

White Rock *Wind Farm*

Alternative Powerline Modification

Submissions Report

July 2013

Table of Contents

1	Introduction	3
1.1	Purpose of this Submissions Report	3
1.2	Scope of the Proposed Modification	3
2	Consideration of Submissions	7
2.1	Public Exhibition	7
2.2	Submissions and Assessment of Submissions	7
3	Response to Submissions	8
3.1	NSW Department of Trade and Investment – Resources & Energy	8
3.2	Department of Planning and Infrastructure	8
3.3	Department of Primary Industries	9
3.4	Airservices Australia	9
3.5	Border Rivers-Gwydir Catchment Management Authority	9
3.6	Environment Protection Authority	10
3.7	Office of Environment and Heritage	11
3.8	Glen Innes Severn Council	49
3.9	Department of Defence	49
4	Conclusion	50

1 Introduction

The White Rock Wind Farm proposal is for the development of a wind farm with up to 119 turbines and associated infrastructure in the Northern Tablelands region of NSW, approximately 20km west of Glen Innes and around 500km north of Sydney. The project received planning approval from the NSW Department of Planning and Infrastructure on 10th July 2012.

A modification application and associated environmental assessment for an alternative powerline route and alternative substation/switchyard location was lodged with the department and was placed on public exhibition from 30 January until 15 February 2013. Nine submissions were received in response to the exhibition.

1.1 Purpose of this Submissions Report

The NSW Department of Planning and Infrastructure provided copies of each of the submissions and requested the proponent to respond to the issues raised in accordance with Section 75H of the NSW Environmental and Planning Assessment Act 1979. This Submissions Report considers and responds to the issues raised in the submissions on the alternative 132kV transmission line route and alternative switchyard/substation location and supports the application for approval for the modification.

1.2 Scope of the Proposed Modification

The proposed modification is a relatively minor change to the scope of the approved wind farm project and is comprised of:

- an alternative 132kV powerline route from the wind farm to TransGrid's 330kV transmission line located approximately 13km west of the wind farm site; and
- an alternative switchyard/substation location to connect the wind farm to the electricity grid.

The alternative powerline components would be the same size and configuration as the original approved 132kV powerline, but would be approximately 5km longer. It would be very similar in construction to the recently upgraded TransGrid 132kV line between Glen Innes and Inverell. The detailed design of the line has not been finalised, but would be either single circuit (three conductors) or double circuit (six conductors) strung on concrete poles spaced approximately 200 – 250m apart as shown in the photographs below. The poles would have a maximum height of 32m.

The alternative substation would be the same configuration as the original approved substation but would have a slightly larger footprint to accommodate 330kV switchgear instead of 132kV switchgear in order to suit the voltage of TransGrid's 330kV Armidale to Dumaresq transmission line.



Figure 1-1 The existing TransGrid 132kV powerline near the wind farm site

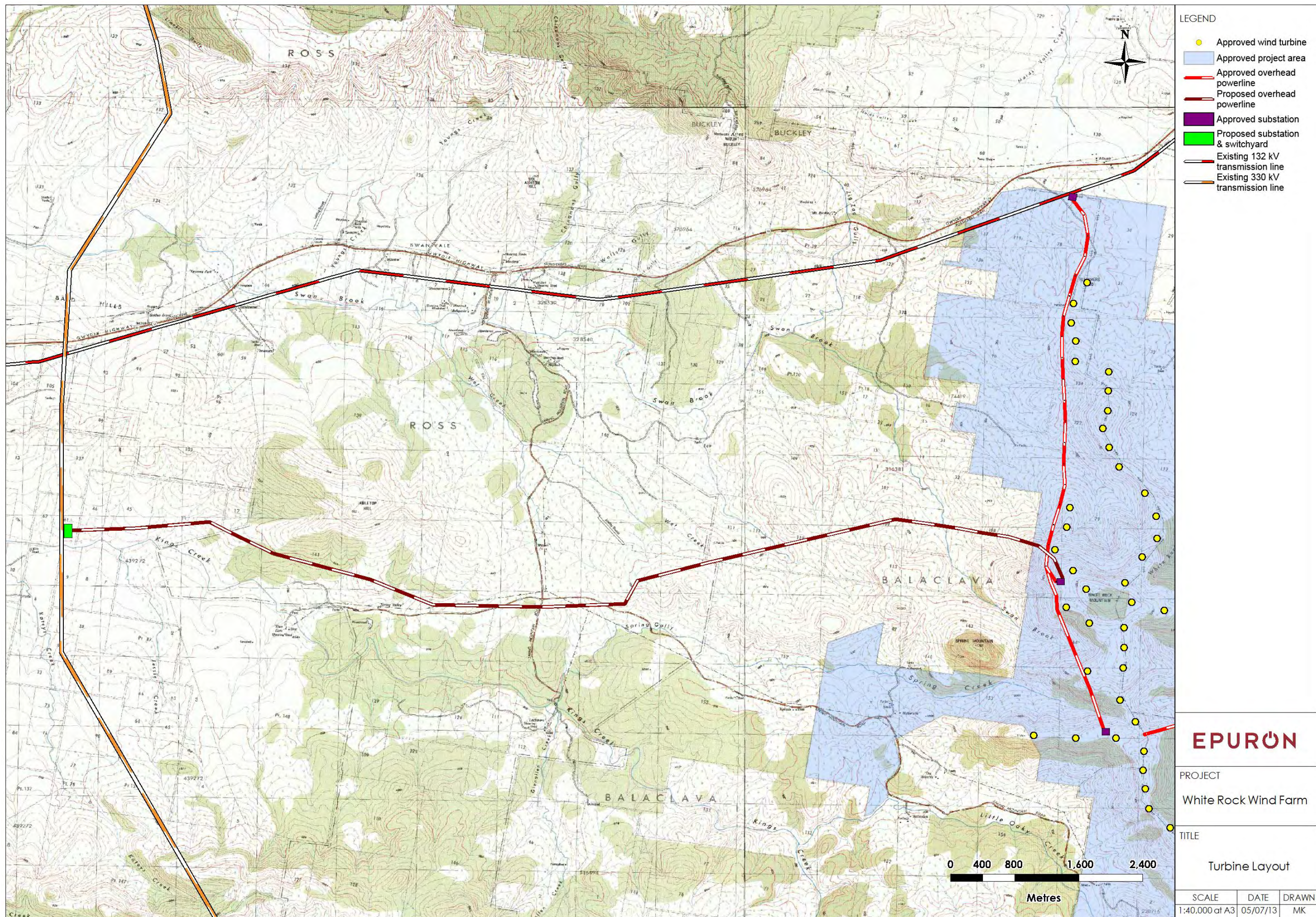


Figure 1-2 Approved 132kV powerline route and proposed alternative powerline route

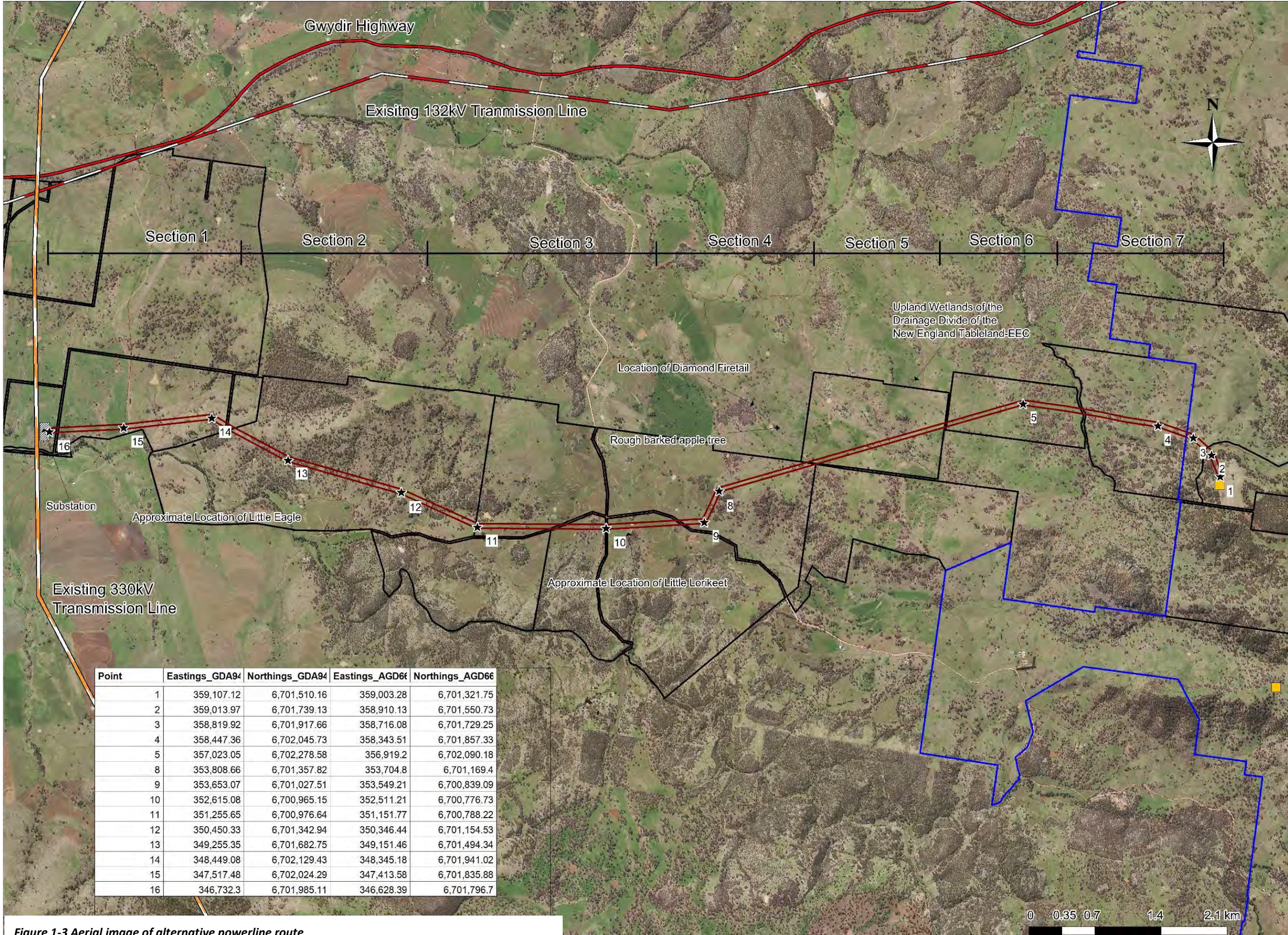


Figure 1-3 Aerial image of alternative powerline route

2 Consideration of Submissions

2.1 Public Exhibition

The modification application and supporting document (environmental assessment) were placed on public exhibition by the NSW Department of Planning and Infrastructure from 30 January to 15 February 2013 at the following locations:

- Department of Planning & Infrastructure Information Centre, Bridge Street, Sydney
- Inverell Shire Council offices
- Glen Innes Severn Shire Council Town Hall Office, Planning Office and Library
- Guyra Shire Council offices
- NSW Nature Conservation Council, Level 2, 5 Wilson St, Newtown, Sydney

Advertisements were also placed prior to the exhibition commencement date in the Early General News section of the Glen Innes Examiner and Tamworth Northern Daily Leader. A newsletter was mailed to residents located within the vicinity of the proposed modification.

2.2 Submissions and Assessment of Submissions

The Department of Planning and Infrastructure received a total of nine submissions, all of which were from government agencies. The issues raised in each submission are addressed in the following section.

3 Response to Submissions

3.1 NSW Department of Trade and Investment – Resources & Energy

Issue	Response
Alternate transmission line route intersects mining lease ML1505 and may inhibit extraction	Epuron has consulted with the landowner (& holder of the mining lease) and the powerline route has already been amended to avoid the current and planned future extraction locations.
Alternate transmission line route intersects exploration licence EL7301 and EL7302	Epuron has consulted with the mineral stakeholder who has confirmed that they do not anticipate a conflict between the proposed line and any potential bauxite resources. See copy of email below.

From: Robert Coenraads <rcoenraads@queenslandbauxite.com.au>
Sent: Wednesday, 27 February 2013 3:03 PM
To: Andrew Wilson
Cc: Marion Lesaffre; Sholom Feldman 3; andrew.helman@industry.nsw.gov.au
Subject: White Rock Wind Farm Powerline Route and EL7301 & EL7302

Dear Andrew,

I have reviewed the maps of the proposed power line in the attached letter and supporting document.

With regard to the intersection of the line with the southern edge of our easternmost block of E.L.7301 (note: we are relinquishing E.L.7302), I do not anticipate a conflict between the proposed line and any bauxite resources that we anticipate finding in the remainder of the tenement.

Kind regards,
Robert

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3.2 Department of Planning and Infrastructure

Comment	Response
Inverell Shire Council gazetted a new Local Environmental Plan on 7 December 2012	The department has noted that they have no objection with the proposal. The proposed modification is permitted with consent.

3.3 Department of Primary Industries

Comment	Response
Office of Water NSW: No objection to approval of the proposed modification	Noted
Crown Lands: i) No issues with the proposal ii) Proponent will need to seek & obtain easements over affected land	Noted The alternative powerline route crosses one Crown waterway and two Crown roads. Once the detailed powerline design and power pole locations have been confirmed and prior to construction, the Proponent will seek and obtain the required easements over this land.
Fisheries NSW: The alternative powerline should not impact on watercourses any more than the original proposal.	Noted
Agriculture NSW: No issues with the proposed modification	Noted

3.4 Airservices Australia

Comment	Response
The alternative 132kV powerline will need to be incorporated into the Aviation Impact Assessment that is required to be carried out for the wind farm prior to the commencement of construction	Noted

3.5 Border Rivers-Gwydir Catchment Management Authority

Comment	Response
The Border Rivers-Gwydir CMA is encouraged to see that an appropriate measures have been committed to ensuring appropriated offsets or	Noted

Comment	Response
mitigating management actions to 'improve or maintain' environmental outcomes associated with clearing native vegetation occur.	

3.6 Environment Protection Authority

Issue	Response
Noise emissions of the higher output wind turbine generators have not been assessed as part of the modification application. The EPA considers that this issue will be appropriately dealt with by the existing noise limits in the project approval.	Agreed. The existing noise limits in the project approval will still apply.
The EA does not appear to have assessed the impacts of any transmission line and associated service track stream crossings	<p>The alternative powerline and temporary access tracks for construction do not cross any major (3rd order or higher) streams.</p> <p>Existing Statement of Commitment 39 (page 196 of EA) regarding the commitment to minimise impact to surface water quality by ensuring infrastructure is sited at least 40m away from existing water courses</p> <p>The powerline route does cross Wet Creek and Swan Brook which are both 1st order streams at the point where the powerline will cross these streams. There is no planned crossing of these streams by temporary construction tracks. Access for construction will be via existing roads.</p>
The EA also appears to have failed to identify steep gradient land, or highly erosive soil types along the proposed transmission line route. As such, it does not appear to identify how works within these areas will be designed and managed during construction and operation to prevent erosion and sedimentation and protect water quality.	The nature of the disturbance to the land from the installation of power poles is considered minimal. However, mitigation for this will be included in an Erosion and Sediment control plan which will be developed as part of the Construction Environmental Management Plan as noted in the existing Statement off Commitment No. 40 (refer to page 196 of the EA)

3.7 Office of Environment and Heritage

Biodiversity Impacts

Issue 1: Full details of survey effort are not provided.

Recommendation: The proponent should be required to provide clear evidence that the survey effort was sufficient to achieve the stated objectives.

Response:

Details of the survey effort and objective are provided in the table below and in Figure 3.1 on page 12. Survey effort was a minimum of 8 hours on site for each of the dates below.

Table 3-1 Survey Effort

Date	Weather	Effort	Location	Survey Objective
11/7/12	Overcast & cool	8 hours	Section 4	Initial reconnaissance followed by both targeted threatened species survey and habitat searches and random meander.
12/7/12	Overcast, mild, moderate winds & rain	8 hours	Section 1	Initial reconnaissance followed by both targeted threatened species survey and habitat searches and random meander.
14/7/12	Heavily overcast, cold, few showers	8 hours	Section 3 Q2	Initial reconnaissance followed by both targeted threatened species survey and habitat searches and random meander.
15/7/12	Sunny, clear, warm to cool, moderate winds	4 hours	Section 4 (again)	Targeted flora and fauna survey and fauna habitat searches and assessments
16/7/12	Sunny, warm, light winds	6 hours	Section 4 (again) T3	Targeted flora and fauna survey and fauna habitat searches and assessments
17/7/12	Sunny, clear, cool	4 hours	Section 5 & 6 T2 & T4	Initial reconnaissance followed by both targeted threatened species survey and habitat searches and random meander.
17/7/12	Overcast & cool	4 hours	Section 2 Q1	Targeted flora and fauna survey and fauna habitat searches and assessments
18/7/12	"moist", foggy, fog & mist, intermittent light showers	8 hours	Section 7 Q4	Initial reconnaissance followed by both targeted threatened species survey and habitat searches and random meander.
9/8/12	Cold, cloudy & windy	8 hours	Section 1 T1	Targeted flora and fauna survey and fauna habitat searches and assessments
10/8/12	Cold, then cool, sunny, windy	8 hours	Section 6 Q3	Targeted flora and fauna survey and fauna habitat searches and assessments

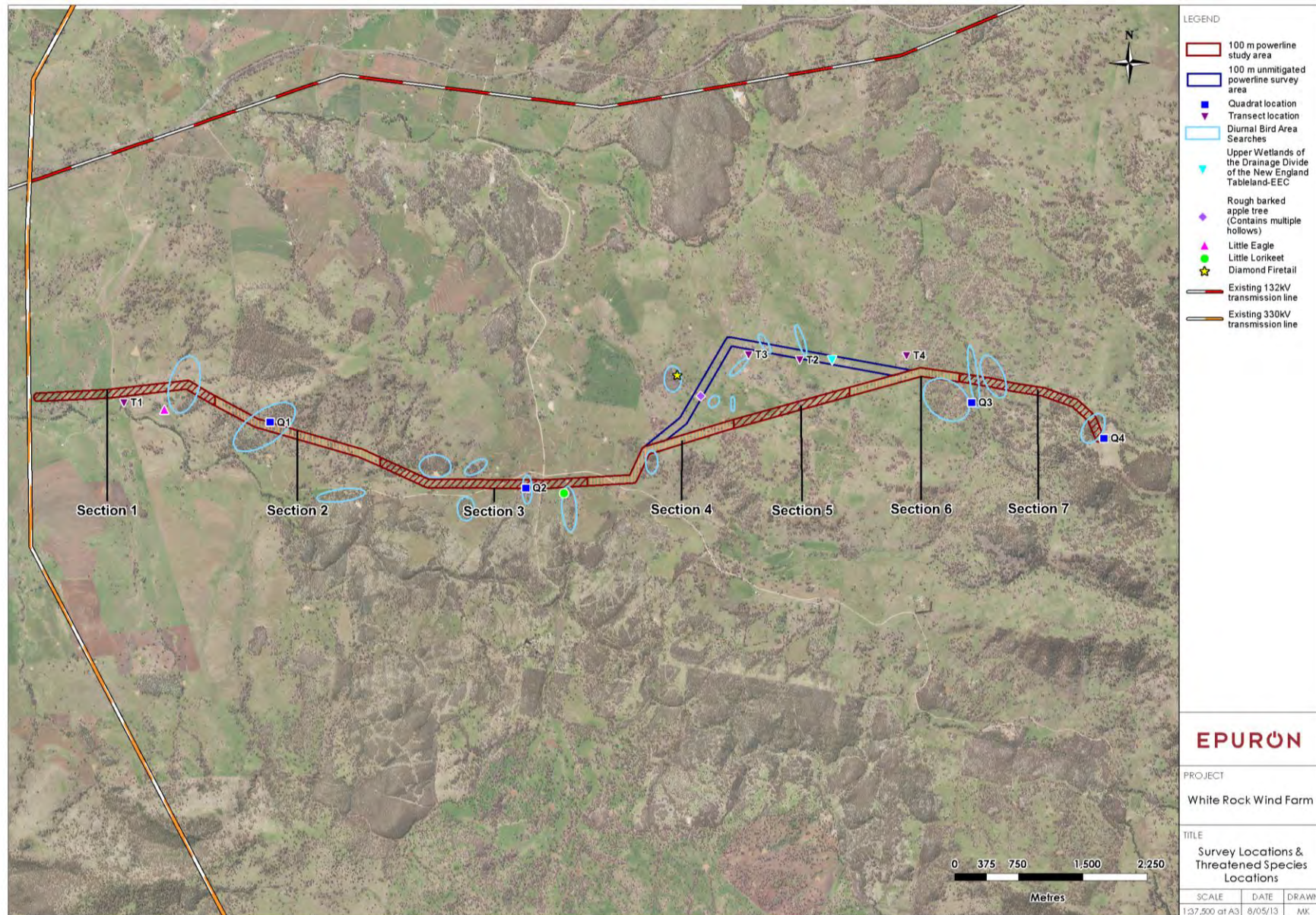


Figure 3.1 - Powerline Study Area and Survey Location

Searches for daylight bird species were carried out by area searches and point counts.

Particular species were targeted as follows:

Species	Target Location
Regent Honeyeater	Along approximately 500m length of the riparian community in Section 6 of the study area, and within mistletoe plants and flowering White Box trees whilst in flower across the study area
Swift Parrot Little Lorikeet	Remnant vegetation surrounding the study area which contained White Box <i>Eucalyptus albens</i> which was in flower during the assessment period
Hooded Robin Scarlet Robin Speckled Warbler	Within adjacent White Box remnant areas with understorey and in sections 2, 5, 6 and 7.
Black Bittern	In Upland Wetland and riparian areas in section 6
Brown Treecreeper	In riparian areas adjacent to section 2 and in section 6, particularly along the 500m riparian zone
Grey Crowned Babbler	Throughout study area and environs

The survey methodology for threatened species of fauna and flora has been described in the supplementary biodiversity assessment for the alternate powerline and considered:

- Search of OEH Atlas database for Glen Innes and Inverell LGAs with a 50km radius from the study area
- Actual recording during the field survey
- Likelihood of occurrence based on the broad habitat parameters encountered in the study area

A Seven Part Test of Significance was then applied to those species considered a higher risk based on the assessment of the initial factors considered above.

Issue 2: A full range of field survey methods has not been employed

Recommendation: That the proponent provides justification for not utilising adequate survey techniques as outlined in the Threatened Species Survey and Assessment Guidelines.

Response:

The range of field survey methods suggested in the guidelines are:

Species	Survey Method	Used	Reason for not using method
Plants	Transects	Yes	-
Plants	Plot-based (or Quadrat) Surveys	Yes	-
Plants	Targeting threatened plants	Yes	-
Amphibians	Listening, spotlighting, searching, call recording	No	Lack of suitable habitat
Reptiles	Active searching Pitfall traps, spotlighting	Yes No	- Season not ideal for reptiles
Diurnal Birds	Area search of selected area for specified time	Yes	-

Species	Survey Method	Used	Reason for not using method
	as noted in Figure 3.1		
Diurnal Birds	Point count for fixed time	No	Area searches and opportunistic assessment were considered sufficient
Nocturnal Birds	Call playback	No	No significant area of habitat present for nocturnal avifauna.
Microbats	Anabats	No	Potential roost sites for the Eastern Bent-wing Bat and other cave dwelling species are absent from the study area. The potential impacts to microbats from the wind farm has been adequately assessed in the EA.
Small mammals	Trapping	No	The majority of the study area has limited or no understorey vegetation and all remnants are isolated from surrounding bushland so there is very limited habitat for terrestrial, scansorial and arboreal mammal species.

Issue 3: The dominant vegetation types within the study area are not described

Recommendation: A full description of each vegetation type in the study area is necessary. As recommended by the guidelines, details of the structure and floristics, a list of dominant plant species in each growth stratum, disturbance (clearing, logging, fire etc), description of weeds present and their density, and suitability of the area as habitat for species, populations and ecological communities should be provided. Each description should, ideally, be supplemented with a photo of a typical area of this vegetation type.

Response:

The following vegetation communities were found to be present within the study area:

- White Box Yellow Box Blakely's Red Gum Woodland EEC,
- Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion EEC;
- River Oak Forest (Riparian) vegetation community; and
- Uplands Wetlands of the Drainage Divide of the New England Tableland Bioregion EEC.

Derived Native Grasslands are also present, however this community is considered to be a derivative or variant to the White Box Yellow Box Blakely's Red Gum Woodland vegetation community throughout the site.

The ecological condition of each section of the study area, and adjacent areas, has been mapped and graded into one of five categories consisting of:

- poor,
- poor to moderate,
- moderate,
- moderate to good, and
- good.

These variants are based on each remnant and a range of habitat values including size, presence or absence of an indigenous understorey, degree of disturbance, degree of weed invasion, impacts from livestock or feral animals such as pigs, rabbits and deer, proximity and connectivity to other sizeable remnants and habitat features including the presence of exposed rocky substrates, woody debris and likelihood of tree hollows.

White Box Yellow Box Blakely's Red Gum Woodland EEC

The structure of the White Box Yellow Box Blakely's Red Gum Woodland community is open woodland with a mean tree height of between 15-20 metres with an open canopy cover. Xeric species tend to dominate the community however in some sheltered situations some minor occurrence of mesic species occur usually small wiry climbers. White Box Yellow Box Blakely's Red Gum Woodland-endangered ecological community occurs in the majority of the naturally vegetated areas within the study area and occurs in Sections 1-6 and is absent in Section 7. However, the community in Sections 1, 4 and 5 are restricted to a few isolated or small clusters of trees only. The community is represented as scattered remnants in Sections 3 and 6, however there are larger scattered remnants of the community in adjacent areas to the powerline easement in Sections 3, 4 and 6. Section 2 contains the largest and least ecologically disturbed area of the White Box Yellow Box Blakely's Red Gum Woodland community.

Trees:

The tree species present include the White Box *Eucalyptus albens*, Yellow Box *Eucalyptus melliodora*, Blakely's Red Gum *Eucalyptus blakelyi*, 'stringybark' *Eucalyptus subtilis*, Tumbledown Red Gum *Eucalyptus dealbata* <-> Dwyer's Red Gum *Eucalyptus dwyeri* (intergrade), Ribbon Gum *Eucalyptus viminalis* or Blackbutt Candlebark *Eucalyptus rubida* subsp. *barbigerorum* (Schedule, 2, *Threatened Species Conservation Act, 1995*). The Rough-barked Angophora *Angophora floribunda* and the Peppercorn Tree *Schinus areira* (exotic) are also present. White Box dominates the community, however in some areas pure stands of Yellow Box occur and in other locations White Box and Blakely's Red Gum occur as co-dominants.

Lower Trees:

The lower tree species present include the Blackwood *Acacia melanoxylon*, Hickory Wattle *Acacia implexa*, Black Cypress Pine *Callitris endlicheri* and the Kurrajong *Brachychiton populneus*. The above species generally tend to be abundant co-dominants, however *Brachychiton populneus* is a species that occurs in *ad hoc* situations and in no area does this species occur in any order of abundance.

Shrubs:

Native Olive *Notelaea macrocarpa* var. *macrocarpa*, Wallaby Weed *Olearia viscidula*, Black Thorn *Bursaria spinosa*, Northern Sandalwood *Santalum lanceolatum*, Northern Silver Wattle *Acacia leucoclada* ssp. *leucoclada* and Cassinia *Cassinia quinquefaria*. All of the above species are common and more or less of similar abundance throughout the study area where there is an understorey.

Monocotyledons & Ground Covers:

The monocotyledons and ground covers present include Geranium *Geranium solanderi*, Native Violet *Viola* sp, Kidney Weed *Dichondra repens*, Spiny-headed Mat-rush *Lomandra longifolia*, Many-flowered Mat-rush *Lomandra multiflora*, Mat-rush *Lomandra* sp, Scrambling Lily *Geitonoplesium cymosum*, Headache Vine *Clematis glycyphylloides*, Stinging Nettle *Urtica incisa*, Drooping Mistletoe *Amyema pendula*, Juncus *Juncus usitatus*, Juncus *Juncus* sp are all abundant species throughout the study area where there is ground cover excluding the areas where the understorey is totally denuded. Buttercup *Ranunculus inundatus* occurs very infrequently and is present in very moist situations only.

Exotic or introduced environmental weed species include Spear Thistle *Cirsium vulgare* (exotic), St. Barnaby's Thistle *Centaurea solstitialis* (exotic), Sweetbriar *Rosa rubiginosa* (exotic), Blackberry *Rubus fruticosus* (exotic), Prickly Pear *Opuntia stricta* (exotic), Purple-top *Verbena bonariensis*, Fleabane *Conyza bonariensis* (exotic), Cobble's Peg *Bidens pilosa* (exotic) and the Fireweed *Senecio* sp (exotic).

Graminaceous taxa (grasses and allies) present include Kangaroo Grass *Themeda australis*, Windmill Grass *Chloris truncata*, Blady Grass *Imperata cylindrica*, Pitted Blue Grass *Bothriochloa decipiens*, Hedgehog Grass *Echinopogon* sp, Tussock Grass *Poa labillardieri*, *Poa sieberiana*, Wallaby Grass *Austrodanthonia tenuis*, Three-awn Spear Grass *Aristida vagans* (exotic) and the Chilean Needle Grass *Nassella neesiana* (exotic and noxious and a Weed of National Significance).

Ferns:

The fern flora is limited however the following species are present within the White Box Yellow Box Blakely's Red Gum Woodland vegetation community within the study area and include the Bristly Cloak Fern *Cheilanthes sieberi* ssp. *sieberi*, Sickle Fern *Pellaea falcata* and the Bracken Fern *Pteridium esculentum*. The Bristly Cloak Fern is a small terrestrial species that is the most abundant and widespread fern species throughout much of the study area occurring even in exposed situations.

Comments

A Seven Part Test of Significance was applied to this EEC.

The Blackbutt Candlebark *Eucalyptus rubida* subsp. *barbigerorum* (Schedule, 2, *Threatened Species Conservation Act 1995*) was provisionally recorded and identified to be present within the study area consequently a Seven Part Test of Significance was also applied to this species.

Suitability of the area as habitat for species, populations and ecological communities

No additional threatened species of flora or ROTAPs (Rare Or Threatened Australian Plants) were recorded within the study area and none are expected to occur or be impacted as a result of the proposal.

For other threatened species and likelihood of occurrence see Table 3-4.

Weeds

Weed invasion is considerable in most areas where previous disturbance has occurred. Declared noxious weeds present within the study area include four species declared as noxious weeds for the Inverell Local Government Area. These weed species include the Sweetbriar *Rosa rubiginosa* (exotic), Blackberry *Rubus fruticosus* (exotic), Prickly Pear *Opuntia stricta* (exotic) and the Chilean Needle Grass *Nassella neesiana*.

Degree of disturbance

The existing degree of disturbance to the study area varies in each section and includes past clearing of trees for cultivation and agricultural pursuits, pasture improvement, selective logging practices, pugging of soils by cattle and sheep and also by feral pigs and deer, ring-barking of trees by cattle and sheep by chewing into the cambium layer of trees resulting in the death of some trees. Impacts from bushfires are limited and patchy whereas weed invasion is considerable in most areas where previous disturbance has occurred. The least affected area is Section 2 and is an area where most threatened species diversity could be expected to occur. eg Diamond Firetail, Little Lorikeet etc.



Figure 3.2 – Representative photograph of White Box Yellow Box Blakely's Red Gum Woodland EEC

Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion EEC

The Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion-endangered ecological community is restricted to the far upper slope of Section 7 of the study area.

The structure of the Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion vegetation community is tall-open forest with a mean tree height of about 25 metres with an open canopy cover. Xeric species tend to dominate the community however once again small wiry climbers of mesic species composition are also present. Section 7 containing the Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland vegetation community is situated in an elevated area that experiences very cold climatic and windy conditions with frequent cold fronts, foggy and misty conditions with periodic snow-falls; the elevation of Section 7 is 1,270 metres ASL.

Trees (upper stratum):

The tree species present include the Ribbon Gum *Eucalyptus viminalis*, Mountain Gum *Eucalyptus dalrympleana* ssp. *heptantha*, and Blackbutt Candlebark *Eucalyptus rubida* subsp. *barbigerorum* (Schedule, 2, *Threatened Species Conservation Act, 1995*), or Blackbutt Candlebark *Eucalyptus rubida* subsp. *barbigerorum* (Schedule, 2, *Threatened Species Conservation Act, 1995*). The Snow Gum *Eucalyptus pauciflorus* was noted to be present along the access track to Section 7 even though the species was not actually recorded within the powerline easement and site of the proposed substation within Section 7.

Lower Trees and Shrubs (mid stratum):

The lower tree species present include the Blackwood *Acacia melanoxylon* and Hickory Wattle *Acacia implexa* only. In this regard, *Acacia melanoxylon* is the dominant lower tree species.

The shrub species present include the Black Thorn *Bursaria spinosa*, Native Olive *Notelaea macrocarpa* var. *macrocarpa*, Wallaby Weed *Olearia viscidula* and Northern Sandalwood *Santalum lanceolatum*. The Black Thorn is the most abundant and conspicuous shrub present within Section 7.

Monocotyledons and Ground Covers (lower stratum):

Monocotyledons and ground covers present include Geranium *Geranium solanderi*, Native Violet *Viola* sp, Kidney Weed *Dichondra repens*, Spiny-headed Mat-rush *Lomandra longifolia*, Many-flowered Mat-rush *Lomandra multiflora*, Scrambling Lily *Geitonoplesium cymosum*, Headache Vine *Clematis glycyphylla*, Stinging Nettle *Urtica incisa*, Purple-top *Verbena bonariensis*, Cobble's Peg *Bidens pilosa* (exotic), Fireweed *Senecio* sp (exotic), *Juncus* sp, Tussock Grass *Poa labillardieri*, *Poa sieberiana*, Kangaroo Grass *Themeda australis*, Hedgehog Grass *Echinopogon* sp and Wallaby Grass *Austrodanthonia tenuis*. Grass *Poa labillardieri* and *Poa sieberiana* are the most common ground cover species present in this instance.

Ferns

Bristly Cloak Fern *Cheilanthes sieberi* ssp. *sieberi* and Sickie Fern *Pellaea falcata* only.

Comments

A Seven Part Test of Significance has been applied to this EEC. In addition, the Blackbutt Candlebark *Eucalyptus rubida* subsp. *barbigerorum* (Schedule, 2, *Threatened Species Conservation Act, 1995*) was provisionally recorded and identified to be present within Section 7 and the Seven Part Test was also applied to this species.

Suitability of the area as habitat for species, populations and ecological communities

No additional threatened species of flora or ROTAPs (Rare Or Threatened Australian Plants) were recorded within Section 7 and none are expected to occur or be impacted as a result of the proposal.

For other threatened species and likelihood of occurrence see Table 3-4.

Weeds

Weed species and weed invasion was minor, not significant or widespread within the EEC.

Degree of Disturbance

Limited cattle grazing has impacted on this area to significantly impact on the remaining native vegetation associated with this EEC, however there is some evidence of pugging of soils and minor weed invasion on the periphery of the tree-line. Frequent storms and stochastic events with high wind velocities resulting in damage to large trees is conspicuous as high wind velocities would be a frequent phenomenon in this area.



Figure 3.3 – Representative photograph of Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion EEC

RIPARIAN COMMUNITY/RIVER OAK VEGETATION COMMUNITY (SWAN BROOK)

STRUCTURE & FLORISTICS

The floristic species composition within the riparian area within the study area being the embankment of Swan Brook located in Section 6 of the study area is limited in species diversity and is dominated by a thin lineal band of tall River Oaks up to 20 metres in height with an open to dense canopy cover. The tree species present consist of the River Oak *Casuarina cunninghamiana* and the Rough-barked Angophora *Angophora floribunda*. The River Oak is the most common, dominant and conspicuous species present within the riparian community.

The majority of the understorey is cleared however a few small shrubs are also present being spinescent species such as the Black Thorn *Bursaria spinosa* as well as unpalatable species such as Native Olive *Notelaea macrocarpa* var. *macrocarpa*. The Needle-leaf Mistletoe *Amyema cabbagei* is also present as an inconspicuous aerial parasitical species upon the foliage of the host trees being the River Oak *Casuarina cunninghamiana* within the riparian area of Swan Brook. The climbers included the Wonga Vine *Pandora pandorana*, Scrambling Lily *Geitonoplesium cymosum* and the Headache Vine *Clematis glycyphylloides* are also present.

The River Oak/riparian community occurs as a lineal band of riparian open forest vegetation dominated the River Oak *Casuarina cunninghamiana* present that basically dissects Section 6 of the study area being located along the banks of the Swan Brook which traverses through Section 6 in a north-south axis.

No threatened species of flora or ROTAPs were recorded within the riparian community.

Weeds

Weed species and weed invasion was not significant or widespread within the community.

Degree of Disturbance

The overall ecological condition of this community is considered to be moderate with a well-developed canopy of River Oak tree extending along the banks of the Swan Brook however the understorey is considerably affected by current grazing practices and stream-bank erosion which limits a healthy recruitment of replacement of younger River Oak trees. There are no obvious signs of recent harvesting of River Oak for timber extraction and there are no recent fire scars present on the boles of the River Oaks or other associated vegetation present within this area.

Suitability of the area as habitat for species, populations and ecological communities

Finally, no threatened species of flora or ROTAPs were recorded within the River Oak vegetation community and none are expected to occur.

For other threatened species and likelihood of occurrence see Table 3.4.



Figure 3.4 – Representative photograph of River Oak Forest (Riparian) vegetation community

UPLAND WETLANDS

The route surveyed passed through the Upland Wetland of the Drainage Divide of the New England Tableland Bioregion. For a number of reasons, including minimising potential impacts to a sensitive EEC, the route has now been amended to traverse to the south of this EEC. This shift has resulted in the proposed powerline crossing outside of the EEC. The Upland Wetlands of the Drainage Divide of the New England Tableland Bioregion-EEC occurs in shallow temporary to near permanent wetlands restricted to the higher altitudes that are above 900 metres ASL associated with the Great Dividing Range of the New England Tableland Bioregion of NSW (OEH 2012)

While this relocation of the powerline has resulted in crossing the wetland at a lower elevation to the south of the Upland Wetland (as it falls outside of the definition which is restricted to altitudes above 900 metres ASL), it is proposed that a new Statement of Commitment be applied to this area to ensure it is treated with due caution during detailed design and construction. See new SOC 71 on page 35.



Figure 3.5 – Representative photograph of the Uplands Wetlands

Issue 4: It is unclear whether sufficient measures have been taken to avoid or minimise impact

Recommendation: The proponent should provide evidence that all reasonable effort has been made to minimise the level of impact, in particular the avoidance of Endangered Ecological Communities.

Response:

The design of the alternative powerline route was an iterative process that took into account a number of constraints. The process involved using maps, GIS data and detailed aerial photography to identify potential routes based on a number of factors including minimising the length of the powerline, considering terrain, cadastral property boundaries, remanent vegetation, access for construction and residence locations.

White Box Yellow Box Blakely's Red Gum Woodland EEC

Following field surveys and discussion with landowners and neighbours the powerline route was further refined to take into account potential impacts such as visual impacts and existing land use such as cultivation and mineral extractions. This refinement included adjustments to the route to completely avoid the area of Upland Wetlands EEC and to minimise the permanent impact on the White Box Yellow Box Blakely's Red Gum Woodland EEC in Section 2.

An alternative route through Section 2 (to the south of the points 11, 12 & 13) which would have had a slightly lower impact on White Box Yellow Box Blakely's Red Gum Woodland EEC was considered, but was rejected based on the increased access and construction impacts in the immediate vicinity of Kings Creek and an increased impact on two residences (located south of point 12 and south of point 13). It would also have had a detrimental impact on the current agricultural cultivation along the edge of the Kings Creek.

Upland Wetlands

The route surveyed passed through the Upland Wetland of the Drainage Divide of the New England Tableland Bioregion. The route has now been amended to traverse to the south of this EEC minimising potential impacts to a sensitive EEC. The Upland Wetlands of the Drainage Divide of the New England Tableland Bioregion-EEC occurs in shallow temporary to near permanent wetlands restricted to the higher altitudes that are above 900 metres ASL associated with the Great Dividing Range of the New England Tableland Bioregion of NSW (OEH 2012)

While this realignment has resulted in siting the powerline at a lower altitude and therefore outside of the EEC, micro-siting by a qualified ecologist to minimise disturbance to the lower elevation drainage line crossing will be undertaken prior to construction. This is Statement of Commitment No. 67.

Issue 5: Native vegetation has not been adequately mapped and therefore quantum of the impact has not been correctly determined.

Recommendation: Vegetation maps must clearly show each vegetation type, by condition, within the impact area. This should include all native vegetation not just EECs. Ideally, the BioBanking Assessment Methodology should be used to guide these assessments.

Plot data should be made available to OEH to enable independent assessment of impacted vegetation. Plot references should be clearly marked on a map to assist any independent assessment. An assessment of all cleared areas is required to determine the extent and quantum of areas of Derived Native Grassland within the study area.

Response:

The detailed vegetation maps (Figure 3.6 to Figure 3.15) on the following pages have been updated to clearly show each native vegetation type and its condition. The impact area as a result of the permanent clearance of native vegetation required to provide the safety clearance (7.5m) from the powerline conductors has also been highlighted. Plot data (using the standard DECCW Vegetation Field Survey Forms) for each of the quadrants and transects was included in Appendix 3 of the Biodiversity Assessment included in Supporting Document (January 2013). Updated impact area calculations have been carried out to confirm the impact on each vegetation type by condition.

Table 3.2 Infrastructure Footprint

Description	Width (m)	Length (m)	Area (ha)
Study Area	100	13,210	132.1
Powerline Easement	50	13,210	66.1
Powerline Poles (approx. 55) Footprint	1	1	< 0.1
Switchyard/Substation	200	200	4.0
Additional permanent access track to Switchyard/Substation	6	800	0.5

Table 3.3 Permanent Impact on Native Vegetation

Vegetation	Vegetation Quality	Powerline & Substation/Switchyard			Total Area (ha)
		Width (m)	Length (m)	Area (ha)	
White Box Yellow Box Blakely's Redgum EEC	Poor	15	444	0.67	0.67
	Poor-Moderate	15	827	1.24	1.24
	Moderate	15	617	0.93	0.93
	Moderate-Good	15	1,525	2.29	2.29
	Good	15	-	-	-
Ribbon Gum Mountain Gum Snow Gum Forest/Woodland EEC	Moderate-Good	15	115	0.17	0.17
					5.30

The total impact on native vegetation is less than half the impact on native vegetation that was estimated for the original 132kV powerline route. A reference map clearly showing the locations of each quadrant and transect has been included in Figure 3.1 on page 12 of this report.



Figure 3.6 - Vegetation Mapping Point 1 to Point 4



Figure 3.7 – Vegetation Mapping Point 4 - 5