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Abbreviations

The following abbreviations have been used in this document

CEMP	Construction Environmental Management Plan
DEC	NSW Department of Environment and Conservation
DLWC	The former NSW Department of Land and Water Conservation, now part of DNR.
DNR	NSW Department of Natural Resources
DOP	NSW Department of Planning
DPI	NSW Department of Primary Industries
EA	Environmental Assessment
EEC	Endangered Ecological Community listed under the EPBC Act and/or under the TSC Act.
EIS	Environmental Impact Statement (which for this Project is deemed to be an EA)
EMR	Environmental Management Representative
N/A	Not/none applicable
OEMP	Operation Environmental Management Plan
PEMP	Project Environmental Management Plan
The Project	The establishment of the Wollar to Wellington 330 kV Transmission Line as described in the EIS submitted by R Byrnes of International Environmental Consultants Pty Ltd on 15 August 2005.

1. Background to Project EMP

1.1 Introduction

The Project Environmental Management Plan (PEMP) addresses all aspects of the project from the impact assessment stage through environmental management during the construction and operation of the transmission line. The PEMP includes both the Construction Environmental Management Plan (CEMP) and outline Operational Environmental Management Plan (OEMP).

The CEMP contained in this document has been updated following the finalisation of the Submissions Report. The final CEMP will be prepared following receipt of the Instrument of Approval from the Minister for Planning, and subsequent detailed design, centre line determination and post approval environmental investigations. Copies of the CEMP will be provided to relevant government departments and councils prior to construction commencing. Any further modifications made to the CEMP will be certified by the EMR as being consistent with the Conditions of Approval.

Members of the public will be provided with access to copies of the PEMP on request, through TransGrid offices.

1.2 Project Outline

In order to provide an adequate level of supply reliability in the central west of NSW, TransGrid proposes to construct a single circuit 330 kV transmission line from Wollar to Wellington. The line is needed to reinforce the electricity supply network serving the region and will ensure the network is capable of supplying an electrical load at acceptable voltage levels.

The line will be some 117 km long and will pass through the Midwestern Regional Council and Wellington Council areas.

The line will commence from the new Wollar 330 kV Switching Station located off Barigan Road south of Wollar. The line travels north towards Wollar Road, then the Ulan Wollar Road before turning west to parallel the Sandy Hollow to Maryvale Rail Line. The line crosses land owned by two mining companies and the route has been negotiated to avoid sterilising future coal resources.

Once past the Ulan Coal Mine and surface facilities area, the line passes the village of Ulan before turning north, crossing Ulan Road then Cope Road to meet the existing Beryl to Ulan 132 kV transmission line. The proposed 330 kV line then parallels the existing 132 kV line for over 15 km, diverging near Stubbo Creek.

The line travels generally in a south westerly direction crossing Barneys Reef Road, Slapdash Creek, the Gwabegar-Wallerawang Railway, Jacksons Lane and then the Castlereagh Highway before turning slightly further south towards the village of Beryl.

The proposed line then travels to the north of the Cudgegong River over relatively steep terrain towards Spring Ridge Road. The line crosses several local dirt roads including Mebul Road, Gum Gully Road and several private access tracks before crossing the sealed Goolma Road and then Gorries Lane.

The line continues west meeting the existing Wellington to Beryl 132 kV transmission line. Running parallel but on the northern side of the existing line for approximately 15 km, the proposed 330 kV line diverges slightly in order to cross to the southern side of the existing line. After rejoining a parallel alignment for a further 10 km, the line diverges south and crosses Twelve Mile Road and then west into Wellington Substation. This last deviation is to avoid the Cadonia Estate.

1.2.1 Physical Components of the Transmission Line

The single circuit transmission line will carry twin conductors of approximately 27 mm in diameter, spaced 380 mm apart and two overhead ground wires, one being an optical fibre ground wire. These will be supported by rectangular or square-based, steel lattice towers throughout, with typical tower heights ranging from 22 to 36 metres. The towers will typically be spaced about 400 metres apart, with variations to this according to terrain and specific environmental considerations.

1.3 Background to the Project EMP

Once the Project Application has been approved, a separate Construction Environmental Management Plan (CEMP) based on the CEMP contained in this report and updated in accordance with the Conditions of Approval will be issued to prospective contractors. The CEMP covers all environmental aspects involved in the design and construction of the proposed Wollar to Wellington line. The CEMP has also been updated from that contained in the original Environmental Assessment document which was placed on public exhibition. The current CEMP contains additional matters raised by other government agencies during the approval process as well as additional information contained in the Submissions Report.

The Operational Environmental Management Plan (OEMP) deals with the environmental aspects associated with the operation and maintenance of the line. These two documents form the Project EMP which also includes TransGrid's internal management approach and systems to ensure that all project environmental requirements are met. This PEMP therefore includes an outline of TransGrid's auditing and verification process.

1.4 Project EMP Objectives

The objectives of the Project EMP for the Wollar to Wellington 330 kV transmission line installation are to:

- ☐ provide a systems approach for the management of environmental issues associated with constructing the single circuit 330 kV line;
- ☐ establish specific strategies and protocols for the management of environmental system components associated with the transmission line construction works. The environmental components include:

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- soil management;
 - flora and fauna;
 - weed management;
 - visual effects;
 - noise management;
 - indigenous heritage; and
 - waste management.
- ☐ define the roles, responsibilities, authorities, accountabilities and reporting lines for personnel involved in the work;
 - ☐ identify statutory and other obligations required by key legislation and policies in relation to the work;
 - ☐ identify procedures to be followed where identified outcomes are not achieved.

Route Plans showing areas of environmental sensitivity and referring to relevant environmental control measures required have been prepared to provide detailed information on the required management protocols to be undertaken at specific locations. Plans associated with this document are contained in Volume 3 of the Environmental Assessment document. These plans have not required updating as a result of the approval process to date, and will be included in the CEMP.

1.5 Conditions of Approval Addressed by the Construction EMP

As part of normal approval conditions granted by DOP, an EMP is required for the construction stage of the works including a number of individual management strategies for elements such as visual impact, flora and fauna, construction noise and soils management. This section has been expanded and modified since the display of the Environmental Assessment to include development approval requirements.

1.6 Consultation with Relevant Authorities, Utilities and Services

The following authorities form part of the ongoing authority consultation process. Further consultation will be undertaken following development approval in order to ascertain any additional requirements for the construction and operation of the transmission line:

- ☐ Department of Planning (DOP);
- ☐ Department of Natural Resources (DNR);
- ☐ Department of Primary Industries (DPI);
- ☐ Department of Environment and Conservation (National Parks and Wildlife Service and Environment Protection Authority)
- ☐ Mid Western Regional Council;

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- ☐ Wellington Council;
 - ☐ NSW Agriculture;
 - ☐ NSW Rural Fire Service;
 - ☐ Roads and Traffic Authority;
 - ☐ State Forests; and
 - ☐ Telstra and other telecommunications organisations.

Although the approval will ultimately be provided by DOP, it is TransGrid policy to involve other relevant government agencies, principally at a local level, prior to and during the construction phase.

Specifically, TransGrid will continue to liaise with Telstra and meet its obligations in respect of the management of earth potential rise and low frequency induction in the usual way under the long-standing agreement between Telstra and electricity utilities.

1.7 Outline of Construction EMP

Various aspects of the environmental management activities to be undertaken for the project are discussed in different sections of the document. Route Plans of the proposed works are provided in Volume 3 of the Environmental Assessment document in A3 format and will be included in the issued CEMP. These plans are relevant to all sections of the text.

- ☐ Section 2 discusses management issues associated with the Construction EMP. Responsibilities for various tasks involved in the environmental management of the construction activities are outlined and contact details for the relevant personnel provided. Reporting lines are outlined and a copy of monthly reporting details to be recorded for the project provided.
- ☐ Section 3 provides details on the soil management strategy associated with transmission line construction, access track construction and maintenance and vegetation clearing. Details of the key soil types found along the route are provided and strategies to protect the soils outlined. An erosion and sediment control plan is presented. Specific treatments needed at various locations along the route are provided.
- ☐ Section 4 specifies noise and vibration management strategies. Sensitive receptors are noted and details given as to the management requirements in the event of various construction techniques along the route.
- ☐ Section 5 covers management of flora and fauna found along the route. Protocols and procedures to be applied during the construction activities in order to protect the local vegetation and fauna are outlined. Weed control activities are discussed

and rehabilitation requirements also outlined. Treatments to be applied at specific localities that are more sensitive are outlined.

- ❑ Section 6 outlines the weed management issues associated with the construction and operation of the line.
- ❑ Section 7 outlines visual issues associated with the construction activities. Management procedures needed to minimise the visual impact of the construction activities and the completed transmission line are provided.
- ❑ Section 8 addresses management issues associated with Aboriginal and European heritage items. Management protocols to be followed in each of the Aboriginal Land Council Areas are detailed. Non-indigenous heritage management protocols are also provided.
- ❑ Section 9 provides strategies to manage waste generated by the construction activities. Procedures to suitably manage the fuels, lubricants and other wastes produced during the project are outlined.
- ❑ Section 10 provides a Traffic Management Plan covering the construction phase of the project.
- ❑ Section 11 provides a Dust Management Plan covering construction activities.
- ❑ Section 12 discusses community consultation issues. Procedures to be followed with respect to community contacts and complaints in relation to the transmission line and construction activities are provided.

Section 13 of the PEMP provides the outline Operations EMP. There are five attached and/or referenced documents to this PEMP. These are the monthly monitoring and recording sheets, access track log which includes all landowner requirements, the DNR guidelines for track construction, the internal TransGrid procedure covering the maintenance of easements and access tracks and relevant A3 sized mapping from the EIS. These documents form part of the PEMP.

2. PEMP Management Responsibilities

2.1 Organisation of Personnel

An Environmental Management Representative (EMR) shall be appointed by TransGrid to be available during construction of the line. The role of the EMR is central to the successful implementation of the PEMP. Although the EMR may be a TransGrid employee, their responsibilities within the project structure provides autonomy to carry out all necessary implementation and auditing functions.

2.1.1 Roles, Responsibilities and Reporting

The key personnel involved with the project and their contact details are as follows:

TransGrid Project Manager	Graham Buckley	Phone:	02 9284 3322
		Fax:	02 9284 3355
		Address	Level 10 Cnr Park and Elizabeth Streets Sydney NSW 2000
Environmental Management Representative	TransGrid advise	to	Phone: TransGrid to advise Fax: Address
TransGrid Construction Engineer	TransGrid advise	to	Phone: TransGrid to advise Fax: Address
Property Liaison Officer	TransGrid advise	to	Phone: TransGrid to advise Fax: Address

The roles, responsibilities and reporting lines associated with the construction of the single circuit transmission line between Wollar and Wellington are outlined in the tables below. If individuals identified to fulfil particular roles change, people affected will be notified of the new personnel involved.

Table 2.1 – Roles and Responsibilities of Relevant Personnel

	TransGrid's Project Manager	TransGrid's Environmental Mgt. Rep. (EMR)	TransGrid Construction Engineer	Contractor's Project Manager	Contractor's Environmental Supervisor
Induction Training	Co-ordinate and facilitate induction and training program	Facilitate induction and training program	Identify TransGrid on-site staff to attend induction and training program	Ensure all on-site staff including sub-contractors attend induction training program	Identify on-site staff for induction and training program
Record Keeping & Complaints Register	Identify records and files needing to be kept and issue record keeping instructions as required. Ensure records are available for audit	Establish and maintain recording sheets and complaints register. Distribute to team and issue record keeping instructions as	Record relevant complaint details and report to EMR	Log data and information of all works undertaken which are subject of the EMP plans or procedures	Identify records that need to be kept. Design filing system. Make file list and files available for audit. Maintain approved Complaint

Table 2.1 – Roles and Responsibilities of Relevant Personnel

	TransGrid's Project Manager	TransGrid's Environmental Mgt. Rep. (EMR) required	TransGrid Construction Engineer	Contractor's Project Manager	Contractor's Environmental Supervisor
Monitoring		Determine sites requiring monitoring. Ensure monitoring is carried out and reports prepared in accordance with EMP.	Identify sites requiring monitoring in the EMP	Inspect sites needing monitoring in the EMP	Register. Notify all complaints to TransGrid and the EMR Undertake monitoring of environmental sites identified in the EMP and prepare a report on the results of the monitoring. Provide copy of the report to the EMR.
Vegetation Procedure	Mgt	Identify where vegetation mgt procedures are to be implemented	Undertake or arrange vegetation protection or weed control activities as required	Instruct contractors to comply with vegetation management procedures	Ensure sensitive sites are known and appropriately handled in accordance with the EMP Observe vegetation management procedures at all sites as required by the EMP and report to EMR
Threatened Species Procedure	Mgt	Review procedures for threatened species and ensure system is in place to carry them out	Ensure threatened species management is undertaken at the relevant location	Instruct contractors to comply with threatened species management procedures	Implement the threatened species management procedures where species may be found Observe threatened species management procedures at all sites as required by the EMP and report to EMR
Noise Mgt		Review the implementation of noise procedures for compliance with consent conditions	Ensure implementation of noise procedures in accordance with consent conditions	Instruct contractors to comply with noise management procedures and provide details as required. Ensure appropriate liaison is maintained with residents likely to be affected by noisy activities	Implement noise management procedures. Observe working hours restrictions. Ensure plant noise control equipment complies with all noise control requirements Observe noise procedures at all sites as required by the EMP. This will include ensuring plant noise control equipment complies with requirements and keeping hours of operation
Erosion and Sediment Control Plan		Review the implementation of procedures associated with erosion and sediment control for compliance with consent conditions	Ensure sites are identified and construction personnel are aware of requirements at specific locations	Instruct contractors to comply with sediment and erosion control procedures and provide details as required	Ascertain sites requiring specific treatments and ensure implementation of protection measures Observe erosion and sediment control procedures at all sites as required by the EMP and report to EMR.
Weed Control Plan	Control	Review weed control requirements	Ensure weed control protocols are addressed prior to and during construction activities	Instruct contractors to comply with weed control procedures	Ascertain sites requiring weed control measures and ensure implementation of weed control procedures Observe weed control procedures during construction as per EMP and report to EMR

Table 2.1 – Roles and Responsibilities of Relevant Personnel

	TransGrid's Project Manager	TransGrid's Environmental Mgt. Rep. (EMR)	TransGrid Construction Engineer	Contractor's Project Manager	Contractor's Environmental Supervisor
Aboriginal and European Heritage Procedures	Review the heritage procedures	Ensure procedures associated with heritage issues are addressed	Instruct contractors to comply with heritage procedures	Identify sites requiring particular control measures	Observe heritage control measures as per EMP and report to EMR
Waste Material Plan	Review the implementation of procedures associated with waste generated due to the project	Communicate waste requirements to construction staff and ensure protocols are met	Oversee waste handling activities during construction	Instruct contractors to comply with waste management procedures	Observe waste management protocols as outlined in EMP
Communication Plan	Prepare communication plan for the project	Establish communication lines related to environmental management issues for the project	Instruct contractors to comply with communication plan	Identify personnel required to implement communication plan and instruct them to comply	Facilitate the requirements of communication plan as required and report to the EMR
Controls	Provide specialists for pre-construction searches and during construction	Record any environmental incidents. Stop any work likely to cause unacceptable environmental impacts. Negotiate revised procedures and remedial measures and authorise recommence-ment	Receive progress reports on contract and recommend payment for completed works	Record contractor and sub-contractor performance and report	Notify all environmental incidents to the EMR. Stop the work if necessary to prevent environmental damage.

2.2 Construction EMP Line of Reporting

The reporting lines for the environmental management issues associated with the project will be as shown in Table 2.2.

2.2.1 Environmental Monitoring and Reporting

The following components of the construction activities will be monitored and reported on regularly during the project:

- ☐ Weed control - monitoring of the weed control program will be undertaken.
- ☐ Erosion and sedimentation control - sites identified in the Erosion and Sedimentation Control Plan as requiring specific attention shall be inspected and monitored during the construction period.
- ☐ Aboriginal archaeology - excavation for tower foundations will be monitored in areas of high potential for archaeological deposits.
- ☐ Revegetation sites will be inspected and monitored during the construction period.

- ❑ All other monitoring data required by the various management plans such as: noise, vibration, dust, water, traffic management issues, erosion and revegetation controls and general environmental performance.

Six monthly Construction Compliance Reports, compiling the above information and meeting the requirements of the Conditions of Approval, will be prepared by the EMR and provided to the Department of Planning.

Table 2.2 - Lines of Reporting

Matters to be Reported	From	To
Induction issues	Environmental Mgt. Rep.	TransGrid's Project Manager
Record keeping and complaints register	Environmental Mgt. Rep.	TransGrid's Project Manager
Monitoring	Contractor's Env. Supervisor	Environmental Mgt. Rep.
Vegetation management procedures	Contractor's Env. Supervisor	Environmental Mgt. Rep.
Threatened species procedures	Contractor's Env. Supervisor	Environmental Mgt. Rep.
Noise management	Contractor's Env. Supervisor	Environmental Mgt. Rep.
Soil erosion and sedimentation control procedures	Contractor's Env. Supervisor	Environmental Mgt. Rep.
Weed control procedures	Contractor's Env. Supervisor	Environmental Mgt. Rep.
Waste management procedures	Contractor's Env. Supervisor	Environmental Mgt. Rep.
Communication plan	Contractor's Env. Supervisor	Environmental Mgt. Rep.
Aboriginal and European Heritage procedures	Contractor's Env. Supervisor	Environmental Mgt. Rep.

2.2.2 Environmental Management Representative

TransGrid will seek the Director General's approval for the appointment of an Environmental Management Representative (EMR) at least 8 weeks before Construction commences. The EMR will be an appropriately qualified and experienced person appointed by TransGrid for the project.

The EMR shall have the responsibilities and powers set out in Conditions of Approval and this PEMP. The EMR will report to TransGrid's Manager/Central Region. Monthly EMR reports will be copied to TransGrid's relevant environmental managers and shall be compiled into the six monthly Construction Compliance Reports provided to DOP and to any appointed external auditors promptly on request. Any person to be appointed as a temporary or permanent replacement EMR during the project shall be promptly nominated to the Director-General for approval.

2.3 Induction Requirements

All personnel involved with construction works along the line will be required to attend a Site Induction Program. The program will be facilitated by the EMR and will promote environmental awareness with respect to construction techniques to be employed. It will address all relevant environmental and community issues including ecology, heritage, noise, dust, traffic, weeds and energy usage.

Once completed, personnel will be required to sign a declaration form indicating that they have been given and understand the environmental management procedures to be used during the construction program.

2.4 Environmental Impact Audit

In accordance with the Conditions of Approval, TransGrid will conduct an independent environmental audit of the impact of the construction activities, within three months after practical completion of construction works, to verify the environmental impacts against those predicted in the EIS and Submissions Report and to identify any residual impacts arising from non-compliance with the PEMP and the contractor's CEMP. Relevant organisations will be consulted by the auditor to identify any specific areas of concern to those organisations.

2.5 Records

Records to be kept in relation to the environmental practices during the construction period will include:

- ☐ a monthly monitoring report of the overall program (to be kept by the TransGrid Construction Engineer). An example of this is included as **Attachment A**;
- ☐ a complaints register (to be kept by the EMR);
- ☐ clearing and revegetation records (to be kept by the Contractor's Environmental Supervisor);
- ☐ soil erosion and control measures implemented (to be kept by the Contractor's Environmental Supervisor); and
- ☐ landowners concerns and feedback (to be kept by the EMR).

2.6 Procedures to be Followed Where Outcomes are Not Achieved

Should the monthly monitoring identify that objectives identified are not achieved, the management plans associated with the element that requires improvement will be reviewed and corrective action taken. If required, additional advice will be obtained from representatives from bodies such as the State Forests or Department of Planning (DOP). If appropriate, property owners will be also contacted. The management plan relevant to the particular environmental element will be reviewed and updated, to address the issue identified. Contractors will be advised of any additional requirements to ensure that future activities comply with the management plans.

3. Soil and Water Management Strategy

3.1 Introduction

This Soil and Water Management Strategy has been prepared based on investigations contained in the Environment Assessment and geotechnical investigations to date. Should any additional requirements be identified in the subsequent development consent, these will be incorporated in the plan prior to finalisation of the CEMP. This section outlines the measures to be implemented to ensure that soil disturbance is minimised and suitably managed to prevent soil erosion.

Details of the procedures to be followed are presented below. Items covering rehabilitation should also be read in conjunction with Chapters 5 and 6.

3.2 Objectives

The Soil Management Strategy has been developed to provide TransGrid personnel and its contractors a set of guiding principles to protect the soils in the area during the construction period. Landscapes along the route which require particular treatments or are otherwise sensitive have been identified and specific procedures outlined to protect these areas.

The Erosion and Sediment Control Plan aims to minimise the impacts of clearing vegetation along the transmission line easement and the construction of new access tracks in accordance with Department of Natural Resources and State Forest guidelines by:

- ☐ maximising ground cover retention;
- ☐ maximising the use of existing access tracks;
- ☐ avoiding creek crossings that would have undue impacts;
- ☐ optimising the clearing of vegetation to ensure the most appropriate methods are used for the terrain;
- ☐ specifying the range of erosion and sediment control procedures required along the route to minimise impacts; and
- ☐ providing a mechanism for monitoring the effectiveness of temporary erosion control measures.

The requirements of individual property owners have been taken into account along the entire route. This has been a critical component in the project to date and will continue throughout the construction phase. In the vast majority of instances, landowner requests for access track location have been adopted. Erosion controls required have been discussed and agreed with individual landowners.

Any modifications to these requirements as a result of planning approval will also need to be discussed with the individual land owner prior to implementation.

3.2.1 Legislative Framework

Although the project was approved under Part 3A of the EP&A Act which covers all other legislative approvals, TransGrid will still abide by the normal ongoing legislative and government agency requirements for protection of the soils resources in NSW. This legislation places responsibilities on those involved in land or vegetation disturbance, directing them to undertake work in a way which minimises detrimental impacts and mitigates against unavoidable impacts. The following legislation contains key responsibilities for TransGrid during the construction of the transmission line between Wollar and Wellington.

The ***Protection of the Environment Operations Act 1997*** regulates all activities that result in water or air pollution except where they are carried out in accordance with a licence issued by the Environment Protection Authority (EPA). This pollution includes that associated with disturbance of soils that generates dust and/or sediment, particularly where these are contaminated. This act also provides for the imposition of severe penalties for serious pollution offences.

The ***Soil Conservation Act 1938*** provides for the “conservation of soil resources and for the mitigation of erosion”. Where developers or landholder actions lead to soil erosion or land degradation they can be prosecuted under this act (s15A, 18 or 22). The Protected Lands provisions (s21C) require permits to be obtained from DIPNR (now Department of Natural Resources) prior to disturbance of vegetation on steeply sloping, riparian or otherwise sensitive lands. Although a permit is not now required for this project, TransGrid will liaise with the local Soil Conservationist or Department of Natural Resources representative and take into account any specific requirements as necessary during construction.

The ***Native Vegetation Act 2003*** controls the clearing of native vegetation throughout NSW and is administered by DNR. Clearing of native vegetation would normally need to meet the “improve or maintain” environmental outcomes test required by this Act. Matters relevant to the conservation and management of native vegetation have been incorporated into the approval under Part 3A of the EP&A Act.

The ***Rivers and Foreshores Improvement Act 1948*** provides the protection and improvement of “protected water” which includes most rivers, lakes and estuaries and associated “protected lands” which includes land within 40 m of these waters. Any activity that is likely to cause interference with the flow of such protected waters or excavation within protected lands would normally require a permit from the DNR. Although a permit is not now required for this project, TransGrid will liaise with the local Department of Natural Resources representative and take into account any specific requirements as necessary during construction.

The ***Crown Lands Act 1989*** requires that any activities occurring on Crown Lands be authorised through a licence, lease or reserve. Any activities that are undertaken on such land must be carried out in accordance with good management principles

including soil and water protection and the maintenance of other environmental values.

The ***Threatened Species Conservation Act 1995*** aims to minimise the impacts of activities affecting threatened species, populations and ecological communities. Such populations need to be adequately assessed and measures to conserve them adopted in management plans, to the satisfaction of the Department of Environment and Conservation (DEC). Identification of such species has been carried out by TransGrid as part of the environmental impact assessment and mitigation measures have been identified and incorporated into this plan and the Statement of Commitments.

The ***Fisheries Management Act 1994*** requires that the Minister for Primary Industries be notified pursuant to S199 of the Act, should any dredging or reclamation work be required in any waters. Although no approvals are required under this legislation, TransGrid will contact the local Department of Agriculture representative and take into account any specific requirements as necessary during construction.

3.3 Route Description

The types and distribution of soils in the area is related to geology, terrain and climate and has a major influence on the construction techniques to be employed along the transmission line. Descriptions of the soils found along the route are provided in the EIS (Section 5.3).

3.4 Erosion and Sediment Control Plan

During the construction of the single circuit 330 kV transmission line there is the potential for erosion and sedimentation to occur due to ground disturbance required to install the towers, access tracks and winch and conductor drum storage sites needed for the project. This is particularly so in areas with moderate to steep slopes and in areas where the soils are fragile and readily erodible.

This Soil Management Strategy has been prepared to detail the mitigation measures to be implemented to ensure that soil disturbance is minimised and potential erosion controlled. Details of the procedures to be followed in relation to the various aspects of soil management are presented in the relevant sections below.

The vast majority of the line is able to be accessed using existing property access tracks and those created for existing transmission lines that parallel the proposed line, and in part due to the extensive grazing and cultivation in the area. Clearing is required within the proposed easement but very little clearing will be necessary for the proposed access tracks. The proposed 117 km easement is 60 metres wide and totals 724 hectares, of which 600 hectares is cleared land and 115 hectares retains some form of woodland. Of the 115 ha within the easement, approximately 97 hectares of woodland will be cleared to permit tower construction and the cleared easement will be maintained free of trees and tall shrubs. Of the woodland that occurs, approximately two thirds consists of dense woodland and one third consists of open woodland with wide spaces between the trees.

Access tracks will be used infrequently by heavy vehicles during construction, with access only being required to transport towers to site and carry out minor vegetation clearing.

Much of the work associated with the construction of this transmission line will not require significant vegetation clearing or soil disturbance. Consequently, the material presented below relates primarily to the areas where new access tracks are required, upgrading of existing tracks and creek crossings and easement clearing will be carried out.

Erosion and sediment control measures will be implemented where required, aimed at minimising the area and length of time that soil is to be exposed, controlling run-on and runoff water in a manner that does not result in erosion, and containing sediment that may leave disturbed areas. Control measures to be applied are aimed at reducing the velocity and volume of water flowing over disturbed surfaces, and controlling and slowing down the path of such flows.

3.4.1 Access Tracks

An access track is a track negotiable by vehicles necessary for construction works along the easement. An access track log for the project has been developed and provided as **Attachment B**.

Access to each new structure location will be required. Access will also be required to temporary sites needed for storing conductor drums, winching and breaking equipment during the conductor stringing.

Where possible existing access tracks will be used with upgrading of these tracks where required. Where new access is required, the location will be determined by the prevailing conditions and property owner preferences. The location of any new tracks will be discussed with each owner.

The contractor will be required to design the access tracks and erosion and sedimentation controls in accordance with the publication and *Guidelines for the Planning, Construction and Maintenance of Access Tracks (DLWC 1985)* and TransGrid will apply the same guidelines to its maintenance activities. Access tracks will be constructed so as not to impair drainage. Impacts will be assessed having regard to *Soil and Landscape Issues in EIA (DLWC 2000)*.

Access to the line easement will normally be obtained at crossings of established roads, and access to structure sites will be along the easement. In cases where terrain conditions prevent continuous access along the line easement between road crossings, 'off easement' access may be required. The locations requiring off easement access are indicated on the Project Route Plans contained in Volume 3 of the EIS as Drawing TL811727 sheets 1 to 42.

3.4.1.1 Categories of Access Track

Where existing tracks are available these have been chosen in preference to establishing new tracks. Track location has been identified in close consultation with each property owner.

Where new access tracks are required, they are to be generally constructed in accordance with DIPNR's (previously DLWC) *Guidelines for the planning, construction and maintenance of tracks 1984 (revised 1985)*, provided in **Attachment C**. The design aims to minimise the impact of the construction on the surrounding environment, by controlling runoff and minimising soil erosion to protect water quality and limit stream sedimentation.

Track work associated with the project will fall into the following categories:

- (a) upgrading of existing tracks. This will generally involve widening, draining and resurfacing. The standard of the track is to be suitable for the purpose for which it was originally constructed. In some cases, it will be necessary to import material.
- (b) Tracks traversing flat plains country. These areas require grader formed tracks with the crown 300 mm above the natural ground surface and constructed with table drains on both sides;
- (c) Tracks traversing flat or gently undulating open or sparsely timbered and/or rocky areas;
- (d) Tracks traversing flat or gently timbered areas;
- (e) Tracks traversing swampy and/or unstable soil conditions. Tracks formed in these areas could require the removal of unstable soil and replacement with hard fill and/or geotextile fabric. In such cases, the track is to be topped with approved gravel with a compacted thickness of 50 mm, leaving the track 150 mm above natural ground level;
- (f) Tracks traversing heavily undulating sparsely timbered and/or rocky areas;
- (g) Tracks traversing heavily undulating timbered and/or rocky areas;
- (h) Tracks traversing rugged sloping timbered and/or rocky areas where the average natural grade of the slope is greater than 1:4 but less than 1:2;
- (i) Tracks traversing rugged steeply sloping areas involving large changes in elevation where the average natural grade of the slope is steeper than 1:2.

The principles on which access tracks are to be constructed are outlined below.

3.4.1.2 Access protocols

- ☐ Construction traffic is to be confined to access tracks as far as practicable;
- ☐ Where access is via open spaces, particularly in cultivated areas or pasture improved grazing land, care shall be exercised to ensure that minimum damage is caused to the surface by confining movement to the nominated route. Indiscriminate traffic in such areas is to be avoided. Unformed access tracks are shown on the Project Plans and usually follow fence lines.

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- ☐ access across paddocks when permitted by the landowner but not requiring constructed tracks will occur under conditions that will not result in damage to soils and vegetation within the paddocks.
 - ☐ The landowner is to be contacted prior to first vehicles entering the property. The landowner is to be advised of subsequent access requirements during the construction phase.
 - ☐ All gates to be left as found (open or closed) unless otherwise indicated by the landowner.
 - ☐ Transportation of bulldozers shall occur with the blade up unless involved in construction activities;

3.4.1.3 Construction techniques and mitigation measures

- ☐ new access tracks are shown on the Project Route Plans and generally follow the contour of the land (with the exception of steep country), minimising earthworks and drainage requirements. In the case of cultivated land, access tracks generally follow fence lines or otherwise located in accordance with property owner requirements;
- ☐ where additional material is required for the construction of tracks, local material will be used;
- ☐ where possible, tracks follow the top of ridges or spurs or flatter areas and avoid steep areas with greater potential for erosion and sediment movement.
- ☐ stormwater is to be controlled by construction of table drains with mitre drains as required, and cross drains to control concentration of runoff;
- ☐ **on flat ground**, tracks shall be formed with appropriate **crowning or crossfall** using suitable materials. To provide for rain water run-off, table drains shall be constructed with mitre drains at appropriate intervals to control the concentration of run-off;
- ☐ **tracks on slopes** are to be constructed with adequate **crossfall drainage** to reduce erosion damage and minimise maintenance needs. The finished track surface shall drain in the direction of the crossfall with the lower edge of the track being 150 – 200 mm below the top edge of the track. It is preferred that tracks slope away from the bank however, in situations where the fill batter is greater than 1.5 m in height or the fill is unconsolidated and likely to erode, then the track is to slope into the bank. To ensure effectiveness of outfall drainage, any earth windrow which develops on the down-slope side of the track shall be bladed off to prevent concentration of water from the road causing erosion. With inward sloping tracks table drains and culverts will also be required.

All cuts and fills shall be constructed to a stable batter to minimise subsequent slumping. Erosion fill areas shall be mechanically compacted using equipment on site. Where topsoil is required to stabilise batters, it shall be stockpiled for respreading after construction, or imported if required. In areas where long

slopes occur above a track, cut batters should be protected by graded diversion banks or drains.

- ❑ in areas where the soils are erodible or the grade of the track is such that water will run down the track rather than across it, then **cross banks** will be constructed for both inward and outward sloping tracks. Cross banks will usually be constructed at right angles to the road, however, diagonal banks may be required to obtain sufficient grade or direct water to a suitable outlet.

Spacing of crossbanks shall be in accordance with DNR guidelines, shown in the table below.

Table 3.1 Cross Bank Spacing (m)

Road Grade	Soil Erodibility		
	Soil Class A Low soil erodibility	Soil Class B High soil erodibility	Soil Class C Very high soil erodibility
Up to 8 ⁰	70 - 90	60 - 70	20 - 30
8 ⁰ to 12 ⁰	60 - 70	50 - 60	*
12 ⁰ to 16 ⁰	40 - 60	*	*
16 ⁰ to 20 ⁰	30 - 40	*	*
20 ⁰ to 22 ⁰	20 - 30	*	*

* - track grade specified should not be constructed on these soil types without consultation with Soil Services

Where tracks are constructed on slopes exceeding 12⁰ only light and infrequent traffic should be permitted

Soil Class A – Brown and red soils derived from finer sediments

Soil Class B – Red soils on fine granites, fine sandstones and basalts –

Soil Class C – Grey and yellow soils derived from coarse grained granites and sediments

Cross banks are generally to be installed progressively during track construction. In some instances it may be difficult for heavy vehicles involved in erection and stringing to traverse cross banks and in such cases the cross banks shall be installed after stringing is completed, but in consultation with the landowner. Some existing tracks are already adequately drained, and these provisions will not be altered unless otherwise requested by the landowner.

Stable and clear outlets for the cross banks are to be constructed to enable water to discharge without the flow concentrating. Where possible, the outlet is to spill into undisturbed vegetation;

- ❑ where **steep country** is to be traversed, the most direct route up the slope has been taken where possible rather than constructing tracks across the slope;
- ❑ **diversion of run-on water:** where necessary run-on water will be diverted away from the new access track sites to minimise the risk of soil erosion occurring while the surface is disturbed;
- ❑ where large areas are to be disturbed **sediment traps** will be constructed downslope of the site to contain sediment. These will consist either of straw bales, filter fences (or similar devices) or small sediment ponds;

- ❑ erosion control structures are to be monitored and maintained during the construction works to ensure that their effectiveness is maintained. Where required, sediment will be removed from sediment control ponds, straw bales replaced and filter fences maintained.

3.4.1.4 Watercourse Crossings

Crossings of a number of creeks will occur as part of the transmission line works. The main creeks that will be crossed (from the Wollar end of the line) are listed below. This table also includes the condition of the existing environment and the expected impacts:

Table 3.2 – Creek Crossings

Creek Crossing	Existing environment	Impacts
Cumbo Creek (Str 31)	Cleared land. Has existing formed tracks	No riparian vegetation to be removed.
Wilpinjong Creek (Str 36A, 37A & 38)	Cleared land. Existing non-formed tracks.	No riparian vegetation. New concrete causeways to replace existing crossings.
Wilpinjong Creek (Str 48)	Cleared land. Not crossed by existing tracks.	No riparian vegetation. No track crossing
Wilpinjong Creek (Str 53)	Cleared land. Existing non-formed tracks cross the creek.	No riparian vegetation. New concrete causeway
Wilpinjong Creek (Str 55)	Cleared land. Existing non-formed track.	No riparian vegetation. New concrete causeway to replace existing crossing.
Wilpinjong Creek (Str 56)	Cleared land. Existing non-formed tracks	No riparian vegetation Existing concrete causeway
Wilpinjong Creek (Str 60)	Cleared land. Not crossed by existing track.	No riparian vegetation. No track crossing.
Moolarben Creek (Str 80)	Cleared land. Not crossed by existing track	No riparian vegetation. No track crossing.
Hollow Creek (Str 82)	Cleared land. Not crossed by existing track.	No riparian vegetation. No track crossing.
Un-named Creek (Str 91)	Blakey's Red Gum. Crossed directly by line. Existing non-formed access track	Some vegetation will be cleared with tall trees lopped. New concrete causeway for access track located on the

Creek Crossing	Existing environment	Impacts
		existing Beryl – Ulan 132kV transmission line.
Un-named Creek (Str 109)	Cleared land. Existing track. Line shares common corridor with existing Beryl – Ulan 132kV T line.	No riparian vegetation. Existing crossing.
Unnamed Creek (Str 112)	White Box – Inland Grey Box crossed directly by the line in close parallel with existing 132 kV line. Existing track with a new radial offshoot.	Tall trees will be lopped. No track will cross the creek.
Stubbo Creek (Str 128)	Cleared land. Existing non-formed track. Crossed directly by the line.	Existing concrete causeway.
Unnamed Creek (Str 134)	Cleared land. Existing non-formed track. Need upgrading.	No riparian vegetation. Track upgrading required.
Unnamed Creek (Str 158)	Cleared land. No track crossing.	No riparian vegetation
Unnamed Creek (Str 163)	Cleared land. Existing track.	No riparian vegetation
Unnamed Creek (Str 171)	Cleared land. Existing non – formed access. Upgrading required.	No riparian vegetation. Existing creek crossing (rock)
Unnamed creeks (Str 173 & 174)	Cleared land. Existing track.	No riparian vegetation. Existing crossings.
Mebul Creek (Str 181)	Cleared land. No access crossing.	No riparian vegetation
Unnamed creek (Str 186)	Cleared land. Existing formed track with rock crossing.	No riparian vegetation. Existing track and crossing.
Goolma Creek (Str 190)	Yellow Box – Blakely’s Red Gum. Existing crossing to be upgraded.	Vegetation around Str 190 will be cleared. Upgrading of existing crossing.
Unnamed Creek (Str 197)	Yellow Box – White Box community. Access track required.	Vegetation will be cleared for tower location and access track.
Unnamed Creek (Str 202 – 203)	Yellow Box – Blakely’s Red Gum community. No creek crossing.	Tall trees will be lopped.

Creek Crossing	Existing environment	Impacts
Unnamed Creek (Str 203 – 204)	Cleared land. No creek crossing	No riparian vegetation. No access crossing of creek.
Un-named Creek (Str 205 – 206)	Yellow Box – White Box community. Existing access. Parallel existing Wellington – Beryl 132kV Line.	Vegetation will be cleared for tower location.
Molly's Creek (Str 207 – 208 - 209)	Cleared land. Existing access. Existing creek crossing to be restored. Parallel existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Un-named creek (Str 210 – 211)	White Box community. Existing tracks. Parallels existing Wellington – Beryl 132kV Line.	Vegetation will be cleared for tower location.
Un-named creek (Str 217 – 218)	Yellow Box – Blakely's Red Gum community. Existing tracks. Existing crossing to be upgraded. Parallels existing Wellington – Beryl 132kV Line.	Towards Str 218, vegetation will be cleared for tower location. Upgrading of existing creek crossing.
Un-named creek (Str 235 – 236)	Cleared land. Existing track and causeway.	No riparian vegetation.
Mitchell Creek (Str 243 – 244)	Cleared land. Existing track. Parallel existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Un-named creek (Str 246 – 247)	Cleared land. Existing track. Parallel existing Wellington – Beryl 132kV Line. Existing creek crossing to be upgraded	No riparian vegetation. Upgrading of existing creek crossing.
Un-named creek (Str 248 – 249)	Cleared land. Existing formed track. Parallels existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Un-named creek (Str 255 – 256)	Cleared land. Existing track. Parallels existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Un-named creek (Str 256 – 257)	Cleared land. Existing formed track. Parallels existing Wellington – Beryl 132kV Line.	No riparian vegetation.
Un-named creek (Str 259 – 260)	Generally cleared land. Some White Box in mid-span. Existing track. Parallels existing Wellington – Beryl 132kV Line.	Tall trees will be lopped.
Un-named creek	Cleared land. Existing track.	No riparian vegetation

Creek Crossing	Existing environment	Impacts
(Str 261 – 262)		
Un-named creek (Str 262 – 263)	Generally cleared land. Some White Box in mid-span. Existing track.	Tall trees will be lopped.
Un-named creek (Str 266 – 267)	Generally cleared land. Some White Box in mid-span. Existing track.	Tall trees will be lopped
Un-named creeks (Str 269, 270 271)	White Box & Cypress Pine Existing track.	Tall trees will be lopped.
Un-named creek (Str 273 – 274)	Cypress Pine. Existing track	Tall trees will be lopped.

Where an access track meets a watercourse which, under normal circumstances cannot be crossed by construction vehicles, a crossing will be constructed, generally consisting of culverts or causeways. Causeways are preferred since they can be built with least disturbance to the stream flow and banks. Culverts are only required where all weather crossing of streams and creeks are required or where the creek has a deep cross section which would require considerable excavation to provide a satisfactory approach to a causeway. Where potential archaeological material may be affected by a creek crossing, the type of crossing and bank stabilisation work proposed is governed by the need to protect the artefacts. General provisions adopted are listed below.

- ☐ soil and vegetation disturbance during construction of causeways and culverts shall be kept to a minimum. Such disturbed areas shall be reseeded and protected from erosion;
- ☐ any timber or debris from the construction work will be stacked adjacent to the watercourse above flood level;
- ☐ where minor drainage lines have to be crossed and disturbed during the construction works they will be rehabilitated following completion of works. During rehabilitation of the sites, care will be taken to ensure that slopes of the gullies are not left steeper than they were initially, since this could result in erosion.

Causeways

In accordance with Statement of Commitment 35, TransGrid will liaise with NSW DPI Division of Agriculture and Fisheries in respect of the four new concrete causeways and four locations requiring causeway and/or track upgrading at a creek crossing as listed in Table 3.2.

Causeways shall be constructed by first removing all loose material from the watercourse at the point to be crossed, thus forming a depression with firm base and

sides. Where archaeological material has been identified and shown on the Project Route Plans, no material is to be removed or otherwise affected without the approval of the Environmental Management Representative and only in accordance with specific archaeological management plan.

The depression shall then be filled with graded layers of approved rock – largest size rocks in the bottom and smallest size in the top layers. The rock layers shall be placed to produce an interlocked bed of rock, sloped and dished, so that it allows water to drain freely through and flow over the causeway. The rock layers shall have a minimum thickness of 450 mm. The finished level of rock layers shall not be higher than the bed of the watercourse in order to avoid creating a baffle to the smooth flow of water over the causeway.

If required, the entire rock surface shall be covered with reinforced concrete having:

- a minimum compressive strength at 28 days of 20 MPa;
- and a minimum thickness of 150 mm;
- a minimum cover over reinforcement of 75 mm, returning at both upstream and downstream sides for a depth of 450 mm;
- reinforcing mesh of F82 ARC or equivalent.

In some cases, a reinforced concrete causeway may be constructed over natural bedding. The concrete and reinforcing shall be of the same strength and size as required for concrete causeways constructed over rock.

Culverts

Culverts shall be constructed using rubber ring jointed reinforced concrete pipes manufactured in accordance with the latest issue of AS 1342 *Precast Concrete Drainage Pipes*. The diameter of the pipe shall be sufficient to carry the normal flow of water and/or run-on water after heavy rain. Pipes shall be bedded in accordance with manufacturer's recommendations and backfilled using appropriate fill material. Head and or tail walls shall be constructed as required.

3.4.2 Gates

New gates are to be installed as shown on the Project Route Plans. Wires in existing fences are to be restored to their former condition as far as practicable, and must remain stock proof overnight.

3.4.3 Rehabilitation

Rehabilitation of disturbed areas will be carried out following completion of works.

- ☐ temporary construction tracks and associated disturbed areas will be ripped, seeded and fertilised following completion of construction;
- ☐ where the access tracks are to be temporary, topsoil will be removed and stockpiled for respreading following completion of the work;

- ☐ following completion of track construction, the area will be reinstated to its original condition;
- ☐ permanent access tracks are to be left in a stable condition and formed banks or fill areas to be sown in consultation with the landowner;
- ☐ table drains are to be stable at completion of the work, and if necessary seeded and protected with jute mesh and bitumen;
- ☐ seed and fertiliser shall be applied to all ground in the vicinity of the access track where surface grasses have been removed or bare patches are evident.

The seed mix will depend largely on landowner requirements however for the revegetation works to be successful, preference would be given to fast growing improved pasture species for the majority of cases. The mix can also include slower growing but more hardy grasses as well as native grasses. The following table gives a general mix, however this can be varied to include other species or rates specific to landowner requirements.

Table 3.3 - Generalised Seed and Fertiliser Applications

Season	Species	Rate kg/ha	Fertiliser	Rate kg/ha	Sowing
Autumn sowing/low bulk pasture	Kangaroo Rye Highlands Bent Rose Clover Red Clover	10 5 5 5	11-34-11 or 15-30-0	400	Early March to Early May
Autumn sowing/high bulk pasture	Cereal Rye Kangaroo Rye Phalaris (Siroso) Highlands Bent Sub Clover Fescue Lucerne	10 5 5 5 5 5 5	11-34-11 or 15-30-0	400	Early March to Early May
Summer sowing/low bulk pasture	Couch Fescue Red Clover	5 5 5	11-34-11	400	Late December to late February
Summer sowing/high bulk pasture	Japanese Millet Phalaris Couch Rhodes Grass Cocksfoot	1 3 5 15 5	11-34-11 15-30-0	400	Late December to late February

* The mixtures in the fertiliser column refer to the percentage by weight of P₂O₅, N, and K₂O in the recommended fertiliser types. Commercial fertilisers are available which contain these proportions of major nutrients (Source: Hannon, 1995).

Sowing methods can also vary depending on slope, season and existing soil seed stock. For areas of healthy pasture without weed infestation prior to disturbance, simple broadcast sowing followed by harrowing will be sufficient. For areas that have been previously treated with herbicide or have otherwise been heavily disturbed by equipment during construction, some shaping, raking or ploughing may be necessary prior to sowing. In these cases, sowing can be done by seed drill or disc plough followed by harrowing if necessary.

For steep slopes or areas of high erosion risk, a more active revegetation method may be employed. An effective method of achieving quick stability on steep batter slopes is to apply a spray application of straw mulch material to the ground surface immediately following the formation of exposed slopes or following topsoiling. The mulch would consist of straw, bitumen, fertiliser and seed mix. Alternatively, Curosol or a similar biodegradable binder mixed with wood fibre could be used. The primary purpose of these applications is to provide immediate surface soil stability to minimise erosion potential while at the same time sowing grass seed and fertiliser.

The hay mulching also slows runoff velocities thus reducing scour potential. However, even with this surface sealing, runoff from larger storm events will have the potential to erode steeper batter slopes. The erosion will reduce once vegetation is established.

The fertiliser application will likely to be either "Starter 15" or "Grower 11" at a rate of 400 kg/ha. An application of gypsum, to improve soil structure and water infiltration may be necessary. Follow-up fertilisation may be necessary in 6 to 12 months and the usual rate would be 125 kg/ha using a product such as "Aftergraze" or equivalent.

All revegetation works will be undertaken in consultation with the landowners.

3.4.4 Vegetation Management

Where tree and shrub cover has been removed from the transmission line route the extent of bare earth is to be minimised and revegetated following completion of the construction phase. Low and slow growing species such as native grasses are to be encouraged and rapid and tall growing species removed by regular slashing. Specific requirements include:

- ☐ vegetation is not to be removed by grading or bulldozing to a bare soil condition and fire is not to be used without the approval from the Rural Fire Services.
- ☐ Wherever possible, vegetation on access tracks is to be removed by slashing or blading only (i.e. pushing the vegetation over with a blade and minimising disturbing the soil beneath the plant).
- ☐ Soil blading is to be avoided except where required to build a track bench on side slopes, to form drainage line approaches or to make rough surfaces trafficable. Disturbed areas are to be cleared in such a way as to disturb the surface as little as possible and leave root and seed stock in the ground.
- ☐ tree and shrub growth is to be arrested through regular slashing to reduce vegetation height to less than 30 cm on average during the year.

In general, easements are inspected at least annually and include assessment of erosion damage. Additional erosion control works which necessitate loss of vegetation will be revegetated in accordance with this protocol. The EMR will be responsible for determination of success of the rehabilitation program in consultation with land owners.

3.4.5 Inspections

The EMR will undertake periodic inspections of temporary and permanent erosion and sedimentation control devices during the construction period, to ensure that the most appropriate controls are being implemented, and to check that controls are being maintained in an effective condition.

On completion of construction, the EMR will determine if or when temporary erosion and sedimentation controls (such as silt stop fencing) will be removed.

3.5 Towers Within 40 m of Creeks

Proposed works within 40 m of protected waters or 20 m of prescribed streams will be reviewed with the local representative of DNR including 10 towers close to named creeks and a larger number (approximately 20) close to unnamed creeks, prior to construction for any specific management principles that may be required.

4. Noise and Vibration Management Strategy

4.1 Introduction

A noise impact assessment for the Wollar to Wellington project has been prepared by Atkins Acoustics Pty Limited. The following management strategy is based on this assessment but will be updated as necessary with any specific conditions of consent which may be imposed.

4.2 Construction Activities

4.2.1 Construction Noise Limits

Given the nature of the construction project, work will be carried out at any particular location over short periods only (i.e. less than 4 weeks). Work at each tower location will take approximately 2 days.

The Construction noise goals are to manage noise from Construction activities so they do not exceed, at any residential receiver during the day, the adopted Rating Background Level of 30 dB(A), and the Short Term LA_{10,15min} of 50 dB(A), Medium Term LA_{10,15min} of 40 dB(A), and Long Term LA_{10,15min} of 35 dB(A). Recognising that the goals are not always achievable, TransGrid will seek to mitigate the impact by minimising the duration of noise exceedances and ensuring that affected properties are adequately forewarned of the prospective noisy days. In the event of any complaint about construction noise, noise monitoring shall be undertaken where such monitoring could assist the management of future works so as to avoid any similar impact during subsequent works.

4.2.2 Construction Hours

Hours for construction works will be limited to:

- ☐ Monday to Saturday, 7 am to 6 pm;
- ☐ Work on Sundays and Public Holidays will be strictly limited.

Work outside these hours and work on Sundays and Public Holidays will only occur when:

- ☐ The work does not cause a noise nuisance at any nearby residential property. Noise nuisance is defined as being greater than 20 dB(A) above background levels, tonal noise generation or activities which could reasonably cause sleep disturbance in the opinion of the EMR;
- ☐ The delivery of materials outside these hours is requested by Police or other authorities for safety reasons; and
- ☐ Emergency work to avoid loss of lives and/or property.

4.3 Receptors Sensitive to Noise Generation

Built up residential areas are generally located well away from the proposed transmission line route between Wollar and Wellington, however some isolated residences occur near the centre line. The closest residence is approximately 250m from a tower site, whilst typically residences are located in excess of 800m from the centre line. Table 4.1 lists all houses within 400 metres of the transmission line.

Table 4.1 - Houses within 400 metres

Span	Number of Houses
35 - 36	1 House
41 - 42	1 House
44 - 45	1 House
46 - 47	2 Houses
53 - 54	1 House
59 - 60	2 Houses
61 - 62	1 House
62 - 63	1 House
80 - 81	1 House
82 - 83	1 House
111 - 112	1 House
134 - 135	1 House
141 - 142	1 House
150 - 151	1 House
154 - 155	1 House
205 - 206	1 House

The Ulan Public School is located approximately 500m from a proposed tower site but there is the intervening public road, railway line and power-line. TransGrid will consult with the Principal of Ulan Public School prior to construction works commencing in the vicinity of the school. Where practicable, high noise activities will not be timetabled during any important school events such as examination periods, unless acceptable alternative arrangements are made. Any such arrangements will be made at no cost to the school.

4.4 Construction Noise Levels of Residential Receptors

During construction of the line, noise generation will occur in relation to access track construction, vegetation clearing, construction of structure foundations, structure erection and conductor and earthwire installation. Ancillary facilities such as concrete batching may also generate noise. Typical noise levels from the plant and equipment to be used during construction are outlined below:

Table 4.2 – Typical Plant and Equipment dB(A) re: 20 × 10⁻⁶ Pa

Item	Sound	Plant Description	Number of Items	Level
Pressure				LA10 @ 7m
Access Track Construction				
Dozer		Tracked	1	90
Water Cart			1	80
Total				90
Vegetation Clearing				
Timber Shredder		Truck mounted	1	90
Excavator		Kato 750	1	82
Chainsaw			1	85
Total				92
Structure Foundations				
Excavator		Kato 750	1	82
Drill Rig		truck mounted	2	87
Concrete Vibrators			1	80
Total				88
Structure Erection				
Crane		Truck mounted	1	80
Compressor		1000 CFM	1	77
Welders			2	75
Total				83
Conductor and Earthwire Erection				
Crane		Truck mounted	1	80
Winch			2	66
Generator		Diesel	1	76
Braking Device			2	66
Total				82
Batching Plant				
Batching Plant			1	85

The predicted construction noise levels for various stages of construction at reference distances have been determined by noise consultants (see EIS). The calculations are conservative as they assume all plant associated with various activities are operating simultaneously and take no account of potential shielding from topography or ground absorption. Accordingly the expected levels at distances greater than one hundred (100) metres are expected to be lower than the levels presented in the EIS. A summary of the impacts is provided below.

The predicted noise levels for the **access track construction** and **vegetation clearing** activities exceed the DEC short-term assessment goal (50dB(A)) at residential

properties within 800 metres of the construction activities. It is envisaged that such activities would be short term (1-3 days) and hours of activities modified to minimise disturbance.

With respect to **structure foundations**, noise exceedances are predicted for residential properties within approximately 600m of the activities.

For **other construction activities**, the predicted noise levels show compliance for residential properties at distances of 300m or greater.

As the envisaged construction activities are transient and would last no more than four (4) weeks at any one location, any noise impact would be short-term.

4.4.1 Noise Control Procedures

Noise control for the construction activities will primarily be achieved through adherence to the construction hours specified and through use of appropriate equipment with effective noise suppression.

- ☐ Construction hours limits will be strictly enforced to ensure that noise does not occur outside these periods.

To minimise potential noise impacts, the construction activities would normally be restricted to the daytime hours 7:00 am to 6:00 pm Monday to Saturday, and at no time on Sundays and public holidays except for the delivery of materials required outside these hours by the Police, RTA or other authorities for safety reasons, or where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

- ☐ It will be a requirement of the contract let for the works that contractors engaged on the construction program will ensure that effective noise control equipment is fitted on all machinery used for the work. This equipment is to be operational and maintained during the project.
- ☐ Work practices will be implemented to minimise potential noise impacts.
- ☐ Noise monitoring shall be conducted in response to community complaints and at the request of the DEC. Reports of investigations shall be provided to the DEC upon request.
- ☐ A site noise training and awareness program will be undertaken for all staff and contractors engaged during construction; and
- ☐ The establishment of procedures to address any noise complaints received from the public during the construction period.

In addition to the above noise control measures, at locations where residents will be impacted by noise levels potentially exceeding the stated criteria, additional procedures will be followed.

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- ☐ Residents will be informed of the construction activities prior to works commencing on these properties. They will be informed that noise associated with construction activities may be heard for a short period only (i.e. generally 1-2 days). The dates and anticipated times during which this noise will occur will be provided.
 - ☐ In terms of noise impacts from activities associated with structure foundations, localised acoustic controls shall be considered where occupied residences are located within 400m of the site. This will involve orientation of equipment so that noise is directed away from residences, staging of activities, shielding and minimisation of simultaneous operations.
 - ☐ Where rock breaking is necessary within 400 m of an occupied residence, the occupier of the residence will be informed of the works at least two days before commencing. Rock breaking will be scheduled where practicable to meet any reasonable resident request. This may include timetabling the work to suite the resident.

The residents to be contacted include those located within 400 m of the centre line. These residents will be contacted at least one week prior to construction activities occurring on their property. Any specific requirement regarding noise generation will be determined.

4.5 Blasting Noise and Vibration

At some locations it may be necessary for hard rock to be broken up by small explosive charges to achieve the required foundation depths, contractors will be instructed to meet the requirements of the Environment Protection Authority (EPA) in relation to blasting noise and vibration. EPA limits are 115 dB linear for overpressure and 5 mm/s vibration at the nearest residence (Environmental Noise Control Manual).

The assessment conducted for the EIA shows that DEC air-blast overpressure goal (115dB_{Lin}) and vibration goal (5 mm/sec) can be satisfied with the employment of controlled MIC's.

4.5.1 Blasting and Vibration Control Measures

As precautionary measures:

- ☐ initial blasts shall not be undertaken less than 200 metres from sensitive receiver locations;
- ☐ Residents located within 400 m of proposed blasts will be consulted at least 48 hours before blasting is scheduled to occur. Blasting will be scheduled where practicable to meet any reasonable resident request. This may include timetabling the work to suite the resident;
- ☐ although MIC's can be up to 5 kg and still meet vibration and overpressure limits, MIC's shall be limited to no more than <2kg;

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- ☐ the initial blasts shall be monitored and blast site procedures developed from the recorded data if necessary. The data should be compiled to confirm maximum charge weights and compliance with the DEC air-blast overpressure and vibration limits. The site data would be used to establish site blast procedures and optimise further blasts.
 - ☐ work practices will be implemented to minimise potential vibration impacts;
 - ☐ a site training and awareness program will be conducted for all staff and contractors engaged during construction.

4.5.2 Contingency Plan

In the event of non-compliance or continuing noise complaints, a Contingency Plan will be developed in consultation with DEC. The plan will be developed following advice from a registered Noise Consultant on methods to reduce noise or blasting impacts.

4.6 Conclusion

During the majority of the construction activities, the noise criteria will not be exceeded. At specific locations where residences are within 800 m of the line the noise criteria may be exceeded for very short periods of time. Given that any high noise levels will be of brief duration, occurring intermittently over 1-2 days at any location, with no such activities occurring during evening or night-time hours, it is not considered that construction noise levels represent a significant impact on the local area.

Any complaints in relation to noise or blasting will be investigated to identify the reasons for the complaint and put additional measures in place to prevent significant noise or blasting nuisance. If necessary monitoring of the noise and blasting activities will be undertaken to quantify the noise levels being generated by the construction activities.

Although adverse impacts are not expected and, subject to landowner agreement, property inspections will be conducted on all structures within 200 m of blasting, or within 50 m of construction activities that generate vibration impacts. Inspections will be in accordance with AS 4349.1.

TransGrid, where responsible, will rectify any property damage caused directly or indirectly by the construction or operation of the transmission line at no cost to the property owner.

5. Flora and Fauna Management Strategy

5.1 Introduction

This strategy provides the management procedures to be undertaken to ensure that the clearing of native flora along the easement of the 330 kV transmission line between Wollar and Wellington conforms to the levels specified in the EIS and that native fauna is protected during the construction works.

The construction phase incorporates an array of flora and fauna management protocols and procedures. The implementation of these management procedures as part of the project enables the conclusions of the EIS and SIS to be verified.

5.2 Consent Conditions

A Species Impact Statement has been prepared for the project by Cumberland Ecology Pty Limited. The following management strategy is based on this assessment but will be updated as necessary with any specific conditions of consent, which may be imposed.

5.3 Flora and Fauna Protection Protocols and Procedures

Vegetation clearing will remove trees and shrubs in areas within the proposed easement where the alignment necessitates vegetation clearance to ensure safe electrical clearance. This extent of clearing will also generally minimise maintenance costs and reduce the risk of bushfire outages. Clearing will generally be undertaken to a level where it can be maintained by periodic slashing. In addition, outside the edges of the proposed easement, trees that could infringe electrical clearance requirements under high wind conditions will be selectively removed. Vegetation in gullies, whose mature development would not infringe safe electrical clearances or create a substantial risk of bushfire outages, will be retained.

5.3.1 Fauna Protection Protocol

The fauna management strategy has been developed to propose conditions of approval in relation to native fauna in the area of the transmission line installation and to outline the mitigation measures to be undertaken during the construction phase of the project to protect native fauna.

The impacts of the construction of the Wollar to Wellington Transmission Line have been identified and include the loss of fauna habitat through the clearing of vegetation, destruction of hollow-bearing trees, and injured wildlife. All of these issues will be managed through the implementation of protocols aimed at protecting native fauna throughout the project, as outlined below.

The fauna protection protocol focuses on the impact associated with the clearing of vegetation resulting in the loss of fauna habitat, and involves:

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- ❑ pre-clearing survey of individual trees which require removal, specifically directed towards detecting any arboreal fauna present. Investigation of trees should be conducted on the day that they are to be felled, to detect any individual animals present at the time;
 - ❑ where arboreal species are detected in a tree, that tree and a 10 metre buffer around it are to be left standing overnight, animal left to vacate the tree of its own accord;
 - ❑ maintenance of close communication between TransGrid's Environmental Management Representative, Construction Engineer, contractor and the DEC and/or WIRES, to facilitate the care of injured or sick animals, or to remove other fauna where necessary;
 - ❑ inspection of any safely accessible tree-hollows, particularly in large old trees, prior to their being felled, where possible;
 - ❑ careful felling of hollow-bearing trees (as described below), and checking of tree-hollows to locate any wildlife; and
 - ❑ collection of any wildlife located during construction activities after all the above mitigation measures have been undertaken, and its immediate release into adjacent bushland.

5.3.2 Hollow-bearing Tree Management Protocol

Tree-hollows are an important resource for many native fauna species, and are vital for some species. The retention and protection of hollow-bearing trees is an important element in the maintenance of biodiversity and in the execution of an environmentally sound development. To this end, a specific protocol relating to hollow-bearing trees is to be implemented along the Wollar to Wellington transmission line, in particular when crossing wooded locations, including:

- ❑ hollow-bearing trees are to be retained if conductor clearance criteria is met;
- ❑ where hollow-bearing trees will be affected, consideration will be given to removing only a portion of the trees, rather than complete removal so long as conductor safety distances are maintained;
- ❑ portions of hollow-bearing trees removed from the easement will be placed in adjacent bushland as hollow logs;
- ❑ if hollow bearing trees are to be felled, a controlled felling technique will be used (described below);
- ❑ installation of nest boxes at locations described in the SIS and indicated in Table 5.1.

Table 5.1 - Nesting Box Allocations against Targeted Species and Locations

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

5.3.3 Controlled Felling of Trees

In the case where a tree with hollows has to be felled, the tree is assumed to provide habitat for fauna. To minimise the risk of harm to any animal that may inhabit the tree, the following procedure shall be followed:

- ☐ nudge the tree with the tree pusher or mechanical plant to induce any fauna to vacate the tree. Then thump the tree two or three times sufficiently to cause vibration and sudden movement of small branches;
- ☐ watch and wait for fauna to vacate the tree (5 minutes or more may be required for slow moving fauna). Repeat if necessary;
- ☐ select the preferred direction of fall and any alternative directions;
- ☐ extend the plant to push the tree at a good height above ground. Push the tree in the preferred direction of fall. If the tree is too strong for the mechanical pusher, try another preferred direction;
- ☐ if the tree is too strong to be pushed with all roots intact, excavate and cut some of the roots on the restraining side;
- ☐ push the tree over (as in step 3 above), or repeat steps 3 and 4 until the tree can be successfully pushed over.

Using this method, the tree falls gently to the ground, restrained by the remaining root system. Fauna are generally not harmed. Note that a large excavator can serve as a tree pusher and enables the tree to be felled very accurately.

In some locations it will not be possible to gain access to the site with a large excavator or similar mechanical plant without undue damage to natural vegetation. In other locations, steep ground and erodible soils may make it necessary to retain the root system of the tree in the ground. In situations such as these, further consideration should be given to lopping the tree rather than felling it. The strategy adopted must take into account worker safety both in the initial vegetation removal and in subsequent maintenance. Whether lopped or felled, the tree will have to be cut rather than pushed.

In these situations, as for tree pushing, the tree should be thumped to induce fauna to vacate it, albeit with an axe or other hand held tool. Some reduction in the speed of fall of a tree is achievable by well designed cutting of the tree. The appropriate design addresses the locations of the cuts and the size and shape of the wedge removed in the direction of fall. In cases where several adjacent trees have to be cut, it may be possible to create a bed of vegetation to break the fall of the most significant habitat tree.

5.3.4 Protection of Habitat Protocol

The protocol detailed below provide the relevant elements required to assess individual sites proposed for disturbance along the Wollar to Wellington transmission line, and to implement appropriate amelioration measures for threatened species or their habitats. Application of the protocol involves a progressive assessment process, which includes the assessment provided in the SIS for this project.

The SIS allows for approval to clear native vegetation as described in the Environmental Assessment and shown on Figures 6a-6o (Volume 3 of the EA). The vegetation to be cleared provides habitat for a range of fauna, particularly woodland birds. The list of known threatened species and endangered ecological communities is provided in the following table.

Table 5.2 - Major Threatened Species and Communities Found Within the Study Area

Common Name			Species / Community Name	TSC Act	EPBC Act
Endangered Communities	Ecological	White Box Yellow Box Blakely's Red Gum Woodland	E		
		Fuzzy Box Woodland	E		
		Yellow Box/Red Gum Grassy Woodland		E	
		Grassy White Box Woodland		E	
		Flora			
		Goodenia macharronii	V	V	

Table 5.2 - Major Threatened Species and Communities Found Within the Study Area

Common Name	Species / Community Name	TSC Act	EPBC
			Act
Fauna			
Black-chinned Honeyeater	Melithreps gularis gularis	V	
Painted Honeyeater	Grantiella picta	V	
Brown Treecreeper	Climacteris picumnus victoriae	V	
Diamond Firetail	Stagonopleura guttatata	V	
Glossy Black-cockatoo	Calyptorhynchus lathami	V	
Hooded Robin	Melanodryas cucullata cucullata	V	
Speckled Warbler	Pyrrholaemus sagittatus	V	
Square-tailed Kite	Lophoictinia isura	V	
Masked Owl	Tyto novaehollandiae	V	
Turquoise Parrot	Neophema pulchella	V	
Squirrel Glider	Petaurus norfolcensis	V	
Large-eared Pied Bat	Chalinolobus dwyeri	V	V
Common Bentwing Bat	Miniopterus schreibersii	V	
East-coast Freetail Bat	Mormopterus norfolkensis	V	
Yellow-bellied Sheath-tail bat	Saccolaimus flaviventris	V	
Eastern Cave Bat	Vespadelus troungtoni	V	

Note: For further detail on these and other relevant threatened species refer to the SIS in Volume 2.

The SIS determined that *Goodenia macbarronii* will not be impacted by the proposed transmission line, however, there is the potential to impact on woodland birds. The location of threatened species is noted on Figures 6a-6o (contained in Volume 3) and is listed on TAMIS database which will form a key resource to be used during both the construction phase and ongoing maintenance. The following protocol will be followed:

- ☐ Habitat for endangered fauna is to be noted on all construction plans issued;
- ☐ Where possible, vegetation within these areas should be cleared outside breeding periods (generally Spring);
- ☐ Identify typical habitat plants, hollow logs or rocks and tag them. Tree felling and hollow log protocols to be followed for all tagged items; and
- ☐ Only the authorised TransGrid Environmental Management Representative can give final approval to the clearing of identified endangered or vulnerable fauna habitat areas and only in accordance with the stated protocols and the level of clearing assessed within the Species Impact Statement.

5.3.5 Replanting and Rehabilitation Management Protocol

This protocol relates specifically to nominated areas of ecological importance. All other areas will be rehabilitated in accordance with Chapter 3 or where weed affected, in accordance with Chapter 6.

Replanting of nominated areas described in Section 5.3.6, may occur where appropriate to provide low growing native shrubs and trees to assist with screening of tower structures, control of erosion and when crossing the Wilpinjong Environment and Conservation Area. In these instances however, the mature height must not infringe safe electrical clearance and in general be less than 4 m high.

In nominated areas, easement and access track rehabilitation procedures to be adopted as part of the construction work include the following:

- ☐ topsoil removal and stockpiling where access tracks construction occurs to conserve the seedbank;
- ☐ removal of all equipment and wastes following completion of the construction activities and topsoil replacement on temporary tracks;
- ☐ sowing of local native grasses along topsoiled tracks to encourage vegetation regrowth;
- ☐ within the existing cleared corridor, native trees and shrubs will be planted in consultation with the landowners to reduce the area cleared of vegetation; and
- ☐ The EMR will be responsible for determination of success of the rehabilitation program in consultation with land owners.

5.3.6 Restricted and Selective Clearing

Clearing of the transmission line easement will be carried out in accordance with TransGrid's internal standard *Principles for the Clearing of Transmission Line Easements*. Refer to **Attachment D**. This standard provides for the majority of the easement to be initially reduced to a condition where it can be subsequently maintained by slashing. Selected areas along the transmission line will have restricted or selective clearing in accordance with section 4.2 of the standard.

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

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

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

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

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

- ☐ Structure 91 (Threatened plant *Goodenia macbarronii* – See Section 7.5 of SIS)
- ☐ Structure 172 – 173
- ☐ Structure 174 – 176 (revegetation with low growing shrubs to protect the highly dispersible soil)
- ☐ Structure 177 – 178
- ☐ Structure 196A – 197
- ☐ Structure 200 – 201
- ☐ Structure 206 – 207 (threatened fauna recorded – Stripe-face Dunnart)
- ☐ Structure 207 - 208
- ☐ Structure 210 – 211
- ☐ Structure 217A – 218
- ☐ Structure 224 – 225
- ☐ Structure 226 – 227
- ☐ Structure 266 – 267.

Restricted and selective clearing is clearing that is restricted in area and selective in vegetation removed, as set out in TransGrid's internal procedure *Maintenance of Easements and Access Tracks*, refer to **Attachment E**, which is referenced in the above mentioned *Principles for the Clearing of Transmission Line Easements*. Where restricted clearing is applied, the area cleared is less than the full width of the easement in the sections of spans (closer to structures) where the conductor blowout (lateral swing under strong transverse or oblique winds) plus required safe electrical clearance does not require clearing to extend to the edge of the easement. Restricted clearing is to be applied as set out in Appendix A of the above mentioned internal procedure (Attachment E). Selective clearing is clearing that involves the removal only of tall growing species that could infringe the safe electrical clearance to conductors due to regrowth between maintenance cycles or in the event that the tree falls towards the conductors. Selective clearing always involves retaining vegetation throughout the easement (except on the access track and the maintenance zone around the tower) whose mature height is less than 4 metres. This height is increased where the terrain or the conductor height allows. This is also illustrated and applied as detailed in the above mentioned Appendix A.

The impacts arising from the proposed transmission line easement clearing have been recognised in the EIS/SIS. Areas have been defined where restrictive and selective clearing will be applied to alleviate the impacts on fauna movement and these include impacts on regional corridors. Furthermore, environmental offset strategies as detailed in section 5.4 are proposed to offset against the loss of habitat.

5.4 Habitat Compensation

In order to compensation for the loss of vegetation, and in particular, the loss of Ecological Endangered Community, TransGrid will provide \$90,000 additional funding to extension of the GreenGrid project, being undertaken in partnership with Greening Australia. The funds to be applied to compensatory plantings of native vegetation predominantly within the NSW South West Slopes Bioregion.

TransGrid will also purchase approximately 130 hectares of land contiguous with the Wollemi National Park, that is predominantly vegetated with grassy woodland EEC communities, for transfer to National Parks Estate, or such alternative lands as may be agreed with DEC.

6. Weed Management Strategy

6.1 Introduction

The control of noxious weeds during the construction phase has been a major issue raised by the community. A separate weed investigation covering each tower site was undertaken as part of the EIS to identify and assess weed infestation along the route. The following management strategy has been designed specifically for this project and with two main objectives, namely:

- ❑ To reduce weed infestation within the easement; and,
- ❑ Avoid the spread of weeds to other properties during construction.

The **Noxious Weeds Act 1993** provides a framework for the state wide control of noxious weeds. The weed control program is to be implemented at every location which is disturbed by the activities associated with the transmission line.

6.2 Weed Identification

The following list of weeds were identified during the surveys.

Table 6.1 – Weeds Identified Along the Easement

Code	Common Name	Scientific Name
SF	Saffron thistle	<i>Carthamus lanatus</i>
SC	Scotch thistle	<i>Onopordum acanthium</i>
Cl	Clover	<i>Trifolium spp.</i>
CP	Cobbler's pegs	<i>Bidens pilosa</i>
PP	Prickly pear	<i>Opuntia spp.</i>
BB	Bathurst burr	<i>Xanthium spinosum</i>
N	Nettle species	<i>Urtica so</i>
Rape	Bird rape	<i>Brassica rapa var. silvestris</i>
KW	Khaki weed	<i>Alternanthera pungens</i>
VT	Variegated thistle	<i>Silybum marianum</i>
FC	Field cress	<i>Lepidium camperstra</i>
PM	Paddy Mellon	<i>Cucumis myriocarpus</i>
EB	Flax-leaf fleabane	<i>Conyza bonariensis</i>
ABT	African box thorn	<i>Lycium ferocissimum</i>
PC	Pattersons curse	<i>Echium plantagineum</i>
ALG	African love grass	<i>Eragrostis spp.</i>
SW	Skeleton weed	<i>Chondrilla juncea</i>
PT	Purple top	<i>Verbena bonariensis</i>
CH	Cat head	<i>Emex australis</i>
CG	Crabgrass	<i>Digitaria sanguinalis</i> and / or <i>Eleusine indica</i>
Stra	Datura / thornapple	<i>Datura spp. (incl D. stramonium)</i>
TM	Twiggy mullen	<i>Verbascum virgatum</i>
ABW	Australian bindi weed	<i>Convolvulus erubescens</i>
Helio	Blue heliotrope	<i>Heliotropium amplexicaule</i>
SG	Swamp grass	<i>Glyceria maxima</i>
Pig W	Pigweed	<i>Portulaca oleracea</i>
A of S	Apple of Sodom	<i>Solanum linnaeanum</i>
DL	Dandelion	<i>Taraxacum officinale</i>
Dock	Dock	<i>Rumex spp.</i>

Code	Common Name	Scientific Name
HFC	Haresfoot clover	<i>Trifolium arvense</i>
GG	Goose grass	<i>Eluesine tristachya</i>
WL	Wild (prickly) lettuce	<i>Lactuca saligna</i>
NH	Nigger heads	<i>Enneapogon nigricans</i>
Stag	Stagger weed	<i>Stachys arvensis</i>
Vul	Squirrel tail grass	<i>Vulpia spp.</i>
BLG	Soft Brome	<i>Bromus mollis</i>
PBD	Purple burr daisy	<i>Calotis cuneifolia</i>
YBD	Yellow burr daisy	<i>Calotis spp.</i>
SP	Scarlet pimpernel	<i>Anaallis arvensis</i>
Briza	Shivery or quaking grass	<i>Briza spp.</i>
RP	Roly Poly	<i>Salsola kali</i>
WW	Wireweed	<i>Polygonum aviculare</i>
Hore	Horehound	<i>Marrubium vulgare</i>
Sorrel	Sorrel	<i>Oxalis articulata</i>
WS	Wild sage	<i>Salvia verbenaca</i>
BB	Blackberry	<i>Rubus fruticosus</i>
PLS	Pepper-leaf senna	<i>Cassia barclayana</i>
WO	Wild oats	<i>Avena spp.</i>
Sweet B	Sweet briar	<i>Rosa rubiginosa</i>
N burr	Noogoora burr	<i>Xanthium occidentale</i>
SLNS	Silverleaf Nightshade	<i>Solanum elaeagnifolium</i>
RrA	Red-root amaranth	<i>Amaranthus retroflexus</i>
Star T	Star thistle	<i>Centaurea calcitrapa</i>
StJW	St Johns Wort	<i>Hypericum spp.</i>
StBT	St Barnaby's thistle	<i>Centaurea solstitialis</i>
SpinyBG	Spiny burr grass	<i>Cenchrus incertus</i>

The distribution of weeds along the alignment is provided in Table 6.2. Three separate weed management protocols have been developed to cater for different sections of the line. These include existing weed infested properties, areas to be cleared and hence vulnerable to infestation and currently un-infested agricultural land which may have the potential to be impacted by weed seed as a consequence of construction process. The respective protocols are detailed in the following sections, while the nominated protocol for each tower location is shown in Table 6.2. Codes for each method are “A” for existing weed infested properties, “B” for wooded land and “C” for un-infested property.

6.3 Existing Weed Infested Properties (Method A)

There are a number of properties along the alignment that are currently experiencing a weed infestation problem. It is important that the construction program assists in alleviating this problem as far as practicable while at the same time, avoid the spread of these weeds to other properties. For weed infested properties, the following protocol will be followed:

- ❑ At least 28 days prior to construction activities commencing, each weed infested tower site, access track and work area will be sprayed with a general non-specific herbicide such as “Grazon” or “Roundup Bioactive” in accordance with manufacturers specifications. This will kill all vegetative material including any pasture grass or natives which may be present.

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- ❑ At least 14 days prior to construction activities commencing, areas where soil disturbance will be necessary, such as the tower sites will be again sprayed with an approved soil residual herbicide to kill dormant seeds. The application rate will be determined in accordance with manufacturers specifications to ensure residual effect of no longer than 3 months. This application will be undertaken in close consultation with land owners and alternative treatments that will achieve the same result may be considered if necessary.
 - ❑ All weed infested soil, including any excess soil from the tower foundations, will be treated in this way. All treated excess soil will be evenly spread around the construction site. No excess topsoil will be removed from a weed infested property.
 - ❑ Immediately prior to construction vehicles entering the property, TransGrid's Environmental Management Representative will inspect the property to ensure that all visible weeds have been killed. The EMR will determine the need for any additional treatment such as ripping and mulching the site.
 - ❑ Construction vehicles working on these properties should remain dedicated to these areas until each work phase is complete. Vehicles which must travel between an identified weed infested property to another property must be clean prior to entering the new property.
 - ❑ Once construction activities have ceased, all areas previously sprayed will be sown with a sterile cover crop of oats or rye depending on season. The purpose of this will be to cleanse the paddock prior to sowing the final seed mix. Depending on agricultural activity, the cleansing crop can be co-ordinated with normal cropping and the same species used. For example, if the affected paddock is to be sown with Barley at the same time, this could also be used for the construction area as well.
 - ❑ No later than 12 months after construction has been completed, the final seed mix should be sown. The mix will be determined in consultation with the land owner and will be designed to meet the landowners future intentions for the affected land. This may include an improved pasture mix or native grasses compatible with the surrounding paddocks and grazing stock usage. For cropped land, the seed mix may remain as cereals but not necessarily sterile.

Ongoing maintenance of the treated areas will be required for two years following completion of construction. Maintenance in the form of additional sowing, fertiliser application and spot spraying may be required. Once the work site has been assessed as being weed free and the affects of the construction works have been concluded, no further weed suppression will be necessary.

It should be noted that the long term management of each property will depend on the owner. Subsequent weed invasion will occur if surrounding paddocks remain weed infested. TransGrid's responsibilities do not extend to maintaining areas outside the easement.

6.4 Woodland Areas (Method B)

Whether currently impacted by weeds or not, areas which require clearing will necessitate a change in vegetation structure from woodland to grassland. The clearing process will involve soil disturbance and provide an ideal environment for weed invasion. For these areas, the following protocol has been developed:

- ☐ At least 14 days prior to clearing, the works area should be inspected for weeds, in particular woody weeds and aggressive weeds such as lantana and blackberry. These should be spot sprayed with “Grazon” or equivalent in accordance with manufacturers specifications.
- ☐ Equipment involved in clearing will remain on each property until completed. The equipment will then be washed prior to moving to the next property.
- ☐ Following the completion of the construction works, the cleared area should be sown with a grass seed mix comparable with the surrounding vegetation systems. In general this will include native grasses, however there are some lightly wooded areas to be cleared which currently operate as grazing properties. These areas can have a mix of native and improved pasture and so the easement will be sown in accordance with landowner requirements. Seasonal requirements may affect the actual time for seeding of areas to maximise success of stabilising grasses.
- ☐ Cleared vegetation which will be windrowed may be either burnt or chipped depending upon property owner, seasonal and regulatory requirements. If burnt, the ash can be spread over the cleared area as part of the rehabilitation program. However, if it is chipped it should be removed from site unless otherwise requested by the property owner. This is because mulching destroys soil nutrients and structure and, once broken down, becomes a high erosion and weed invasion risk.
- ☐ Within 12 months of construction completion, the easement will be inspected and spot spraying of weeds may be undertaken.

6.5 Un-infested Construction Sites (Method C)

The primary objective for these areas is not to introduce weeds to the construction site. This will be achieved by employing two simple methods:

- ☐ Only recently cleaned vehicles may enter the property.
- ☐ Immediately following completion of the construction program, the disturbed area will be sown with a seed mix comparable to the surrounding land.

As with weed infested sites, weed free properties will be inspected 12 months following completion of construction to determine their weed status. This will include inspections of the paddocks surrounding the construction sites to determine if there has been an increase in weed infestation as a result of the project. The EMR

will be responsible for determination of success of the rehabilitation program in consultation with land owners.

Table 6.2 - Weed Location

Tower	%	Vegetation Type &	%	Weeds recorded	Control Method
Number	slope	Land Use	Visibility		
Creek Crossing	7%	Agrc weeds	25%	SF, PM, ST, Sweet B, Star T, RP, BB, N Burr	A
1a	1	Grass/Cleared	20-100	Dock, SW, BB, ABW, Sweet B	A
2a	0	Grass/Cleared/Ridge Top	30	Stra (high volumes), KW (on track between towers) SF.	A
3a	1	Grass/Cleared/Ploughed	50	ABW, BB, Stra	A.
4a	2	Grass/Cleared/Valley Terrace	20	KW	C
5a	4	Grass/Cleared/Valley Side	20	Sweet B, SF, BB	A
Drainage line Crossing	3%	Cleared/Grazed	35%	WW	C
6 (angle)	0	Grass/Cleared/Ridge Top	40	PBD, YBD	C
7	2	Grass/Cleared/Valley Side	10	SW, Sweet B, PC, FB, BB	C
8	2	Grass/Cleared/Valley Side	10	Sweet B, Pig W, KW	A
9	0	Grass/Cleared	70	N, Stra, KW (at gates going to 10)	C
10	2	Grass/Cleared/Valley Side	50	A of S, Dock, WW, KW (high volumes), YBD, ABW, PM	A
11	0	Grass/Cleared/Valley Side	40	KW, A of S	A
12	1	Grass/Cleared	10	KW, SF, A of S	A
13	1	Grass/Cleared/Valley Side	20	KW (high volumes) BB, PP	A
14	1	Grass/Cleared/Valley Terrace	40	No weeds	C.
15	1	Grass/Cleared/lightly treed	40	occasional A of S	C
16	1	Grass/Cleared/Ridge Top	10	occasional A of S	C
17	0	Grass/Cleared/Plateau	40	occasional A of S	C.
18	0	Grass/Cleared	20	SF (High volumes)	A
19	0	Grass/Cleared/Valley Top	0	SF, FB, StJW, A of S, WS	A
20	5	Grass/Cleared/Valley Side	10	PP, StBT, SF, PT, Helio,	A
21	0	Grass/Cleared/Valley Terrace	0	Hore, A of S, FB, SF, StBT, SC	A
22	0	Grass/Cleared/Valley Terrace	20	Hore, YBD, PP, Sweet B.	A
22.1	5	Grass/Cleared/Valley Side	40	PP, FB, StJW, StBT	A
23a	4	Grass/Cleared/Valley Side	10	A of S, StBT, SF, Sweet B, StJW	A
24a	3	Grass/Cleared/Valley Side	50	FB, A of S, SW, PBD	A
25a	0	Grass/Cleared/Valley Terrace	10	FB, SF, A of S	A
Shale Oil / Slate	5%	Cleared/Grazed	15%	FB, SF, A of S	N/A

Tower	%	Vegetation Type &	%	Weeds recorded	Control Method
Number	slope	Land Use	Visibility		
Mine					
26a	1	Grass/Cleared/Valley Terrace	40	FB, SF, A of S	A
27a	10	Grass/Cleared/Valley Side	40	No weeds - healthy native pasture	C
28	4	Grass/Cleared/Valley Side	10	SF, FB, BLG	A
28.1	0	Grass/Cleared/Floodplain	0	FB, DL, PT	C
28.2	0	Grass/Cleared/Alluvial Terrace >750m from Wilpinjong Creek	30	BB, KW, A of S, BLG	A
29	0	Grass/Cleared/Alluvial Terrace >300m from Wilpinjong Creek	60	BB, KW, A of S, BLG, WW	A
30	0	Grass/Cleared/Alluvial Terrace >70m from Wilpinjong Creek	10	BB, KW, A of S, BLG, WW	A
31	0	Grass/Cleared/Floodplain >100m from Wilpinjong Creek	0	BB, KW, A of S, BLG, WW	A
32	0	Grass/Cleared/Floodplain >100m from Wilpinjong Creek	10	BB, KW, A of S, BLG, WW, SF	A
33	0	Grass/Cleared/Floodplain >100m from Wilpinjong Creek	5	BB, KW, A of S, BLG, WW, SF	A
34	0	Grass/Cleared/Floodplain >240m from Wilpinjong Creek	0	BB, KW, A of S, BLG, WW, SF	A
35	0	Grass/Cleared/Floodplain >100m from Wilpinjong Creek	0	BB, KW, A of S, BLG, WW, SF	A
European Heritage					N/A
Indig Heritage site		Cleared / Grazed	5		N/A
Creek Crossing to 36 a		Riparian Corridor		few weeds - healthy native pasture, dock	C
36a	0	Grass/Cleared/Floodplain/Nort h bank of Wilpinjong Creek	10	few weeds - healthy native pasture, dock	C
European Heritage	0%	Grazed	5%	KW	C
Creek Crossing	0%	Riparian Corridor	0%	KW	C

Tower Number	% slope	Vegetation Type & Land Use	% Visibility	Weeds recorded	Control Method
37a	0	Grass/Cleared/Floodplain/North bank of Wilpinjong Creek	0	few weeds - healthy native pasture, dock	C
38	0	Grass/Cleared/Floodplain/South bank of Wilpinjong Creek	5	few weeds - healthy native pasture, FB	C
39	0	Grass/Cleared/Floodplain	10	BB, SF, SW, FB	A
40	0	Grass/Cleared/Floodplain	10	SF, StBT, FC	A
41	0	Grass/Cleared/Floodplain	10	KW (high proportions), Dock, FB, SF, BB, WW	A
42	0	Grass/Cleared/Floodplain	10	FB, SF, KW, BB, WW	A
43	0	Grass/Cleared/Floodplain	10	PT, SF, KW	A
44	0	Grass/Cleared/Floodplain	10	FB, KW (high proportions), PT	A
45	0	Grass/Cleared/Floodplain	10	Nil but small kikuyu patch	C
46	0	Grass/Cleared/Floodplain	10	SF, Sweet B, BB	A
47	0	Grass/Cleared/Floodplain	10	SF, PT	A
48	0	Grass/Cleared/Floodplain	10	No weeds - healthy native pasture	C
49		Grass/Cleared/Floodplain	10	few weeds - healthy native pasture, BB	C
50		Grass/Cleared/Floodplain	10	few weeds - healthy native pasture, BB	C
51		Grass/Cleared/Floodplain	10	few weeds - healthy native pasture, RP	C
52		Grass/Cleared/Floodplain	10	No weeds - healthy native pasture	C
53		Grass/Cleared/Floodplain	10	SpinyBG, Sweet B, FB, PC, Mostly native pasture	C
54		Grass/Cleared/Floodplain	10	FB, PC, Sweet B, Mostly native pasture	C
55		Grass/Cleared/Floodplain	10	DL, FB mostly native pasture	C
56		Woodland	5	No weeds	B
57		Woodland	5	No weeds	B
58		Woodland	5	No weeds	B
59		Woodland	5	Access not available	
60				Access not available	
61				Access not available	
62				Access not available	
63				Access not available	
64	2	Heath regrowth Slope	50	No weeds (only native Chinese scrub)	C
65	2	Heath regrowth Slope	20	No weeds (only native Chinese scrub)	C
66	1	Cleared, grazed	5	Helio (high proportions)	A

Tower	%	Vegetation Type &	%	Weeds recorded	Control Method
Number	slope	Land Use	Visibility		
67	1	Heath regrowth Slope	10	No weeds (only native Chinese scrub)	C
68	0	Heath regrowth Slope	50	No weeds (only native Chinese scrub)	C
69	0	Heath regrowth	10%	No weeds (only native Chinese scrub)	C
70	2	Cleared / Grazed	30%	SpinyBG (high proportions)	A
71	0	Grass/Cleared/Ploughed	75%	FB, Dock, PT, PC, Pig W, DL	A
72	0	Ploughed/Planted	10%	No weeds (only native Chinese scrub)	C
72.1	0	Ploughed/Grass	20%	No Weeds (ploughed paddock)	C
73a	2	Heath regrowth Slope	20%	SF, FC, SweetB	A
74	0	Cleared / Grazed	35%	SF, FC, SweetB	A
75	0	Heavily disturbed by erosion, dam building and imported fill	40%	PC, ABW, BLG, SF,	A
76	0	Cleared / Grazed Bulldozed	50%	PP, CP	A
77	1	Cleared / Grazed Road verge	40%	PP	A
78	1	Cleared / Grazed Erosion	90%	PP	A
79	0	Cleared, grazed Knoll top	40%	SW, FB, DL	A
80	0	Cleared / Grazed. Floodplain	40%	SF, RP, PT	A
81	5%	Native forest – regrowth. E. dealbata / Cypress	35%	few weeds native pasture (red grass) FB	C
82	0%	Grey box (<i>E.microcarpa</i>) open forest	25%	No weeds	B
83	5%	Highly disturbed – former gravel pit	55%	No weeds	C
84	5%	Native forest – regrowth. E. dealbata / Cypress	20%	No weeds	B.
85	5%	Native forest – regrowth. E. dealbata / Cypress	20%	No weeds	B
86a	5%	Native forest – regrowth. E. dealbata / Cypress	20%	No weeds	B
87	5%	Native forest – regrowth. E. dealbata / Cypress	20%	No weeds	B
88	5%	Native forest – regrowth. E. dealbata / Cypress	20%	No weeds	B

Tower Number	% slope	Vegetation Type & Land Use	% Visibility	Weeds recorded	Control Method
89	0%	Native forest – regrowth. E. dealbata / Cypress / E. melliodora, A. floribunda	20%	few weeds - FB	B
90	1	Open woodland/Cyprus	10%	few weeds - A of S	B
91	0	Grass/Cleared/Eroded	40-60	DL, FB	C
92	0	Grass/Cleared/<200m to water	10	TM, DL, FB, SW, Doc	C
93	0	Grass/Cleared	5	HFC, SW.	C
94	0	Grass/Cleared	15	GG, SW	C
95	0	Grass/Cleared	10	NH, FC, clover, SW, Stag	C
96	0	Grass/Cleared	0	Vul, DL, Dock, Stag, FC, BLG	C
97	1	Grass/Cleared/Lightly Treed	60	No weeds	C
98	1	Grass/Cleared	30	Clover, ABW, SW, dock	C
99	1	Grass/Cleared	40	BLG	C
100	0	Grass/Cleared	10	FB,	C
101	1	Grass/Cleared	50	PBD	C
102	1	Grass/Cleared	10	No weeds	C
103	0	Ironbark Forest	0	SP	C
104	0	Grass/Cleared	5	DL, FB	C
105	0	Ploughed/Planted	80	No weeds	C
106	1	Grass/Cleared	0	KW (high volumes), PM, Stag, BLG, Briza, ABW, PC	A
107	0	Grass/Cleared/Knoll Top	20	SW, RP	C
108	5	Grass/Cleared/Eroded	50	RP, WW, KW, PM, SF	C
109	0	Grass/Cleared	0	BLG, SW, SF, WW, Hore, YBD	C
110	0	Grass/Cleared	0	SW, PC, Briza, Stag, CP	C
111	0	Grass/Cleared	0	Briza, Sorrel, SW, PC, Stag, CP	C
112	0	Grass/Cleared/Ploughed >50m from temp. creek	70	Briza, Sorrel, SW, PC, Stag, CP, WS (high volumes)	A
113	0	Open Woodland Grey Box	50	No weeds	B
114	1	Grass/Cleared	40	PBD, DL	C
115	0	Grass/Cleared	10	SW, DL, PC, PBD, FB, Stag, Rape, FC, Hore	A
116	1	Grass/Cleared	0	SW, DL, PC, PBD, FB, Stag, Rape, SF , FC, Hore, TM, BB, WL	A

Tower	%	Vegetation Type &	%	Weeds recorded	Control Method
Number	slope	Land Use	Visibility		
117	2	Grass/Cleared	0	SW, DL, PC, PBD, FB, Stag, Rape, SF, FC, Hore,	A
118	0	Grass/Cleared	10	Pig W, DL, PC, SW, Briza, Dock, FC, Stag, FB	A
119	0	Grass/Cleared	10	Pig W, DL, PC, SW, Briza, Dock, FC, Stag, FB	A
120	0	Grass/Cleared	40	Pig W, DL, PC, SW, Briza, Dock, FC, Stag, FB	A
121	0	Grass/Cleared	10	PC, Sweet B	C
122	0	Grass/Cleared/Ridge Top	10	No weeds	C
123	1	Grass/Cleared	20	BLG, PC, Stag, YBD, ABW, CH, KW, A of S,	A
124	2	Grass/Cleared	10	BLG, PC, Stag, YBD, ABW, CH, KW, A of S, N, RrA	A
125	0	Grass/Cleared/Gully	50	KW, DL, BLG, PC, Stag	A
126	0	Grass/Cleared	10	KW, DL, BLG, PC, Stag	A
127	1	Cleared/Ploughed	100	Nil	C
Creek Crossing	10%	RBApple, RR Gum on banks cleared land either side	25%	N, Hore, BB, SF, RrA	A
128	0	Grass/Cleared >50m to Stubbo Creek	50	SF, Stag, KW (high volumes on vehicle tracks), BLG, N	A
129	0	Grass/Cleared <300m to Stubbo Creek	70	SF, WW, KW, ABW, Stag, CH, PM PC.	A
130	0	Cleared/Ploughed	100	Nil	C
131	0	Cleared/Ploughed/Cropped	10	PT, FC, TBW, SF, WW, Stag, CH, PM, PC	A
132	0	Grass/Cleared	20	Pasture improved	C
133	0	Cleared/Ploughed	50	Pasture improved. SF, YBD.	C
134	0	Grass/Cleared/Ploughed/ Floodplain	0	PT, PC, SW, BLG	C
Creek Crossing	1 10%	Floodplain			C
135	0	Grass/Cleared	100	KW (high volumes), at gates to tower 136	A
136	3	Grass/Cleared/Ploughed	20	KW (high volumes), WW, SF, BLG.	A
137	2	Grass/Cleared prev ploughed	5	SF, SW, DL, BLG, Stag	A
138	1	Grass/Cleared	0	SF, FB, DL, YBD	A
139	1	Grass/Cleared	0	KW (high volumes) at gates after rail line. SLNS	A
140	0	Grass/Cleared	0	SF, SW, DL, BLG, Stag, SLNS	A
141	0	Grass/Cleared	0	SLNS (high volumes), SF, PM	A

Tower Number	% slope	Vegetation Type & Land Use	% Visibility	Weeds recorded	Control Method
142	0	Grass/Cleared	0	SLNS (moderate volumes), SF, PM, Stag	A
143	1	Grass/Cleared	0		A
144	0	Grass/Cleared/Ploughed	40	FB, SF, PC at tower PM, Sweet B, SF, N Burr, , PT, ABT, SLNS	A
145	0	Grass/Cleared/Ploughed	50	BLG, SF	C
146	0	Grass/Cleared/Ploughed	70	CH, SF (high volumes), BB	A.
147	1	Grass/Cleared/Ploughed	5	CH	C
148	0	Grass/Cleared/Ploughed	100	CH	C
149	0	Grass/Cleared	50	Stra, BB on access track. Hore, SW, DL, SF, PC, Briza, dock, Stag at tower	A
150	0%	Cleared, ploughed		SF, KW, BB, CH, PC, FB, SW, CG, PM, Stra, TM, Helio, VT	A
151a	1%	Slight terrace c. 250m from Creek, cleared ploughed	40%	SF, KW, BB, CH, PC, FB, SW, CG, PM, Stra, TM, Helio, VT	A
152a	1%	small spur adjoining floodplain	35%	SF, KW, BB, CH, PC, FB, SW, CG, PM, Stra, TM, Helio	A
153a	0%	Floodplain, cleared, ploughed	5%	SF, KW, BB, CH, PC, FB, SW, CG, PM, Stra, TM, Helio, SG	A
154	0%	Floodplain, cleared, ploughed	5%	ABW, ABT	C
155	0	Floodplain, cleared, ploughed	15%	SF, KW, BB, CH, PC, FB, SW, CG, PM, Stra, TM	A
156a	0%	Cropped paddock - adjoining floodplain	80%	PC, PT, SF, ALG, CP	C
157a	3%	slight hill - exposed, grazed, cleared	30%	BB, SF, ABT	C
158	0%	ploughed paddock	100%	FB, SF, ABT	A
159a	0%	ploughed paddock	100%	SF, KW, SC, PM, BB	A
160	3%	Flat area next to a big drop	25%	No weeds	C
161	8%	Exposed very rocky hillside	35%	BB, N, Rape, SC	C
162	3%	Exposed very rocky hillside	35%	PP	C
163	8%	Exposed hillside over looking Goodiman Ck (50m away). Totally cleared	35%	SF, SC, Cl, CP	C
164	0%	Flat area in a regrowth area after timber cutting c. 20 yrs ago. Not grazed now but was c. 10 yrs ago	40%	No weeds	B

Tower	%	Vegetation Type &	%	Weeds recorded	Control Method
Number	slope	Land Use	Visibility		
165	3%	100m sth of Goodiman Ck, cleared, grazed.	40%	N, SF, PC, FB, PP	A
166	2%	Hilltop overlooking flats, cleared, grazed	20%	No weeds	C
Road work track	20%	Existing track	100		N/A
167	15%	Open flat country, cleared, grazed, previously ploughed	15%	SF, FB, PC, PP, SW	A
168	2%	Very rocky ridge over looking Goodiman Ck, cleared grazed.	25%	SF, FB, PC, PP, SW	A
169	5%	Slight hill, cleared grazed	40%	SF, FB, PC, PP, SW	A
170	3%	Cleared, grazed	40%	SF, FB, PC, PP, SW	A
Creek Crossing	2	fmr yellow box R-b Apple woodland Cleared/Ploughed/Cropped. 1 Yellow box to be removed.	15%	BB, SF, FB, PC, PP, SW	A
171	0%	fmr yellow box R-b Apple woodland Cleared/Ploughed/Cropped within 50 m Goodiman Ck	20%	BB, SF, FB, PC, PP, SW	A
172	3%	Saddle between 2 hills, partially cleared, grazed, very rocky	25%	PP, SF, FB, Hore	C
173	3%	Natural bench on a hills, partially cleared, grazed, very rocky	25%	PP, SF, FB, Hore	C
174	0%	Formerly cleared - now in regrowth of scrubs	30%	No weeds (only Chinese scrub)	C
175	2	Woodland/Cyprus Pine/Gum	40	No weeds	C
176	5	Woodland/Cyprus Pine/Gum	50	PP	C
177	3%	Top of a very steep exposed hill	15%	PP, SF, FB, Hore	C
178	5%	Toe slope of small hill	25%	PP, SF, FB, Hore	C
179	5%	Half way up a hill in white box community	20%	No weeds	C

Tower	%	Vegetation Type &	%	Weeds recorded	Control Method
Number	slope	Land Use	Visibility		
180	3%	Top of a very steep exposed hill overlooking Mebul Ck	15%	PP, SF, FB, Hore	C
181				Access not available	
182				Access not available	
183				Access not available	
184				Access not available	
185				Access not available	
186				Access not available	
187				Access not available	
188				Access not available	
189				Access not available	
190				Access not available	
191	0%	Cleared/Ploughed/Cropped close to creek	95%	SF, FB,	C
Creek Crossing	1%	Rough-barked Apple, Silver Wattle, River bottle brush, carex, phragmites.		PP, SF, FB, Hore, BB	C
192	0%	Cleared grazed ploughed	95%	PP, SF, FB, Hore	C
193	3%	Timbered hill top / side	15%	PP, SF, FB, Hore	C/B
194	5%	very rocky hill top	25%	PP, SF, FB, Hore	C
195	8%	exposed hill side cleared grazed.		PP, SF, FB, Hore	C
196	2%	exposed hill -good look out over creek, cleared grazed.	25%	Hore (high proportions)	A
197	2%	Yellow / grey box open woodland. Grazed	15%	PP, SF, FB, Hore	C
198	2%	fmr Y.Box open woodland Cleared grazed	15%	PP, SF, FB, Hore	C
198a	2%	Y.Box open woodland Cleared grazed	35%	PP, SF, FB, Hore	C
199	3%	Y.Box / grey box open woodland grazed	20%	PP, SF, FB, Hore	C
200	3%	Small spur on a hill, grazed	20%	PP, SF, FB, Hore	C

Tower	%	Vegetation Type &	%	Weeds recorded	Control Method
Number	slope	Land Use	Visibility		
201	1%	Hill top, grazed	15%	PP, SF, FB, Hore	C
202	10%	Hillside, timbered grazed.	20%	PP, SF, FB, Hore	C
203	1%	flat bit on toe slope	20%	PP, SF, FB, Hore	
204	2%	small hill overlooking sml drainage line	15%	SF	C
205	5%	small bench on small hill	15%	No weeds	C
206	3%	Sharp ridge on hill	15%	No weeds	C
207	3%	Hill slope	15%	No weeds	C
Creek Crossing	1	fmr Yellow Box woodland, cleared ploughed		PP, SF, FB, Hore, BB, SC	A
Creek Crossing	2	fmr Yellow Box woodland, cleared ploughed		PP, SF, FB, Hore, BB, SC	A
Creek Crossing	1	Box woodland on red ridge soils		PP, SF, FB, Hore, BB, SC	A
Creek Crossing	2	fmr Yellow Box woodland, cleared ploughed		PP, SF, FB, Hore, BB, SC	A
208	10%	Steep Hill top white box, delabata and Currajong	25%	PP, SF, FB, Hore	A
209	15%	Steep Hill slope white box, delabata and Currajong	15%	SF (high proportions)	A
210	15%	Steep Hill slope white box, delabata and Currajong	15%	SF (low proportions)	C
211	3%	Steep Hill top white box, delabata and Currajong	15%	SF (high proportions)	A
212	3%	Cleared / Grazed	10%	PP, SF, FB, Hore, BB, SC	A
213	2%	Cleared / Grazed	10%	PP, SF, FB, Hore, BB, SC	A
214	5%	Cleared / Grazed	10%	PP, SF, FB, Hore, BB, SC	A
215	3%	Cleared / Grazed	15%	PP, SF, FB, Hore, BB, SC	A
216	3%	Cleared / Grazed	15%	Few weeds - native grass	
217a	15%	Cleared / Grazed	10%	SF, PLS, WO	A
218	8%	In amongst 3 RBS's on the side of a hill	10%	SF	A
Creek Crossing	5%	Partially Cleared / Grazed	25%	SF	A

Tower Number	% slope	Vegetation Type & Land Use	% Visibility	Weeds recorded	Control Method
219	5%	Partially Cleared / Grazed	1%	SF, PM, PP, FB	A
220	5%	Partially Cleared / Grazed very small hill next to drainage line	15%	SF, FB, PC, PP, SW	A
221	5%	Cleared / Grazed	10%	SF, FB, PC, PP, SW	A
222	5%	Cleared / Grazed	15%	SF, FB, PC, PP, SW	A
223a	5%	Cleared / Grazed, small thin ridge	10%	SF, FB, PC, PP, SW	A
224	0	Lightly treed/Grass/Ridge top	5	SF, FB, PC, PP, SW	A
225	2	Lightly treed/not cleared	5	SF, FB, PC, PP, SW	A
226	1	Grass/Cleared	5	SF, FB, PC, PP, SW	A
227	0	Grass/Cleared/lightly treed	10	SF, FB, PC, PP, SW	A
228	2	Grass/Cleared	0	SF, FB, PC, PP, SW	A
229	2	Grass/Cleared	5	SF, FB, PC, PP, SW	A
230	1	Grass/Cleared	50	SF, FB, PC, PP, SW	A
231	0	Grass/Cleared	0	SF, FB, PC, PP, SW	A
232	1	Grass/Cleared	0	SF, FB, PC, PP, SW	A
233	0	Grass/Cleared	0	SF, FB, PC, PP, SW	A
234				Access not available	
235				Access not available	
236				Access not available	
237				Access not available	
238				Access not available	
239				Access not available	
240				Access not available	
241				Access not available	
242				Access not available	
243	0	Cleared / Grazed 250 - 300 m to Mitchell's Creek	5%	SF, FB, PC, PP, SW	A
244a	0	Cleared / Grazed 150m to Mitchell's Creek	5%	SF, Dock	C
245	0%	Cleared / Grazed	10%	SF, Dock	C
246	1	Grass/Cleared	0	SF, Dock	C

Tower	%	Vegetation Type &	%	Weeds recorded	Control Method
Number	slope	Land Use	Visibility		
247	1	Cleared/Ploughed/Cropped	30	SF, FB, PC, PP, SW	A
248	2	Cleared/Ploughed/Cropped	40	SF, FB, PC, PP, SW	A
249	2	Grass/Cleared/40m to Drainage	30	SF, FB, PC, PP, SW	A
250	1	Grass/Cleared	0	SF, FB, PC, PP, SW	A
251	1	Grass/Cleared	70	SF, FB, PC, PP, SW	A
252	1	Cleared/Ploughed	50	SF, FB, PC, PP, SW	A
253	3	Grass/Cleared	20	SF, FB, PC, PP, SW	A
254	0	Grass/Cleared/Knoll top	40	SF, FB, PC, PP, SW	A
255	1	Grass/Cleared	10	SF, FB, PC, PP, SW, hore	A
256	2	Grass/Cleared	50	SF, FB, PC, PP, SW	A
257	5	Grass/Cleared	5	SF, FB, PC, PP, SW	A
258	0	Cleared / Grazed	5	SF, FB, PC, PP, SW	A
259	3%	Cleared / Grazed on a slight hill slope next to a contour bank	25%	SF, FB, PC, PP, SW	A
260	10%	at the head of a steep gully	10%	SF, FB, PC, PP, SW	A
261	10%	On a steep hill, cleared grazed	15%	SF, FB, PC, PP, SW	A
262	5%	Hill top, grazed, cleared impacted by a water pipe	25%	SF, FB, PC, PP, SW	A
263	5%	Cleared / Grazed	5	SF, FB, PC, PP, SW	A
264	2	Grass/Cleared	10	SF, FB, PC, PP, SW	A
265	3	Grass/Cleared	20	SF, FB, PC, PP, SW	A
266	12	Grass/Cleared	20	SF, FB, PC, PP, SW	A
267	3	Grass/Cleared	20-30	SF, FB, PC, PP, SW	A
268	12	Grass/Cleared	20	SF, FB, PC, PP, SW	A
269	12	Grass/Cleared/60m to Drainage	40	SF, FB, PC, PP, SW	A
270	10	Grass/Cleared/70m to Drainage	20	SF, FB, PC, PP, SW	A
271	0	Grass/Cleared/Ridge top	10	SF, FB, PC, PP, SW	A
272	10	Grass/Cleared/100m to Drainage	40	SF, FB, PC, PP, SW	A
273	4	Grass/Cleared	10	SF, FB, PC, PP, SW	A
274	0	Grass/Cleared	10	SF, FB, PC, PP, SW	
275	0	Grass/Cleared	0	SF, FB, PC, PP, SW	A

7. Visual Impact Management Strategy

7.1 Introduction

The Visual Management Strategy will be updated once development consent conditions are known. The general principles of the strategy are outlined in the following sections.

7.2 Visual Environment

In general terms, the visual catchments in the study area contain a number of major landscape elements, including:

- ☐ agriculture and rural settings;
- ☐ hills and slopes both wooded and cleared;
- ☐ village landscapes;
- ☐ alluvial plains;
- ☐ steep wooded slopes; and
- ☐ Mining, roads and railways.

Visually, the most significant impacts will occur where the transmission line deviates from the route of the existing transmission lines and service corridors. Where the line follows the existing transmission lines, the new line does not introduce a new visual element in the landscape and the impacts of the installation are limited to the additional structures associated with the new transmission line.

7.3 Visual Management Procedures

7.3.1 General Management Procedures

To minimise the visual impacts associated with the installation of the new transmission line the following measures are to be implemented:

- ☐ dull surface conductors will be used along the length of the line to minimise reflection from the surfaces;
- ☐ locating the line with the backdrop of existing woodland; and
- ☐ Maximising distance from residences where possible.

7.3.2 Areas of High Visual Impact

Areas of high visual impact were identified in the Project EIS. These areas included Slate Gully Road, Mount Molly, Ulan Road/Cope Road and Twelve Mile Road crossing. In these locations:

- ☐ vegetation planting may be carried out to reduce the visual impacts of the line on the landscape.
- ☐ Where the planting is to occur on private property landholders will be consulted in relation to the species to be planted on their properties.
- ☐ Specifically along Slate Gully Road, tower structures will be painted green in a proven measure that blends structures into a vegetated background.

The above strategy will be developed into a site by site plan, including for screening plantings at locations where visual impacts are high as set out in the EIS. Any plantings on private properties will be carried out selectively in consultation with residents who will be expected to water the plants after the initial fortnight from planting.

7.3.3 Land Owner Consultation

Following construction of the transmission line and implementation of the mitigation strategies described above, land owners with a view of the line will be contacted regarding the effectiveness of the management procedures. Advice will be sought from these land owners for additional works that may be carried out to further reduce the visual impact. TransGrid will give due consideration to any additional works suggested or requested.

7.3.4 Maintenance

Routine inspections of the transmission line and easement will include an assessment of the ongoing effectiveness of the management strategies applied to reduce the visual impact. In some cases, maintenance works may be required to ensure that visual impacts continue to be mitigated as far as possible. This will be assessed by TransGrid Network as part of the ongoing Operations Environmental Management Plan.

8. Heritage Management Strategy

8.1 Introduction

The heritage management strategy outlines the detailed commitments made by TransGrid in relation to indigenous and non-indigenous heritage along the route of the transmission line and the measures to be taken and protocols followed to ensure that these commitments are met during the construction of the line.

8.2 Post Approval Works

The Heritage Assessment for the Wollar to Wellington project was undertaken by OzArk Environmental and Heritage Management Pty Ltd. The following management strategy has been updated to include committed post approval excavations and investigations.

TransGrid will arrange for the archaeologist, assisted by the representatives of the relevant Indigenous groups, to survey from towers 59 to 63, 181 to 190 and 234 to 242 (approximately 9% of the route) that was not surveyed for the EIS, and will develop management strategies for any finds, that are consistent with the strategies developed for the sites identified in the EIS and PEMP. TransGrid will consult with DEC and the participating Indigenous groups concerning the management strategies before incorporating them into the Indigenous Heritage Management Plan.

8.3 Indigenous Heritage Management Procedures

The transmission line route crosses land within the Aboriginal Land Council areas of Wellington and Mudgee. Aboriginal groups participating in the survey were the Gallanggabang Aboriginal Corporation (GAC), Warrabinga Native Title Claimants Corporation (Warrabinga) and Murong Gialinga ATSIC. These groups provided representatives throughout the length of the project.

With the exception of a small number of properties, the entire transmission line route and associated access tracks was surveyed on foot. The study recorded twenty-eight (28) Indigenous sites. Nineteen (19) of these were open sites, nine (9) with Potential Archaeological Deposit (PAD); seven (7) isolated finds and two (2) PAD's. Of the 28 recorded sites along the easement, thirteen (13) will be directly impacted by the proposed works, while a further six (6) require mitigative measures to ensure they are not impacted. The categorising of these 19 sites into groups according to recommended management simplifies the presentation of the devised management strategies and mitigative measures, which are outlined in the Tables below.

8.3.1 Aboriginal Heritage Protocols (General)

NPWS will be notified in writing of TransGrid's intention to proceed with the Wellington to Wollar transmission line project. Mr Bob Sutherland, the NPWS contact should also be met with personally to ensure that he is aware of the written communication:

Bob Sutherland
WAHU Department of Environment and Conservation (DEC)
North-West Regional Office
48-52 Wingewarra St; PO Box 2111, Dubbo, NSW, 2830

Phone contact should be made with each of the Aboriginal Community Groups to continue the consultation process and inform them that the project is to commence. Contact details are:

Joyce Williams
Chair
Gallangabang Aboriginal Corporation
PO Box 463 Wellington NSW 2820;

Lance Syme
Liaison Officer
Warrabinga Native Title Claimants Corporation
PO Box 440 Picton NSW 2571;

David Maynard
Sites Officer
Murong Gialinga ATSIC
PO Box 1098, Mudgee, 2850;

Larry Flick
Chair
Mudgee Local Aboriginal Lands Council
Unit 3/2 Lovejoy St Mudgee 2850;

- ☐ Aboriginal Community representatives should be given at least 14 days notice in writing of their required involvement in Aboriginal heritage management of the project including any sub-surface investigations.
- ☐ Prior to commencement of the construction, all field management staff and contractors shall familiarise themselves with the location of indigenous sites and areas of archaeological sensitivity indicated on the route plan both within the transmission line easement and associated access tracks; and the obligations of field management staff and contractors under the NPWS Act.
- ☐ All recorded sites will be marked with flagging tape prior to construction activities to enable construction personnel to identify and avoid significant areas.
- ☐ Should additional sites and/or areas of PADs be identified during the construction work, appropriate management recommendations for the sites and/or PADs will be made by the archaeologist in consultation with the Aboriginal Community Representatives and DEC (NPWS).
- ☐ In the event that previously unidentified Aboriginal objects or historical relics are discovered during construction, all work that is likely to effect or disturb the object or relic will cease immediately and the DEC and nominated Indigenous Group representatives will be informed, in accordance with the *National Parks and Wildlife Act 1974*, and the *Heritage Act 1977*.

- ❑ If areas additional to those assessed in the EIS survey are to be impacted by the proposed development, then further archaeological assessment may be required. This would include all storage pads, access tracks, works depots, car parks for heavy vehicles, drilling pads etc.
- ❑ A small section of the line, from towers 59 to 63, 181 to 190 and 234 to 242 (representing approximately 9%), was not available to be surveyed at the time of the EIS. This area will be surveyed by the archaeologist, assisted by the representatives of the relevant Indigenous groups and management strategies developed for any artefacts or sites recorded. Management strategies will be consistent with the strategies developed for sites identified in the EIS.
- ❑ Subject to DEC consent, TransGrid will ensure any relics collected are appropriately described and assessed and kept secure in interim storage pending advice from DEC as to the appropriate care and control arrangements.

8.3.2 Identified Sites within the Project Area

Table 8.1 - All tower sites and creek crossings within the study area that have Indigenous Heritage recommendations attached to them.

Tower Number or Creek Crossing	Management Recommendation	Reason for Recommendation
9	A temporary onion skin fence should be erected 20 metres west of tower 9	WW-IF7 lies 30 m west of tower 9.
30	Monitor excavation of tower foundations.	Moderately sensitive landform. Proximity to Wilpinjong Creek and WC-OS12 with PAD
32	Monitor excavation of tower foundations.	Moderately sensitive landform. Proximity to Wilpinjong Creek and WC-IF2
35	Monitor excavation of tower foundations.	Moderately sensitive landform. Proximity to Wilpinjong Creek and previously recorded sites (Navin Officer WCP 193 and 151: open artefact scatters)
36	Salvage excavation within impact footprint of tower.	WC-PAD1. Moderately sensitive landform. Proximity to Wilpinjong Creek. Depth of deposit Proximity to Navin Officer WCP 174: open artefact scatter with >500 artefacts and, on other side of creek WCP 134 (artefact scatter)
37	Salvage excavation within impact footprint of tower.	WC-PAD1. Moderately sensitive landform. Proximity to Wilpinjong Creek. Depth of deposit Proximity to Navin Officer WCP 174: open artefact scatter with >500 artefacts and, on other

Table 8.1 - All tower sites and creek crossings within the study area that have Indigenous Heritage recommendations attached to them.

Tower Number or Creek Crossing	Management Recommendation	Reason for Recommendation
		side of creek WCP 134 (artefact scatter)
38	Salvage excavation within impact footprint of tower.	WC-PAD2. Moderately sensitive landform. Proximity to Wilpinjong Creek Depth of deposit Proximity to Navin Officer WCP 134 (artefact scatter)
41	Monitor excavation of tower foundations.	Proximity to WC-OS13
46	Monitor excavation of tower foundations.	Moderately sensitive landform. Proximity to Wilpinjong Creek and WC-OS15 with PAD
Wilpinjong Creek crossing	Monitor creek crossing ground impacts. Wilpinjong Creek crossing west of tower 50. No construction 40 m east of proposed crossing.	Unrecorded site present on low knoll 80 m east of creek crossing.
51	Monitor excavation of tower foundations.	Proximity to Wilpinjong Creek and WC-OS16 with PAD and WC-IF5
53	Monitor excavation of tower foundations.	Right on site WC-OS17 with PAD
80	Monitor excavation of tower foundations.	Moderately sensitive landform. Proximity to MC-OS19 and Moolarben Creek
112	Monitor excavation of tower foundations.	Impacts to BSR-OS8.
128	Monitor excavation of tower foundations.	Proximity to SC-OS10.
134	Monitor excavation of tower foundations.	Proximity to SDC-OS9
Slapdash Creek Crossing	Monitor creek crossing construction	Slapdash Creek Crossing, SDC-OS9 with PAD in vicinity, moderately sensitive landform
155	Monitor excavation of tower foundations.	Proximity to WC-IF1
191	Salvage excavation within impact	Right on site GC-OS5 with PAD Archaeologically sensitive landform

Table 8.1 - All tower sites and creek crossings within the study area that have Indigenous Heritage recommendations attached to them.

Tower Number or Creek Crossing	Management Recommendation	Reason for Recommendation
	footprint of tower.	Depth of deposit
198	Salvage excavation within impact footprint of tower.	Right on site CR-OS4 with PAD Archaeologically sensitive landform Depth of deposit

8.3.3 Summary of Requirements - Table 8.2

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations
Creek Crossing	777802E 6409014N 410m	Agric weeds	25%	Site recorded, WC-OS11, on nth bank at gates retouched flakes	Whether or not access track is to go through this site.	The access track will not go ahead in this location and hence the site will not be impacted.	No further investigation required
1a	777482E 6410028N 403m	Grass/Cleared	20-100%	Low			No further investigation required
2a	777213E 6410183N 421m	Grass/Cleared/Ridge Top	30%	Low			No further investigation required
3a	776878E 6410335N 416m	Grass/Cleared/Ploughed	50%	Low			No further investigation required
4a	776450E 6410533N 433m	Grass/Cleared/Valley Terrace	20%	Low			No further investigation required
5a	775860E 6410804N 419m	Grass/Cleared/Valley Side	20%	Low			No further investigation required
Drainage line Crossing	775675E 6410877N 430m	Cleared/Grazed	35%	Low			No further investigation required
6 (angle)	775496E 6410962N 433m	Grass/Cleared/Ridge Top	40%	Low			No further investigation required
7	775546E 6411363N 438m	Grass/Cleared/Valley Side	10%	Low			No further investigation required
8	775581E 6411769N 437m	Grass/Cleared/Valley Side	10%	Low			No further investigation required
9	775649E 6412148N 435m	Grass/Cleared	70%	Low	WW-IF7. 30m west of Tower 9: Quartzite Flake 775615E 6412143N 441m	No impact from proposed works. Temporary fence to be erected 20 m west of Tower 9, to include erosion zone.	No further investigation required
10	775690E 6412521N 430m	Grass/Cleared/Valley Side	50%	Low			No further investigation required
11	775572E 6412852N	Grass/Cleared	10%	Low			No further investigation

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
	413m						required
12	775405E 6413254N 417m	Grass/Cleared/Valley Side	20%	Low			No further investigation required
13	775413E 6413248N 442m	Grass/Cleared/Valley Terrace	40%	Low			No further investigation required
14	775077E 6414089N 435m	Grass/Cleared/lightly treed	40%	Low			No further investigation required
15	774859E 6414645N 557m	Grass/Cleared/Ridge Top	10%	Low			No further investigation required
16	774677E 6415076N 468m	Grass/Cleared/Plateau	40%	Low			No further investigation required
17	774466E 6415608N 462m	Grass/Cleared	20%	Low			No further investigation required
18	774571E 6415876N 451m	Grass/Cleared/Valley Top	0%	Low			No further investigation required
19	774711E 6416257N 458m	Grass/Cleared/Valley Side	10%	Low			No further investigation required
20	774860E 6416645N 451m	Grass/Cleared/Valley Terrace	0%	Low			No further investigation required
21	775009E 6417018N 419m	Grass/Cleared/Valley Terrace	20%	Low			No further investigation required
22	775124E 6417325N 429m	Grass/Cleared/Valley Side	40%	Low			No further investigation required
22.1	775068E 6417667N 421m	Grass/Cleared/Valley Side	40%	Low			No further investigation required
23a	775016E 6418069N 420m	Grass/Cleared/Valley Side	10%	Low			No further investigation required
24a	774973E 6418323N 413m	Grass/Cleared/Valley Side	50%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
25a	775010E 6418697N 413m	Grass/Cleared/Valley Terrace	10%	Low			No further investigation required
Shale Oil / Slate Mine	shaft = 774808 6418645N 407m footings 774851E 6418775N 405m	Cleared/Grazed	15%	Low	Potential for damage from inadvertent vehicle movements	Temporary fencing around this site, at minimum on the side closest to the construction activities and heritage awareness induction.	No further investigation required
26a	775012E 6419204N 418m	Grass/Cleared/Valley Terrace	40%	Low			No further investigation required
27a	775154E 6419578N 391m	Grass/Cleared/Valley Side	40%	Low			No further investigation required
28	775212E 6419915N 372m	Grass/Cleared/Valley Side	10%	Low			No further investigation required
28.1	775192E 6420154N 366m	Grass/Cleared/Floodplain	0%	Low			No further investigation required
28.2	774935E 6420385N 369m	Grass/Cleared/Alluvial Terrace >750m from Wilpinjong Creek	30%	Low			No further investigation required
29	774518E 6420305N 367m	Grass/Cleared/Alluvial Terrace >300m from Wilpinjong Creek	60%	Low			No further investigation required
30	774065E 6420225N 367m	Grass/Cleared/Alluvial Terrace >70m from Wilpinjong Creek	10%	Low/Moderate	WC-OS12 is 20m north of Tower 30 -774081E 6420248N 367m. 2 Flakes on terrace 50m from water. Although site will be avoided, there is potential for artefacts in the proposed construction area	Monitor construction of tower by Aboriginal community member or archaeologist. Fence off site WC-OS12 20m north of Tower 30 to avoid direct impacts.	Monitor excavation of tower foundations.
31	773633E 6420151N 362m	Grass/Cleared/Floodplain >100m from Wilpinjong Creek	0%	Low/Moderate	Close to water but on floodplain so intact sites unlikely.		No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
32	773194E 6420077N 363m	Grass/Cleared/Floodplain >100m from Wilpinjong Creek	10%	Low/Moderate	Close to water but on floodplain so intact sites unlikely. However, WCIF2 773082 6420044 368m, a Silcrete Flake was recorded between Towers 32 and 33, 100m from creek.	Monitor this tower location by Aboriginal community member or archaeologist, due to the potential for artefacts from disturbed, floodplain contexts.	Monitor excavation of tower foundations.
33	772803E 6420007N 371m	Grass/Cleared/Floodplain >100m from Wilpinjong Creek	5%	Low			No further investigation required
34	772400E 6419930N 374m	Grass/Cleared/Floodplain >240m from Wilpinjong Creek	0%	Low			No further investigation required
35	772023E 6419866N 378m	Grass/Cleared/Floodplain >100m from Wilpinjong Creek	0%	Low/Moderate	Close to water. Proximity of to 2 sites recorded by Navin Officer (WCP 193 and 151).	Monitor by Aboriginal community member or archaeologist due to proximity to previously recorded sites.	Monitor excavation of tower foundations.
European Heritage	out of impact corridor				Homestead built 1912 c. 8m north of corridor -vacant -about to be demolished		No further investigation required
Indig Heritage site	out of impact corridor	Cleared / Grazed	5%	Moderate-High	Several isolated artefacts were recorded outside of the study corridor - they are believed to be part of an extension to sites recorded recently by Navin Officer P/L. Advise client to peg out tracks etc and not venture beyond them.		No further investigation required
Creek Crossing to 36a	771627E 6419797N	Riparian Corridor		Moderate-High	A site recorded by Navin Officer occurs on the southern bank of the creek. Top soil is eroded here. Plan by client are to rock armour crossing to prevent further erosion which will aid in site protection. Need to liaise with mine & TransGrid to determine		No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations Investigations EIS and
					management of track.		
36a	771627E 6419797N 373m	Grass/Cleared/Floodplain/ North bank of Wilpinjong Creek	10%	Low/Moderate	Will impact site WC PAD 1: 15m from creek, close proximity to site WCP 174 recorded by Navin Officer.	Test excavation of site WC-PAD1 will be required to assess site significance.	12 to 16 test pits to a depth of 20 cm to 1 m
European Heritage	771272 6419754N	Grazed	5%		Post and Rail Fence - wont be impacted by proposal.	Temporary fencing around the site.	No further investigation required
Creek Crossing	771151E 6419721N	Riparian Corridor	0%	Moderate-High	Banks of the creek have deep sandy soils. Need further info from geomorphic to make final assessment.		No further investigation required
37a	771196E 6419721N 377m	Grass/Cleared/Floodplain/ North bank of Wilpinjong Creek	0%	Low/Moderate	Will impact site WC PAD 1: 15m from creek, close proximity to site WCP 174 recorded by Navin Officer. Also 120m east of Tower 37a was WC-IF3 771371 6419748 377m. Volcanic retouched scrapper.	Test excavation of site WC-PAD1 will be required to assess site significance.	12 to 16 test pits to a depth of 20 cm to 1 m
38	770833E 6419666N 380m	Grass/Cleared/Floodplain/ South bank of Wilpinjong Creek	5%	Low/Moderate	Will impact site WCPAD2: Proximity to Water (50m) and to Navin Officer site WCP 174	Test excavation of site WC-PAD2 will be required to assess site significance.	6 to 8 test pits to a depth of 20 cm to 1 m
39	770497E 6419704N 382m	Grass/Cleared/Floodplain/ South bank of Wilpinjong Creek. Former swamp.	10%	Low			No further investigation required
40	770260E 6419957N 361m	Grass/Cleared/Floodplain/ South bank of Wilpinjong Creek. Former swamp.	10%	Low			No further investigation required
41	769987E 6420251N 376m	Grass/Cleared/Floodplain/ South bank of Wilpinjong Creek. Former swamp.	10%	Low	Proximity (30m) to WCOS13 with PAD	Monitor by Aboriginal community member or archaeologist during tower excavation and ground surface disturbance. No direct impact to WC-OS13 from proposed works. A	Monitor excavation of tower foundations.

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
						temporary, highly visible fence should be erected along the south-eastern boundary of the easement immediately south of Tower 41, extending for app. 40m.	
42	769746E 6420529N 387m	Grass/Cleared. Knoll in Valley	50%	Low			No further investigation required
43	769416E 6420769N 385m	Grass/Cleared/Ploughed Terrace 400 m from creek	0%	Low	Proximity to site WC-OS14 which is between towers 42 and 43	No impact from proposed works to WC-OS14.	No further investigation required
44	769083E 6420979N 383m	Cleared / Grazed. Floodplain	20%	Low	Proximity to site WCOS14 which is between towers 42 and 43	No impact from proposed works to WCOS14. Site should be fenced off	No further investigation required
45	768778E 6421197N 395m	Cleared / Grazed. Floodplain	20%	Low			No further investigation required
45-46		Cleared / Grazed. Floodplain	varies	Low-moderate	Proximity to site WC_OS15 with PAD – to be protected from inadvertent vehicle impacts during construction.	A temporary, highly visible fence to be erected 20m from the centreline along the northern boundary of the easement between Towers 45 and 46 during the construction phase of the electricity towers.	As per EIS
46	763490E 6421390N 388m	Cleared / Grazed. Floodplain	50%	Moderate	Proximity of water and WC-OS15 with PAD which lies between towers 45 and 46	Due to proximity to WC-OS15, works at Tower 46 should be monitored by Aboriginal community member or archaeologist during tower excavation and ground surface disturbance. No direct impact to WCOS15. New gate and a temporary fence along north boundary of easement during construction to protect WC-OS15.	Monitor excavation of tower foundations.

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
47	768281E 6421634N 393m	Cleared / Grazed. Floodplain	10%	Low			No further investigation required
48	768045E 6422003N 399m	Cleared / Grazed. Floodplain	20%	Low			No further investigation required
49	767793E 6422363N 399m	Cleared / Grazed. Terrace 250 metres from creek	20%	Low			No further investigation required
50	767571E 6422636N 399m	Cleared / Grazed. Slope above floodplain	20%	Low			No further investigation required
50-51		Cleared / Grazed. Slope above floodplain	20-30%	Low-moderate	Proximity of Site WC-OS16 with PAD requires protection from inadvertent vehicle damage.	A temporary highly visible fence to be erected 20m from the centreline along the southern boundary of the easement between Towers 50 and 51 during the construction phase.	Monitor excavation of tower foundations.
Creek Crossing at Wilpinjong Creek		Creek		Moderate	Number of sites means creek line is very sensitive	Monitor by Aboriginal community member or archaeologist for the duration of ground surface disturbing works into the banks of the creek.	As per EIS
51	767244E 6422905N 398m	Cleared / Grazed. Slope above creek	30%	Moderate	Proximity of WC-OS16 with PAD and WC-IF5, both of which lie between towers 50 and 51	Monitor by Aboriginal community member or archaeologist during tower excavation and ground surface disturbance. No impact to WC-OS16 with PAD from proposed works. Temporary fence to protect site during construction. Move WCIF5 to WC-OS 16.	Artefact will be collected and relocated prior to construction commencing.
52	766871E 6423174N 412m	Cleared / Grazed. Slope above floodplain	50%	Low			No further investigation required
53	766479E 6423495N	Cleared / Grazed. Knoll top	50%	Moderate	WC-OS17 with PAD is directly within the impact zone of tower	Test excavate this site to	6 to 8 test pits to a depth

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
	405m	above floodplain			53	determine significance.	of 20 cm to 1 m
54	766129E 6423772N 408m	Cleared / Grazed. Slope to creek 80m away	40%				No further investigation required
55	765866E 6424050N 409m	Cleared / Grazed. Slope to creek 100m away	60%	Low	WC-OS18 between towers 55 and 56	Creek crossing west of tower 55: There is to be no construction 40 m east of proposed crossing due to an unrecorded site on knoll above erosion/creek gully. Fence access track in this area to ensure no inadvertent impacts.	As per EIS
56	765571E 6424379N 426m	Cleared / Grazed. Break in slope	80%	Low			No further investigation required
57	765319E 6424602N 450m	Lightly treed/Ironbark Ridge top Sandy soil	80%	Low			No further investigation required
58	765335E 6424605N 481m	Lightly treed/Ironbark slope	60%	Low			No further investigation required
59	Access not available						To be surveyed prior to construction
60	Access not available						To be surveyed prior to construction
61	Access not available						To be surveyed prior to construction required
62	Access not available						To be surveyed prior to construction
63	Access not available						To be surveyed prior to construction
64	764204E 6426575N 445m	Heath regrowth Slope	50%	Low			No further investigation required
65	763797E 6426666N	Heath regrowth Slope	20%	Low			No further investigation

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
	448m						required
66	763507E 6426726N 444m	Cleared, grazed	5%	Low			No further investigation required
67	763296E 6426392N 437m	Heath regrowth Slope	10%	Low			No further investigation required
68	762925E 6426338N 440m	Heath regrowth	50%	Low			No further investigation required
69	762572E 6426274N 440m	Heath regrowth	10%	Low			No further investigation required
70	762258E 6426268N 439m	Cleared / Grazed	30%	Low			No further investigation required
71	761993E 6426176N 434m	Grass/Cleared/Ploughed	75%	Low			No further investigation required
72	761582E 6426061N 434m	Ploughed/Planted	10%	Low			No further investigation required
72.1	761225E 6425875N 428m	Ploughed/Grass	20%	Low			No further investigation required
73	760970E 6425735N 432m	Heath regrowth Slope	20%	Low			No further investigation required
74	760649E 6425558N 405m	Cleared / Grazed	35%	Low			No further investigation required
75	760268E 6425375N 421m	Heavily disturbed by erosion, dam building and imported fill	40%	Low			No further investigation required
76	759861E 6425147N 427m	Cleared / Grazed Bulldozed	50%	Low			No further investigation required
77	759502E 6424958N 432m	Cleared / Grazed Road verge	40%	Low			No further investigation required
78	759140E 6424770N 438m	Cleared / Grazed Erosion	90%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
79	758813E 6424592N 432m	Cleared, grazed Knoll top	40%	Low			No further investigation required
80	758290E 6424320N 429m	Cleared / Grazed. Floodplain	40%	Moderate	MC-OS19 in vicinity of tower 80. Possibility of artefacts from site or elsewhere in the disturbed floodplain deposits.	Monitor by Aboriginal community member or archaeologist during tower excavation and ground surface disturbance. No direct impact to MC-OS19 from proposed works, although site should be fenced off to ensure its protection.	Monitor excavation of tower foundations.
80-81		mixture	35-40%	Low-moderate	Site MCOS19 requires protection from inadvertent vehicle impacts.	A temporary, highly visible fence is to be erected along the northern boundary of the easement between Towers 80 and 81 during the construction phase of the towers.	As per EIS
81	757984E 6424155 N 433 m	Native forest – regrowth. E. dealbata / Cypress	35%	Low			No further investigation required
82	757719E 6424371 N 432 m	Grey box (<i>E. microcarpa</i>) open forest	25%	Moderate	SHC-IF6 recorded 100 m from the impact corridor.	Site easily avoided by this tower construction.	No further investigation required
83	757719E 6424371N 449 m	Highly disturbed – former gravel pit	55%	Low			No further investigation required
84	756948E 6425018N 507 m	Native forest – regrowth. E. dealbata / Cypress	20%	Low			No further investigation required
85	756510E 6425379N 523 m	Native forest – regrowth. E. dealbata / Cypress	20%	Low			No further investigation required
86	756544E 6425439N 561 m	Native forest – regrowth. E. dealbata / Cypress	20%	Low			No further investigation required
87	755856E 6425918N 538 m	Native forest – regrowth. E. dealbata / Cypress	20%	Low	European stone wall / shelter recorded. Unlikely to be of age to be a relic but recorded for due diligence. European dam	If destroyed undertake detailed measurements and drawings. Will not be impacted by the development.	No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
					wall recorded.		
88	755386E 6426309N 517 m	Native forest – regrowth. E. dealbata / Cypress	20%	Low			No further investigation required
89	755112E 6426537N 503 m	Native forest – regrowth. E. dealbata / Cypress / E. melliodora, A. floribunda	20%	Low			No further investigation required
90	754708E 6426743N 371m	Open woodland/Cyprus	10%	Low			No further investigation required
91	754377E 6426767N 477m	Grass/Cleared/Eroded	40-60%	Moderate	TransGrid have determined that this tower can be moved to avoid site CT-OS7, Open Site parallel to creek. Moderate number of artefacts	Tower 91 has been relocated 40m to the north-west (to other side of creek) to avoid site. No further management necessary	No further investigation required
92	753978E 6426923N 482m	Grass/Cleared/<200m to water	10%	Low			No further investigation required
93	753607E 6427059N 482m	Grass/Cleared	5%	Low			No further investigation required
94	753187E 6427133N 498m	Grass/Cleared	15%	Low			No further investigation required
95	752783E 6427320N 507m	Grass/Cleared	10%	Low			No further investigation required
96	752397E 6427469N 521m	Grass/Cleared	0%	Low			No further investigation required
97	751938E 6427608N 535m	Grass/Cleared/Lightly Treed	60%	Low			No further investigation required
98	751664E 6427778N 549m	Grass/Cleared	30%	Low			No further investigation required
99	751360E 6427866N 556m	Grass/Cleared	40%	Low			No further investigation required
100	751110E 6428029N 559m	Grass/Cleared	10%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
101	750703E 6428272N 563m	Grass/Cleared	50%	Low			No further investigation required
102	750293E 6428331N 563m	Grass/Cleared	10%	Low			No further investigation required
103	749790E 6428429N 533m	Ironbark Forest	0%	Low			No further investigation required
104	749400E 6428333N 546m	Grass/Cleared	5%	Low			No further investigation required
105	748923E 6428228N 530m	Ploughed/Planted	80%	Low			No further investigation required
106	748425E 6428112N 553m	Grass/Cleared	0%	Low			No further investigation required
107	747971E 6428035N 569m	Grass/Cleared/Knoll Top	20%	Low			No further investigation required
108	747633E 6427947N 585m	Grass/Cleared/Eroded	50%	Low			No further investigation required
109	747094E 6427821N 567m	Grass/Cleared	0%	Low			No further investigation required
110	747708E 6427732N 539m	Grass/Cleared	0%	Low			No further investigation required
111	746456E 6427795N 528m	Grass/Cleared	0%	Low			No further investigation required
112	746098E 6427869N 523m	Grass/Cleared/Ploughed >50m from temp. creek	70%	Moderate	BSR-OS8 on east bank of creek. Numerous artefacts recorded. TransGrid have determined that tower can only be moved c.8m which does not avoid entire site.	As tower cannot be shifted, test excavation of site BSR-OS8 will be required to determine significance of site.	6 to 8 test pits to a depth of 20 cm to 1 m
113	745774E 6427857N 520m	Open Woodland Grey Box	50%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
114	745489E 6427850N 528m	Grass/Cleared	40%	Low			No further investigation required
115	745189E 6427726N 530m	Grass/Cleared	10%	Low			No further investigation required
116	744833E 6427578N 529m	Grass/Cleared	0%	Low			No further investigation required
117	744450E 6427420N 524m	Grass/Cleared	0%	Low			No further investigation required
118	744037E 6427249N 508m	Grass/Cleared	10%	Low			No further investigation required
119	743618E 6427076N 498m	Grass/Cleared	10%	Low			No further investigation required
120	743207E 6426906N 502m	Grass/Cleared	40%	Low			No further investigation required
121	742808E 6426739N 506m	Grass/Cleared	10%	Low			No further investigation required
122	742434E 6426586N 511m	Grass/Cleared/Ridge Top	10%	Low			No further investigation required
123	742040E 6426423N 499m	Grass/Cleared	20%	Low			No further investigation required
124	741641E 6426259N 490m	Grass/Cleared	10%	Low			No further investigation required
125	741265E 6426103N 477m	Grass/Cleared/Gully	50%	Low			No further investigation required
126	740913E 6425956N 469m	Grass/Cleared	10%	Low			No further investigation required
127	740518E 6425791N 459m	Cleared/Ploughed	100%	Low			No further investigation required
	740156E 6425791N 448m	RB Apple, RR Gum on banks cleared land either side	25%	Site recorded, SC-OS10 (w-w) on western side of	West side of creek lies SC-OS10, an Open Site with two artefacts - on Access Rd to	Conveyer belt to cover site SC-OS10 for access for heavy vehicles from gates to track.	As per EIS

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
				Stubbo Creek, along access track.	Tower 128. 740096E 6425780N 450m. Protection of site required.	Protection of will be conveyor belt matting.	
128	740083E 6425614N 451m	Grass/Cleared >50m to Stubbo Creek	50%	Low/Moderate	Due to proximity of SCOS10, need to determine if artefacts from this site have been ploughed to location of tower 128. Actual site will not be impacted	For the duration of the construction phase conveyor belting should be laid on the access track from the farm gate back down to the vicinity of where erosion has removed the A horizon level soils (where the track turns to start the creek crossing). As excavation for the access road will occur more than 6 m upslope from the present north bank, monitoring is recommended.	Monitor excavation of tower foundations.
129	739716E 6425461N 448m	Grass/Cleared <300m to Stubbo Creek	70%	Low			No further investigation required
130	739325E 6425298N 445m	Cleared/Ploughed	100%	Low			No further investigation required
131	738919E 6425131N 443m	Cleared/Ploughed/Cropped	10%	Low			No further investigation required
132	738518E 6424965N 440m	Grass/Cleared	20%	Low			No further investigation required
133	738359E 6424592N 433m	Cleared/Ploughed	50%	Low			No further investigation required
134	737964E 6424346N 426m	Grass/Cleared/Ploughed/Floodplain	0%	Low/Moderate	SDC-OS9 with PAD at 431m 737875E 6424275N approx 150m west of Tower 134. Some potential for artefacts from this site within construction area.	Monitor by Aboriginal community member or archaeologist during tower excavation and ground surface disturbance.	Monitor excavation of tower foundations.
Creek Crossing	737887E 6424345N	Floodplain		Low	Although SDC-OS9 with PAD is outside the impact corridor	As the Slapdash Creek access track will impact the landform	As per EIS

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations
Slapdash Creek					on an elevated terrace, the cutting for the access track will impact the landform upon which the site is located.	of SDC-OS9 with PAD, although not the site itself, monitor by Aboriginal community member or archaeologist for the duration of ground surface disturbing works into the banks of the creek..	
135	737604E 6424115N 429m	Grass/Cleared	100%	Low			No further investigation required
136	737218E 6423863N 436m	Grass/Cleared/Ploughed	20%	Low			No further investigation required
137	736878E 6423642N 423m	Grass/Cleared	5%	Low			No further investigation required
138	736494E 6423401N 444m	Grass/Cleared	0%	Low			No further investigation required
139	736150E 6423175N 426m	Grass/Cleared	0%	Low			No further investigation required
140	735779E 6422938N 442m	Grass/Cleared	0%	Low			No further investigation required
141	735396E 6422699N 451m	Grass/Cleared	0%	Low			No further investigation required
142	735028E 6422463N 451m	Grass/Cleared	0%	Low			No further investigation required
143	734643E 6422205N 426m	Grass/Cleared	0%	Low			No further investigation required
144	734340E 6421988N 404m	Grass/Cleared/Ploughed	40%	Low			No further investigation required
145	733951E 6421769N 448m	Grass/Cleared/Ploughed	50%	Low			No further investigation required
146	733584E 6421520N	Grass/Cleared/Ploughed	70%	Low			No further investigation

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
	415m						required
147	733193E 6421283N 449m	Grass/Cleared/Ploughed	5%	Low			No further investigation required
148	732819E 6421051N 449m	Grass/Cleared/Ploughed	100%	Low			No further investigation required
149	732429E 6420792N 441m	Grass/Cleared	50%	Low			No further investigation required
150	732109E 64205493N 420m	Cleared, ploughed					No further investigation required
151a	731933E 6420354N 414m	Slight terrace c. 250m from Creek, cleared ploughed	40%	Low-Moderate			No further investigation required
152a	731698E 6420041 412m	small spur adjoining floodplain	35%	Low-Moderate			No further investigation required
153a	731453E 6419718N 411m	Floodplain, cleared, ploughed	5%	Low			No further investigation required
154	731200E 6419379N 409m	Floodplain, cleared, ploughed	5%	Low			No further investigation required
155	730960E 6419061N	Floodplain, cleared, ploughed	15%	Site Recorded – WC-IF1	WC-IF1 will be impacted by tower 155.	Monitor earthworks & pick up & collect	Artefact to be collected prior to commencement of construction and relocated
156a	730482E 6419063N 418m	Cropped paddock -adjoining floodplain	80%	Low			No further investigation required
157	730035E 6419079N 427m	slight hill -exposed, grazed, cleared	30%	Low			No further investigation required
158	729531E 6419084N 406m	ploughed paddock	100%	Low			No further investigation required
159a	729099E 6419098N 419m	ploughed paddock	100%	Low			No further investigation required
160	728497E 6419119N 474m	Flat area next to a big drop	25%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS
161	728269E 6419094N 503m	Exposed very rocky hillside	35%	Low			No further investigation required
162	728017E 6419123N 445m	Exposed very rocky hillside	35%	Low			No further investigation required
163	727531E 641938N 466m	Exposed hillside over looking Goodiman Ck (50m away)	35%	Low			No further investigation required
164	727180E 6419149N 435m	Flat area in a regrowth area after timber cutting c. 20 yrs ago. Not grazed now but was c. 10 yrs ago	40%	Low			No further investigation required
165	727005E 6418857N 430m	100m sth of Goodiman Ck, cleared, grazed.	40%	Low			No further investigation required
166	726718E 6418383N 440m	Hilltop overlooking flats, cleared, grazed	20%	Low			No further investigation required
Road work on track	726391E 6417624N & 726501E 6417255N	Existing track	100%	Low	Nil		No further investigation required
167	726497E 6417990N 428m	Open flat country, cleared, grazed, previously ploughed	15%	Low			No further investigation required
168	726310E 6417649N 430m	Very rocky ridge over looking Goodiman Ck, cleared grazed.	25%	Low			No further investigation required
169	725885E 6417327N 384	Slight hill, cleared grazed	40%	Low			No further investigation required
170	725598E 6417119N 417m	Cleared, grazed	40%	Low			No further investigation required
Creek Crossing	725272E 6416737N	former yellow box R-b Apple woodland Cleared/Ploughed/Cropped. One Yellow box to be removed.	15%	Yes, potential artefacts found outside of study area on elevated terrace.	Minimise impact beyond area of need. Avoid elevated terrace.	Fence access track to ensure no impacts beyond.	As per EIS
171	725224E 6416831N 410m	former yellow box R-b Apple woodland Cleared/Ploughed/Cropped within 50 m Goodiman Ck	20%	Low- Moderate			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
172	724803N 6416530N 456m	Saddle between 2 hills, partially cleared, grazed, very rocky	25%	Low			No further investigation required
173	724409E 6416292N 457m	Natural bench on a hills, partially cleared, grazed, very rocky	25%	Low			No further investigation required
174	724040E 6416961N 432m	Formerly cleared - now in regrowth of scrubs	30%	Low			No further investigation required
175	723709E 6415867N 449m	Woodland/Cyprus Pine/Gum	40%	Low			No further investigation required
176	723537E 6415763N 450m	Woodland/Cyprus Pine/Gum	50%	Low	European Timber Cutting site	No direct impact. Fence access track from 176 to 177 to ensure no inadvertent impacts.	No further investigation required
177	723018E 6415502N 506m	Top of a very steep exposed hill	15%	Low			No further investigation required
178	722385E 6415238N 430m	Toe slope of small hill	25%	Low			No further investigation required
179	722131E 6415124N 420m	Half way up a hill in white box community	20%	Low			No further investigation required
180	721790E 6414967N	Top of a very steep exposed hill overlooking Mebul Ck	15%	Low	European Mine shaft(s) present		No further investigation required
181	Access not available						To be surveyed prior to construction
182	Access not available						To be surveyed prior to construction
183	Access not available						To be surveyed prior to construction
184	Access not available						To be surveyed prior to construction
185	Access not available						To be surveyed prior to construction

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
186	Access not available						To be surveyed prior to construction
187	Access not available						To be surveyed prior to construction
188	Access not available						To be surveyed prior to construction
189	Access not available						To be surveyed prior to construction
190	Access not available						To be surveyed prior to construction
190-191					Site GC-OS6 requires protection from inadvertent vehicle impacts during construction.	A temporary, highly visible fence to be erected along the existing fence lines surrounding the paddock in which this site is located.	As per EIS
191	716819E 6412701N 395m	Cleared/Ploughed/Cropped close the a big creek	95%	Site recorded -GC-OS5 with PAD	Large site. Although TransGrid attempted to replace #191 with 2 towers 150m e & w of tower 191, this has been determined as not feasible. It was feasible however to shift tower 191 45m west avoiding the main site area. None the less GC-OS5 will be impacted and consequently test excavation of the impact area will be required.	As complete avoidance of site GC-OS5 with PAD was not feasible, limited test excavation in the area of proposed impact is recommended to assess its significance. A temporary, highly visible fence to be erected around the construction footprint area of Tower 191 and the access tracks to this site.	6 to 8 test pits to a depth of 20 cm to 1 m
Creek Crossing (Goolma Ck)	717211E 6412758N 383m	Rough-barked Apple, Silver Wattle, River bottle brush, carex, phragmites. !RBA need to be lopped for safety.		GC-OS6 recorded in ploughed field between the proposed access track and the agricultural fence.	Need to avoid site by rerouting access track around existing fence line.	Avoid site by re-routing access track.	No further investigation required
192	716430E 6412529N 393m	Cleared grazed ploughed	95%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
193	716004E 6412337N 414m	Timbered hill top / side	15%	Low			No further investigation required
194	715424E 6412068N 434m	very rocky hill top	25%	Artefacts seen below this hill on ploughed paddock - not impacted by development.			No further investigation required
195	714793E 6411780N 450m	exposed hill side cleared grazed.					No further investigation required
196	714544E 6411661N 480m	exposed hill -good look out over creek, cleared grazed.	25%	Low			No further investigation required
197	713902E 6411376N 393m	Yellow / grey box open woodland. Grazed	15%	No artefacts in proposed impact corridor.			No further investigation required
198	713391E 6411139N	former Y.Box open woodland. Now cleared grazed	15%	Extensive site recorded CR-OS4. Extended across entire valley floor almost to tower 199.	Alternate tower location proposed (713355E 6411131N 412m) which is c. 40m to the west. Subsequent modelling by TransGrid determined this tower shift to be impossible; hence this site will be impacted.	The impact area for tower 198 will require test excavation to determine significance. To mitigate against further inadvertent disturbance to this site fencing will be required along Uamby Road, as well as along the access tracks to Tower 198 and around the construction zone for this tower. It is further recommended that this site be recorded in detail prior to the Proponent undertaking some site preservation measures such as stabilising erosion areas with soil and subsequently planting grasses to inhibit further erosion.	6 to 8 test pits to a depth of 20 cm to 1 m The remaining site not impacted by the construction works will be recorded.
199	712887E 6410916N 425m	Y.Box / grey box open woodland grazed	20%	No artefacts in proposed impact corridor.			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
200	712568E 6410770N 437m	Small spur on a hill, grazed	20%	Low			No further investigation required
201	712069E 6410541N 477m	Hill top, grazed	15%	Low			No further investigation required
202	711355E 6410442N 428m	Hillside, timbered grazed.	20%				No further investigation required
203	711221E 6410148N 404m	flat bit on toe slope	20%	Low			No further investigation required
204	710958E 6409938N	small hill overlooking small d line	15%	Low			No further investigation required
205	710727E 6409923N 415m	small bench on small hill	15%	Low			No further investigation required
206	710437E 6409910N 423m	Sharp ridge on hill	15%	Low			No further investigation required
207	710081E 6409857N 405m	Hill slope	15%	Low-Moderate (nr UC-OS3 w-w)			No further investigation required
Creek Crossing	710373E 6408520N	former Yellow Box woodland, cleared ploughed		Site recorded UC-OS1 with PAD	Need to protect site from access track upgrade.	Monitor earthworks and protect eastern eroding bank, put fencing either side of the track, rock armour the ground with a fabric on the ground to separate the imported fill	As per EIS
Creek Crossing	710270E 6409577N	former Yellow Box woodland, cleared ploughed		Site recorded UC-OS2	This crossing is not likely to be used in the project.	Avoid use of this crossing.	No further investigation required
Creek Crossing	710011E 6409482N	Box woodland on red ridge soils		Alternate crossing to UC-OS2 (w-w) No heritage potential here.			No further investigation required
Creek Crossing	709935E 6409813N	former Yellow Box woodland, cleared ploughed		Site recorded UC-OS3.	Access track will require the removal of part of the bank of the Creek upon which UC-OS3 is located. Some potential for	Monitoring of earthworks will be required during excavation for access track.	As per EIS

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations EIS and Investigations
					artefacts.		
208	709763E 649860N	Steep Hill top white box, dealbata and Kurrajong	25%	Low			No further investigation required
209	709185E 640942N 463m	Steep Hill slope white box, dealbata and Kurrajong	15%	Low			No further investigation required
210	768944E 6409818N 474m	Steep Hill slope white box, dealbata and Kurrajong	15%	Low			No further investigation required
211	708222E 6409575 501m	Steep Hill top white box, dealbata and Kurrajong	15%	Low			No further investigation required
212	707739E 6409429N 551m	Cleared / Grazed	10%	Low			No further investigation required
213	707363E 6409313N 543m	Cleared / Grazed	10%	Low			No further investigation required
214	707022E 6409226N 536m	Cleared / Grazed	10%	Low			No further investigation required
215	706617E 6409052N 592m	Cleared / Grazed	15%	Low			No further investigation required
216	706167E 6408961N 645m	Cleared / Grazed	15%	Low			No further investigation required
217a	705987E 6408831 607m	Cleared / Grazed	10%	Low			No further investigation required
218	705329E 6408633N 527m	In amongst 3 RBS's on the side of a hill	10%	Low			No further investigation required
Creek Crossing	705324E 6408577N 508m	Partially Cleared / Grazed	25%	Low			No further investigation required
219	704847E 6408520N	Partially Cleared / Grazed	1%	Low			No further investigation required
220	704480E 6408420N 545m	Partially Cleared / Grazed very small hill next to drainage line	15%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
221	704003E 6408266N 566m	Cleared / Grazed	10%	Low			No further investigation required
222	703756E 6408192N	Cleared / Grazed	15%	Low			No further investigation required
223a	703504E 6408114N	Cleared / Grazed, small thin ridge	10%	Low			No further investigation required
224	703094E 6407983N 571m	Lightly treed/Grass/Ridge top	5%	Low			No further investigation required
225	702688E 6407853N 605m	Lightly treed/not cleared	5%	Low			No further investigation required
226	702268E 6407712N 588m	Grass/Cleared	5%	Low			No further investigation required
227	701713E 6407581N 611m	Grass/Cleared/lightly treed	10%	Low			No further investigation required
228	701338E 6407453N 602m	Grass/Cleared	0%	Low			No further investigation required
229	700869E 6407314N 595m	Grass/Cleared	5%	Low			No further investigation required
230	700478E 6407172N 613m	Grass/Cleared	50%	Low			No further investigation required
231	700065E 6407044N 595m	Grass/Cleared	0%	Low			No further investigation required
232	699617E 6406908N 583m	Grass/Cleared	0%	Low			No further investigation required
233	699271E 6406806N 590m	Grass/Cleared	0%	Low			No further investigation required
234	Access not available						To be surveyed prior to construction
235	Access not available						To be surveyed prior to construction

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
236	Access not available						To be surveyed prior to construction
237	Access not available						To be surveyed prior to construction
238	Access not available						To be surveyed prior to construction
239	Access not available						To be surveyed prior to construction
240	Access not available						To be surveyed prior to construction
241	Access not available						To be surveyed prior to construction
242	Access not available						To be surveyed prior to construction
243	695951E 6404963N 516m	Cleared / Grazed 250 -300 m to Mitchells Creek	5%	Low			No further investigation required
244a	695551E 6404783N 503m	Cleared / Grazed 150m to Mitchells Creek	5%	Low			No further investigation required
245	695178E 6404584N 491m	Cleared / Grazed	10%	Low			No further investigation required
246	694818E 6404412N 499m	Grass/Cleared	0%	Low			No further investigation required
247	694415E 6404232N 491m	Cleared/Ploughed/Cropped	30%	Low			No further investigation required
248	694042E 6404006N 507m	Cleared/Ploughed/Cropped	40%	Low			No further investigation required
249	No reading taken	Grass/Cleared/40m to Drainage	30%	Low-Moderate			No further investigation required
250	693234E 6403609N 519m	Grass/Cleared	0%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
251	692833E 6403397N 522m	Grass/Cleared	70%	Low			No further investigation required
252	No peg due to crop	Cleared/Ploughed	50%	Low			No further investigation required
253	692066E 6403022N 534m	Grass/Cleared	20%	Low			No further investigation required
254	691695E 6402830N 548m	Grass/Cleared/Knoll top	40%	Low			No further investigation required
255	691280E 6402623N 513m	Grass/Cleared	10%	Low			No further investigation required
256	690863E 6402410N 484m	Grass/Cleared	50%	Low			No further investigation required
257	690316E 6402120N 497m	Grass/Cleared	5%	Low			No further investigation required
258	689833E 6401889N 496m	Cleared / Grazed	5%	Low			No further investigation required
259	689505E 6401722N 499m	Cleared / Grazed on a slight hill slope next to a contour bank	25%	Low			No further investigation required
260	688955E 6401444N 552m	at the head of a steep gully	10%	Low			No further investigation required
261	688744E 6401337N 557m	On a steep hill, cleared grazed	15%	Low			No further investigation required
262	688644E 6400769N 538m	Hill top, grazed, cleared impacted by a water pipe	25%	Low			No further investigation required
263	688521E 6400137N 168m	Cleared / Grazed	5%	Low			No further investigation required
264	688419E 6399420N 518m	Grass/Cleared	10%	Low			No further investigation required
265	688411E 6399449N 498m	Grass/Cleared	20%	Low			No further investigation required

Tower Number	GPS (AGD) Co-ordinates	Vegetation Type & Land Use	% Visibility	Heritage Potential	Management Issues	Management Recommendations (EIS)	Post Excavations and Investigations EIS and
266	688361E 6399143N 513m	Grass/Cleared	20%	Low			No further investigation required
267	687757E 6398924N	Grass/Cleared	20-30%	Low			No further investigation required
268	687555E 6398903N 492m	Grass/Cleared	20%	Low			No further investigation required
269	687198E 6398840N 431m	Grass/Cleared/60m to Drainage	40%	Low			No further investigation required
270	686657E 6398764N 410m	Grass/Cleared/70m to Drainage	20%	Low			No further investigation required
271	686252E 6398702N 460m	Grass/Cleared/Ridge top	10%	Low			No further investigation required
272	686043E 6398979N 460m	Grass/Cleared/100m to Drainage	40%	Low			No further investigation required
273	685806E 6399298N 396m	Grass/Cleared	10%	Low			No further investigation required
274	685419E 6399260N 374m	Grass/Cleared	10%	Low			No further investigation required
275	685069E 6399211N 373m	Grass/Cleared	0%	Low			No further investigation required

8.4 Non-Indigenous Heritage Management Protocols - Table 8.3

The following table summarises the likely impacts to recorded non-indigenous sites.

SITE NAME	LOCATION	POSSIBLE IMPACTS
Shale Oil Mine and Remnant Infrastructure	100 m west of Tower 25a	No direct impacts are associated with the current proposal. Potential impacts are associated with encroachment from contracting staff and vehicles to investigate the feature.
Stone Cottage	50 m north of Tower 35	No direct impact from the current proposal. The building was subsequently demolished by the property owner after initial photography.
Remnant Post and Rail Fence	Within the impact corridor between Towers 36a and 37a.	No direct impact from the current proposal. Potential impacts are associated with inadvertent impacts from contracting staff and vehicles working between the tower sites.
Remnant Sheep Yards and Former Dip	c. 80 m south of the impact corridor between Towers 52 - 53	No direct impact from the current proposal. Potential impacts are associated with inadvertent impacts from contracting staff and vehicles working between the tower sites.
Remnant Farm Structures and Equipment	90 % Within the impact corridor between Towers 53 – 54. 1 piece of farm machinery c. 150 south of the impact corridor along the access track.	No direct impact from the current proposal. Potential impacts are associated with inadvertent impacts from contracting staff and vehicles working between the tower sites.
Unknown Origin Dam Wall	c. 100 south of the impact corridor between Towers 87 - 88	No direct impact from the current proposal. Very unlikely potential impacts are associated with inadvertent impacts from contracting staff between the tower sites due to steep and rugged topography.
Unknown Origin Rock Shelter	Within impact corridor at the location for Tower 87	This feature may be possibly destroyed by the tower placement. It must be noted that this feature is unlikely to be a relict as defined by the Act.
Former Mine Shafts	Outside of impact corridor between Towers 1. 174 – 175 and 2. Tower 180	No direct impact from the current proposal. Very unlikely potential impacts are associated with inadvertent impacts from contracting staff.
Sandy Hollow – Gulgong Railway Line	Within impact corridor between Towers 185 – 186.	No direct impact from the current proposal. Very unlikely potential impacts are associated with inadvertent impacts from contracting staff.
Uamby Homestead and Cemetery	Outside of impact corridor (c. 1.5 km) near towers 198 - 201	No direct impacts are associated with the current proposal. Potential impacts are associated with encroachment from contracting staff and vehicles to investigate the feature.

The Wollar - Wellington 330kV Transmission line and access roads will not affect the historic items found in the site area. However, where the construction works are to be in close proximity to the ruins or items, a temporary fence may be constructed for the duration of the construction to avoid any disturbance. Determination of what appropriate measures are required to protect these European Heritage items will rest with the project Environment Management Representative.

9. Waste Management Strategy

9.1 Consent Conditions

The following waste management strategy conforms to TransGrid general policy and guidelines. These will be modified as appropriate in response to any specific development consent conditions imposed.

9.2 Waste Management Procedures

Both solid and liquid waste materials will be generated during the construction program. Waste materials generated during the construction phase will be removed from site and recycled or disposed of appropriately, in consultation with landholders and leaseholder.

Waste generated will include:

- ☐ empty conductor drums;
- ☐ surplus conductors, insulators and fittings;
- ☐ packing boxes, cans and protective wrappings of transmission line fittings and consumable materials;
- ☐ vegetation removed during the line erection;
- ☐ spoil from tower excavation sites; and
- ☐ lubricants from machinery services.

9.2.1 Inert Wastes

Empty drums, surplus conductors, insulators and fitting and other packaging products will be removed from site and recycled in accordance with TransGrid's salvage procedures. Local contractors will be used where possible.

9.2.2 Domestic Wastes

Domestic wastes, such as food wrappings and scraps will be appropriately disposed of either in bins at depots or at licensed local landfill sites.

9.2.3 Vegetation

Vegetation cleared during the construction program will generally be disposed of by burning, mulching, chipping or removal from site, in consultation with local residents.

Any burning of vegetation will be carried out in accordance with requirements in the Rural Fires Act, 1997 and in consultation with local authorities. Any necessary permits will be obtained.

9.2.4 Spoil from Tower Sites

Clean material that is excavated from the tower sites during the structure erection will be spread around the area to fill any minor depression and facilitate surface drainage, or will be removed from the site in covered trucks for off site disposal.

9.2.5 Fuels and Lubricants

All servicing of vehicles will occur at contractor sites. In the event that servicing occurs at a construction site no fuel or lubricants will be deposited on the site. All waste material will be removed from site and disposed of appropriately. The Environment Protection Authority will be contacted regarding a licensed contractor for the collection of waste oil in the area. Disposal of wastes shall be in conformity with TransGrid's waste management standards.

9.3 Spill Response Plan

During construction activities chemicals will be used for weed control and refuelling of construction vehicles and concrete trucks will need to be washed down.

- ☐ Wherever possible these activities will be conducted at depots where properly bunded areas are available to contain any spillages;

Should such activities occur along the transmission line route the following precautions will be taken:

- ☐ Concrete trucks will not be washed out or down on site and surplus concrete will be taken to approved depots for disposal;
- ☐ all maintenance for construction vehicles will be carried out on properly constructed concreted areas which are bunded and have the required oil separation facilities down stream of the area. Contractors will be responsible for ensuring that maintenance is conducted appropriately;
- ☐ all storage areas for chemicals will have earthen bund walls constructed around them to contain any spills and prevent pollution of the surrounding environment in accordance with the Dangerous Goods Act;
- ☐ sites will only be used if they have been previously cleared and disturbed, can be protected from potential pollution and if the landholder agrees to the location;
- ☐ any spills of chemical, fuels or lubricants will be cleaned up immediately by soaking the spill up with an absorbent material such as soil and removing it to appropriate disposal areas;
- ☐ should any spill occur which threatens a water way or will contaminate soils, contractors should notify the TransGrid Construction Engineer and/or the EMR immediately.

10. Traffic and Transportation Management

10.1 Introduction

The purpose of this Traffic and Transport Management Plan is to reduce the impacts of the construction and operation of the line on the local road system. The Environment Assessment demonstrated that there is little potential for impacts on the main State and regional roads in the area which include the Mitchell Highway (State Highway No.7), Castlereagh Highway (State Highway No.18) and the Golden Highway (State Highway No.27). However, there are numerous local roads in the region that are fully maintained and funded by local councils. Council roads consist of both sealed and gravel sections. They have variable widths ranging from three to seven metres, plus shoulders.

Local named roads which will be used during construction period include:

- ❑ Goolma Road, The Twelve Mile Road, Cope Road, Ulan Road, Ulan-Wollar Road, Wollar Road, Barneys Reef Road and Blue Springs Road for access to the main sections of the line.
- ❑ Barigan Road, Highett Road, Puggoon Siding Road, Puggoon Road, Merotherie Road, Jacksons Lane, Dunedoo Road, Trilby Lane, Spring Ridge Road, Mebul Road, Gum Gully Road, Wrights Lane, Uamby Lane, Gorries Lane, Spicer Creek Road and The Twelve Mile Road.

There are also numerous un-named local roads and tracks which lead to the proposed property access tracks and new tracks constructed as part of this project. Property access tracks as shown on the Project Route Plans.

While the majority of the main access roads are sealed two lane roads, others are sealed one lane or unsealed one or two lane roads.

10.2 Traffic Management Plan

As a result of consultation with the local Councils and land owners, a number of initiatives will be implemented during the construction period in order to reduce and then rectify any impacts on the local road system. These provisions will form part of the Construction Traffic Management Plan to be prepared by the successful construction contractor and in consultation with the RTA and the Mid Western Regional and Wellington Councils.

10.2.1 Transport Management

The following management initiatives will apply to the construction period:

- ❑ Use of unsealed roads during wet weather by heavy articulated vehicles, where damage may be caused to the road surface, will be avoided if possible.
- ❑ Delivering of materials requiring trucks using local roads will generally be restricted to Monday to Saturday, 7 am to 6 pm;

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- ❑ Deliveries of materials on Sundays and Public Holidays will be strictly limited and will only occur if it does not cause a noise nuisance at any nearby residential property or has been requested by Police or other authorities for safety reasons or is otherwise considered by the EMR as an emergency.
 - ❑ It is unlikely that any road will be required to be closed as a result of the transmission line construction. However, in the event that a road closure, change to access or traffic delay is considered necessary or likely, the RTA, Council or the police will be notified to seek their input and/or assistance. Closing of roads will be avoided wherever possible, particularly during peak livestock/crop transport and holiday periods.
 - ❑ Lead and/or chase vehicles will be used where required for long loads to warn local traffic of long loads associated with the construction work. Access to private property will be undertaken in accordance with the community contact protocols.
 - ❑ Access along the easement will conform to other protocols as necessary including weed management, noise and dust management.
 - ❑ In the event that temporary access is required, negotiations will be carried out with individual affected landowners to achieve a suitable arrangement.
 - ❑ All vehicles used in the construction, operation and maintenance of the line will comply with all state and local regulations, licensing and load limits. Drivers will abide by road rules at all times and conduct their business in a professional and courteous manner.
 - ❑ All drivers of vehicles will be given strict instructions on the route to be taken to each site and made aware of their responsibilities to follow only the designated routes and entry and exit points to the site. This will ensure that only the identified roads assessed during the planning process are utilised.
 - ❑ Vehicles associated with the transmission line construction will not be permitted to queue on a public road for access to a site. Should such a situation arise, the vehicles will be directed to a safe and legal parking spot in the area to wait until access to the site can be arranged.
 - ❑ In the event that a traffic incident occurs during the course of construction, the EMR or project manager will immediately contact the local police. Any traffic related incidents will be reported in the monthly EMR report to TransGrid to monitor any impacts of the construction traffic.
 - ❑ In the event that a traffic incident occurs, a review of the Traffic and Transport Strategy will be carried out by the EMR and TransGrid to identify any revisions that can be made to prevent a reoccurrence of such incident.

10.2.2 Rectification Works

Prior to commencement of construction, TransGrid will conduct a dilapidation survey of Council roads that will be used by construction traffic. The plan will be forwarded to the relevant Council for comment four weeks prior to commencement of construction works.

On completion of heavy vehicle construction traffic in each Council area, TransGrid will restore Council roads to a condition equal to or better than the condition existing at the time of the dilapidation survey.

11. Dust Management Strategy

11.1 Introduction

The purpose of this Dust Management Strategy is to reduce the impacts of the construction of the transmission line on the receiving environment. In accordance with DEC guidelines, the objectives of Dust Management Strategy are to minimise visible and nuisance dust wherever possible.

11.2 Potential Sources of Dust

The Environment Assessment demonstrated that the only potential impact on air quality resulting from the transmission line development is during the construction phase. Under normal operating conditions it is not expected that there will be any impact on air quality.

During the construction phase, dust will be generated through the following activities:

- ☐ Vehicular movements on unsealed roads;
- ☐ Clearing of vegetation;
- ☐ Foundation construction; and
- ☐ Access road construction.

11.3 Dust Controls

The Dust Management Strategy has been developed to provide TransGrid personnel and its contractors a set of guiding principles to protect the air quality in the area during the construction period. Landscapes along the route which require particular treatments or are otherwise sensitive have been identified and specific procedures outlined to protect these areas.

The Dust Management Strategy aims to minimise the impacts of dust generation along the transmission line easement and the construction of new access tracks by:

- ☐ maximising ground cover retention;
- ☐ maximising the use of existing access tracks;
- ☐ optimising the clearing of vegetation to ensure the most appropriate methods are used for the terrain;
- ☐ use of a water cart during dry and/or windy conditions to minimise dust generation;
- ☐ maintaining all vehicles in a clean and satisfactory condition. If carrying loads of dusty material, covers will be placed over the load to prevent dust leaving the vehicle;

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- ☐ drill rigs and auger type equipment will be fitted with standard dust shields;
 - ☐ adhering to a speed limit of 40 km/hr on private roads during dry and/or windy conditions; and
 - ☐ providing a mechanism for monitoring the effectiveness of temporary erosion control measures.

11.4 Rehabilitation Plan

Rehabilitation of work sites will be carried out as work proceeds and as soon as possible after the completion of work on each site to minimise the time interval of exposed surface that are likely to generate dust.

Revegetation techniques such as loosening of ground compacted by construction equipment, improving soil quality of excavated material spread around structure sites, spreading of fertiliser and grass or crop seeding will be implemented as required with regard to the weed control strategy where applicable. Stabilised spray mulches or grass matting may be used in steep areas. Details of rehabilitation works and methods are provided in Sections 3.4.3, 5.3.5 and Chapter 6.

12. Community Consultation Management

12.1 Community Notification Strategy

Before Construction commences, and then at 3 monthly intervals maximum, TransGrid will advise in relevant newspapers the nature of the works proposed for the next 3 months. The advertisement will provide details of the timing of the work, the hours of operation, areas of activity and a contact phone number should members of the community wish to contact TransGrid.

In addition, affected landholders will be contacted by letter one month prior to commencement of construction activities to ensure that specific issues such as access, vegetation lopping and clearing, operating hours etc can be negotiated if necessary in a manner that is acceptable to both parties. This stakeholder list will include all directly affected land holders, as well as any other group (Slate Gully Road residents for example) who register an interest to be contacted. This contact letter will contain information about the work to be undertaken, the anticipated timing of the work, a contact name and a business hours office and '1800' number should additional information be sought. In addition a 24 hour mobile number will be provided for use in the event of an emergency.

One week before the construction activities commence along a specific section of the route, phone calls will be made to all those residences potentially affected by noise, vibration or access as a result of the scheduled construction activities in the next week. This will ensure that residents receive personal attention and have the opportunity to clarify access or other issues for the duration of the construction activities. Should blasting activities be likely to affect residences this issue will be specifically raised to ensure that residents are aware that minor blasting activities will occur and what this is likely to mean for them.

In addition, TransGrid will maintain on their website a detailed timetable of construction activities so interested parties can easily identify how the works could potentially impact them. The website will also contain a list of contact numbers for responsible personnel, which will include a 24-hour toll free number.

12.2 Complaints Management

TransGrid will develop a Construction Complaints Management System before construction commences and will implement and maintain the System for the duration of construction. The Construction Complaints Management System will be consistent with AS 4269 "Complaints Handling".

Details of complaints received during the construction of the line will be recorded in a complaints log book which will be maintained by the EMR who will be the nominated officer to receive, log, track and respond to complaints as shown in **Table 2.1**.

The log book will be kept up to date and initial responses will be provided to the complainant within 24 hours and a detailed response within 10 working days. Information in the complaints register will include:

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- ☐ complainant's details including name, contact phone number, address;
 - ☐ complaint details listing time, date, issue of complaint, etc;
 - ☐ site associated with complaint;
 - ☐ initial actions taken;
 - ☐ follow up response to complaint including correspondence with complainant; and
 - ☐ further actions required.

A contact number will be advertised and displayed for the community to make contact with the construction team. The phone will be attended during approved construction hours. Outside these hours, calls will be recorded by an answering machine and attended to the following working day.

This information will be kept in TransGrid's site office and will be available on request to the Department of Infrastructure, Planning and Natural Resources, all relevant government agencies and all Councils.

12.3 Property Inspections and Rectification Works

TransGrid will ensure that land owner / occupier access to properties is maintained during construction in accordance with agreements reached. Subject to landowner agreement, property inspections will be conducted on all structures within 200 m of blasting, or within 50 m of construction activities that generate vibration impacts. Other locations may be nominated by the EMR. Inspections will be in accordance with AS 4349.1.

At least two weeks notice will be given to all landowners prior to inspections being carried out. Landowners will be informed of the reasons for the inspections, the scope and methodology of the inspections and the process of making a property damage claim.

A register of all property inspections will be maintained by TransGrid. The register will include details of any landowner refusals or other specific issues raised during the inspections.

TransGrid, where responsible, will rectify any property damage caused directly or indirectly by the construction or operation of the transmission line at no cost to the property owner.

13. Outline Operations Environmental Management Plan

13.1 Introduction

Once the transmission line has been constructed and commissioned by TransGrid Engineering, its ongoing operational management is provided by TransGrid Network. The Operations Environmental Management Plan (OEMP) addresses issues relevant to the ongoing maintenance of the transmission line. It builds on aspects contained in the Construction Environmental Management Plan (CEMP). The OEMP includes current operational management systems and standards such as that covering Maintenance of Easements and Access Tracks, which is attached to this Project Environmental Management Plan.

The final OEMP is prepared after the development has been constructed. Therefore the OEMP is a project tailored document specific to the ongoing environmental management of the transmission line. Although centred on the future management of the completed project, the document will build on the results of management systems and outcomes of the construction works and supervision.

The material provided below is based on current operational standards but may be changed in light of the final CEMP documentation, any issues which may arise during construction and updated Network standards.

13.2 Operations EMP Objectives

The objectives of the Operations EMP for the Wollar to Wellington 330 kV transmission line installation are to:

- ☐ provide a systems approach for the ongoing maintenance and management of environmental issues associated with the line;
- ☐ establish specific strategies and protocols for the management of environmental system components associated with the transmission line maintenance works. The environmental components include:
 - track and access maintenance;
 - easement clearing and maintenance;
 - landowner liaison;
 - flora and fauna;
 - weed management;
 - indigenous heritage; and
 - waste management.
- ☐ outline specific plans for the monitoring the implementation and effectiveness of maintenance and operational controls;

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- ☐ define the roles, responsibilities, authorities, accountabilities and reporting lines for personnel involved in the ongoing operational management of the line;
 - ☐ identify statutory and other obligations required by key legislation and policies in relation to the ongoing operational management of the line;
 - ☐ identify procedures to be followed where identified outcomes are not achieved.

13.3 Organisation of Personnel

The OEMP will state the TransGrid Network personnel responsible for the ongoing management of the Wollar to Wellington 330 kV transmission line and will include their roles and responsibilities, lines of reporting and contact details.

13.4 Components of the OEMP

The following standards form part of the OEMP:

- ☐ Environmental Assessment of Maintenance Work on Transmission Lines, Easements and Access Tracks. Current document GM AS L2 006 applies.
- ☐ Environmental Controls – Maintenance of Transmission Lines, Easements, and Access Tracks. Current document No GD EN G3 002 applies.
- ☐ Maintenance of Easements and Access Tracks. Current document GM AS L1 002 applies (**Attachment D**).

These TransGrid Network documents relate to all transmission line assets held by TransGrid. Although they will ultimately form part of the Operations EMP for the Wollar to Wellington line, there will likely be some modifications to incorporate specific issues resulting from the environmental investigations contained in the EIS/SIS and subsequent CEMP. Likely changes and variations would include:

- ☐ There would be no need to undertake further environmental assessments for easement maintenance such as slashing of regrowth. This work has been completed in the EIS/SIS.
- ☐ Development of specific protocols for environmentally sensitive areas where changes to standard maintenance work would be necessary. These are documented on the TAMIS system and would include Archaeological sites and areas where specific vegetation plantings were permitted.
- ☐ Specific landowner issues regarding ongoing access for maintenance.
- ☐ Inclusion of any specific development consent condition relating to the ongoing management of the asset. These conditions would be transferred, as appropriate, into the final Operations Environmental Management Plan.

By undertaking the above reviews, the specific needs for the project will be met with the ongoing management and operation of the asset.

Attachments

A – Monthly Environment Report

B – Access Track Log

C – Guidelines for Track Construction

D – Principles for the Clearing of Easements

E – Maintenance of Easements & Access Tracks

F – A3 Mapping

Attachment A

Monthly Environment Report (Sample TransGrid Report Form)

Attachment B

B – Access Track Log

Attachment C

Guidelines for Track Construction (Land & Water Conservation document)

Attachment D

Principles for the Clearing of Easements (Internal TransGrid standard)

GD AS G3 015

Attachment E

Maintenance of Easements & Access Tracks (Internal TransGrid procedure)

GM AS L1 002

Attachment F

A3 Mapping

- o Figure 1 - Route Alignment - Key Map
- o Figures 2a to 2o - Existing Environment (15 sheets)
- o Project Route Plans - Sheets 1 to 42