NSW GOVERNMENT
Department of Planning

MAJOR PROJECT ASSESSMENT: VINEYARD TO ROUSE HILL ELECTRICITY UPGRADE

Director-General's
Environmental Assessment Report
Section 75I of the
Environmental Planning and Assessment Act 1979

September 2006

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GLOSSARY AND ABBREVIATIONS

ACCC	Australian Competition and Consumer Commission.
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency.
Department, the	Department of Planning.
DEC	Department of Environment and Conservation.
DEH	Department of Environment and Heritage (Commonwealth).
Director-General	Director-General of the Department of Planning.
EA	Environmental Assessment for the Vineyard to Rouse Hill Electricity Upgrade (prepared for Integral Energy by Parsons Brinckerhoff, October 2005) in accordance with section 75H of the EP&A Act.
Easement	A right given to a third party to use a portion of property for certain purposes.
EMF	Electric and Magnetic Fields.
EMP	Environmental Management Plan.
EP&A Act	*Environmental Planning and Assessment Act 1979.*
EPBC	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
Hz	Hertz – a unit of frequency equal to one cycle per second.
IPART	Independent Pricing and Regulatory Tribunal.
kV	Kilovolt. One kV = 1000 Volts.
mG	Milligauss – a unit used to measure the magnetic flux density or strength of a magnetic field.
Minister	Minister for Planning.
MVA	Megavolt ampere – a unit of energy or capacity commonly used when expressing the rating of a network element.
NHMRC	National Health and Medical Research Council.
N, N-1	System normal (N) conditions - exists when the network is configured in its usual state with all network elements available for service. Single contingency (N -1) conditions – exists when the network is configured such that a single network element is unavailable for service. This is due to a planned or unplanned event.

Project	The Vineyard to Rouse Hill Electricity Upgrade as proposed by Integral Energy in the Environmental Assessment and Submissions Report.
Proponent	Integral Energy.
RTA	Roads and Traffic Authority
SoC	Statement of Commitments..
Submissions Report	Submissions Report for the Vineyard to Rouse Hill Electricity Upgrade (prepared for Integral Energy by Parsons Brinckerhoff, March 2006) in accordance with section 75H(6) of the EP&A Act.
TSC Act	*Threatened Species Conservation Act 1995.*

EXECUTIVE SUMMARY

The Project

Integral Energy is proposing to upgrade its existing 132kV overhead transmission line known as Feeder 9JA between the Vineyard bulk supply point and a proposed future switching station at Rouse Hill. The 8.5 km line will be rebuilt largely within the existing 30 m wide easement except for a small section of 1.5 km at the northern end which will require a new easement. The proposed alignment is shown in **Figure 1.**

The Project would involve:

- construction of 43 twin sets of steel poles with an average height of 22 m, within the existing 30 m wide easement and within the new easement at the northern section of the line;
- replacement of the existing single circuit transmission line with two single circuit overhead transmission lines, and increasing the line's capacity from a nominal 84 MVA to twin 500 MVA. (The two circuits would share the electrical load equally, with either circuit being able to provide the total load should one of the circuits suffer an unplanned event);
- use of three construction site compounds and the existing and proposed easement for all construction activities; and
- construction of an estimated 3.4 km of access tracks within the existing and new easement (and their continued use post-construction for maintenance purposes).

The upgrade is needed to address the current network supply deficiencies and to meet the expected demand from future development of the North West Growth Sector. This sector will undergo a radical transformation over the next 25-30 years with the NSW Government's plan to build approximately 60,000 new dwellings in this area.

Following consideration of the public submissions on the Environmental Assessment (EA), Integral Energy has modified the Project in its Submissions Report. The modifications involved a change of conductors from twin Mango to single Invar resulting in a decrease of overhead wires from 14 to 8; and some pole relocation and modification of pole height. Integral Energy is seeking approval for the modified Project.

The capital cost of the modified Project is $17.4 million to be fully funded by Integral Energy. A maximum of 30-50 people will be employed during construction.

Part 3A and EA Exhibition

The Project is subject to Part 3A of the Environmental Planning and Assessment (EP&A) Act and requires approval by the Minister for Planning

The Environmental Assessment (EA) for the Project was publicly exhibited for six weeks between 7 November and 16 December 2005, with submissions accepted until 20 January 2006. A total of 1114 submissions, mostly objecting to the preferred option, were received during and after the exhibition. The key issues raised relate to the options development and assessment process, community desire for undergrounding, visual impact, health concerns from electric and magnetic fields, claims of reduced marketability of land and depreciation of property values, and need and timing of augmentation of the power supply.

The Department received the Submissions Report from the Proponent on 10 March 2006.

Panel of Experts

In response to the considerable community concerns on the Project, the Minister for Planning on 18 December 2005 constituted an Independent Hearing and Assessment Panel (Panel of Experts) in accordance with section 75G of the EP&A Act.

The Panel of experts comprised of Mr Barrie Unsworth (Chair), Mr Charles Hill and Dr Colin Roy. Their terms of reference were to consider, evaluate and advise the Minister on issues raised in public submissions to the Environmental Assessment, taking into account:

- the essential need to augment electricity supply by December, 2007; and
- the economic, social and environmental justification for the proponent's preferred option.

The Panel reported to the Director-General on 6 March 2006. The Panel invited public submissions and held round table meetings with individual residents, community groups, Blacktown City Council, the NSW Department of Health, and Integral Energy. A copy of the Panel Report is in **Appendix 1**.

The Panel Report endorsed the Proponent's preferred option, having satisfied itself of the following considerations:

- the use of the existing easement is the preferred route for the supply upgrade as proposed;
- the underground options for Feeder 9JA would not represent a prudent investment for Integral Energy;
- the provision of a secure supply of electricity to the community is of paramount importance; and
- the Environmental Assessment prepared on behalf of Integral Energy satisfactorily addresses the key environmental issues.

It also recommended that:

- the Proponent compensate (on grounds of magnetic fields) a number of landowners whose dwellings are within a certain distance from the centre of the easement to enable them to reconfigure their dwellings or relocate within the property or elsewhere;
- when the area traversed by the Feeder 9JA easement is considered for rezoning for urban development, the undergrounding of cables be examined by the Growth Centres Commission on the basis of the easement being relinquished by the Proponent as partial compensation for the cost of laying the cables and that the balance of funding be provided by the developers.

Proponent's Submissions Report

Integral Energy requested the Minister's approval for the Project in a letter dated 10 March 2006, accompanied by the Submissions Report.

Integral Energy has made some modifications to the Project in response to public submissions. These consisted of pole relocation in six places, variable changes in heights of 9 poles and the replacement of twin Mango conductors with single Invar conductors, resulting in a reduction of overhead wires from 14 to 8. Further detailed design work and subsequent remodelling of the magnetic field predictions have resulted in a substantial reduction of magnetic fields at the edge of the easement.

Department's Consideration

The Department has considered the following documents in its assessment of the proposal:

- the project EA and submissions;
- the Panel Report;

- the Proponent's Submissions Report; and
- the two Independent Reports commissioned by the Department.

Undergrounding

Blacktown City Council, a large number of residents/landowners and the Member for Riverstone, Mr John Aquilina MP have vigorously supported in both submissions and representations the undergrounding of 9JA relative to the other project options in the EA. The Department whilst cognisant of the reliability and demand objectives of the proposal has carefully considered the merits and practicality of undergrounding 9JA either immediately, or as urban residential development occurs in the Riverstone and Riverstone East release areas as predicted over the next 5-10 years.

The route of 9JA Feeder runs along an existing easement on land currently zoned General Rural (1A) under the Blacktown LEP. The land includes the Riverstone and Riverstone East

release areas which are earmarked for urban residential redevelopment in accordance with the Growth Centres SEPP, North West Growth Centre Structure Plan, and the North West Growth Centre Precinct Plans.

To ascertain whether undergrounding was justifiable, the Department commissioned independent reports on both (a) whether there was precedent for undergrounding in rural areas earmarked for urban development, and (b) the costs and relative benefits associated with undergrounding.

Precedent

The Broad Report (**Appendix 3**) indicated that there is an established precedent of energy distributors such as TransGrid and Energy Australia having already undergrounded up to two thirds of their distribution networks in the CBD and in other urban areas. In most cases undergrounding occurred in existing urban environments or as urban residential development took place. The report did not identify circumstances where undergrounding had occurred in rural areas on the basis that these areas would one day be redeveloped for urban residential purposes.

Notwithstanding, the Broad Report found that an undergrounding option could be supported to meet both current replacement and reliability upgrade requirements and to meet the objectives of the Metropolitan Strategy when urban residential redevelopment occurred given the benefits that would be derived. It was suggested that at that time, a multi-contributor approach to funding could be adopted with beneficiaries contributing through developer charges, the Government contributing to meet the broader amenity objectives and the sunk cost of replacement of aged assets passed through in electricity tariffs.

Review of Project Costing

The Department also questioned Integral Energy's costing for undergrounding the 9JA Feeder using Integral Energy's own engineering specifications. The review by Burns and Roe Worley (BRW) focused on a comparative cost examination between the proposed modified option and a fully underground option along the exiting easement (Option E). A copy of the BRW Report is attached (**Appendix 2**). The report found that while the cost differential between the proposal and a fully underground option had narrowed considerably, it was still significant at $40 million compared to Integral Energy's cost comparison of $55 million. Similarly, the Broad Report acknowledged there is a substantial cost difference between aboveground and underground options although it was recognised that the quantifiable costs of undergrounding electricity cables is substantially higher than the quantifiable benefits.

The Department believes there is little supporting justification to undergrounding the subject section of Feeder 9JA now. Several factors support this conclusion, including:

- there remains considerable cost difference between undergrounding and the proposed overhead line;
- until the land is rezoned for urban residential development, beneficiaries are unlikely to be in a position to fund undergrounding;
- this is consistent with IPART recommendations in 2002 that beneficiaries should pay for the discretionary undergrounding of powerlines;
- undergrounding in rural areas while the details of the urban form are yet to be determined may compromise optimal subdivision patterns in the future;
- National Electricity Rules require that any such project be 'prudent investment' (i.e. cost effective); and
- lack of certainty that IPART (or the Australian Energy Regulator) would permit costs of undergrounding the 9JA Feeder now to be "passed through" to consumers.

Similarly, the Independent Panel found no justification for undergrounding the 9JA Feeder now and recommended that the potential for undergrounding be investigated by the Growth Centres Commission when the area traversed by Feeder 9JA is considered for rezoning for urban residential development. The panel also recommended that further investigation would be required on the basis of the easement being relinquished by the Proponent as partial compensation for undergrounding and the balance of funding to be provided by the developers.

The Department understands the desirability of undergrounding the 9JA Feeder. However, there is little justification for this to occur now as there is no immediate funding and the upgrade must occur in the next few years due to existing reliability and capacity issues. The Department does however recommend that all efforts be made to negotiate the undergrounding of the 9JA Feeder when the land traversed by the easement (including Riverstone and Riverstone East Release Areas) are rezoned and redeveloped for residential purposes. In addition, planning in general for future electricity infrastructure should be better coordinated with future urban development programs to ensure both systematic and optimal outcomes for the urban environment.

Consequently, the Department recommends Conditions of Approval that require the Proponent to:

- negotiate in good faith with the Growth Centres Commission (or a nominated developer) regarding the undergrounding of any relevant sections of the line, if and when residential urban development is approved on land traversed by the existing or future easement (including Riverstone and Riverstone East Release Areas). Further, that it makes an appropriate contribution to the costs of doing so; and
- that when any such proposal arises, provide regular reports to both the Minister for Planning, Minister for Energy and the Treasurer on the progress of any such negotiations. Further, that the Proponent complies with any reasonable requirements agreed to between these Ministers.

Additional routes and co-location with other infrastructure

In addition to the alternative routes considered in the EA, other routes suggested for the new line are along the floodplain corridors or co-location with road or rail corridors. The Panel considered all of these suggestions in their report with particular regard to Integral Energy's response on these matters.

EMF and Compensation issue

Health concerns about magnetic fields are a predominant issue not only of those residents who live in close proximity to the easement but the wider community. The NSW Department of Health indicated a policy position that the residents should not be exposed to more than the current level of magnetic fields. This could be achieved by means of underground cabling, restricting density of adjacent

development, and/or increasing the width of the easement. The Panel responded to Health's advice by adopting a 'nominal widening' of the easement from 30 m to 45 m and recommending compensation for eight properties which are within 22.5 m of the easement's centreline. The purpose of the compensation is to enable the owners to reconfigure their dwellings or to relocate within the property or elsewhere. Subsequent changes to pole height and remodelling of magnetic fields predictions have reduced the number of existing dwellings likely to be affected in the long term by increased magnetic field levels from eight to two. The Department recommends that these two dwellings be acquired, subject to the owner's agreement, due to their special circumstances. Apart from the long term magnetic fields issue, these dwellings would experience the most visual impacts because TransGrid's high voltage power lines cross these properties.

The magnetic fields predictions for the remaining six identified dwellings will be independently verified. Should the verification process identifies any dwellings that will be affected by magnetic field levels greater than the current levels, the Proponent will then be obliged to undertake/fund measures to reconfigure or relocate the affected dwellings upon request of the property owner.

Permissibility and Terms of Easement

Legal advice provided by a residents group contested two issues affecting the proposal. One questions the proposal being dealt with under Part 3A of the EP&A Act; and the other involves the permissibility of the new line under the terms of the easement. On the first issue, the Department is satisfied that the proposal is a permissible use and is subject to Part 3A of the EP&A Act. The second issue is a property matter and not a matter to be addressed under the EP&A Act.

An amendment to the Electricity Supply Act 1995 namely the *Electricity Supply Amendment (Protection of Electricity Works) Act 2006* was enacted on 26 May 2006. Integral Energy has advised that this has the effect of resolving any uncertainties about the Proponent's powers to undertake the proposed upgrade.

Notwithstanding, before Integral Energy could commence construction of the new line, it must be satisfied that it is authorised to use the easement for that purpose. The Department has imposed Condition of Approval No 3 to this effect.

Conclusion

Following consideration of the project EA, public submissions and associated reports, the Department is of the view that:

- the modified project is justified in the short term. The upgrade is required immediately to improve reliability of electricity supply and to cater for the anticipated scale of future demand in the North West sector;
- the benefits of the modified project outweigh the residual impacts which can be appropriately mitigated and managed;
- the modified project offers significant social and economic benefits for the North West sector by providing timely delivery of electricity supply that would facilitate orderly development in this area;
- undergrounding now is not practicable for various reasons outlined above; and
- if and when urban residential development occurs in the area (including Riverstone and Riverstone East release areas), it would be highly desirable that the proposed overhead line be undergrounded. Accordingly, the Proponent should be required as a Condition of Approval to negotiate the undergrounding of such line with the Growth Centres Commission (GCC) at that time and to make an appropriate contribution to the costs of doing so.

1 INTRODUCTION

1.1 The Project

Integral Energy operates a 132kV transmission line, known as Feeder 9JA, between Wallerawang and Carlingford, within an existing 30m wide easement. It is proposing to upgrade an 8.5 km section between the Vineyard bulk supply point and a proposed switching station at Schofields Road, Rouse Hill. Seven km of the upgrade is proposed to be undertaken within the existing easement, and 1.5 km on the northern end (traversing south of the Riverstone Sewage Treatment Plant) would require a new easement. The proposed alignment and its planning context are shown in **Figures 1 and 2.**

The key components of the proposal are:

- construction of 43 twin sets of steel poles, average height of 22 m, within the existing 30 m wide easement and at the new easement;
- replacement of the existing single circuit transmission with a two single circuit overhead transmission line, increasing the line's capacity from a nominal 84 MVA to twin 500 MVA;
- use of three construction site compounds and the existing and new easement for all construction activities;
- construction of an estimated 3.4 km of access tracks within the existing and new easement (and their continued use post-construction for maintenance purposes).

Figure 1: The Proposed Alignment

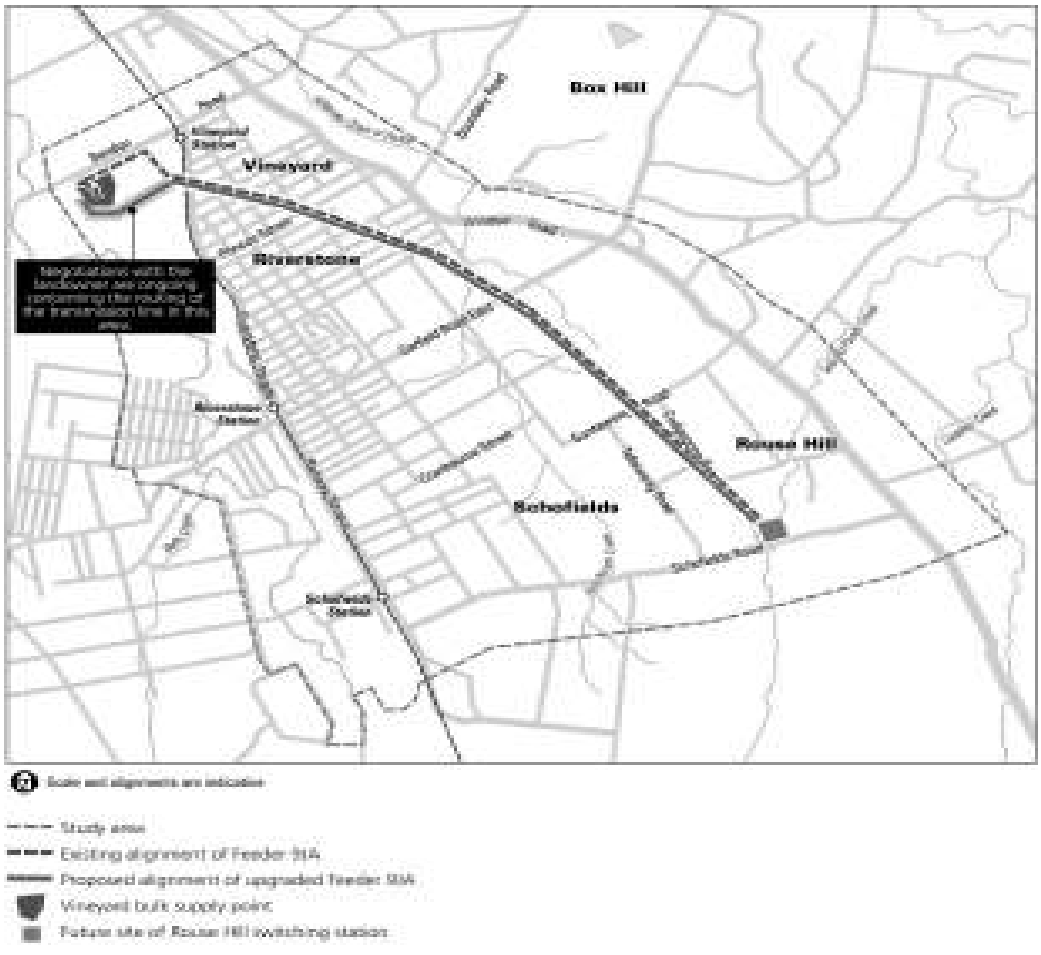
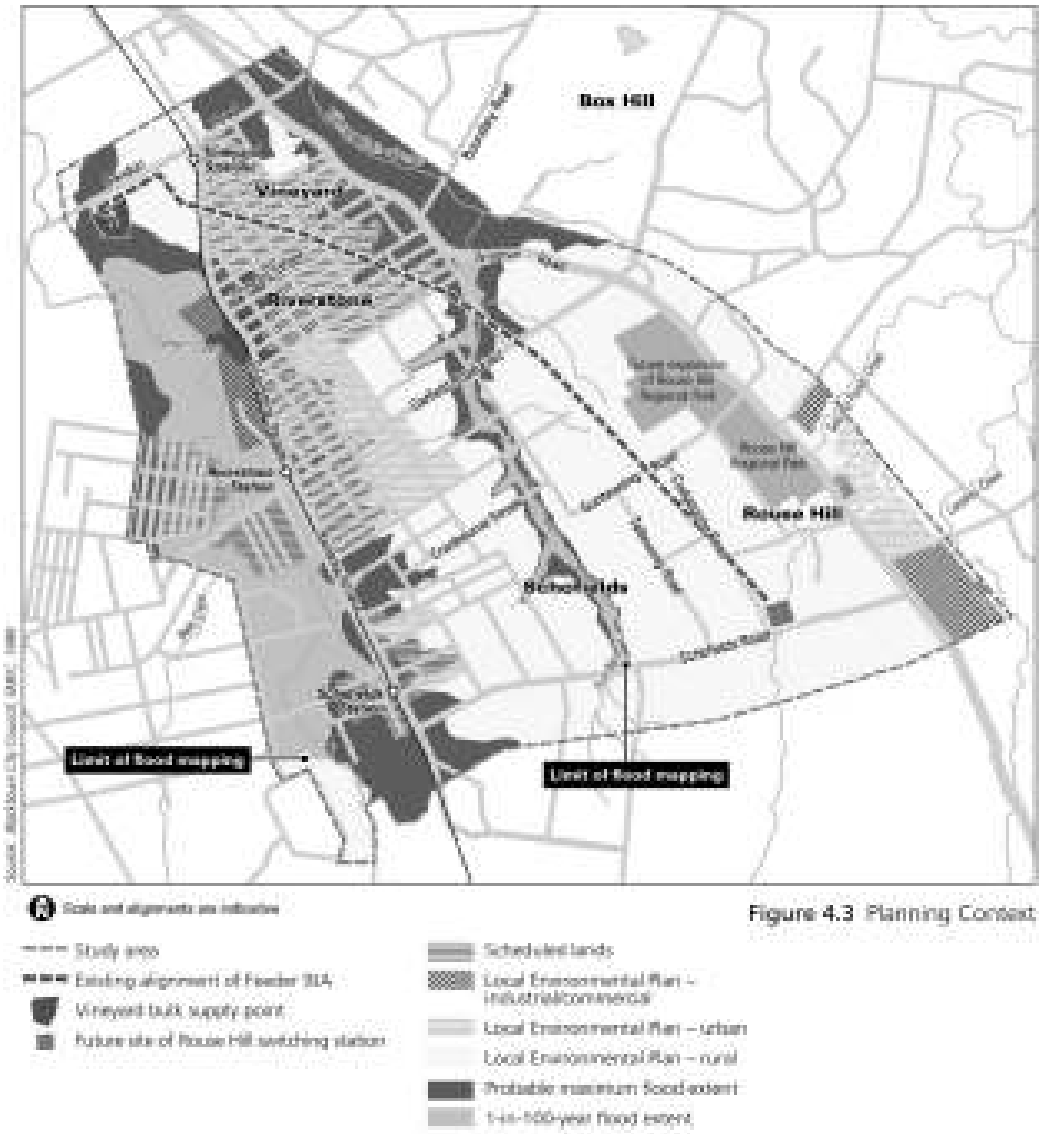


Figure 2: The Planning and Environmental Context



The existing transmission line was installed over 50 years ago and does not have adequate capacity to supply the current electricity demand of the area. Integral Energy forecasts that peak electricity demand will exceed the available capacity by mid-2008, resulting in the potential for widespread blackouts.

The proposed upgrade is therefore needed to provide a safe, secure and reliable supply to existing and future customers in the North West Sector and to avoid the potential for blackouts at times of peak electricity demand.

Twelve project options were developed based on:

- four different route corridors (and combinations);
- underground and overhead options (and combinations); and
- various height, number and designs of overhead support structures.

A comprehensive range of criteria involving environmental, social, economic and design considerations were used for evaluating the performance of the different options. Option C (an overhead transmission

line along the existing easement) was chosen as the preferred option. The Proponent considers this to have the least social and environmental impacts and would cost substantially less than any of the underground options considered.

Integral Energy has undertaken extensive consultation with the community, local council and government agencies over a period of one and half years. This was in the form of meetings, project newsletters, establishment of a Community Advisory Group to obtain feedback on project options, and stakeholder workshops on option selection.

The capital cost of the Project is $16.8 million, as identified in the EA (prior to proposed modifications), to be fully funded by Integral Energy.

In conjunction with the Project, Integral Energy proposes to implement a range of demand management initiatives to contain future increases in electricity consumption. This includes an education and incentive program, use of financial incentives, and providing assistance in installation of off-peak air-conditioning systems and smart metering. It has committed $500,000 to a demand management fund to be spent on projects within the Blacktown and Baulkham Hills local government areas.

1.2 Modifications to the Project

Integral Energy has made some modifications to the Project in the Submissions Report. It has requested the Minister's approval for the modified Project.

The modifications are:

- relocation of six poles and modifications to the height of nine poles (shown in Tables 6.1 & 6.2 and Figures 6.1(a-c), Submissions Report). Changes to the pole locations were made to reduce impacts to properties. Changes to the pole heights (some decreased, others increased, but no higher than 24 m) and revisions to EMF modelling would result in a reduction of magnetic field levels.
- use of single 'Invar' conductors (in place of the original twin Mango conductors), which reduces the number of overhead wires from 14 to 8, and minimises the visual impacts to a certain degree.

Integral Energy conducted a risk assessment of potential impacts of the pole relocation on biodiversity and heritage items, which concluded that there would be no appreciable difference to the impacts identified for the original locations in the EA.

The revised modelling predictions of magnetic fields resulted in a substantial reduction in magnetic fields in the order of 24 to 67% compared to the levels indicated in the EA.

The proposed new configuration for the line would be similar to Option D, as shown in the EA. The revised capital cost of the Project is $17.4 million, an increase of approximately $600,000 over the original Project.

Potential change to proposed easement

Approximately 1.5 km of the route alignment at the northern end is a new easement which Integral Energy is currently negotiating with the landowner. The principle being pursued by Integral Energy is a relinquishment of the existing easement in favour of the new easement. If this is not achievable, Integral Energy will be seeking a modification of the Minister's approval under Section 75W of the EP&A Act to use the existing easement. Such a modification would be subject to the assessment procedures under this section of the Act.

2 STATUTORY FRAMEWORK (NSW)

2.1 Transition to Part 3A

The proposal was initially subject to the former Division 4, Part 5 of the EP&A Act. This was on the basis that:

- Integral Energy is both the Proponent and a determining authority for the proposal; and
- The Proponent determined that the proposal is likely to significantly affect the environment and require an Environmental Impact Statement (EIS) in accordance with Section 112 of the EP&A Act.

Consequently, the approval of the Minister for Planning would have been required for the proposal.

The Director-General's requirements for the preparation of the project EIS were issued on 14 January 2004.

When Part 3A (Major infrastructure and other projects) of the EP&A Act commenced on 1 August 2005, Division 4, Part 5 was simultaneously repealed. A Ministerial Order under Section 75B(1) of the Act (gazetted on 29 July 2005) made projects that would otherwise have been under that division subject to Part 3A. As a result, the project is now subject to the assessment and approval processes under Part 3A and the Minister for Planning is the relevant approval authority.

On 6 October 2005, under Clause 8J of the EP&A Regulation 2000, the Director-General adopted the previously issued Director-General's requirements for the purpose of Part 3A EA requirements.

2.2 Permissibility of the Project

The proposed route is located wholly with the Blacktown Local Government Area and passes through four land use zones under the Blacktown LEP 1988, being:

- Zone 1(a) – General Rural;
- Zone 5(a) – Special Uses (General);
- Zone 5(b) – Special Uses (Arterial Road and Arterial Road Widening); and
- Zone 6(a) – Public Recreation

Under the above zonings, the proposed transmission line is permissible with consent. Clause 11(1) of State Environmental Planning Policy No 4 – Development Without Consent and Miscellaneous Exempt and Complying Development applies to the proposal. This has the effect of making the proposal an 'activity' under Part 5 of the EP&A Act. As described previously, a Ministerial Order makes Part 5 projects where the proponent is also a determining authority and but for that order would require an EIS, subject to Part 3A.

2.3 Public Exhibition of the Environmental Assessment

The EA was publicly exhibited between 6 November and 16 December 2005, with an extended period for submissions until 20 January 2006.

Copies of all the submissions received from the public exhibition of the EA were forwarded to the Expert Panel.

Integral Energy's response to the submissions is contained in its Submissions Report which was submitted to the Department on 10 March 2006.

2.4 Independent Hearing and Assessment Panel

In response to the community's significant concerns with the Project, the Minister for Planning constituted on 18 December 2005 an Independent Hearing and Assessment Panel in accordance with Section 75G of the EP&A Act.

The Panel of experts comprised Mr Barrie Unsworth (Chair), Mr Charles Hill (Director, Planning Workshop) and Dr Colin Roy (Director, ARPANSA). Their terms of reference were to consider, evaluate and advise the Minister on issues raised in public submissions to the Environmental Assessment, taking into account the essential need to augment electricity supply by December, 2007; and the economic, social and environmental justification for the proponent's preferred option.

The Panel held meetings at the Blacktown City Council on 9-10 February 2006 with community groups, Blacktown City Council, the NSW Department of Health and Integral Energy. The Panel reported its findings to the Director-General on 6 March 2006, and the Minister is required to consider the Panel's report in deciding whether or not to approve the project.

3 OVERVIEW OF ENVIRONMENTAL ISSUES

3.1 Summary of EA Submissions received

A total of 1114 individual submissions, the majority of which are form letters, were received in response to the public exhibition of the EA. The submissions consist of 101 unique representations as summarised in **Table 1**.

Table 1: Summary of Submissions

Submissions type	No of submissions
Government Agencies • NSW Department of Health • Western Sydney Area Health Service • Blacktown City Council	3
Community Groups	6
Private companies	3
Individuals Form letters (1027 in total)	70 16 types
Petitions (total of 1711 signatures)	3
Total	**101**

3.2 Review of Environmental Issues

The Department has reviewed the EA, submissions to the EA, the Proponent's Submissions Report, the Panel Report and additional information provided by the Proponent. The Project raised a range of environmental, social and economic issues which are outlined in **Table 2.** A more detailed consideration of key issues is provided in Section 4 of this report. It is important that this section be read in conjunction with the Submissions Report and the Panel Report to understand how the key issues raised in submissions were addressed. The Department is satisfied that the responses provided by the Proponent in the Submissions Report are reasonable.

Table 2 summarises the type and frequency of the issues raised in the submissions.

Table 2: Summary of Issues Raised in the Submissions

Issue	Number of submissions	Department's Consideration
Options development and assessment	87	Numerous questions and comments made in the submissions – response provided by Integral Energy is considered adequate. Key issue related to assessment of alternative routes and undergrounding - see Section 4.2.
EMF and health effects	68	Key issue in Department's assessment - see Section **Error! Reference source not found.**.
Planning	60	Various issues raised related to: undesirable co-existence of transmission line and residential development; necessary consultation between Integral Energy and Department of Planning; coordination of the proposal with the North West Growth Centre Structure Plan; co-location with road and rail corridors; cost recoupment through easement relinquishment; alleged illegal use of easement for the proposed upgrade; permissibility of the proposal and not being a Part 3A project; adverse effect of the proposal on planning of the Riverstone Release Area, etc. These issues are addressed in Sections 4.1, 4.2, and 4.6.
Visual	54	Key issue - see Section 4.4
Property issues	51	Key Issue - see Section 4.5
Consultation	44	Integral Energy has undertaken extensive consultation with the community, government agencies and other project stakeholders. It has complied with all statutory requirements for consultation, public exhibition of the EA, and consideration of submissions under the EP&A Act.
Social impacts	38	These concern issues of equity and costs, ie some residents claim adverse impact and losses from the proposal for the benefit of the wider community. Also, perceived inequity in not having underground lines in the area when some parts of the growth centre have underground cabling. Integral Energy's response to these issues is considered reasonable. See related discussion in Sections 4.2, **Error! Reference source not found.**, 4.4, and 4.5.
North West Sector related	28	Related to discussion on need and timing of the electricity

Issue	Number of submissions	Department's Consideration
		supply augmentation - Section 4.1.
Other	24	Miscellaneous issues raised included: non-disclosure of fees paid to the environmental consultants; political party promises about undergrounding; TV and radio interference; potential bushfire risk. Adequate response provided by the Proponent in the Submissions Report. Environmental control measures addressing the last two items are incorporated in the Proponent's SoC and in this report's recommended Conditions of Approval.
Support proposal	9	Integral Energy has modified the original Project in the Submissions Report. The modified proposal is effectively Option D which is substantially similar to Option C (the preferred option) in terms of its physical aspects and other option selection criteria and performance measures. The modified proposal provides a reasonable balance of environmental, social and economic benefits and impacts as the original Project.
Flora and fauna	1	Potential impacts can be adequately managed through the proposed environmental control measures.

4 ASSESSMENT OF THE PROJECT'S KEY ISSUES

This Section of the Report provides the Department's assessment of the Project's key issues. The assessment is based on an examination of the Environmental Assessment, issues raised in submissions, the Proponent's Submissions Report and the Panel Report.

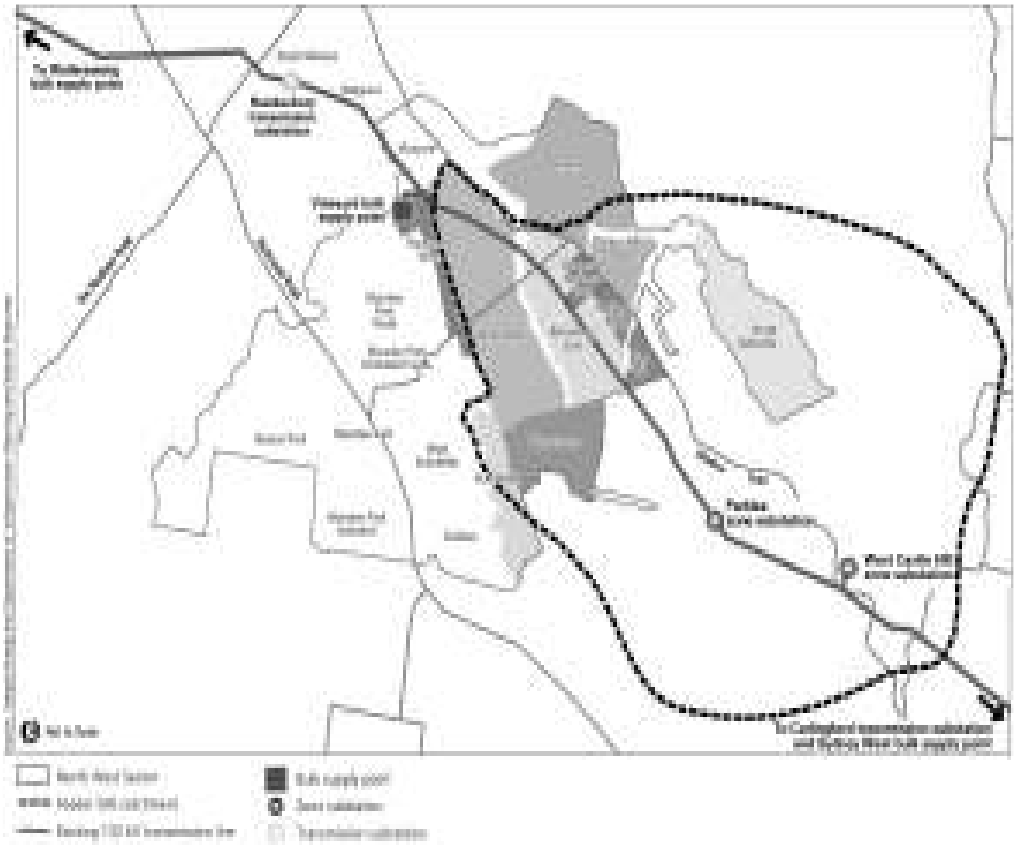
4.1 Need and Justification for the Project

4.1.1 Background

In 2004, the NSW Government announced new land releases in Sydney's North West Sector. Approximately 60,000 new dwellings are proposed to be developed in this area over the next 25-30 years. Existing rural and rural residential areas will be transformed into a mixture of low and medium density development comprising residential, commercial and industrial activities. These areas include Vineyard, Riverstone, East Riverstone, Box Hill, Schofields, Alex Avenue and Area 20, which are within the catchment area of the proposed upgrade of Feeder 9JA.

Electricity demand on the present line has increased substantially over the past 50 years. It is forecast to double over the next 10 years. By 2014/15, demand is predicted to exceed 200 MVA which is equivalent to servicing 38,000 dwellings. Integral Energy estimated that a total future demand of 500 MVA will be required for a fully developed North West Sector. The proposal is for two 500 MVA circuits, one circuit for providing supply and the other for back-up of supply. The total catchment area that will be served by the feeder upgrade is shown in **Figure 3.**

Figure 3: Location of North West Growth Centres and Catchment Area of Feeder 9JA



The proposed upgrade is needed to ensure reliable electricity supply to existing customers during peak periods and to adequately cater for the anticipated scale of development and population growth in the North West Sector. As stated in the Environmental Assessment (EA), the primary objectives of the Project are to:

- provide sufficient capacity to meet current and predicted future demand for electricity;
- provide a safe, secure and reliable supply of electricity; and
- provide for the orderly and economic development of land.

The EA indicated that the North West Sector network is already deficient in the following areas, hence the need for the proposed upgrade. The current deficiencies are:

1. *Insufficient capacity* – Parklea and West Castle Hill substations are supplied with electricity via Feeders 9JA and 229. These feeders each have a peak capacity of 84 MVA under 'single contingency (N-1) conditions'. However, they are individually being operated at 45 MVA for reliability purposes. In theory, they could service a total demand of 168 MVA but with no back-up.

   In the summer of 2003-04, the measured peak demand on these two substations was 117 MVA, which is 33 MVA above the capacity of either feeder. This is manageable while the substations are serviced simultaneously by the two feeders. However, should a fault occur in either one of the feeders during peak demand periods, a consequence would be widespread blackouts as neither of the feeders is able to supply the full demand of both substations (117 MVA) on its own and there is no back–up for either feeder. This situation is known as 'load at risk' (33 MVA in this example) and is the difference between demand and supply.

   Integral Energy estimated that the load at risk in 2008 will be approximately 80 MVA, accounting for the existing capacity shortfall and additional capacity required by committed commercial and industrial development. Beyond 2008-09 there will be no ability to meet any increase in demand even with all the network elements in service.

2. *Inadequate security of supply* – due to the deficiencies in the existing capacity of Feeder 9JA, electricity supply is not secure. The proposed upgrade is needed so that the system can still supply load when a fault occurs during a planned or unplanned event.

3. *Asset Age* – Feeder 9JA was built in 1952 within a 30 metre wide easement to supply a predominantly rural area. The line is old and has reached the end of its lifespan. A new upgraded line is needed to improve current reliability of supply and to cater for the 70 MVA committed commercial and industrial supply as well as the future residential development of the sector.

The EA indicated that the upgrade of the first circuit needs to be completed by December 2007; and the second circuit by December 2008.

4.1.2 Key Issues

A principal issue raised in the public submissions relates to the need for the augmentation of supply but more critically, the timing for such augmentation.

With the notable exception of the Anti -Transmission Tower Action Group (ATTAG)[1], most of the submissions on the project EA and to the Panel generally accept the need for the upgrade. However, the urgency and timing of the upgrade are the main issues being questioned by Blacktown City Council and the Rouse Hill Heights Action Group. These parties submitted the following arguments:

- Need for augmentation would not be "essential" until at least 2009/2010 due to the commissioning of a new zone substation at Bella Vista in 2005/06;
- Rezoning of rural land for urban purposes has not commenced. The EA suggestion that a substantial amount of development will occur in the supply area between 2006 and 2009 is optimistic;
- Upgrade is only urgently needed because Integral Energy has failed to plan ahead adequately.

4.1.3 Department's Consideration

Need for Upgrade

Figure 3.3 of the EA (Volume 1) shows the current demand forecast over the next 10 years. The graph indicates demand exceeding supply from 2003-04. As documented by Integral Energy, this is manageable up until a point at which the forecast demand equals the combined capacity of Feeders 9JA and 229. This point is reached in 2008-09 beyond which there is no ability to supply any additional customers. The expected commissioning of a new substation at Bella Vista[2] in December 2006 will temporarily remove some load from Feeder 9JA. However, the peak demand of Feeder 9JA will continue to grow as the North West Sector develops. Figure 3.4 of the EA (Volume 1) shows that by 2014/15, some 8,000 customers may not be able to be supplied at all. This number can be expected to increase well into the future unless the capacity of the system is sufficiently upgraded. The load

[1] ATTAG considers that the requirement for moving power laterally (as well as a southerly direction) is creating the perceived need for the upgrade. It argues that the proposed upgrade is not necessary as power demand transfer in an east-west direction from the Schofields Road site could be achieved by the Marsden Park zone substation to be built in the future. See Integral Energy's response to this issue in the Submissions Report, item 88, page 4-30.

[2] Integral Energy advised that when Bella Vista Zone substation is commissioned, it will initially be supplied from the Sydney West bulk supply point via Blacktown transmission substation/Carlingford transmission substation/Baulkham Hills transmission substation. When all the elements of the strategy for the North West sector are implemented, as described in Section, Vol 1 of the EA, the Bella Vista Zone substation will be supplied from the Vineyard bulk supply point.

capacity of the upgrade is based on the Department's growth figures proposed for the North West Sector which it considers to be valid for infrastructure planning.

The Department considers that the need and justification for the upgrade has been sufficiently demonstrated. As with the Panel, the Department fully accepts the need for the increased capacity to ensure a secure electricity supply for current and future population in the North West Sector. The Panel is of the opinion that such foresight and action is required of any electricity provider. As discussed below, there is a current need to provide a secure supply. This obviates the Marsden Park option mentioned by ATTAG as an alternative to 9JA.

Timing of Upgrade

Some submissions questioned the urgency of the upgrade given that rezoning of the area for urban development has not occurred and hence, the upgrade should be deferred until such time in the future. In this regard, the Department is convinced of the need to complete the upgrade by December 2007/08 (Integral Energy's timeframe) and not delay it for a few more years. The reasons for this are:

- capacity is limited while residential, commercial and industrial development demand continues to grow (70 MVA is already committed for current commercial and industrial developments); and
- reliability of supply is an issue.

Timely upgrade would assist in the orderly planning and development of land in the North West Sector. The Department supports the Panel's view that additional capacity must be provided before the load growth forecasts exceed current feeder capacity. The need to meet reliability standards is an essential requirement now and is independent of future urban development demands.

4.2 Alternative Routes and Undergrounding

4.2.1 Background

The EA provided a detailed and comprehensive assessment of the project options, including a description of the process for option selection that included participation by the Community Advisory Group and various government agencies.

Four potential development corridors for the proposal were identified between the Vineyard bulk supply point and the future site of the Rouse Hill Switching Station[3]. These corridors were:

- Riverstone Parade, Railway Terrace, Schofields Road;
- Hamilton Street, McCulloch Street, Boundary Road, Schofields Road;
- The route of the existing Feeder 9JA alignment; and
- Windsor Road, Schofields Road.

Twelve project options A–L (including overhead, underground or a combination of these) were then developed from the feasible corridors. These comprised options using the existing easement, various public roads, the Eastern Creek floodplain area, and combinations of these.

The criteria and performance measures used for assessing the various options were grouped into the following categories:

[3] As indicated by Integral Energy, the site of the Switching Station on Schofields Road was dictated by its strategic location at the approximate 'centre of load' of the North West Sector. This will minimise the length of all future electrical connections and help reduce the cost of future augmentations.

- Demand and supply issues;
- Design, construction, operation and maintenance characteristics;
- Impacts on the biophysical environment;
- Impacts on the community; and
- Financial and economic impacts.

Option C was identified as the preferred option in the EA because it was found to provide the best balance between environmental, social, economic and design criteria. This option is an overhead line along the route of the existing easement involving 43 twin sets of steel poles, 22 m high on average, and using twin Mango conductors with a total of 14 wires. Subsequently, Integral Energy has modified the proposal involving use of a different type of conductor, relocation of some poles and height changes to certain poles.

4.2.2 Key Issues

Options development and assessment generated the most number of submissions from the public submissions. Most of these preferred underground cabling for reasons of visual amenity, health concerns from magnetic fields emissions, protection of property values, and overall urban outcomes.

The proposed upgrade on the existing easement is supported by some resident groups (Schofields Road, Riverstone Parade and Railway Terrace Residents Group and the Marsden Park Scheduled Land Committee) whose dwellings are within or adjacent to the alternative routes considered. They also supported undergrounding on the existing easement. Most of the remaining submissions opposed the proposal and preferred undergrounding claiming that this would remove social and environmental impacts and result in an improved and more acceptable urban environment.

Blacktown City Council and several community groups comprising ATTAG, RHHAG and VRMPD expressed a unanimous desire for undergrounding in their submissions, and in additional representations to the Department. Blacktown City Council also suggested consideration of other alternative routes such as the area's floodplain corridors or co-location with existing infrastructure corridors.

Numerous issues on options development and assessment were raised in the submissions. Typical comments were:

- Community consultation has not led to a better solution;
- Integral Energy only considered the bottom line when selecting options;
- The options assessment process was biased. It undervalued the negative externalities of the preferred solution. The underground option has many positive outcomes over overhead lines;
- Integral Energy should relinquish the easement. It has not included the opportunity cost of the easement in its calculations of environmental and social impacts; and
- Financing methods such as development levies could be implemented to pay for undergrounding.

4.2.3 Department's Consideration

The following is the Department's consideration of the Proponent's preferred option (modified Option C)[4] and the undergrounding alternative. It also addresses the other options suggested by Blacktown City Council. This assessment also considers the Panel findings.

[4] Option C has been modified – see below. For the purposes of the following discussion, Option C and the modified version are effectively the same, except for reduced visual impacts, and a small cost increase.

Why Option C and not underground

A large number of submissions criticised Integral Energy for choosing Option C primarily on cost considerations. Option C at $16.8 million is less than a quarter of the cost of a fully underground option along the existing easement (ie Option E at $72.8 million).

Integral Energy in its Submissions Report justified Option C (and as modified) both on costs and other considerations, as follows:

- undergrounding would not meet the 'prudent investment' test[5] of the National Electricity Rules and IPART. The suggestion of using development levies or capital contributions from the wider community (some 800,000 existing customers) cannot be justified on equity considerations;
- the proposal would provide greater flexibility for reconfiguration or relocation of the infrastructure in the future, should it be required and certain conditions are met;
- an upgrade using the existing easement would provide certainty that the Project could be completed in the time required; and
- finding fault with underground cables is more difficult than overhead wires. If a fault occurs, the rectification of that fault may take days or weeks for underground cables whereas only a few hours or a day for overhead wires.

Consistent with the Panel, the Department endorses the preferred option as a short term solution and considers that undergrounding has merits but funding mechanisms for undergrounding would require further investigation. It would not be appropriate to underground now while the details of the urban form are not yet determined. An appropriate time for investigation of undergrounding potential is when the area is about to be redeveloped (such that subdivision patterns and funding mechanisms are known to inform the feasibility of that option). The Department also believes that it would be cheaper to construct an overhead line and underground it later than to construct an underground line and then to relocate it.

Modified Project

The Panel has not considered the modified Project, which is essentially the same as the original Project except for the 'Invar'[6] type of conductors used. Integral Energy is seeking approval for the modified Project.

The modified Project is effectively Option D[7] in the EA. It has a higher capital cost than Option C ($17.4 million vs $16.8 million) and would have less overhead wires (8 vs 14), which would have some effect on reducing visual impact. On balance, the Department considers that the modified Project remains cost-effective and would have minimal social and environmental impacts, in the short term.

Undergrounding

Blacktown City Council, a large number of residents/landowners and the Member for Riverstone, Mr John Aquilina MP vigorously supported in both submissions and representations the undergrounding of 9JA relative to the other project options in the EA. The Department, whilst cognisant of the reliability and demand objectives of the proposal, has carefully considered the merits and practicality of undergrounding 9JA either immediately, or as urban development occurs in the Riverstone and Riverstone East release areas as predicted over the next 5-10 years.

[5] Investment which is the most economically cost-effective option to address limitations in the network, to meet reasonable customer and community expectations, and to meet appropriate network service standards.

[6] This is a new technology, high-temperature type of conductor. The Mango conductors proposed for Option C are standard technology commonly used by Integral Energy in its transmission network.

[7] See Figures 4.8c and 4.8d and Table 4.4, Volume 1 of the EA for comparisons of project description, selection criteria and performance measures for both Option C and Option D.

The route of 9JA Feeder runs along an existing easement on land currently zoned General Rural (1A) under the Blacktown LEP. The land includes the Riverstone and Riverstone East release areas which are earmarked for urban redevelopment in accordance with the Growth Centres SEPP, North West Growth Centre Structure Plan, and the North West Growth Centre Precinct Plans.

To ascertain whether undergrounding was justifiable, the Department commissioned independent reports on both (a) whether there was precedent for undergrounding in rural areas earmarked for urban residential development, and (b) the costs and relative benefits associated with undergrounding. These reports were respectively prepared by Paul Broad and Burns and Roe Worley.

Precedent

The Broad Report (**Appendix 3**) indicated that there is an established precedent of energy distributors such as TransGrid and Energy Australia having already undergrounded up to two thirds of their distribution networks in the CBD and in other urban areas. In most cases undergrounding occurred in existing urban environments or as urban development took place. The report did not identify circumstances where undergrounding had occurred in rural areas on the basis that these areas would one day be redeveloped for urban purposes.

Notwithstanding, the Broad Report found that an undergrounding option could be supported to meet both current replacement and reliability upgrade requirements and to meet the objectives of the Metropolitan Strategy when urban redevelopment occurred given the benefits that would be derived. It was suggested that a multi-contributor approach to funding could be adopted with beneficiaries contributing through developer charges, the Government contributing to meet the broader amenity objectives and the sunk cost of replacement of aged assets passed through in electricity tariffs.

Review of Project Costing

The Department also questioned the EA's costing for undergrounding the 9JA Feeder using Integral Energy's own engineering specifications. The review by Burns and Roe Worley (BRW) focused on a comparative cost examination between the proposed modified option and a fully underground option along the exiting easement (Option E). A copy of the BRW Report is attached (**Appendix 2**). The report found that while the cost differential between the proposal and a fully underground option had narrowed considerably, it was still significant at $40 million (2006 material prices) compared to Integral Energy's cost figure of $55 million. Similarly, the Broad Report acknowledged there is a significant cost difference between aboveground and underground options although it was recognised that the quantifiable costs of undergrounding electricity cables is substantially higher than the quantifiable benefits.

The Department believes there is little supporting justification to undergrounding the line now. Several factors support this conclusion, including:

- there remains considerable cost difference between undergrounding and the proposed overhead line;
- until the land is rezoned for urban residential development, beneficiaries are unlikely to be in a position to fund undergrounding;
- this is consistent with IPART recommendations in 2002 that beneficiaries should pay for the discretionary undergrounding of powerlines;
- undergrounding in rural areas while the details of the urban form are yet to be determined may compromise optimal subdivision patterns in the future;
- National Electricity Rules require that any such project be 'prudent investment' (i.e. cost effective); and
- lack of certainty that IPART (or the Australian Energy Regulator) would permit costs of undergrounding the 9JA Feeder now to be "passed through" to consumers.

Similarly, the Independent Panel found no justification for undergrounding the 9JA Feeder now and recommended that the potential for undergrounding be investigated by the Growth Centres Commission when the area traversed by Feeder 9JA is considered for rezoning for urban development. The panel also recommended that investigation would be required on the basis of the easement being relinquished by the Proponent as partial compensation for undergrounding and the balance of funding to be provided by the developers.

The Department understands the desirability of undergrounding the 9JA Feeder. However, there is little justification for this to occur now as there is no immediate funding and the upgrade must occur in the next few years due to existing reliability and capacity issues. The Department does however recommend that all efforts be made to negotiate the undergrounding of the 9JA Feeder when the Riverstone and Riverstone East Release Areas are rezoned and redeveloped. In addition, planning in general for future electricity infrastructure would be better coordinated with future urban development programs to ensure both systematic and optimal outcomes for the urban environment.

Consequently, the Department recommends Conditions of Approval that require the Proponent to:

- negotiate in good faith with the Growth Centres Commission (or a nominated developer) regarding the undergrounding of any relevant sections of the line, if and when residential urban development is approved on land traversed by the existing or future easement (including the Riverstone and Riverstone East Release Areas). Further, that it makes an appropriate contribution to the costs of doing so; and
- that when any such proposal arises, provide regular reports to both the Minister for Planning, Minister for Energy and the Treasurer on the progress of any such negotiations. Further, that the Proponent complies with any reasonable requirements agreed to between these Ministers.

Additional routes and co-location with other infrastructure

In addition to the alternative routes considered in the EA, other routes suggested for the new line are along the floodplain corridors or co-location with road or rail corridors. The Panel considered all of these suggestions in their report with particular regard to Integral Energy's response on these matters.

- Along First Ponds Creek Floodplain – this option would entail a number of requirements, ie acquisition of a new easement through privately owned lands currently unencumbered by an easement; establishment of a switching station at Hambledon Road/Schofields Road; connections to the 9JA alignment; and pole heights meeting the Probable Maximum Flood levels.
- Along the Eastern Creek Floodplain – similar requirements as those for the First Ponds Creek corridor. A switching station would need to be established and a new easement acquired.
- Co-location with the North West Rail Link - based on RailCorp advice, it is likely that any future NWRL extension will go via Box Hill to the Richmond line, and would not follow the existing 9JA easement. To date, there is no defined route nor committed government funding for this rail link. The timing differences are a fundamental issue – the electricity upgrade is needed immediately whereas the NWRL extension from Rouse Hill to Vineyard would not be completed before 2020. The implications of the proposed upgrade not proceeding within the more immediate timeframe would mean: declining reliability of supply for existing customers, limited future development of the North West sector, and inability to meet statutory requirements in terms of providing a secure supply for this growth sector.

In relation to use of major arterial roads (eg Windsor Road, Schofields Road) for the proposal, the Panel agrees with Integral Energy that options using the road reservations were not practical as these would necessitate partial or full undergrounding of the transmission line within the reservations. In respect of

Windsor Road, Integral Energy claimed that there are many technical difficulties and construction/maintenance impacts of co-location for either an overhead or underground option. There are also timing differences between the Windsor Road upgrade project (well advanced) and the proposed upgrade. Divergent timeframes are also a particular issue with co-location along Schofields Road where road upgrading is not expected to begin until 2010. These works will also receive consideration as part of the undergrounding investigation.

In relation to other issues raised concerning options development, Integral Energy has responded to them in its Submissions Report. The Department considers the response provided to be reasonable.

Conclusion

Given the above considerations, the Department is satisfied that the modified Project (which is substantially similar to the original Project) would provide a reasonable balance of social, environmental and economic considerations and could be recommended for the Minister's approval. It considers that the options development and assessment process undertaken by Integral Energy is adequate. While some submissions claim that the consultation conducted was ineffective, Integral Energy has demonstrated that the initial Project (and the subsequent modified Project) would have minimal social and environmental impacts relative to most of the options considered.

While the Department considers that the proposal is neither appropriate nor achievable in the current circumstances, the undergrounding of the line in the longer term would be highly desirable. To this end, the Department recommends Conditions of Approval that require the Proponent to:

- negotiate in good faith with the Growth Centres Commission (or a nominated developer) regarding the undergrounding of any relevant sections of the line, if and when residential urban development is approved in the areas traversed by the existing or future easement; and
- that when any such proposal arises, provide regular reports to both the Minister for Planning, Minister for Energy and the Treasurer on the progress of any such negotiations. Further, that the Proponent complies with any reasonable requirements agreed to between these Ministers.

4.3 Electric and Magnetic Fields and Health

4.3.1 Background

All alternating electric currents generate electric and magnetic fields (EMFs). This includes electricity transmission lines such as 9JA.

The electric field emanating from a transmission line depends on the voltage, while the magnetic field depends upon the current (the amount of electricity flowing through the wires).

The potential health effects of EMFs are a concern amongst many people in the community.

EMF Policy

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) has published information on its web site dealing with powerlines and human health. Some of the key conclusions are:

- Electric fields can be easily shielded;
- Shielding of magnetic fields is technically difficult – increasing distance from the source is the easiest way of reducing exposure. Buried transmission lines generate lower magnetic fields, because of their design;

- Human studies have consistently shown that there is no evidence that prolonged exposure to weak electric fields results in adverse health effects;
- Whether chronic exposure to magnetic fields is equally harmless remains an open question. However, the studies to date have indicated either no association or a weak association with adverse health effects. Thus, the majority of scientists, and Australian radiation health authorities in particular, do not regard chronic exposure to 50Hz fields at the levels commonly found in the environment as a proven health risk;
- The widespread use of electricity means that everyone is exposed to EMFs from a variety of sources; and
- On balance the scientific evidence does not indicate that exposure to 50Hz EMFs found near powerlines is a hazard to human health.

To the extent that there are concerns, they now focus on magnetic rather than electric fields.

There are currently no Australian standards regulating exposure to these fields.

The National Health and Medical Research Council (NHMRC) had issued Interim guidelines on limits of exposure to 50/60 Hz electric and magnetic fields. These guidelines were aimed at preventing immediate health effects resulting from exposure to these fields. The recommended magnetic field exposure limit for members of the public (24 hour exposure) was 1,000 milligauss (mG). It should be noted that this limit did not apply to cancer risk resulting from chronic exposure to 50 Hz magnetic fields. The equivalent electric field limit was 5kV/m. It should also be noted that these guidelines have been rescinded and are now under review.

In Australia, it is common to apply the Principle of Prudent Avoidance – without 'undue inconvenience' (simple, easily achievable measures) and at modest cost, to reduce EMF exposure.

NSW Health has advised the Department of its policy on magnetic fields. It stated that it would be appropriate to use the Prudent Avoidance Principle when considering magnetic fields associated with new or upgraded high voltage power lines, with the objective of minimising the level of magnetic field exposure for residents. It added that, in areas where future higher density development is likely, it would be highly desirable to avoid creating levels of magnetic field exposure higher than those that existed prior to the upgrade, and it would be desirable to explore options to decrease levels to lower than previously existed.

EMF levels – 9JA and the proposed Upgrade
The EA sets out existing and predicted EMF levels.

It states that electric fields will be about 5% higher under the proposed lines than currently, and about 60% higher at the easement edge.

Magnetic fields will vary with load. As load will grow over time, the magnetic field will similarly increase over time. Field strength for a range of years was identified graphically in Figure 7.3 of the EA, and tabulated in Attachment 2 to the EA's Technical Paper 8.

These showed that current field strength is about 11.7mG at the easement boundary. Under the proposed lines, it will fall to about 6.1 mG in 2007 (at almost double the current load), rising over time as load increases, to about 18.1 mG by 2043. The current field strength (11.7mG) will be exceeded some time before 2031.

The chosen design configuration means that magnetic field levels are much lower for a given load under the proposed lines, compared to the existing line.

The EA noted that EMF levels would be well below the old NHMRC guideline levels.

Integral Energy has since advised that it proposed to modify some pole heights and has carried out further detailed design work. Consequently, it has remodelled the magnetic field strength predictions. These predictions are presented in Table 6.2 of the Submissions Report. This shows magnetic field strengths on a span by span basis instead of a universal number for the whole line. It also shows a substantial reduction in the field strengths. Predicted field strengths for the proposed lines, at the easement edge in 2043, vary from about 5.4 mG to about 13.8 mG. This compares to the 18.1 mG predicted in the EA, and the current 11.7 mG. In all but four spans, field strength will be below the current level.

4.3.2 Key Issues

Widespread concern was expressed by community, in their submissions, about the possible health effects of EMFs. The range of issues is detailed in Section 4.2.9 of the Submissions Report. The issues included potential adverse health impacts, the relevance of standards cited in the EA, need to use more conservative standards (i.e. much lower limits), need to widen the easement, and need to use other options such as undergrounding.

NSW Health and the Sydney West Area Health Service made submissions to the Environmental Assessment, and made a presentation to the Panel.

Essentially, they:

- Acknowledged the need for the proposal;
- Reaffirmed the uncertainty of magnetic field health effects, and that current evidence is not sufficient to establish that these fields cause cancer;
- Stated that Prudent Avoidance is still appropriate;
- Stated that magnetic fields should not be increased and preferably be reduced;
- Stated that the current magnetic field level of 11.7mG (identified as 'abnormal' in Figure 7.3 of the EA) should be the baseline for comparison of options;
- Stated that the preferred option could increase magnetic fields in the longer term;
- Stated that further consideration should be given to the means of reducing magnetic fields, including control of development density, easement widening and undergrounding.

4.3.3 Consideration

The Department acknowledges there are a range of views on the EMF issue.

The Department's position is that it must place the greatest weight on the views of the expert authorities which, in this case, include ARPANSA and NSW Health. It also notes that the Minister appointed a senior representative of ARPANSA to the Panel, to ensure the community's EMF concerns were properly and expertly addressed.

Given this, and for the reasons stated in Section 4.3.1, the Department considers that attention should focus on magnetic fields, and not on electric fields.

Integral Energy has accepted, in the Submissions Report, that it is "not unreasonable" to regard the current magnetic field levels generated by 9JA as a reference point.[8] However, it has questioned its use as a standard or benchmark, as it would be arbitrary. It also argues that Prudent Avoidance is about addressing the means of reducing fields without undue inconvenience and at modest cost, rather than aiming for a particular target.

The Department acknowledges that the use of the existing field levels could be arbitrary. However, it accepts the desirability of limiting any increase in magnetic fields and of reducing fields where practicable.

The Panel has stated that it "is inclined to adopt the more precautionary approach advocated by the NSW Department of Health". The Panel also noted that with future urban development, an increased number of people could be exposed to higher fields than currently exist.

The predicted magnetic field levels identified in the Submissions Report largely achieve the goal of controlling or reducing magnetic fields. Table 6.2 of the Submissions Report shows that for 38 of the 42 spans the magnetic field strength in 2043, at the edge of the easement, will be below, and often significantly below, the current levels. No data has been provided for earlier years, but as the load should be lower, magnetic fields should also be lower.

As this new information was presented after the public exhibition of the EA, and it is very different from the information presented in the Environmental Assessment, the Department recommends that independent verification of the revised predictions be obtained prior to construction commencing. It also recommends that mitigation measures be applied if the verifier finds that the field strengths will be greater than the levels identified in Table 6.2. Such mitigation might involve a small increase in pole height (up to a metre).

However, there are four spans where the predicted magnetic fields will, by 2043, exceed the current magnetic field levels.

The Panel, in addressing the issue of increased magnetic fields (based on the Environmental Assessment data) discussed a number of options including undergrounding, reducing development density and easement widening.

It did not favour reducing development density. It also did not favour undergrounding in the short term, although it did recommend that this option be re-considered when urban development is being planned.

The Panel did favour, in effect, a nominal 'widening' of the easement to 45m (from 30m), as this would ensure that magnetic fields did not exceed current levels (based on the EA data) at the easement edge. Rather than require a new easement, it recommended that Integral Energy compensate the owners of legally existing dwellings that were partially or wholly located within the 45m corridor. The Panel did not detail what compensation might entail, other than to state it should allow owners to "reconfigure their dwelling, or relocate within the property or elsewhere, prior to the operation of the transmission line". The Panel estimated about eight dwellings would be affected.

[8] In the Environmental Assessment, more emphasis was placed on the magnetic fields that the existing 9JA could produce at full capacity (84 MVA) rather than the fields currently generated (based on the line being used at 45 MVA). If the former were used, 'existing' field levels would be higher, meaning that levels generated by the new lines would not exceed 'existing' field levels at any time up until 2043. NSW Health supported the use of the latter, lower numbers, as the appropriate baseline. The Panel has generally agreed with the NSW Health approach to magnetic fields.

The Panel did not have the opportunity to consider the new magnetic field data prior to submitting its report to the Director-General. The Department's examination indicates that two dwellings could, by 2043, be affected by magnetic field strengths greater than current levels.

The Department considers that the very specific circumstances of these two dwellings would justify their acquisition, subject to the owners' agreement. Apart from the long term magnetic fields issue, these dwellings would experience the most visual impacts because other transmission lines (TransGrid) cross these properties. At these locations, Integral Energy is effectively obligated to use lower poles so that it can safely pass under the TransGrid lines. The lower poles reduce opportunities to decrease magnetic field strengths. The Department emphasises that this should not be seen as setting a precedent for other transmission lines

The magnetic field predictions for the remaining six identified dwellings will be independently verified. Should the verification review identify that any such properties will be affected by magnetic fields greater than 11.7mG by 2043, the Department recommends Condition of Approval No 60 which requires the Proponent to facilitate reconfiguration/relocation of dwellings upon request of their owners.

Conclusion

The Department accepts that there is concern about the potential health impacts of EMFs. However, based on the predicted changes in magnetic field strengths, and the views of the Panel and relevant authorities, it does not appear the new lines will have any significantly greater impact on human health than the current line. In most instances, magnetic field strengths will be reduced.

It accepts the desirability of NSW Health's goal of controlling or reducing exposure to magnetic fields, and accepts the Panel's recommended approach to addressing this goal, in this instance. This goal will largely be achieved by the proposal put forward in the Submissions Report. As a further precaution, the Department recommends acquisition of two properties and reconfiguration/relocation of the other dwellings should the verification review process identify magnetic fields greater than 11.7mG in the very long term.

The Department recommends conditions be imposed that:

- require Integral Energy to acquire the two identified properties;
- require independent verification of Integral Energy's revised magnetic field strength predictions for the remaining six dwellings, and where any of these will be affected by increased magnetic field levels, to undertake or fund measures that will enable landowners to reconfigure or relocate their dwelling;
- require the application of mitigation measures at source to ensure that the predictions are achieved; and
- require the development and implementation of a magnetic field monitoring program for the Director-General's approval.

Recommended Conditions of Approval Nos 56, 58, 59 and 60 reflect these requirements.

4.4 Visual impact

4.4.1 Background

An assessment of the potential visual impacts of the proposal is provided in Technical Paper 6, Volume 3. The assessment addressed the visibility of the proposal and the ability of the new line to be

'absorbed' within its existing and expected future landscape. Ten landscape character units were identified within the study area.

The visual impact of the proposal was derived from a matrix of visibility and visual absorption capacity ratings from specific local vantage points. Vantage points with high public use such as main roads, rail corridors and railway stations, neighbourhood centres and access points to reserves were selected for analysis.

The proposed twin steel poles are 5 m taller on average than the existing H-shaped wooden poles along the alignment. These structures may be visible above the tree canopy in some places, and the proposed widening of the cleared area of the easement would increase the overall level of visibility. Also, there would be more wires – 14 and 8 respectively for the original and modified proposal vs three from the existing line.

4.4.2 Key Issues

Most of the submissions expressed concerns about the severity of visual and amenity impacts of the proposal. These claim that the height of the new lines will detract from the future residential character and amenity of the Vineyard to Rouse Hill area and have a detrimental effect on property values.

4.4.3 Department's Consideration

An overhead line has been a long-standing feature of the area for over 50 years. Most people who live in the area bought their properties with the transmission line already in existence.

The greater visual impact of the Project with taller structures and a significant increase in overhead wires is being opposed by the local community. The upgrade is also seen as the one opportunity to remove the existing line and to place the new line underground.

In considering the community's concerns about the Project's visual impact, the Department had regard to the following considerations:

- Integral Energy has largely incorporated in the design of the line the means of mitigating the visual impacts. These are through the use of slender poles finished in a mid-grey colour and conductors finished with an aged, very dull sheen;
- commitment in the EA to retain as much mature vegetation as possible to help mitigate the impact; and
- although the new line would have a greater visual impact than the existing line, transmission lines are not a newly introduced landscape feature in the area.

A further consideration in support of the proposal is the impracticality of undergrounding the line now for the reasons discussed in Section 4.2. Undergrounding is possible as a longer term consideration.

The Department supports the Panel view that the proposed line would be relatively unobtrusive as the poles generally, apart from some areas, do not exceed the height of the tree canopy. However, as substantial changes to the area are expected, it is not certain to what extent existing mature trees outside the easement would be protected. Clearing associated with future development may be substantial and would increase the visibility of the proposal compared to the existing situation.

The Department notes, as concluded in the EA, that the visual impact of the new line once built would be moderate. However, this would change over time as the area is developed and it is likely that the visibility of the structures would increase with clearing associated with future development.

The EA stated that a consideration for the Growth Centres Commission is the ability to effectively incorporate in future development approvals processess a policy of retaining mature trees within the area, and specifically adjacent to the Feeder 9JA easement.

To further reduce the impact of the new line, Integral Energy has modified the Project by replacing the type of conductors used which would result in the approximate halving of the overhead wires from 14 to 8.

Figure 4 illustrates the transmission line as it exists, as proposed in the EA, and as modified in the Submissions Report.

Integral Energy commits to minimise the visual impacts of the proposal through such measures as selective planting of trees/suitable vegetation outside of the easement to provide screening from nearby residences. Clearing of vegetation would also be minimised during both construction and operation of the line. The visual impact mitigation measures will be detailed in the Construction and Operation EMPs. Recommended Condition of Approval No 61 would ensure that these commitments are implemented.

Figure 4: Artist impressions - Existing, as Proposed in the EA, and as Modified

4.5 Property values

4.5.1 Background

A clear community concern is the potential adverse effect of the proposal on property values due to visual impacts and safety and health concerns from magnetic fields exposure. Hill PDA (a property

consulting firm), on behalf of Integral Energy, conducted a study which estimated the change in property prices that would result from the implementation of various proposed options. The study is reported in Appendix E, Volume 2 of the EA.

The method used for the study consisted of a literature review of both local and overseas technical papers on the subject and a survey of 50 real estate agents and land valuers in the area.[9]

The literature review found that for new High Voltage Overhead Transmission Lines (HVOTL), a 2-10% reduction in market value could be expected for properties within 50 m of the infrastructure in established areas. The survey results indicated that the proposed new line would reduce property values by 0-2% for properties located within 50 m of the easement.

4.5.2 Key issues

A substantial number of submissions expressed concerns about property devaluation as a result of the proposal. Local residents believe that the proposal will lower property values more than that stated in the EA. Some claim that their properties will be unsaleable. Blacktown City Council's submission cited overseas studies involving HVOTLs which found a depreciation of values by up to 20%, especially for smaller properties.

Additional representations to the Department questioned the integrity of the survey undertaken by Hill PDA.

4.5.3 Department's Consideration

In its Submissions Report, Integral Energy stated that the results of the Hill PDA report are conservative for the reasons stated in that report. The analysis is strategic and based on englobo land prices and does not purport to be specifically applicable to any particular property. There are many individual factors that influence individual property values. Integral Energy cited examples of development (eg at Carlingford and more recent land releases at Werrington Downs, Rouse Hill and Cambridge Park) where people had chosen to buy properties in close proximity to electricity infrastructure.

Both valuers and estate agents surveyed by Hill PDA found that although properties adjacent to HVOTLs sell, the presence of lines remove some buyers from the market and reduces demand which reduces price.

The Department considers that property valuation is a challenging issue. Although visual amenity and public health issues may have some effect on property values, such values are generally influenced by a wide variety of factors, beyond the direct impact of the development. It would be inherently difficult to quantify the effects of individual developments on property values. As Integral Energy claims, community 'perception' of the environmental issue could influence an impact on property prices rather than necessarily the magnitude of the impact.
The Department considers it arguable that the proposal would significantly reduce property values in the area. The identified impacts could be mitigated to acceptable levels and it is important to see the proposal in the following context:

- there is an existing line now which has been a long-standing feature in the area;
- most current landowners knew about the line when they bought their properties;
- magnetic field impacts will go down in the short term, and continue to do so in the long term; and

[9] Only 36 responded out of the 50 surveyed. The names of the surveyed property professionals were not included in the Hill PDA report. The report identified a range of limitations of the study methods and acknowledged that these would affect the accuracy of the results.

- an overall appreciation in value arising from a more reliable supply of electricity, rezoning and future residential development in the area can be realistically expected.

4.6 Permissibility of Use and Terms of Easement

4.6.1 Background

Part 3A of the EP&A Act
The Project is being dealt with under Part 3A of the EP&A Act. As described in Section 2.1, the proposal was a transitional project that previously was subject to Division 4, Part 5 of the EP&A but was carried over to Part 3A of the Act under a Ministerial Order gazetted on 29 July 2005.

Terms of the Easement
The existing line occupies an existing easement which will be used to build the new line. Many of the easements are "railway easement" and some are "electricity easement".

The EA indicated that Integral Energy has a proprietary interest in the existing easement occupied by Feeder 9JA, but does not own the land. Integral Energy acquired the rights to construct, maintain and operate a transmission line within the existing easement from Prospect Electricity, its predecessor.
The easement was acquired in the early 1950's and crosses approximately 274 landholdings owned by 82 landowners.

4.6.2 Key Issues

The Vineyard Riverstone Marsden Park Development Inc (VRMPD) provided legal advice that contested two related but separate issues. These are: the planning permissibility of the proposal; and Integral Energy's authority to carry out the proposal under the terms of the existing easement.

The VRMPD advice claimed that the proposal was not subject to Part 3A of the EP&A Act but rather required development consent from Blacktown City Council. It also claimed that the proposed transmission lines do not constitute "railway purposes" and therefore cannot be carried out under the terms of the easements acquired for such purposes.

4.6.3 Department's Consideration

Permissibility of use
The Department considers that the proposal is permissible without development consent and hence subject to Part 3A, as discussed in Section 2.1.

Terms of the easement
There are conflicting legal advices as to Integral Energy's ability to use the easement for the proposed upgrade. Integral Energy and Blacktown City Council have advice to the effect that the proposal can be carried out under the terms of the easement given the legislative history of the railways and the framework under which the railway easement was granted. In contrast, additional legal advice to Blacktown City Council and the legal advice for VRMPD concluded that the proposal is not allowable within the terms of the easement. This was essentially on the grounds that the easement was granted specifically for 'railway purposes' and has a limited meaning.

An amendment to the Electricity Supply Act 1995 namely the *Electricity Supply Amendment (Protection of Electricity Works) Act 2006* was enacted on 26 May 2006. Integral Energy has advised this has the effect of resolving any uncertainties about the Proponent's powers to undertake the proposed upgrade.

Ultimately, the Department does not consider that this is a matter to be addressed under the EP&A Act. Rather it is a property matter. Nothwithstanding, a condition requiring Integral Energy to ensure that it has authority to build the new line on the existing easement is included in the recommended Conditions of Approval.

5 CONSIDERATION OF OTHER ISSUES

This Section of the Report provides the Department's assessment of the Project's other environmental issues. The assessment is based on an examination of the EA and issues raised in submissions made during the exhibition period together with the Proponent's response presented in its Submissions Report.

5.1 Soil and Water Management

5.1.1 Background

The EA identified the drainage path and conditions of each section of the proposed alignment (Table 6.1, Volume 1) to the following watercourses in the area: Eastern Creek, Killarney Chain of Ponds, First Ponds Creek and Second Ponds Creek. Water quality in Eastern Creek is regularly monitored by Blacktown City Council. Water quality in First and Second Ponds Creeks is not known to be monitored. The Rouse Hill Sewage Treatment Plant discharges to Seconds Ponds Creek.

The EA identified that the Project could affect the local biophysical environment through:

- transport of sediments (or other pollutants) from construction sites, work compounds or vehicle access tracks, particularly where the highly erodible South Creek soils may be intersected;
- carriage of spoil by vehicle tyres leaving construction sites which may be washed into the local watercourses or the stormwater drainage system;
- interactions of foundations with potentially saline groundwater and disposal of potentially saline or contaminated groundwater from excavations;
- accidental spills and leaks of fuels, chemicals, herbicides or other pollutants into nearby watercourses; and
- the effect of the proposed structures to the south of the Vineyard bulk supply point on the Hawkesbury-Nepean system and floodplain.

A range of environmental management measures were proposed in the SoC. These include the preparation of Soil and Water Management Sub Plans as part of the CEMP and OEMP, and mitigation measures such as:

- construction of water retarding structures to minimise sediment run-off on adjacent watercourses;
- progressive rehabilitation of disturbed areas;
- geotechnical and water quality tests to minimise risk of corrosion to buried infrastructure (pole foundations) due to the presence of saline groundwater in the area; and
- regular inspections and maintenance of sedimentation controls, particularly following significant rain events.

5.1.2 Key Issues

No submissions were raised regarding soil and water management. However, the requirement for an estimated 3.4 km of access tracks was stated in the EA, although their location has not been identified .

The Proponent's SoC indicated that the need, design and location of these tracks will be identified by the Construction Contractor. The absence of this information raises issues about the potential impact of the access tracks on soil erosion and water quality and associated impact on flora and fauna and cultural heritage.

5.1.3 Department's Consideration

The Department notes from the EA that the proposed construction works do not require extensive earthworks or large areas of earth to be exposed. Existing access tracks to the easement will also be utilised as much as possible. Consequently, the EA does not predict management of soil erosion and water quality to be problematic.

The Department considers that the location of access tracks is not just for the contractor(s) to determine. It is important that the location and management of access tracks meet certain criteria such as maximising the use of existing tracks, minimising soil erosion impacts on water quality, flora and fauna and cultural heritage, and being consistent with the control measures identified in the SoC in relation to these environmental issues. To this effect, the Department recommends Conditions of Approval Nos 46 to 48 which:

- set out criteria for track selection;
- require the CEMP to identify the location of the access tracks on a map and to demonstrate consistency with the respective management plans for Soil and Water Management, Flora and Fauna and Indigenous Heritage, or specify selection criteria for access tracks; and
- restrict construction of any access track unless the EMR has first certified that it is consistent with the CEMP and/or the defined criteria in the CEMP.

Conditions of Approval Nos 49 to 51 involving soil and water management and incorporating environmental measures proposed in the SOC are recommended.

5.2 Flora and Fauna

5.2.1 Background

The EA provided an assessment of the potential impacts of the proposal on flora and fauna in Technical Paper 2, Volume 3.

Flora
The identified native vegetation communities, which are endangered ecological communities under the NSW Threatened Species Conservation Act (TSC) 1995, are:

- Shale Plains Woodland, a form of Cumberland Plain Woodland;
- Shale Hills Woodland, a form of Cumberland Plain Woodland;
- Shale-gravel Transition Forest; and
- Alluvial Woodland, a form of River-flat Eucalypt Forest on coastal Floodplains.

Cumberland Plain Woodland is also listed as a threatened ecological community under the Environment Protection and Biodiversity Conservation Act 1999.

Eight-part tests under the TSC Act were conducted for the above identified endangered ecological communities. These tests concluded that the proposal is unlikely to have a significant impact. Vegetation clearing and subsequent vegetation maintenance activities would be restricted to areas already cleared or modified.

Desktop investigations and field surveys identified 63 native and 20 introduced plant species along the alignment. Two threatened species, *Dillwynia tenuifolia and Grevillea juniperina ssp. Juniperina,* were recorded during the survey. *Dillwynia tenuifolia* is locally abundant at proposed pole location 11. Approximately 360 of the estimated population of 500+ plants occur within the easement. The location of pole 11 has been modified to avoid impacts on this species.

Seven *Grevillea juniperina ssp. Juniperina* plants (including one dead plant) were identified between pole locations 1 and 2. These species were planted for landscaping of land that was previously cleared.

Eight-part tests were conducted for these two threatened species and others listed (*Pimelea spicata* and *Acacia pubescens*) which concluded that the impact would not be significant.

Up to seven hectares of vegetation, including endangered species, would be cleared for the construction and operation of the new line.

Fauna

Twenty-four threatened fauna species have been recorded or have the potential to occur in the area. These comprise four amphibian species, one reptile species, ten bird species, eight mammal species and one invertebrate species. All of these are listed under the TSC Act and 13 are also listed under the EPBC Act.

Eight-part tests conducted for the Cumberland Plain Large Land Snail (an endangered species) concluded that the impact of the proposed clearing on this species would not be significant.

The EA indicated that all the identified species are considered unlikely to be significantly affected by the proposal for one of more of the following reasons:

- core habitats were not recorded in the study area;
- the area is outside the normal range of the species;
- the species are considered locally extinct; and
- resources used by the species are unlikely to be adversely affected by the proposal.

5.2.2 Key issues

One submission expressed concern about the proposed extensive clearing of the Cumberland Plain Woodland.

As previously noted in Section 5.1, an estimated 3.4 km of access tracks to the easement has not been identified in the EA. Consequently, the potential impacts of these access tracks on flora and fauna have not been assessed.

5.2.3 Department's consideration

The Proponent's SoC indicated the preparation of a Flora and Fauna Management Sub Plan as part of the CEMP and OEMP. The Sub Plans would address a range of construction, maintenance and rehabilitation strategies and measures for flora and fauna management. Specific actions and/or restrictions were outlined to ensure protection for the threatened species *Dillwynia tenuifolia, Grevillia juniperina ssp. Juniperina and the Cumberland Plain large land snail.*

The Department considers that construction impacts on flora and fauna would be manageable provided the mitigation measures identified in the SoC are successfully implemented. Following construction of the Project, a Management Plan will be developed for the *Dillwynia tenuifolia* population for implementation by the Proponent and its contractors.

Recommended Conditions of Approval No 32 to 33 which include environmental measures in the SoC and 46 to 47 relating to access tracks should ensure impacts on flora and fauna are minimised.

5.3 Noise

5.3.1 Background

Construction
An assessment of potential construction noise impacts is provided in Technical Paper 4, Volume 3 of the EA. This indicates that predicted construction noise emissions would generally comply with the relevant criteria under the Department of Environment and Conservation's Environmental Noise Control Manual 1994. An exception is potential exceedances of between 1 and 6 dBA at approximately 10 dwellings immediately adjacent to the proposal.

Vehicle movements will be confined to the easement area with the majority of activities occurring at the pole locations. Access to the easement will be from adjoining public roads. Typical construction vehicle movements are expected to vary between 5 and 30 per hour, the higher figure typical of traffic visiting the compound areas.

No vibration impacts are expected because of the anticipated type of plant involved and the limited amount of excavation work. Due to the low volume of earthworks, the small number of truck movements proposed and the prevailing traffic volumes on surrounding roads, construction traffic noise impacts are not expected to be generated.

Operation
An assessment of potential operational noise impacts of the Project is provided in Technical Paper 5, Volume 3 of the EA. The study focused on two operational noise phenomena known as corona noise and aeolian noise. Corona noise is the faint buzzing or crackling noise heard under certain

meteorological conditions. Aeolian noise is the sound heard when wind blows across a structure or conductor.

Background noise levels were measured at various locations within the area to characterise current noise profiles at different times of the day and night. Project-specific noise design objectives were established from these levels.

5.3.2 Key Issues

No issues regarding construction and operational noise associated with the proposal were raised in the submissions.

5.3.3 Department's Consideration

The EA found that corona noise of between 39 and 44 dBA could be expected during nighttimes. This is up to 9 dBA above the adopted noise design goal of 35 dBA. The level of predicted noise impact is partly a result of the low level of background noise currently present in the area.

The level of aeolian noise depends on wind speed and duration but is also influenced by the number and size of conductors and conductor arrangement. The increase in the number of conductors from 3 to 8 in the modified Project would potentially lead to an increase in aeolian noise.

The Department notes that the corona noise measurements were undertaken from porcelain insulators used on the current line. The refurbishment of another transmission line replacing porcelain insulators with the polymeric type proposed for the new line had eliminated corona noise. Integral Energy commits to using the polymeric type insulators and it is therefore not expected that the Project would result in audible levels of corona.

Aeolian noise would only be problematic when wind gusts exceed 10 m per second. Such conditions occur infrequently at the site and sustained wind speed events are not expected to be common in the area, and thus aeolian noise is not expected to be a source of concern for the proposal.

The Department anticipates that an increase in background noise levels would accompany future development of the area. However, this would not be for some time and would also depend on the particular land uses developed along the easement. This would have the effect of masking the corona or aeolian noise to levels that are likely to be inaudible. On this basis, Integral Energy has not considered it necessary to have specific operational monitoring or mitigation measures.

The Department notes that the SoC includes a range of noise mitigation measures for construction activities. A Noise and Vibration Management Sub-Plan will be prepared as part of the CEMP to identify necessary noise control measures, including noise monitoring/reporting and measures for dealing with exceedances and noise complaints. The Department considers that construction noise should not be a problem provided mitigation measures are properly managed. Recommended Conditions of Approval Nos 39 to 45 which include the noise and vibration-related SoC would

minimise noise generation during the construction period. The SoC also includes a commitment to the use of polymeric insulators to reduce the effect of corona noise.

Integral Energy proposes that construction be undertaken on Saturday pm which is outside standard hours. This has not been fully justified. Therefore, it will be necessary for Integral Energy to address this through the CEMP process, and obtain the Director-General's approval.

5.4 Heritage

5.4.1 Background

The EA provides an assessment of the archaeological and cultural heritage values of the area and the potential impact of the Project on Aboriginal and European heritage values in Technical Paper 7, Volume 3.

The assessment included a search of Aboriginal and European heritage registers and a number of field surveys. The Deerubbin Local Aboriginal Land Council, Darug Tribal Aboriginal Corporation and Darug Custodian Aboriginal Corporation were involved in the site inspections conducted.

Potential Aboriginal Heritage Impacts
The new line would pass through existing Aboriginal cultural heritage sites and landscapes with high Aboriginal archaeological sensitivity. Three identified areas of such sensitivity are:

- the Eastern Creek floodplain;
- the Chain of Ponds and First Ponds Creek north of Windsor Road; and
- the Second Ponds Creek floodplain.

Aboriginal artefacts and artefact-bearing deposits are present within the easement corridor. Construction of the Project would involve surface and subsurface disturbance and excavation in areas of moderate to high sensitivity. Aboriginal archaeological test excavation is proposed to be conducted in the immediate areas of the Vineyard bulk supply point (pole locations 1 to 8), due to its particular sensitivity.

The EA concluded that as the easement areas have previously been disturbed from the construction of the line and its continued maintenance since the 1950's, no impacts on Aboriginal heritage are expected as a consequence of the Project.

Potential European Heritage Impacts
Three European heritage sites have been identified within the study area, these being:

- the Riverstone Railway Station and Yard site;
- the former Riverstone Meat Works; and
- the Grantham Farm and early Riverstone Estate building.

The EA concluded that no impacts on these items are expected due to the distance between these sites and the proposed line.

5.4.2 Key Issues

There were no issues raised in the submissions regarding indigenous or non-indigenous heritage issues.

As noted in Sections 5.1 (Soil and Water Management) and 5.2 (Flora and Fauna), the location of access tracks to the easement has not been identified in the EA. Consequently, potential impacts on Aboriginal and non-indigenous values of activities on these tracks have not been assessed.

5.4.3 Department's Consideration

The Proponent's SoC indicated that a number of initiatives will be undertaken including:

- preparation of an Indigenous Heritage Management Sub Plan as part of the CEMP;
- Aboriginal archaeological test excavation in the immediate areas of pole locations 1 to 8 to be conducted by a qualified archaeologist in conjunction with Aboriginal stakeholder groups to investigate the subsurface profile;
- establishment of an exclusion zone around the Registered Aboriginal Site RL 3 (poles 17 and 18);
- a detailed archaeological survey involving recording and collection of identified Aboriginal artefacts within all areas (other than sealed or gravel roads) where continual tracking of heavy machinery is proposed; at the proposed site compounds; and at all pole construction sites;
- a program of Aboriginal archaeological monitoring and salvage collection in areas of previous disturbance to be conducted by a qualified archaeologist in partnership with Aboriginal stakeholder groups.

The Department considers that the proposed surveys, monitoring and environmental control measures should ensure protection of Aboriginal objects and heritage relics. Recommended Conditions of Approval Nos 34 to 38 and 46 to 47 require the implementation of the proposed undertakings in the SoC and the need to minimise impacts on cultural heritage values when determining the location of access tracks.

5.5 Statement of Commitments and Miscellaneous Conditions

In accordance with section 75F(6) of the EP&A Act, the Proponent prepared a Statement of Commitments that was included in the Proponent's Submissions Report. These commitments, among other undertakings, contain proposed mitigation measures to reduce impacts of a range of social and environmental issues identified in the EA.

The Department's recommended Conditions of Approval incorporate the Proponent's Statement of Commitments as referred to throughout this report. A summary of the Department's recommended Conditions are as follows:

- Conditions of Approval Nos 1 to 5. These include requirements for the Proponent to negotiate with the Growth Centres Commission regarding the undergrounding of any relevant sections of the line, if and when urban residential development occurs in the Riverstone and Riverstone East release areas;

- Conditions of Approval Nos 6 to 15. These cover administrative, compliance and auditing requirements;
- Conditions of Approval Nos 16 to 21 These require the preparation of a CEMP and an OEMP and specify the requirements for an Environmental Management Representative;
- Conditions of Approval Nos 22 to 26. These cover broad communication and consultation with the community, including advertising the construction activities and establishing a complaints management system;
- Condition of Approval No 27 requires the Proponent to submit a program to fund community services and infrastructure in the vicinity of the proposal;
- Conditions of Approval Nos 28 to 30 concern the Proponent's contribution to a demand management fund and implementation of a demand management program;
- Condition of Approval No 31 requires the Proponent to use at least 50% of the site's electrical energy requirements from a renewable energy source;
- Conditions of Approval Nos 33 to 33 cover flora and fauna management;
- Conditions of Approval Nos 34 to 38 cover heritage management;
- Conditions of Approval Nos 39 to 45 cover noise and vibration management and construction hours;
- Conditions of Approval Nos 46 to 48 cover criteria for location of access tracks;
- Conditions of Approval Nos 49 to 51 cover soil and water management;
- Condition of Approval No 52 cover spoil and spill management;
- Conditions of Approval Nos 53 to 55 cover air quality management;
- Conditions of Approval Nos 56 to 58 include requirements for an independent verification of magnetic fields predictions; and a five-year magnetic field monitoring program as part of the OEMP;
- Condition of Approval No 59 require the Proponent to acquire two identified properties due to visual and magnetic fields issues;
- Condition of Approval No 60 require the Proponent to undertake/fund measures towards reconfiguration or relocation of identified dwellings;
- Conditions of Approval No 61 relate to visual impact minimisation measures;
- Conditions of Approval Nos 62 to 64 cover property damage and access;
- Conditions of Approval Nos 65 to 66 cover road dilapidation reports and construction traffic management;
- Condition of Approval No 67 covers hazard and risk management;
- Condition of Approval No 68 covers waste management and recycling;
- Condition of Approval No 69 requires identification and management of alterations to utilities and services; and
- Condition of Approval No 70 specifies location criteria for ancillary facilities such as construction compounds.

6 CONCLUSIONS AND RECOMMENDATIONS

Integral Energy is proposing to upgrade its existing 132kV overhead transmission line known as Feeder 9JA between the Vineyard bulk supply point and a proposed future switching station at Schofields Road, Rouse Hill.

The upgrade is needed to relieve current network constraints and to cater for the expected population growth in the North West Sector. This sector will undergo a radical transformation over the next 25-30 years with the NSW Government plan to allow development of approximately 60,000 new dwellings in this area.

The public exhibition of the Environmental Assessment for the Project attracted over 1100 submissions. Significant concerns were raised by the local community about the Project's visual impact, public health effects from magnetic fields and potential detrimental effects on property values. A large number of submissions expressed a desire for undergrounding and/or an alternative route.

The Minister constituted a Panel of Experts in response to the community's concerns. The terms of reference for the Panel were to consider and evaluate the issues raised in the public submissions taking into account the essential need to augment electricity supply by December, 2007; and the economic, social and environmental justification for the proponent's preferred option.

Panel recommendations

The Panel recommended that the Proponent's preferred option be endorsed for consideration by the Minister. It made two other recommendations, these being: the provision of compensation on grounds of magnetic fields emissions to landowners whose dwellings are within a certain distance from the centreline of the easement; and future investigation of cable undergrounding by the Growth Centres Commission, as the area is rezoned for urban development. Undergrounding would be on the basis of the easement being relinquished by the Proponent as partial compensation for the cost of laying the cables and the balance of funding being provided by the developers.

Modified Project

Integral Energy has modified the Project following consideration of the submissions on the EA. The modifications involved pole relocation, changes in pole height, and use of a different type of conductor, which would almost halve the number of overhead wires. The magnetic fields predictions have been remodelled after the design changes, and with more detailed design data. Various assumptions made in the initial predictions were reviewed which led to new magnetic fields predictions. The effect of these changes is a substantial reduction in magnetic fields at the edge of the easement. Notwithstanding, the Department recommends a Condition of Approval requiring an independent verification of the remodelled magnetic fields predictions. The Condition requires the Proponent to engage an independent expert to review the predictions and to obtain the Director-General's agreement for the expert.

Need for the upgrade

The Department's assessment considered the Panel findings and the Proponent's response to the issues raised by the public submissions. In line with the Panel's view, the Department accepts the need for the proposed upgrade to improve the current supply reliability, as well as to cater for the committed commercial and industrial development and anticipated future demand in the North West Sector. It is satisfied that the proposed upgrade is required as proposed, and not at some future time when the area is being redeveloped. In this regard, the Department notes that Integral Energy's current distributor licence requires that it provides an N-1 capability at the date of commissioning of the new line, ie completion of the first circuit by December 2007; and the second circuit (back-up supply) by December 2008.

Undergrounding

The Department acknowledges that undergrounding of the line would enhance the visual amenity and appeal of the subject area and would also reduce the community's health and safety concerns with magnetic fields. However, it shares the Panel's view that undergrounding relative to the original (and modified) Project is not currently practicable or achievable.

The Department believes that an overhead line would not preclude future opportunities for rebuilding or relocating the line elsewhere should the necessary conditions be met. Compared to underground cabling, an overhead line would provide the flexibility for such relocation, if desired, to enable more optimal and efficient development. An inappropriately located underground line built now would be far more expensive to relocate and may result in sub-optimal implications for future development of the area. The Department notes that, in the absence of detailed urban development plans, it is not possible to define now with certainty where an underground line should be best located.

There are also a number of other factors, as outlined in 4.2 of this report, why undergrounding is not achievable under the current circumstances. These relate to government regulatory tests regarding cost-effectiveness of projects and the lack of immediate funding availability to achieve undergrounding.

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Nonetheless, the Department considers it highly desirable that the line be undergrounded sometime in the future as the area is developed. It recommends Conditions of Approval that require the Proponent to negotiate with the Growth Centres Commission on the undergrounding of relevant sections of the transmission line, if and when urban residential development is approved in the area traversed by the existing or future easement. In that event, the Proponent is obligated to contribute to the costs of undergrounding, provide regular reports to both the Minister for Planning, Minister for Energy and the Treasurer on progress of any such negotiations, and to comply with any reasonable requirements agreed between these Ministers.

Magnetic Fields

Magnetic fields from the new line are predicted to decrease in the short term and will still decrease in the longer term at most locations. There are, however, some existing dwellings within close proximity of the easement that may be exposed to magnetic fields greater than currently exists in the longer term. The Panel recommended compensation for eight properties which are within 22.5 m of the easement's centreline. The purpose of compensation is to enable the owners to reconfigure their dwellings or to relocate within the property or elsewhere.

Integral Energy has since modified the heights of some poles and remodelled the magnetic fields predictions, resulting in a substantial reduction in magnetic fields strength. The Department's examination indicates that two dwellings could, by 2043, be affected by magnetic field strengths greater than current levels. Acquisition of these properties is recommended due to their very specific circumstances involving issues of visual impact and long term magnetic field levels.

Magnetic field predictions for the other properties would be subject to independent verification. Should the verification process identify that any of these dwellings would be affected by increased magnetic fields, Integral Energy would be required to undertake or fund measures that will enable landowners to reconfigure or relocate their dwellings.

Legal issues

Legal advice provided by a residents group contested two separate issues: the application of Part 3A of the EP&A Act to the proposal; and permissibility of the proposed upgrade under the terms of the existing easement. On the first issue, the Department is satisfied that the provisions of Part 3A apply to the proposal. The second issue is a property matter and not a matter to be addressed under the EP&A Act. Nonetheless, Integral Energy has advised that this has been resolved by a recent amendment to the Electricity Supply Act 1995 the effect of which is to protect the presence, operation and use of certain electricity works not protected by easements.

A condition is recommended that requires Integral Energy to be satisfied that it has authority to build the new line on the existing easement. The onus is on Integral Energy to ensure that it has the authority to build a new line on the existing easement before it commences construction.

Conclusion

In conclusion, the Department considers that the Project, as modified, would meet the project objectives stated in the Environmental Assessment. Timely augmentation would improve the reliability and security of power supplies for existing customers and future population in the North West Sector. The modified Project is substantially similar to the original Project in terms of its physical form and other criteria and performance measures adopted. The modified Project is cost-effective and provides a reasonable balance of environmental, social and economic considerations. It would also provide certainty that the upgrade could be completed in the time required. However, there are concerns about its long term compatibility with major urban development.

Overall, the Department considers that the modified Project is justified and that the expected benefits would outweigh any residual impacts which can be appropriately managed and mitigated. However, it considers it desirable that the line be placed underground sometime in the future as the area is redeveloped. Consequently, this report recommends that the modified Project be approved, subject to the recommended Conditions of Approval which oblige the Proponent to negotiate with the Growth Centres Commission towards the implementation of undergrounding in the future.

7 RECOMMENDED CONDITIONS OF APPROVAL

DEFINITIONS AND ABBREVIATIONS

Term	Definition
Ancillary Facility	Temporary facility for Construction that does not form part of the Project. Examples are an office and amenities compound, batch plant (concrete or bitumen), materials storage compound.
Conditions of Approval	The Minister's Conditions of Approval for the Project.
CEMP	Construction Environmental Management Plan.
Construction	Includes all work in respect of the Project other than survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, minor clearing (except where threatened species, populations or ecological communities would be affected), establishing site compounds (in locations meeting the criteria of the Conditions), or other activities determined by the EMR to have minimal environmental impact (e.g. minor access roads, minor adjustments to services/utilities, etc.).
DEC	Department of Environment and Conservation.
Department, the	Department of Planning (DoP).
Director-General, the	Director-General of the Department (or delegate).
Director-General's Agreement	A written advice from the Director-General (or delegate).
Director-General's Approval	A written approval from the Director-General (or delegate). Where the Director-General's Approval is required under a Condition the Director-General will endeavour to provide a response within one month of receiving an approval request. The Director-General may ask for additional information if the approval request is considered incomplete. When further information is requested the time taken for the Proponent to respond in writing will be added to the one month period.
Director-General's Report	The report provided to the Minister by the Director-General of the Department under section 75I of the EP&A Act.
DNR	Department of Natural Resources.
EA	Means the Vineyard to Rouse Hill Electricity Upgrade Environmental Assessment, prepared by Parsons Brinckerhoff, October 2005.
EMR	Environmental Management Representative.
EP&A Act	Environmental Planning and Assessment Act.
Minister, the	Minister for Planning.
Operation	Means the Operation of the Project, but does not include commissioning trials of equipment or temporary use of parts of the Project during

Term	Definition
	Construction.
OEMP	Operation Environmental Management Plan.
Project	The project described in Section 5 of the Vineyard to Rouse Hill Electricity Upgrade EA, Volume 1 and modified in Section 1.3 of the Vineyard to Rouse Hill Electricity Upgrade Submissions Report.
Proponent	Means Integral Energy
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre).
Reasonable and Feasible	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. Feasible relates to engineering considerations and what is practical to build. Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
SoC	Statement of Commitments in the Submissions Report.
Submissions Report	Means the *Vineyard to Rouse Hill Electricity Upgrade Submissions Report* prepared by Parsons Brinckerhoff for Integral Energy (March 2006).
Sensitive Receiver	Residence, education institution (e.g. school, TAFE college), health care facility (e.g. nursing home, hospital) and religious facility (e.g. church).
Stages	Stages refers to the: • division of an Project into multiple contract packages; and/or • Construction or Operation of a Project in discrete sections.
Structure	Residence, farm shed or other building.

ADMINISTRATIVE CONDITIONS

The Project

1. The Project must be carried out consistent with:

   a) the procedures, safeguards and mitigation measures identified in the Environmental Assessment, as modified by the Submissions Report; and
   b) these Conditions.

   These Conditions prevail in the event of any inconsistency with the requirements for the Construction and Operation of the Project arising out of the documents described in (a) above.

2. These Conditions of Approval do not relieve the Proponent of its obligations under any other Act.

3. The Proponent must ensure, prior to the commencement of construction, that the carrying out of the Project is authorised under the relevant easements applying to the land upon which the Project is proposed to be constructed and operated.

UNDERGROUNDING IN FUTURE RESIDENTIAL AREAS

Note: *The Independent Panel and Department of Planning both advise that given the Proposal will be utilising an existing easement and that the existing zoning is rural, undergrounding of the Proposal is not practicable at this stage. However, it is considered desirable by local communities that a high voltage power line such as that proposed be undergrounded when residential urban development is approved on land traversed by the easement in which the Proposal is to be constructed*.

4. Accordingly:

   i. if and when urban residential development is approved on land that is traversed by any existing or future easement in which the Project is constructed (including the Riverstone and Riverstone East Release Areas) – but not where the Project is constructed within an easement or reservation for a railway or arterial road; and

   ii. the Growth Centres Commission determines that the undergrounding of the line is justified, then the Growth Centres Commission may, at the time the urban residential development occurs, having regard to Government policy on the costs of

      (i) residential land release; and
      (ii) undergrounding,

      require the Proponent to negotiate in good faith with the Growth Centres Commission (or a nominated developer) to underground any relevant sections of the line and to make an appropriate contribution to the cost of doing so.

5. That when any such proposal arises that is subject to 4.ii, the Proponent must:
   a) establish a timetable for negotiations;
   b) provide regular reports to the Minister for Planning, Minister for Energy and the Treasurer on the progress of any such negotiations; and
   c) comply with any reasonable requirements agreed between those Ministers.

Compliance

General

6. The Proponent must notify in writing the Director-General and Blacktown City Council of the start of the Project's Construction and Operation. Such notification must be provided at least four weeks before the relevant start date unless otherwise agreed to by the Director-General.

7. It is the responsibility of the Proponent to ensure compliance with all of these Conditions and to implement any measures arising from these Conditions of Approval.

8. The Proponent must bring to the Director-General's attention any matter that may require further assessment by the Director-General.

9. The Proponent must comply with any requirements of the Director-General arising from the Department's assessment of:

   a) any reports, plans or correspondence that are submitted to satisfy these Conditions of Approval; and
   b) the implementation of any actions or measures contained in such reports, plans or correspondence.

Staging Report

10. The Proponent may elect to construct the Project in discrete work packages or defined stages provided that such stages or work packages are consistent with these Conditions of Approval. Where discrete work packages or defined stages are proposed, the Proponent must submit a Staging Report to the Director-General at least four weeks before Construction commences (or within any other time agreed to by the Director-General). The Staging Report must:

    a) describe the work packages or defined stages; and
    b) identify how the Conditions will be addressed in each work package or defined stage.

Pre-Construction Compliance Report

11. The Proponent must submit a Pre-Construction Compliance Report to the Director-General at least four weeks before Construction commences (or within any other time agreed to by the Director-General).

The Pre-Construction Compliance Report must include:

a) details of how the Conditions of Approval required to be addressed before Construction were complied with;
b) the time when each relevant Condition of Approval was complied with, including dates of submission of any required reports and/or approval dates; and
c) details of any approvals or licences required to be issued by any relevant government departments and/or council before Construction commences.

Pre-Operation Compliance Report

12. The Proponent must submit Pre-Operation Compliance Reports to the Director-General at least four weeks before Operation (or within any other time agreed to by the Director-General).

The *Pre-Operation Compliance Report* must include:

a) details of how the Conditions of Approval required to be addressed before Operation were complied with;
b) the time when each relevant Condition of Approval was complied with, including dates of submission of any required reports and/or approval dates; and
c) details of any approvals or licences issued by any relevant government departments and/or council for the Project's Operation.

Construction Compliance Reports

13. The Proponent must provide the Director-General, Blacktown City Council, and any other government departments nominated by the Director-General with Construction Compliance Reports. The EMR must review the Construction Compliance Reports before they are submitted to the Director-General and bring to the Director-General's attention any shortcomings.

The first *Construction Compliance Report* must report on the first six months of construction and be submitted a maximum six weeks after expiry of that period. The second, and subsequent, Construction Compliance Reports must be submitted at maximum intervals of six months from the date of submission of the first Construction Compliance Report (or at any other time interval agreed to by the Director-General) for the duration of Construction.

The Construction Compliance Reports must include information on:

a) compliance with the CEMP and the Conditions of Approval;
b) compliance with any approvals or licences issued by relevant government departments and/or Blacktown City Council for the Construction phase of the Project;
c) the implementation and effectiveness of environmental controls. The assessment of effectiveness should be based on a comparison of actual impacts against performance criteria identified in the CEMP;

d) environmental monitoring results, presented as a results summary and analysis;
e) the number and details of any complaints, including a summary of main areas of complaint, action taken, response given and intended strategies to reduce recurring complaints;
f) details of any review and amendments to the CEMP resulting from Construction during the reporting period; and
g) any other matter relating to compliance with the Conditions of Approval or as requested by the Director-General.

The Construction Compliance Reports must also be made Publicly Available.

Environmental Impact Audits

Environmental Impact Audit Report - Construction

14. An *Environmental Impact Audit Report - Construction* must be prepared and submitted to the Director-General a maximum three months after the Project begins Operation (or at any other time interval agreed to by the Director-General). The *Environmental Impact Audit Report – Construction* must also be submitted to Blacktown City Council and other government departments upon the request of the Director-General.

The *Environmental Impact Audit Report – Construction* must:

a) identify the major environmental controls used during Construction and assess their effectiveness;
b) summarise the main environmental management plans and processes implemented during Construction and assess their effectiveness;
c) identify any innovations in Construction methodology used to improve environmental management; and
d) discuss the lessons learnt during Construction, including recommendations for future projects.

Environmental Impact Audit Report - Operation

15. An *Environmental Impact Audit Report - Operation* must be submitted to the Director-General a maximum 24 months after the Project begins Operation and at any additional periods that the Director-General may require. The *Environmental Impact Audit Report - Operation* must also be submitted to Blacktown City Council and other government departments upon the request of the Director-General.

The *Environmental Impact Audit Report - Operation* must:

a) be certified by an independent person at the Proponent's expense. The certifier must be advised to the Director-General before the *Environmental Impact Audit Report – Operation* is prepared;

b) compare the Operation impact predictions made in the EA, Submissions Report and any supplementary studies with the actual impacts;
c) assess the effectiveness of implemented mitigation measures and safeguards;
d) assess compliance with the systems for operation maintenance and monitoring;
e) discuss the results of consultation with the local community particularly any feedback or complaints; and
f) be made Publicly Available.

ENVIRONMENTAL MANAGEMENT

Construction Environmental Management Plan

16. A *Construction Environmental Management Plan (CEMP)* must be prepared and implemented in accordance with these Conditions of Approval and all relevant Acts and Regulations. The *CEMP* must be prepared in accordance with the Department of Infrastructure, Planning and Natural Resources (DIPNR) *Guideline for the Preparation of Environmental Management Plans.* The Proponent must obtain the Director-General's Approval for the CEMP before Construction commences or within any other time agreed to by the Director-General.

The Proponent must ensure that the mitigation measures identified in the EA, Submissions Report and in these Conditions are incorporated into the CEMP.

The CEMP must:

a) incorporate the mitigation measures identified in the Statement of Commitments for:
    - Soil and Water Management
    - Infrastructure, Utilities and Services
    - Energy, Greenhouse Gases and Resource Use
    - Visual Impact Management
    - Flora and Fauna
    - Traffic Management
    - Heritage and Archaeology
    - Air Quality
    - Waste Management and Recycling

   as relevant to the Pre-construction and Construction phases of the Project, and state how they will be implemented;

b) include a Construction program, identifying construction activities and their location and timing;
c) cover any relevant environmental elements identified by the Proponent, or its contractor, from their environmental due diligence investigations;
d) contain the Construction Sub Plans required by the Conditions of Approval;
e) be prepared following consultation with Blacktown City Council and relevant government departments;

f) be made Publicly Available;
g) include a community consultation and notification strategy (including local community, Blacktown City Council and relevant government departments), and construction complaint handling procedures;
h) include environmental management details such as:
    i identification of statutory obligations which the Proponent is required to fulfil during Construction, including all approvals and licences;
    ii an environmental management structure indicating the responsibility, authority and accountability for personnel relevant to the CEMP;
    iii the role of the EMR and identification of Construction activities requiring EMR attendance;
    iv details of the Construction personnel induction and training program;
    v Emergency response procedures;
i) include implementation details such as:
    i. identification of relevant environmental elements;
    ii. measures to avoid and/or control environmental impacts;
    iii. the tools to be used to implement the CEMP such as plans, schedules and work instructions;
j) include monitoring and review details such as:
    i performance criteria;
    ii performance monitoring methods;
    iii auditing and corrective actions procedures;
    iv CEMP review procedures.

Operation Environmental Management Plan

17. An *Operation Environmental Management Plan (OEMP)* must be prepared and implemented in accordance with these Conditions and all relevant Acts and Regulations. The *OEMP* must be prepared in accordance with the DIPNR *Guideline for the Preparation of Environmental Management Plans.* The Proponent must obtain the approval of the Director-General for the OEMP before Operation commences or within any other time agreed to by the Director-General.

    The OEMP must:

    a) identify the Operation activities;
    b) incorporate the mitigation measures identified in the Statement of Commitments for:
        - Soil and Water Management
        - Visual Impact Management
        - Flora and Fauna

    as relevant to Operation phase of the Project, and state how they will be implemented;

    c) cover relevant environmental elements identified by the Proponent either from its environmental due diligence investigations or required to satisfy any other licence or approval;

d) include the Operation Sub Plans required under these Conditions of Approval;
e) be prepared in consultation with relevant government departments and Blacktown City Council;
f) be made Publicly Available;
g) include environmental management details such as:
    i identification of statutory obligations which the Proponent is required to fulfil during the Project's Operation, including all approvals and licences;
    ii an environmental management structure indicating the responsibility, authority and accountability for personnel relevant to the OEMP;
    iii details of a personnel induction and training program;
    iv Emergency response procedures;
h) include implementation details such as:
    i identification of relevant environmental elements;
    ii measures to avoid and/or control environmental impacts;
    iii the tools to be used to implement the OEMP such as plans, schedules and work instructions;
i) include monitoring and review details such as:
    i performance criteria;
    ii performance monitoring methods;
    iii auditing and corrective actions procedures;
    iv OEMP review procedures.

If the Proponent has an Operation Environmental Management Plan (for example a certified and operating environmental management system) for its other activities which is applicable to this Project then that system may be proposed as the OEMP. Details of the existing system must be provided to the Director-General demonstrating its application to this Project.

Environmental Management Representative

18. The Proponent must request the Director-General's Approval for the appointment of an Environmental Management Representative (EMR) at least eight weeks before Construction commences (or within any other time agreed to by the Director-General). In its request the Proponent must provide the following information:

a) qualifications and experience of the EMR including demonstration of general compliance with relevant Australian Standards for environmental auditors;
b) authority and independence (from the Proponent or its contractors) of the EMR including details of the Proponent's internal reporting structure; and
c) resourcing of the EMR role. The EMR must be available:
    i for sufficient time to undertake the EMR role. This timing shall be agreed between the Proponent and the EMR and advised to the Director-General in the request for approval;
    ii at any other time requested by the Director-General;
    iii during any Construction activities identified in the CEMP to require the EMR's attendance; and
    iv for the duration of Construction.

19. The Director-General may at any time immediately revoke the approval of an EMR appointment by providing written notice to the Proponent. Interim arrangements for EMR responsibility following the revocation must be agreed in writing between the Director-General and the Proponent.

20. The Director-General may at any time conduct an audit of any actions undertaken by the EMR. The Proponent must:

    a) facilitate and assist the Director-General in any such audit; and
    b) include in the conditions of the EMR's appointment the need to facilitate and assist the Director-General in any such audit.

21. The EMR is authorised to :

    a) consider and advise the Director-General and the Proponent on matters specified in the Conditions of Approval and compliance with such;
    b) determine whether work falls within the definition of Construction where clarification is requested by the Proponent;
    c) review the CEMP;
    d) periodically monitor the Proponent's activities to evaluate compliance with the CEMP. Periodic monitoring must involve site inspections of active work sites at least fortnightly;
    e) provide a written report to the Proponent of any non-compliance with the CEMP observed or identified by the EMR. Non compliance must be managed as identified in the CEMP;
    f) issue a recommendation to the Proponent to stop work immediately if in the view of the EMR an unacceptable impact on the environment is occurring or is likely to occur. The stop work recommendation may be limited to specific activities causing an impact if the EMR can easily identify those activities. The EMR may also recommend that the Proponent initiate reasonable actions to avoid or minimise adverse impacts;
    g) review corrective and preventative actions to monitor the implementation of recommendations made from audits and site inspections;
    h) certify that minor revisions to the CEMP are consistent with the approved CEMP; and
    i) provide regular (as agreed with the Director-General) reports to the Director-General on matters relevant to carrying out the EMR role including notifying the Director-General of any stop work recommendations.

    The EMR must immediately advise the Proponent and the Director-General of any incidents relevant to these Conditions resulting from Construction that were not dealt with expediently or adequately by the Proponent.

COMMUNICATION AND CONSULTATION

Advice of Construction Activities

22. Before Construction commences, and then at maximum three monthly intervals, the Proponent must advertise in relevant newspapers the: nature of the works proposed for the next three months; areas in which these works are proposed; Construction hours; and a contact telephone number.

    The Proponent must ensure that the local community and businesses are advised of Construction activities that could cause disruption. Methods to disseminate this information must be identified in the CEMP. Information to be provided must include:

    a) details of any traffic disruptions and controls;
    b) construction of temporary detours; and
    c) work approved to be undertaken outside standard Construction hours, in particular noisy works, before such works are undertaken.

23. The Proponent must establish a Project internet site before Construction commences and maintain the internet site until Construction ends. This internet site must contain:

    a) periodic updates of work progress, consultation activities and planned work schedules. The site must indicate the date of the last update and the frequency of the internet site updates;
    b) a description of relevant approval authorities and their areas of responsibility;
    c) a list of reports and plans that are Publicly Available under this Approval and details of how these can be accessed;
    d) contact names and phone numbers of relevant communications staff; and
    e) the 24 hour toll-free complaints contact telephone number.

    Updates of work progress, Construction activities and planned work schedules must be provided where significant changes in noise or traffic impacts are expected.

Community Liaison Group

24. A Community Liaison Group (CLG) must be formed and hold its first meeting before Construction commences. The CLG must include the EMR and representatives from the Proponent and its head contractor. Community representatives should be identified and selected from relevant community and business groups, individual members of the community adjoining the Project and representatives from Blacktown City Council.

    The Proponent must, at its own expense:

    a) maintain the CLG for the duration of Construction unless otherwise approved by the Director-General;
    b) provide a chairperson for the CLG. The chairperson must be independent of the Proponent and may be elected from the CLG membership;
    c) nominate two representatives to attend all CLG meetings;

d) provide to the CLG regular information on the progress of Construction and related environmental performance;
e) promptly provide to the CLG information that the CLG Chair may reasonably request concerning the Project's environmental performance;
f) provide access for site inspections by the CLG;
g) provide meeting facilities for the CLG, and take notes of CLG meetings. These meeting notes must be available to CLG members within 14 days of the meeting and should be endorsed by the Chair;
h) where reasonably required by the Chair, arrange consultant(s) to explain technical information to the CLG; and
i) where reasonably required by the Chair, invite representatives from relevant government departments or other individuals to attend CLG meetings.

Issues for discussion by the CLG include the dissemination of information to the community, design issues related to the Conditions or mitigation measures, the CEMP and Construction activities. The CLG may make comments about these issues which must be considered by the Proponent. The Proponent must report back to the CLG on its considerations of the comments.

The Proponent may review a CLG's membership and/or the need for the CLG at any time during Construction. The Proponent must seek the Director-General's approval to dissolve a CLG. Any request for dissolution must demonstrate why the CLG is no longer required.

In the event of any dispute between the CLG and the Proponent, the Proponent's decision is final provided it is consistent with these Conditions of Approval.

25. The Proponent must consult property owners about implementing mitigation measures that affect their property. Mitigation measures should be implemented according to a program derived from that consultation if consistent with the Conditions of Approval.

Construction Complaints Management System

26. The Proponent must prepare and implement a *Construction Complaints Management System* before Construction commences and maintain the System for the duration of Construction. The *Construction Complaints Management System* must be consistent with AS 4269 "Complaints Handling" and include:

a) a 24 hour, toll free telephone number listed with a telephone company and advertised;
b) a system to receive, record, track and respond to complaints within a specified timeframe. When a complaint cannot be responded to immediately, a follow-up verbal response on what action is proposed must be provided to the complainant within two hours during night-time works and 24 hours at other times;
c) a process for the provision of a written response to the complainant within 10 days, if the complaint cannot be resolved by the initial or follow-up verbal response; and
d) a mediation system for complaints unable to be resolved.

Information on all complaints received, including the means by which they were addressed and whether resolution was reached with or without mediation, must be included in the *Construction Compliance Reports* and must be made available to the Director-General on request.

COMMUNITY ENHANCEMENT PROGRAM

27. Prior to the commencement of construction, the Proponent shall prepare and submit for the approval of the Director-General, a Community Enhancement Program (CEP) to fund (or provide in kind) community infrastructure and services in the vicinity of the Proposal. The Proponent shall establish a fund and contribute a sum of $1 million for the purposes of implementing the CEP. In preparing the CEP the Proponent shall consult with the Community Liaison Group, the Growth Centres Commission and Blacktown City Council.

SUSTAINABLE ENERGY

28. Consistent with Commitment Nos 64 and 65, the Proponent must contribute $500,000 to a special purpose fund to underwrite a program of demand management and energy minimising activities. The purpose of the program is to offset the environmental and social impacts of providing additional electricity supplies to all classes of consumers in the North West Sector. The details and timetable for the program must be included in the OEMP.

29. The fund is to be established by Integral Energy and managed in accordance with item Nos 66-69 of the SoC.

30. As part of the OEMP, the Proponent must identify strategies applicable to the Feeder 9JA catchment and relevant to the Distribution Network Service Provider for all classes of customers to reduce energy demand and encourage the use of energy sources that have lower greenhouse gas emissions than coal-fired power stations.

31. The Proponent must use electrical energy derived from a renewable energy source accredited by the Department of Energy, Utilities and Sustainability (DEUS) for the supply of at least 50% of the on-site electrical energy requirements for the Project's Construction. Power consumption (green power or other) must be reported in the Construction Compliance Reports.

FLORA AND FAUNA

32. A Flora and Fauna Management Sub Plan must be prepared prior to commencement of construction and implemented as part of the CEMP and approved by the Director-General. The Sub Plan must be prepared in accordance with item Nos 37 and 93- 113 of the SoC. The Sub Plan must be prepared in consultation with the DEC and Blacktown City Council and include:

    (a) plans showing:

i. terrestrial vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities were recorded; and areas to be cleared. The plans must also identify vegetation adjoining the Project where this contains important habitat areas and/or threatened species, populations or ecological communities;
ii. aquatic vegetation communities; important habitat areas; locations where threatened species, populations or ecological communities were recorded; and areas to be cleared. The plans must also identify vegetation adjoining the Project where this contains important habitat areas and/or threatened species, populations or ecological communities;

(b) methods to manage impacts on flora and fauna species (terrestrial and aquatic) and their habitat which may be directly or indirectly affected by the Project. These must include:
i. procedures for vegetation clearing, soil management and managing other habitat damage (terrestrial and aquatic) during Construction;
ii. methods to protect vegetation both retained within, and also adjoining, the Project from damage during Construction;
iii. a habitat tree management program including fauna recovery procedures and habitat maintenance (e.g. relocating hollows or installing nesting boxes);
iv. methods to minimise damage to aquatic habitats;
v. where possible, and where consistent with DEC or NSW Fisheries requirements, strategies for re-using in rehabilitation works individuals of any threatened plant species that would be otherwise be destroyed by the Project;
vi. performance criteria against which to measure the success of the methods

(c) rehabilitation details including:
i. identification of locally native species to be used in rehabilitation and landscaping works, including flora species suitable as a food resource for threatened fauna species;
ii. methods to remediate affected aquatic habitats or fish passages;
iii. the source of all seed or tube stock to be used in rehabilitation and landscaping works including the identification of seed sources within the Project. Seed of locally native species within the Project should be collected before Construction commences to provide seed stock for revegetation;
iv. methods to re-use topsoil (and where relevant subsoils) and cleared vegetation;
v. measures for the management and maintenance of all preserved, planted and rehabilitated vegetation (including aquatic vegetation);

(d) a Weed Management Strategy including:
i. identification of weeds within the Project and adjoining areas;
ii. weed eradication methods and protocols for the use of herbicides;
iii. methods to treat and re-use weed infested topsoil;
iv. strategies to control the spread of weeds during Construction;

(e) a program for reporting on the effectiveness of terrestrial and aquatic flora and fauna management measures against the identified performance criteria. Management methods must be reviewed where found to be ineffective.

33. As part of the OEMP, the Proponent must include the issues outlined in item No. 114 of the SoC; and develop and implement a Management Plan for *Dillwynia tenuifolia* population, including implementing the commitments set out in item Nos 116 to 117 of the SoC.

HERITAGE

INDIGENOUS HERITAGE MANAGEMENT

34. An Indigenous Heritage Management Sub Plan must be prepared as part of the CEMP. The Sub Plan must be prepared in consultation with all relevant Aboriginal groups and the DEC and include:

    a) details of the archaeological investigations to be undertaken and any associated licences or approvals required;
    b) procedures to be implemented if previously unidentified Aboriginal objects are discovered during Construction. If such objects are discovered all work likely to affect the object(s) must cease immediately and the DEC informed in accordance with the *National Parks and Wildlife Act 1974*;
    c) an education program for Construction personnel on their obligations for Aboriginal cultural materials; and
    d) the range of matters identified in item No. 122 of the SoC.

Aboriginal Objects

35. The Proponent must implement the stated commitments set out in SoC No 123 to 130 inclusive.

36. If during the course of Construction the Proponent becomes aware of any unexpected Aboriginal object(s), all work likely to affect the object(s) must cease immediately and the DEC informed in accordance with the *National Parks and Wildlife Act 1974*.

Historical Relics

37. The CEMP must include:

    a) procedures to be implemented if previously unidentified historical relics are discovered during Construction; and
    b) an education program for Construction personnel on their obligations for historic relics.

38. If during the course of Construction the Proponent becomes aware of any unexpected historical relic(s), all work likely to affect the relic(s) must cease immediately and the Heritage Council notified in accordance with the *Heritage Act 1977*.

NOISE AND VIBRATION

Construction Noise and Vibration Management Sub Plan

39. A Construction Noise and Vibration Management Sub Plan must be prepared as part of the CEMP. The Sub Plan must be prepared in consultation with Blacktown City Council and the CLG and include:

    a) an education program for Construction personnel about noise minimisation;
    b) identification of each Construction activity, including Ancillary Facilities, and their associated noise sources;
    c) identification of all potentially affected Sensitive Receivers;
    d) the Construction noise objective specified in the Conditions of Approval;
    e) the Construction vibration criteria specified in the Conditions of Approval;
    f) determination of appropriate noise and vibration objectives for each identified Sensitive Receiver;
    g) noise and vibration monitoring, reporting and response procedures;
    h) assessment of potential noise and vibration from each Construction activity, including noise from Construction vehicles and any traffic diversions;
    i) a description of management methods and procedures and specific noise mitigation treatments that will be implemented to control noise and vibration during Construction;
    j) justification for any activities outside the Construction hours specified in the Conditions of Approval. This includes identifying areas where Construction noise would not be audible at any Sensitive Receiver;
    k) procedures for notifying residents of Construction activities that are likely to affect their noise and vibration amenity; and
    l) contingency plans to be implemented in the event of non-compliances and/or noise complaints.

Construction Hours

40. Construction must be restricted to between the hours of 7:00 am to 6:00 pm (Monday to Friday), 8:00 am to 1:00 pm (Saturday) and at no time on Sundays and public holidays except:

    a) for the delivery of materials required outside these hours by the Police or other authorities for safety reasons; or
    b) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; or
    c) where the work is identified in the Construction Noise and Vibration Management Sub Plan and approved as part of the CEMP.

    Local residents must be informed of the timing and duration of work approved under item (c) at least 48 hours before that work commences.

Construction Noise Objective

41. All construction works undertaken on the site must be undertaken in accordance with the EPA's *Environmental Noise Control Manual* (ENCM) and must not give rise to 'offensive

noise' as defined under the *Protection of the Environment Operations Act 1997* and accompanying Regulations.

Background noise levels are those identified in the EA or otherwise identified in the Construction Noise and Vibration Management Sub Plan.

Any activities that have the potential for noise emissions that exceed the ENCM's objectives must be identified and managed in accordance with the Construction Noise and Vibration Management Sub Plan. The Proponent must implement all Reasonable and Feasible noise mitigation and management measures with the aim of achieving the Construction noise objective.

If the noise from a Construction activity is substantially tonal or impulsive in nature (as described in Chapter 4 of the *NSW Industrial Noise Policy*), 5dB(A) must be added to the measured Construction noise level when comparing the measured noise with the Construction noise objective.

Construction Noise Management

42. The Proponent must ensure that public address systems used at any Construction site are not used outside the Construction hours detailed in the Conditions of Approval unless otherwise approved through the Construction Noise and Vibration Management Sub Plan. Public address systems must be designed to minimise noise spillage off-site.

43. No rock breaking, rock hammering, and any similar activities maybe undertaken unless otherwise identified in the Construction Noise and Vibration Management Sub Plan, and approved as part of the CEMP.

44. The Proponent must, where Reasonable and Feasible, erect noise mitigation measures at the start of Construction (or at other times during Construction) to minimise Construction noise impacts.

Vibration Criteria

45. Vibration caused by Construction and received at any Structure outside the Project must:

    a) for structural damage vibration be limited to German Standard DIN 4150 Part 3 *Structural Vibration in Buildings. Effects on Structures*; and
    b) for human exposure to vibration be limited to the evaluation criteria presented in British Standard BS 6472 - *Guide to Evaluate Human Exposure to Vibration in Buildings* (1Hz to 80 Hz) for low probability of adverse comment.

    These limits apply unless otherwise identified in the Construction Noise and Vibration Management Sub Plan, and approved as part of the CEMP.

ACCESS TRACKS

46. Access tracks must be located so as to minimise impacts on flora and fauna and indigenous heritage. The CEMP must, except as provided in Condition 47, identify on a map the location of access tracks and demonstrate consistency with the Soil and Water Management, Flora and Fauna and Indigenous Heritage Management Sub Plans and how use of existing tracks has been maximised.

47. Where the location of access tracks cannot be identified at the time the CEMP is submitted, the CEMP must set out the criteria against which access track location is chosen. These criteria must include maximum use of existing tracks, minimising soil erosion impacts on water quality, flora and fauna and cultural heritage, and must be consistent with the Soil and Water Management, Flora and Fauna and Indigenous Heritage Sub Plans.

48. No access track may be constructed unless the EMR has first certified that it is consistent with the CEMP and/or the criteria set out in the CEMP.

PHYSICAL ISSUES

Soil and Water Management

Soil and Water Quality Management Sub Plan

49. A Soil and Water Management Sub Plan must be prepared as part of the CEMP. The Sub Plan must be prepared in consultation with the DEC, Department of Natural Resources and Blacktown City Council. The Sub Plan must:

    a) where relevant, be consistent with the Department of Housing's guideline "Managing Urban Stormwater - Soils and Construction" and the RTA's "Guidelines for the Control of Erosion and Sedimentation in Roadworks";
    b) identify the Construction activities that could cause soil erosion or discharge sediment or water pollutants from the site;
    c) describe management methods to minimise soil erosion or discharge of sediment or water pollutants from the site including a strategy to minimise the area of bare surfaces during Construction;
    d) describe the location and capacity of erosion and sediment control measures;
    e) identify the timing and conditions under which Construction stage controls will be decommissioned;
    f) include contingency plans to be implemented for events such as fuel spills;
    g) identify how the effectiveness of the sediment and erosion control system will be monitored, reviewed and updated; and
    h) be consistent with item Nos 33-36 and 38-50 of the SoC relating to the Pre-Construction and Construction phases of soil and water management for the Project.

50. As part of the OEMP, the Proponent must incorporate the mitigation measures in item Nos 51-54 of the SoC and state how they will be implemented.

Construction

51. An appropriately qualified soil scientist or person with similar expertise in soil and water management must be consulted according to a schedule identified in the Soil and Water Management Sub Plan to:

    a) undertake inspections of temporary and permanent erosion and sedimentation control devices;
    b) ensure that the most appropriate controls are being implemented;
    c) check that controls are being maintained in an efficient condition; and
    d) check that controls meet the requirements of any relevant approval and/or licence condition.

    The results of these inspections and any follow-up actions must be reported in the *Construction Compliance Reports* required by the Conditions of Approval.

Spoil and Fill Management

52. All material excavated from Construction must be re-used or recycled unless otherwise approved in the CEMP. The Proponent must ensure that the re-use of material generated from Construction is maximised in preference to importing fill.

Air Quality

Dust Management Sub Plan

53. A Dust Management Sub Plan must be prepared as part of the CEMP. The Sub Plan must identify:

    a) potential sources of dust;
    b) dust management objectives consistent with DEC guidelines;
    c) a monitoring program to assess compliance with the identified objectives. Monitoring for dust deposition and particulate concentration must be undertaken according to the DEC Guideline "Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales";
    d) mitigation measures to be implemented, including measures during weather conditions where high level dust episodes are probable (such as strong winds in dry weather); and
    e) a progressive rehabilitation strategy for exposed surfaces with the aim of minimising exposed surfaces.

Construction

54. Construction vehicles using public roads must be maintained to prevent any loss of load, whether dust, liquid or soils. Facilities must be provided at exit points of all Construction sites/compounds to minimise tracking mud, dirt or other material onto a public road or footpath. In the event of any spillage, the Proponent must remove the spilled material as soon as practicable within the working day of the spillage.

55. The Proponent must ensure that all plant and equipment used in connection with the Project are:

    a) maintained in a proper and efficient condition; and
    b) operated in a proper and efficient manner.

SOCIAL AND ECONOMIC ISSUES

Electric and Magnetic Fields

56. The Proponent must, prior to the commencement of construction, engage an appropriately qualified independent expert to review the magnetic field predictions set out in Table 6.2 of the Submissions Report. The Proponent must obtain the Director-General's agreement for the expert, prior to the review. Where the expert identifies that the predicted magnetic field strength will be greater than the field strength identified in Table 6.2, the Proponent must apply all reasonable and feasible mitigation measures, at source, as recommended by the expert and approved by the Director-General, to ensure that the predicted magnetic field strengths are no greater than those specified in Table 6.2. This requirement to apply mitigation measures does not apply where any increased field strength only affects those properties described in Conditions 59 and 60.

57. The Proponent must implement engineering standards as described in Section 6.2 of the Submissions Report. These standards will include:
    a) The construction of poles and conductors at the heights described in Table 6.2 of the Submissions Report;
    b) The adoption of a phasing arrangement for each circuit which will minimise magnetic fields due to mutual cancellation;
    c) The adoption of a triangular circuit geometry.

58. As part of the OEMP, the Proponent must develop and implement a magnetic field monitoring program. This program must address the first five years of operation (and as further required by the Director-General), and include: baseline data, monitoring periods and locations and justification for such, prediction verification and measures for dealing with exceedances of predictions. The ongoing monitoring program must be approved by the Director-General.

Property Acquisition

59. Upon receiving a written request from a landowner of a property identified below, and providing such request is made within 12 months of the date of approval from a person who owned the property at the date of approval, or a person who had entered into a Contract to purchase such a property at the date of approval, the Proponent must enter an agreement with the relevant landowner to purchase the property in accordance with the provisions of the Land Acquisition (Just Terms Compensation) Act 1991.

The Proponent must advise the Director-General of any such agreement as soon as practicable after an agreement has been reached.

If within three months of receiving a request from a relevant landowner the Proponent and the landowner cannot agree on the acquisition, then either party may refer them to the Director-General, who shall appoint an independent arbitrator. All costs associated with the independent arbitrator must be funded by the Proponent.

The Proponent must advise the Director-General of the results of the arbitration as soon as practicable after completion.

Where agreement cannot be reached through arbitration, either party may refer them to the Director-General for final resolution.

This condition applies to the following properties:

1. No 120 Guntawong Road, Rouse Hill; (Lot 97 DP 208203); and
2. No 165 William Street (corner Princes Street), Riverstone (Lots 39-50, Section 9, DP 1480).

Alternatively, if the relevant landowner(s) do not wish to have their property acquired in accordance with this condition they may, at their sole discretion, elect for the provisions of Condition 60 to apply instead. To instigate this, they must advise the Proponent in writing within six months of the date of this approval. Where this occurs, the provisions of Condition 59 no longer apply to the subject property.

Property Reconfiguration

60. Upon receiving a written request from a landowner of a property identified below, and providing such request is made within 12 months of the date of approval from a person who owned the property at the date of approval, or a person who had entered into a Contract to purchase such a property at the date of approval, the Proponent must endeavour to enter an agreement with the relevant landowner. The purpose of the agreement is to identify reasonable and feasible measures that the Proponent will undertake/fund to enable a relevant landowner to reconfigure his/her dwelling, or relocate/rebuild the dwelling elsewhere on the property.

The Proponent must advise the Director-General of any such agreement as soon as practicable after an agreement has been reached.

If within three months of receiving a request from a relevant landowner the Proponent and the landowner cannot agree on the measures, then either party may refer them to the Director-General, who shall appoint an independent arbitrator. All costs associated with the independent arbitrator must be funded by the Proponent.

The Proponent must advise the Director-General of the results of the arbitration as soon as practicable after completion.

Where agreement cannot be reached through arbitration, either party may refer them to the Director-General for final resolution.

This condition applies to legally existing dwellings, located on the following properties, at the date of this approval:

1. No 44 Cudgegong Road, Rouse Hill (Lot 118, DP 208203);
2. No 97B Cudgegong Road, Rouse Hill (Lot 79, DP 208203);
3. No 117 Guntawong Road, Rouse Hill (Lot 1, DP 554233);
4. No 271 Garfield Road East, Riverstone (Lot 18, DP 30458);
5. No 53 Junction Road, Riverstone (Lot 13, Section 28, DP 1459); and
6. Nos 58-65 Otago Road, Vineyard (Lots 58-65, Section F, DP 1654 and Lots 11-17, Section 45, DP 1480).

If the independent verifier, as required by Condition 56, confirms that magnetic field strength at the outer edge of the easement at the identified properties will be no greater than 11.7mG[1] by the year 2043, then the Proponent is not required to comply with the measures specified above in this condition.

Visual Impact

61. As part of the CEMP and OEMP, the Proponent must undertake measures to minimise the visual impact of the proposal in accordance with item Nos 71 and 72 of the SoC.

Property Damage and Access

62. Subject to landowner agreement, property inspections must be conducted on all Structures within:

    a) 200 metres of blasting;

[1] The figure of 11.7mG represents the magnetic field strength identified in the Environmental Assessment as the "current" (2005-06 operating conditions) level at 15m from the centreline (ie at the easement edge). It does not represent a standard or goal. The prediction as to whether the 11.7mG level will be exceeded should be based on established engineering techniques derived from Electricity Supply Association of Australia guidelines for the calculation and reporting of EMFs or as agreed by the verifier.

b) 50 metres of Construction activities that generate vibration impacts;
c) any other locations identified by the Proponent; and
d) any other locations identified by the EMR.

The property inspections must be undertaken consistent with AS 4349.1 "Inspection of Buildings".

Property inspections need not be undertaken if a risk assessment indicates Structures will not be affected. The risk assessment must be undertaken before Construction commences by a suitably experienced and qualified geotechnical and construction engineer.

The owners of all properties on which property inspections are to be conducted must be advised at least two weeks before the inspection of its scope and methodology and of the process for making a property damage claim. A copy of the property inspection report must be given to the owner of each property inspected at least three weeks before Construction that could affect the property commences.

A register of all properties inspected must be maintained by the Proponent indicating whether the owner accepted or refused the property inspection offer. A copy of the register must be provided to the Director-General upon request.

63. The Proponent, where liable, must rectify any property damage caused directly or indirectly (for example from vibration or from groundwater change) by the Project's Construction or Operation at no cost to the property owner(s). Alternatively the Proponent may negotiate compensation for the property damage with the property owner.

64. The Proponent must ensure that access to properties is maintained during Construction. The Proponent must ensure that any legal property access affected by the Project is reinstated to an equivalent standard or that alternative arrangements are negotiated with the relevant property owner.

Traffic

65. Road dilapidation reports must be prepared for all roads likely to be used by Construction traffic. These reports must be prepared before Construction commences and after Construction is complete. Copies of the reports must be provided to the relevant roads authority. Any damage resulting from Construction, except that resulting from normal wear and tear, must be repaired at the Proponent's cost. Alternatively the Proponent may negotiate an alternative arrangement for road damage with the relevant roads authority.

66. A Construction Traffic Management Sub Plan must be prepared as part of the CEMP. The Sub Plan must be prepared in consultation with the relevant roads authority and include:

a) identification of all public roads to be used by Construction traffic, in particular roads proposed to transport large quantities of Construction materials. The expected timing and duration of road usage must be stated;
b) management methods to ensure Construction traffic uses identified roads;

c) identification of all public roads that may be partially or completely closed during Construction and the expected timing and duration of these closures. Consideration must be given to programming Construction works to minimise road closures during peak hours and/or holiday periods;
d) impacts on existing traffic (including pedestrians, vehicles, cyclists and disabled persons);
e) temporary traffic arrangements including property access;
f) access to Construction sites including entry and exit locations and measures to prevent Construction vehicles queuing on public roads;
g) a response plan for any Construction traffic incident; and
h) monitoring, review and amendment mechanisms.

Hazards and Risk Management

67. As part of the Construction and Operation EMPs, the Proponent must prepare and implement Hazards and Risk Management Sub Plan(s). These Sub Plans must include:

a) details of the hazards and risks associated with the Project;
b) mitigation measures including contingency plans; and
c) Item No. 138 of the SoC in relation to the OEMP.

Waste Management and Recycling

68. As part of the Construction and Operation EMPs the Proponent must prepare Waste Management and Re-use Sub Plan(s). The Sub Plans must address the management of wastes during the Construction and Operation stages respectively in accordance with the NSW Government's Waste Reduction and Purchasing Policy. The Sub Plan(s) must identify requirements for:

a) the application of the waste minimisation hierarchy principles of avoid/reduce/re-use/recycle/dispose;
b) waste handling and storage;
c) disposal of wastes. Specific details must be provided for cleared vegetation, contaminated materials, glass, metals and plastics, hydrocarbons (lubricants and fuels) and sanitary wastes; and
d) any waste material that is unable to be re-used, re-processed or recycled must be disposed at a facility approved to receive that type of waste.

Utilities and Services

69. The Proponent must identify the utilities and services (hereafter "services") potentially affected by Construction to determine requirements for diversion, protection and/or support. Alterations to services must be determined by negotiation between the Proponent and the service providers. The Proponent in consultation with service providers must ensure that disruption to services resulting from the Project are minimised and advised to customers. The Pre-Construction activities relating to utilities and services, as outlined in Item Nos 55-61 of the SoC, must be adhered to.

Location of Ancillary Facilities

70. The sites for Ancillary Facilities must satisfy the following criteria unless otherwise approved through the CEMP:

a) be located within the Approved Project Area;
b) have ready access to the road network;
c) be located to minimise the need for heavy vehicles to travel through residential areas;
d) be sited on relatively level land;
e) be separated from nearest residences by at least 200 m (or at least 250 m for a temporary batch plant);
f) not be within 100 m of, or drain directly to, SEPP 14 wetlands;
g) be located above the 20 ARI flood level unless a contingency plan to manage flooding is prepared and implemented;
h) not require vegetation clearing beyond that already required for the Project; and
i) not affect the land use of adjacent properties.

The location of the Ancillary Facilities must be identified in the CEMP and must include an analysis against the above criteria. Where these criteria cannot be met the CEMP must demonstrate there will be no adverse impacts from the Ancillary Facility's construction or operation.