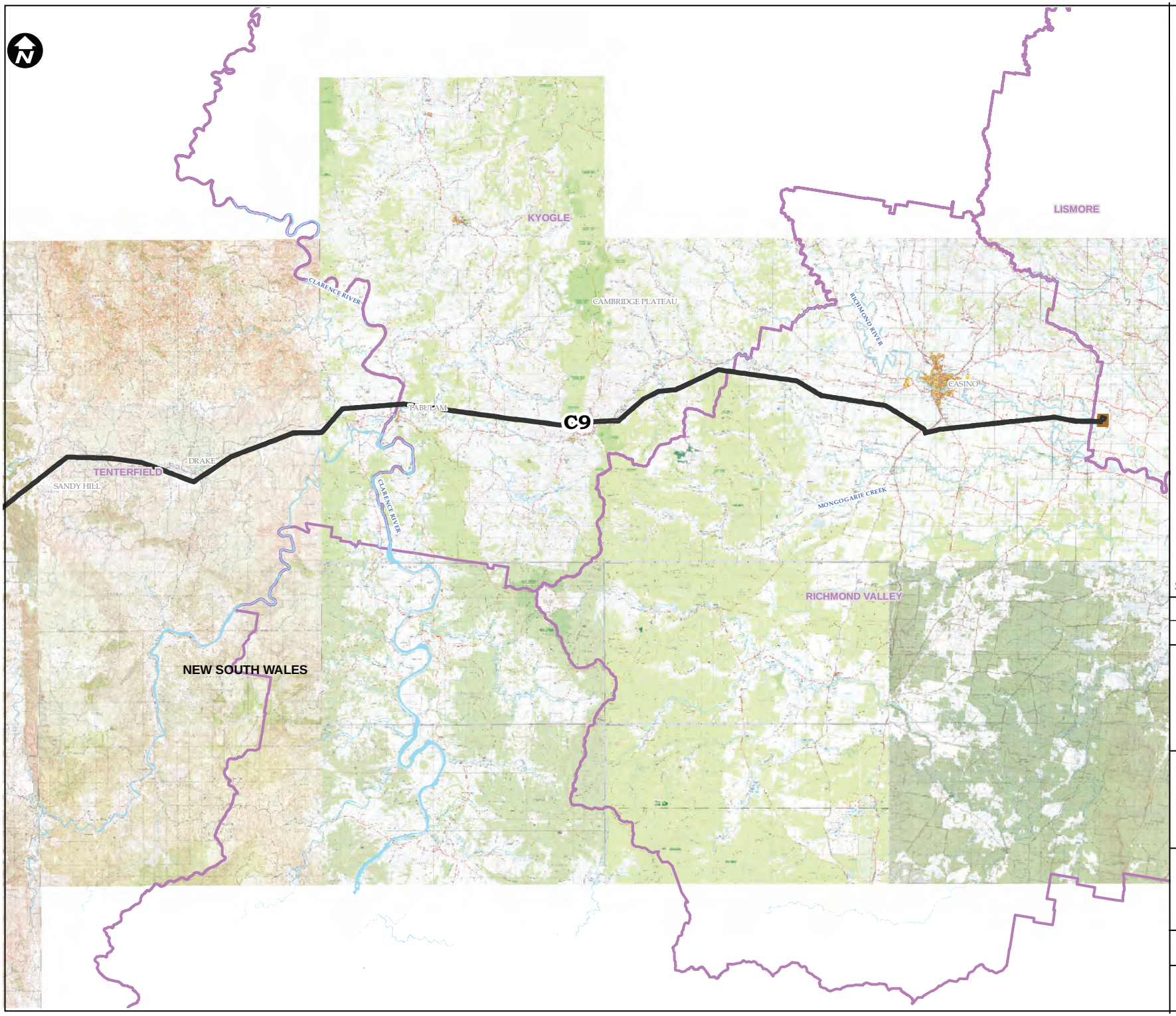


Legend

- C9 — Study Area Components
- Existing Transmission Lines
- Existing Substation
- Creeks/Rivers
- Local Government Area

0 4 8 16

Kilometres

Source: TransGrid

Drawn: AJW	Approved: CB	Date: 24/09/2009
Job No.: 43177662	File No.: 43177662.054.mxd	

Client

TransGrid

Project

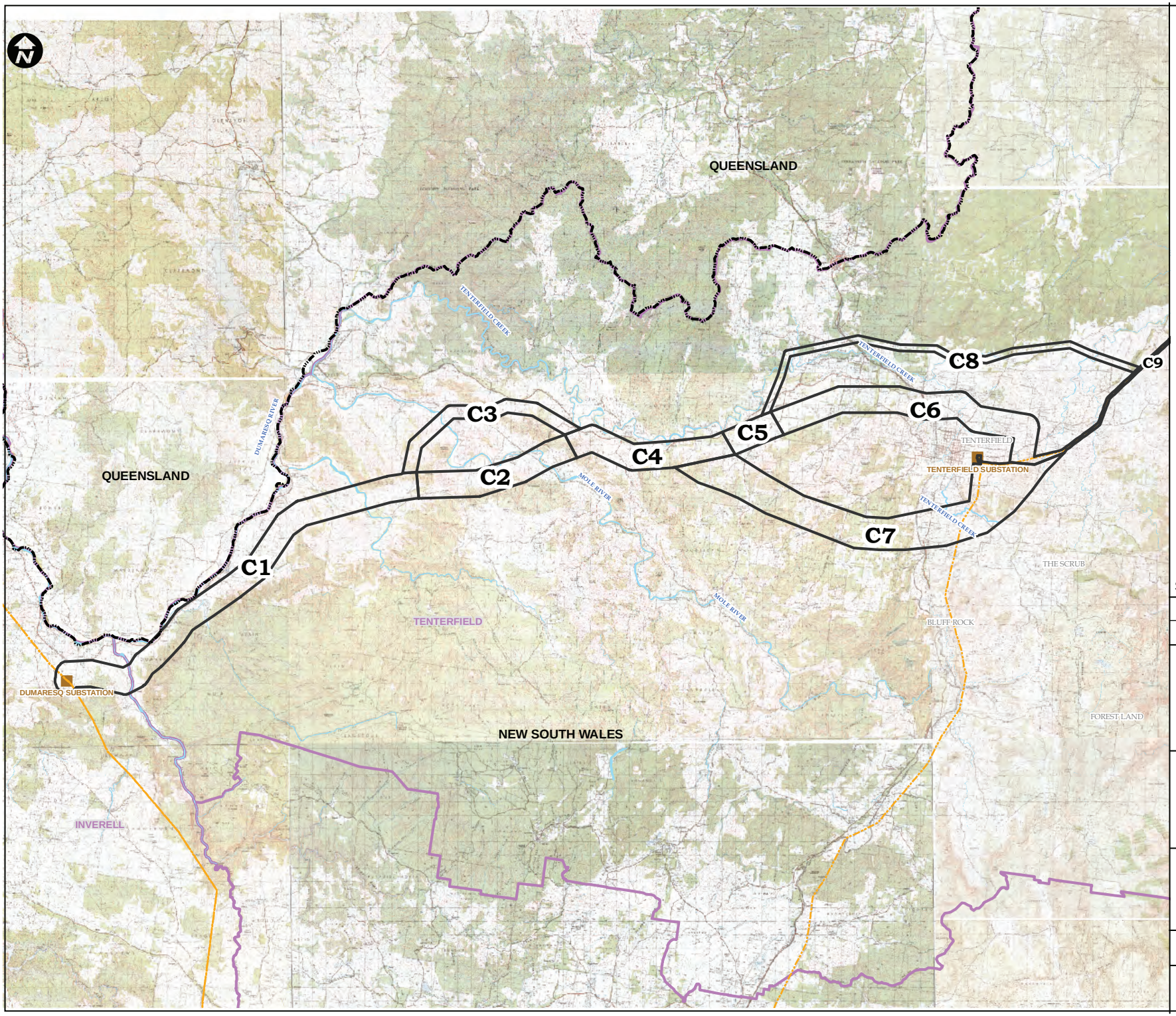
DUMARESQ SUBSTATION TO LISMORE SUBSTATION 330 kV TRANSMISSION LINE

Title

KEY WATER COURSES (EAST)

Figure: 5-6a

URS



Legend

- C9 — Study Area Components
- Existing Transmission Lines
- Existing Substation
- Creeks/Rivers
- Local Government Area

Note: Component C7 not shown.
(refer to Section 3)

0 3.5 7 14
Kilometres

Source: TransGrid

Drawn: AJW	Approved: CB	Date: 24/09/2009
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TransGrid

Project

DUMARESQ SUBSTATION TO LISMORE SUBSTATION 330 kV TRANSMISSION LINE

Title

KEY WATER COURSES (WEST)

Figure: 5-6b

URS

Preferred Corridor

6.1 Introduction

In order to develop and evaluate corridor alternatives, clear objectives are essential. As outlined in **Section 2**, the objective of this report is to identify a preferred corridor which provides the best social, environmental, technical and economic option available. There are numerous factors that need to be considered as part of the corridor selection process including environmental, engineering, property, financial, economic, social and planning issues. Key issues in the Dumaresq to Lismore area include topography, access, proximity to residences, severance, vegetation clearing, land use, visual, ecological, and heritage constraints as identified within **Section 5** of this report.

6.2 Component Analysis

The characteristics and constraints identified within the Study Area differ widely among the components. The corridor selection process used needs to have the ability to take into consideration the balance and significance of the varying issues and constraints across different parts of the area considered.

The Study Area was divided into a series of components to assist in the description and analysis of identified constraints (refer **Section 2.5, Figure 2-2a and 2-2b).** The areas for consideration in developing the best combination of components to form a preferred corridor option were the constraints between C2 and C3 and between C6 and C8. The following section considers each of these components.

6.2.1 Component Options

Constraints within C2 and C3

Ecological Considerations

C2 passes through areas of diverse topography, with significant landform variations between steep ravines and high ridgelines. There are extensive biodiversity constraints within C2 due to the likelihood of threatened species occurring within the area. A number of Endangered Ecological Communities (EECs) have been identified within the area. C2 also passes through the Gibraltar National Park. Avoiding locations set aside as conservation areas will assist in minimising ecological impact.

C3 lies to the north of C2, and crosses the Mole River. This poses a minor constraint as the river can be easily spanned by the transmission line, with minimal impact on the riparian environment. There are fewer biodiversity constraints within C3, with smaller areas of land likely to support threatened species and/or EECs. An alignment which avoids the majority of areas shown in **Figures 5.3d and 5.3e** should be able to able to be selected following detailed biodiversity surveys. C3 does not pass through any National Parks, and traverses generally less steep terrain.

Heritage Considerations

C2 is located away from the Bruxner highway and runs for the most part adjacent to Mole River of which the southern banks have a high potential for larger Aboriginal occupation sites of some complexity. An alignment paralleling in close proximity to the Mole River should be avoided if possible.

C3 crosses Mole River then traverses a small mountain range. The proximity to water and landform characteristics increase the likelihood of a range of Aboriginal sites that may include shelters and bora grounds, the former of which are usually easy to avoid.

Visual and Landscape Considerations

Within C2 there is likely to be some degree of visibility toward the proposed transmission line from a small number residential dwellings and local roads including the Bruxner Highway. Visibility may also be higher where the transmission line crosses drainage lines associated with the Mole River. Subject to final alignment, the transmission line may pass through timbered areas covering sloping land rising to low ridgelines (between C2 and C4).

Within C3 the degree of landscape or visual constraint is generally limited by the smaller number of receptors, although views toward the transmission line may be available from sections of the Bruxner Highway.

Land use Constraints

Within C2 it was identified as part of initial corridor identification (Connell Wagner, 2006) that the primary land use in this area is agricultural. As part of the consultation process it was also identified that in recent years subdivision of the large properties is this area had been occurring, creating a more densely populated rural residential area (refer **Section 5.5**).

Within C3 the land use is also primarily agricultural. As seen in **Figure 5-5b** the lot size in this area is generally much larger than in C2.

Constraints within C6 and C8

Ecological Considerations

C6 passes predominantly through areas of medium and high constraints (refer **Section 5**). Constraints primarily result from the numerous patches of EECs within this component, as well as areas of high constraint based on likelihood of threatened species occurrence (**Figure 5.3 series**). Although there are some patches of low constraint within this corridor, the impracticality of attempting to identify an alignment for the final easement between areas of high constraint is likely to be prohibitive. The EEC within this section of the alignment is listed under the TSC Act and potentially the EPBC Act. The EEC within this section could potentially be avoided or spanned in some areas.

Corridor option C8 predominately passes through areas of 'low constraint'. There are patches of 'high – EEC' believed to occur within this section (**Figure 5.3 series** – hatched areas), likely to be listed under the *Threatened Species Conservation* Act 1995 (TSC Act) and potentially the Commonwealth *Environment Protection and Biodiversity Conservation* Act 1999 (EPBC Act). The vegetation believed to be EEC within this section of the alignment is patchy and would be able to be avoided in most cases following detailed design of the final easement. Based on the current analysis of potential corridors, C8 would be the preferable option, with lower potential impact on biodiversity values. Analysis of this component has been conducted on a desktop basis, with assumptions gathered from a combination of aerial photograph and topographic map interpretation and extrapolation of data that has been ground-truthed.

Heritage Considerations

The geomorphology of the northern portion of C8 lends itself to the possibility of rock shelters on deeply incised gullies. Rock shelter sites may occur wherever there are suitable overhangs / caves. The quality and extent of such features will determine the nature and type of potential occupation. The flat and cleared portions of C8 also traverse many major tributaries that have high potential for larger Aboriginal occupation sites of some complexity. The ridge top locations between drainage lines that are likely to contain limited archaeological evidence in the form of one-off occupation activities can also be home to stone arrangements or ceremonial sites. Although it is considered that impact to heritage sites can be managed, overall the lower levels of previous disturbance indicate this area should be avoided to protect potentially occurring intact sites.

C6 on the other hand traverses south of the Bruxner Highway in close proximity to a number of major tributaries. The higher levels of clearing through this area means that sites, if present, are more likely to have been previously disturbed.

Visual and Landscape Considerations

C6 is the component with the highest density of rural residential dwellings located within it. Depending on the location of the alignment, the transmission line would likely be visible from a number of properties within this component. The transmission line would also cross a number of local road corridors including the New England Highway.

Within C8 there is potential for some degree of visibility toward the proposed transmission line from a number of rural residential dwellings as well as from sections of the Bruxner Highway. The degree of visibility would be largely dependent on the selection of a final alignment and the extent or screening potential of surrounding topography and vegetation.

Land use Considerations

As identified as part of the consultation undertaken with the community there has been a reasonably high level of development and development related activity within component C6. Large agricultural blocks have been subdivided to form smaller lots and associated residential dwellings. As discussed in **Section 5.5** there is a concentration of development activity to the immediate north and north east of the Tenterfield township. **Figure 5-5b** also shows that lot size in this area is relatively small.

C8 contains both large rural blocks and some smaller rural residential blocks (lot density shown in **Figure 5-5b**). When compared to C6, the number of smaller blocks impacted by the proposed 330kV easement is significantly less.

Comparison of Component Options

In order to determine a preferred corridor option, additional analysis was undertaken on each of the component options (C2 versus C3 and C6 versus C8) taking into consideration a number of environmental, land use, social and community factors. The results of the analysis are presented in **Table 6-1**. It should be noted that a notional centreline located within each of the components has been used purely for the purposes of constraints analysis

.

Table 6-1 Component Option Analysis

Component	Length (km)*	No. of Lots 0-1ha within 250m of notional centreline* (i.e. 500m corridor)	No. Of Lots 0-2ha within 250m of notional centreline* (i.e. 500m corridor)	No of Lots 0-5ha within 250m of notional centreline* (i.e. 500m corridor)	No. of Lots 0-10ha within 250m of notional centreline* (i.e. 500m corridor)	No of Lots >10ha within 250m of notional centreline* (i.e. 500m corridor)	No of Lots >50ha within 250m of notional centreline* (i.e. 500m corridor)	No of Lots >250ha within 250m of notional centreline* (i.e. 500m corridor)*
C2	15.46	0	0	0	1	18	13	3
C3	18.79	0	1	2	2	22	16	7
C6	41.72	14	22	29	55	141	27	2
C8	33.63	1	6	12	19	127	36	1

*Denotes where a notional centreline has been used purely for the purposes of constraints analysis, taking into consideration the available engineering factors and community feedback on constraints which have been identified.

Component	No. of Holdings intersected by the notional centreline*	No. of Holdings within 250m of notional centreline* (i.e. 500m corridor)	No of Airstrips Within Component	National Park and Nature Reserve (km) Within Component	No. of Recorded Threatened Species within Component	No. of Known Aboriginal Heritage Items Within Component
C2	15	16	0	1	0	3
C3	14	16	0	0	0	1
C6	84	140	0	0	2	0
C8	54	88	1	0	1	0

*Denotes where a notional centreline has been used purely for the purposes of constraints analysis, taking into consideration the available engineering factors and community feedback on constraints which have been identified.

6.3 Preferred Component Identification

Analysis of key constraints within C2, C3, C6 and C8 has allowed the following conclusions to be drawn.

As demonstrated in **Section 6.2.1** and **Table 6-1** the differences in the degree of constraints between C2 and C3 are limited. In comparison to the notional centreline used for analysis purposes, C2 is slightly shorter but encompasses a similar number of holdings (C2 has 15 holdings, C3 has 14 holdings). C3 incorporates a slightly larger number of lots greater than 5ha and significantly greater number of lots bigger than 50ha. Smaller lots sizes less than 5ha are not common in this area.

C3 has fewer ecological constraints and generally crosses less extreme terrain, whereas C2 has a number of ecological constraints that may be difficult to avoid. Steep ridgelines and more dwellings within C2 may result in the visual impact of a 330kV easement being more significant in this component. However, views of the transmission line from the Bruxner Highway would occur in C3. Consultation has also identified that subdivision of a number of the larger agricultural lots has occurred in C2.

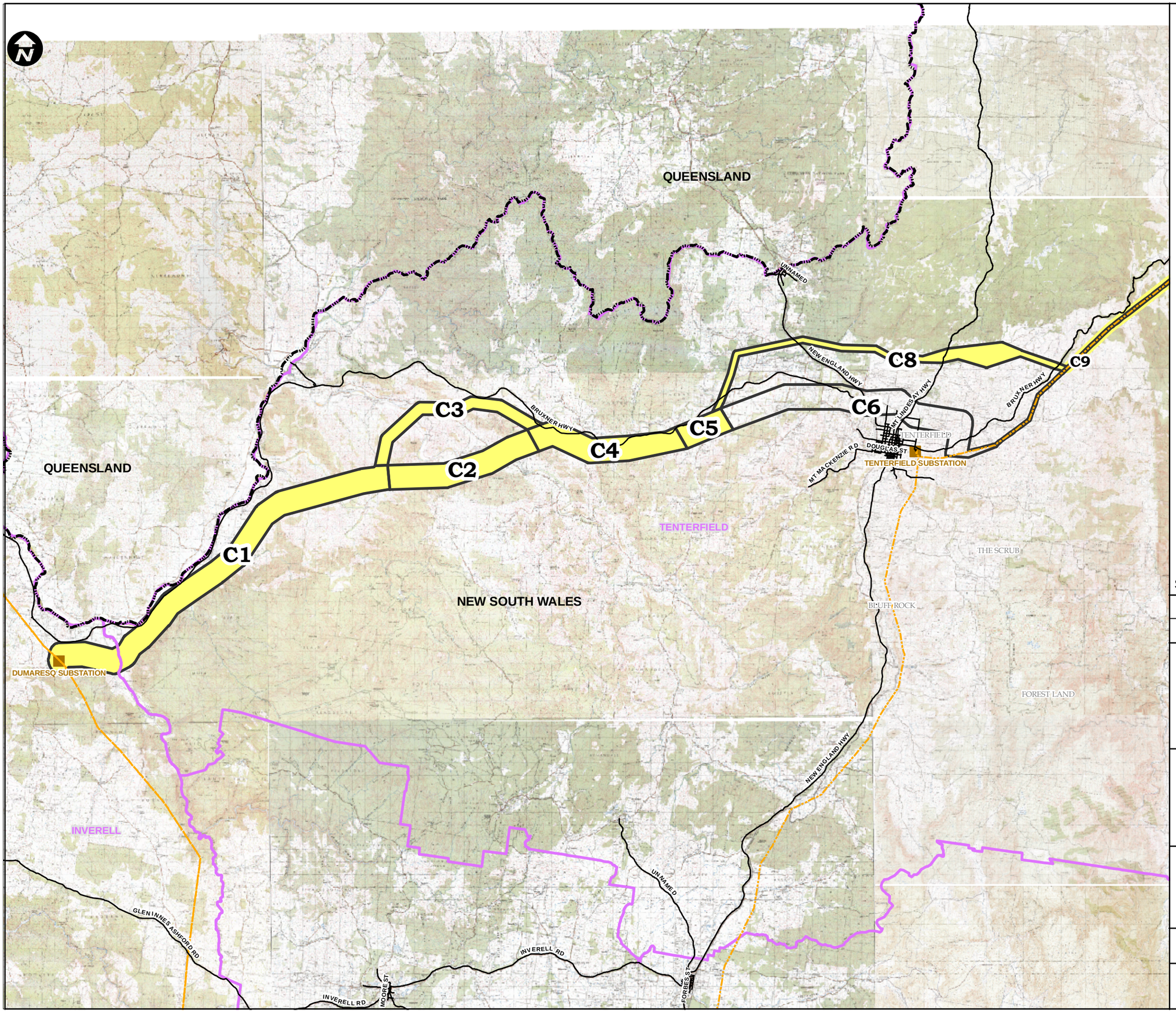
Until detailed field surveys can be undertaken, both C2 and C3 remain as potential component options. There is not a significant degree of difference in constraints identified to date between these components to warrant removing either C2 or C3 at this stage. The process of ruling one of these components out will occur once ground-truthing is undertaken and detailed information is acquired regarding the constraints identified in **Section 5** and **Section 6**.

As demonstrated in **Section 6.2.1** and **Table 6-1** the differences in the degree of constraints between C6 and C8 are quite significant. Through a comparison of the notional centreline used for analysis purposes, C6 is longer than C8 and includes a significantly larger number of holdings that would be potentially affected by the 330kV easement (84 holdings in C6 compared to 54 holdings in C8). The number of holdings identified within 250m either side of the notional centreline (140 holdings in C6 compared to 88 holdings in C8) also highlights a significantly higher number of adjacent properties that would potentially be affected by the transmission line in C6. C6 also has a significantly higher percentage of lots less than 10ha in size.

The difference between C6 and C8 in terms of environmental impact is less significant than the land use analysis discussed above. However, ecological constraints identified in C6 are potentially more difficult to avoid. Ecological constraints identified in C8 are potentially less significant. Desktop Aboriginal heritage investigations identified that the potential for intact Aboriginal Sites is higher in C8 than C6.

The analysis undertaken to date and the conclusions in particular in relation to land use and property aspects (**Table 6-1**) has identified that C8 is the preferred option.

The preferred component options are presented in **Figure 6.1a** and **6.1b**.



Legend

- C9 — Study Area Components
- Existing Transmission Lines
- Existing Substation
- Local Government Area
- Preferred Components

Note: Component C7 not shown.
(refer to Section 3)
Preferred corridor C9 is 60m wide

0 4 8 16
Kilometres

Source:TransGrid

Drawn: AJW	Approved: CB	Date: 24/09/2009
Job No.: 43177662	File No.: 43177662.053.mxd	

Client

TransGrid

Project

DUMARESQ SUBSTATION TO LISMORE SUBSTATION 330 kV TRANSMISSION LINE

Title

PREFERRED COMPONENT IDENTIFICATION (WEST)

Figure: 6-1a

URS