

# 5 Refinements to the project

## 5.1 Introduction

---

This chapter describes refinements made to the pipeline alignment as a result of further consultation, cultural heritage and biodiversity studies that have occurred since the completion of the EA.

All refinements made to the alignment have been made with the objective of reducing the overall environmental impact of the project.

Spring biodiversity studies and cultural heritage fieldwork have informed ongoing route refinement to avoid all significant constraints. Assessment of the refinements has confirmed that there have been changes to the impact on existing constraints, but there have been no additional impacts.

QHGP has undertaken consultation with a range of stakeholders leading up to, throughout and after the public exhibition of the EA. Refinements have been incorporated into the latest alignment (Revision L) from the route exhibited in the EA (Revision H); the cumulative effect of which is to reduce the overall impact of the pipeline.

## 5.2 EA amendments

---

This section contains a summary of addendums and amendments to the project. These have been collated through ongoing consultation with stakeholders and through information provided in submissions.

### 5.2.1 General additions

As a result of refinements made to the pipeline route, the total length of the pipeline is now 833km with 611km in NSW and 222km in Queensland.

Section 4.3.17 of the EA describes the 'Kooragang Nature Reserve'. The Hunter – Central Rivers CMA noted that this nature reserve has now been incorporated into the Hunter Wetlands National Park.

As responded to in Section 2.2 of this report, 'Kooragang Island Conservation Officers' was a general description given to the officers of the government agencies responsible for ecological maintenance of the Kooragang Island and wetlands areas. They include DECC, DWE, the Hunter – Central Rivers Catchment Management Authority (CMA) and the Kooragang Wetlands Remediation Project. QHGP intends to continue liaison with officers in these relevant agencies

### 5.2.2 Biodiversity

Section 9.2.2 of the EA listed *Cadellia pentastylis* (Ooline) as an EEC under the *Threatened Species Conservation Act 1995* (TSC Act). This species is listed as vulnerable under the EPBC Act, but not an EEC.

### 5.2.3 Land use

Potential land use planning issues identified in Table 18.1 of the EA included the consideration of the new Muswellbrook Shire LEP 2008 that has been forwarded to the DoP for gazettal. The Muswellbrook Draft LEP was reviewed and its updated zoning requirements were considered in relation to the Study Area.

For the Muswellbrook Draft LEP 2008 the study area crosses land within the following zones:

- Zone RU1 Primary Production:
  - The objective of this zone is to encourage sustainable primary industry production by maintaining and enhancing the natural resource base. It is also to encourage diversity in primary industry enterprises and minimise the fragmentation and conflict between land uses within the zone and with adjoining zones.
- Zone E3 Environmental Management:
  - The objective of this zone is to protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values. It is also to provide for a limited range of development that does not have an adverse effect on those values.

Although consent is not specifically given to gas transmission pipelines in the Muswellbrook Draft LEP 2008, the proposal falls under the *State Environmental Planning Policy (Major Projects) 2005* and is therefore able to take priority over LEPs. This is outlined in Chapter 7 of the EA.

### 5.2.4 Surface and groundwater

The Border Rivers – Gwydir CMA noted that whilst the majority of wetlands have been avoided they can still be sensitive to potential upstream impacts during construction. Within the sensitivity criteria, crossings that feed into downstream environments, such as wetlands, are considered as being of high sensitivity. For this reason, the following river crossings have been identified as being of high sensitivity:

- The Gwydir River, as it flows into the Ramsar recognised Gwydir Wetlands.
- The Gnoura Gnoura Creek, which was mistakenly referred to as the Gnowra River in Section 15.4.2 of the EA.

QHGP has committed to managing sensitive crossings in commitments W1, W1A, W2, W10 and W11.

## 5.3 Project refinements

---

This section contains a summary of the refinements made to the project since public exhibition of the EA. Refinements have been informed by stakeholder consultation and additional biodiversity and cultural heritage fieldwork. These refinements will continue in conjunction with stakeholder consultation until construction. The maps presented in this report reflect Revision L of the pipeline route.

### 5.3.1 Biodiversity

Biodiversity fieldwork has been undertaken along the pipeline route, with the results presented in Chapter 4 of this report. This fieldwork was to verify the potential biodiversity constraints described in Chapter 9 of the EA. It was established that Revision L has avoided all significant biodiversity constraints. Chapter 4 of this report describes the management measures to be implemented that will mitigate low significance impacts.

### **5.3.2 Aboriginal cultural heritage**

The Aboriginal cultural heritage fieldwork identified one additional site of high significance within the proposed Study Area- the Gil Gil Creek scarred tree. In accordance with the mitigation protocols discussed in Chapter 10 of the EA and on the advice of QHGP's Aboriginal heritage consultants AHMS, the site will be avoided by the ROW within the Study Area. Avoidance of this site is supported by commitment AH1A. In addition to the general mitigation measures, the site will be flagged and cordoned for protection during the construction phase, with appropriate curtilage developed in consultation with relevant identified knowledge holders.

In accordance with commitment AH1, the refined route Revision L has avoided previously identified cultural heritage sites of high significance. The fieldwork undertaken by QHGP consultants has identified previously unrecognised or incorrectly located items of cultural heritage significance. The number of registered DECC AHMS sites within the 200 m Study Area was reduced from 16 to 11. The 11 registered sites potentially within the Study Area were eight artefact scatters/isolated finds, one axe grinding groove complex and two modified trees. Revision L avoided the four previously identified sites of high impact significance, as explained below.

The axe grinding groove complex and modified trees will be avoided within the ROW, in accordance with commitment AH3. To the extent that the results of the oral history research are relevant, the information gained will inform the management of these sites.

#### *Euraba Mission*

It was established that information provided by DECC AHMS site cards was incorrect in the assessment of the location of the Euraba Mission and burial sites. Fieldwork conducted by QHGP consultants has identified revised locations and the information provided to DECC to assist in its mapping of significant cultural heritage sites. Archaeological surveys have also identified an additional eight scarred trees in the area that the pipeline avoids. Further details are provided in Appendix B.

Revision L of the pipeline does not impact on the Euraba Mission site. The centreline avoids burial site locations by approximately 500 metres and the closest scarred tree is avoided by approximately 50 metres.

#### *Wallalong Brush*

The location of the Wallalong Brush conflict site has been identified and avoided in the vicinity of KPs 798–805 (Revision L). Further details are provided in Appendix A.

### **5.3.3 Historical heritage**

Section 10.2 of the EA describes the methodology for historical heritage assessment and identifies mitigation and management measures which are reflected in the revised SoCs. Within the Revision L of the Study Area there are 15 known hard constraints and eight known moderate constraints. There are 4 moderate constraints within 100m of Revision L of the Study Area. Any changes to Table 10.8 of the EA have been identified in Table 5.1 of this report. Detail of the assessment of Revision H to L is provided in the Historical heritage reports in Appendix E.

### **5.3.4 Infrastructure**

Table 16.1 of the EA contains a summary of the probable construction methods for various infrastructure crossings. As the pipeline route has been refined some KPs have changed, however the crossing methods will be the same. No additional impacts on affected infrastructure have been identified as a result of route refinements. Section 5.4 below identifies certain areas where route refinements have resulted in reduced infrastructure impacts.

### 5.3.5 Surface and groundwater

Table 15.3 and Appendix K of the EA contain a summary of the watercourse crossings assessed as being of high significance and requiring fieldwork, referenced by KP. As the pipeline route has been refined, some KPs have changed and the total number of watercourse crossings has reduced from 176 to 174. Section 5.4 below identifies certain areas where route refinements have resulted in improved watercourse crossings that would reduce potential impacts.

## 5.4 Stakeholder consultation

---

As a result of the development of Revision L, the QHGP Study Area now affects thirteen new landowners.

QHGP's land agents have contacted twelve of these landowners and discussions regarding the pipeline traversing their properties have commenced:

- Eight of these landowners are located in the Morpeth/Duckenfield Road area (shown on Figure 5.17). Consultation has commenced with these property owners and QHGP's land agents state that the majority are accepting of the route refinement.
- Three new landowners are located in the Quirindi area (shown on Figure 5.11) where the route has been refined to avoid impacting on farmland. Consultation with all of these landowners has taken place and all are satisfied with the outcome.
- One landowner is located in the Boomi area (Figure 5.1) with a property in the vicinity of KP237. The route has been adjusted in this area as a result of the recently completed biodiversity fieldwork in order to avoid EPBC listed endangered vegetation. Contact has been made with this landowner and consultation has commenced.

Land agents are currently working to contact the remaining landowner regarding a property in the Ardglan area (Figure 5.12) in vicinity of KP634. A major road infrastructure project in Ardglan that has been in planning and construction for several years has to date prevented the development of a definitive route through the area. Construction has recently been completed, allowing QHGP to revisit its planning for the Ardglan area. In order to avoid impacting on the town area it has been necessary to route the pipeline through this landowners' property. Efforts are currently being made to obtain contact details for the landowner via a company search so consultation may commence with them.

QHGP is committed to continuing the stakeholder engagement and landowner consultation process that has been successfully undertaken for the past year to reach a mutually agreeable outcome with all newly affected landowners.

## 5.5 Route refinements and assessment

---

The pipeline route in the EA that went on public exhibition was Revision H. As a result of landholder and stakeholder consultation and additional field studies, the pipeline route has been refined to the current Revision L. Geographic survey maps showing the current pipeline route can be found in Section 5.5. Table 5.1 contains a summary of changes made to the route between Revision H and Revision L. Maps illustrating various constraints are contained in Appendix F.

**Table 5.1 Outcomes resulting from consultation and field studies in relation to the alignment**

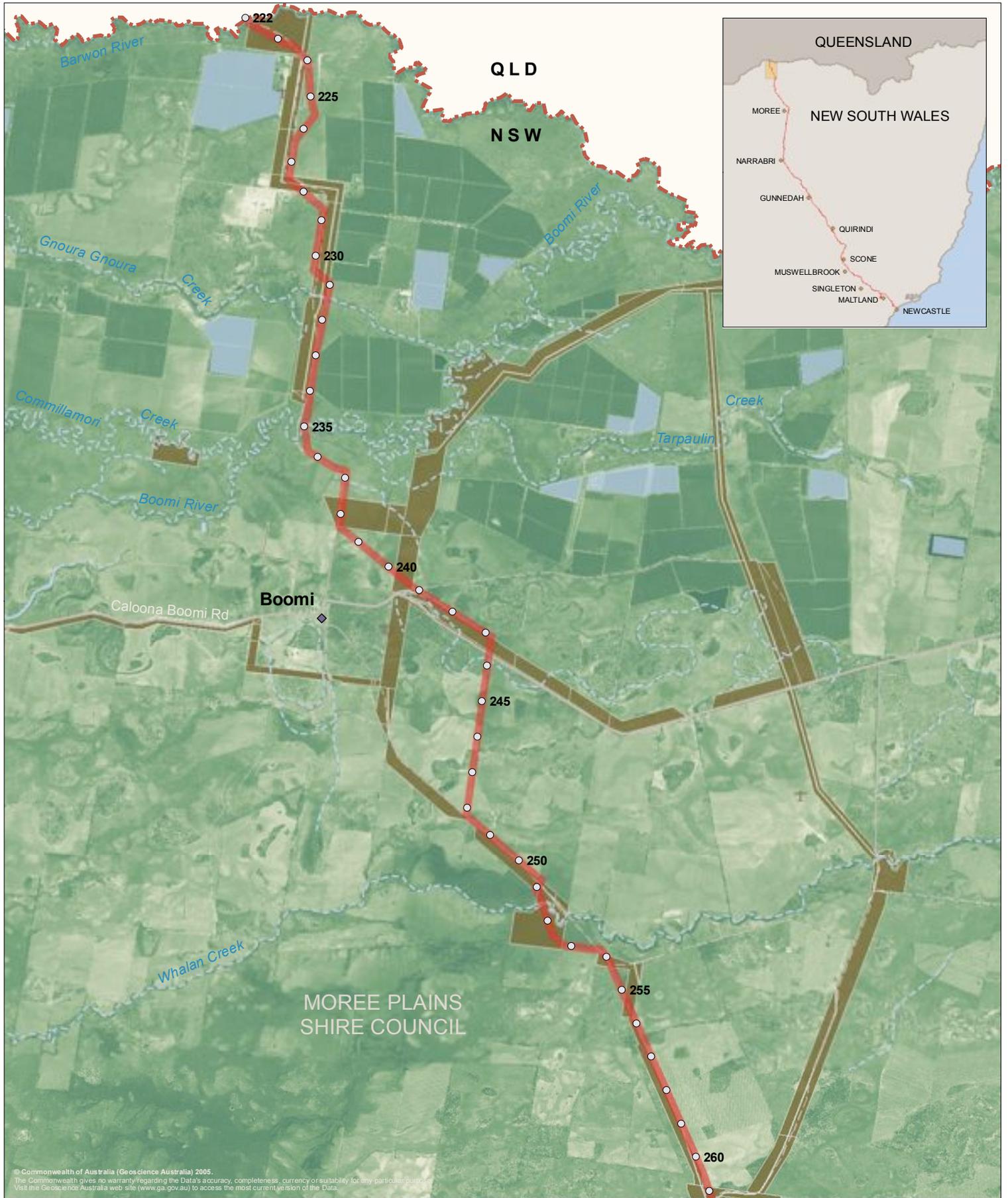
Area	Outcomes	Assessment
Boomi area (Figure 5.1)	<ul style="list-style-type: none"> <li>• Avoid areas of potential indigenous cultural significance.</li> <li>• Avoid EPBC listed endangered vegetation (Bluegrass).</li> <li>• Avoid woodlands.</li> </ul>	<ul style="list-style-type: none"> <li>• Known hard historical heritage constraint avoided: <ul style="list-style-type: none"> <li>• Euraba mission.</li> </ul> </li> </ul>
Garah area (Figure 5.2)	<ul style="list-style-type: none"> <li>• Avoid bushland.</li> </ul>	<ul style="list-style-type: none"> <li>• Additional scarred tree identified. Avoid within ROW, utilise relevant results of oral history research.</li> <li>• Known moderate historical heritage constraint within the Study Area: <ul style="list-style-type: none"> <li>• Underbridge.</li> </ul> </li> </ul>
Ashley area (Figure 5.3)	<ul style="list-style-type: none"> <li>• No further refinements</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Moree area (Figure 5.4)	<ul style="list-style-type: none"> <li>• Avoid bushland.</li> <li>• Avoid wetland and lagoon.</li> <li>• Avoid threatened species habitat.</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Bellata area (Figure 5.5)	<ul style="list-style-type: none"> <li>• No further refinements</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Narrabri north area (Figure 5.6)	<ul style="list-style-type: none"> <li>• No further refinements</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Narrabri area (Figure 5.7)	<ul style="list-style-type: none"> <li>• Reduce impacts on properties (route refined as per landholders' requests).</li> <li>• Reduce number of impacted landholders.</li> </ul>	<ul style="list-style-type: none"> <li>• Newly identified dam or borrow-pit at KP 487 (Revision L). Avoid by refinement of the ROW or manage as per watercourse risk assessment.</li> </ul>
Boggabri area (Figure 5.8)	<ul style="list-style-type: none"> <li>• No further refinements</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Gunnedah area (Figure 5.9)	<ul style="list-style-type: none"> <li>• Avoid irrigation areas and irrigation infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Breeza area (Figure 5.10)	<ul style="list-style-type: none"> <li>• Minimise crossings of the Central Ranges Pipeline.</li> <li>• Reduce watercourse crossing impacts.</li> <li>• Avoid farm infrastructure and optic fibre cable.</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>

Area	Outcomes	Assessment
Quirindi area (Figure 5.11)	<ul style="list-style-type: none"> <li>• Avoid windbreak.</li> <li>• Avoid or reduce impacts on farm infrastructure.</li> <li>• Reduce potential land use conflicts with high value agricultural land.</li> <li>• Avoid irrigation infrastructure.</li> <li>• Reduce impacts on quarry operations.</li> <li>• Avoid horse yards, houses and sandstone escarpments.</li> <li>• Avoid cultivated land.</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Murrurundi area (Figure 5.12)	<ul style="list-style-type: none"> <li>• Avoid rough terrain.</li> <li>• Reduce impacts on railway overpass currently under construction.</li> <li>• Reduce impacts on heritage-listed structures.</li> <li>• Reduce potential land use conflicts with high value agricultural land.</li> <li>• Avoid impacts on farm infrastructure.</li> <li>• Avoid remnant vegetation.</li> <li>• Reduce number of landholders.</li> <li>• Avoid trees on property route (as per landholder's request).</li> </ul>	<ul style="list-style-type: none"> <li>• Newly identified dam at KP 674 (Revision L). Avoid by refinement of the ROW or manage as per watercourse risk assessment.</li> <li>• Two hard historical heritage constraints identified within the Study Area: <ul style="list-style-type: none"> <li>• Glenalvon group.</li> <li>• Railway signal box.</li> </ul> </li> <li>• One moderate constraint is considered to be high or medium heritage significance that is located within 100m of the pipeline Study Area: <ul style="list-style-type: none"> <li>• Lassen Park (Homestead).</li> </ul> </li> </ul>
Muswellbrook area (Figure 5.13)	<ul style="list-style-type: none"> <li>• Avoid impacts on farm infrastructure.</li> <li>• Avoid irrigation areas.</li> <li>• Reduce potential land use conflicts (as per landholder's request).</li> <li>• Reduce impacts on road and rail junction.</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Singleton North area (Figure 5.14)	<ul style="list-style-type: none"> <li>• Reduce impacts on landholders by following a road corridor.</li> <li>• Avoid rough terrain.</li> <li>• Increase distance between ROW and residences.</li> <li>• Avoid disturbance to water bodies.</li> <li>• Avoid vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Singleton East area (Figure 5.15)	<ul style="list-style-type: none"> <li>• Reduce watercourse crossing impacts.</li> <li>• Reduce impacts on properties.</li> <li>• Reduce number of impacted landholders.</li> <li>• Better alignment for construction.</li> <li>• Avoid dwellings.</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>

Area	Outcomes	Assessment
Maitland area (Figure 5.16)	<ul style="list-style-type: none"> <li>• Reduce impacts on properties.</li> <li>• Avoid rough terrain (gully).</li> <li>• Improve road/rail crossing.</li> <li>• Refined alignment to minimise impact on heritage property.</li> <li>• Align adjacent to existing infrastructure and for minimal impact through industrial zone.</li> </ul>	<ul style="list-style-type: none"> <li>• No additional impacts</li> </ul>
Newcastle area (Figure 5.17)	<ul style="list-style-type: none"> <li>• Refine route to progress on floodplain.</li> <li>• Avoid sites of future residential subdivision.</li> <li>• Reduce potential impact on properties and reduce impacts on cultivation.</li> <li>• Reduce impact on wetlands.</li> <li>• Reduce impact on existing and planned industrial activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced traffic impacts through minimised road crossings.</li> <li>• One hard historical heritage constraint identified within the Study Area: <ul style="list-style-type: none"> <li>• Morpeth Township.</li> </ul> </li> <li>• One moderate constraints that is considered to be high or medium heritage significance that is located within 100m of the pipeline Study Area: <ul style="list-style-type: none"> <li>• Berry Park.</li> </ul> </li> </ul>

## 5.6 Revised route

The following maps display Rev L of the pipeline route.



© Commonwealth of Australia (Geoscience Australia) 2005.  
 The Commonwealth gives no warranty regarding the Data's accuracy, completeness, currency or suitability for any particular purpose.  
 Visit the Geoscience Australia web site ([www.ga.gov.au](http://www.ga.gov.au)) to access the most current version of the Data.

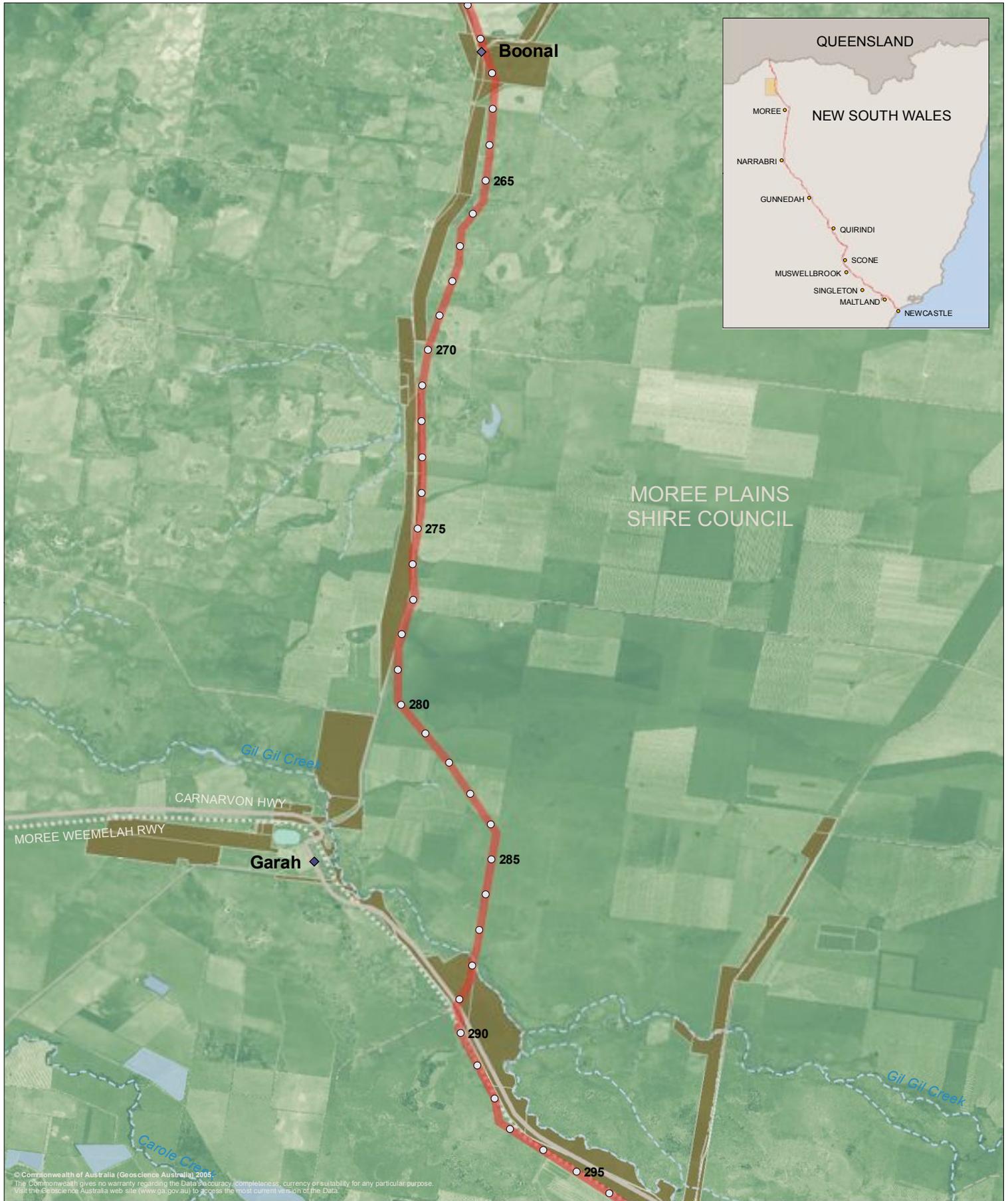
**Drawing no.** 07002g\_CP\_01-3  
**Date** 14 November 2008  
**Source** Geoscience Australia  
 NSW Department of Lands  
 RLMS Pty Ltd  
**Datum** GDA 94

Legend	
○	Kilometre point
■	Study Area
✈	Airport/Landing ground
■	Water storage area
■	Travelling stock reserve
---	State border
—	Principal road
—	Secondary road
—	Minor road
- - -	Minor road (unsealed)
---	Railway
—	Major river (perennial)
- - -	Minor river (non-perennial)



**Figure 5.1** 200m wide Study Area - Boomi area (KP 222-261)

1:140,000 (at A4)  
 0 1 2 3 4km



**Drawing no.** 07002g\_CP\_02-3  
**Date** 14 November 2008  
**Source** Geoscience Australia  
 NSW Department of Lands  
 RLMS Pty Ltd  
**Datum** GDA 94

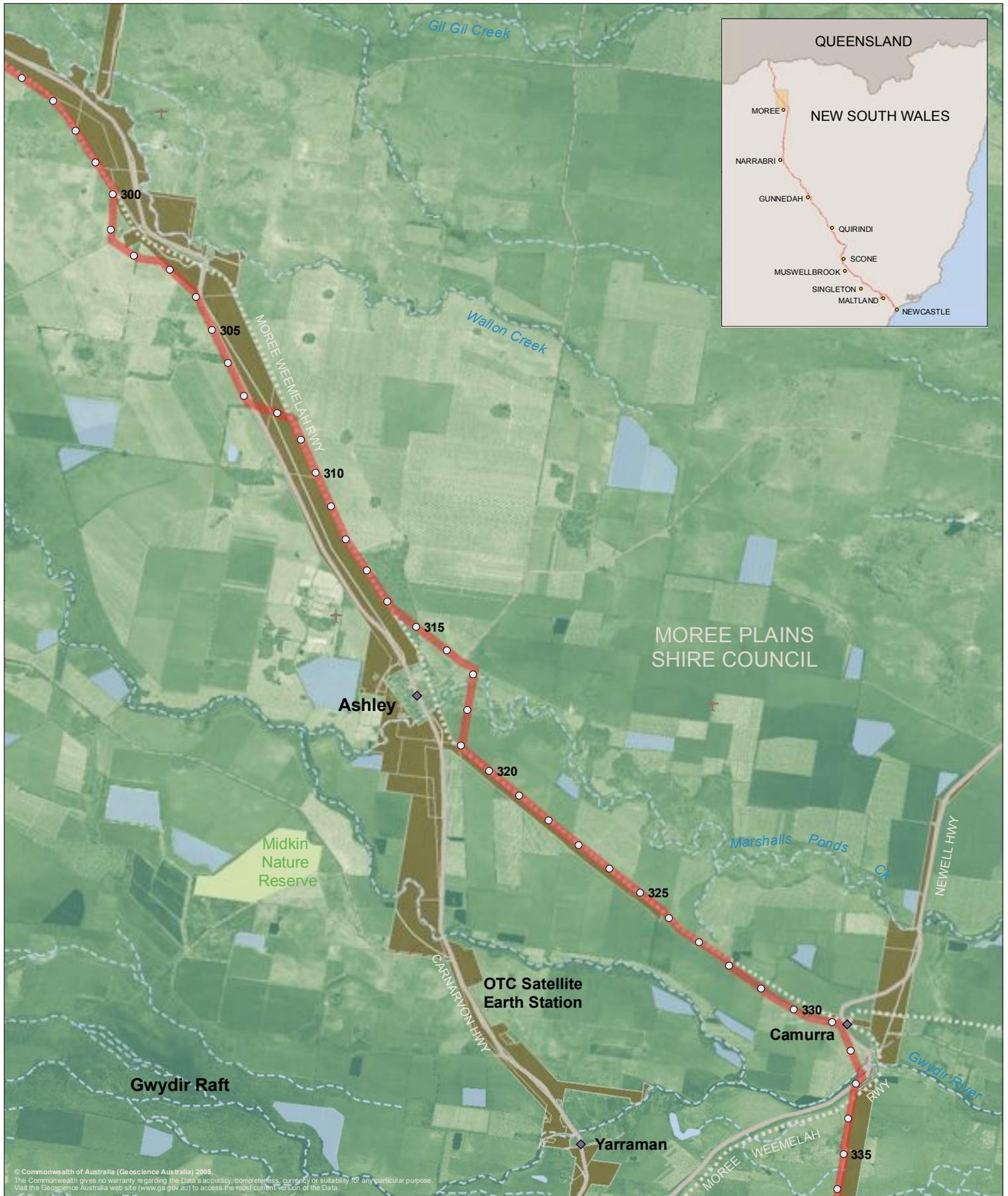
- Legend**
- Kilometre point
  - Study Area
  - Recreation area
  - Water storage area
  - Travelling stock reserve
  - Principal road
  - Secondary road
  - Minor road
  - - - Minor road (unsealed)
  - Railway
  - Major river (perennial)
  - - - Minor river (non-perennial)



**Figure 5.2** 200m wide Study Area - Garah area (KP 263-296)

1:140,000 (at A4)  
 0 1 2 3 4km

© Commonwealth of Australia (Geoscience Australia) 2005. The Commonwealth gives no warranty regarding the Data's accuracy, completeness, currency or suitability for any particular purpose. Visit the Geoscience Australia web site (www.ga.gov.au) to access the most current version of the Data.



© Commonwealth of Australia (Geoscience Australia) 2005.  
 The Commonwealth gives no warranty regarding the Data's accuracy, completeness, currency or suitability for any particular purpose.  
 Visit the Geoscience Australia web site ([www.ga.gov.au](http://www.ga.gov.au)) to access the most current version of the Data.

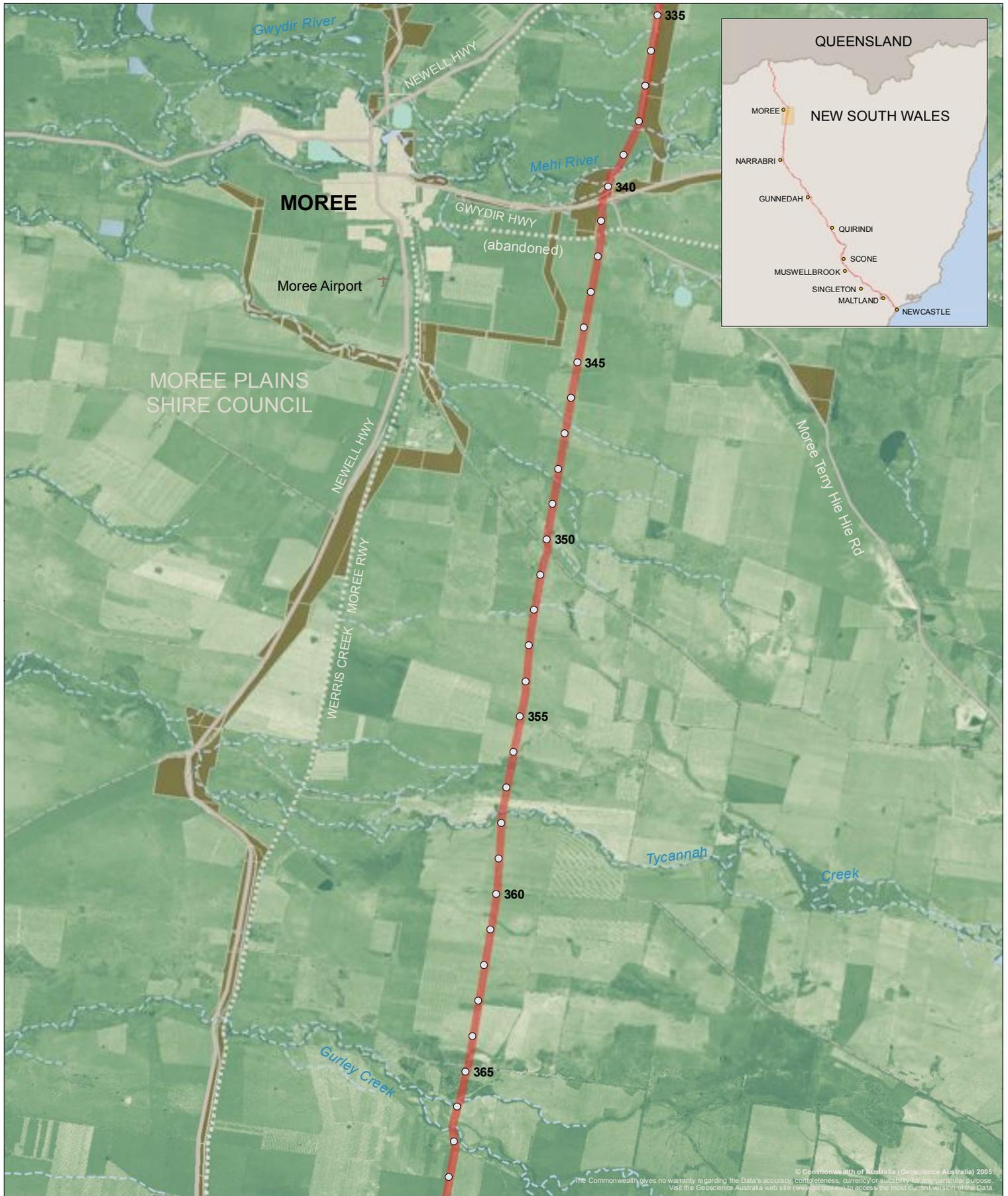
**Drawing no.** 07002g\_CP\_03-3  
**Date** 14 November 2008  
**Source** Geoscience Australia  
 NSW Department of Lands  
 RLMS Pty Ltd  
**Datum** GDA 94

- Legend**
- Kilometre point
  - Study Area
  - ✈ Airport/Landing ground
  - NSW estate
  - Water storage area
  - Travelling stock reserve
  - Principal road
  - Secondary road
  - Minor road
  - - - Minor road (unsealed)
  - ⋯ Railway
  - Major river (perennial)
  - - - Minor river (non-perennial)



**Figure 5.3** 200m wide Study Area - Ashley area (KP 296-336)

1:140,000 (at A4)  
 0 1 2 3 4km



Drawing no. 07002g\_CP\_04-3

Date 14 November 2008

Source Geoscience Australia  
NSW Department of Lands  
RLMS Pty Ltd

Datum GDA 94

**Legend**

- Kilometre point
- Study Area
- ✈ Airport/Landing ground
- Recreation area
- Water storage area
- Built up area
- Travelling stock reserve
- Principal road
- Secondary road
- Minor road
- - - Minor road (unsealed)
- ⋯ Railway
- Major river (perennial)
- - - Minor river (non-perennial)



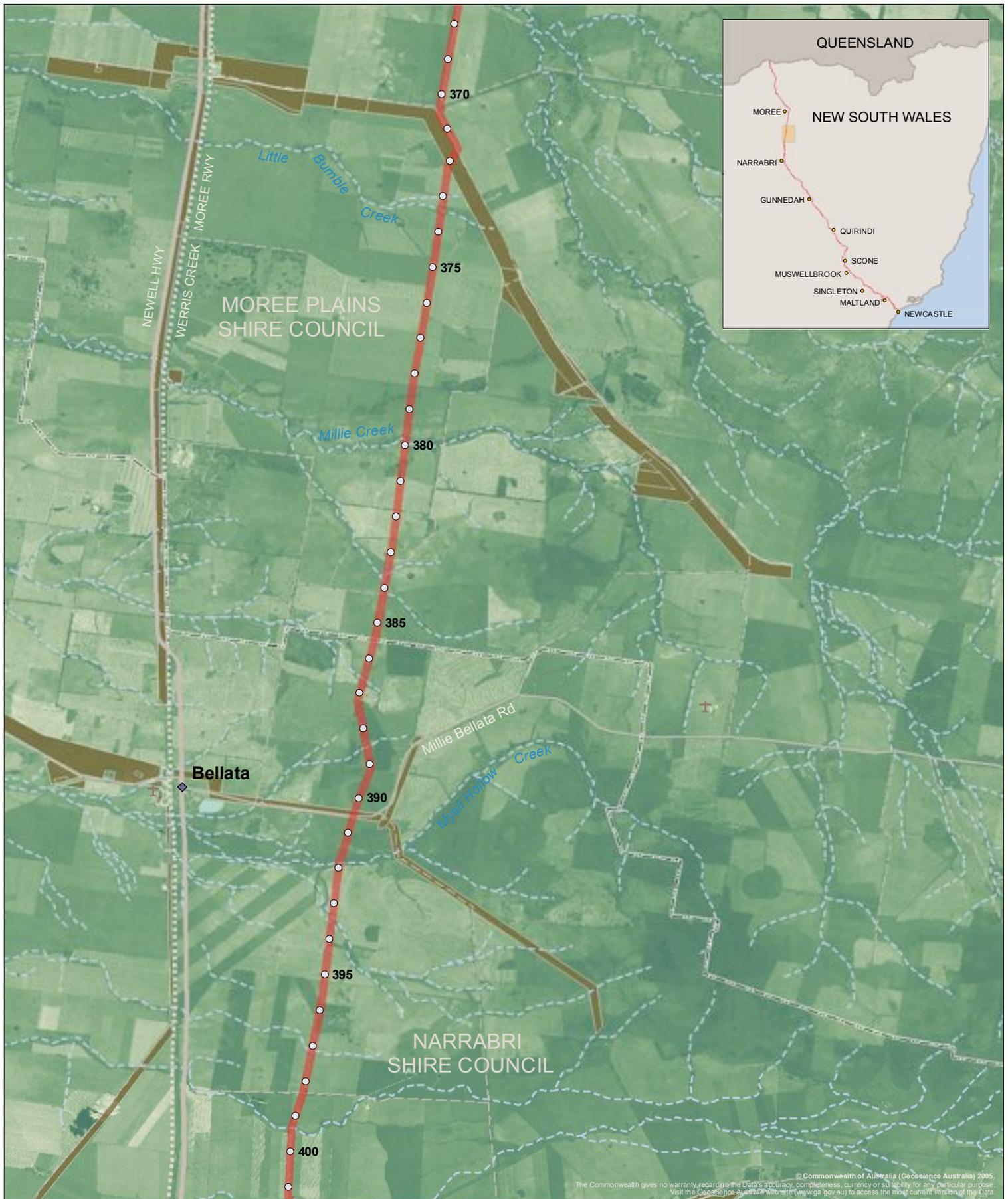
**Figure 5.4** 200m wide Study Area - Moree area (KP 335-369)

1:140,000 (at A4)

0 1 2 3 4km



© Commonwealth of Australia (Geoscience Australia) 2005. The Commonwealth gives no warranty regarding the Data's accuracy, completeness, currency or suitability for any particular purpose. Visit the Geoscience Australia web site ([www.ga.gov.au](http://www.ga.gov.au)) to access the most current version of the Data.



© Commonwealth of Australia (Geoscience Australia) 2005. The Commonwealth gives no warranty regarding the Data's accuracy, completeness, currency or suitability for any particular purpose. Visit the Geoscience Australia website ([www.ga.gov.au](http://www.ga.gov.au)) to access the most current version of the Data.

**Drawing no.** 07002g\_CP\_05-3  
**Date** 14 November 2008  
**Source** Geoscience Australia  
 NSW Department of Lands  
 RLMS Pty Ltd  
**Datum** GDA 94

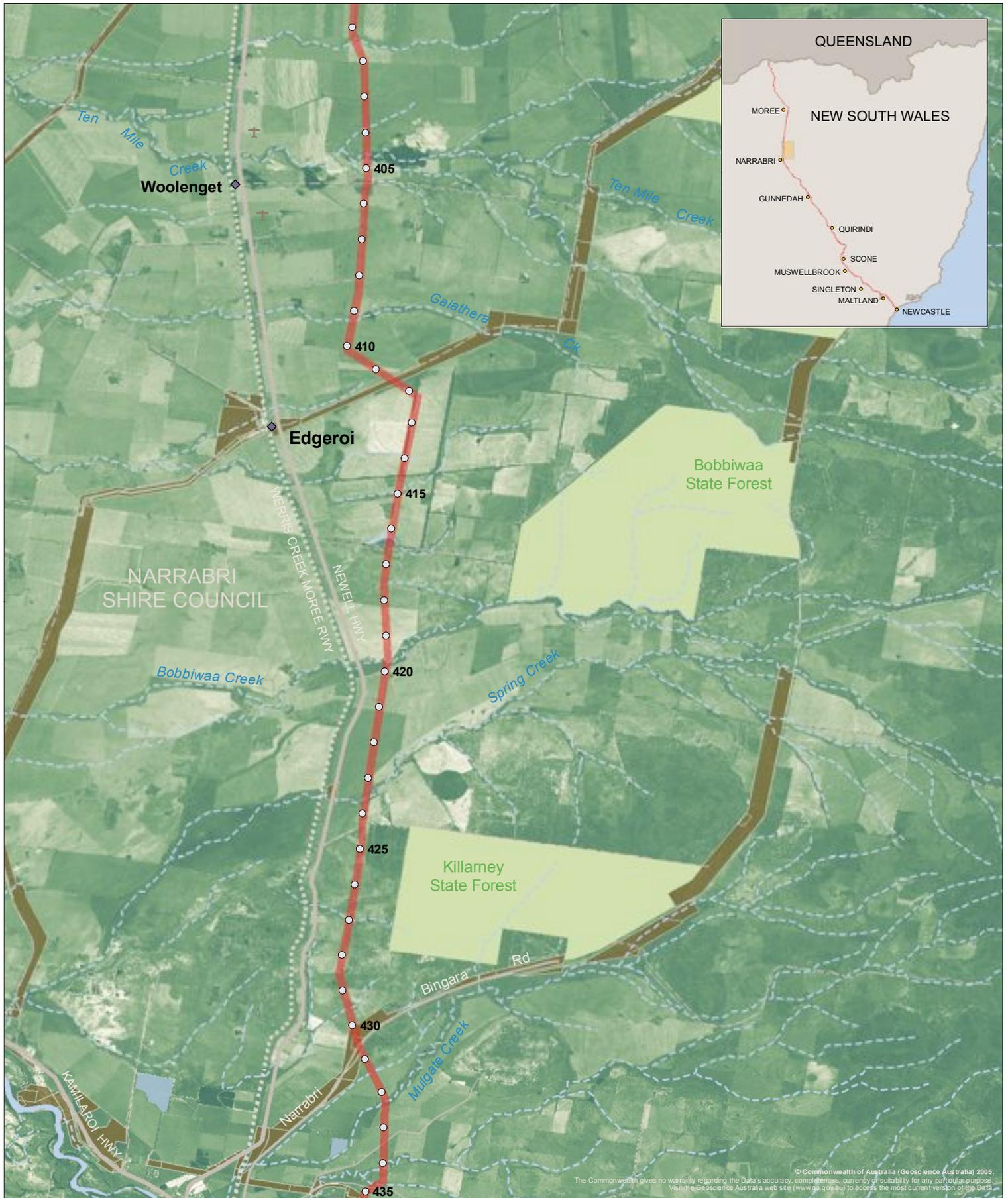
- Legend**
- Kilometre point
  - Study Area
  - ✈ Airport/Landing ground
  - Recreation area
  - Travelling stock reserve
  - LGA boundary
  - Principal road
  - Secondary rRoad
  - Minor road
  - - - Minor road (unsealed)
  - ⋯ Railway
  - Major river (perennial)
  - - - Minor river (non-perennial)



**Figure 5.5** 200m wide Study Area - Bellata area (KP 369-401)

1:140,000 (at A4)

0 1 2 3 4km



**Drawing no.** 07002g\_CP\_06-3  
**Date** 14 November 2008  
**Source** Geoscience Australia  
 NSW Department of Lands  
 RLMS Pty Ltd  
**Datum** GDA 94

- Legend**
- Kilometre point
  - Study Area
  - ✈ Airport/Landing ground
  - NSW estate
  - Water storage area
  - Travelling stock reserve
  - Principal road
  - Secondary road
  - Minor road
  - - - Minor road (unsealed)
  - ⋯ Railway
  - Major river (perennial)
  - - - Minor river (non-perennial)



**Figure 5.6** 200m wide Study Area - Narrabri north area (KP 401-435)

1:140,000 (at A4)

0 1 2 3 4km

© Commonwealth of Australia (Geoscience Australia) 2005. The Commonwealth gives no warranty regarding the Data's accuracy, completeness, currency or suitability for any particular purpose. Visit the Geoscience Australia web site ([www.ga.gov.au](http://www.ga.gov.au)) to access the most current version of the Data.