise monitoring shall be undertaken where such monitoring could assist the management of future works so as to avoid any similar impact during subsequent works.		During Construction.
29. Vibration Criteria	Vibration caused by construction will be limited to German Standard DIN 4150 Part 3 *Structural Vibration in Buildings. Effects on Structures;* and for human exposure to vibration will be limited to the evaluation criteria presented in British Standard BS 6472 – *Guide to Evaluate Human Exposure to Vibration in Buildings* (1 Hz to 80 Hz) for low probability of adverse comment. In the event of any complaint about vibration, monitoring shall be undertaken where such monitoring could assist the management of future works so as to avoid any similar impact during subsequent works.		During Construction
30. Blasting	(a) Blasting will only be undertaken between the hours of 8:00 am and 5:00 pm, Monday to Saturday. (b) The vibration level due to blasting will meet the requirements of the "*Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration*" prepared by the Australian and New Zealand Environment and Conservation Council. (c) If blasting is required, TransGrid will undertake blasting trials to enable site-specific blast designs to be developed that will ensure that the performance		During construction.

Issue	***Commitment***	***Relevant Organisation***	***Implementation Timing***
	criteria are satisfied. (d) TransGrid will make all reasonable attempts to advise occupants of residences located within 400 m of a blast of intended blasting. The advice will be provided at least 48 hours before a blast and will include a schedule of blast times and a telephone number and contact name.		
Soil and Water Management			
31. Soil and Water Management	TransGrid will implement the Soil and Water Strategy included in the PEMP in consultation with relevant organisations. The contractor will be required to design the access tracks and erosion and sedimentation controls in accordance with the publication and *Guidelines for the Planning, Construction and Maintenance of Access Tracks (DLWC 1985)* and TransGrid will apply the same guidelines to its maintenance activities. Access tracks will be constructed so as not to impair drainage. Impacts will be assessed having regard to *Soil and Landscape Issues in EIA (DLWC 2000).*	DOP, DEC, DNR, Mid Western Regional Council, Wellington Council.	Construction phase and ongoing.
32. Inspections	The EMR will undertake periodic inspections of temporary and permanent erosion and sedimentation control devices during the construction period, to ensure that the most appropriate controls are being implemented, and to check that controls are being maintained in an effective condition.		During Construction.
33. Creek Crossings	The impacts at crossings of named and unnamed creeks will be limited to those arising from the works described in Table 6 of the Submissions Report which shall replace the table at Section 3.4.14 of the PEMP included in the EIS.		During construction and ongoing
34. Towers Within 40m of Creeks	Proposed works within 40 m of protected waters or 20 m of prescribed streams will be reviewed with the local representative of DNR including 10 towers close to named creeks and a larger number (approximately 20) close to unnamed creeks.	DNR	Prior to the relevant construction works
35. Liaison with Fisheries	TransGrid will liaise with NSW DPI Division of Agriculture and Fisheries in respect of the four new concrete causeways and four locations requiring causeway and/or track upgrading at a creek crossing as listed in Table 6 of the Submissions Report.	DPI Fisheries Division	Prior to the relevant construction works
Visual Impacts			
36. Visual Impact Management	The Visual Impact Management Strategy included in the PEMP will be implemented, including tower painting near Slate Gully Road. The strategy will		Prior to Construction.

Issue	*Commitment*	*Relevant Organisation*	*Implementation Timing*
	be developed into a site by site plan, including for screening plantings at locations where visual impacts are high as set out in the EIS. Any plantings on private properties will be carried out selectively in consultation with residents who will be expected to water the plants after the initial fortnight from planting.		
Traffic, Air Quality and Spills			
37. Construction Traffic Management	TransGrid will require the construction contractor to prepare a Construction Traffic Management Plan in consultation with the RTA and the Mid Western Regional Council and Wellington Council.	RTA, Mid Western Regional Council, Wellington Council.	During Construction.
38. Dust Management	TransGrid will require the construction contractor to prepare and implement a Dust Management Plan in respect of the works.		Prior to Construction.
39. Construction Vehicle Spillage	Construction vehicles using public roads will be maintained to prevent any loss of load, whether dust, liquid or soils. In the event of any spillage, TransGrid will remove the spilled material as soon as practicable within the working day of the spillage.		During construction.
40. Plant and Equipment	All plant and equipment used in the construction of the transmission line will be maintained and operated in a proper and efficient condition.		During construction.
Property Damage and Access			
41. Property Inspections	Subject to landowner agreement, property inspections will be conducted on all structures within 200 m of blasting, or within 50 m of construction activities that generate vibration impacts. Inspections will be in accordance with AS 4349.1.		During construction.
42. Repairs to Property	TransGrid, where liable, will rectify any property damage caused directly or indirectly by the construction or operation of the transmission line at no cost to the property owner.		During construction.
43. Property Access	TransGrid will ensure that land owner / occupier access to properties is maintained during construction in accordance with agreements reached.		During construction.
44. Dilapidation Surveys of Council Roads	Prior to commencement of construction, TransGrid will conduct a dilapidation survey of Council roads that will be used by construction traffic. The plan will be forwarded to the relevant Council for comment four weeks prior to commencement of construction works.	Mid Western Regional Council, Wellington Council	Four weeks prior to commencing construction works
45. Restoration of	On completion of heavy vehicle construction traffic in each Council area,	Mid Western Regional	On completion of heavy

Statement of Commitments

Issue	*Commitment*	*Relevant Organisation*	*Implementation Timing*
Council Roads	TransGrid will restore Council roads to a condition equal to or better than the condition existing at the time of the dilapidation survey.	Council, Wellington Council	vehicle construction traffic
Waste			
46. Waste Management	As part of the Construction EMP, TransGrid will require its construction contractor to prepare and implement a Waste Management, Recycling and Re-use Plan.		Prior to Construction.
Utilities and Services			
47. Telstra Facilities	TransGrid will liaise with Telstra and meet its obligations in respect of the management of earth potential rise and low frequency induction in the usual way under the long-standing agreement between Telstra and electricity utilities.	Telstra	Prior to commencement of commissioning of the new transmission line
Hazard and Risk Management			
48. Hazard and Risk Management	As part of the Construction and Operation EMPs, TransGrid will prepare and implement Hazard and Risk Management Plans.		Prior to Construction.

APPENDIX 3

Wollar to Wellington 330 kV Transmission Line

UPDATED PROJECT ENVIRONMENTAL MANAGEMENT PLAN