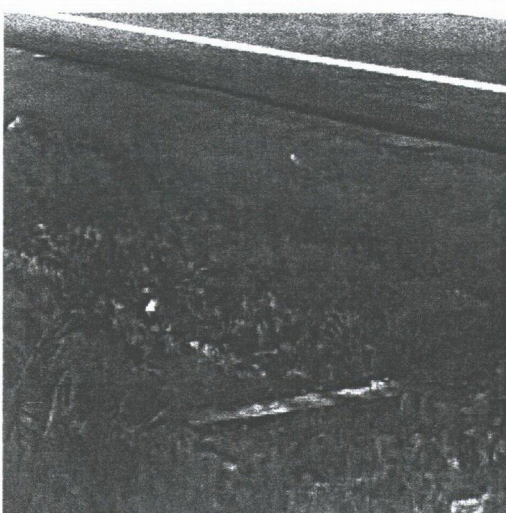
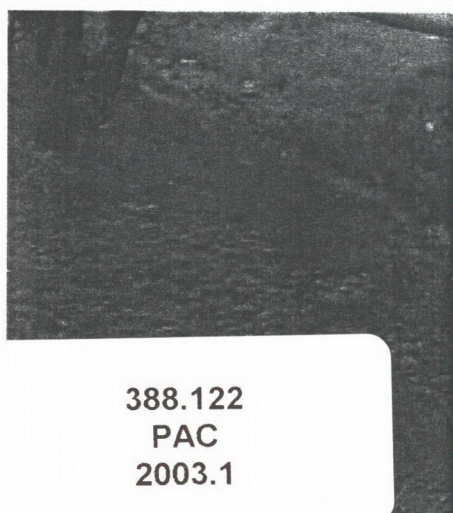
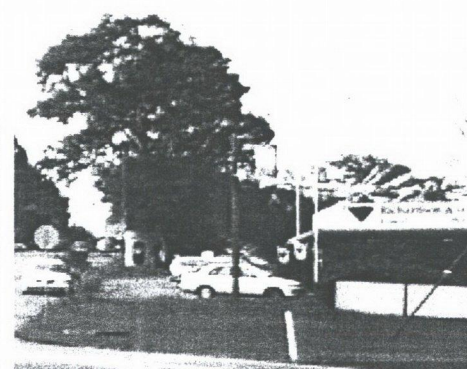
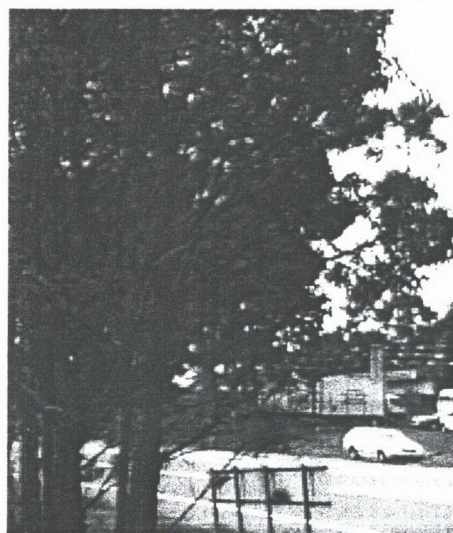




# Proposed New Access to Wyong Hospital at the Intersection of Pacific Highway and Craigie Avenue, Kanwal

Review of Environmental Factors

Hunter Region  
May 2003



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**Proposed New Access to Wyong Hospital at  
the Intersection of Pacific Highway  
and Craigie Avenue**

**SH10 – Pacific Highway  
Kanwal  
Wyong LGA**

**REVIEW OF ENVIRONMENTAL FACTORS**

**DECISION REPORT**



# **REF DECISION REPORT HUNTER REGION**

## **Proposed New Access to Wyong Hospital at the intersection of Pacific Highway and Craigie Avenue**

### **SH10 – Pacific Highway Kanwal Wyong LGA**

#### **INTRODUCTION**

A Review of Environmental Factors (REF) has been prepared to assess the potential environmental impacts of the proposal as described below. The REF has been prepared by Environmental Technology Branch and forwarded for assessment from Infrastructure Development Section. This Decision Report has been prepared to consider the REF in relation to requirements under the NSW Environmental Planning and Assessment Act and Commonwealth Environment Protection and Biodiversity Conservation Act.

The objectives of this Decision Report are to:

- Assess the likely environmental impacts detailed in the REF,
- Determine the significance of those impacts,
- Propose conditions of approval to apply should the proposal proceed and,
- Address the position under the Commonwealth EPBC Act.

#### **PROJECT DESCRIPTION**

The proposal is to upgrade the existing T intersection of Craigie Ave at the Pacific Highway, Kanwal to a 4-way signalised intersection. The proposal involves relocating the existing Wyong Hospital vehicle access point in the north, to become the fourth leg of the intersection opposite Craigie Avenue.

The proposal also involves widening of the Pacific Highway. This will allow for the construction of a fourth leg to provide access to the hospital, widening of the existing intersection, provision of a turning bay and installation of traffic signals.

The works would include:

- Earthworks associated with widening of the Pacific Highway,
- Minor clearing of vegetation in the vicinity of the intersection including 15 trees,
- A cutting to an approximate depth of 4 metres on the western side of the Highway,
- Installation of traffic control signals and associated intersection works,
- Ancillary activities associated with the proposal including drainage works, provision of bus bays and footpaths, utility adjustments, landscaping and planting, stockpiling and establishment of a compound site on the western side of the Pacific Highway.



Several specialised assessments have been undertaken including urban design, traffic study, heritage and Aboriginal archaeology and ecology.

The objectives of the proposal as stated in the REF are to:

- *'provide a safer and controlled access to both Craigie Avenue to the east and to a relocated main access to Wyong Hospital to the west;*
- *improve safety at the intersection for motorists and cyclists;*
- *improve facilities for public transport, cyclists and pedestrians;*
- *provide safe Highway crossing conditions for pedestrians and bus users in this location;*
- *increase traffic capacity at the intersection;*
- *provide improved traffic management for through, entering and exiting traffic;*
- *minimise impact on the local community and the environment;*
- *to provide a more convenient, direct and visible access to Wyong Hospital for private vehicles, emergency vehicles, bus users and pedestrians;*
- *to provide an intersection that does not diminish the amenity of the area, with landscaping and design treatments to enhance the intersection and provide an appropriate gateway to the hospital.'*

## JUSTIFICATION OF THE PROPOSAL

The REF requires that the proposed intersection work is needed to improve the safety of the intersection for vehicles, pedestrians and bus users particularly those accessing the hospital and medical centre. It is anticipated that the works will reduce the frequency of motor vehicle accidents and increase traffic capacity by providing additional traffic lanes to cater for future demand (particularly given the planned expansion of the hospital).

## CONSIDERATION OF REVIEW OF ENVIRONMENTAL FACTORS

The REF has been examined and considered. The REF addresses the requirements of Section 111 of the Environmental Planning and Assessment Act, 1979.

In considering the activity this assessment has examined and taken into account, all matters affecting or likely to affect the environment by reason of that activity as addressed in the REF and associated information. This assessment was considered in accordance with the Department of Urban Affairs and Planning's best practice guideline *Is an EIS Required*.

This assessment has considered the potential impacts of the activity on critical habitat and on threatened species, populations or ecological communities or their habitats for both terrestrial and aquatic species.

As part of the consideration of the activity this assessment has also addressed matters of national environmental significance and any impacts on Commonwealth land. In relation to matters of national environmental significance, this evaluation has been undertaken in accordance with Government Administrative Guidelines on determining whether an action has, will have, or is likely to have a significant impact.



## CONCLUSION

The activity described in the REF will have some environmental impacts which can be ameliorated satisfactorily. Having regard to the safeguard measures proposed and to the Conditions of Approval set out below, this assessment has considered that these impacts are unlikely to be significant and therefore an Environmental Impact Statement is not required.

The activity described in the REF will not affect declared critical habitat. The activity described in the REF will not significantly affect threatened species, populations or ecological communities or their habitats. Therefore a Species Impact Statement is not required.

The activity described in the REF will not affect Commonwealth land. It will have some environmental impacts on matters of National Environmental Significance, which can be ameliorated satisfactorily. Having regard to the safeguard measures proposed and to the Conditions of Approval set out below, I consider that these impacts are unlikely to be significant.

## CONDITIONS OF APPROVAL

### 1. REF Safeguard / Mitigation Measures

- 1.1 All safeguard measures stated in the REF and these Conditions of Approval shall be applied to the proposal. These Conditions of Approval prevail where there is any inconsistency with the mitigation measures.

### 2. Licences, permits and approvals, and Environmental Specification

- 2.1 All necessary licences, permits and approvals required by legislation shall be obtained prior to works commencing. These licences, permits and approvals shall be complied with during works.
- 2.2 The general requirements of RTA QA Environmental Protection Specification G35 shall be implemented and complied with during construction, and shall be amended to include project specific requirements rising from the REF and these conditions of approval.

### 3. Environmental Management Plan (EMP's).

- 3.1 A Contractor EMP shall be prepared addressing all REF safeguard measures, these Conditions of Approval and other environmental requirements as applicable.
- 3.2 The Contractor EMP shall be reviewed by the RTA Environmental Adviser, Hunter Client Services prior to commencement of site works.

### 4. Environmental Awareness and Training.

- 4.1 All members of the project team involved in the proposed activities shall be made aware of their environmental responsibilities and measures to minimise impacts.



## **5. Environmental Auditing and Inspection.**

- 5.1 A risk assessment is to be carried out on the proposal in accordance with the RTA Audit Pack and CSD risk assessment procedures to determine an audit and inspection program for the works.
- 5.2 Any works resulting from this approval and as covered by the REF may be subject to an environmental audit(s) and/or inspection at any time during their duration.

## **6. Community Consultation and Liaison.**

- 6.1 Any complaints received shall be recorded and attended to promptly. On receiving a complaint, works shall be reviewed to determine whether issues relating to the complaint can be avoided or minimised. Feedback shall be provided to the complainant explaining what outcomes resulted.

## **7. Access and Traffic Management.**

- 7.1 All works shall be undertaken so as to minimise impacts to traffic flow. Where at all possible traffic flow shall be maintained during works.

## **8. Erosion, Sediment and Water Quality Control.**

- 8.1 All erosion and sediment control devices shall be developed in accordance with RTA Road Design Guide 1989, Section 8 – Erosion and Sedimentation and the Department of Housing publication 'Managing Urban Stormwater-Soils and Construction'.
- 8.2 Controls shall be implemented on site prior to commencement of works and shall be inspected at a minimum of weekly intervals and within 24 hours of all rainfall events. Any problems are to be rectified without delay. Regular routine maintenance (and records to illustrate this maintenance) shall be undertaken to replace damaged sediment control structures and maintain and improve other temporary measures as required.
- 8.3 An erosion and sediment control plan shall be prepared for the site.

## **9. Noise and Vibration.**

- 9.1 Work activities shall be restricted to the following hours, unless undertaken in accordance with Condition 9.2.  
     Monday to Friday 7.00 am to 6.00 pm.  
     Saturdays 8.00 am to 1.00 pm.  
     No construction on Sundays or Public Holidays.
- 9.2 Any works undertaken outside of normal working hours shall be undertaken in accordance with Practice Note VII from the RTA's Environmental Noise Management Manual.
- 9.3 No vibratory equipment with the potential to cause vibration structural damage to the Medical Centre or any other structure shall be used. Vibration and noise monitoring during works shall be undertaken as required to ensure levels do not exceed relevant guidelines/criteria.



- 9.4 Ongoing consultation shall be undertaken with the Medical Centre, Hospital and any other premises to discuss the proposed construction works and measures to minimise impacts during works including from noise, vibration (structural damage and nuisance impacts), access, dust and traffic.

#### 10. Waste Minimisation and Management/ Chemical Management.

- 10.1 The EMP shall contain details (i.e. type and quantities) of proposed surplus material likely to be generated, locations for stockpiling material and proposed methods of disposal.
- 10.2 Concrete washout shall only occur in designated bunded areas away from drainage lines. All staff including subcontractors shall be inducted on the areas where concrete washout is to occur.
- 10.3 During the detailed design phase of the project, investigations shall be undertaken to identify the presence of coal tar. If present, a procedure for removal must be prepared and submitted to RTA Environmental Services, Hunter Client Services prior to undertaking the works.

#### 11. Vegetation Management

- 11.1 Clearing for trees which contain potential habitat for fauna (i.e. hollow bearing trees) shall be undertaken in the presence of an ecologist / wildlife carer.
- 11.2 Clearing shall be kept to an absolute minimum. Trees and vegetation to be retained near the works shall be protected where necessary. Stockpiles and other activities shall not occur within close proximity of trees to be retained (i.e. within the drip line of the tree canopy).

### RECOMMENDATION


It is recommended that the proposed upgrade and associated works at the intersection of the Pacific Highway and Craigie Avenue, Kanwal proceed subject to implementation of all environmental safeguard measures identified in the REF and the above conditions to approval.


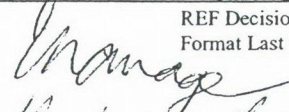
The REF approval shall remain current for five years from the date of approval, at which time it shall lapse if construction works have not begun.

Approval recommended by:





Nick Godfrey-Smith  
Regional Environmental Adviser  
Hunter Client Services  
11/06/03



 16/6/03  
Infrastructure Development Manager  
  
16/6/03



## Document Controls

<b>Business Unit</b>	Environmental Technology Branch		
<b>Project No.</b>	IO 301361		
<b>Document description</b>	REF: Proposed New Access to Wyong Hospital at the Intersection of Pacific Highway and Craigie Avenue, Kanwal		
	<b>Name</b>	<b>Signed</b>	<b>Date</b>
<b>Approving Manager</b>	Erwin Budde		29/5/03
<b>Reviewing Officer</b>	Erwin Budde		29/5/03

<b>Person managing this document</b>	<b>Person(s) writing this document</b>
Michael Griffiths	Michael Griffiths

<b>Location</b>	<b>File</b>
G:\Ops\Environ\Assessments_Section\Projects\0203\301361 - Craigie Road Intersection REF review\Final REF.doc	

<b>Document Status</b>	<b>Date</b>
Final	28 May 2003

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Prepared by RTA Operations – Environmental Technology Branch

<b>Prepared for:</b>	<b>Prepared by:</b>
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<b>Appendix B -</b>	Photographs of the Site
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<b>Appendix K</b>	Background and Database Searches
<b>Appendix L</b>	Ecological Report



## I Introduction and Methodology

- |     |                          |   |
|-----|--------------------------|---|
| I.1 | <b>Name and Location</b> | Proposed new access to Wyong Hospital at the intersection of Pacific Highway (SH10) and Craigie Avenue, Kanwal. |
| I.2 | <b>Council Area</b>      | Wyong Shire Council.  |
| I.3 | <b>RTA Region</b>        | Hunter Region.  |
| I.4 | <b>Introduction</b>      |   |

The NSW Roads and Traffic Authority proposes to upgrade the intersection of SH10 Pacific Highway and Craigie Avenue, Kanwal, which includes an additional fourth leg to act as the new entrance to Wyong Hospital. The upgrade also includes the widening of the intersection, provision of turning bays and installation of traffic control signals. Refer to **Appendix A** for location maps.

This Review of Environmental Factors (REF) has been prepared by RTA Environmental Technology Branch in accordance with the RTA's Environmental Impact Assessment Policy, Guidelines and Procedures, Version 4 (RTA, 2001).

For the purposes of these works, the RTA is the proponent and the determining authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this REF is to describe the Proposal, to document the likely impacts of the Proposal on the environment, and to detail protective measures to be implemented.

The description of the proposed works and the associated environmental impacts have been undertaken in the context of Clause 228 of the *Environmental Planning and Assessment Regulation 2000*, the *Threatened Species Conservation Act 1995* (TSC Act), the *Fisheries Management Act 1994* (FM Act), and the (Commonwealth) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In doing so, the REF helps fulfill the requirements of Section 111 of the EP&A Act that the RTA examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:

- Whether the Proposal is likely to have any significant impact on the environment and therefore the necessity for an Environmental Impact Statement (EIS) under Section 112 of the EP&A Act,

The significance of any impact on threatened species as defined by the TSC Act 1995, in Section 5A of the EP&A Act and therefore the requirement for a Species Impact Statement (SIS).

### I.5 Background

The Proposal is considered a high priority for the Pacific Highway in this area. Wyong Shire Council has had a long-term plan to upgrade the intersection of the Pacific Highway and



Craigie Avenue, which would also provide a new entrance to Wyong Hospital. The project was also identified in the Final Report for the Pacific Highway Tuggerah – Doyalson Route Development Study, which was completed in April 2000 and yet to be released for public comment.

Development of the concept design for the intersection upgrade has been undertaken in consultation with representatives from Council, Central Coast Health (the Hospital) and the adjacent Medical Centre. These organisations are in support of an upgrade to the intersection.

An urban design consultant was engaged to provide input into the development of the concept design. The urban design report is included in **Appendix C**.

## **1.6 Methodology**

A Draft REF for the Proposal was prepared by RTA Infrastructure Development Section, Hunter Region. The preparation of the Draft REF included all background searches, literature review and environmental assessment. Environmental Technology Branch was then engaged to finalise the REF and provide additional specialist input.

## **1.7 Site Description**

### **General**

The suburb of Kanwal and its surrounds are characterised by a rural residential landscape interspersed by new residential subdivisions. Refer to **Appendix B** for photographs of the study area.

### **Existing road**

The existing section of the Pacific Highway near Craigie Avenue has one travel lane each way as well as merging and turning lanes for traffic exiting or turning right into Wyong Hospital and Craigie Avenue. These are defined with a painted median and painted 'seagulls'. The Highway forms two northbound travelling lanes to the north of the painted median, beyond the proposed extent of work. The existing posted speed limit is 80km/h.

Craigie Avenue is a two-lane road with a posted speed limit of 60km/h. There is a school zone approximately 200m away from the intersection, for Kanwal Primary School.

### **Traffic**

In this location the existing traffic volumes are approximately:

- Pacific Highway 19400 vpd.
- Craigie Avenue 3800 vpd

### **Land uses**

The Pacific Highway-Craigie Avenue intersection is located on the southern frontage of Wyong Hospital in Kanwal. The Hospital is proposing to undergo an expansion to double its capacity and has plans for several new buildings and car parks, as part of the development.



The current access to the Hospital is off the Pacific Highway, approximately 150 metres north of the Craigie Avenue intersection. Both existing and planned Hospital buildings are situated well back from the Highway by at least 75 metres.

A large Medical Centre (Kanwal Medical Centre) is adjacent to the southwest side of the Hospital and shares Highway access with the Hospital. It includes a number of buildings containing various medical services as well as a kiosk. These buildings are situated closer to the Highway, with the closest buildings having a setback of approximately 30 metres.

Directly east of the study area, on the northern side of Craigie Avenue, is a commercial yard consisting of a car sales and truck and bus rental business. The south-east side of Craigie Avenue has a small real estate business. The building is set back from the corner of the Pacific Highway.

Beyond the Craigie Avenue intersection to the east and southeast is a residential area containing the suburbs of Kanwal and Wyongah. This area contains Kanwal Primary School, located on Craigie Avenue approximately 250m east of the study area.

To the south and west of the Hospital is predominantly paddocks and scattered bushland, some of which has been planned for future development. The Warnervale development area and proposed Warnervale District Centre lie to the northwest of Wyong Hospital.

### **Waterways and drainage**

Approximately 250 metres to the south of the intersection, the Highway crosses a small, unnamed creekline. Tuggerah Lake is approximately 1km east of the Proposal footprint. The Pacific Highway has no kerb and guttering, but has open drains providing drainage to the creekline. Elsewhere drainage follows an overland path. Craigie Avenue has kerb and guttering on both sides of the road.

### **Vegetation and threatened species**

The creekline south of the study areas has been described as having 'good quality riparian vegetation', which has the potential to contain threatened species. These are *Melaleuca biconvexa* (a tree), the Glossy Black Cockatoo and the Squirrel Glider<sup>1</sup>. A koala has been sighted roughly 700m south west of the study area (refer to **Appendix D**), however no sightings have been made near the study area.

The vegetation of the study area consists mostly grassed areas and a narrow strip of immature trees of mixed species

---

<sup>1</sup>\* 'Tuggerah to Doyalson – Pacific Highway Route Development Study Cultural Heritage Assessment, Wyong LGA', Sue Effenberger, Prisma, February 1999.

<sup>1</sup> 'Report on Ecological Considerations Relevant to the Alignment of the Proposed Pacific Highway Upgrade from Tuggerah to Doyalson', Ecotone Ecological Consultants Pty Ltd, August 1998.



(*Eucalyptus* sp., *Melaleuca* sp. and *Casuarina* sp.). The most common species in the stand of trees is Spotted Gum (*Corymbia maculata*). This strip of trees is immediately below overhead power lines and have been severely lopped in the past to avoid interference with this infrastructure.

Closer to the creekline, *Casuarina* sp. are most common. Mature trees are located within the Hospital site, and also adjacent to the car yard, at the top of a steep cutting. None of these mature trees would be impacted by the Proposal.

### **Topography**

The topography in the area is gently sloping from the north to the south and east. The Pacific Highway is on a 5% grade through the intersection.

### **Heritage**

A Cultural Heritage Assessment was undertaken in 1999 covering the project area for the Pacific Highway Route Development Study (**Appendix J**). The study identified one item of heritage significance in the vicinity of the study area. This is Rosedale Homestead, located on the corner of Craigie Avenue and Pearce Rd, roughly 150 metres east of the study area. It is not included in any heritage listings. This site would not be affected by the proposed upgrade of the intersection.

The report also covers Aboriginal heritage along the route, which includes the project footprint. A site survey was undertaken with a site officer from the Darkinjung Local Aboriginal Land Council, in respect of the Pacific Highway from Tuggerah to Doyalson.

The findings of the inspection were:

- (1) Darkinjung Local Aboriginal Land Council has no objections to the proposed road works.
- (2) If any sites are discovered during operations that Darkinjung Local Aboriginal Land Council is to be contacted immediately.

A copy of the Heritage Study is contained in **Appendix J**, which includes a copy of the letter from Darkinjung Local Aboriginal Land Council dated 28 January 1999.

Further contact was made with Darkinjung Local Aboriginal Land Council on 8 April 2003, where an update on the status of the project was provided. Verbal confirmation was provided from Darkinjung Local Aboriginal Land Council that the details of the letter dated 28 January 1999 were still current.

Further details of heritage searches are contained in section 6.1, and **Appendix K**.

### **Contaminated land**

The preliminary geotechnical report stated that the existing pavement may contain 'coal tar', a by-product of the coal



## **1.8 Proposal Description**

industry that was used in road pavements. Coal Tar is considered an environmental contaminant and is now required to be removed if it is encountered to an authorized waste disposal unit. The presence of coal tar would need to be confirmed during the detailed design phase as removal requires special consideration.

### **Bus stops & footpaths**

Current pedestrian access over the Pacific Highway is via a pedestrian refuge island opposite the existing bus stops approximately 50 metres north of the existing Hospital entry.

Provision for pedestrians at the existing bus stops is relatively poor and unsafe, with no connecting pedestrian paths to the Hospital and Medical Centre.

The Highway edge to the Hospital is characterised by open drains of bitumen and grass, with kerb and guttering occurring only at the immediate intersections. The uneven surfaces, lack of footpaths and difficult crossing of the Highway have resulted in unsafe access for pedestrians, including bus users.

### **Environmental sensitivity**

Overall, the environmental sensitivity of the study area is relatively low because of the distance between the intersection and any sensitive land uses. In addition, the area does not contain large amounts of vegetation that would be disturbed during construction. There is however a waterway to the south of the study area that would require management to mitigate the potential adverse impacts from the Proposal.

### **General**

The Proposal involves the upgrading of the existing T-intersection to a 4-way signalised intersection, with the additional 4th leg to connect with Wyong Hospital's internal road network. The Proposal includes widening of the western side of the Highway from 225 metres north to 250 metres south of the intersection. This would allow provision of turning lanes at the intersection, as well as two northbound and two southbound through lanes. The Proposal would allow each of the intersection movements to operate from separate turn lanes on the Highway, separate right turn lanes on the side roads, and a shared through and left turn lane on the side roads.

The Proposal would tie into the existing conditions of the Highway at the northern and southern ends. Existing northbound travel is provided by a single lane at the southern tie in and two lanes at the northern tie in. The Pacific Highway southbound ties into single lanes at both the northern and southern connections. The layout would also include a bus bay for each direction located on the departure side of the intersection. An on-road 1.5 metre cycleway would be provided through the intersection. The existing access road into the



Hospital would be transformed into a paved pedestrian access and used by vehicles in emergency situations only. The upgraded intersection would include pedestrian crossings on all four sides of the intersection as well as pedestrian paths linking to the Hospital, Medical Centre and the proposed new bus stops (see below).

Directly opposite Craigie Avenue, a road link would be created to connect the Pacific Highway to the internal network of the Hospital and, indirectly, to the Medical Centre. This connection would be undertaken by the Hospital, as the RTA's Proposal would be constructed to the road boundary, as noted in the public display poster (refer to **Appendix G**). It would be aligned with Craigie Avenue, and at approximately 90 degrees to the Highway. The Hospital will be redeveloping its internal road network and car parking as part of its expansion, and has included the proposed intersection upgrade and new leg in its plans.

The concept design plan for the Proposal is contained in **Appendix E**.

#### **Bus bays and footpaths**

Two new bus bays would be provided on the Highway close to the intersection, to replace the existing bus stops at the northern end of the Hospital. This is to encourage people travelling by bus to the Hospital and Medical Centre to use the proposed signalised crossing. Pedestrian paths would be provided to ensure pedestrian safety and to connect the bus bays with the Hospital and Medical Centre.

#### **Drainage**

Open grassed table drains with a concrete 'V' drain would be installed south of the intersection. Kerb and guttering would be provided at both the intersection and its approaches. A grassed drainage swale, winding through trees, would be created across part of the Hospital site close to the existing entrance.

#### **Property access**

The Proposal would change property access for the Hospital and Medical Centre from the existing entrance north of the study area to a new entrance that would branch off the Pacific Highway-Craigie Avenue intersection. The existing access road into the Hospital would be transformed into a paved pedestrian access, with removable bollards or similar being installed to allow it to be used as an emergency vehicular access.

It is critical that staging and traffic management provisions during the construction phase ensure that access to the Hospital for vehicles and pedestrians are maintained at all times.

There are two other accesses into private property, which would need to be maintained/reinstated.

One is an access to the property on the southeast corner of



Craigie Avenue. This would be provided with a gutter crossing and a gravel formation to the gate. Alternatively, it may be possible for access to be gained to this property from either Craigie Ave or Pearce Road. It would be desirable if the Highway access could be replaced with a new access from either alternative, to improve road safety. This would be further investigated during the detailed design phase.

The other access is to the domestic garbage site of the Wyong Medical Centre at the southern end of the project, which would be maintained.

### **Property acquisition**

The following property acquisitions would need to be made for the works:

- A strip of land to the southwest of the study area in front of the Medical Centre, which is dedicated road reserve but yet to be acquired (area = 2710 m<sup>2</sup>).
- A small portion of adjacent crown land that is dedicated road reserve but yet to be acquired (area = 494 m<sup>2</sup>).

A realignment boundary has previously been established on the western side of the existing road reserve. Acquisition of this land would be required for the Proposal.

Any Highway widening on the eastern side would utilise the existing road reserve. The preferred layout would also utilise the existing Craigie Avenue alignment with the Highway, with the new Hospital access to be directly opposite Craigie Avenue.

### **Utilities**

The study area has overhead powerlines, as well as underground telecommunication lines, sewerage and water pipes.

Based on a preliminary investigation the following utilities would likely be affected by the Proposal:

- |                      |                                     |
|----------------------|-------------------------------------|
| - Electricity        | 7 poles, 4 provisional              |
| - Telecommunications | Local distribution cable 350m       |
| - Water              | 150mm watermain, approximately 200m |
| - Sewer              | 60m plus manhole adjustments        |

The affected utility authorities have been consulted and have provided preliminary estimates for their adjustments based on the original concept design. These have been used as the basis for input into the concept estimate.

### **Vegetation removal**

Most of the area that would be required for construction of the Proposal is grassed (mixed exotic species) and relatively clear of other vegetation. On the western side of the road, additional vegetation includes a narrow band of juvenile trees dominated



by Spotted Gum, interspersed with other mixed species such as *Eucalyptus*, *Casuarina* and *Melaleuca* sp. The dominant species is Spotted Gum.

It is expected that approximately fifteen individual trees of the mixed species outlined above would have to be removed for the road widening and batter work associated with the Proposal. The larger trees on the car yard side are standing above a cut batter that shows signs of erosion and would not be affected. It is proposed that the batter would be stabilised using appropriate soil binding species as part of the landscaping and urban design work.

### **Earthworks**

The new access road into the Hospital would be in a cutting. The geotechnical report indicates that hard sandstone could be encountered in the Hospital access area. This would be further investigated during the detailed design phase. Total depth of cut would be in the range of 2-3m with a maximum depth of 4m including the construction of a drainage blanket and stormwater drainage.

No blasting would be carried out for the proposed works.

The remaining work would be primarily at grade, minimising earthwork requirements. Some leveling and grading would be required on the western edge where widening is proposed into the currently sloping Hospital land.

### **Urban and landscape design**

Any Proposal for the intersection upgrade should be designed to ensure a favourable solution not only from a traffic and engineering aspect, but also from an urban and landscape design perspective. This is in reflection of RTA's growing commitment to urban design, and also in recognition of the importance of the intersection providing a new gateway to Wyong Hospital.

As such the development of the Proposal included the engagement of an urban and landscape design consultant to assist the RTA to develop and achieve an integrated engineering and urban/landscape design result, and to ensure the upgraded intersection would provide positive amenity outcomes.

This included an initial site analysis to identify both the existing qualities of the area, the constraints and opportunities for the project, and the development of urban and landscape design principles. The report also included advice on landscaping of the study area, the location of footpaths, bus stops and crossings, and providing the Hospital and Medical Centre with a more noticeable entrance.

Two of the key related issues raised by the consultant were the location of the eastern bus bay, and that the removal of the trees on the eastern side of the Highway to accommodate any batter flattening works, may result in an adverse impact both from a visual and environmental perspective. The report stated



## **I.9 Construction Process**

that there is the opportunity to retain the trees and the batter by re-landscaping the batter with appropriate soil binding species such as 'Lomandra' viro-cells.

Following this advice the eastern side bus bay was positioned south of the intersection, allowing the retention of both the Spotted Gums on the eastern side batter and the natural corridor which it creates. **Appendix C** contains the urban design report.

### **General**

Construction of the Proposal would involve the following:

- excavation on the western side of the Highway;
- widening of the intersection;
- installation of drainage lines;
- installation of traffic control signals;
- linemarking for lane changes and new traffic control conditions proposed above;
- construction of medians at the intersection;
- construction of footpaths; and
- landscape planting on batters, drainage swales and other locations to improve the amenity of the study area.

### **Plant and equipment to be used**

Plant requirements for the Proposal, including excavation and construction, are expected to be:

- hydraulic excavator;
- bogey drive tip trucks;
- Asphalt paving equipment;
- vibratory rollers (2100mm rollers 114kW - may use smaller rollers due to proximity of houses);
- grader;
- water wagon; and
- tree lopping plant and equipment.

### **Compound site**

It is envisaged that a compound site would be set up on the western side of the Highway, in the open area adjacent to the existing intersection.

### **Workforce and working hours**

The works would be put out to public tender and undertaken by contract. The workforce would comprise approximately 6 – 12 persons.

Construction activities would be undertaken in standard working hours:

Monday-Friday: 7.00am to 6.00pm  
Saturday: 8.00am to 1.00pm  
Sunday and Public Holidays: No work

### **Materials**



Quarried materials for the Proposal would be sourced from local licensed quarries.

#### **Traffic**

Traffic would continue to use the Pacific Highway and Craigie Avenue during construction of the Proposal, with appropriate traffic control in accordance with the RTA Policy and Guidelines.

### **I.10 Cost and Source of Funds**

The total project cost of the Proposal is expected to be approximately \$3.8 million (total project cost in current dollars).

Part funding for the project is identified under Wyong Shire Council's Warnervale East and Wadalba North-West & North Wyong Industrial Estate Section 94 Plan (current version May 2002). The Plan provides for a total developer contribution of \$2.854M. Within this, the plan sets a contribution for Wyong Hospital specific to this intersection of \$1.198M based on the traffic generation from its proposed Hospital development. The remaining funds are to be received from future development within the Warnervale/Wadalba area. To date, Council has collected only \$147,000 towards the work. At the current rate of development, the total contribution may not be available for up to ten years.

The Plan also requires Central Coast Health (Wyong Hospital) to underwrite the balance of the project up to \$2.854M, until such time as future uncommitted contributions from other developers are received by Council.

The project was included in the 2002/2003 State Electoral Statement for Wyong Electorate with an allocation of \$1.3M. This is in addition to the \$200K previous project expenditure.

Confirmation is currently being sought from Central Coast Health (Wyong Hospital) of its commitment to meet the financial obligations under Council's Section 94 Contribution Plan.

### **I.11 Commencement of Work**

Construction is expected to begin in late 2003.

### **I.12 Period of Construction**

The expected duration of works would be 6 to 9 months.



## 2 Statutory Position

### 2.1 Zoning

The Proposal is subject to the Wyong Local Environmental Plan (LEP). The following zoning applies to the study area:

- The study area for the Proposal lies largely within the existing road reserves of the Pacific Highway and Craigie Avenue, which are unzoned under the LEP and would therefore be assessed under Part 5 of the EP&A Act.
- Land required for widening on the western side of the Highway is zoned (5a) Special Uses – Hospital and (5a) Special Uses – Medical Centre. The land that would be used for the Proposal within this zone is dedicated road reservation, however, under the LEP, development for any purpose within this zone requires the consent of Council under the LEP. A map extract showing the zoning is included in Appendix K.
- Land north of the Hospital is zoned Arterial Road.

In accordance with the LEP, the proposed works would require development consent. As the Proposal is for the purposes of a classified road, SEPP 4 applies to this Proposal (Section 2.2).

### 2.2 State Environmental Planning Policies

#### **State Environmental Planning Policy No. 4 (SEPP 4) – Development without Consent and Miscellaneous Complying Development**

Clause 11C(2) states “*where, in the absence of this clause, development for the purposes of a classified road or toll work, or a proposed classified road or toll work, may be carried out only with development consent being obtained therefore, that development be carried out without that consent*”.

SEPP No. 4 applies to the Proposal, as the proposed works are for the purposes of a classified road as defined by the *State Roads Act 1986*. Therefore the RTA would not require consent from Wyong Shire Council prior to undertaking the proposed works. This activity has therefore been assessed under Part 5 of the EP&A Act 1979.

#### **State Environmental Planning Policy No 44 - Koala Habitat Protection (SEPP 44)**

Wyong Shire LGA is identified within the Schedules of SEPP 44 as a Local Government Area in which Koalas are known to occur. As such, the impacts of any developments undertaken in these areas should consider the Proposal in light of the assessment criteria provided in this planning document. No potential Koala feed trees would be removed as a result of the Proposal and any impact on Koala habitat is therefore unlikely.

### 2.3 Regional Environmental Plans

No Regional Environment Plan is relevant to this Proposal.

### 2.4 Confirmation of Part 5 Position

It is confirmed that this Proposal is subject to environmental impact assessment under Part 5 of the EP&A Act.



### 3 Specialist Studies and Community Involvement

#### 3.1 Specialist studies

##### Traffic study

A traffic study was commissioned to provide an assessment of the proposed signalised intersection of the access to Wyong Hospital and Craigie Avenue. The study was completed in October 2001. The investigation included forecasting of traffic flows, movements and intersection capacity. The modeling demonstrates that a Level of Service B is achieved for the proposed layout in the year 2011. A copy of the report is in **Appendix F**.

##### Urban Design Study

As outlined in Section 1.6, an urban and landscape design consultant was engaged to assist the RTA to develop and achieve an integrated engineering and urban/landscape design result, and to ensure the upgraded intersection would provide positive amenity outcomes. **Appendix C** contains the urban design report.

##### Ecological Assessment

An Ecological Issues Report was undertaken in 1998 to determine any ecological constraints on the proposed four lane upgrade of the Pacific Highway from Tuggerah to Doyalson. This study encompassed the Study Area. **Appendix L** contains this report.

##### Heritage Assessment

A Cultural Heritage Assessment was undertaken in 1999 for the proposed four lane upgrade of the Pacific Highway from Tuggerah to Doyalson. This study encompassed the Study Area. **Appendix J** contains this report.

#### 3.2 Community involvement

Community involvement for the Proposal included a public display of the concept design, written requests for advice from other agencies and organizations and letters to adjacent residents in the area.

##### Public display

The public display was held from 26 February 2003 to 1 April 2003 at the following locations:

- RTA Central Coast Office, The Clock Tower, Railway Station Woy Woy.
- Wyong RTA Motor Registry, Corner Anzac Avenue and 1 Street, Wyong.
- Wyong Shire Council, 16 Hely Street, Wyong.
- Wyong Hospital, Pacific Highway, Kanwal.
- Lake Haven Library, Lake Haven Shopping Centre Goobar.



Ave, Lake Haven.

All sized posters, including a site map and concept plan were put on display, with contact names, phone numbers and an address for making enquiries and submissions. A copy of the public display poster is in **Appendix G**.

The display period was advertised in The Newcastle Herald, and The Central Coast Express Advocate on 26 February 2003 and in The Newcastle Herald again on 22 February 2003. The closing date for submissions was 2 April 2003.

#### **Letters to property owners**

A letter advising of the public display was hand delivered in an unaddressed envelope to properties along Wiomera Rd, along Pacific Highway further North, along Craigie Avenue between the Highway and Pearce Road and properties to the south of the study area along the Pacific Highway. This was considered appropriate to ensure that nearby residents were made aware of the Proposal and given an opportunity to comment. A copy of the letter to property owners is included in **Appendix H**.

#### **Letters to agencies**

Letters advising of the Proposal and requesting comments and any requirements were sent to the organisations listed below. A copy of the letter is in **Appendix H**.

- NSW Environment Protection Authority, Newcastle Office
- Department of Land and Water Conservation, Hunter Regional Office
- Wyong Shire Council
- Ambulance Service, Hunter Area Office
- Central Coast Health
- Kanwal Medical Centre
- Local Bus Services (Busways and Red Bus Company)

The public utility agencies were also consulted as part of the concept design process.

#### **Responses**

One telephone enquiry was received from a resident wishing to clarify aspects of the Proposal with respect to kerb and gutter, bus stops and pedestrian facilities. The query was resolved with no further action required.

Another telephone enquiry was received from the owner of the property on the southeast corner of Craigie Avenue, regarding the current access to the property. As detailed in Section 1.6, the owner was advised that access would be either reinstated by providing a gutter crossing and a gravel formation to the gate, or alternatively, it may be possible for access to be gained to this lot of land from either Craigie Ave or Pearce Road. It



would be desirable if the Highway access could be replaced with a new access from either alternative, from a road safety aspect. A site meeting was conducted on 3 April 2003 with the owner's representative. The three options outlined above were discussed and deemed suitable for further investigation, with safety and all weather access as key issues. The issue of the most suitable access would be further investigated during the detailed design phase.

Written submissions were received from three organisations. These are outlined below. Copies of the submissions are included in **Appendix I**.

#### **Richardson & Wrench, Kanwal**

A supportive letter was submitted by the principal of Richardson & Wrench, Kanwal. His business is located on Craigie Avenue just east of the intersection. The letter stated that he fully supported the installation of lights from a safety and traffic performance perspective.

*Comment:* No action required.

#### **Kanwal Public School**

The school's relieving deputy principal submitted a letter which was supportive of the outcome of the Proposal, however concerns were raised regarding the construction phase of the project. The issues raised were in relation to the potential for additional traffic to use Wiowera Rd, Craigie Ave, Hughes Ave and Walker Ave, during the construction period to avoid or bypass the construction. The concern was for children safety while construction is taking place. It was noted in the letter that they were confident that the RTA had taken all these concerns into consideration.

*Comment:* The widening of the Highway would take place on the western side of the Highway. Subsequently the works would be staged so that the first stage would consist of widening the Highway while existing traffic management at Craigie Ave and the Hospital access would continue to function with minor modifications. The second stage would require northbound traffic switching to the new work whilst the medians and median drainage were constructed, with southbound traffic remaining at the existing location. The final stage would be re-positioning the crown in the asphalt and the construction of the kerb and gutter along the eastern side of the Highway.

With the above staging in place it is unlikely that the construction of the Proposal would cause major delays to traffic on the Highway, as the initial construction is undertaken outside the existing carriageway and once constructed it would be used in the ensuing stages which would help with the flow of traffic. Therefore the amount of traffic likely to use the roads outlined above in an effort to bypass the works is not predicted to be high, as delays using the Highway would not be great.



None the less, traffic would need to be monitored during the construction phase particularly in the vicinity of the school to ensure that safe conditions were being provided for school users.

#### **Kanwal Medical Centre via Wyong Shire Council**

The owner of the Medical Centre wrote to Council expressing his concern with the proposed access to the Medical Centre from the new intersection and the lack of involvement they have had with the development of the Proposal. They have sought Council's assistance in this matter.

*Comment:* The RTA's Proposal is to widen the existing Highway, signalize the intersection and provide a new entry off the intersection for Wyong Hospital. As per the display poster, the access to the Hospital from the intersection (road boundary) is to be provided by others (Wyong Hospital). The Medical Centre currently has access via the Hospitals internal road system using the Hospital's current access off the Highway. The Proposal allows for the Medical Centres access to remain via the Hospital internal road system via the new intersection. As the new intersection is some 130 metres further south, the access to the Medical Centre would be much improved.

A meeting was held with a Wyong Council representative on 25 March 2003, to discuss the concerns of the Medical Centre. A copy of the DA conditions for the Medical Centre was provided. It is noted that the conditions include:

- Vehicular access, apart from a temporary driveway for construction vehicles, is prohibited directly onto the Pacific Highway from the subject property.
- The creation of a right of way from the development site on the adjoining Hospital site to the existing access to the Pacific Highway.

It is also noted that a site meeting was convened on 10 Sept 2001 at the commencement of the development of the project. The meeting included representatives from the Hospital, Council and the Medical Centre. The purpose of the meeting was to discuss the options investigated for the intersection, noting the RTA's preferred option, which is essentially the option which was displayed. All participants were in general agreement with the Proposal. It was noted at the meeting that the RTA was responsible for the construction to the road boundary, and that the Medical Centre would need to negotiate what access arrangements it required from the Hospital.

Overall, the RTA's Proposal provides the opportunity for improved access to the Medical Centre. It is also noted that the Medical Centre was consulted in the development of the Proposal, and it was made clear what access arrangements would be provided and what the responsibilities of each party



were in arranging/providing access.

While the RTA is not responsible for providing access to the Medical Centre as this is beyond the Highways road boundary, the RTA has been proactive in providing recent input into alternatives for the Medical Centre access off the Hospitals access road. These options have been discussed with the medical centers owner, the Hospital and Council. The RTA would continue to provide assistance as required to ensure that the ultimate access to both the Hospital and the Medical Centre from the new intersection is satisfactory from a traffic performance and safety perspective.



## 4 Strategic Stage

### 4.1 Strategic Planning

The Proposal is in line with the State strategic policy on Transport, '*Action for Transport 2010*', in that it would improve conditions considerably for pedestrians wanting to access important community services: the Hospital and the Medical Centre. It also would improve access and safety for those arriving or leaving by bus, thereby improving travel by public transport.

The Proposal also complies with the '*Shaping the Central Coast Regional Planning Strategy*'. This plan, prepared by the Department of Urban Affairs and Planning, Gosford and Wyong Councils and the community, addresses the future growth of the Central Coast region and the creation of livable communities. The Proposal is in accordance with this plan as it proposes work that would allow for future growth in the area while addressing the needs of pedestrians, buses and cyclists and providing better linkages to vital community services.

The Proposal is strategically significant in terms of linking services on one side of the Highway with residential areas (existing and future) on the other, particularly in light of future development and population expansion expected in the area. Growth in the region can be expected to bring an increase in traffic on the Highway, which would make the Hospital and Medical Centre less accessible by non-car means without the proposed pedestrian improvements. A safe link is important particularly for those using the Hospital who may not be able to drive due to age, illness or disability.

The Proposal is also in accordance with the RTA's mission to "manage road related transport infrastructure and provide safe and efficient access to the road network for the people of NSW".

### 4.2 Need for the Proposal

The Proposal is needed to improve the safety of the intersection for vehicles, pedestrians and bus users, particularly those accessing the Hospital and Medical Centre.

The Pacific Highway in the vicinity of the intersection carries approximately 19400 vehicles per day, with a design hourly volume of 2046 vehicles during the PM peak. For the period 1 January 1996 to 30 June 2001 there were 15 accidents in the vicinity of the intersection and Hospital entrance. Bringing the Hospital entrance further south and grouping traffic movements together at a signalised intersection would improve safety and reduce accident potential along this stretch of the Highway.

There is also a need to increase the traffic capacity with the provision of additional traffic lanes, and therefore provide a satisfactory level of service for future years. A traffic study was undertaken in October 2001 by Northern Transport Planning and Engineering Pty Ltd. The report provides an assessment of the performance of the proposed signalised intersection using



SIDRA analysis. The analysis adopted a growth rate of 2%. The modeling demonstrates that a Level of Service B is achieved for the proposed layout in the year 2011.

The need for improvements at the intersection is made greater by the Hospital's future planned expansion and the expected residential growth in the area, representing potentially up to 120% increase in traffic accessing Wyong Hospital.

For improved safety and convenience for access by normal traffic and emergency vehicles, it is also desirable for Wyong Hospital to have a more direct entrance point that is visible and quickly recognisable.

Council conditions of development consent for the Medical Centre prohibited a separate access from the Highway and required that a right of way be implemented using the Hospital internal road network for access to this development. The Proposal would move the access to the Pacific Highway much closer to the Medical Centre and therefore access to the Medical Centre would be much improved.

Further to the Proposal, the need for footpaths at the Hospital was identified in a Road Safety Audit completed in 1998 as part of the SH10 Pacific Highway Tuggerah to Doyalson Route Development Study.



## 5 Concept Stage

### 5.1 Proposal Objectives

The objectives of the Proposal are as follows:

- Provide a safer and controlled access to both Craigie Avenue to the east and to a relocated main access to Wyong Hospital to the west;
- Improve safety at the intersection for motorists and cyclists;
- Improve facilities for public transport, cyclists and pedestrians;
- Provide safer Highway crossing conditions for pedestrians and bus users in this location;
- Increase traffic capacity at the intersection;
- Provide improved traffic management for through, entering and exiting traffic;
- Minimise impact on the local community and the environment.
- To provide a more convenient, direct and visible access to Wyong Hospital for private vehicles, emergency vehicles, bus users and pedestrians.
- To provide an intersection that does not diminish the amenity of the area, with landscaping and design treatments to enhance the intersection and provide an appropriate gateway to the Hospital.

### 5.2 Options Considered

Options considered for upgrading the intersection are as follows:

#### **1. A roundabout instead of traffic control signals**

Wyong Shire Council initially proposed a roundabout so as to provide an opportunity for U-turns on the Pacific Highway at this location. This option could fulfill the traffic safety objective, and could include a new fourth leg into the Hospital, but would not offer any improvements in safety for pedestrians crossing the Highway. Primarily for this reason a roundabout option was rejected in favour of a signalised intersection with pedestrian crossings.

#### **2. Regrading of the Pacific Highway and realignment of Craigie Avenue**

This option involves 'squaring up' and 'raising' the intersection.

The transformation of this junction into a 4 way intersection controlled by traffic signals would allow the previously slow movement of right turn vehicles from Craigie Ave to occur at a greater speed. The concern about this movement occurring at speed is the crossfall produced by a combination of the through

5% grading of the Highway and the northbound lane crossfall of 4%. These grades combine to produce an adverse crossfall of approximately 6.4% at the steepest part of the turn and is greater than the recommended maximum of 4% adverse crossfall for turning vehicles.

This crossfall would be considered a non-conformance relative to the following information detailed in the RTA Road Design Guide.

For the intersection to conform with the geometric requirements for turning vehicles ie. maximum adverse crossfall of 4%, the through grading of the Highway would need to be flattened from 5% to 4% through the intersection.

The regrading of the Highway and realignment of Craigie Avenue would result in considerably more impact on adjacent properties with acquisitions required from 6 properties compared to 2 for option 4. The concept estimate for this option was \$5.3M.

The raising of the Highway would also result in a steep 2 to 1 batter with a physical barrier at the top of the embankment. A less steep batter of 4 to 1 would result in the acquisition of 2 additional properties and an increase of \$700K to the project.

This option provides a conforming geometry, however the high construction costs, the long-term adverse appearance of a steep embankment, and the provision of a barrier in such an environment, are all disadvantages of this option.

### **3. Do nothing**

Leaving the intersection as it is would retain the poor existing pedestrian environment, limiting the safety and accessibility of travelling to the Hospital on foot or by bus.

With the Hospital proposing to double its size in the near future, vehicles entering the Hospital at the existing entrance would cause increased traffic congestion and unsafe conditions. The circuitous route for vehicles to the Hospital and especially to the Medical Centre would also remain. Both facilities would be left with the unclear entrance that exists, without having a visible 'presence' from the Highway that could be produced under the current Proposal.

In conclusion, the do nothing option does not address the safety issues or the objectives of the Proposal.

### **4. At grade/signalised intersection**

This option consists of retaining the existing grade of the Highway, the alignment of Craigie Avenue, and to signalise the intersection with an additional fourth leg connecting to Wyong Hospital.

The issue with this option is the adverse crossfall out of Craigie Avenue, which would be considered a non-conformance relative to the following information detailed in the RTA Road



Design Guide.

Because of this issue, the following issues and actions to address the non-conformance were developed as part of developing this option.

- While this option does not satisfy the geometric requirements of the RTA Road Design Guide, the associated risks are considered low given that the volumes of vehicles turning right out of Craigie Avenue, which are subject to the adverse crossfall, are relatively low.
- As an action plan the median on the northern side of the intersection could be lengthened to limit the potential for this turning movement to be undertaken at speed.
- Additional warning signs including advisory speed signs to be erected in Craigie Ave.
- Other design factors would be considered during the detailed design to lesson the risks associated with the turn including possible correction to crossfall.

The economic analysis showed that this option is the best value for money with a Benefit Cost Ratio (BCR) of 3.42 compared to a BCR of 1.88 for option 2 described above.

As option 4 satisfies all the safety issues and objectives of the project as set out in section 5.1, has the highest BCR, the least impact on property and the environment, this option was considered the preferred option.

A copy of the Concept Design Plan is provided at **Appendix E**.

## 6 Assessment Stage

### 6.1 Background Searches

A search was conducted on the following databases to identify any potential issues. Copies of the search results are included at **Appendix K**.

#### **Register of National Estate**

A search of the Register of National Estate was conducted on 17 February 2003. No recorded sites exist in the vicinity of the Study Area.

#### **NSW Heritage Office**

A search of the NSW State Heritage Register was conducted on 17 February 2003. No recorded sites exist in the vicinity of the Study Area.

#### **RTA Heritage and Conservation Register**

A search of the RTA Heritage and Conservation Register was conducted on 31 March 2003. No recorded sites exist in the vicinity of the Study Area.

#### **LEP Heritage List**

A search of the Wyong Shire LEP Heritage List was conducted on 17 February 2003. No recorded sites exist in the vicinity of the Study Area.

#### **NPWS Aboriginal Heritage Information Management System (AHIMS)**

A search of the AHIMS database was conducted on 2 April 2003. The NPWS AHIMS has no recorded aboriginal objects or aboriginal places in or near the Study Area.

#### **Native Title Claims search**

A Native Title Claims search was conducted on 29 August 2002 for Wyong LGA. At the time of this search, no claims or applications were registered within the Wyong LGA.

#### **NPWS Wildlife Atlas – Flora**

A search of the Atlas was undertaken on 28 March 2003. No threatened flora was identified within the study area.

One sighting of *Callistemon linearifolius* (Boynoe's Wattle), and one sighting of *Eucalyptus camfieldii* (heart-leaved Stringybark) have been recorded approximately 400m north-east of the study area. These species are listed as vulnerable.

#### **NPWS Wildlife Atlas – Fauna**

A search of the Atlas was undertaken on 28 March 2003. No threatened flora was identified within the study area.

The Glossy Black Cockatoo and Squirrel Glider potentially occur within the creekline corridor, however better quality habitat areas for these species exist in the wider region. The habitat provided here is considered marginal in comparison



## 6.2 Environmental Issues

with other areas in the locality (Refer to **Appendix L**).

One recorded sighting of *Scoteanax rieppellii* (Greater broad nosed bat) was recorded approximately 500m south of the study area. This species is listed as vulnerable.

### **EPBC Database search**

A search of Environment Australia's EPBC Act Database was conducted for all areas within 1km of the Study Area on 17 February 2003. A summary of the findings is provided below:

- No threatened communities occur within the area.
- 10 Migratory species potentially occur within the area
- 16 threatened species potentially occur within the area
- 10 marine protected species potentially occur within the area.
- No World Heritage Areas, Ramsar sites, Commonwealth areas or Conservation reserves occur within the search area.

A schedule of the species potentially occurring in this area is provided at **Appendix K**.

### **Acid sulphate soils**

There are no known occurrences of acid sulphate soils within 500 metres of the study area. An environmental constraints map of the local area (**Appendix D**) shows the likely extent of acid sulphate soils.

Potential environmental effects of the Proposal, and proposed measures to mitigate the identified impacts are described below.

### **General**

A Contractor's Environmental Management Plan (CEMP) would be prepared prior to the commencement of works.

### **Water quality**

#### *Potential Impacts*

Construction of the Proposal would disturb soil within the footprint of the works. This would increase the potential of soil erosion and subsequent increases in the turbidity and sedimentation of receiving waters and waterways.

There is also the potential of chemical or fuel spillage occurring during construction of the Proposal.

#### *Proposed Mitigation Measures*

- Water quality would be managed according to details in Section 6.5.3 (Water Quality), Section 6.5.4 (Water Extraction), and 6.13 (Spillage Prevention and Containment) of the RTA's QA Specification G36.
- An Erosion and Sedimentation Control Plan (ESCP) would be prepared and implemented in line with the Department

of Housing's *Managing Urban Stormwater* Guidelines (DoH 1998) 'Blue Book' as part of the Contractor's Environmental Management Plan (CEMP) for the study area and approved by the Regional Environmental Adviser before works commence. This would address requirements for the roadworks and drainage works separately, as well as the requirements for the stripping, stockpiling and re-spreading of topsoil.

- The works would be planned and carried out to avoid erosion and sedimentation. This would include careful location of site compounds, access tracks, stockpile sites and temporary working areas, as well as staging of work to minimise the extent and duration of disturbance to vegetation.
- All construction plant, equipment, vehicles and machinery would be maintained in accordance with manufacturer's specification in order to meet the requirements of the *Protection of the Environment Operations (POEO) Act*, 1997 and associated regulations.
- Disturbed/exposed soil would be stabilised as quickly as possible.
- As part of the Plan, all erosion and sedimentation control measures would be maintained and checked weekly and after storm or rain events.
- Sediment fences or gravel bags with sediment fences would be used in preference to hay bales.
- Construction activities would be programmed to minimise the area of ground exposed to erosion at any one time.
- Temporary sediment control fences would be installed on the downhill side, and diversion drains on the uphill sides of stockpile sites, prior to stockpiling material.
- Stockpile materials would be placed a minimum of 5 metres away from the dripline of trees to be retained.
- During construction there would be no stockpiling or parking of equipment in areas where vegetation is protected.
- Should any spillage occur during works, the Environmental Adviser, Hunter Region, would be contacted immediately, and contaminants would be immediately contained, removed, treated (if necessary) and disposed of to the satisfaction of the EPA.
- During construction, an appropriate spill containment kit would be kept on site at all times.

## **Air Quality**

### *Potential Impacts*

The proposed construction activities are likely to create some



airborne dust. Mitigation measures would reduce the magnitude of this impact.

#### *Proposed Mitigation Measures*

- Air quality would be managed according to details in Section 6.6 (Air Quality), of the RTA's QA Specification G36.
- If any spoil is being transported to or from the study area, it would be covered. All disturbed soil would be stabilised as soon as possible to minimise erosion.
- Vehicles using public roads to import material to the study area or remove excess or unsuitable material from the study area subject to being wind blown would have their loads covered.

### **Noise and Vibration**

#### *Potential Impacts*

**Construction:** No blasting would be undertaken during construction of the Proposal and the proposed construction activities are not likely to generate perceptible vibration at any sensitive receiver.

There would be potential for increased noise levels at the site during the construction period. While the Hospital is a noise-sensitive land use, the Hospital buildings are situated over 100m from the road and work site. The Medical Centre, Car Sales Business and Real Estate Business would experience temporary noise level increases during construction. As the nearest residential dwelling is located more than 50 metres from the proposed works, potential noise impacts on residents are expected to be minor.

Due to the nature of the proposed works, the relatively short duration of construction, and the proposed working hours, noise level increases as a result of construction activities are expected to be minor.

**Operation:** The upgrade would provide a new access to the internal road system in the Hospital grounds. This would not affect flows negatively or traffic mix within the Hospital grounds. By moving the access from the Highway closer to the Medical Centre, the Proposal will reduce traffic congestion within the Hospital's internal road network as traffic accessing the medical center would have a more direct route, reducing conflict between Hospital and Medical Centre traffic.

The Proposal is unlikely to result in any change to existing traffic mix or frequency at Craigie Avenue and the Pacific Highway. Traffic flow on the Highway would be affected by the Proposal as a result of the introduction of traffic signals at the intersection. This would occasionally halt through traffic that currently has continuous right of way, to provide for safe turning movements from Craigie Avenue, and may slightly

increase noise levels at a residential property which backs onto the Pacific Highway approximately 150m north of the intersection as a result of braking noise. However, the existing situation often requires vehicles entering and exiting the Hospital and Craigie Road to accelerate rapidly in order to join the traffic stream, increasing the noise levels at the noise sensitive receivers. The Proposal would reduce the occurrence of this activity and therefore mitigate any likely increased noise generated by traffic on the Pacific Highway.

Previous assessments for this type of intersection upgrade indicate noise levels are unlikely to be significantly affected (pers. comm. Jeff Parnell, RTA Environmental Technology). Therefore increases to existing noise levels in the area during operation of the Proposal are expected to be minor and the Proposal is not likely to create long-term noise impacts, as it is not expected to result in any change to existing traffic mix, or frequency.

#### *Proposed Mitigation Measures*

All work would be undertaken in accordance with the RTA's *Noise Management Manual*, 2001 and with specifications set out in Sections 6.7 and 6.8 (pp.17/18) of RTA's Environmental Protection (Management Plan) - QA Specification G36. In addition:

- Best management practices would be adopted that are consistent with the RTA's Environmental Noise Management Manual, 2001.
- Nearby residents would be notified prior to the works commencing and a contact number for complaints would be provided.
- All construction plant and equipment used on the site would, in addition to other requirements, be fitted with properly maintained noise suppression devices in accordance with the manufacturer's recommendations; maintained in an efficient condition; and operated in a proper and efficient manner.
- Construction activities would be undertaken in accordance with the EPA recommended hours of:
  - Monday-Friday: 7.00am to 6.00pm
  - Saturday: 8.00am to 1.00pm
  - Sunday and Public Holidays: No work
- For work performed outside standard working hours the consultation procedure for Road Maintenance Undertaken Outside Normal Working Hours and *Practice Note vii (Noiseworks after Normal Hours)* of the RTA's Noise Management Guidelines would be followed.

#### **Biodiversity**

##### *Potential Impacts*



The Proposal's impact on vegetation would include clearing of grass and the removal of less than 15 immature trees (mixed native species). After construction, it is proposed that new vegetation would be planted around the intersection, along the Pacific Highway for the length of the upgrade, and at the Hospital entrance. These plantings would be sympathetic to the surrounding environment and consist of locally indigenous native species.

There is potential for the threatened flora species *Melaleuca biconvexa*, to occur near the creekline approximately 250m south of the study area (refer to **Appendix L**), however no individuals of this species were identified within the Study Area during the Ecological Issues Report or during the site visit and it is highly unlikely that an individual of this species would be impacted directly, or indirectly, by this Proposal.

The Proposal would be unlikely to impact directly on fauna or any fauna habitat of value. Noise and dust may disturb fauna in the creek corridor and within surrounding vegetation during construction of the Proposal, however the disruption would be of a relatively short duration and of low magnitude. The loss of the trees described above would not have a major impact on fauna as the narrow band of juvenile native trees is unlikely to represent important habitat as these trees have been severely lopped in the past, are subject to headlight shine from vehicles turning right from Craigie Avenue and no tree hollows were identified during the site inspection. The Proposal has been designed to minimize the removal of vegetation and has involved retaining mature native trees within the study area that are likely to be of greater habitat value for native fauna.

#### *Proposed Mitigation Measures*

- Flora and fauna would be managed during the maintenance activities in accordance with Sections 6.9 (Vegetation), 6.10 (Fauna) and Section 6.18 (Restoration of Site) of the RTA's QA Specification G36.
- Revegetation of previously cleared areas within the Proposal Site would be carried out on completion of construction works using locally indigenous native species, preferably propagated from locally collected seed stock. A range of groundcover, shrub and larger tree species would be included.
- Construction methods would be employed that would minimise the spreading or introduction of weeds caused by construction activity on or around the site.
- If any fauna that would be affected were found in vegetation to be trimmed or removed, WIRES would be called to remove the animal(s).

#### **Contaminated land**

##### *Potential Impacts*

Although no indication of contaminated land was identified during the site assessment, the works have the potential to reveal areas that have been contaminated as a result of previous landuse or illegal dumping.

There is also a possibility that earthmoving for the proposed works would uncover 'coal tar', a product of the coal industry now considered an environmental contaminant.

#### *Proposed Mitigation Measures*

Should areas be found to be affected by contaminated waste, all works would cease and the following mitigative measures would be adopted:

- Contaminated waste would be identified and classified by a suitably qualified consultant.
- Contaminated waste identified or generated during the Proposal would be disposed in accordance with EPA guidelines.
- Any 'coal tar' encountered would be removed to an authorised waste disposal site.

#### **Visual amenity**

##### *Potential Impacts*

The widening proposed for this intersection would have the potential to create a negative visual impact. This would be mainly impact people travelling through the intersection, as surrounding development does not overlook the intersection and residences are not close enough to be affected visually.

However, beneficial visual effects would be produced as a result of the proposed landscaping and urban design measures. This would minimise the impact of the Proposal and would improve the aesthetics of the area for road users. The urban design report (**Appendix C**) found that the Proposal would improve the visual amenity of the intersection and its approaches.

##### *Proposed Mitigation Measures*

The Landscaping and Urban Design Plan (**Appendix C**) would be implemented as part of the Proposal.

#### **Social / community**

##### *Potential Impacts*

The local community would benefit from the Proposal by gaining a safer pedestrian crossing of the Pacific Highway to access Wyong Hospital and the Kanwal Medical Centre. People travelling by bus to these community facilities would also benefit from the safer crossing. The Proposal would also provide a safer intersection for traffic movements.

Negative impacts on the community would largely be limited to traffic delays and increased noise levels during construction.



### *Proposed Mitigation Measures*

- Traffic would be managed during construction works in accordance with Section 6.4 (Access and Traffic Management) of the RTAs QA Specification G36; and
- Existing access to Wyong Hospital and Kanwal Medical Centre would be maintained throughout the proposed works.
- Should work be required outside of the standard working hours, the procedure contained in the RTA Noise Management Manual, "Practice Note vii – Roadworks Outside of Normal Working Hours" would be followed.

### **Parking**

#### *Potential Impacts*

The small Hospital car park adjacent to the current intersection would be removed when the Hospital constructs a link road to link the internal road network to the access to be provided as part of the Proposal. This has been discussed with the Hospital and Medical Centre representatives who agreed that the loss of the car park was not significant compared to making the new access function satisfactorily. Additional parking is proposed as part of the Hospital's expansion and it is anticipated that this would more than make up for the loss of the car park. Provision of parking within the Hospital grounds, or impacts on parking as a result of the rearrangement of the Hospitals internal road network does not form part of this Proposal. Although the RTA are assisting to develop a concept design for linking the Hospitals internal road network to the proposed intersection, no further consideration of impacts of the Hospitals internal traffic management is considered necessary.

### **Pedestrians and cyclists**

#### *Potential Impacts*

The installation of the traffic signals coupled with the addition of footpaths in the area would greatly improve the safety for pedestrians, particularly during peak traffic flows.

The provision of the 1.5 metre cycleways for both north and southbound cyclists at and on the approaches to the intersection would greatly improve safety for cyclists, particularly during peak traffic flows.

### **Traffic Management**

#### *Potential Impacts*

The Proposal has the potential to restrict traffic flow during construction, however, traffic would continue to use the intersection at all times. Traffic control plans would ensure the best management of traffic through the worksite, with particular attention to peak times.

It is critical that access to the Hospital is permitted at all times.

Staging of the works would be carefully considered and planned to ensure that free access is maintained.

It is not expected that the Proposal would increase traffic flow at the intersection or on any adjacent roads.

#### *Proposed Mitigation Measures*

- A Traffic Control Plan would be prepared and implemented during the construction period in accordance with the RTA's *Traffic Control At Work Sites Volume 2*, and *AS 1742.3 Manual of uniform traffic control devices Part 3: Traffic control devices for works on roads*.
- A Communications Plan would be developed to ensure the community is notified of the works and any changes to access during construction.
- Existing access to Wyong Hospital and Kanwal Medical Centre would be maintained throughout the proposed works.

### **Waste Management**

#### *Potential Impacts*

During construction, waste would be generated by the removal of vegetation, excess construction materials, the maintenance and operation of equipment and on-site workers.

#### *Proposed Mitigation Measures*

The principles of waste management are to minimise the amount of waste generated, recycle waste wherever possible and dispose of the remainder in a responsible manner in accordance with appropriate RTA policy. The RTA adopts the Resource Management Hierarchy principles embodied in the *Waste Avoidance & Resource Recovery Act 2001* (WARR Act).

Accordingly, the following waste minimisation and impact mitigation methods are proposed:

- The management of waste would be undertaken in accordance with Section 6.17 (Waste Management) of the RTA's QA Specification G36.
- The management of waste would be undertaken in accordance with principles of the WARR Act.

### **Indigenous Heritage**

#### *Potential Impacts*

A search of the AHIMS database and review of the Heritage Issues Report (**Appendix J**) found that there were no known Aboriginal sites within, or near to, the Study Area.

Although the occurrence of a site of indigenous heritage value at the site of the Proposal is unlikely given the level of disturbance of the site, there is potential for items of indigenous heritage significance being unearthed during



construction of the Proposal.

*Proposed Mitigation Measures*

- All works would be undertaken in accordance with Clause 6.14 "Indigenous Heritage" of the RTA's QA Specification *G36 Environmental Protection (Management Plan)*.
- Should any relic, artefact or material (including skeletal remains) suspected of being of Aboriginal origin be encountered, all construction work that might affect the item would cease, and the area would be protected from further damage or disturbance. The discovery would be reported to the RTA Environmental Adviser Hunter Region, RTA Aboriginal Liaison Officer and arrangements made for an officer of the National Parks and Wildlife Service and the Darkinjung Local Aboriginal Land Council to be consulted.

**6.3 Summary of Beneficial Effects**

- Increased safety at the intersection for vehicles and cyclists
- Safer Highway crossing conditions for pedestrians and bus users in this location
- Improved pedestrian facilities in the form of connecting footpaths providing safer access between the bus stops and the Hospital and Medical Centre
- Improved traffic capacity through the provision of additional travel lanes.
- An improved, more visible and more direct entrance for the Hospital and Medical Centre
- Landscaping improvements to the intersection and immediate surrounds, improving the visual amenity of the area.

**6.4 Summary of Adverse Effects**

- Visual impact of a wider and larger road surface, however the impact would be lessened and potentially improved given the landscape and urban design principles which have been adopted.
- Short term (6-9 months) disruption of traffic
- Short term minor impacts during construction such as noise, dust, and sedimentation from excavation for widening, however, this would be minimised through the implementation of the mitigation measures described in Section 7 of this document.
- Loss of around nine native trees

**6.5 Protection of the Environment Policies**

No Protection of the Environment Policies currently exist for this locality.

## 7 Implementation Stage

### 7.1 Safeguards Process

A Contractor's Environmental Management Plan (CEMP) would be developed in accordance with the specifications set out in the RTA's *Environmental Protection (Management Plan) – QA Specifications G36*. The CEMP would incorporate additional site specific requirements, which are not covered by G36, as outlined below. The CEMP would be reviewed and certified by the RTA Environmental Adviser, Hunter Region, prior to the commencement of any site works.

In addition, the following site specific mitigation measures would be undertaken to further minimise potential impacts

### 7.2 Water quality

- An Erosion and Sedimentation Control Plan (ESCP) would be prepared and implemented in line with the Department of Housing's *Managing Urban Stormwater* Guidelines (DoH 1998) 'Blue Book' as part of the Contractor's Environmental Management Plan (CEMP) for the study area and approved by the Regional Environmental Adviser before works commence. This would address requirements for the roadworks and drainage works separately, as well as the requirements for the stripping, stockpiling and re-spreading of topsoil.
- The works would be planned and carried out to avoid erosion and sedimentation. This would include careful location of site compounds, access tracks, stockpile sites and temporary working areas, as well as staging of work to minimise the extent and duration of disturbance to vegetation.
- All construction plant, equipment, vehicles and machinery would be maintained in accordance with manufacturer's specification in order to meet the requirements of the *Protection of the Environment Operations (POEO) Act, 1997* and associated regulations.
- Disturbed/exposed soil would be stabilised as quickly as possible.
- As part of the Plan, all erosion and sedimentation control measures would be maintained and checked weekly and after storm or rain events.
- Sediment fences or gravel bags with sediment fences would be used in preference to hay bales.
- Construction activities would be programmed to minimise the area of ground exposed to erosion at any one time.
- Temporary sediment control fences would be installed on the downhill side, and diversion drains on the uphill sides of stockpile sites, prior to stockpiling material.
- Stockpile materials would be placed a minimum of 5 metres away from the dripline of trees to be retained.



### 7.3 Air Quality

- During construction there would be no stockpiling or parking of equipment in areas where vegetation is protected.
- Should any spillage occur during works, the Environmental Adviser, Hunter Region, would be contacted immediately, and contaminants would be immediately contained, removed, treated (if necessary) and disposed of to the satisfaction of the EPA.
- If any activities are likely to cause pollution of nearby waterways, a licence would be obtained for the works under the PoEO Act.; and
- During construction, an appropriate spill containment kit would be kept on site at all times.
- If any spoil is being transported to or from the study area, it would be covered. All disturbed soil would be stabilised as soon as possible to minimise erosion.
- Vehicles using public roads to import material to the study area or remove excess or unsuitable material from the study area subject to being wind blown would have their loads covered.

### 7.4 Noise and Vibration

- Best management practices would be adopted that are consistent with the RTA's Environmental Noise Management Manual, 2001.
- Nearby residents would be notified prior to the works commencing and a contact number for complaints would be provided.
- All construction plant and equipment used on the site would, in addition to other requirements, be fitted with properly maintained noise suppression devices in accordance with the manufacturer's recommendations; maintained in an efficient condition; and operated in a proper and efficient manner.
- Construction activities would be undertaken in accordance with the EPA recommended hours of:

Monday-Friday: 7.00am to 6.00pm

Saturday: 8.00am to 1.00pm

Sunday and Public Holidays: No work

- For work performed outside standard working hours the consultation procedure for Road Maintenance Undertaken Outside Normal Working Hours and *Practice Note vii (Noiseworks after Normal Hours)* of the RTA's Noise Management Guidelines would be followed.

### 7.5 Biodiversity

- Flora and fauna would be managed during the maintenance activities in accordance with Sections 6.9 (Vegetation), 6.10 (Fauna) and Section 6.18 (Restoration of Site) of the RTA's QA Specification G36.

	<ul style="list-style-type: none"> <li>• Revegetation of previously cleared areas within the Proposal Site would be carried out on completion of construction works using locally indigenous native species, preferably propagated from locally collected seed stock. A range of groundcover, shrub and larger tree species would be included.</li> <li>• Construction methods would be employed that would minimise the spreading or introduction of weeds caused by construction activity on or around the site.</li> <li>• If any fauna that would be affected were found in vegetation to be trimmed or removed, WIRES would be called to remove the animal(s).</li> <li>• Should areas be found to be affected by contaminated waste, all works would cease and the following mitigative measures would be adopted: <ul style="list-style-type: none"> <li>- Contaminated waste would be identified and classified by a suitably qualified consultant.</li> <li>- Contaminated waste identified or generated during the Proposal would be disposed in accordance with EPA guidelines. Any 'coal tar' would need to be removed if encountered to an authorised waste disposal site.</li> </ul> </li> </ul>
<b>7.6 Contaminated land</b>	
<b>7.7 Visual amenity</b>	<ul style="list-style-type: none"> <li>• The Landscaping and Urban Design Plan (<b>Appendix C</b>) would be implemented as part of the Proposal.</li> </ul>
<b>7.8 Socio Economic</b>	<ul style="list-style-type: none"> <li>• Traffic would be managed during construction works in accordance with Section 6.4 (Access and Traffic Management) of the RTAs QA Specification G36; and</li> <li>• Existing access to Wyong Hospital and Kanwal Medical Centre would be maintained throughout the proposed works.</li> <li>• Should work be required outside of the standard working hours, the procedure contained in the RTA Noise Management Manual, "Practice Note vii – Roadworks Outside of Normal Working Hours" would be followed.</li> </ul>
<b>7.9 Traffic management</b>	<ul style="list-style-type: none"> <li>• A Traffic Control Plan would be prepared and implemented during the construction period in accordance with the RTA's <i>Traffic Control At Work Sites Volume 2</i>, and <i>AS 1742.3 Manual of uniform traffic control devices Part 3: Traffic control devices for works on roads</i>.</li> <li>• A Communications Plan would be developed to ensure the community is notified of the works and any changes to access during construction.</li> <li>• Existing access to Wyong Hospital and Kanwal Medical Centre would be maintained throughout the proposed works.</li> </ul>
<b>7.10 Waste Management</b>	<ul style="list-style-type: none"> <li>• The management of waste would be undertaken in accordance with Section 6.17 (Waste Management) of the</li> </ul>



### 7.11 Indigenous Heritage

RTA's QA Specification G36.

- The management of waste would be undertaken in accordance with principles of the WARR Act.
- All works would be undertaken in accordance with Clause 6.14 "Indigenous Heritage" of the RTA's QA Specification *G36 Environmental Protection (Management Plan)*.
- Should any relic, artefact or material (including skeletal remains) suspected of being of Aboriginal origin be encountered, all construction work that might affect the item would cease, and the area would be protected from further damage or disturbance. The discovery would be reported to the RTA Environmental Adviser Hunter Region, RTA Aboriginal Liaison Officer and arrangements made for an officer of the National Parks and Wildlife Service and the Darkinjung Local Aboriginal Land Council to be consulted.

## 8 Consideration of Environmental Factors

8.1	Clause 228 Checklist (NSW Legislation)	Factor	Impact
		<b>a) Any environmental impact on a community?</b>	
		<i>Comments:</i>	
		Short-term negative impacts to the community would include disruption of traffic and minor noise impacts during construction.	Short term - ve
		Long term positive impacts to the local community include a safer pedestrian crossing of the Pacific Highway to access Wyong Hospital and the Kanwal Medical Centre. People travelling by bus would also benefit from the safer crossings. The intersection would be made safer as a result of the Proposal.	Long term + ve
		The associated landscaping works would improve the visual amenity of the area.	
		<b>b) Any transformation of a locality?</b>	
		<i>Comments:</i>	
		Transformation of the locality would include an improved access to the Hospital and Medical Centre. Urban design and landscaping treatments around the intersection and Hospital entrance would improve the visual amenity of the intersection.	Long term + ve
		<b>c) Any environmental impact on the ecosystems of the locality?</b>	
		<i>Comments:</i>	
		Potential short-term impacts on ecosystems would be during construction, which may include changes to water quality in the stream from sedimentation, and disturbance to fauna from noise and dust. However, the potential impacts would be mitigated by the measures described in Section 7.	+ ve
		In the long term, plantings to be incorporated as part of the Proposal would improve habitat for wildlife.	
		<b>d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</b>	
		<i>Comments:</i>	
		The proposed widening of the intersection has the potential to reduce the aesthetic value of the Study Area as it would become a construction site. The loss of some trees would negatively affect aesthetic	Short term -ve



value, however implementation of the landscape and urban design concept plan would improve the site's aesthetic value. Long term + ve

No recreational, scientific or other environmental quality would be reduced.

**e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?** Nil

*Comments:*

No such places or buildings are in the vicinity of the Proposal. There would be no impacts of this kind.

**f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)?**

*Comments:*

Nil

The Proposal would not impact on any protected fauna within the meaning of the *National Parks and Wildlife Act 1974*.

**g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?**

*Comments:*

No species would be placed in danger from the proposed works. The Proposal would impact a relatively small, previously disturbed area that has little natural value, having already been developed for roads and other uses. No impacts on protected or endangered species, communities, feeding resources or habitats are expected as a result of the Proposal. Nil

**h) Any long-term effects on the environment?**

*Comments:*

Long term + ve

The Proposal would result in long-term improvements to road safety and would not have any long-term negative effects on the environment.

**i) Any degradation of the quality of the environment?**

*Comments:*

Short term - ve

There would be potential short-term impacts on water and air quality due to soil disturbance during construction, however impacts would be mitigated by the implementation of the control measures outlined in Section 7.

Long term

In the long term there would be no degradation of the environment provided the safeguards outlined in Section 7 of this REF are implemented. +ve

The urban design and landscaping treatments around the intersection and Hospital entrance mean the overall upgrade would improve the visual amenity of the intersection.

**j) Any risk to the safety of the environment?**

*Comments:*

Short  
term

In the short term, there is a risk of spillage of chemicals as a result of construction activities and some risk for motorists, pedestrians and workers, as the works would be undertaken under trafficked conditions.

- ve

Long  
term  
+ ve

The Proposal would not cause any risk to the safety of the environment in the long term.

In the long term the Proposal would bring positive impacts by increasing the level of safety for road users, including cyclists, bus users, drivers and pedestrians.

**k) Any reduction in the range of beneficial uses of the environment?**

*Comments:*

There would be no reduction in the usefulness of the environment by the Proposal. The majority of affected environment is already used as a road or has been previously dedicated for road use. The segment that would be acquired from the Medical Centre would not have an adverse effect on that business.

Nil

**l) Any pollution of the environment?**

*Comments:*

There is potential for pollution of the environment during construction, including sediment and fuel/chemical spillages entering the local stream. This potential would be minimised through the implementation of safeguards outlined in this REF.

Possible  
Short  
term  
- ve

Noise levels would increase during construction.

**m) Any environmental problems associated with the disposal of waste?**

*Comments:*

Nil

No environmental problems would be caused by the disposal of waste. Waste generated as a result of the Proposal would be disposed of at approved waste disposal sites.



**n) Any increased demands on resources, natural or otherwise, which are, or are likely to become in short supply?**

*Comments:*

Nil

There would not be any increased demand on resources, natural or otherwise which are, or are likely to become in short supply.

**o) Any cumulative environmental effect with other existing or likely future activities?**

*Comments:*

The Proposal would not have any negative cumulative environmental effects. The upgrade would cater for future development already planned for the wider area, not encourage it without appropriate planning. Nil

**8.2 EPBC Act  
(Commonwealth  
Legislation)**

**Factor**

**Impact**

**a) Any environmental impact on a World Heritage property?**

*Comments:*

Nil

No World Heritage Properties exist within 20km of the Proposal.

**b) Any environmental impact on wetlands of international importance?**

*Comments:*

Nil

The Proposal is not within 20km of any wetlands of international importance.

**c) Any environmental impact on Commonwealth listed threatened species or ecological communities?**

*Comments:*

Nil

Threatened species potentially occur along the creekline south of the site (*Melaleuca biconvexa*, Glossy Black Cockatoo, Squirrel Glider), however they would not be affected by the Proposal with implementation of the mitigation measures described in Section 7 of this REF.

**d) Any environmental impact on Commonwealth listed migratory species?**

*Comments:*

Nil

The Proposal would not have any impact on Commonwealth listed migratory species.

**e) Does any part of the Proposal involve a nuclear action?**

*Comments:*

Nil

The Proposal would not involve a nuclear action.

**f) Any environmental impact on a Commonwealth marine area?**

*Comments:*

Nil

The Proposal would not impact on a Commonwealth marine area.



g) Any environmental impact on  
Commonwealth land?

*Comments:*

Nil

Commonwealth land would not be affected,  
indirectly or directly, as part of this Proposal.

## 9 Certification

This Review of Environmental Factors provides a true and fair review of the Proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the Proposal.



Name: Michael Griffiths  
Designation: Environmental Officer  
Date: 28/5/2003

I have examined this Review of Environmental Factors and the certification by Michael Griffiths and accept the Review of Environmental Factors on behalf of the RTA.



Name: Matthew Mate  
Designation: Project Development Manager  
Date:



## 10 References

Ecotone Ecological Consultants Pty Ltd, 'Report on Ecological Considerations Relevant to the Alignment of the Proposed Pacific Highway Upgrade from Tuggerah to Doyalson', August 1998.

Roads and Traffic Authority. 2001. Environmental Impact Assessment Guidelines, Version 4

Roads and Traffic Authority. 2001. RTA Environmental Noise Management Manual

Roads and Traffic Authority. 2001. RTA QA Specification G35 Environmental Protection (Management Plan)

Sue Effenberger, Prisma,. 'Tuggerah to Doyalson – Pacific Highway Route Development Study Cultural Heritage Assessment, Wyong LGA', February 1999.



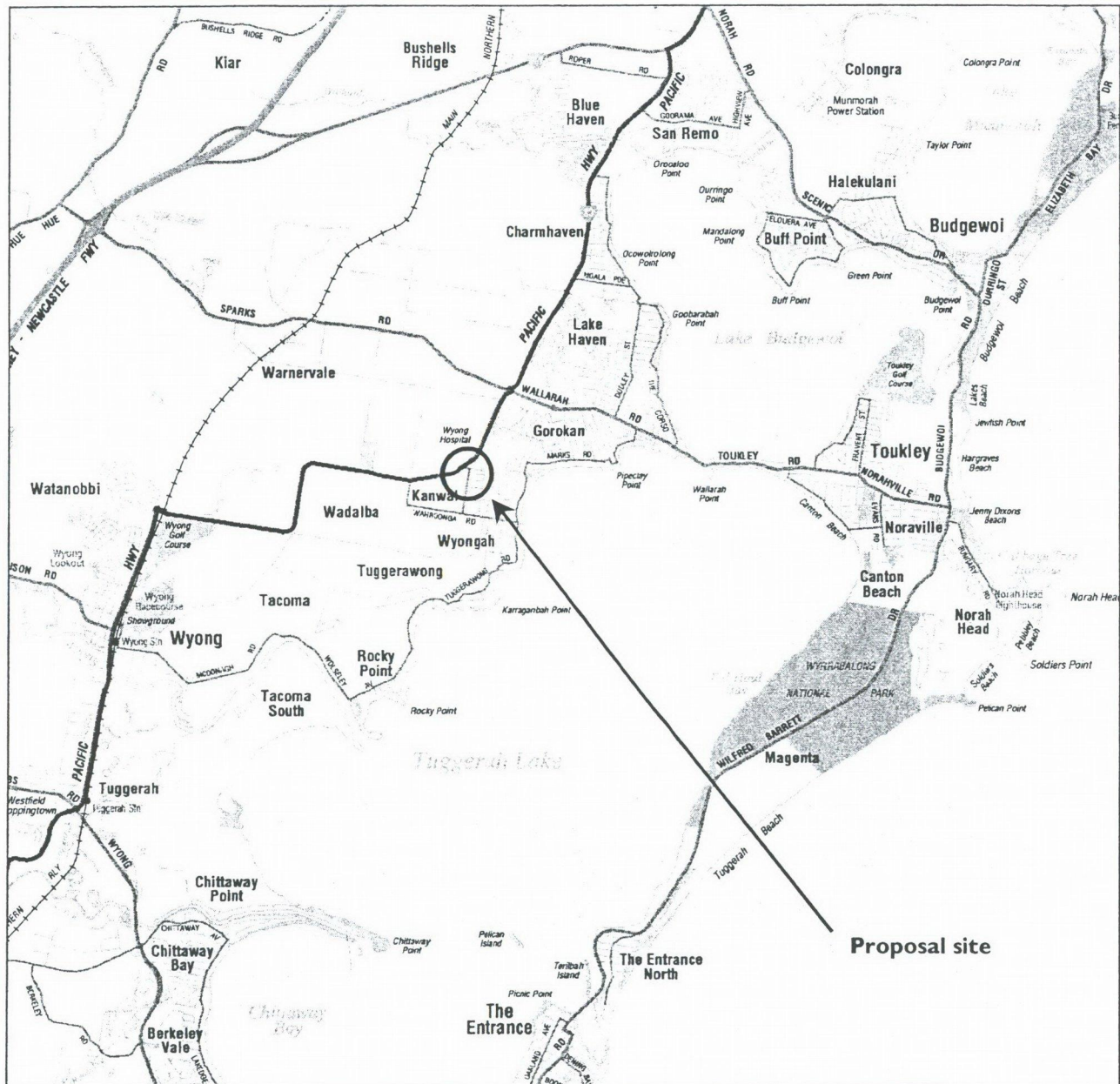
# Appendix A

## Location Maps



## Map 1: Location of Proposal Site

Proposed Upgrade of the Intersection of SH10 Pacific Highway and Craigie Avenue, Kanwal

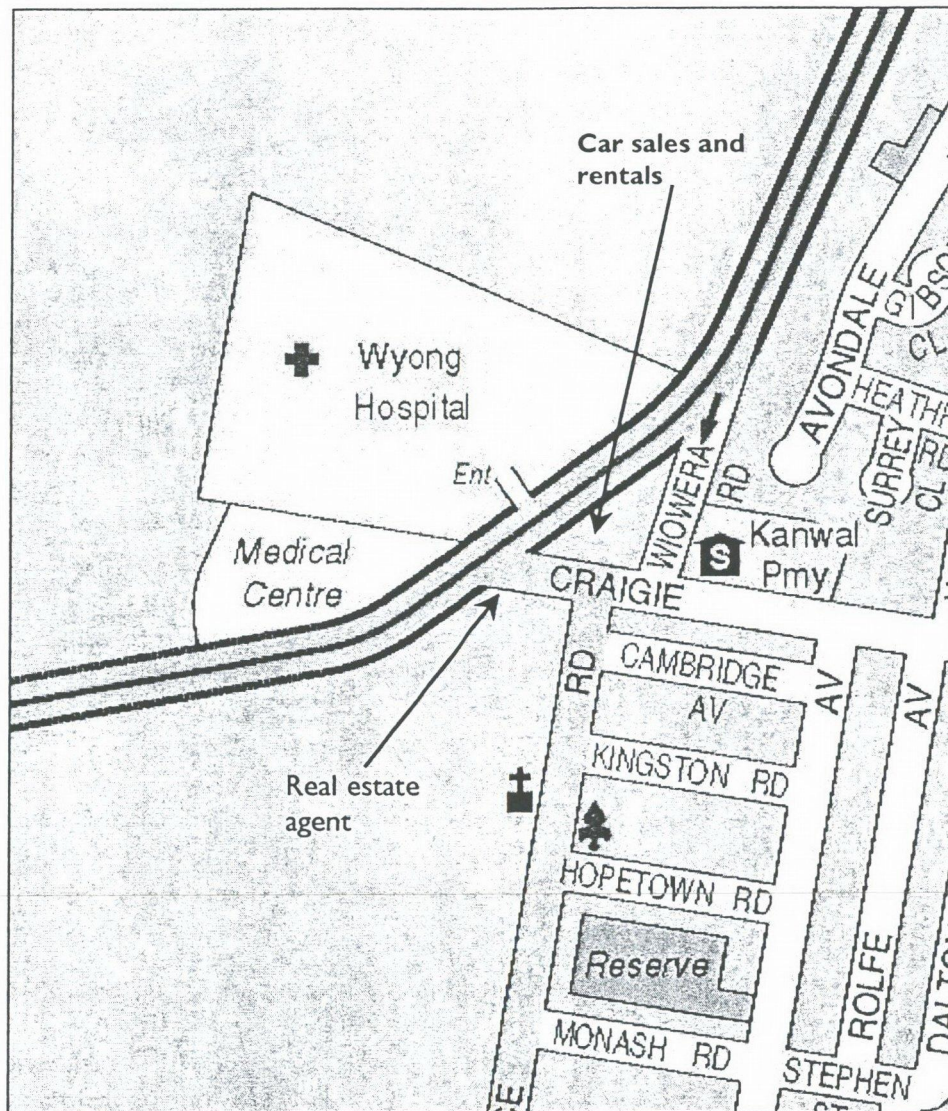


Scale: 1:100 000



## Map 2: Proposal site

Proposed Upgrade of the Intersection of SH10 Pacific Highway and Craigie Avenue, Kanwal





## Appendix B

### Photographs of the Site





**Plate 1:** View south west across the intersection from the car sales/rentals corner. To the left of the picture the Kanwal Medical Centre can be seen. Part of the Wyong Hospital car park can also be seen across the Pacific Highway. The proposed fourth leg would link to the hospital network through this area

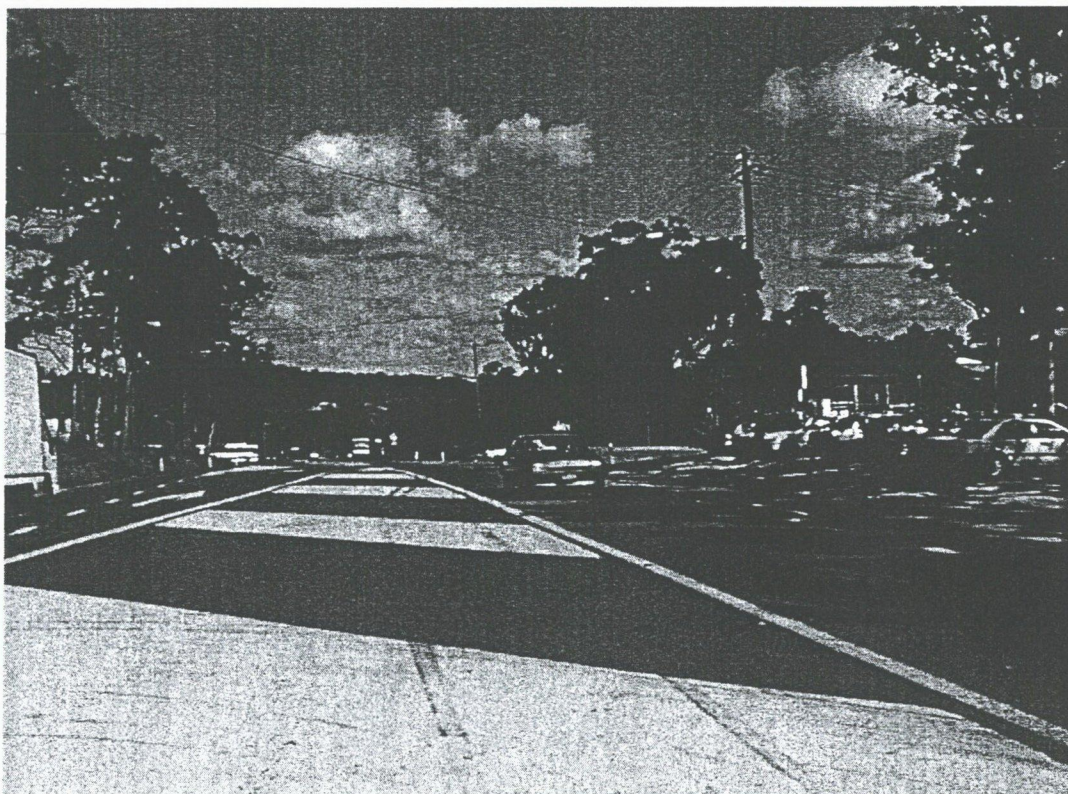


**Plate 2:** View west along Craigie Avenue towards the intersection, showing the car sales/rental business on the right.





**Plate 3:** View north along the Pacific Highway, away from the intersection. The trees shown in this picture would not be disturbed by the Proposal.



**Plate 4:** View south along the Pacific Highway towards the intersection with Craigie Avenue. To the right is some external car parking used by the hospital.





**Plate 5:** View south along the Pacific Highway, from slightly north of Plate 4. To the right is the bus stop (there is also one to the left outside the picture), and in the centre is median refuge crossing currently provided for pedestrians.



# Appendix C

## Urban Design Report



**Roads & Traffic Authority**

***PACIFIC HIGHWAY & CRAIGIE AVE  
INTERSECTION UPGRADE***  
NORTH WYONG

**ANDREWS NEIL**  
ARCHITECTS PLANNERS ECOLOGISTS LANDSCAPE CONSULTANTS

November 2001



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- 2.0 LOCATION
- 3.0 SITE ANALYSIS
  - 3.1 Pedestrian Desire Lines
  - 3.2 Overhead Services
  - 3.3 Existing Vegetation
    - 3.3.1 Species List
  - 3.4 Opportunities and Constraints
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- |          |                                       |
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| Figure 1 | Location Plan                         |
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| Figure 6 | Landscape / Urban Design Concept Plan |

ANDREWS NEIL  
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## **1.0 INTRODUCTION**

Andrews Neil have been engaged by the Roads & Traffic Authority (RTA) to prepare the Urban and Landscape Design principles for the proposed upgrade of the Pacific Highway and Craigie Avenue intersection, Kanwal. The works include a redesign of the current entry to Wyong Hospital and the Kanwal Medical Centre.

Landscape and Urban Design Principles will address the treatment and location of footpaths, bus stops, landscaping and the general appearance of the intersection. As part of the report Andrews Neil have prepared a site analysis, concept plan and perspective to convey the general landscape and engineering design principles.

## **2.0 LOCATION**

The site is located along the Pacific Highway, approximately, 350 metres both sides of the existing entry to Wyong Hospital. The Craigie Avenue/Pacific Highway intersection is located at the southern portion of the hospital site, opposite the Kanwal Medical Centre. (Refer to Figure 1.)

Adjoining landuses to the proposed works include the Kanwal Medical Centre, Wyong Hospital, car dealership, a small commercial centre located on the southern side of Craigie Avenue and an unoccupied service station opposite the existing hospital entry. An exposed batter with isolated Spotted Gums (*Corymbia maculata*) exists on the eastern side of the highway. The hospital frontage also contains a number of isolated native trees with a grassy understorey.

## **3.0 SITE ANALYSIS**

The suburb of Kanwal and its surrounds are characterised by a rural residential landscape interspersed by new residential subdivisions. Landuse in the area primarily centred around small scale agricultural based activities and more recently new residential subdivisions, have resulted in the development of schools, shopping and commercial precincts. The increased number of residents has necessitated the need for improved pedestrian safety and access to the hospital and medical centre.

A site analysis has been prepared to assist with the planning and design of an improved pedestrian network to access the hospital and medical centre.

### **3.1 Pedestrian Desire Lines**

Figure 2 indicates the existing, preferred movement of pedestrians to the hospital and medical centre. Current pedestrian access over the Pacific Highway is via a pedestrian refuge island opposite the existing bus stop, approximately 50 metres north east of the existing entry. There are no pedestrian footpaths to connect pedestrians with the hospital or medical centre from the crossing point.

The highway edge to the hospital is characterised by drainage swales of bitumen and grass with kerb and guttering occurring only at the immediate intersections. The uneven surfaces, lack of footpaths and difficult road crossing has resulted in unsafe access for pedestrians.

### **3.2 Overhead Services**

Overhead services generally run along the north western side of the highway as indicated in Figure 3. The existing trees in front of the hospital partially screen the power lines and provide a sense of scale to the poles.

It is proposed that the power lines will be relocated closer to the hospital as part of the construction works. Proposed street tree plantings should consider the proposed location of overhead lines as a constraint and select appropriate species. Alternatively, locating street trees away from the powerlines should also be an option providing the required clearance is achieved.



### 3.3 Vegetation

Figure 4 outlines the areas of vegetation affected by the works. The dominant canopy species on both sides of the highway is Spotted Gum (*Corymbia maculata*), which create a natural corridor as shown in Photo 1 on Figure 4. The trees have very little understorey which is dominated by turf in front of the hospital. On the opposite side of the highway the trees are contained on an exposed batter with no soil binding understorey.

Areas to the north and south of the proposed works are the least affected as there is less significant vegetation and the main road widening proposals occur at the intersection. Proposed batter works and road widening will affect some mature trees. The likely removal of vegetation as indicated in Figure 4 will not affect the natural corridor, however, removal of trees on the eastern side of the highway to accommodate any proposed batter works may result in a significant visual impact.

#### 3.3.1 Species List

Following is a list of species encountered within the site;

*Allocasuarina littoralis*  
*Angohpora costata*  
*Acacia longifolia*  
*Casuarina glauca*  
*Daviesia ulicifolia*  
*Lomandra longifolia*  
*Melaleuca decora*  
*Melaleuca nodosa*  
*Melaleuca sieberi*

A number of weed and grass species also occur frequently throughout the site.

### 3.4 Opportunities and Constraints

Figure 5 outlines the opportunities and constraints in relation to urban and landscape design principles.

#### 4.0 VISUAL IMPACT

The project will have a significant impact given that the road corridor is to be widened and traffic signals installed. However, this impact is likely to be an improvement to the area given that the following landscape & urban design principles have been adopted;

- All disturbed areas are to be planted with tree and shrubs species to reflect the local character.
- Pedestrian paths have been provided throughout the proposal to ensure pedestrian safety. The current situation does not include formed pathways.
- Existing exposed batter to the north of Craigie Avenue is proposed to be stabilised with appropriate soil binding native species.
- Where traffic medians are 5m wide it is proposed to plant with low growing species and native trees. This will visually break up the extent of hard surfaces and provide a visual key to the location of the intersection.

The existing entry lacks identification and can be easily missed. The new proposal will highlight the entry with landscaping and signage. Landscaping will reflect the existing character by incorporating locally significant trees such as *Casuarina glauca* at the lower, southern end and *Corymbia maculata* on the ridge.

### 5.0 LANDSCAPE & URBAN DESIGN PRINCIPLES

#### Sightlines

Landscaping should not affect the vision of pedestrians or drivers, therefore, planting should be limited to groundcovers at intersections and pedestrian crossings to maintain sightlines.



### **Low Maintenance**

Landscaping should reflect the scale of the road by employing a broad scale approach to planting design. Broadscale planting themes are preferred over small garden areas. Mass planting areas allow large expanses of the same species to be planted in groups which tends to reduce maintenance.

When planting, the following principles should be adopted to reduce the likelihood of weed invasion;

- Use two applications of a non residual glyphosate herbicide.
- Mulch to 75mm depth.
- High plant densities.
- Edging between turf and mass planting areas.
- The use of endemic species and site soils will assist with the rapid establishment of the landscape.

Landscaping should consider the maintenance regime and who is likely to carry out the ongoing maintenance. Generally, areas such as batters will be left un-maintained following the required maintenance period. Areas such as clearance zones and drainage swales should be planted with species tolerant of regular slashing eg: turf or native grasses.

### **Reflect the Existing Landscape Character**

Landscaping should address the local character of the area, this provides interest along the road when it passes through different landscape types. This is easily achieved through the appropriate selection of plant species and colour and material finishes of built elements.

### **Pedestrian Links**

It is preferable for pedestrian paths to be located separately from the road or to have a kerb or other physical means of separation from the traffic lanes. Pedestrian paths should be designed to link with all bus stops and crossing points. The use of shrubs adjacent to paths is to be avoided to ensure that sightlines are maintained.

### **Drainage Swales**

Maintenance of drainage swales generally includes slashing to ensure that flows are not impeded. Drainage swale surfaces should be turfed or planted with native grass species tolerant of periodic inundation.

### **Batters & Cuttings**

Batters and cuttings are preferable to retaining walls as they can accommodate landscaping to soften the impact of the road construction. Batter slopes are preferred at 1:3, however, 1:2 can be accommodated with stabilisation fabrics or spray on soil binders.

### **Planting Versus Seeding**

Seeding with native tree and shrub species is the most economical way to achieve a landscaped effect in broadscale projects. Native grasses tend not to perform as well from seed as trees and shrubs. Planting of native grasses in virocells is a more viable method for achieving a low, easily maintained cover.

Planting provides an instant landscaped effect and is especially useful when making a feature of a particular area eg; at intersections, crossings or significant cultural/historic sites. Planting is generally more expensive than seeding and allows the designer more flexibility to create features or highlight selected areas. A combination of seeding and planting can be used to achieve an attractive and economical solution to landscaping.

## **6.0 CONCLUSION**

The proposed landscape concept plan has incorporated the recommended landscape and urban design principles where appropriate. The plan allows for new areas of landscaping as well as the rectification of existing areas such as the exposed batter to the north of the proposed intersection. The plan has been designed to ensure that the landscape will be easily managed and a reflection of the natural vegetation

communities.

Vehicular access to the hospital will also be improved as the intersection will be highlighted with landscaping and signage. The existing entry will be paved and used for emergency access only, removeable bollards will be installed to prevent unauthorised use.

The overall upgrade will improve both pedestrian and vehicular safety as well as the visual amenity of the intersection.



[illegible]

The map shows the town of Wyong, Australia, with a grid of streets and a central area labeled 'Wyong Hospital'. To the left of the hospital is a 'Medical Centre'. The town is situated along a river or coastline, with a 'Harbour' and 'Village' area on the left. The map includes labels for 'Karnival' and 'Wyong'. The map is oriented with North at the top.

**Aerial view**



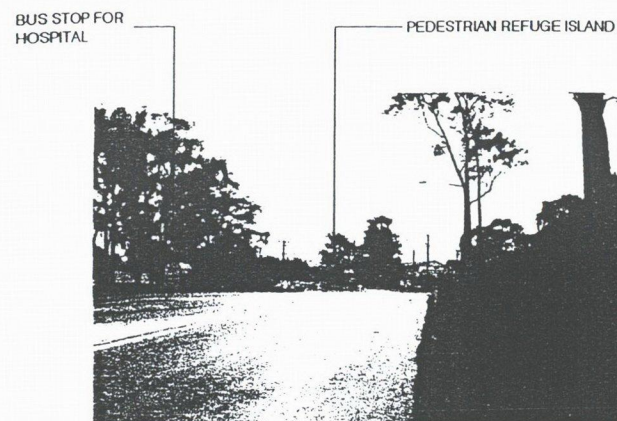


PHOTO 1. NO FORMAL PATHS EXIST ADJACENT TO THE HIGHWAY OR ALONG PEDESTRIAN DESIRE LINES. PEDESTRIAN ACCESS TO THE HOSPITAL AND MEDICAL CENTER IS IN THE FORM OF A REFUGE ISLAND IN THE MIDDLE OF THE HIGHWAY

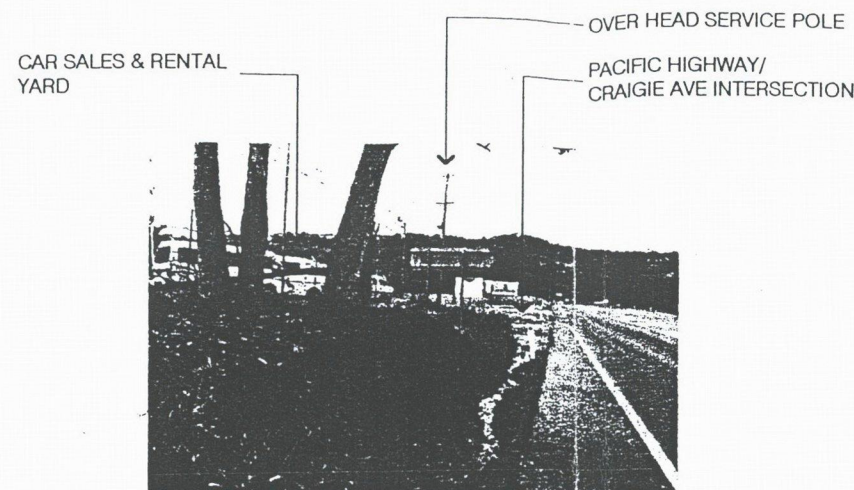


PHOTO 2. PHOTOGRAPH SHOWS EXISTING BATTER AND DRAINAGE SWALE. EXPOSED TREE ROOTS AND LITTLE VEGETATION EXIST ON THE STEEP BATTER.

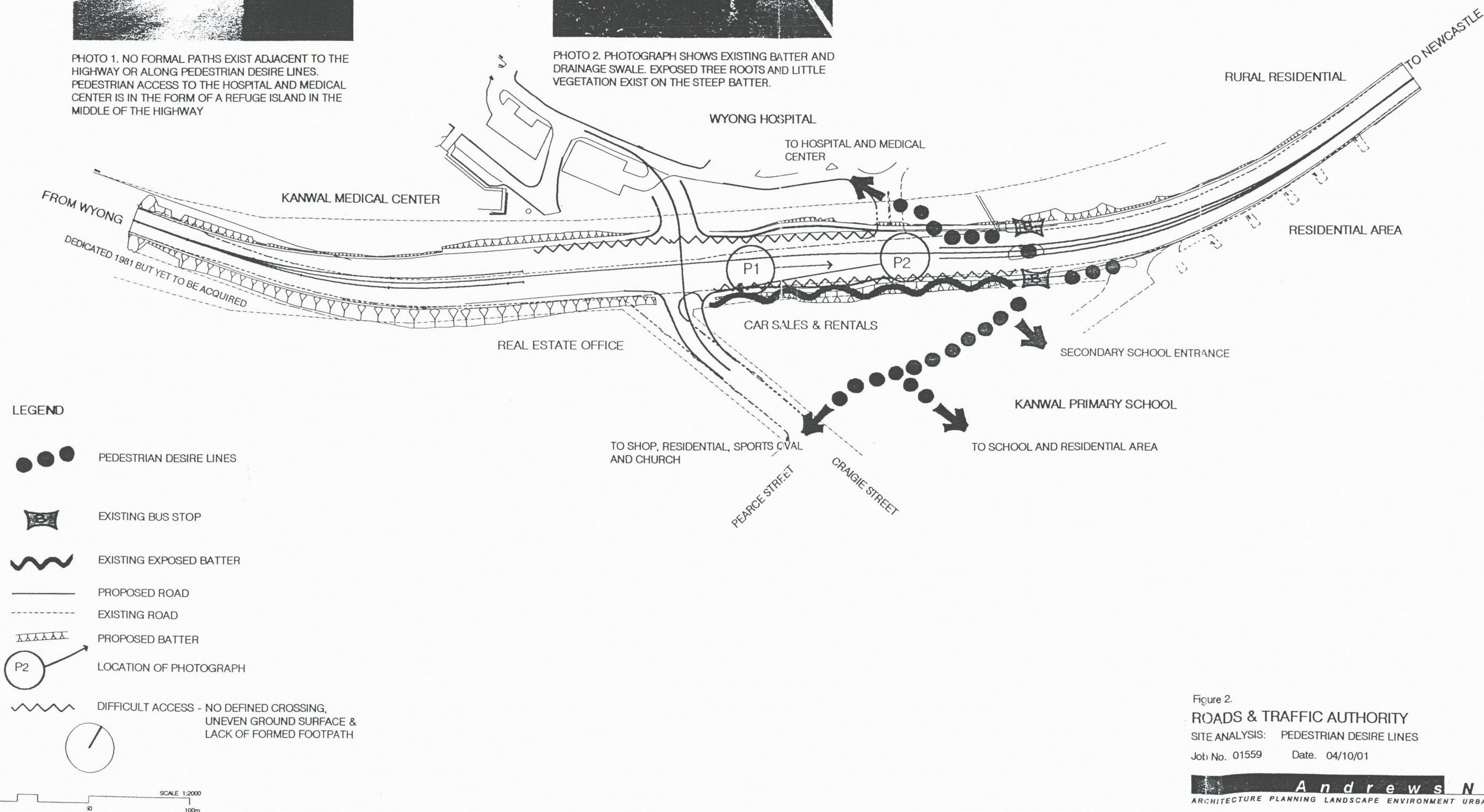


Figure 2.  
ROADS & TRAFFIC AUTHORITY  
SITE ANALYSIS: PEDESTRIAN DESIRE LINES  
Job No. 01559 Date. 04/10/01



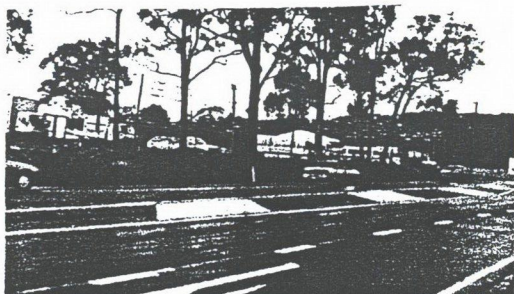
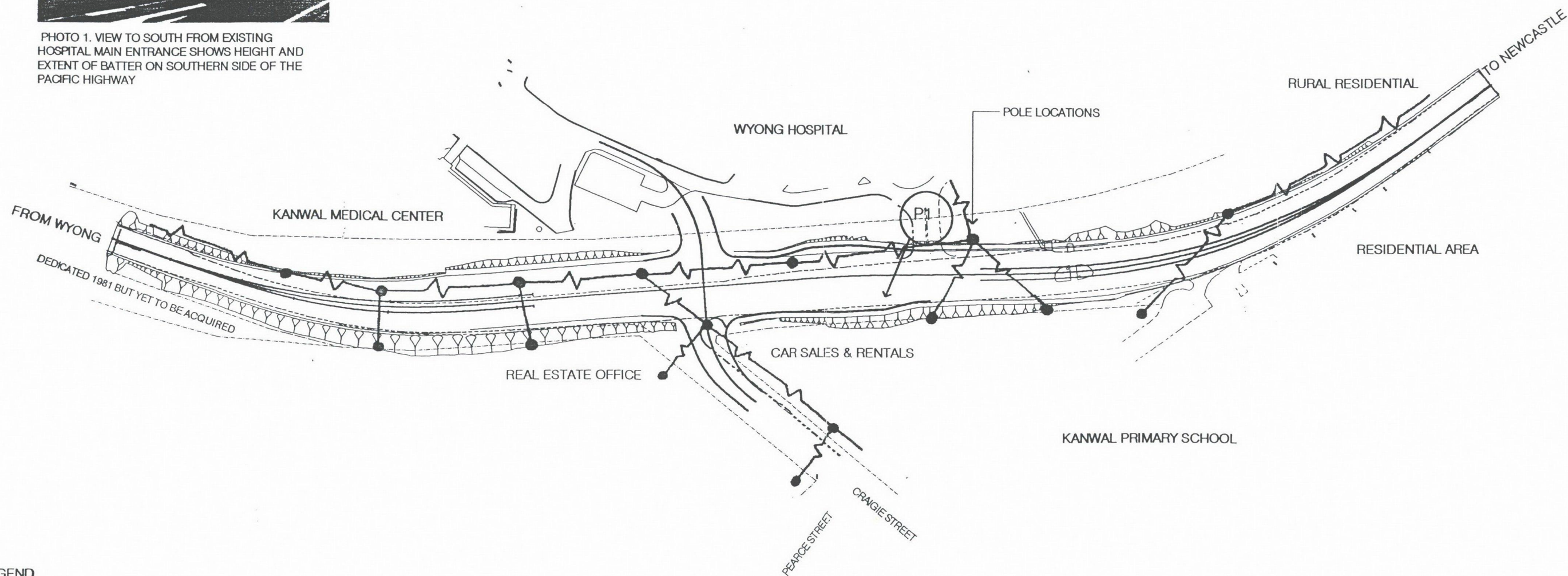


PHOTO 1. VIEW TO SOUTH FROM EXISTING HOSPITAL MAIN ENTRANCE SHOWS HEIGHT AND EXTENT OF BATTER ON SOUTHERN SIDE OF THE PACIFIC HIGHWAY



LEGEND

- OVER HEAD SERVICES
- PROPOSED ROAD
- EXISTING ROAD
- PROPOSED BATTER
- LOCATION OF PHOTOGRAPH



SCALE 1:2000  
50 100m

Figure 3.  
ROADS & TRAFFIC AUTHORITY  
SITE ANALYSIS: OVER HEAD SERVICES  
Job No. 01559 Date. 04/10/01

**Andrews Neil**  
ARCHITECTURE PLANNING LANDSCAPE ENVIRONMENT URBAN DESIGN



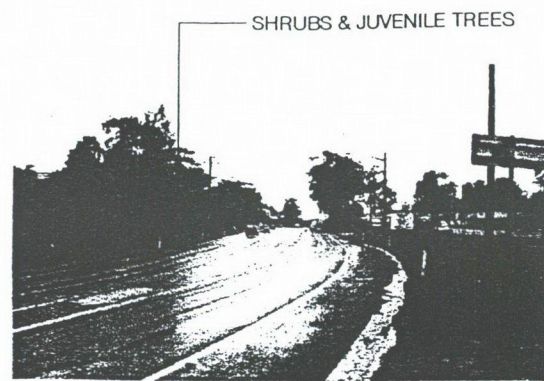


PHOTO 1. LOOKING EAST ALONG PACIFIC HIGHWAY SHOWING SHRUBS AND REMNANT TREES.

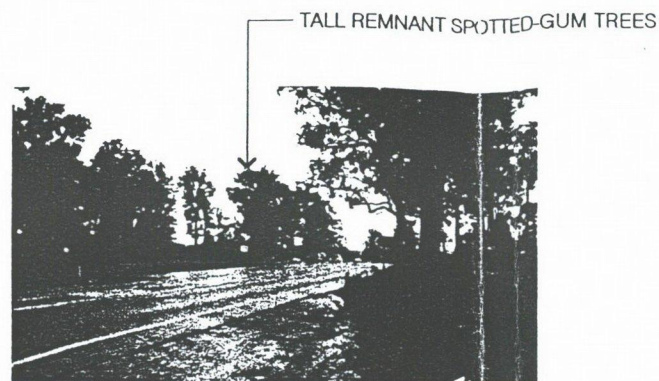
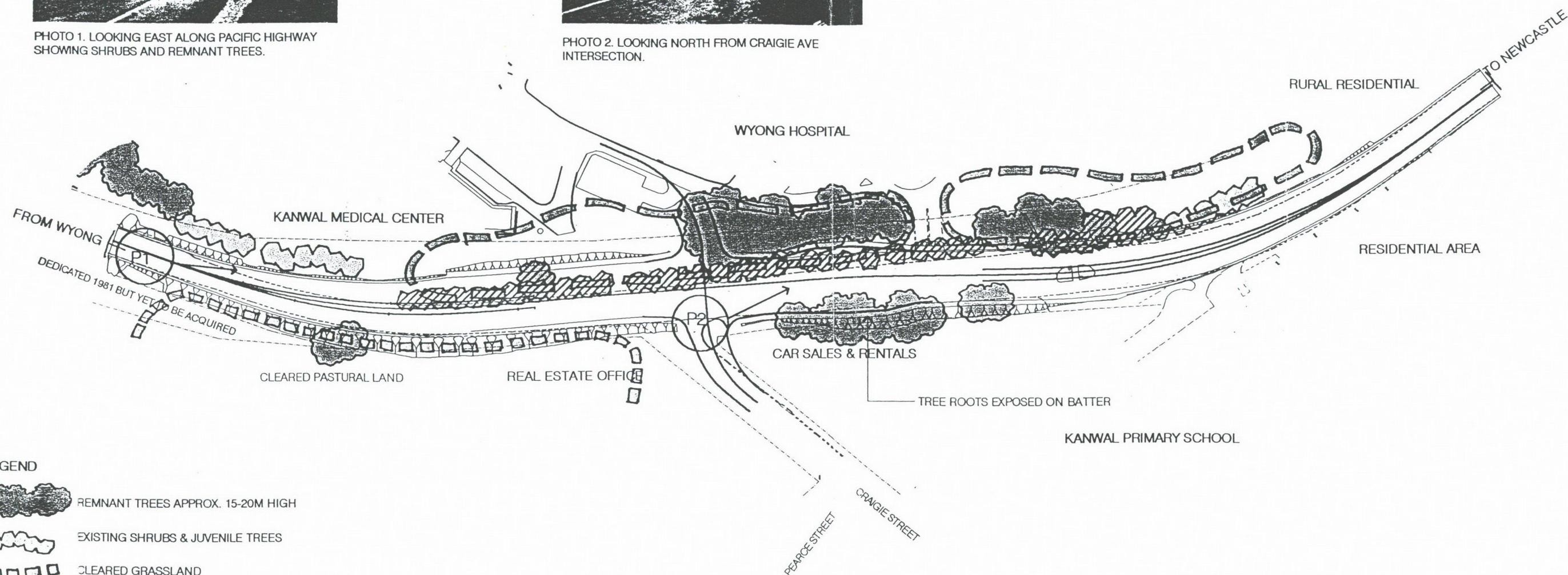


PHOTO 2. LOOKING NORTH FROM CRAIGIE AVE INTERSECTION.



# LEGEND

- REMNANT TREES APPROX. 15-20M HIGH
- EXISTING SHRUBS & JUVENILE TREES
- CLEARED GRASSLAND
- TURFED AREAS
- PROPOSED ROAD
- EXISTING ROAD
- PROPOSED BATTER
- LOCATION OF PHOTOGRAPH
- VEGETATION LIKELY TO BE REMOVED



SCALE 1:2000  
50 100m

Figure 4.

ROADS & TRAFFIC AUTHORITY

SITE ANALYSIS: EXISTING VEGETATION

Job No. 01559

Date. 04/10/01

**Andrews Neil**  
ARCHITECTURE PLANNING LANDSCAPE ENVIRONMENT URBAN DESIGN



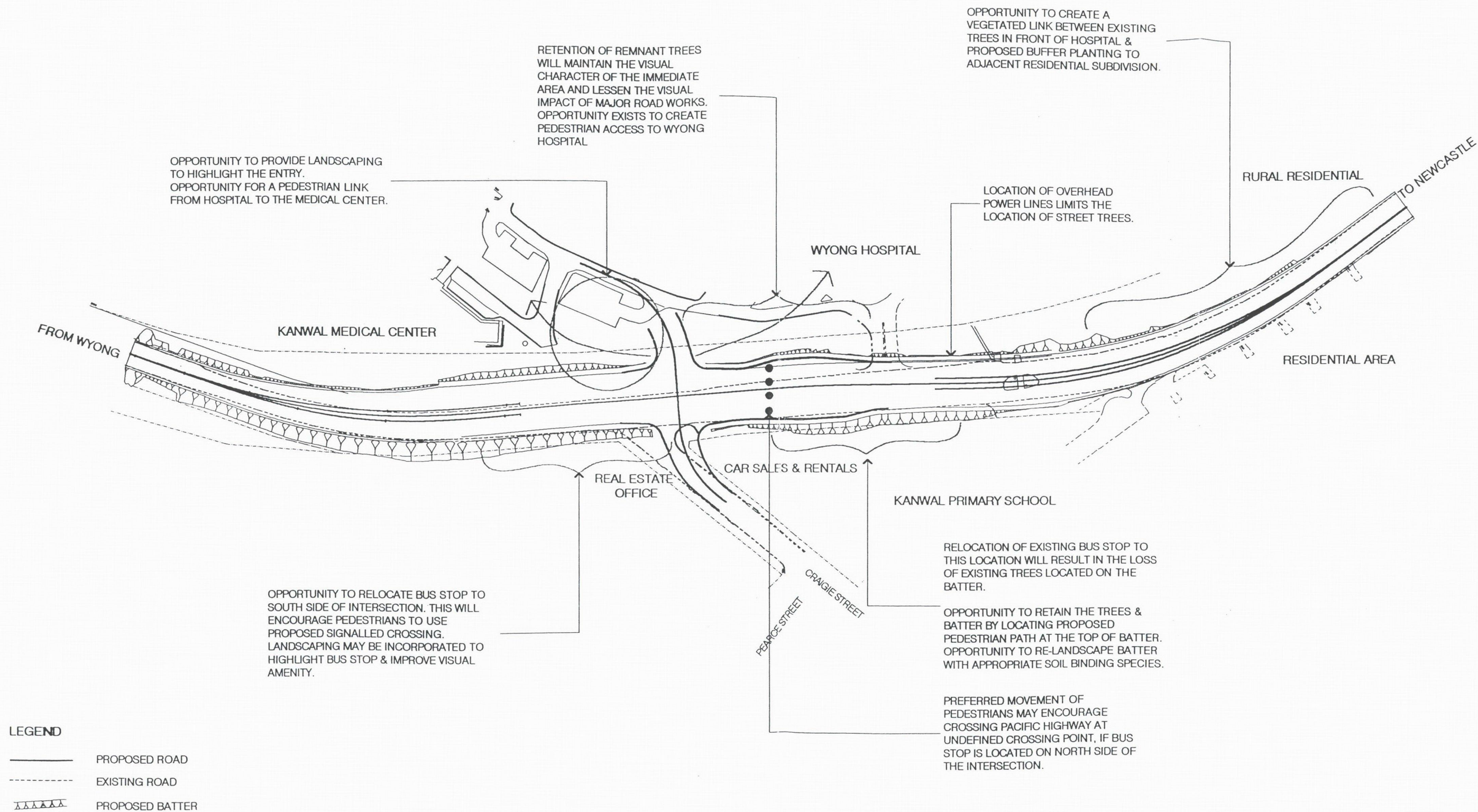


Figure 5.

# ROADS & TRAFFIC AUTHORITY

SITE ANALYSIS: OPPORTUNITIES & CONSTRAINTS

Job No. 01559

Date. 04/10/01

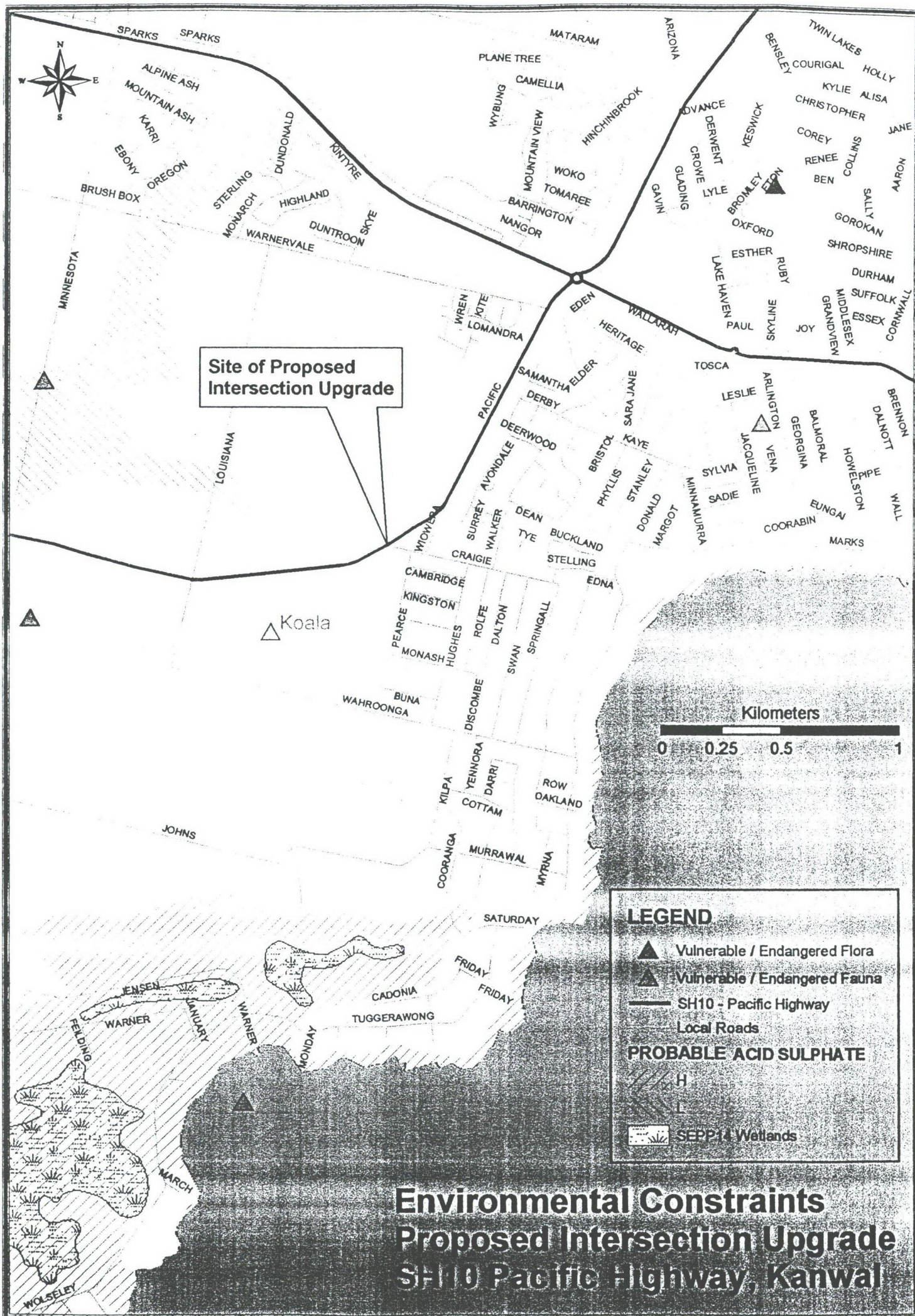
**Andrews Neil**  
ARCHITECTURE PLANNING LANDSCAPE ENVIRONMENT URBAN DESIGN



## Appendix D

### Environmental Constraints Map



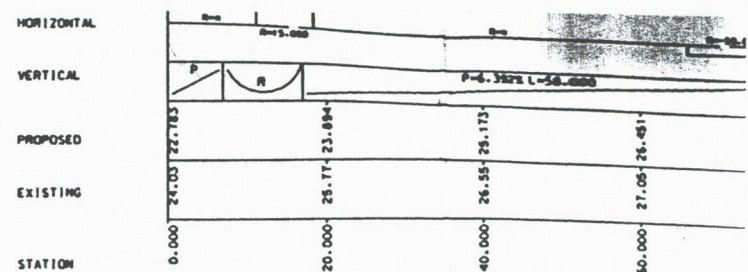
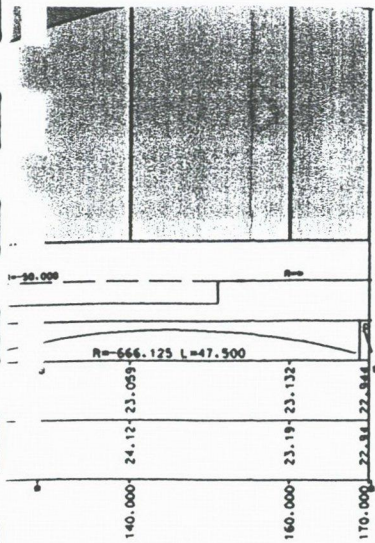




# Appendix E

## Concept Design Plans

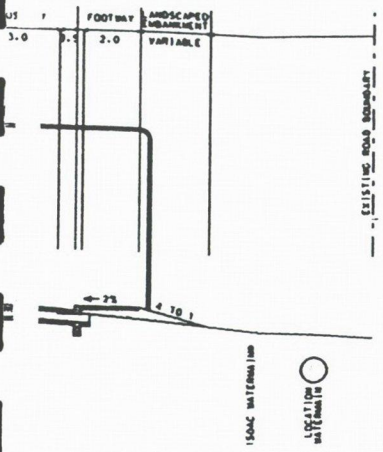
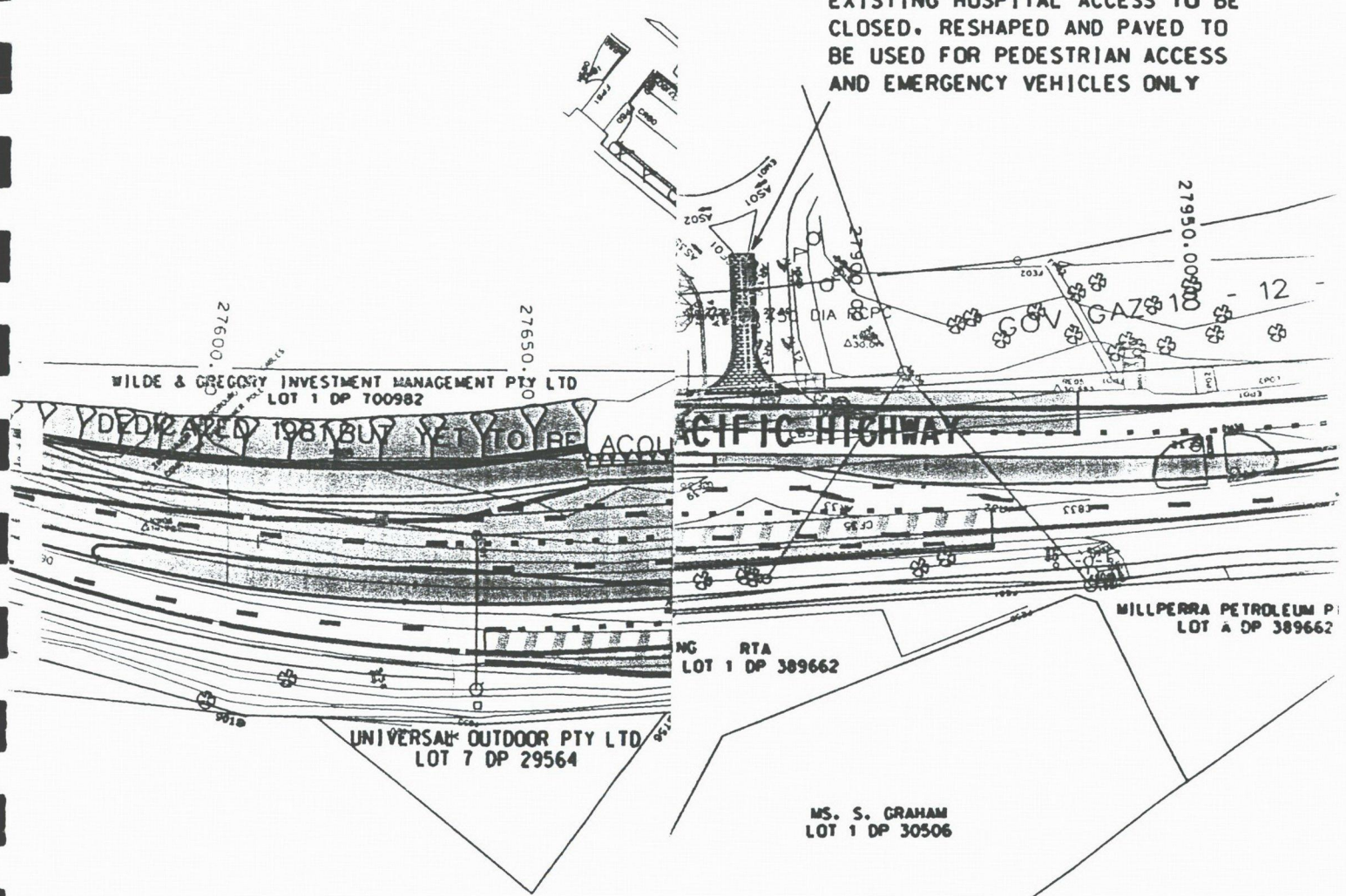




LONGITUDINAL SECTION  
ALONG MINOR ACCESS TO HOSPITAL

SCALE  
H 1:500  
V 1:50

EXISTING HOSPITAL ACCESS TO BE  
CLOSED. RESHAPED AND PAVED TO  
BE USED FOR PEDESTRIAN ACCESS  
AND EMERGENCY VEHICLES ONLY



FOOTWAY	BUS BAY	CYCLE WAY	NORTH BOUND TRAVEL LANE	NORTH BOUND TRAVEL LANE	RAISED MEDIAN	RIGHT TURN BAY	SOUTH BOUND TRAVEL LANE
2.0	3.0	1.5	3.5	3.5	1.8	3.5	3.5
						CONTROL	



# Appendix F

## Traffic Study



**RTA**

# **Proposed Signalised Access to Wyong Hospital**

# **Review of Intersection Performance**

**Prepared by**

**Northern Transport Planning and Engineering Pty Ltd**

**A.B.N. 79 056 088 629**

**Oct 2001**



Table 4-2: SIDRA Analysis– Year 2011 PM Peak Layout 1

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy	Left Turn	60/2	C	29.0	13
	Northbound	Through	839/46	B	24.8	105
		Right Turn	121/0	C	40.6	30
		Craigie Ave	Left Turn	107/0	B	26.7
	Westbound	Through	16/0	B	26.7	24
		Right Turn	64/6	D	46.6	21
		Pacific Hwy	Left Turn	22/2	B	27.2
	Southbound	Through	548/53	B	20.8	76
		Right Turn	189/9	C	40.4	52
		Hospital Access	Left Turn	300/0	B	25.8
	Eastbound	Through	19/2	B	25.8	60
Right Turn		92/3	C	39.9	25	
INTERSECTION				B	27.5	



## 1. Introduction

This report provides an assessment of the performance of the proposed Signalised Intersection of the access to the Wyong Hospital and Craigie Avenue.

This new intersection is designed to align with Craigie Avenue to accommodate the combined turning movements for these two intersections.

These Traffic Signals will also accommodate existing and predicted pedestrian movements to and from the Wyong Hospital and to a nearby school.

Consideration has been given to the growth in traffic flows on Pacific Highway and to expansion of facilities within the Wyong Hospital campus.

The following three alternative intersection layouts have been used to assess the performance of the proposed new intersection:

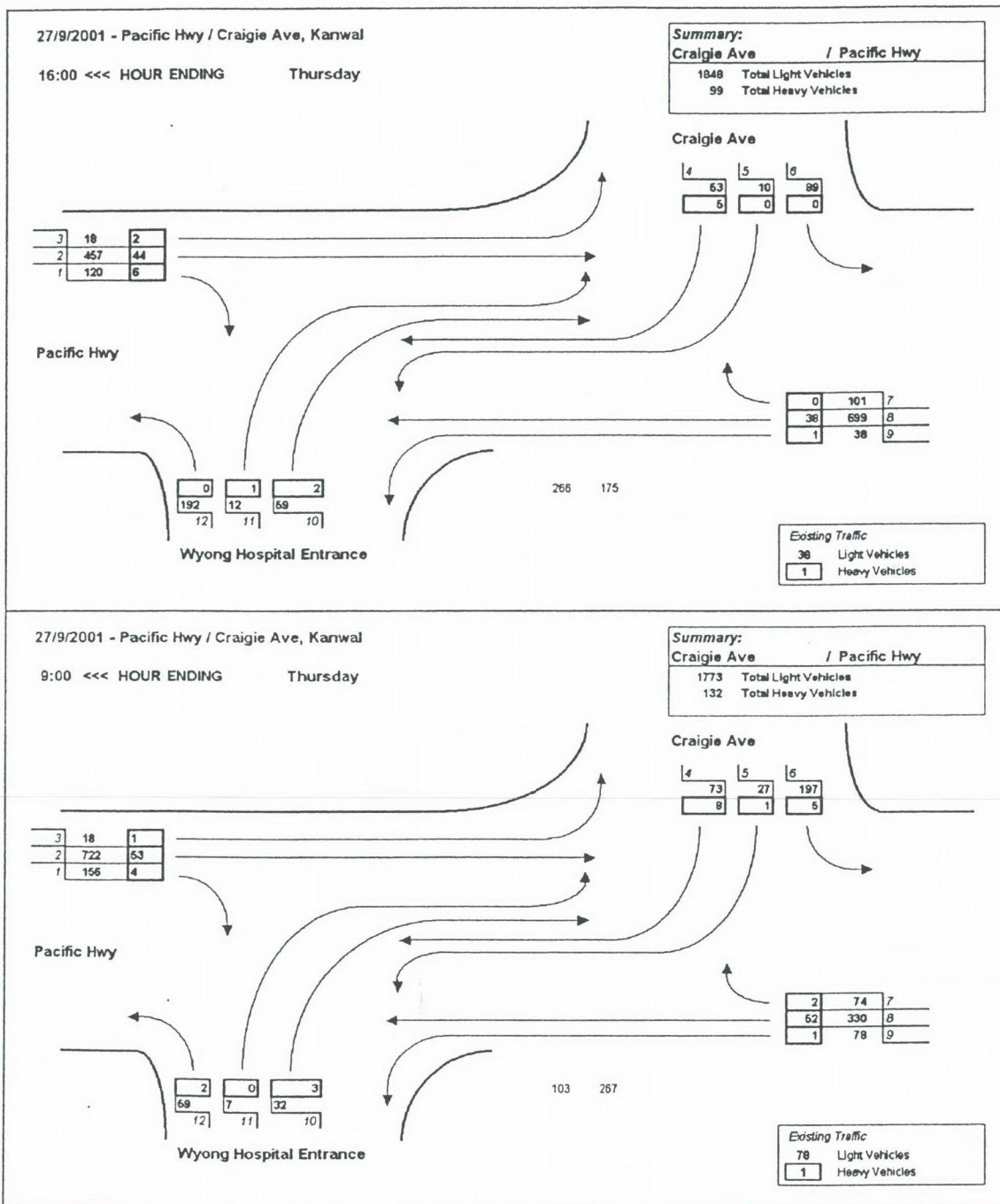
<i>Layout Options</i>	<i>Main Characteristics</i>	<i>Years Tested</i>
Alternative 1	4 through lanes on Pacific Hwy plus 150 metre right turn lane into Wyong Hospital Plus turning lanes on other approaches	2021 & 2011
Alternative 2	Four lanes on Pacific Hwy plus 85 metre right turn lane into Wyong Hospital Plus shorter turning lanes on other approaches	2011
Alternative 3	2 Northbound through lanes and 1 southbound through lane on Pacific Hwy plus 85 metre right turn lane into Wyong Hospital Plus shorter turning lanes on other approaches	2011

Details of these alternatives layouts are attached as Appendix D.



## 2. Existing Traffic

Surveys were carried out on Thursday 27<sup>th</sup> September to record existing turning movements. A summary of the results of these surveys is presented below: (a full report is attached as Appendix A).





### 3. Future Traffic Flows

It is predicted that existing through traffic flows on the Pacific Highway will grow at a rate of 2% linear over the next 20 years.

Future development of the Wyong Hospital campus is also anticipated with the provision of additional facilities.

Discussions with Andrew Hulse of Arup Transportation Planning indicated that this expansion of facilities could lead to an increase of up to 40% in existing trip generation rates to the Hospital site. A summary of the predicted trip generation from the Hospital site is attached as Appendix C.

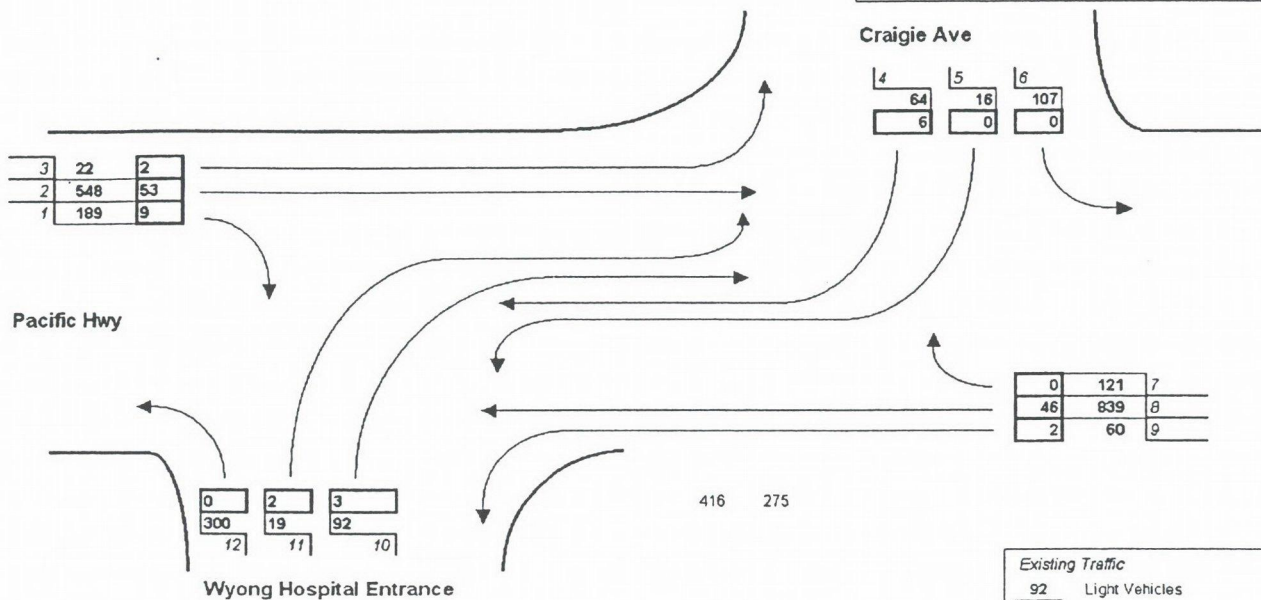
Both of these expected increases in traffic flows have been used to calculate future Year 2021 traffic flows.



# Predicted Year 2011 Traffic Flows

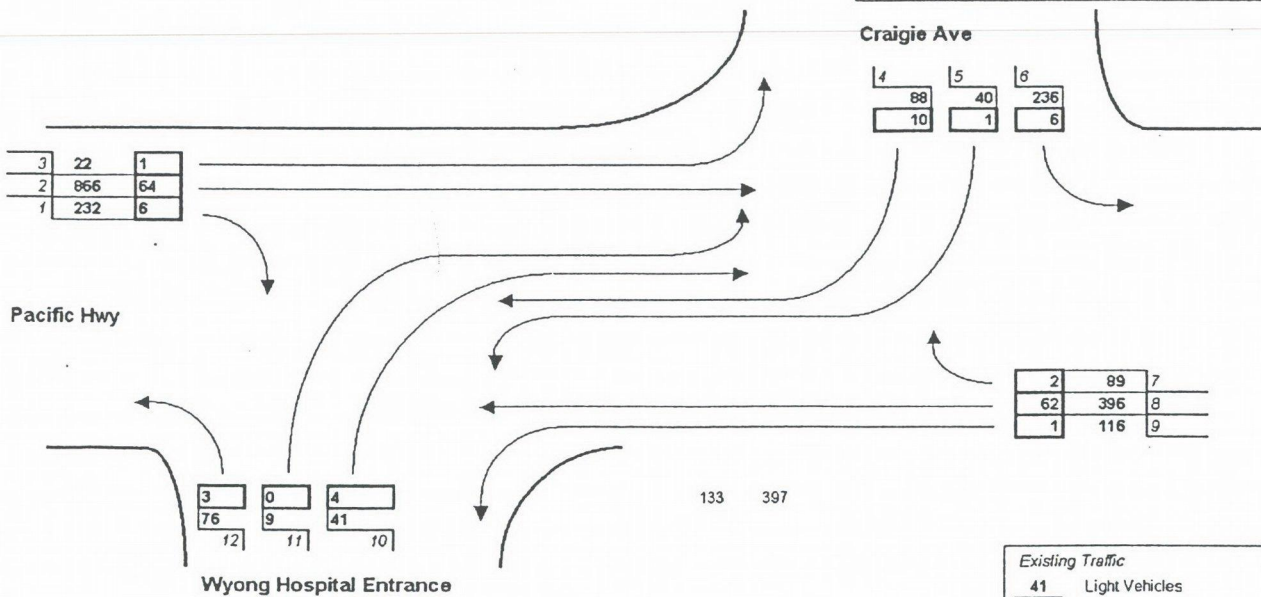
Pacific Hwy / Craigie Ave, Kanwal Year 2011  
Growth Rate 2%  
16:00 <<< HOUR ENDING Thursday

**Summary:**  
Craigie Ave / Pacific Hwy  
2376 Total Light Vehicles  
122 Total Heavy Vehicles



Pacific Hwy / Craigie Ave, Kanwal Year 2011  
Growth Rate 2%  
9:00 <<< HOUR ENDING Thursday

**Summary:**  
Craigie Ave / Pacific Hwy  
2211 Total Light Vehicles  
161 Total Heavy Vehicles

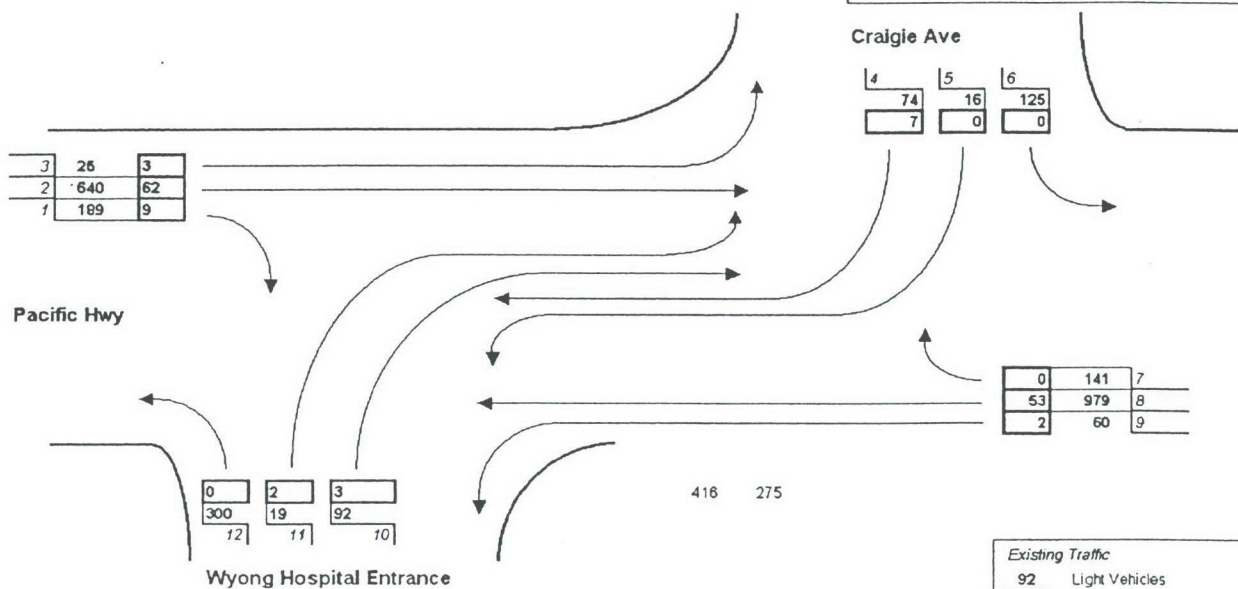




## Predicted Year 2021 Traffic Flows

Pacific Hwy / Craigie Ave, Kanwal      Year 2021  
 Growth Rate 2%  
 16:00 <<< HOUR ENDING      Thursday

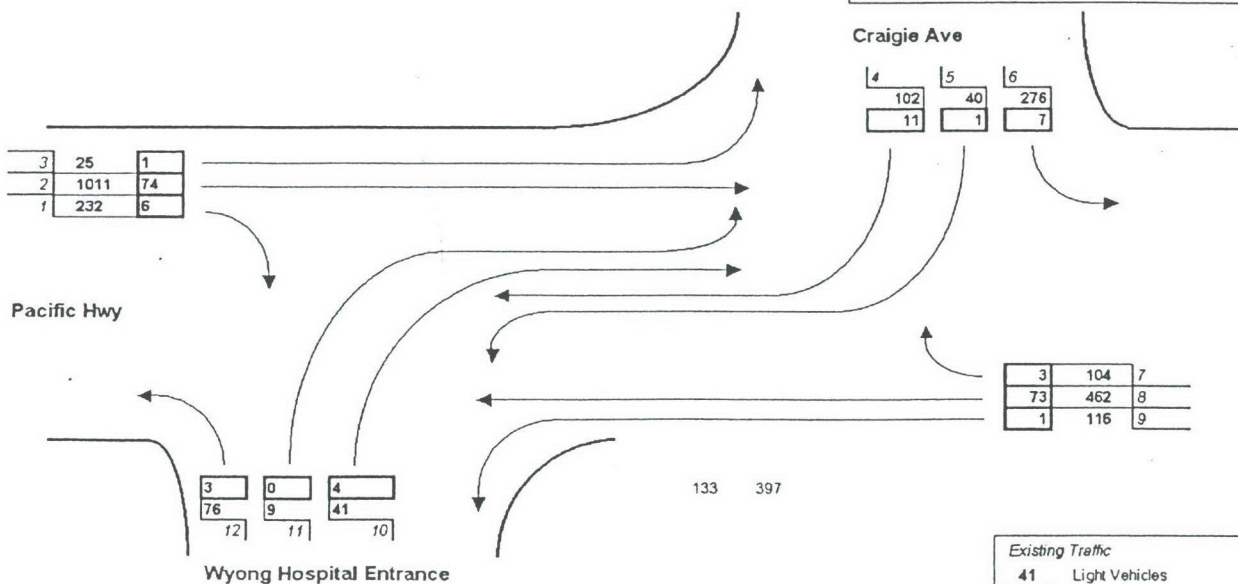
**Summary:**  
 Craigie Ave / Pacific Hwy  
 2659 Total Light Vehicles  
 140 Total Heavy Vehicles



**Existing Traffic**  
 92 Light Vehicles  
 3 Heavy Vehicles

Pacific Hwy / Craigie Ave, Kanwal      Year 2021  
 Growth Rate 2%  
 9:00 <<< HOUR ENDING      Thursday

**Summary:**  
 Craigie Ave / Pacific Hwy  
 2494 Total Light Vehicles  
 185 Total Heavy Vehicles



**Existing Traffic**  
 41 Light Vehicles  
 4 Heavy Vehicles



#### 4. SIDRA Analysis predicted year 2011 Traffic – Craigie Ave / Pacific Hwy / Hospital Access Layout 1

SIDRA has been used to assess the performance of the proposed new intersection.

The results of this analysis are summarised in Table 4-1 and 4-2 below:

**Table 4-1: SIDRA Analysis –Year 2011 AM Peak Layout 1**

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy	Left Turn	116/1	C	29.9	21
	Northbound	Through	396/62	B	22.0	50
		Right Turn	89/2	C	38.1	20
		Craigie Ave	Left Turn	236/6	B	25.2
	Westbound	Through	40/1	B	25.2	49
		Right Turn	88/10	C	33.4	21
		Pacific Hwy	Left Turn	22/1	B	22.4
	Southbound	Through	866/64	B	17.2	97
		Right Turn	232/6	C	31.7	49
		Hospital Access	Left Turn	76/3	B	20.6
	Eastbound	Through	9/0	B	20.6	12
		Right Turn	41/4	C	38.9	11
INTERSECTION				B	23.3	

Definition – Level of Service for Traffic Signals

Level of Service	Average overall delay per vehicle in seconds (d)	Description
A	$d \leq 6.5$	Very Good
B	$6.5 < d \leq 19.5$	Very Good
C	$19.5 < d \leq 32.5$	Good
D	$32.5 < d \leq 52.0$	Acceptable
E	$52.0 < d \leq 78.0$	Bad
F	$78.0 < d$	Bad



Table 4-2: SIDRA Analysis– Year 2011 PM Peak Layout 1

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy	Left Turn	60/2	C	29.0	13
	Northbound	Through	839/46	B	24.8	105
		Right Turn	121/0	C	40.6	30
		Craigie Ave	Left Turn	107/0	B	26.7
	Westbound	Through	16/0	B	26.7	24
		Right Turn	64/6	D	46.6	21
		Pacific Hwy	Left Turn	22/2	B	27.2
	Southbound	Through	548/53	B	20.8	76
		Right Turn	189/9	C	40.4	52
		Hospital Access	Left Turn	300/0	B	25.8
	Eastbound	Through	19/2	B	25.8	60
		Right Turn	92/3	C	39.9	25
INTERSECTION				B	27.5	



## 5. SIDRA Analysis predicted year 2021 Traffic – Craigie Ave / Pacific Hwy / Hospital Access Layout 1

SIDRA has been used to assess the performance of the proposed new intersection.

The results of this analysis are summarised in Table 5-1 and 5-2 below:

**Table 5-1: SIDRA Analysis –Year 2021 AM Peak Layout 1**

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy Northbound	Left Turn	116/1	C	32.5	25
		Through	462/7 3	B	25.6	68
	Craigie Ave Westbound	Right Turn	104/3	D	42.7	28
		Left Turn	276/7	B	28.3	66
		Through	40/1	B	28.3	66
		Right Turn	102/1 1	C	38.2	29
	Pacific Hwy Southbound	Left Turn	25/1	B	24.4	4
		Through	1011/ 74	B	21.1	137
		Right Turn	232/6	C	35.4	55
	Hospital Access Eastbound	Left Turn	76/3	B	23.4	15
		Through	9/0	B	23.4	15
		Right Turn	41/4	D	45.6	13
	<b>INTERSECTION</b>			<b>B</b>	<b>26.9</b>	

**Table 7-2: SIDRA Analysis– Year 2021 PM Peak Layout 1**

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy Northbound	Left Turn	60/2	C	32.9	15
		Through	979/53	C	31.4	151
	Craigie Ave Westbound	Right Turn	141/0	D	47.5	43
		Left Turn	125/0	C	29.0	32
		Through	16/0	C	29.0	32
		Right Turn	74/7	D	51.3	29
	Pacific Hwy Southbound	Left Turn	25/3	C	32.8	7
		Through	640/62	B	28.1	113
		Right Turn	189/9	D	49.5	65
	Hospital Access Eastbound	Left Turn	300/0	B	28.3	71
		Through	19/2	B	28.3	71
		Right Turn	92/3	D	43.7	29
	<b>INTERSECTION</b>			<b>C</b>	<b>33.5</b>	



## 6. SIDRA Analysis predicted year 2011 Traffic

### – Craigie Ave / Pacific Hwy / Hospital Access Layout 2 shortened turn lanes

SIDRA has been used to assess the performance of the proposed new intersection.

The results of this analysis are summarised in Table 6-1 and 6-2 below:

**Table 6-1: SIDRA Analysis – Year 2011 AM Peak Layout 2 with shortened turn lanes**

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy	Left Turn	116/1	C	29.9	22
	Northbound	Through	396/62	B	21.3	51
		Right Turn	89/2	C	39.8	22
		Craigie Ave	Left Turn	236/6	B	27.6
	Westbound	Through	40/1	B	27.6	55
		Right Turn	88/10	C	37.4	24
		Pacific Hwy	Left Turn	22/1	B	22.9
	Southbound	Through	866/64	B	17.8	91
		Right Turn	232/6	C	34.8	52
		Hospital Access	Left Turn	76/3	B	22.6
	Eastbound	Through	9/0	B	22.6	14
		Right Turn	41/4	D	44.0	12
INTERSECTION				B	24.4	

**Table 8-2: SIDRA Analysis – Year 2011 PM Peak Layout 2 shortened turn lanes**

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy	Left Turn	60/2	C	29.0	13
	Northbound	Through	839/46	B	24.8	105
		Right Turn	121/0	C	39.5	30
		Craigie Ave	Left Turn	107/0	B	26.0
	Westbound	Through	16/0	B	26.0	23
		Right Turn	64/6	D	46.6	21
		Pacific Hwy	Left Turn	22/2	B	28.0
	Southbound	Through	548/53	B	21.7	69
		Right Turn	189/9	C	40.4	52
		Hospital Access	Left Turn	300/0	B	25.8
	Eastbound	Through	19/2	B	25.8	60
		Right Turn	92/3	C	39.9	25
INTERSECTION				B	27.7	



## 7. SIDRA Analysis predicted year 2011 Traffic

### – Craigie Ave / Pacific Hwy / Hospital Access Layout 3 One lane southbound plus shortened turn lanes

SIDRA has been used to assess the performance of the proposed new intersection.

The results of this analysis are summarised in Table 7-1 and 7-2 below:

**Table 7-1: SIDRA Analysis – Year 2011 AM Peak Layout 3 One Lane Sthb + shortened turn lanes**

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy	Left Turn	116/1	C	31.1	28
	Northbound	Through	396/62	B	22.8	64
		Right Turn	89/2	E	57.8	33
		Craigie Ave	Left Turn	236/6	C	38.6
	Westbound	Through	40/1	C	38.6	81
		Right Turn	88/10	D	48.4	35
		Pacific Hwy	Left Turn	22/1	B	25.2
	Southbound	Through	866/64	F	90.4	474
		Right Turn	232/6	D	54.1	83
		Hospital	Left Turn	76/3	C	32.3
	Access					
	Eastbound	Through	9/0	C	32.3	23
Right Turn		41/4	E	57.4	18	
INTERSECTION			E	57.6		

**Table 7-2: SIDRA Analysis – Year 2011 PM Peak Layout 3 One Lane Sthb + shortened turn lanes**

Intersection	Approach	Movement	Flow	Level Of Service	Ave Delay (sec)	95% Back Queue (m)
Hospital Access /Pacific Hwy Signals	Pacific Hwy	Left Turn	60/2	C	30.0	13
	Northbound	Through	839/46	B	26.1	109
		Right Turn	121/0	D	44.0	33
		Craigie Ave	Left Turn	107/0	C	32.0
	Westbound	Through	16/0	C	32.0	27
		Right Turn	64/6	D	43.2	20
		Pacific Hwy	Left Turn	22/2	B	22.2
	Southbound	Through	548/53	B	18.4	134
		Right Turn	189/9	B	25.7	33
		Hospital Access	Left Turn	300/0	B	25.3
	Eastbound	Through	19/2	B	25.3	60
		Right Turn	92/3	D	43.1	26
INTERSECTION			B	26.7		



## 8. Summary of Results

Layout	Year	Peak Period	Level Of Service	Average Delay (sec)	Maximum Queue (m)
1	2011	AM	B	23.3	97
		PM	B	27.5	105
	2021	AM	B	26.9	137
		PM	C	33.5	151
2	2011	AM	B	24.3	101
		PM	B	27.6	105
3	2011	AM	E	57.6	474
		PM	B	26.7	134

## 9. Discussion

Analysis was originally carried out based on **Layout 1**, which provided turning lanes designed to minimize the probability that queues in through lanes would block entry into these turning lanes. This analysis showed that both for Year 2011 and Year 2021 the intersection would perform at Level Of Service between B and C.

Further analysis was carried out using a revised intersection **Layout 2** using shorter turning lanes designed to be adequate to accommodate the queues generated by these turning vehicles. Analysis for this revised layout was only carried out for Year 2011. This analysis shows that the revised layout will operate successfully with a level of service of B being achieved.

This analysis suggests that the revised intersection will perform satisfactorily even though queue lengths in the through lanes have the potential to block access to the turning lanes provided.

Further analysis was carried out for year 2011 using **Layout 3**, which provides only one lane for southbound traffic. The performance of this layout in the AM peak is unsatisfactory with Level Of Service E. This option results in significant queuing of up to 474 metres on the northern approach

The capacity provided by only one southbound through lane is insufficient to accommodate the predicted 2011 traffic volumes.

A check of the performance of **Layout 3** using existing traffic volumes shows that the intersection would operate at a level of service B but queue lengths of up to 169 metres will be experienced on the northern approach. The degree of saturation on these southbound lanes is over 85% and will therefore be sensitive to any increase in traffic volumes.

However, it is possible that **Layout 3** will provide a reasonable level of service for up to 5 years. Improvement works could then be carried out as and when required.

## 10. Recommendation

Accordingly, it is recommended that detailed design of the proposed traffic signals be carried out based on Alternative **Layout 3** provided traffic congestion at this intersection is monitored and appropriate upgrading works carried out as the performance of the intersection drops and queue lengths on the Pacific Highway become excessive.



# **Appendix A**

## **Intersection Turning Movements**

### **Hospital Access / Wyong Road / Craigie Ave**

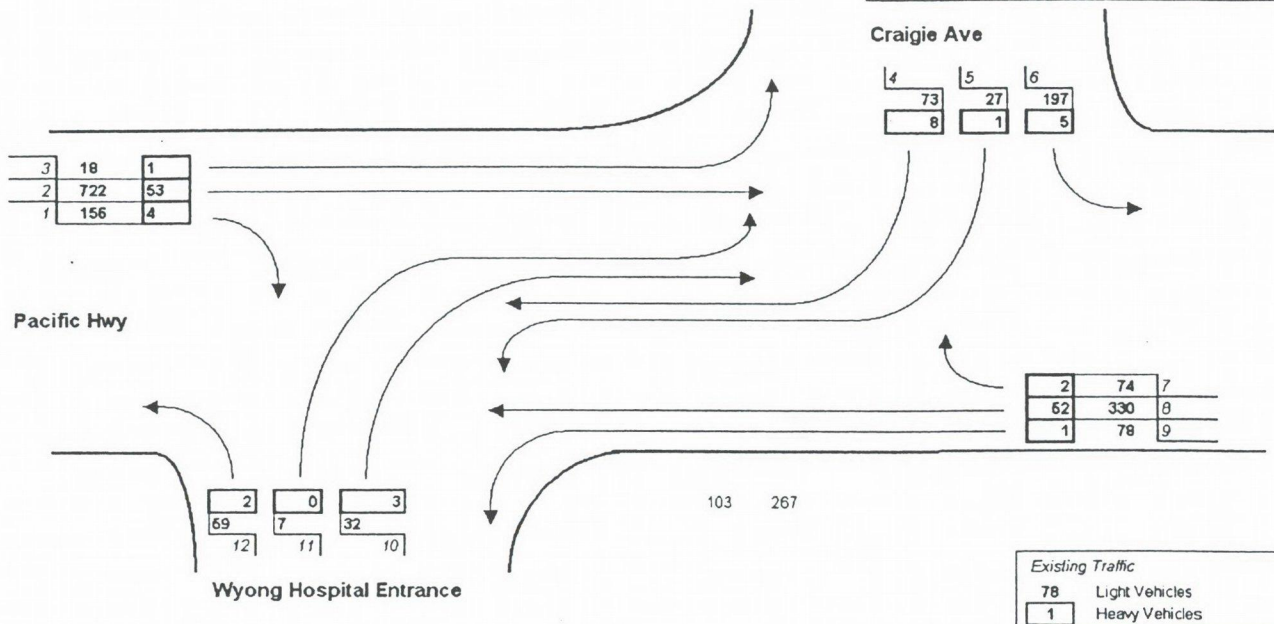


27/9/2001 - Pacific Hwy / Craigie Ave, Kanwal

9:00 <<< HOUR ENDING

Thursday

Summary:	
Craigie Ave	/ Pacific Hwy
1773	Total Light Vehicles
132	Total Heavy Vehicles



Light Vehicles																	Totals	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	15 MIN	1 HOUR
08:15	39	177	2	15	8	43	16	89	22	5	1	15	0	0	0	0	432	
08:30	38	183	5	14	4	42	21	67	20	6	2	12	0	0	0	0	414	
08:45	39	183	6	26	6	59	22	85	19	10	0	15	0	0	0	0	470	
09:00	40 <	179 <	5	18 <	9 <	53	15 <	89	17 <	11	4	17	0	0	0	0	457	1773 <
09:15	37	149	4	11	6	47 <	12	76	9	6	3	20	0	0	0	0	380	1721
09:30	36	154	3	12	6 <	23	10	99	14	9 <	4	27	0	0	0	0	397	1704
09:45	40	145	5	15	6 <	24	11	99	10	10 <	2 <	26	0	0	0	0	393	1627
10:00	41	148	9 <	11	4	22	15	96 <	13	7	2	22 <	0	0	0	0	390	1560
Heavy Vehicles																	Totals	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	15 MIN	1 HOUR
08:15	2	16	0	0	0	1	0	13	0	1	0	0	0	0	0	0	33	
08:30	1	16	0	1	0	2	1	9	0	2	0	0	0	0	0	0	32	
08:45	0	9	0	6	0	1	0	13	1	0	0	1	0	0	0	0	31	
09:00	1 <	12 <	1	1	1 <	1 <	1	17	0	0 <	0	1	0	0	0	0	36	132
09:15	0	8	1	1 <	0 <	1 <	1	14	1	0	0	2	0	0	0	0	29	128
09:30	1	19	1	0	0 <	1	1	14	1	0	0	1 <	0	0	0	0	39	135
09:45	2 <	12	1	0	0 <	1	0	14 <	0	0	1	0	0	0	0	0	31	135
10:00	0	10	2 <	2	0	1	2 <	16	2 <	1	1 <	0	0	0	0	0	37	136 <
All Vehicles																	Totals	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	15 MIN	1 HOUR
08:15	41	193	2	15	8	44	16	102	22	6	1	15	0	0	0	0	465	
08:30	39	199	5	15	4	44	22	76	20	8	2	12	0	0	0	0	446	
08:45	39	192	6	32	6	60	22	98	20	10	0	16	0	0	0	0	501	
09:00	41 <	191 <	6	19 <	10 <	54	16 <	106	17 <	11	4	18	0	0	0	0	493	1905 <
09:15	37	157	5	12	6	48 <	13	90	10	6	3	22	0	0	0	0	409	1849
09:30	37	173	4	12	6 <	24	11	113	15	9 <	4	28	0	0	0	0	436	1839
09:45	42	157	6	15	6 <	25	11	113	10	10 <	3 <	26	0	0	0	0	424	1762
10:00	41	158	11 <	13	4	23	17	112 <	15	8	3	22 <	0	0	0	0	427	1696

Note: Arrows "<" indicate the end time for the peak hour for each turning movement.

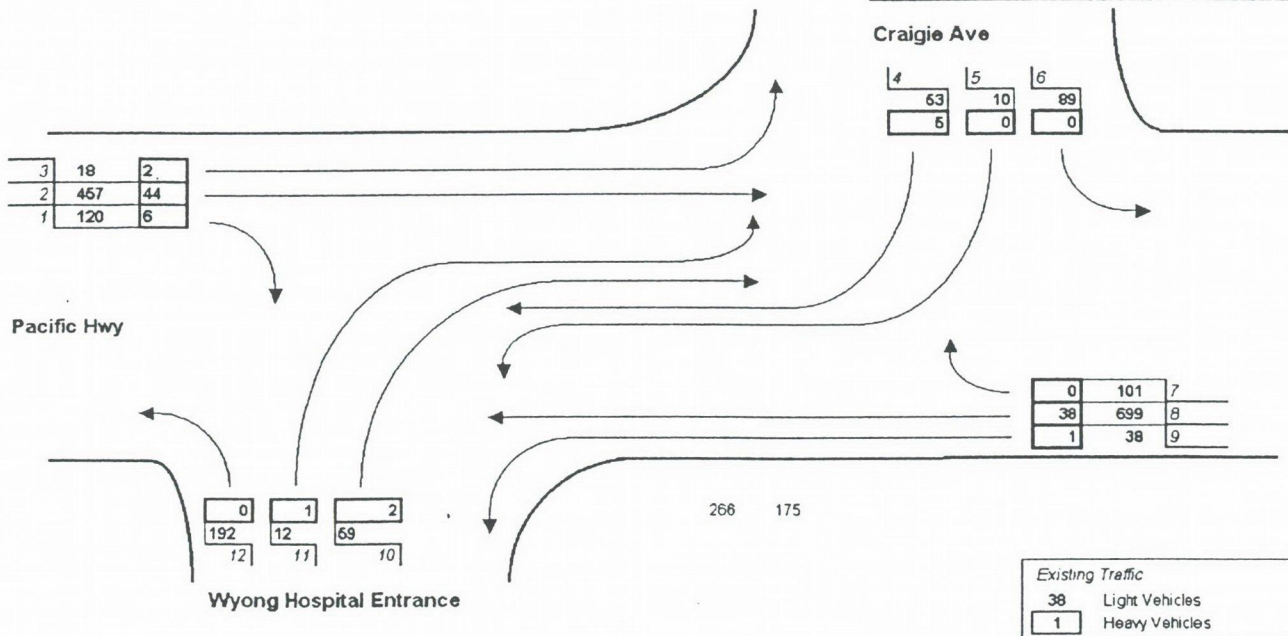


27/9/2001 - Pacific Hwy / Craigie Ave, Kanwal

16:00 <<< HOUR ENDING

Thursday

Summary:	
Craigie Ave	/ Pacific Hwy
1848	Total Light Vehicles
99	Total Heavy Vehicles



Light Vehicles																	Totals	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	15 MIN	HOURL
15:15	33	113	4	13	3	35	19	173	7	11	2	40	0	0	0	0	453	
15:30	30	114	6	11	4	17	32	165	14	19	2	53	0	0	0	0	467	
15:45	28	110	1	13	2	16	26	201	8	18	3	49	0	0	0	0	475	
16:00	29 <	120	7	16	1	21 <	24	160	9	11	5	50 <	0	0	0	0	453	1848
16:15	20	117 <	4	20 <	0	24	29 <	165	9 <	23 <	4	40 <	0	0	0	0	455	1850 <
16:30	16	113	8	10	5	14	26	177	5	10	3	36	0	0	0	0	423	1806
16:45	21	83	3	5	1	14	20	176	11	12	7	41	0	0	0	0	394	1725
17:00	17	89	9 <	16	5 <	28	35	189 <	5	14	6 <	38	0	0	0	0	451	1723
Heavy Vehicles																	Totals	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	15 MIN	HOURL
15:15	1	12	0	4	0	0	0	7	0	0	0	0	0	0	0	0	24	
15:30	2	12	1	1	0	0	0	7	0	1	0	0	0	0	0	0	24	
15:45	1	11	0	0	0	0	0	10	1	1	0	0	0	0	0	0	25	
16:00	2 <	9 <	1 <	0 <	0	0	0	14	0	0 <	0 <	0	0	0	0	0	26	99 <
16:15	0	7	0 <	1	0	1 <	1 <	8	0	0 <	0 <	1	0	0	0	0	19	94
16:30	0	4	0	0	0	0 <	0 <	8	1 <	1 <	0 <	0	0	0	0	0	14	84
16:45	0	1	0	0	0	0 <	0 <	15 <	0	0	0	0	0	0	0	0	16	75
17:00	0	4	0	0	0	0 <	0 <	6	0	1 <	0	1 <	0	0	0	0	12	61
All Vehicles																	Totals	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	15 MIN	HOURL
15:15	34	125	4	17	3	35	19	180	7	11	2	40	0	0	0	0	477	
15:30	32	126	7	12	4	17	32	172	14	20	2	53	0	0	0	0	491	
15:45	29	121	1	13	2	16	26	211	9	19	4	49	0	0	0	0	500	
16:00	31 <	129 <	8	16	1	21 <	24	174	9	11	5	50	0	0	0	0	479	1947 <
16:15	20	124	4	21 <	0	25	30 <	173	9 <	23 <	4	41 <	0	0	0	0	474	1944
16:30	16	117	8	10	5	14	26	185	6	11	3	36	0	0	0	0	437	1890
16:45	21	84	3	5	1	14	20	191	11	12	7	41	0	0	0	0	410	1800
17:00	17	93	9 <	16	5 <	28	35	195 <	5	15	6 <	39	0	0	0	0	463	1784

Note: Arrows "<" indicate the end time for the peak hour for each turning movement.



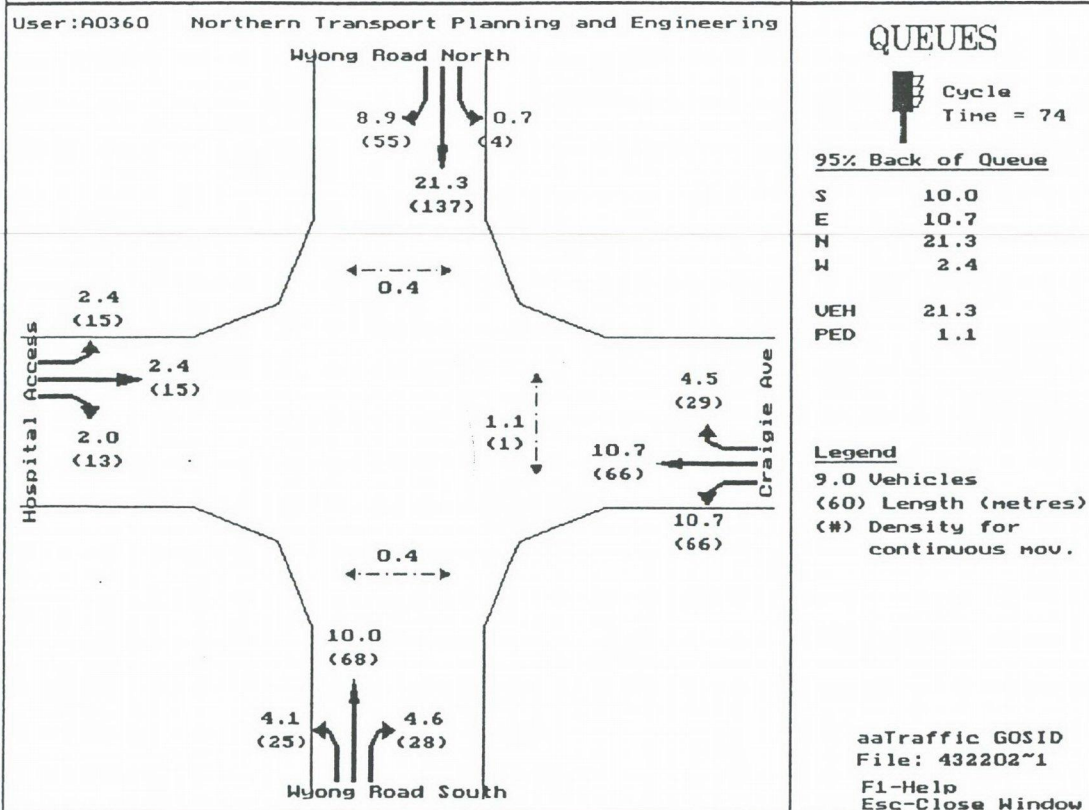
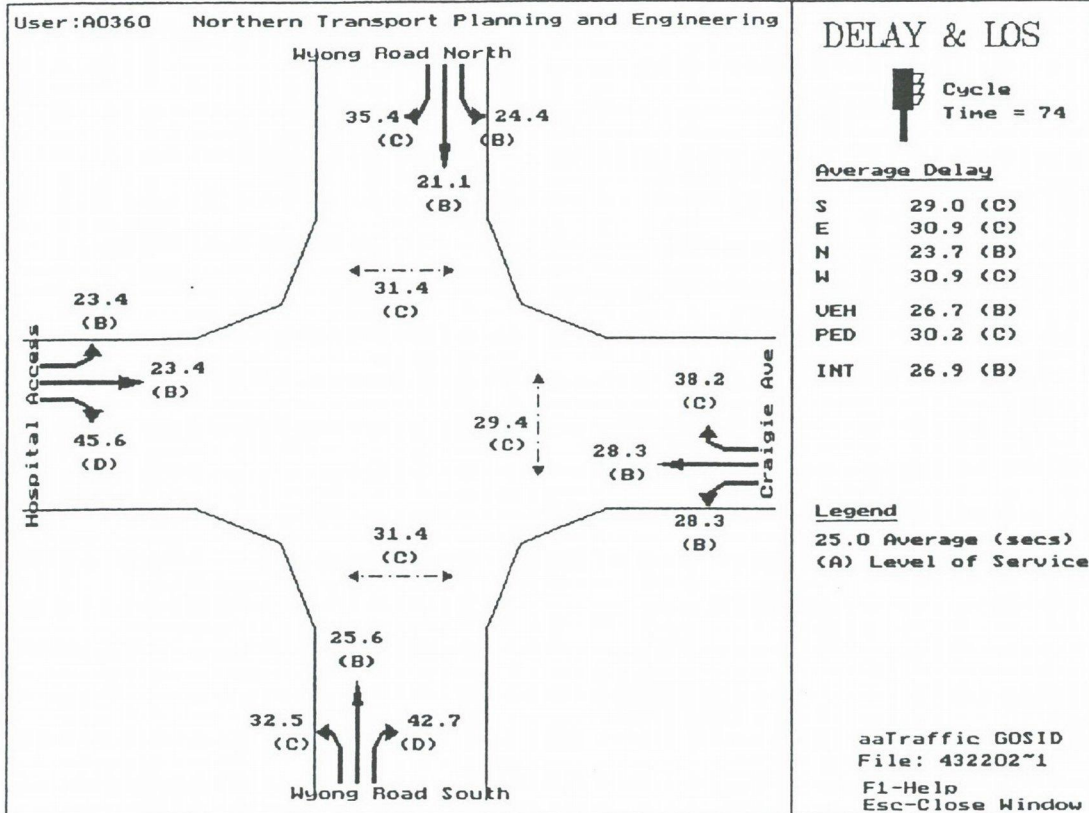
# **Appendix B**

## **SIDRA Analysis**

### **Hospital Access / Wyong Road / Craigie Ave**

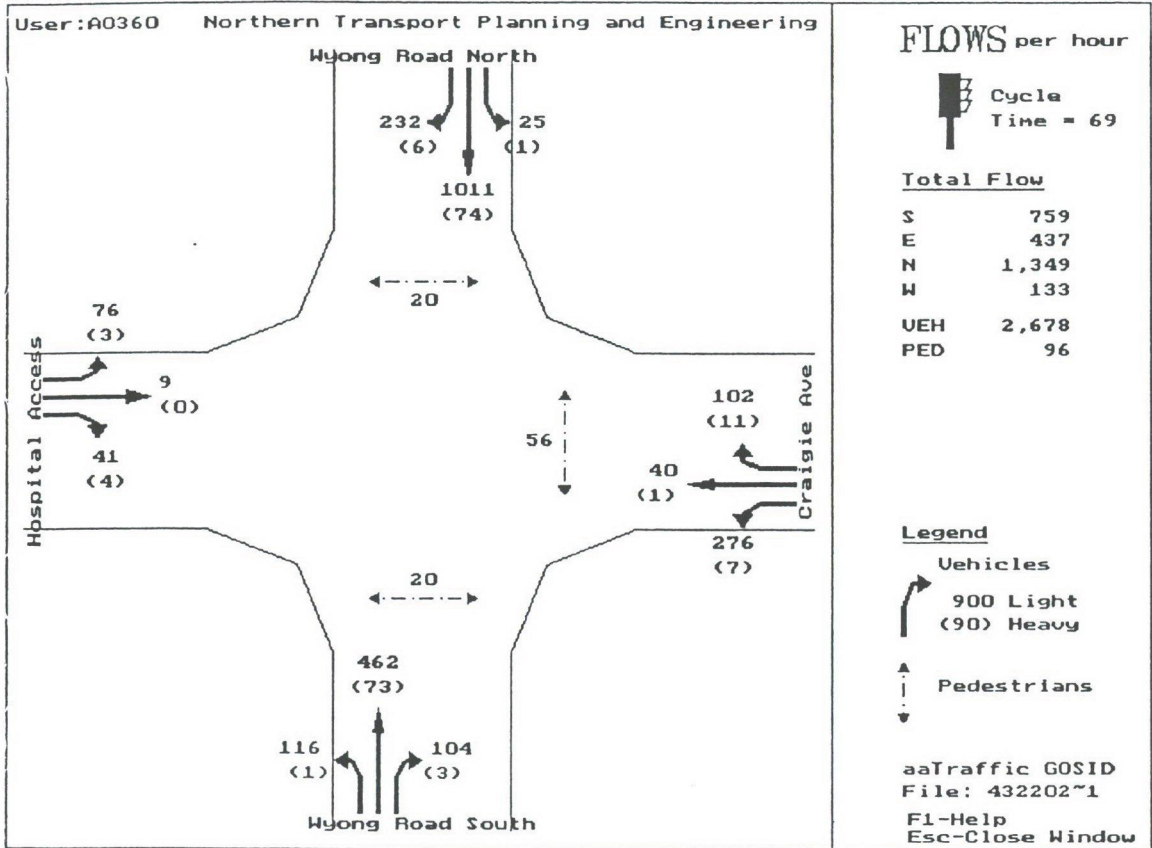


# Wyong Hospital Access AM Peak Hour – SIDRA Analysis Year 2021 Layout 1





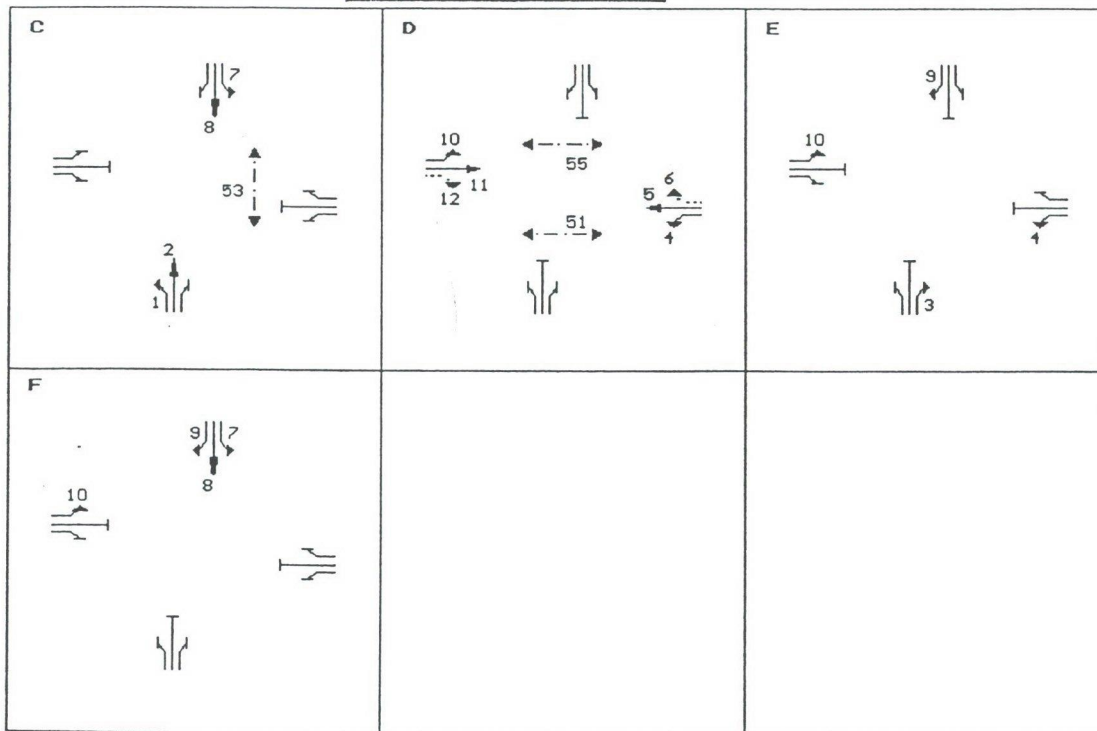
AM Peak Year 2021 Flows based on Full Development of the Wyong Hospital plus 2% linear growth in background traffic.



File: 432202~1

**PHASE SEQUENCE**

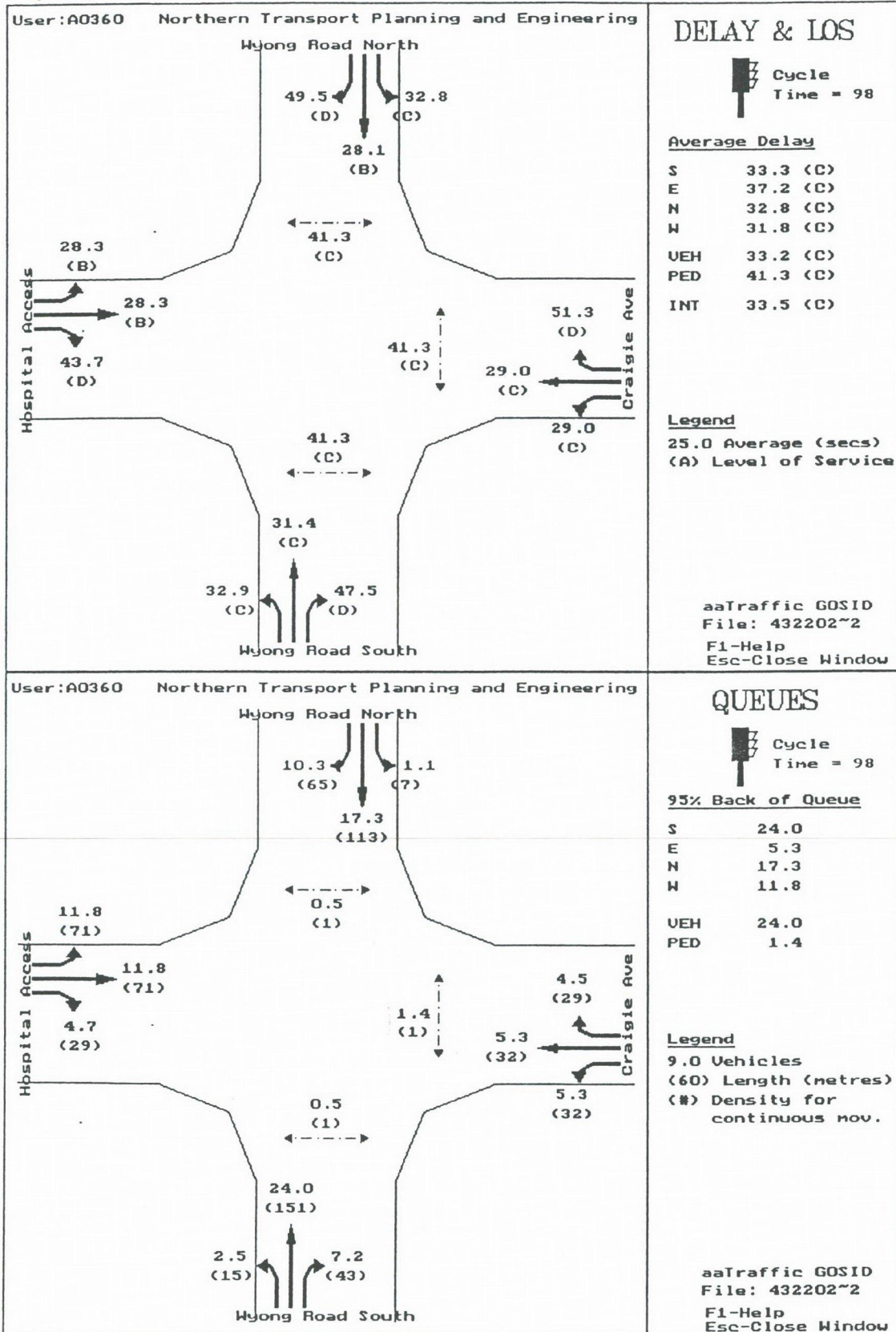
Sequence No.: 2



Press <Esc> to close window

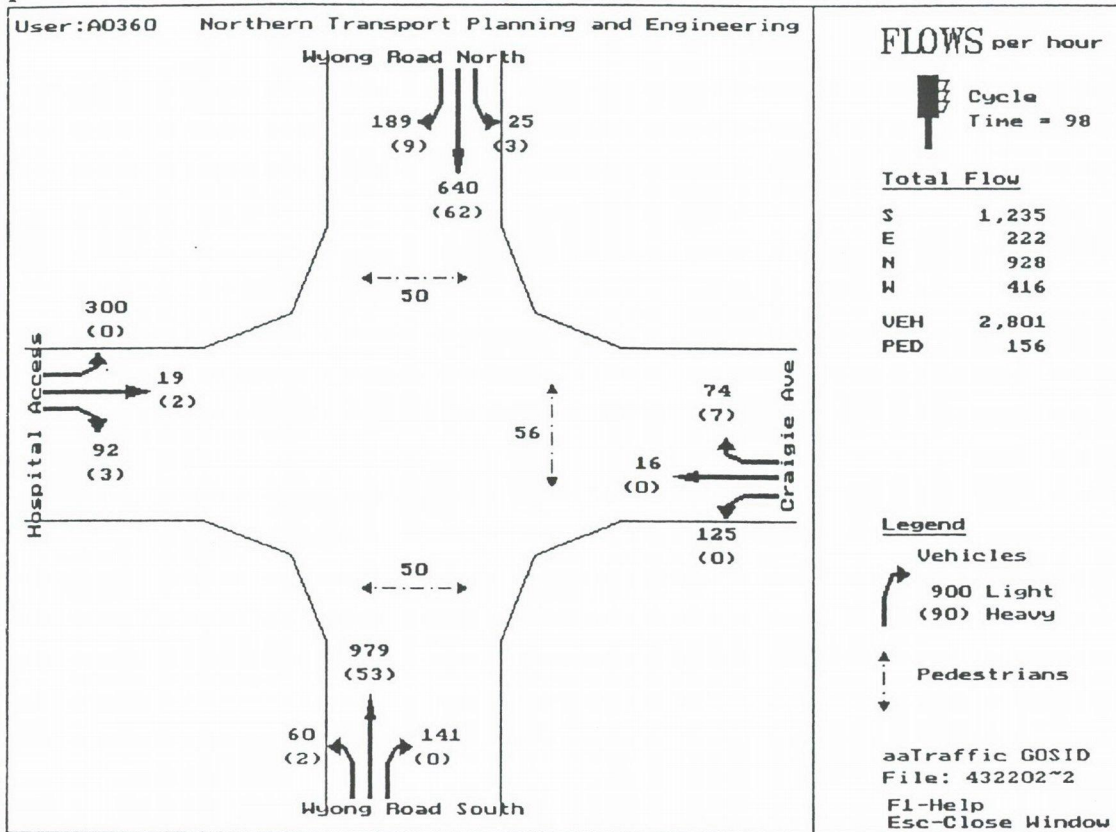


# Wyong Hospital Access PM Peak Hour – SIDRA Analysis Year 2021 Layout 1





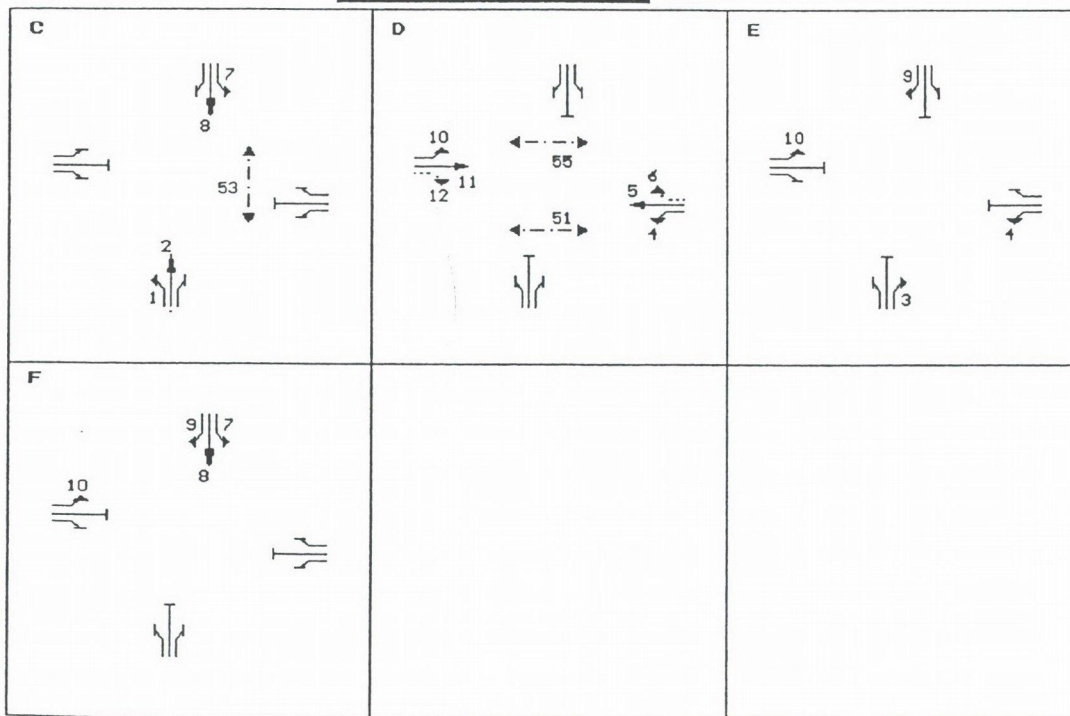
PM Peak Year 2021 Flows based on Full Development of the Wyong Hospital plus 2% linear growth in background traffic.



File: 432202~2

**PHASE SEQUENCE**

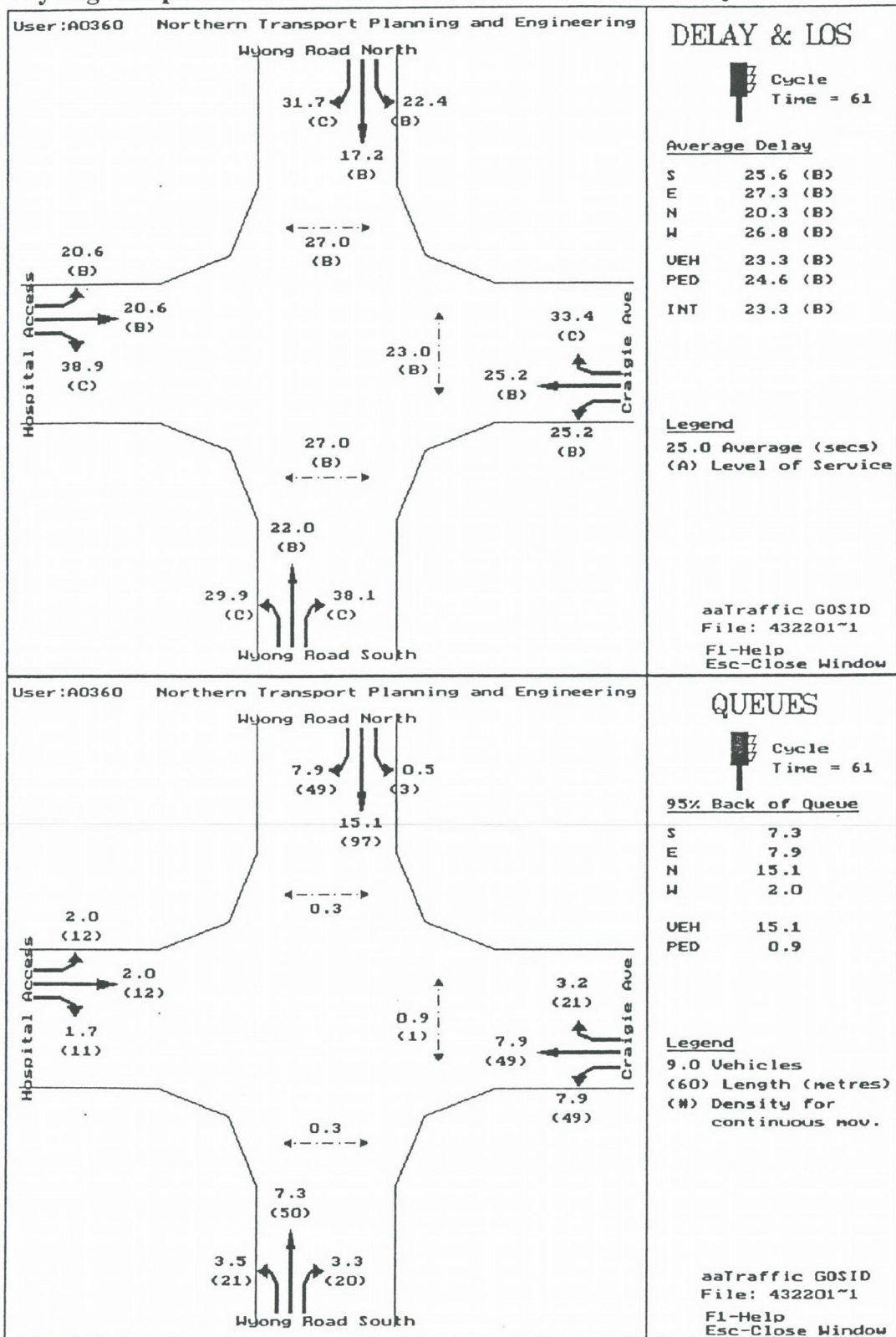
Sequence No.: 2



Press (Esc) to close window

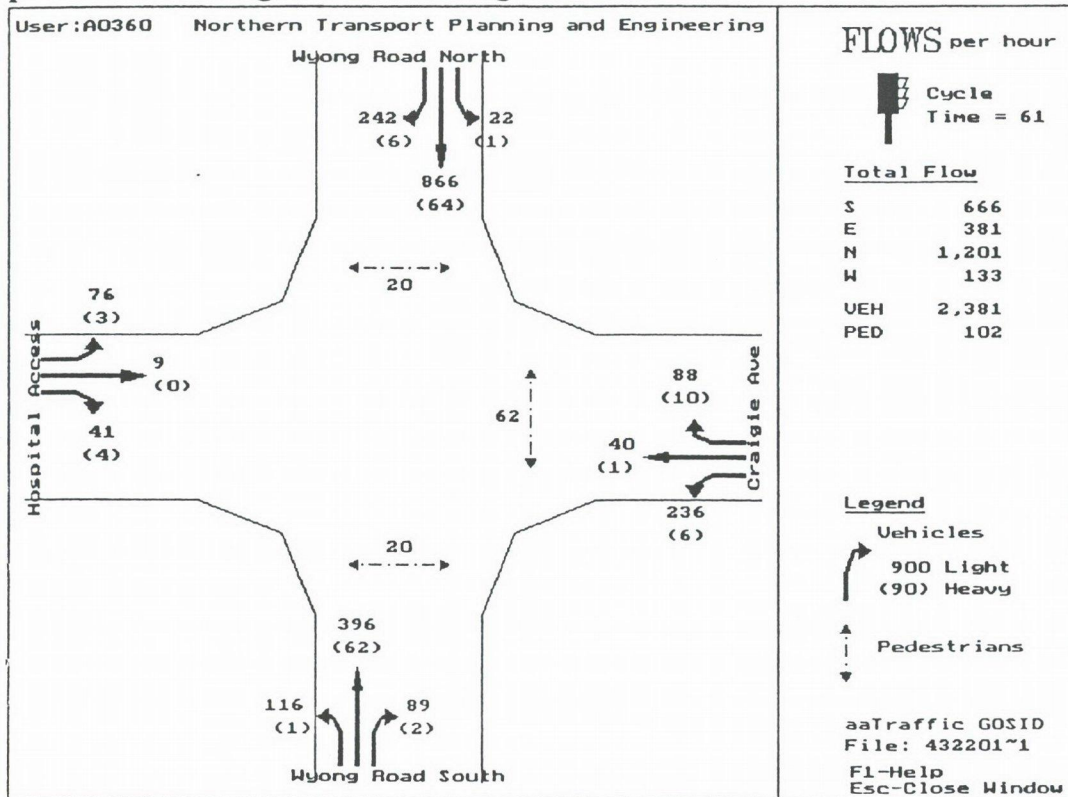


# Wyong Hospital Access AM Peak Hour – SIDRA Analysis Year 2011 Layout 1





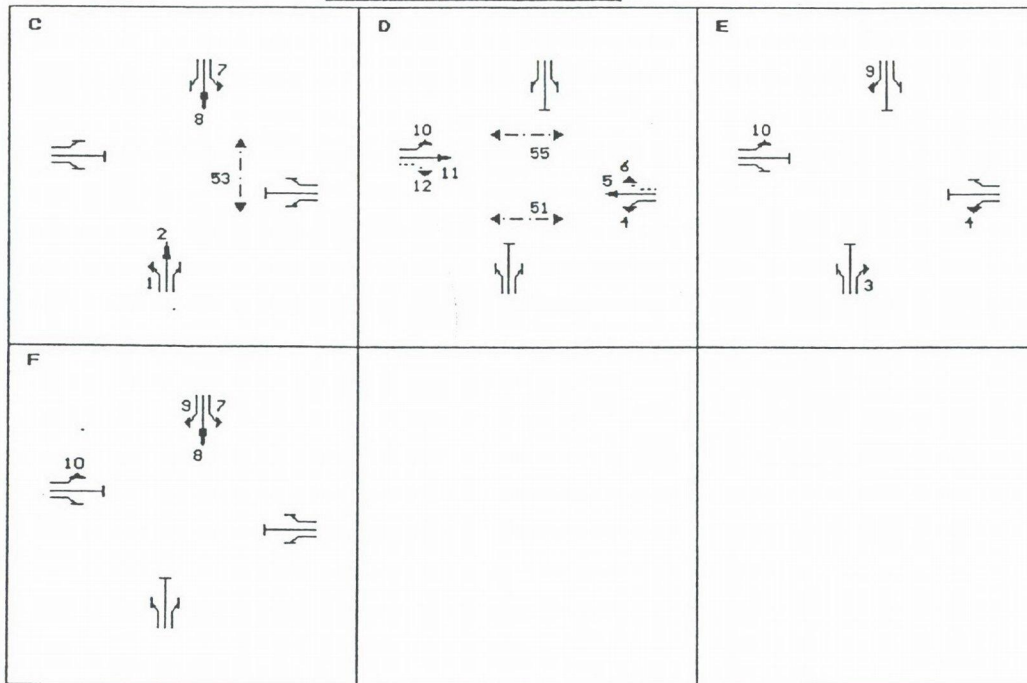
# AM Peak Year 2011 Flows based on Full Development of the Wyong Hospital plus 2% linear growth in background traffic.



File: 432201~1

## PHASE SEQUENCE

Sequence No.: 2

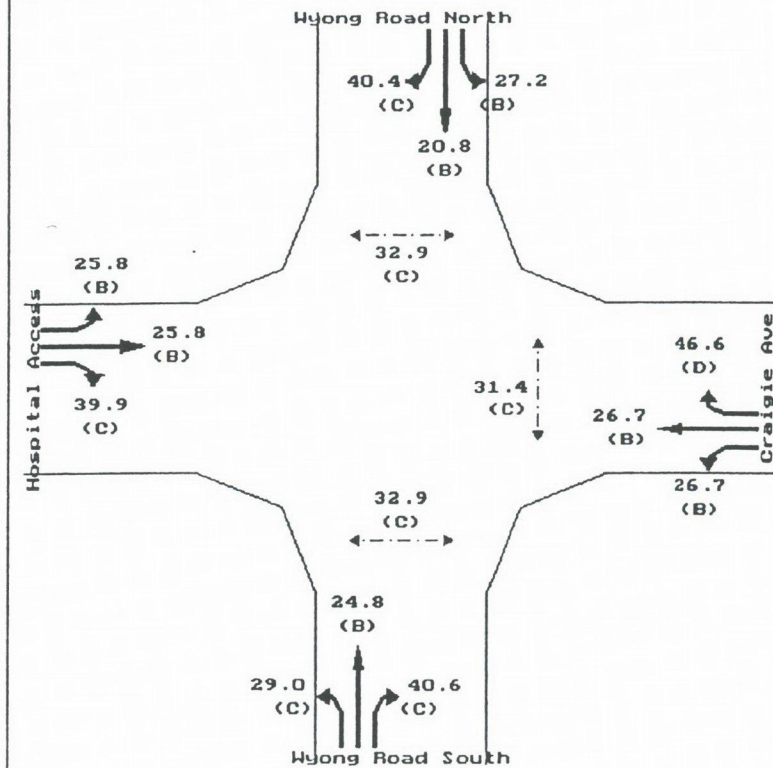


Press <Esc> to close window



# Wyong Hospital Access PM Peak Hour – SIDRA Analysis Year 2011 Layout 1

User:A0360 Northern Transport Planning and Engineering



## DELAY & LOS



Cycle  
Time = 78

### Average Delay

S	26.8 (B)
E	33.9 (C)
N	25.7 (B)
W	29.0 (C)
VEH	27.4 (B)
PED	32.0 (C)
INT	27.5 (B)

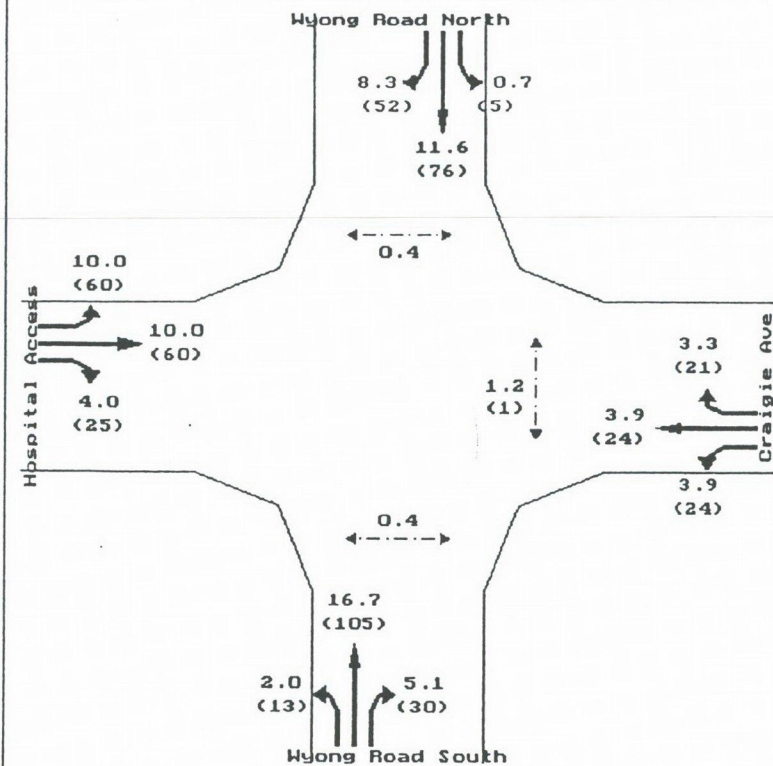
### Legend

25.0 Average (secs)  
(A) Level of Service

aaTraffic GOSID  
File: 432201~4

F1-Help  
Esc-Close Window

User:A0360 Northern Transport Planning and Engineering



## QUEUES



Cycle  
Time = 78

### 95% Back of Queue

S	16.7
E	3.9
N	11.6
W	10.0
VEH	16.7
PED	1.2

### Legend

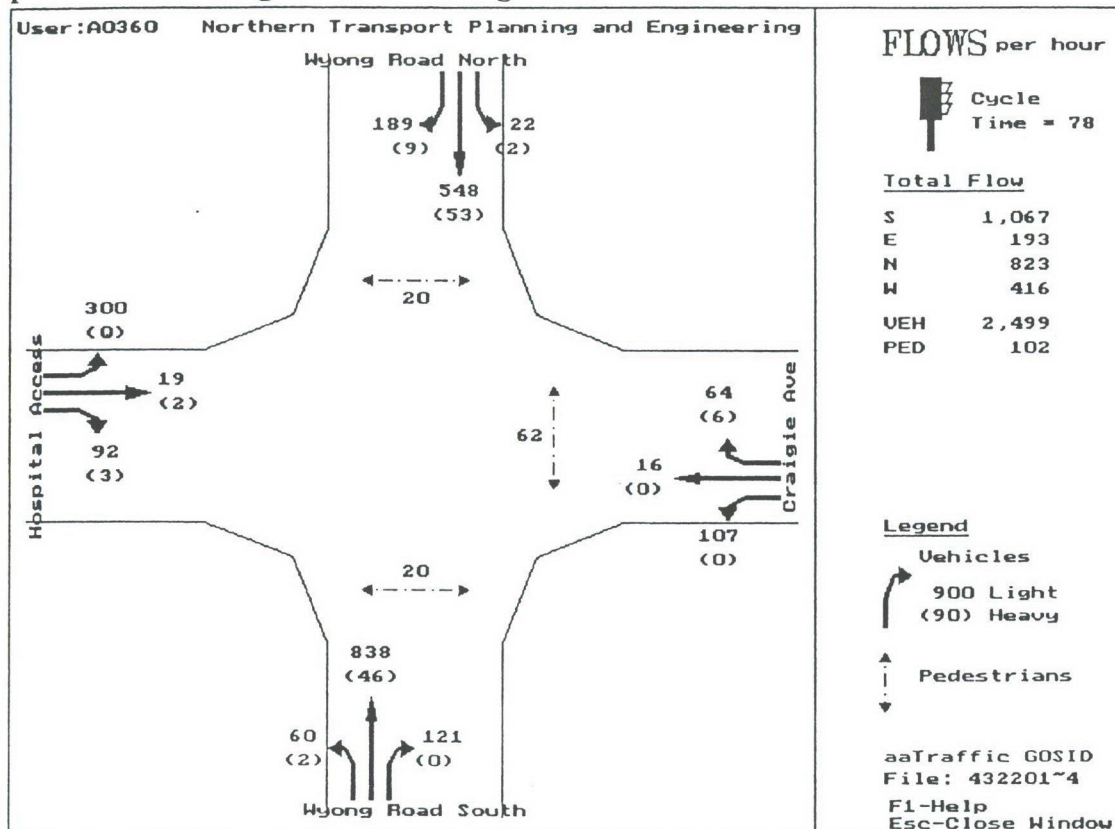
9.0 Vehicles  
(60) Length (metres)  
(#) Density for continuous mov.

aaTraffic GOSID  
File: 432201~4

F1-Help  
Esc-Close Window

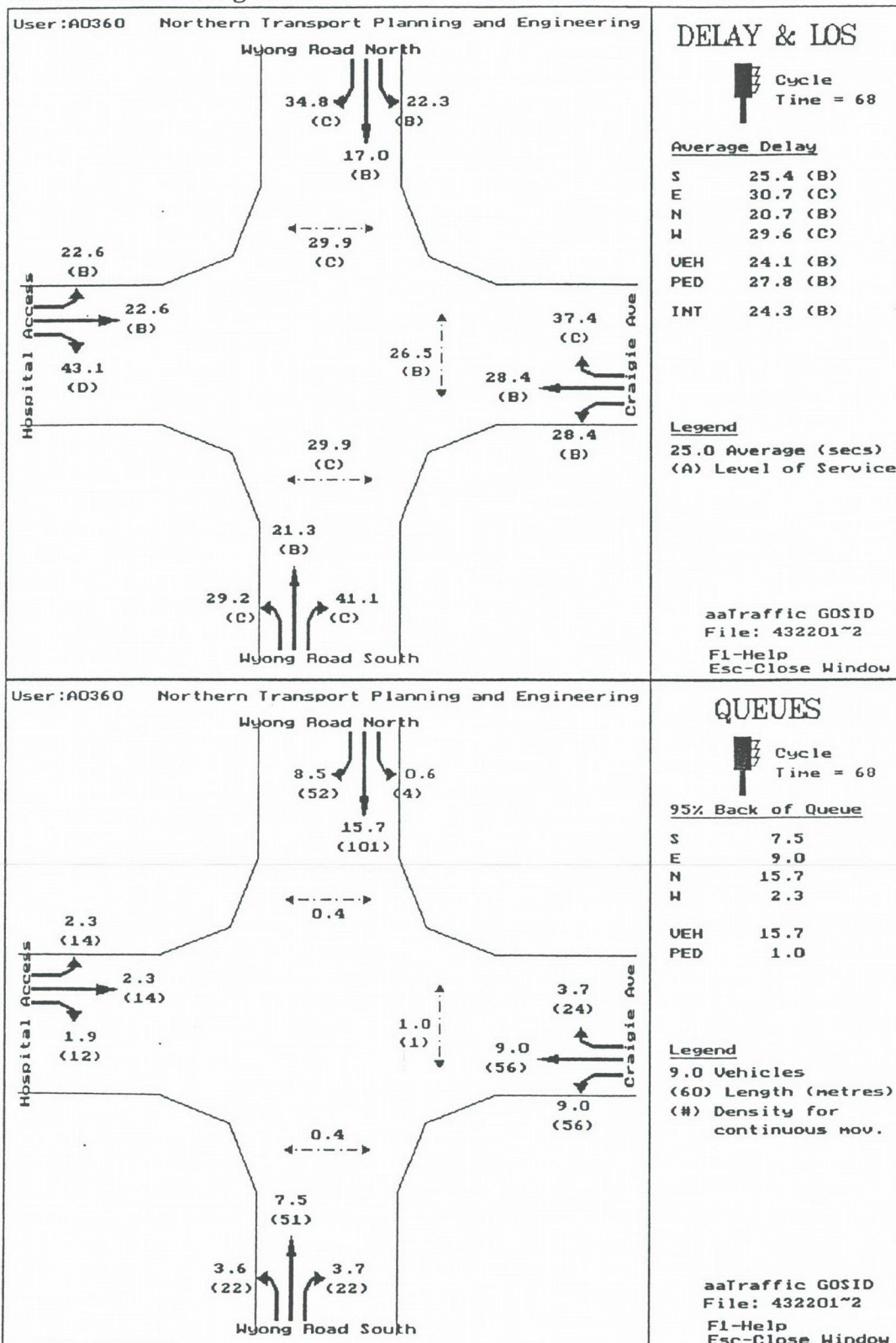


# PM Peak Year 2011 Flows based on Full Development of the Wyong Hospital plus 2% linear growth in background traffic.



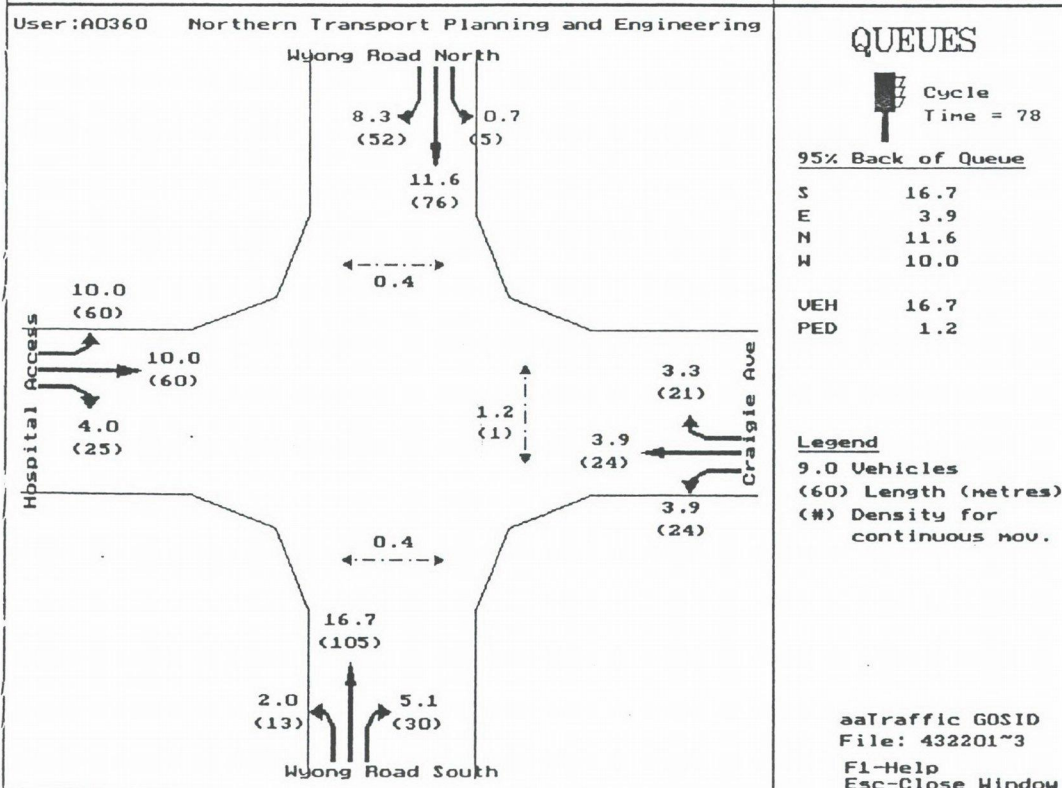
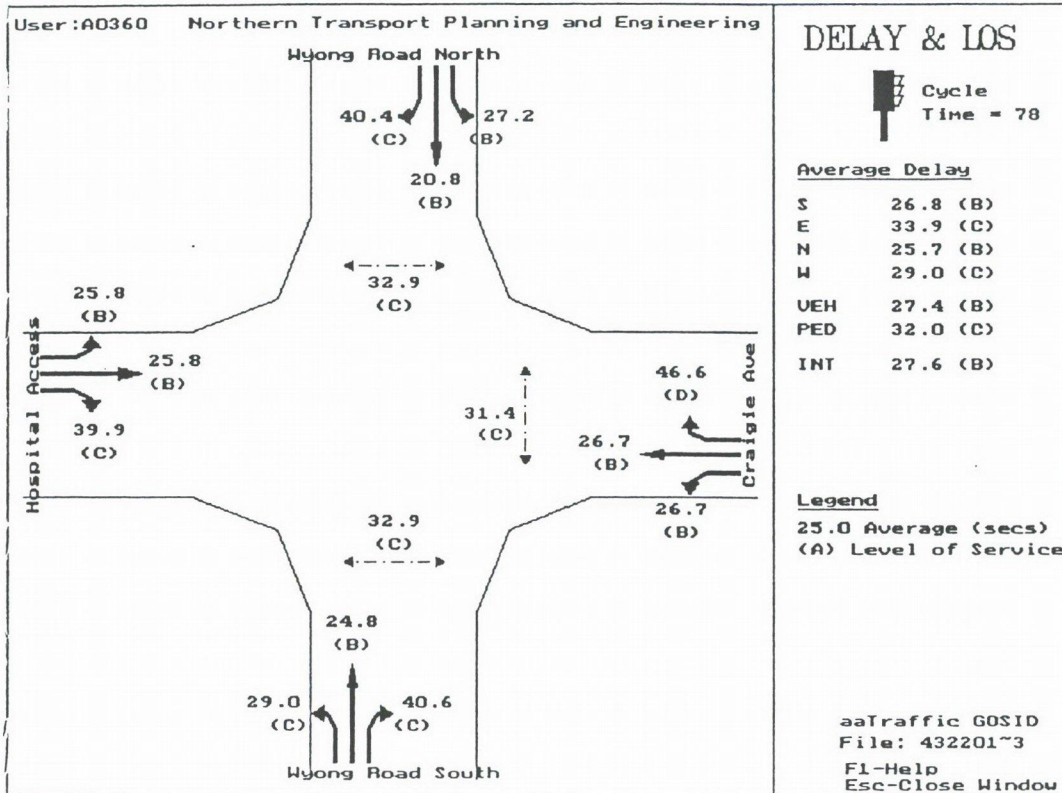


# Wyong Hospital Access AM Peak Hour – SIDRA Analysis Year 2011 Layout 2 shortened turning lanes



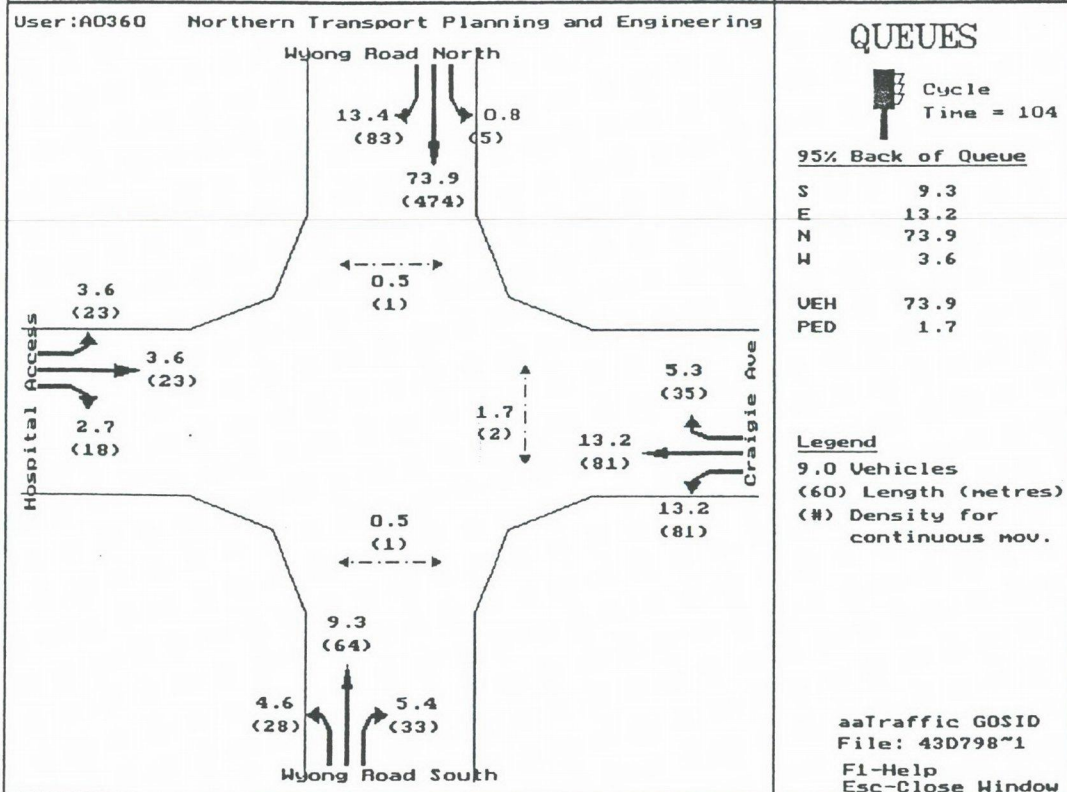
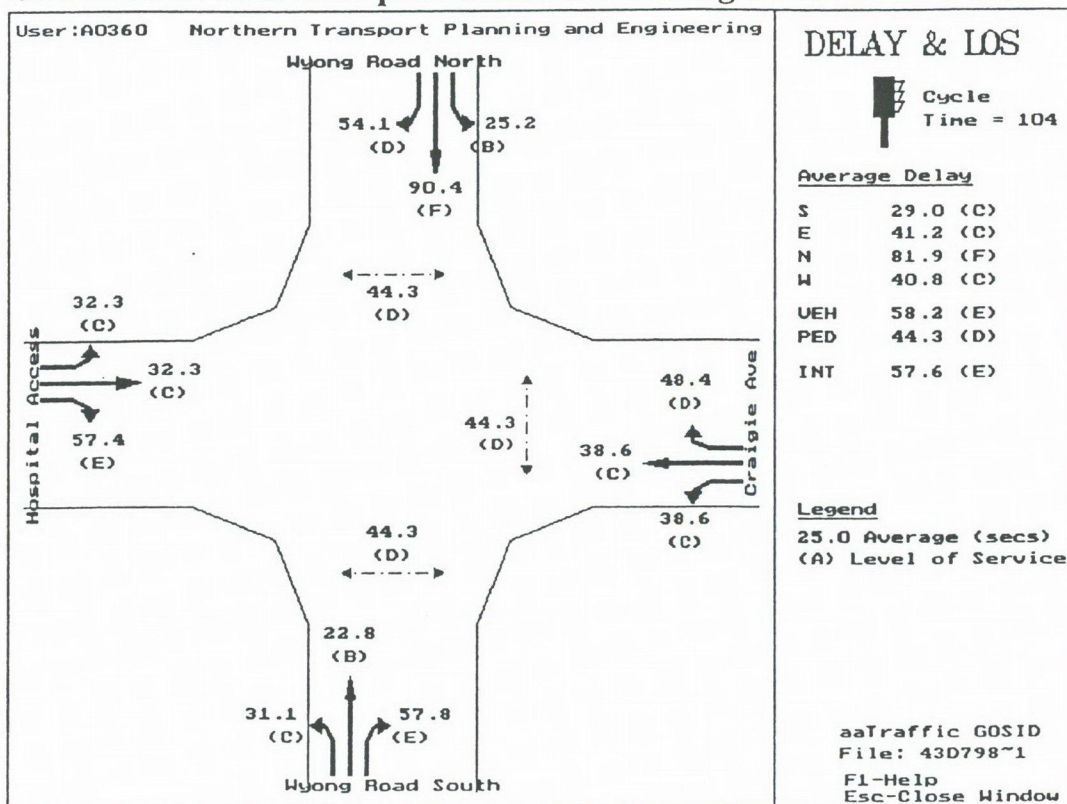


# Wyong Hospital Access PM Peak Hour – SIDRA Analysis Year 2011 Layout 2 shortened turning lanes



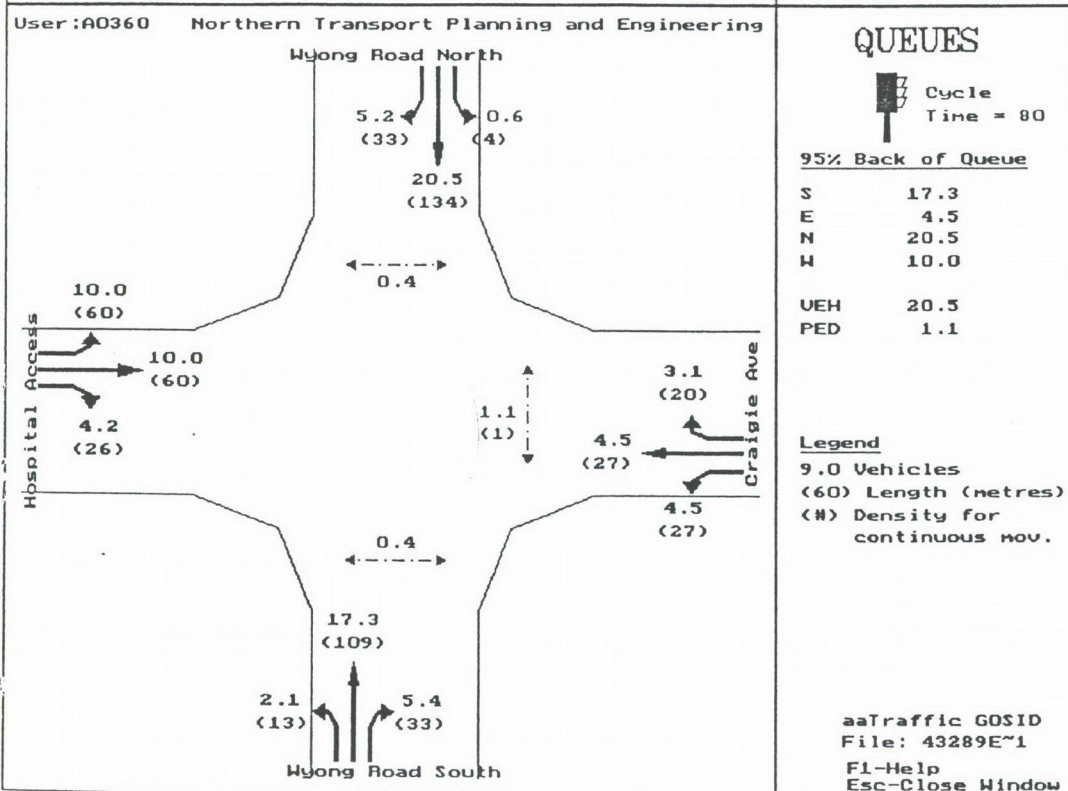
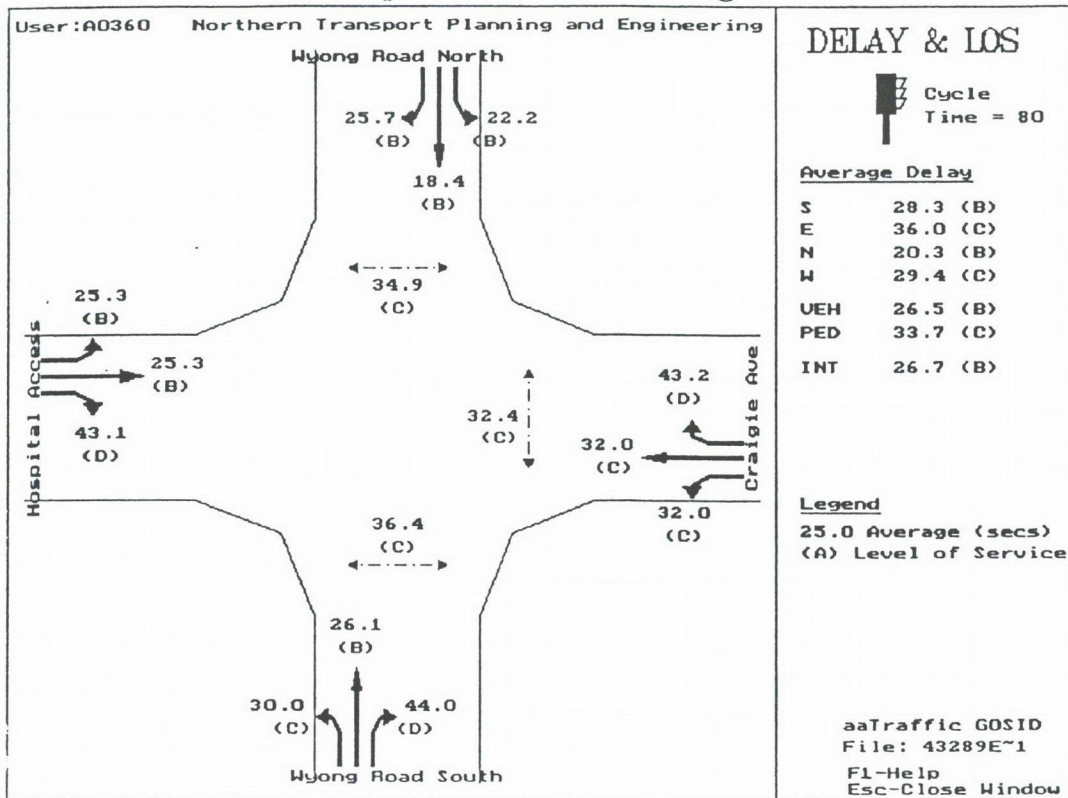


# Wyong Hospital Access AM Peak Hour – SIDRA Analysis Year 2011 Layout 3: One Lane Southbound plus shortened turning lanes.





# Wyong Hospital Access PM Peak Hour – SIDRA Analysis Year 2011 Layout 3: One Lane Southbound plus shortened turning lanes.





# Appendix C

## Wyong Hospital

---

### **Existing and Predicted Future Traffic Generation**



Wyong Hospital and Kanwal Medical Centre  
Vehicle Movements from Wednesday 27 June 2001 survey  
Main Hospital Gate

Time Ending	Half Hourly Volume		Hourly volume-half hour ending		
	in	out	In	Out	In + Out
7:30	28	21	28	21	49
8:00	95	19	123	40	163
8:30	123	29	218	48	266
9:00	142	50	265	79	344
9:30	106	76	248	126	374
10:00	95	83	201	159	360
10:30	141	41	236	124	360
11:00	108	99	249	140	389
11:30	104	97	212	196	408
12:00	92	100	196	197	393
12:30	59	99	151	199	350
13:00	79	94	138	193	331
13:30	109	97	188	191	379
14:00	57	82	166	179	345
14:30	125	98	182	180	362
15:00	92	116	217	214	431
15:30	94	125	186	241	427
16:00	103	155	197	280	477
16:30	75	140	178	295	473
17:00	59	134	134	274	408
17:30	36	109	95	243	338
18:00	53	53	89	162	251
18:30	36	51	89	104	193
19:00	24	39	60	90	150
19:30	22	47	46	86	132
20:00	14	33	36	80	116
20:30	13	27	27	60	87
21:00	16	22	29	49	78

am road peak

Additional Future Hospital  
Hourly Volume

In Out

130 30

hospital peak

100 150

pm road peak

80 130



# **Appendix D**

## **Wyong Hospital**

### **Alternative Intersection Layouts**

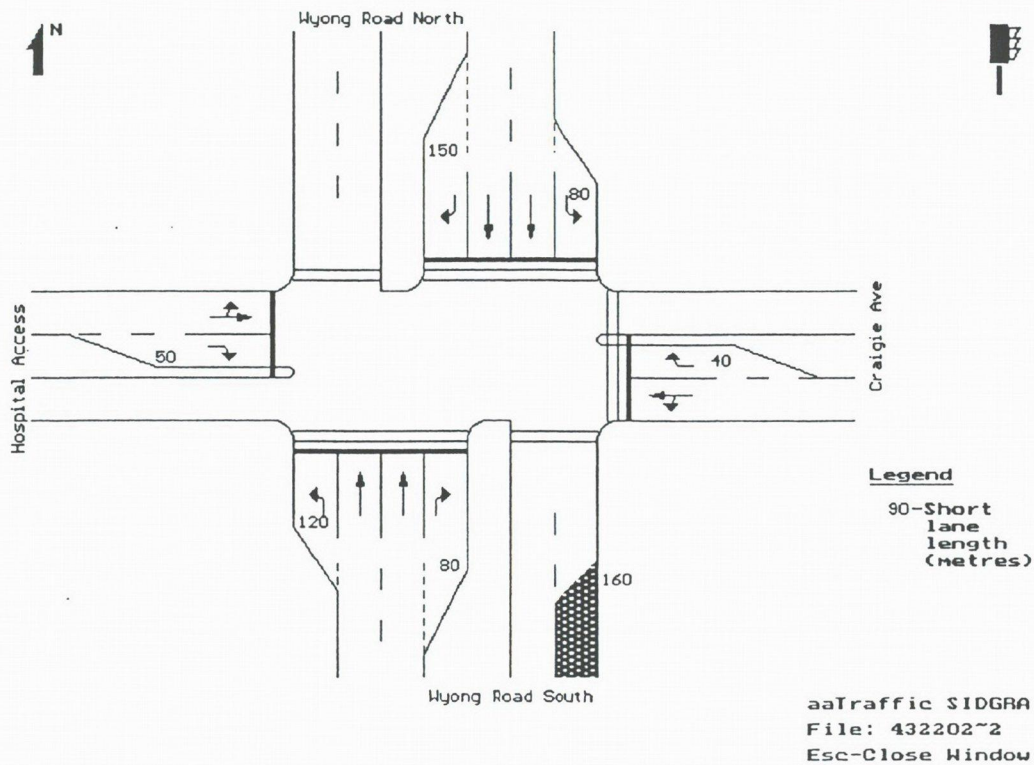


## Alternative 1: 4 Through Lanes in SH 10 plus Turning Lanes

User: A0360

Northern Transport Planning and Engineering

GEOMETRY

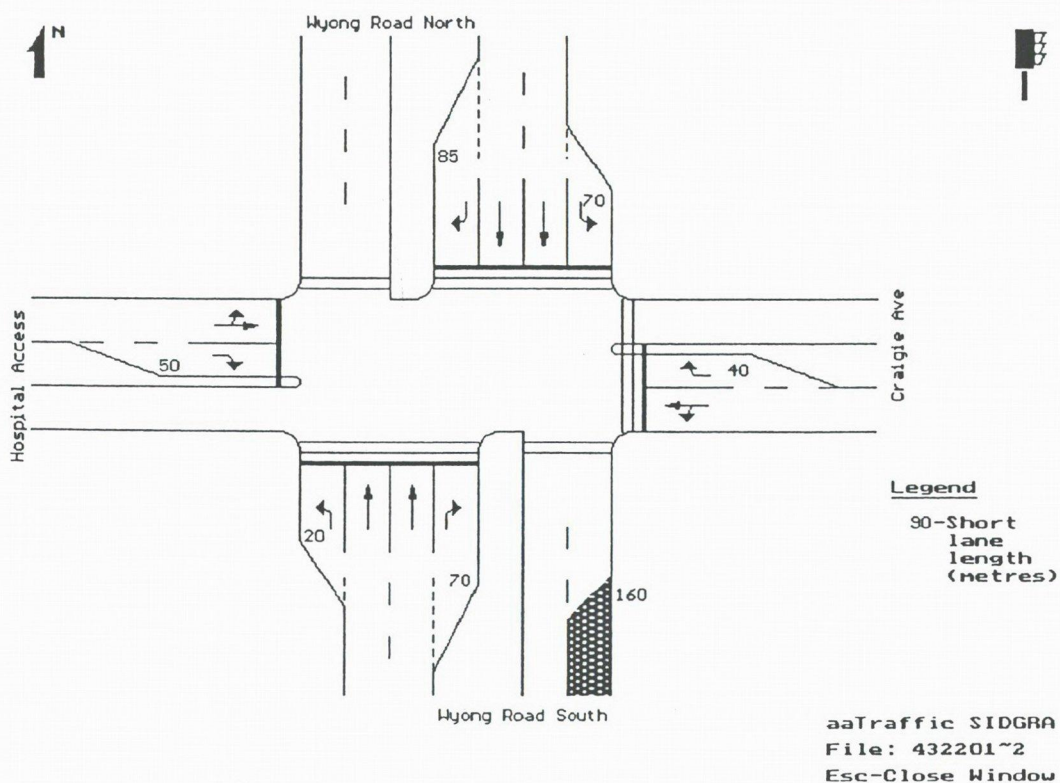


## Alternative 2: 4 Through Lanes in SH 10 plus Shortened Turning Lanes

User: A0360

Northern Transport Planning and Engineering

GEOMETRY

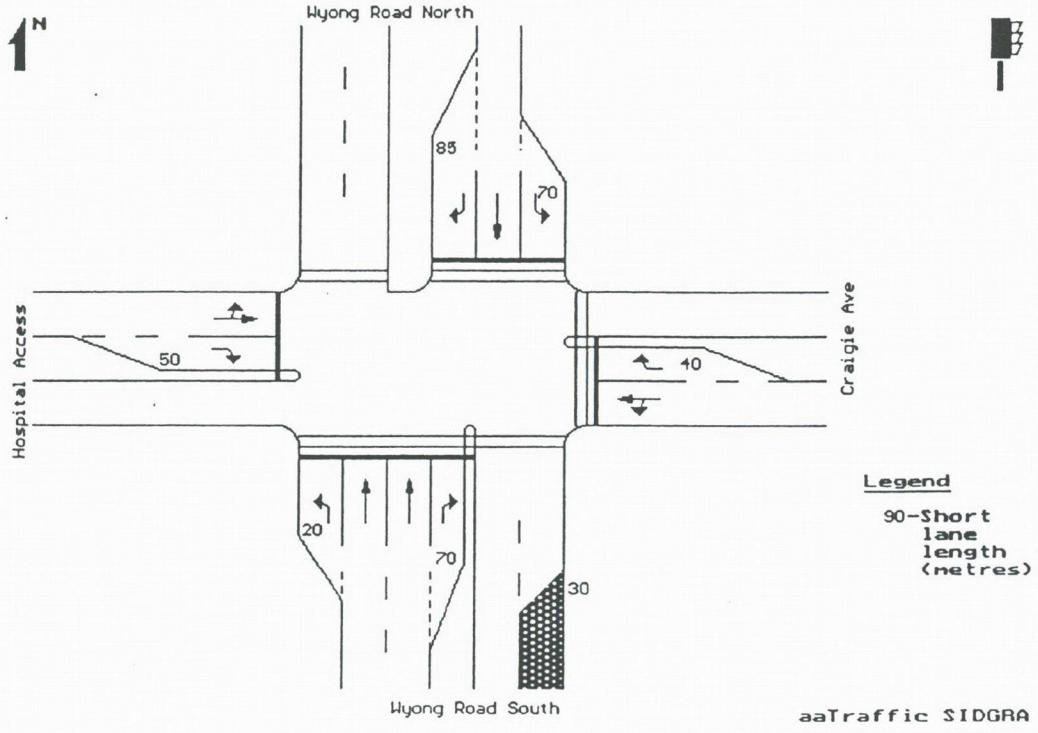


# Alternative 3: 2 Nthb and 1 Sthb Lane in SH10 plus Shortened Turning Lanes

User: A0360

Northern Transport Planning and Engineering

GEOMETRY



aaTraffic SIDGRA  
File: 43D798~1  
Esc-Close Window



## Appendix G

Public display poster

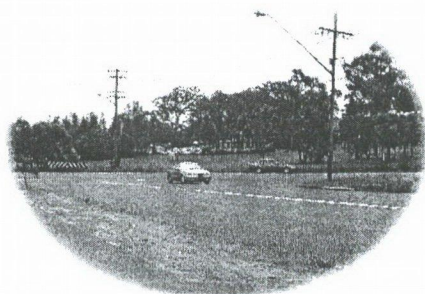




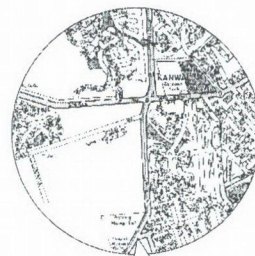
# STATE HIGHWAY No 10 - PACIFIC HIGHWAY

## KANWAL

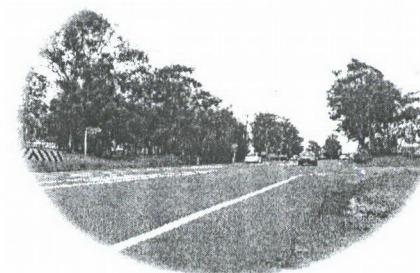
### NEW ACCESS TO WYONG HOSPITAL AT THE INTERSECTION WITH CRAIGIE AVENUE



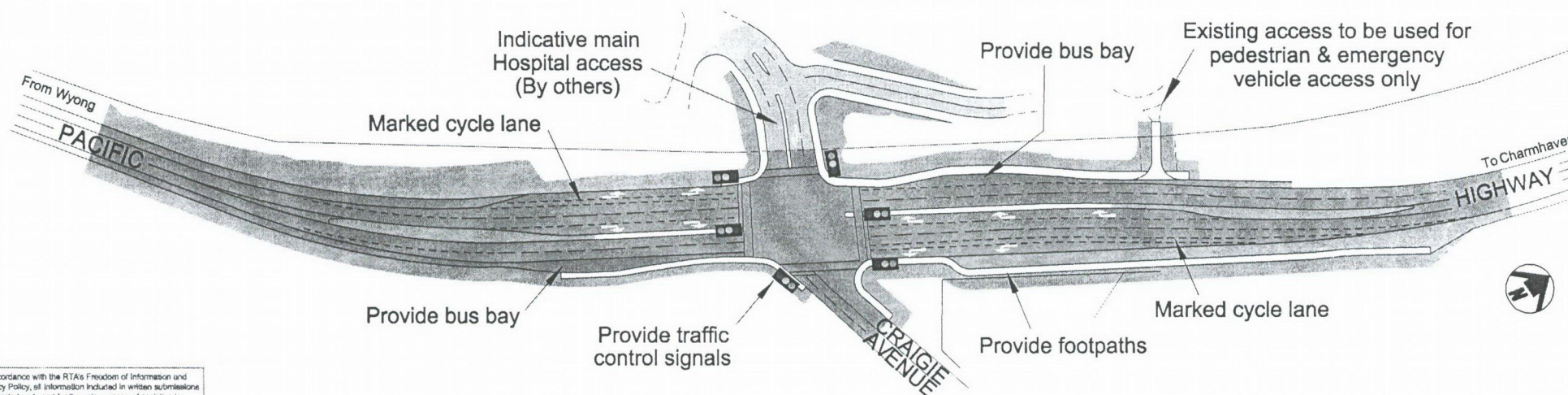
View Looking West Along  
Craigie Avenue



LOCATION



View Looking North Along  
Pacific Highway



In accordance with the RTA's Freedom of Information and Privacy Policy, all information included in written submissions is collected and used for the sole purpose of assisting in the assessment of this proposal.

The RTA will attempt to keep information confidential. If the RTA is requested to do so at the time the submission is lodged, however, there may be legislative or legal justification for the release of the information, for example under the Freedom of Information Act, 1986 or under subpoena or statutory instrument.

The supply of information is voluntary.

Each respondent has free access, at all times, to the information provided by him/her, but not any information provided by other respondents where that respondent has indicated that the submission should be treated as confidential. Any respondent may make a correction to the information that he/she provided, by providing the correction in writing to the same address where the original representations were sent.

The information collected will be held by the RTA at 68 Dwyer Street, Newcastle NSW 2300, and will not be used for any purpose other than the assessment of this particular project.

#### ADVANTAGES:

- Improved access to Wyong Hospital.
- Improved traffic management.
- Improved safety for motorists, cyclists & pedestrians.
- Improved facilities for public transport.

Enquiries about this display can be made by contacting :  
Matthew Mate  
Project Development Manager  
Telephone: (02)4924 0646  
Email: [matthew\\_mate@rta.nsw.gov.au](mailto:matthew_mate@rta.nsw.gov.au)

Comments about this display can be made in writing to :  
Matthew Mate  
Roads and Traffic Authority  
Locked Bag 30  
Newcastle NSW 2300  
Comments should be received by: 2 April 2003



# Appendix H

## Consultation



File No: 10/505.1772  
Contact: Matthew Mate  
Tel: (02) 4924 0646  
Fax: (02) 4924 0342

To the Residents  
Kanwal, NSW

**PROPOSED NEW ACCESS TO WYONG HOSPITAL AT THE INTERSECTION  
OF SH10 PACIFIC HIGHWAY AND  
CRAIGIE AVENUE, KANWAL  
PUBLIC DISPLAY OF CONCEPT DESIGN**

---

Dear Sir/Madam

The Roads and Traffic Authority has completed a concept design for the proposed 'New Access to Wyong Hospital at the Intersection of SH10 Pacific Highway and Craigie Avenue, Kanwal'.

The RTA has developed a concept design for the intersection based on construction of a new 4-way signalised intersection, part of which will become the main entrance to the hospital. The intersection would include a four-lane road with a central median, cycle lanes, turning lanes, pedestrian crossings and bus bays on the departure sides of the intersection. As well as improving traffic access to the hospital and the adjacent medical centre, the planned improvements will significantly improve pedestrian safety at the intersection.

The concept design is on display for public comment at the following locations:

- RTA Central Coast Office, The Clock Tower, Railway Street, Woy Woy.
- Wyong RTA Motor Registry, Corner Anzac Avenue and Hely Street, Wyong.
- Wyong Shire Council, 16 Hely Street, Wyong.
- Wyong Hospital, Pacific Highway, Kanwal.
- Lake Haven Library, Lake Haven Shopping Centre Goobarabah Ave, Lake Haven.

Copies of this letter have been delivered to properties adjoining the proposed works. The display has also been advertised in local newspapers.

Attached is a copy of the display poster for the proposed works. Members of the community with an interest in this project are encouraged to provide their written comments to the RTA by close of business on Wednesday 2 April 2003. Please address correspondence to Matthew Mate, Roads and Traffic Authority, Locked Bag 30, Newcastle, NSW 2300.

Should you wish to discuss the project or require further information, please contact Matthew Mate, Project Development Manager, on 4924 0646.

Yours faithfully

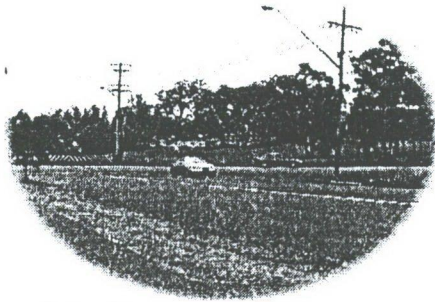
  
C W Nunn  
Infrastructure Development Manager  
Hunter Client Services

25/03/03

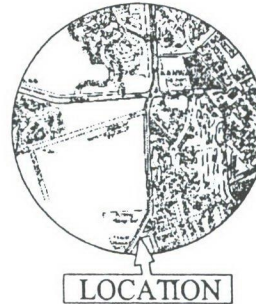




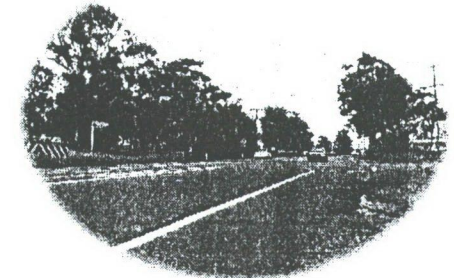
# STATE HIGHWAY No 10 - PACIFIC HIGHWAY KANWAL NEW ACCESS TO WYONG HOSPITAL AT THE INTERSECTION WITH CRAIGIE AVENUE



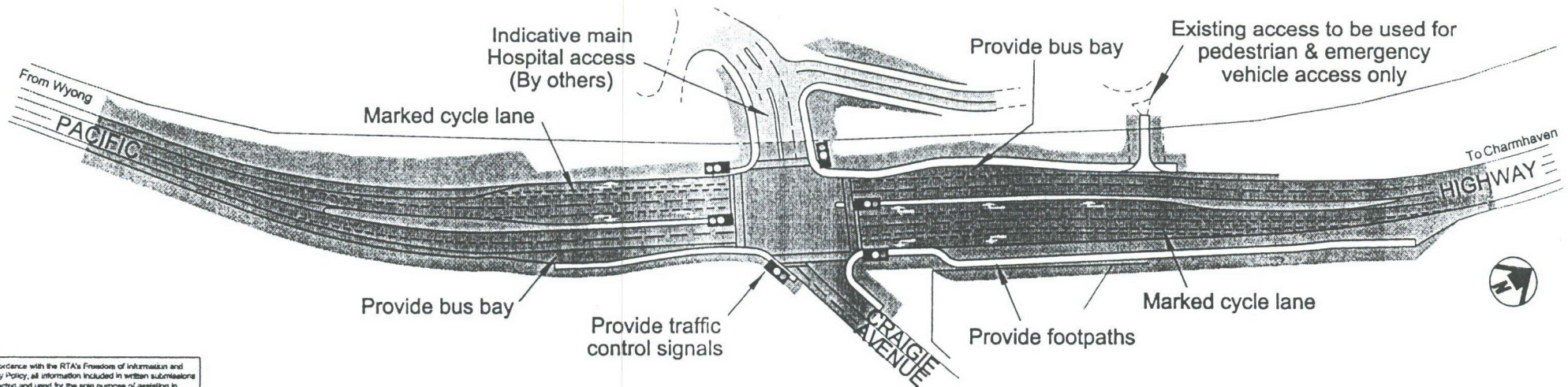
View Looking West Along  
Craigie Avenue



LOCATION



View Looking North Along  
Pacific Highway



In accordance with the RTA's Freedom of Information and Privacy Policy, all information included in written submissions is collected and used for the sole purpose of assisting in the assessment of this proposal.

The RTA will attempt to keep information confidential, if the RTA is requested to do so at the time the submission is lodged. However, there may be legislative or legal justification for the release of the information, for example under the Freedom of Information Act, 1999 or under subpoena or statutory instrument.

The supply of information is voluntary.

Each respondent has free access, at all times, to the information provided by themselves, but not any information provided by other respondents where that respondent has indicated that the submission should be treated as confidential. Any respondent may make a correction to the information that has been provided, by providing the correction in writing to the same address where the original representations were sent.

The information collected will be held by the RTA at 54 Darby Street, Newcastle NSW 2300, and will not be used for any purpose other than the assessment of this particular project.

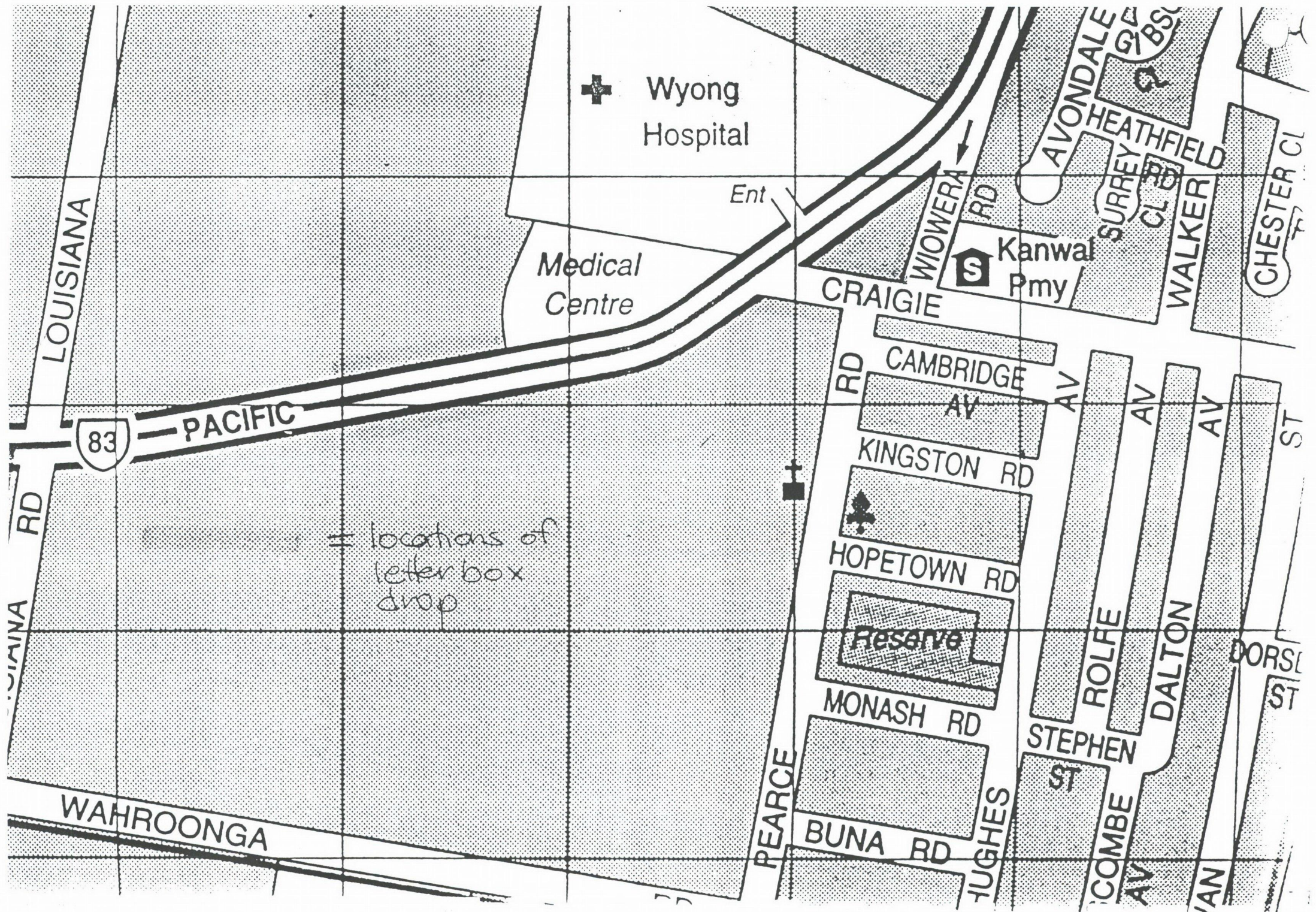
## ADVANTAGES:

- Improved access to Wyong Hospital.
- Improved traffic management.
- Improved safety for motorists, cyclists & pedestrians.
- Improved facilities for public transport.

Enquiries about this display can be made by contacting :  
Matthew Mate  
Project Development Manager  
Telephone: (02)4924 0646  
Email: [matthew\\_mate@rta.nsw.gov.au](mailto:matthew_mate@rta.nsw.gov.au)

Comments about this display can be made in writing to :  
Matthew Mate  
Roads and Traffic Authority  
Locked Bag 30  
Newcastle NSW 2300  
Comments should be received by: 2 April 2003







File No: 10/505.1772  
Contact: Matthew Mate  
Tel: (02) 4924 0646  
Fax: (02) 4924 0342



Area Director of Capital Development  
Central Coast Health  
PO Box 361  
GOSFORD NSW 2250

**FILE COPY**

www.rta.nsw.gov.au  
**Roads and Traffic  
Authority**  
ABN 64 480 155 255  
**Hunter Region**

59 Darby Street  
Newcastle NSW 2300  
Telephone (02) 4924 0240  
Locked Bag 30  
Newcastle NSW 2300  
DX 7813 Newcastle

**Attention: Mr Ron Robinson**

**INVITATION TO COMMENT - PUBLIC DISPLAY OF CONCEPT DESIGN  
NEW ACCESS TO WYONG HOSPITAL AT THE INTERSECTION OF  
SH10 PACIFIC HIGHWAY AND CRAIGIE AVENUE, KANWAL**

Dear Sir

The Roads and Traffic Authority is currently preparing a Review of Environmental Factors (REF) for the proposed 'New Access to Wyong Hospital at the Intersection of SH10 Pacific Highway and Craigie Avenue, Kanwal'.

The RTA has developed a concept design for the intersection based on construction of a new 4-way signalised intersection, part of which will become the main entrance to the hospital. The intersection would include a four-lane road with a central median, cycle lanes, turning lanes, pedestrian crossings and bus bays on the departure sides of the intersection. As well as improving traffic access to the hospital and the adjacent medical centre, the planned improvements will significantly improve pedestrian safety at the intersection.

The concept design will be on display for public comment from 26 February 2003 to 26 March 2003 at the following locations:

- RTA Central Coast Office, The Clock Tower, Railway Street, Woy Woy.
- Wyong RTA Motor Registry, Corner Anzac Avenue and Hely Street, Wyong.
- Wyong Shire Council, 16 Hely Street, Wyong.
- Wyong Hospital, Pacific Highway, Kanwal.
- Lake Haven Library, Lake Haven Shopping Centre Goobarabah Ave, Lake Haven.

Attached is a copy of the display poster for the proposed works. Your organisation is invited to comment on the proposed works and to advise of any interests, concerns or requirements it has, statutory or otherwise. Comments received will be included and addressed in the REF.

To enable the fullest consideration of your comments in the REF, your written response would be appreciated by 2 April 2003. Please address correspondence to Matthew Mate, quoting file reference number 10/505.1772. Should you wish to discuss the project or require further information, please contact Matthew Mate, Project Development Manager, on 4924 0646.

Yours faithfully

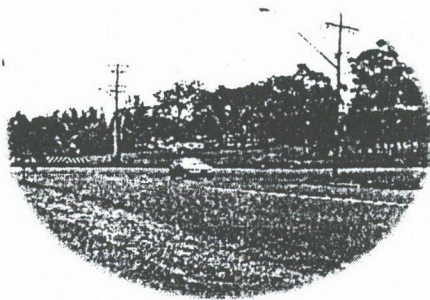
C W Nunn  
Infrastructure Development Manager  
Hunter Client Services

24/2/03

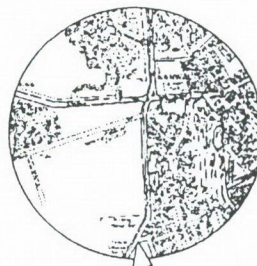




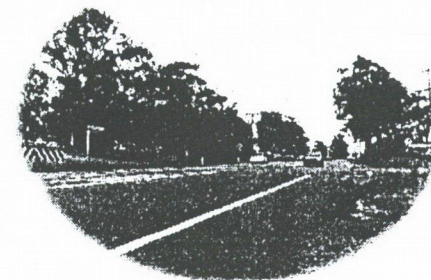
# STATE HIGHWAY No 10 - PACIFIC HIGHWAY KANWAL NEW ACCESS TO WYONG HOSPITAL AT THE INTERSECTION WITH CRAIGIE AVENUE



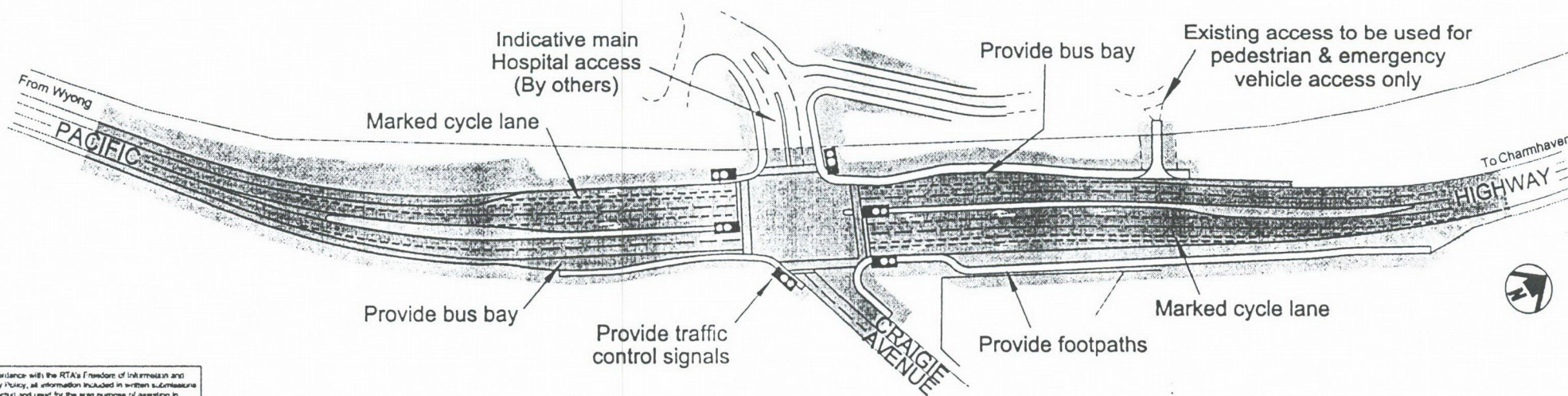
View Looking West Along  
Craigie Avenue



LOCATION



View Looking North Along  
Pacific Highway



In accordance with the RTA's Freedom of Information and Privacy Policy, all information included in written submissions is collected and used for the sole purpose of assisting in the assessment of this proposal.

The RTA will attempt to keep information confidential, if the RTA is requested to do so at the time the submission is lodged. However, there may be exigencies or legal justification for the release of the information, for example under the Freedom of Information Act, 1999 or under subpoena or statutory instrument.

The supply of information is voluntary.

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The information collected will be held by the RTA at 56 Darby Street, Newcastle NSW 2300, and will not be used for any purpose other than the assessment of this particular project.

## ADVANTAGES:

- Improved access to Wyong Hospital.
- Improved traffic management.
- Improved safety for motorists, cyclists & pedestrians.
- Improved facilities for public transport.

Enquiries about this display can be made by contacting :  
Matthew Mate  
Project Development Manager  
Telephone: (02)4924 0646  
Email: [matthew\\_mate@rta.nsw.gov.au](mailto:matthew_mate@rta.nsw.gov.au)

Comments about this display can be made in writing to :  
Matthew Mate  
Roads and Traffic Authority  
Locked Bag 30  
Newcastle NSW 2300

Comments should be received by: 2 April 2003



<b>Title</b>	<b>Company</b>	<b>Address1</b>	<b>Address2</b>	<b>City</b>	<b>Attention</b>
The Regional Manager	Department of Land and Water Conservation	Hunter Region Office	PO Box 2213	DANGAR NSW 2309	Mr Chad Stockham
The Regional Manager	NSW Environmental Protection Authority	Newcastle Office	PO Box 488G	NEWCASTLE NSW 2300	Mr Graham Clarek
The General Manager	Wyong Shire Council	PO Box 20	WYONG NSW 2259		Mr Bob Burch
Sector Manager	Ambulance Service of NSW	Northern Division	PO Box 17	HAMILTON NSW 2303	
Area Director of Capital Development	Central Coast Health	PO Box 361	GOSFORD NSW 2250		Mr Ron Robinson
Planning & Infrastructure Manager	Busways	Locked Bag 61	PYMBLE NSW 2073		Mr Trevor Jennings
Planning & Development Officer	The Entrance Red Bus Company	PO Box 3088	BATEAU BAY NSW 2261		Mr David Baine
Director	Kanwal Medical Centre	5 Amy Close	Wyong North NSW 2259		Mr Kevin Gregory



# Appendix I

## Submissions



m mare

10/505.1772;1

Real Estate Agents  
Auctioneers  
ABN 47 326 480 413

Cnr Craigie Ave & Pacific Hwy  
Kanwal NSW 2259

Facsimile 4392 4755  
Email kanwal@randw.com.au  
www.randw.com.au/kanwal  
Telephone 4392 4188

# Richardson & Wrench

Kanwal

Roads and Traffic Authority  
Locked Bag 30  
NEWCASTLE NSW 2300

26<sup>th</sup> March 2003

ATT MATTHEW MATE

Dear Matthew,

I have received a copy of the proposed traffic lights at the corner of Craigie Ave and the Pacific Hwy Kanwal and upgrade of the entrance to Wyong Hospital.

As the owner of Richardson & Wrench Kanwal I would like to support the installation of traffic lights at this intersection.

I have owned the business for two years and have witnessed an enormous amount of accidents at this intersection; it is about time something is done.

The other great concern is the amount of traffic from Kanwal Public School that congests Craigie Ave both morning and afternoon I am sure that it would flow better with traffic lights in place to provide people with a safe exit from Craigie Ave on to the Pacific Hwy.

I fully support the installation of the lights and the sooner the better.

Regards,



Lyn Scott  
PRINCIPAL

m r m mate

03/7961

DEADLINE 2 5 APR 2003

REC'D IN OFFICE SERVICES HUNTER REGION	
2 8 MAR 2003 ATTACHED	
Date	Initials



10/03/1772;

**Kanwal Public School**  
- A dynamic, caring, learning community



Craigie Avenue,  
KANWAL. 2259.

Phone: (02) 4392 3477

Fax: (02) 4393 1621

Email: [kanwal-p.school@det.nsw.edu.au](mailto:kanwal-p.school@det.nsw.edu.au)

Mr Matthew Mate  
Project Development Officer  
Roads and Traffic Authority  
Locked Bag 30  
Newcastle  
NSW 2300

Thursday, 27 March 2003

Dear Mr Mate,

In response to your correspondence dated 25<sup>th</sup> March 2003, we are writing to make you aware of some concerns that we have. While the outcome of the proposal is totally acceptable, our concerns are with the construction phase.

Concerns of the school to be addressed by RTA while construction takes place include:

1. Additional traffic into Wiowera Rd as traffic tries to take shortcuts to alleviate their delays. We feel that this increase in traffic could cause an accident near and/or around school children.
2. Problems that teachers and staff will face arriving at and departing from school due to increased traffic along Wiowera Rd, Craigie Ave, Hughes Ave, and Walker Ave.
3. Possible additional traffic down Walker Ave as traffic uses Wallarah Rd and Walker Ave to bypass the construction.

Please be aware that our concerns are for children's safety while construction is taking place, but we feel confident that the RTA has taken all of these concerns into consideration.

Yours sincerely,

K. Deagan

K. Deagan

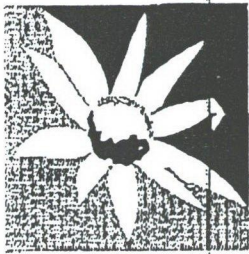
Relieving Deputy Principal

03/7997  
MR. MATE

DEADLINE 30 APR 2003

REC'D IN OFFICE SERVICES HUNTER REGION
- 2 APR 2003
ATTACHED
3.4.03
Initials





**WYONG SHIRE COUNCIL**  
**STRATEGIC PLANNING DEPARTMENT**  
DX 7306, WYONG PO BOX 20, WYONG NSW 2259  
Telephone: (02) 4350 5455 Fax: (02) 4351 1096  
Email: BurchB@wyong.nsw.gov.au  
Website: www.wyongsc.nsw.gov.au

## FACSIMILE TRANSMISSION

TO: Matthew Mate FROM: Bob Burch  
COMPANY: Roads and Traffic Authority TELEPHONE: (02) 4350 5455  
FAX: 4924 0342<sup>347</sup> DATE: March 24, 2003  
4929 7107

PAGES INCLUDING THIS COVER PAGE : 7

File: D/000116

---

RE: Pacific Highway/Craigie Avenue Intersection - Access to Kanwal Medical Complex

As discussed, I have spoken to Kevin Gregory. He has no objections to me giving you a copy of his correspondence to Council dated March 19, 2003. A copy of that letter follows.

Regards

Bob Burch  
TRANSPORTATION ENGINEER

FAXED



# Wilde & Gregory

## Investment & Management Pty. Limited

ACN 050 285 553

### Kanwal Medical Complex

1 Amy Close,

North Wyong 2259

Phone: 0414 522 445 Fax: 4352 1223

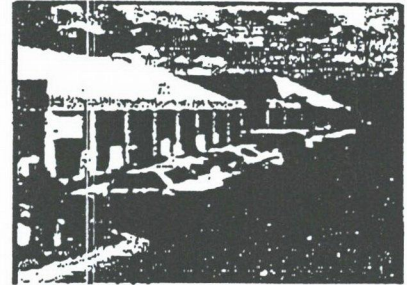
Wednesday, March 19, 2003

Bob Birch  
Wyong Shire Council  
PO Box 20  
Wyong 2259

Dear Bob,

Re: Kanwal Medical Complex  
Development Consent 276/92

File with C Ferry  
Date 4/2/03  
Please Attach 2/3



WYONG SHIRE COUNCIL			
Doc. No.		595 229	
RECD.		20 MAR 2003	
ACT	INFO	DEPT	FILE No.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	REB	D/000116

This company is the owner and developer of the above mentioned Medical Complex.

The Company received development consent (276/92) on 25th June 1993 for the construction of Complex subject to obtaining alternative access from the Pacific Highway pending construction of a proposed roundabout at the intersection of Craige Avenue.

At all times we understood the roundabout would service the, Hospital and the Medical Complex.

We came to that conclusion after discussions with Council Officers, Plans drawn by Council Officers (copy enclosed marked Original Concept ) and the fact that in 1993 this company contributed \$31,000.00 to Council for the upgrading of the intersection with Craige Avenue as a condition of our development approval.

We are aware that the RTA has been in the process of planning the design of an intersection. Despite several phone calls to the RTA we have had no communication or requests for input to the design process.

We now understand the RTA has adopted a proposed intersection design for the upgrading of access to the Hospital that does not provide for direct access to the Medical Complex from a public road. (copy enclosed marked A)

The RTA has not sought to consult with the directors of this Company to seek its input into the design of proposed accesses. Furthermore it appears that the RTA has structured its proposal around a design prepared by Central Coast Area Health Service



for it's internal road layout. Again we were not invited to contribute to the internal design

I'm sure that Council always anticipated that the Medical Complex would. We see no reason why an intersection substantially in accordance with the original concept designed by Council could not be considered.

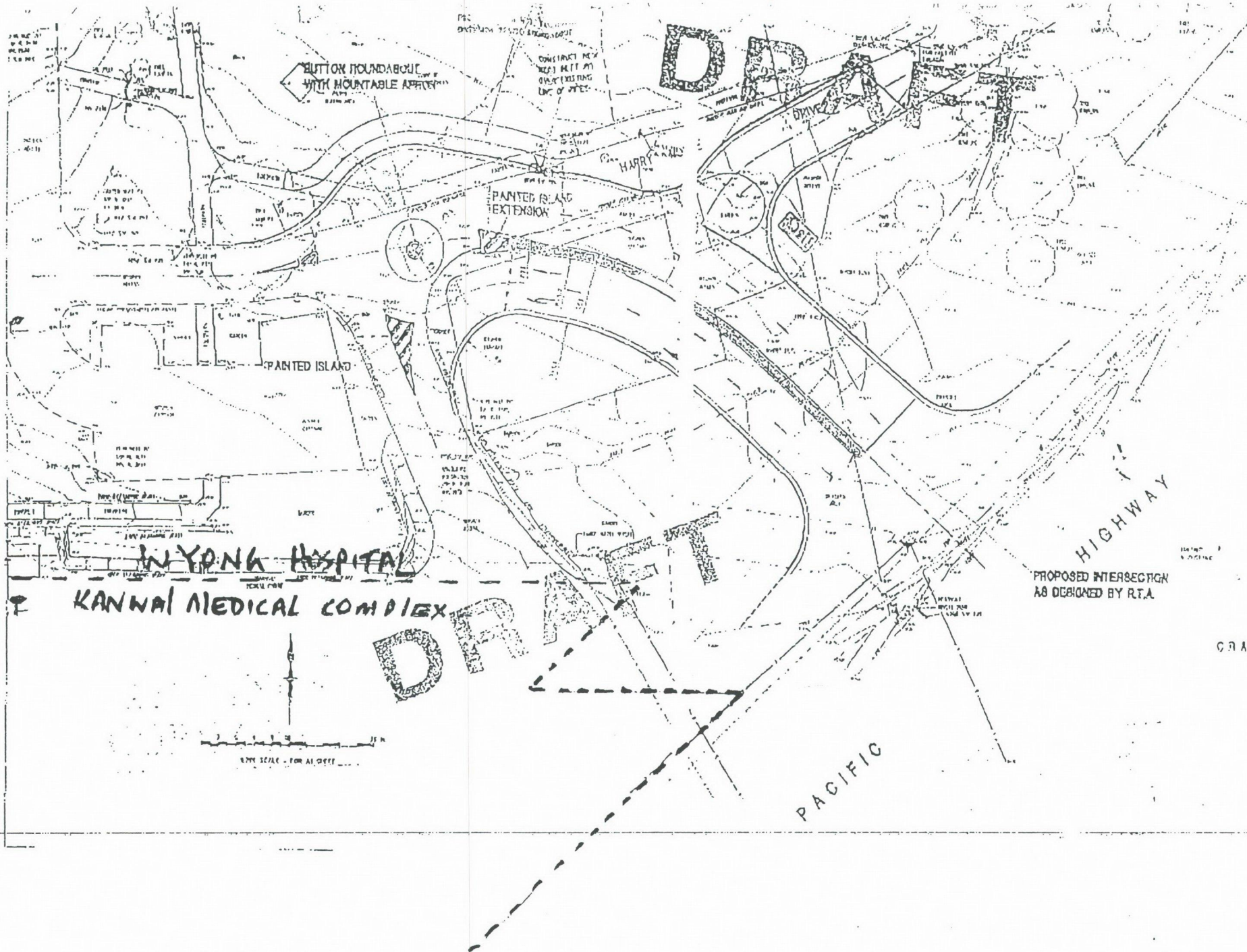
We seek your help in having any upgrading of access to the Hospital and Medical Complex completed on an equitable basis, insomuch as it provides access to the staff and patients from a public road.

Yours faithfully,  
**Wilde & Gregory**  
**Investment & Management Pty. Limited**

Kevin Gregory  
Director

A handwritten signature in cursive script, appearing to read 'Kevin Gregory', is written over a horizontal line.







WYONG HOSPITAL

CARPARK

FUTURE CARPARKING

HOSPITAL

MEDICAL COMPLEX

GENERAL PRACTITIONERS

CRAIGIE AVE

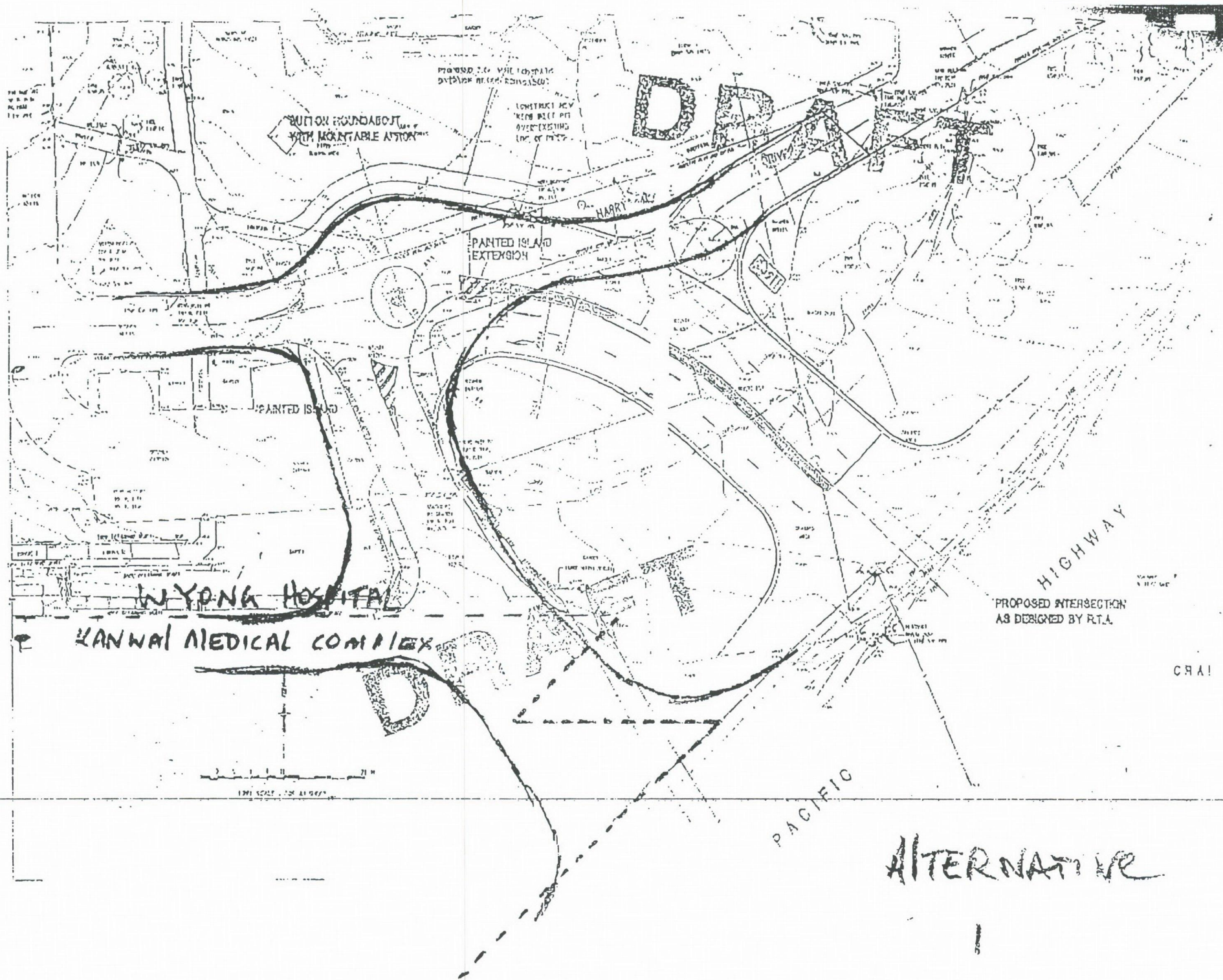
PRELIMINARY

For Discussion

C







ALTERNATIVE

CRAI



2

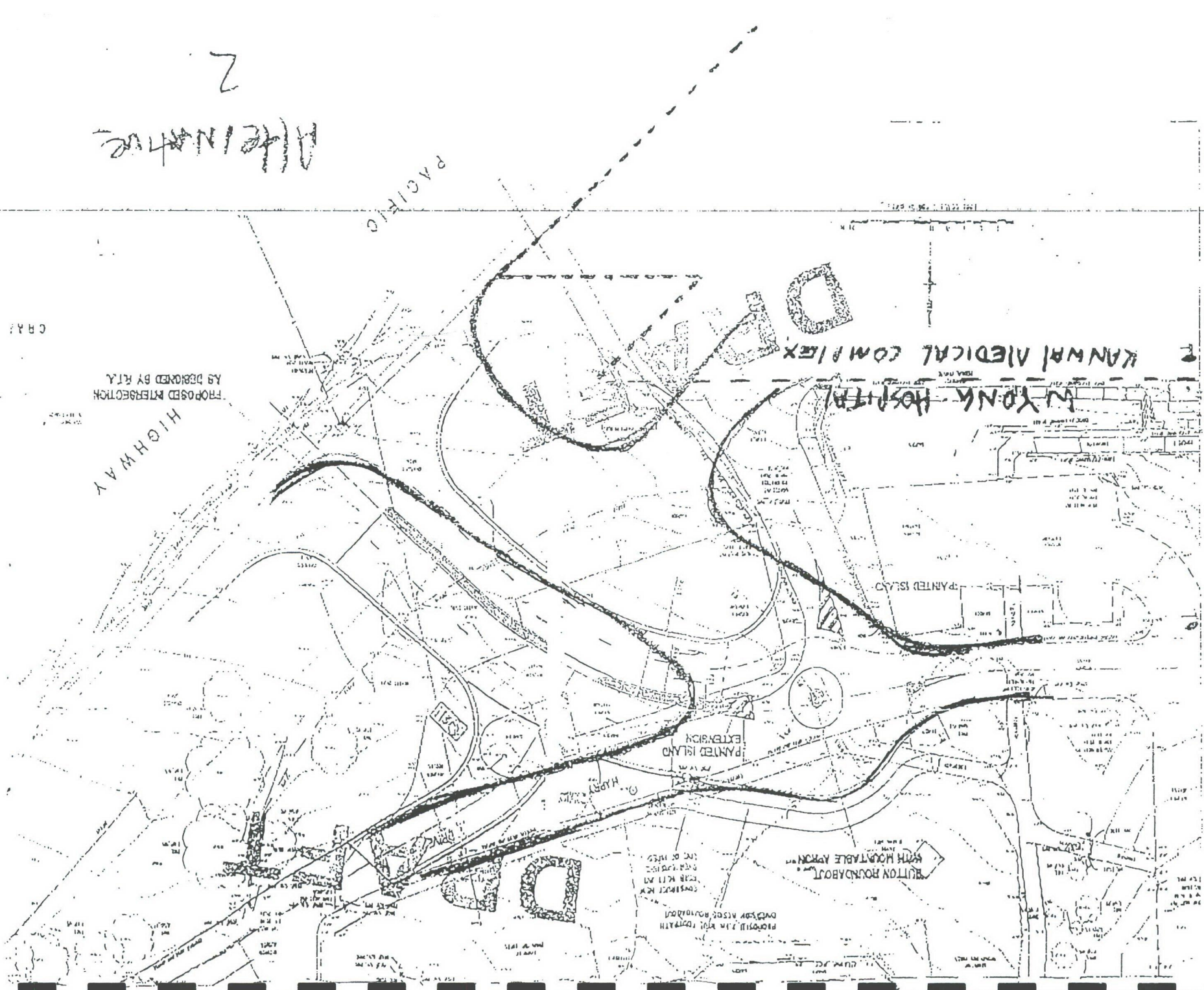
Alteinnave

PACIFIC

CRAY

PROPOSED INTERSECTION  
AS DESIGNED BY R.T.A.  
HIGHWAY

KANWAL MEDICAL COMPLEX  
WYONK HOSPITAL





# Appendix J

## Heritage Study



Report to:

Mr Brian Watson  
Project Manager  
Sinclair Knight Merz  
125 Bull Street  
Newcastle West, NSW 2302  
Australia

*Tuggerah to Doyalson-Pacific Highway  
Route Development Study  
Cultural heritage assessment  
Wyong LGA*

Report author :

Sue Effenberger *BA GradDipMarArc  
Archaeologist*



---

**prisma** HERITAGE ENGINEERING ENVIRONMENT  
PO BOX 119  
WANGI WANGI NSW 2267  
0249754388 TELEPHONE 0249753214 FACSIMILE  
[prisma@hunterlink.net.au](mailto:prisma@hunterlink.net.au) email



## **Appendix C – Heritage Issues Report**

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## Cultural heritage report

### *Pacific Highway - Tuggerah to Doyalson Route Development Study Wyong LGA Sue Effenberger (014)916597*

#### 1. Preamble and study brief

Sinclair Knight Merz approached **prisma heritage** on behalf of the proponent RTA Major Projects to undertake a cultural heritage assessment for route development of the Pacific Highway (SH10) from Tuggerah to Doyalson, which is approximately 20 km.

The study is an exercise in planning for short medium and long term strategies for a 20 year period.

The area is highly developed, however, the consultant anticipated that the survey would reveal archaeological features. The consultant anticipated that the features would comprise stone artefact scatters, shell middens and possibly scarred trees. No rock engravings on platforms or otherwise would have been anticipated since platforms of exposed Hawkesbury Sandstone were not prevalent in this area, by contrast to further west and the Sydney to Newcastle Freeway. There have been few consultant reports for the immediate vicinity, and road alignment, and they did not report archaeological sites.

The assessment proposed here will conform to the current legislation and guidelines observed by the heritage statutory bodies, NSW National Parks and Wildlife Service and the NSW Heritage Office where possible. This report is designed for use in RTA planning studies and will not replace the need for a full archaeological assessment (according to statutory guidelines) should any of the sites mentioned below be under threat from development plans.

The proposed project method was as follows:

#### **Phase One - Technical Data Collection**

##### **Background**

- Client and proponent requirements for the project.
- Establish liaison with key personnel, eg Wyong Shire Council, RTA Heritage Officer.
- Literature research including archaeological, historical, anthropological and environmental reports.
- Register search, NPWS, Heritage Office, Wyong Shire Council.
- Research and study plan (preliminary).
- Regional context.
- Legislative requirements.
- Aboriginal community requirements (in association with proponent, Aboriginal liaison officers, principal consultant).



## Field survey

- Engagement of Aboriginal survey team.
- Selection of appropriate field methods.
- Sample survey and recording (2 days), mapping, photography, preliminary significance based on background. Aboriginal and non-Aboriginal sites.
- NPWS/Heritage Office recording requirements, including register of sites and site recording forms.
- Cultural field assessments, preliminary, historical and anthropological.
- Archaeological assessment.

## Analysis and synthesis

- Summary of impact history.
- Potential impact on cultural heritage.
- Mapping of data
- Preparation of report, to meet requirements of proponent, client., and Aboriginal community.

## 2. Overview

The study focuses the Pacific Highway in the Wyong LGA, skirting the flood plain 4 km west of Tuggerah Lake, between Tuggerah and Kanwal, continuing north to Doyalson near the shore of Budgewoi Lake.

The Pacific Highway transects land which is a low lying deltaic floodplain of no more than 10 m AHD to the south, rising 40 to 80 m in the mid section, and waning again to 30 m AHD at the northern end. The floodplains include a system of several lagoons and wetlands, the most extensive of which are the Colongra wetlands east of Doyalson.

Vegetation has been cleared for pasture to service past agrarian use, in which grazing and dairying predominated. Remnant vegetation in the southern low-lying areas is swamp forest comprising Paperbark, Swamp Mahogany, Swamp Oak and some Sydney Blue Gum. To the north, Angophora, Scribbly Gum, Red Bloodwood, and Brown Stringybark predominate. There is a pocket of Spotted Gum, Grey Gum, Stringybark, and Ironbark on higher ground just north of Wyong and in the vicinity of the reservoir at Wadalba.

Built features include the existing highway, shops and dwellings, farms, a golf course, playing fields, railway stations, municipal buildings, a race course, one minor and two major waterway crossings, and industrial area and the Munmorah State Coal Mine.

## 3. The Lakes

The Tuggerah Lakes system is a coastal-parallel lagoon behind a barrier ridge of dunes which is periodically breached, but has stabilised to become infilled and shallow. The system is more formally termed a "barrier estuary". Muds have settled to form basin deposits, which has narrowed the tidal range in the present day. Much of the sand deposit is marine in origin, but extensive clearing and urbanisation have contributed to the shallow mud-lined basin of today.



Historical accounts have described the transformation of the Lakes from deep, sandy basin teeming with natural resources to a waterway that challenges environmental managers today. An historical account by Swancott described how it was possible to shoot duck and Black Swans in the 1840s as well as terrestrial game such as "opossum", bandicoot, snakes, iguana (sic, presumably goanna). Fisheries were abundant and it was possible to catch Mullet, Flathead, Bream, Blackfish and Schnapper in abundance. Fishing is still a recreational pastime. Shellfish such as Cockles and Oysters were plentiful in the Lake and could feed the returned Servicemen and families after the WWI.

Another account by Edward Stinson (Stinson 1984 : 145) described the land fringing the lakes. The pioneers thought of the land south of Wyong River and north of Ourimbah Creek as "the big plain" or the Tuggerah Flats. The Tuggerah Flats meld with Narara Valley towards Gosford in the south, and is part of an ancient river delta through which Ourimbah Creek flows.

#### 4. History

Wyong is situated where the Governor Darling granted land of 640 acres to William Cape in 1828. Cape gave the grant the name Wyong Hill, although the landform that this name refers to is now Chapmans Hill. *Wai-ong* was the Aboriginal name for the wild yams in the area. Using today's land marks, the original Cape lease extended between Porters Creek (west) and Byron Street (east) and between Wyong River (south) and the right angle bend of Pacific Highway at the northern edge of the golf course (north). The land remained unoccupied in parts and in the 1870s William Alison purchased the swamp lands east of Wyong Hill to Tuggerah Lake from various land holders (Bennett 1969 : 4). According to historical accounts, Alison was responsible for much of the tree clearing by ringbarking in the area (Stinson 1979 : 4).

Alison died in 1885 and Albert Hamlyn Warner purchased the unsold Alison estate. Warner was a successful entrepreneur with offices in Sydney, Wyong and Warnervale and was responsible for much of the land development and subdivision in the Wyong area. As late as 1880 Wyong still was part of a wild scrub with dingos and wallabies (Stinson 1979 : 2).

Surveyors laid out the town of Wyong after the railway line had been laid in 1888/9, but it was not until 1906 that Wyong became a township. The railway changed past life patterns for Wyong and district residents and the reliance that they had on ships for transport made way for new roads, bridges, track, rolling stock and motor traffic. By 1930, the switch from sealane to road was complete.

Timber getting was the mainstay for commerce in the area and most of the timber was transported to Sydney, with Maitland being a secondary destination. Along a typical early transport route near Wyong, as illustrated by George Bloodsworth's route in the 1830s, the timber would be sawn in a pit-at Jilliby, brought by dray to Wyong, rafted down Wyong Creek to Tuggerah Lakes, then floated to the other side of Tuggerah Lake. At this point, the timber would be transferred by dray to Cabbage Tree Hollow, where it was shipped to Sydney (Fisher 1998 : 12). The timber was used for a variety of purposes - building materials, packing cases, mine shafts, wharf and bridge piles- but much of it was used at the local shipbuilding yards around Gosford.

If not required as whole logs, the timber was milled at one of the many local businesses, such as the one adjacent to the Wyong railway station. With the advent of the railway, transport by ship across the Lake and through the Entrance to Sydney and beyond was no longer necessary and cargoes were brought directly to Wyong River and the railway station. Sawmilling and affiliated industries found greater profits as the cargoes congregated within a convenient distance of transport. The productive stands of Sydney Blue Gum, Blackbutt, and Ironbark continued to be



harvested from the open forests while Turpentine, and Cedar were cut from the closed forest of the gullies (Fisher 1997 : 33). The prosperity in the timber industry continued until the Depression in the 1930s, when shortages curtailed felling.

The O'Neill and Goldsmith mill at the Wyong Station, one of four steam driven mills in the area, made a large impact on the township itself. They purchased the Alison mill in 1889 and added Jilliby and Yarramalong mills to the network within a decade. By the turn of the century, as many as 25 drays could be entering the town from the west along Anzac Avenue at one time, and could be banked up as far as Porters Creek 1 km away. During these times of high congestion, timber piles would be stacked in the surrounding streets (Bennett 1969). They cut Blackbutt, Grey Gum, Turpentine, Blue Gum and Spotted Gum. Saw dust from the mill was used to absorb the swamp waters under the Wyong race course in 1913. They sold the mill in 1917 to Wilson & Flood, who closed during the Depression, in 1929 (Fisher 1998 : 24).

Prosperity in the region was stimulated by the success of the timber industry, fertile floodplains and ability to set up viable dairies, orchards and grazing. As timber stands became depleted through excessive felling, the agrarian economy bolstered Wyong's growth. The advent of the railway in 1889 stimulated the timber industry again after a temporary lull. Railway sleepers were in constant demand. Other benefits of the railway were soon evident as greater access to Wyong and The Entrance fishing, boating and bathing destinations created new demands for commerce.

The tourism industry thrived in the naturally picturesque and now well provisioned villages. During the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, several boarding houses and regular ferry trade, especially near The Entrance, supplemented the agrarian economy. The Central Coast area generally became known for its "weekenders" at the seaside.

## 5. Aboriginal history

From historical accounts, the resources of the Tuggerah Lakes area would have been abundant for the Aborigines, variously described as coming from *Tuggara*, or *Tahkahrah* Beach by Lancelot Threlkeld, Missionary in the Lake Macquarie area from 1824 to 1859 (Gunson 1974 : 96, 226). The name Tuggerah has come from the Darkinjung language, meaning, "cold, bleak, exposed" (Stinson 1979).

According to ethnographic research, Prior to disruption by white settlement, the Aborigines who lived within the study area comprised two clans, the coastal *Durringgai* (or *Koorringai*) and the hinterland *Darginjung* (or *Darkinjung*). It is very likely that the two intermingled seasonally or for ceremonies, however the Tuggerah Beach Aborigines described by Threlkeld would most likely have affiliations with the *Durringgai*. Darkinjung territory extended from the Hawkesbury River northward to Wollombi and the south drainage of the Hunter River. To the south they merged with the *Thurrawal* or Sydney peninsula (Vinnicombe 1980).

Traditional patterns would have involved ascending frees for honey, fishing, and hunting birds such as parrots, satin birds, cat birds, ducks, quail pigeons, and black swans. They would have hunted small game such as opossum, bandicoots, snakes, and goannas as well as kangaroo. The traditional ways of the Aborigines would have been well known to settlers who often relied on their knowledge of food and medicine, as well as practical skills, to survive.

Stinson 1979 described an interesting account of a ceremonial camp at the mouth of Wyong Creek, the present site of Tacoma south. This was a site of much reverence where tribes from Wollombi would descend from the mountains to participate in a secret and sacred corroboree,



decorating themselves with pipeclay and feather headdresses. Music was provided by the men clapping together boomerangs and singing.

According to historical sources Billy Fawcner, a much respected and loved person and apparent last of the Darkinjung people in the district, drowned at Tuggerah Beach Lake in his bark canoe in 1875 (*Town and Country Journal* 6/3/1875, cited in Stinson 1979 : 1). Billy Fawcner led his life in traditional ways, spearing fish, collecting honey and hunting. The local population frequently interacted with the Aborigines at Black Margaret Swamp, near Swansea (Stinson 1979 : 3).

The numbers of Aborigines recorded historically were fewer than would have been expected in such an ideal environment. In 1827 Willoughby Bean, magistrate of Gosford, reported to the Colonial Secretary that a total of 65 Aborigines belonged to Erina, Wyong, Broken Bay, Narara and Tuggerah Beach Tribes. By then, the ravages of smallpox, liquor, slaughter, poisoning, and shooting by settlers were complete. Another study in 1842 by John Mann located 60 or 80 Aborigines in Brisbane Water and district.

Today the curatorship of Aboriginal cultural heritage is vested in the Darkinjung Local Aboriginal Land Council, who operate within an administrative boundary declared under the NSW *Aboriginal Land Rights Act 1983*. The boundary is defined as the southern and western boundaries of the Lake Macquarie LGA to Wollombi Forest Road and north west along that road to Walkers Ridge Forest Road and south west to the eastern boundary of the Parish of Hay. The southernmost boundary is marked by Mangrove Creek and the northern shores of Barrenjoey Head.

## 6. Feature mapping

The following is an account of the historical and archaeological features as they relate to Maps 1-8 provided by SKM (ref 18/6/1998, RTA Photogrammetry section Road Technology Branch) to the consultant. For each map provided, may be two or three maps which are part of the whole. They have been labelled a to c, for example. The tables list the features, and for each feature there is a map reference that corresponds to maps that have been reproduced in this report. Certain maps were not reproduced if their presence could not serve to illustrate nor explain a feature.

The source for most of the information comes from Stinson volumes 1 to 6, however, if another author was cited, then this is indicated in the text. Some field observations were also recorded.

### Map 1 : Tuggerah (not shown)

The Tuggerah Lakes Hotel, built 1900, on the north west corner of Anzac Road and Pacific Highway. George Smith was proprietor and advertised, "First class stabling accommodation for horses, vehicles, and boats provided." It was demolished in 1974 (Stinson 1984 : 145).

Joseph Lees, the first butcher in the area, travelled the district in a horse drawn cart from the 1870s onwards. His descendants followed his trade and one established a shop on the south west corner of Anzac Road and Pacific Highway in the 1920s. It was demolished in the 1960s (Stinson 1979 : 135).

Tuggerah Railway Station built 1890, "Tuggerah Lakes Station"

Government Wharf, lake foreshore at the end of Wyong Lake Road, built 1899/1901 to service the fisheries and holiday makers as well as the timber felling industries. This wharf was a last vestige of the ships under sail at the Lakes. The wharf serviced the public in times when Wyong River was too silted to be navigable.



All Saints Church, Anzac Road Tuggerah, built 1930,1933.
Old Maitland Road, (off map, west of the F3 freeway)
Unconsolidated Quaternary sediments, towards lake might contain middens and artefact scatters.
Good source of coastal chert for artefacts.
The village of Tuggerah came into existence around the time of constructing the railway in 1888.

#### Maps 2A to 2C : Wyong River crossing (2A not shown)

2B	1	The Wyong River pier bridge (concrete and steel) was built to carry the railway line in 1886. A local history source stated that the materials for the bridge was brought to the site via Terrigal by ship, via Tuggerah by bullock and horse team where the materials were loaded onto draught lighter. These lighters were then towed across the lake and up Wyong Creek to the bridge site (Bennett 1969 : 6).
2B	2a	In 1890 Charles Alison established a Rowing Club, with boat shed., at the southern end of Rotary Park.
2B	2b	The Wyong Wharves were located on the north bank of the creek immediately to the west of the truss and the railway bridges. Passengers and cargoes were taken to various parts of Tuggerah Lakes. River silt had to be regularly dredged to maintain the river as navigable.
2B	4	Some of the trees at the bank of Wyong River near the bowling club were imported. They were Camphor laurels, Illawarra Flame Tress and Weeping Willows.
2B	5	It was possible to cross Wyong River in 1903 via a wooden truss bridge that the south with the north bank of Wyong Creek. This truss bridge, like many of its kind, was not valued for its heritage and was destroyed circa 1960s.
2B	6	Pioneer Dairy, opposite Johnson Road, Tuggerah, established 1910.
2C	1	Commonwealth Bank 1928
2C	2	The original Royal Hotel was opened in 1889 by John Robley. The wooden structure was demolished in 1920 to make way for the present structure
2C	3	Wilkinson's Store, built 1921 was the second of the Wilkinson's store to be located on that block. The first 1894 store was originally Young and Wilkinson, until the Wilkinson brothers went into business but by 1921 the store had been destroyed by fire, to be replaced with a brick structure, and a less varied commerce.
2C	4a	Railway and station master's cottage



2C	4b	Access over the railway line from Wyong to the Lakes and north along Pacific Highway was via a level crossing at the Warner Avenue "T" intersection, where one would pass the Station Master's cottage and water tanks on the north side. Warner Avenue provided a connection to Pollock Avenue and the Pacific Highway for those travelling north to Swansea/Newcastle. The use of the level crossing was eventually replaced by the traffic bridge opposite the Grand Hotel entrance, that met Warner's Avenue via Howarth Street.
2C	5	Tanks were located approximately at the southern end of the Wyong railway platform, where Warners road once crossed Pacific Highway. They were still located there, as noted in an historical account, in 1969 (Bennett 1969 : 7). The water was piped from Ourimbah Creek.
2C	6	The castellated buildings at the south end of the railway station were built by Albert Hamlyn Warner in 1926 and were occupied by Hungerford who dispensed petrol there. They eventually became the Wyong Saddlery (Stinson 1980 : 52).
2C	7	Behind the Royal Hotel is a car park that is the site of the drained and filled Wyong Dam. This dam provided water to horses and other livestock.
2C	9	At the north west corner of Church Street and Pacific Highway, is located the Coffee Palace built by John Robley in 1904 as an accommodation house. Warner acquired this and the adjacent shops along Pacific Highway in 1907, when , he added the "witch's hat" or octagonal roof,. Later incarnations were as a newsagency, owned by David McGeachie in 1919. In 1928 it was May's Tea Rooms. Rapley's stables were located behind, facing Church Street.
2C	10	The Coronet "Picture Palace" (1923), was located adjacent to the Coffee House, in Church Street, to the west. In 1936 it was partially destroyed in a fire. It was a grocery, hardware and produce store run by the Davies brothers from 1937 to 1972. In 1981 it was used as a cigarette distributor's warehouse (2 : 9).
2C	11a	Shop group reference 11 to 14. Wyong District Record 1908. Between The Coffee Palace at Church Street and Baker's Lane, was a group of shops which included, from south to north along Pacific Highway the office of the Wyong District Record (1908), and The Wyong Boot Palace, a pharmacy and open space which eventually became the Rural Bank address. All these buildings were destroyed in a 1914 fire.
2C	11b	Shop group reference 11 to 14. Dining rooms 1915.
2C	12a	Shop group reference 11 to 14. Wyong Boot Palace 1908. Destroyed by fire 1914.
2C	12b	Shop group reference 11 to 14. Hairdresser 1915.
2C	13	Shop group reference 11 to 14. Warners Real Estate, Boot Palace 1915.
2C	14a	Shop group reference 11 to 14. Pharmacy, tailor, butcher 1915.
2C	14b	Shop group reference 11 to 14. Masonic Hall circa 1920.
2C	15	Former Methodist church in Rankens Court, opened in 1907.
2C	16	Owen George Chapman residence Rankens Court. World War II memorials.



2C	17b	The old Rural Bank, on Bakers Lane corner, is a good example of functional early modern architecture so prevalent in commercial and institutional buildings in the 1930s. This style of building is often called P&O or Ocean Liner, because of its rounded walls, flat roof and strong horizontal capping around the roof line and further down the facade (here accentuated in white), reminiscent of the ocean liner funnel and plimsoll line. The bricks are salmon and the dimensional stone at the entrance is probably polished granite.
2C	17a	Before Rural Bank was built, the site was Mrs Morris' confectionery shop, and later the surgery and residence of Dr Gersh Baker in 1914.
2C	18	Former public school, was built in 1888 to accommodate the families of the shopkeepers, such as Chapman and Breckenridge, in the area.
2C	19	The old Court House (extant) is the site of several demolished buildings. The old Post and Telegraph Office, was built in 1892. The Bank of NSW was opened in 1906 and closed months later, to be taken over by Smith and Woodbury, timber merchants.
2C	20	William Arthur Chapman, 1928 residence, later Commonwealth Bank (1978)
2C	22	The Commercial Bank was opened in 1906 and was replaced by a new Commercial Bank building on the same site in 1977, at the south west corner of Alison Road and Pacific Highway.
2C	23	The Breckenridge General Store operated on the north west corner of Alison Road and Pacific Highway from 1886. It is the oldest extant building in Wyong. Since the Breckenridge left in 1903, the building took various guises, including that of the Rainbow Cafe until it was gutted by fire in 1980 and was demolished.
2C	24	In 1911, the brick post office, on the east side of the police station and horse paddocks was built. On its east side was Bell's Cordial Factory (1909). The modern-day post office was built on this site.
2C	25	In, the police station and lockup with horse paddock. was built next to the Chapman building.
2C	26	The Chapman second store, built in 1900 as Chapman and Sons, was the largest and most modern of its kind between Newcastle and Sydney (Stinson 1980 : 1). The current site of Wyong High School was known as Chapmans Paddock and the horses who worked during the week pulling delivery carts for the store spent weekends there
2C	27	Wyong's earliest butcher was Albert Bailey who had a shop on the north side of Alison Road, opposite the Court House.
2C	29a	In Alison Road on the north east corner of Margaret Street, Thos. Lloyd ran a farrier workshop. Lloyd and Dawe were in partnership until 1912.
2C	29b	The Astra Theatre was built on the same site as Lloyd's farriers in 1936 with its main entrance opening to Alison Road. It was demolished in the 1970s to make way for the Plaza complex.
2C	30	Watt's Concert Hall was in Church Street, it was the first hall in 1887 - the first schoolroom in 1888, and the first church. Exact whereabouts unknown.
2C	31	Boggs blacksmith 1936 to 1970.



2C	32	The Literary Institute (School of Arts) existed from 1898 at 29 Alison Road, and was the first picture theatre until the Coronet theatre opened. It was later a shoe factory.
2C	33	Bowcock blacksmith 1909
2C	34	Bank of New South Wales, which became Wyong Motors in 1925. The partnership was between Smith & Woodbury and William Arthur Chapman. Between 1935 and 1970s it became the biggest on the Central Coast.
2C	35	The Commercial Hotel was first built in on Pacific Highway opposite the traffic bridge to Howarth Street, in 1906, and relocated to 32 Hely Street in 1911. The Grand Hotel was built on the site in 1912. The Commercial Hotel in Hely Street, close to Chapmans store, is currently a solicitor's office.
2C	36	Commercial Hotel, transferred to this site in 1911.
2C	37	The timber yard occupied the open space around the railway station and the mill was located on the south approach to the race course. It closed during the Depression in 1930.
2C	38	Wyong's largest steam mill was O'Neill & Goldsmith, opened in 1900 after taking over the site from Alison in 1886. It was later used by Wilson and Flood in the 1920s.
2C	40	Brisbane Water Ambulance Service.
2C	41	A Protestant (St James Church of England, dedicated 1906) and a Roman Catholic Church (St Cecelia's dedicated 1908) with presbytery, side-by side on land donated by Albert Hamlin Warner.
2C	42	William John Chapman relocated his general store from across the road to a new and large store with his sons. The first store was on the south west corner of Alison and Hely Streets.
2C	43	The earliest route through Wyong and north via the Pacific Highway began at the site of (Mat) Woodbury's Inn, also known as "The Cedars", at the junction of Yarramalong Road and the Old Maitland Road (Bennett 1969 : 22). The dilapidated inn building remained encircled by a road until about 20 years ago. This location is now a picnic ground. The route continued east over Woodburys Bridge, as it is still known, then Porters Bridge and connected with Hill Street (now Anzac Avenue). Via Howarth, Warner and Pollock Streets, the route connected with Pacific Highway (Bennett 1969 : 6).
2C	44	Traffic bridge over railway to Howarth Street 1911.
Off map		Tacoma South corroboree ground, Kuringgai, Wollombi Aborigines. Open artefact scatter.
Off map		The Woodbury's Inn failed after the road to Maitland (the Old Maitland Road to the west) was re-routed through Tuggerah in the 1870s, crossing the Wyong River by punt. Soon after, in 1888, the railway established the crossing.
Off map		Tacoma was the site of the railway and bridge labour force.



Off map		Tacoma also became the centre of a thriving fishing industry which has a modern day counterpart in the Fisherman's Cooperative Society (Bennett 1969 : 5) and was once known as East Wyong. A wharf was built at the river mouth at South Tacoma
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#### Maps 3A to 3C : Wyong (3A, 3B not shown)

3C	1	The "Acropolis" home is located within the triangle formed by Watanobbi Road, West Street and Pacific Highway. It was built by Leslie Aubrey Warner in the 1930s. It was named Acropolis after a cafe owned by Peter Veneris, Greek national, who lived in the house into retirement.
3C	2	Golf Course, this would provide exposures for artefact inspections. Since most of this area is reclaimed swamp, and there are local stories of how sawdust from the mills was used in the reclamation, it is unlikely that artefacts would be found there.

#### Maps 4A to 4C : Korakoa (not shown)

Pollock Avenue might have been the pathway for Aborigines between Wyong River and Kanwal. The same track serviced early settlers as a stock route.

#### Maps 5A to 5C : Kanwal (5A, 5B not shown)

5C	1	"Rosedale" homestead was purchased by Harry Graham from Warner in 1912. In 1915 it became the Kanwal Post Office. From 1918 its was owned by the Sullivans then Beldon. Thomas W Pearce purchased it in 1927, and he served as a councillor in the Shire. The building is on the corner of Bingara and Pearce Roads.
5C	2	The Anglican Church of St Mary was dedicated in 1924 and closed in 1981.
Off map		Source of kaolin for ceremonies at Pipeclay Point.
Off map		Entrance source of red ochre.

#### Maps 6A to 6B : Gorokan to Lakeside (not shown)

No archaeological nor heritage features in the vicinity of Pacific Highway.

#### Map 7A to 7D : Charmhaven to San Remo (not shown)

Flanks of Wallarah Creek, potential sites.

Original Wallarah bridge built in 1916, new bridge built after World War II.



Open space Opposite Charmhaven Avenue. No sites nor artefacts had been discovered, however Aboriginal representatives from Darkinjung Local Aboriginal believed that the space was in some way used or inhabited by families in the ancient past. The proximity of the site to resources - it is close to the Lake shore as well as Wallarah Creek - is compatible with previous site locations.

#### Map 8A to 8B : F3 connection and Norah Road at Doyalson (8A not shown)

8B	1	A portion of the old Newcastle road had been exposed adjacent to the motorway. The layers of road construction could be inspected as some of the road base eroded away. Road construction has been documented in historical accounts. The ground was first cleared, then capped with cracked irregular stone, or random rubble, that ingeniously fit together in the present example. Whether the entire length of the Newcastle Road has been constructed in this way is not known. The next layer is compacted soil. Further south on the same road, the layers exposed, from bottom to top, were tar (presumably overlying the stone), gravel, and bitumen. It is very likely that this road would have post dated the opening up of the countryside to settlers in 1861 as part of the Robertson Land Act, when a concerted effort was made to allow vehicular traffic to reach the eastern side of Lake Macquarie. A dray track passed from Wyong through the scrub to "Pogewoy" (Budgewoi), Clouten (1967) believed that this track may have been utilised by the cedar gangs operating in the valleys west of Wyong. For the most part, the roads along the coastal plain to Newcastle could not be negotiated by drays or coaches because there were no bridges over the creeks. A decline in shipping along the coast would have increased the impetus to build routes along the coastline. This would have occurred sometime after the railway was built in 1888/9.
8B	2	The area to the north of Pacific Highway to Doyalson has been extensively mined as part of the Munmorah State Coal Mine

## 7. Archaeological sensitivity

An earlier work by Vinnicombe (1980) has described the archaeological remains in the vicinity of Tuggerah Lakes as being "negligible". The lack of sites seemed to be at odds with the abundant resources which would have attracted Aboriginal settlement, and numerous settlers accounts of Aboriginal traditional ways. This she attributed to increasing urbanisation and depletion of the shoreline. Further investigation at specific sites has revealed some archaeological deposit, albeit disturbed.

Historic settlement has left structures behind, but much of it has been destroyed by urbanisation. Apart from remains which have been located on some rural properties, most of the structures of heritage significance date to a period of expansion and development for the Wyong area between 1890s and 1930s, which coincided with the advent of the railway and the attraction of the area for the "weekender" hordes from Sydney. The expansion was curtailed by the Depression and downturn in the timber felling industries. Another wave of settlement occurred after the end of WWI when returned Servicemen were resettled in the Wyong area and The Entrance in a bid to open up the Central Coast. A draft heritage register of any historic sites is currently being considered by the Wyong Shire Council (WSC) and a draft Local Environmental Plan with a



schedule of heritage sites will shortly be released (Peter Marler WSC, personal communication 1999).

The following tables illustrate the general sensitivity of the features mapped above. This table of sensitivities is neither comprehensive nor binding in that the sites may only be assessed for their significance based on archaeological and heritage studies as outlined in Heritage Office and NSW National Parks and Wildlife Service guidelines for consultant archaeologists.

## 7.1 Explanation

This report uses a method to classify sites which has as its goal to identify the archaeological and heritage sensitivity of the sites. The sites have been given high (H), medium (M) and low (L) sensitivities, based on initial research. The status column refers to whether the structure is still standing (extant), or whether it has been destroyed (gone) or whether remains have archaeological potential (archaeological).

Those sites of high sensitivity which are located within the corridor of influence for RTA and Pacific Highway upgrading are shaded in the tables and the entries are in bold text (they may be found located on the above maps). These sites will need further investigation prior to disturbance by route development or should be avoided altogether. Sites with medium or low sensitivity should not constrain development unless they have a significance criteria classification by Wyong Shire Council or this report. They do not have bold text. These sites will also need further investigation.

The significance criteria have been taken from sources including the NSW Heritage Office and NSW NPWS guidelines. A brief explanation follows.

## 7.2 Overview of significance

The NPWS guidelines state that since Aboriginal sites are protected by law, a significance assessment is normally undertaken (in NSW) when a site is threatened by development or when a plan of management for a site or area is being developed. The NPWS identified that a significance assessment is appropriate when:

- there is a need to assess significance prior to devising a plan of management for the sites, eg "Consent to Destroy"
- as a preliminary to conservation work

The definition of significance and principles of significance assessment outlined by the Australian International Council on Monuments and Sites (ICOMOS) Burra Charter 1988 has attempted to avoid bias by providing a firm guideline (not law) in cultural significance assessment. The ICOMOS definition of cultural significance is,

*"the concept which helps in estimating the value of places. The places that are likely to be of significance are those which help an understanding of the past or enrich the present, and which will be of value to future generations."* (ICOMOS 1988)

The Burra Charter refers most closely to historic and architectural features and the term "cultural significance" embraces aesthetic, historic, scientific and social value for past, present or future generations. Bowdler (1983) has redefined appropriate criteria for assessment of Aboriginal site significance. Her criteria have been well received by the archaeological community.

Significance must be established in two parts, by the assessment of significance through research



and accurate documentation and by a statement of significance. The significance of a site is embodied in its fabric, setting and contents and is best understood by a methodical process of collecting and analysing information prior to making decisions. The keeping of accurate and complete records about any site will assist the future care, management and interpretation of the site.

The following criteria describe the necessary components of a significance assessment, with further sub-criteria described under each.

#### *Aboriginal Significance (ABOR)*

This is the significance assessed by Aborigines as a community or through the Local Aboriginal Land Council. Assessment can only be determined by adequate consultation with Aborigines. In some cases, it may be applicable to consult an individual vested with authority in the community to make a judgement on behalf of the community, for example an Aboriginal elder.

The assessment of the Aboriginal heritage is customarily through an attached report from the responsible Aboriginal community, however this significance is best expressed orally, or through primary documents which represent the community's united view.

##### Sub-criteria:

- the existence of either Aboriginal burials and/or remains
- the rarity of types of Aboriginal sites and objects on the lands in the context of the cultural area in which the lands are located
- the diversity of the Aboriginal sites and objects on the lands
- the antiquity of the Aboriginal sites and objects on the lands
- the area has an intangible quality recognised by Aborigines.

#### *Historical Significance (HIST)*

The culmination of historical, and documentary research can tie a place or site into historical themes, and regional or individual histories. A place may have historic value if it has been associated with an historic figure, event, phase or activity. It could also be the actual location of an event.

##### Sub-criteria:

- the site fits into a regional historical theme that has been defined at the State level
- that the site relates to an historical event, place, person or continuing commemoration
- that there is potential for the site to contribute to the understanding of an historical process.

#### *Scientific Significance (SCI)*

This is often referred to as the archaeological significance. Most significance classifications in archaeological reports fall into this category. The scientific significance is the concern of archaeologists working in the field and theoreticians in terms of the aims, interests, problems and debates of the profession as a whole. The strength of the scientific significance will depend on the rarity, representativeness and quality of the data. It is most certainly strengthened by the presence of *in situ* material. Scientific significance may lead to the long term preservation of a site, or it may result in the partial or total destruction of the site through collecting and excavation of artefacts for scientific purposes.



Sub-criteria:

- its potential to yield information that will contribute to an understanding of Australia's natural or cultural history.
- importance for information contributing to a wider understanding of the history of human occupation
- the intactness and integrity of the site
- the connectedness to other sites
- the potential of the site to contribute to an understanding of the chronology
- the ability to contribute to research priorities defined by the archaeological community

*Significance of sites in degree and nature*

The framework for assessment has been adapted from the Heritage Guidelines (Heritage Office 1997) because the above criteria and sub-criteria do not address issues associated with the sites relationship with other sites, especially in contrasting environmental zones. The level of significance in planning entities is also not addressed.

The following is a list of the criteria used in this report:

The criteria form two distinct groupings, one group relates to the **nature criteria**

- ◇ historical (HIST)
- ◇ scientific/research (SCI)

The other relates to the **degree criteria** (not used in this report)

- ◇ representativeness (REP)
- ◇ rarity (RARE)

Each item or place may satisfy one or more of the **nature** attributes. For every **nature** attribute that the item or place satisfies, it must also satisfy at least one of the **degree criteria** to qualify for registration as an item or place as being of State, and possibly Commonwealth, significance.

Aboriginal archaeological sites are customarily recognised by their best fit to any or many of the nature criteria, but the sites may also be recognised for their degree, ie their rarity, representativeness and association with other cultural heritage relics or sites. For a rare site, there is only one chance to preserve it before it is lost to perpetuity. A representative site ensures that a sufficient number or amount of the particular site or relic are preserved for future research and/or "environmental archiving" if it is not to be interfered with. That is, if there are a multitude of other examples of a site/relic type, then the less significant is the site in terms of its representativeness. The association of the site/relic places it into historical, scientific or cultural context with other similar or related sites, which embues it with a strengthened importance for its preservation.

The levels, State, Regional and Local relate to the appropriate management context of the item or place. The management context is determined by comparing similar items or places in the locality, the region and the state.

To interpret correctly the site's place in the State's heritage, reference must be made to the concise statement of its cultural significance as a whole, not solely to its individual attributes. The overall significance incorporates and synthesises all its attributes. The **heritage statements** should be the culmination of considered research and will not be attempted here.



If no significance classification has been given to the site, by either the Wyong Shire Council or this report, then the system assigns the abbreviation "NS".

### 7.3 High sensitivity

The shaded table entries refer to those sites within or close to the RTA corridor.

**Table 1 : Sites with high Aboriginal, scientific sensitivity**

REF	MAP	YEAR	SITE	STATUS	WYONG SHIRE COUNCIL SIG	REPORT SIG
2	Off map	0	Tacoma South corroboree ground	ARCHAEOLOGICAL	NS	ABORIGINAL
3	Off map	0	Source of kaolin for ceremonies at Pipeclay Point.	ARCHAEOLOGICAL	NS	ABORIGINAL
4	Off map	0	Entrance source of red ochre.	ARCHAEOLOGICAL	NS	ABORIGINAL
5	7	0	Flanks of Wallarah Creek, potential sites.	ARCHAEOLOGICAL	NS	ABORIGINAL
6	7	0	Open space Opposite Charmhaven Avenue	ARCHAEOLOGICAL	NS	ABORIGINAL
7	8B	1826	A portion of the old Newcastle road.	ARCHAEOLOGICAL	NS	SCIENTIFIC
8	Off map	1870	Tacoma fishing industry Fisherman's Cooperative Society	EXTANT	NS	LOCAL
9	2B	1870	The Wyong Wharves	ARCHAEOLOGICAL	NS	SCIENTIFIC
10	Off map	1870	The Woodbury's Inn	ARCHAEOLOGICAL	NS	SCIENTIFIC
11	2C	1886	Alison mill in 1886, O'Neill & Goldsmith mill 1900 Wilson and Flood mill 1920s.	ARCHAEOLOGICAL	NS	SCIENTIFIC
1	2B	1886	The Wyong River pier bridge (concrete and steel)	EXTANT	NS	STATE
2	2C	1888	Railway and station master's cottage	EXTANT	NS	REGIONAL
12	Off map	1888	Tacoma railway and bridge labour force.	ARCHAEOLOGICAL	NS	HISTORICAL



REF	MAP	YEAR	SITE	STATUS	WYONG SHIRE COUNCIL SIG	REPORT SIG
13	2C	1888	Former public school	EXTANT	REGIONAL	REGIONAL
14	2C	1889	The original Royal Hotel	ARCHAEOLOGICAL	NS	HISTORICAL
15	2B	1890	Alison Rowing Club	ARCHAEOLOGICAL	NS	SCIENTIFIC
16	2C	1892	The old Court House	EXTANT	REGIONAL	REGIONAL
17	2C	1894	The first store Young and Wilkinson	ARCHAEOLOGICAL	NS	HISTORICAL
18	2C	1898	The Literary Institute (School of Arts)	EXTANT	NS	REGIONAL
19	Off map	1899	Government Wharf	ARCHAEOLOGICAL	NS	SCIENTIFIC
20	2C	1900	In, the police station and lockup with horse paddock. was built next to the Chapman building.	ARCHAEOLOGICAL	NS	HISTORICAL
21	2B	1903	Wooden truss bridge	ARCHAEOLOGICAL	NS	SCIENTIFIC
22	2C	1904	Coffee Palace	EXTANT	REGIONAL	REGIONAL
23	2C	1906	St James Church of England, St Cecelia's	EXTANT	LOCAL	LOCAL
24	2C	1907	Former Methodist church	EXTANT	LOCAL	LOCAL
25	2B	1910	Pioneer Dairy	EXTANT	REGIONAL	REGIONAL
26	2C	1912	Grand Hotel	EXTANT	NS	LOCAL
27	5C	1912	Rosedale homestead , Kanwal Post Office.	EXTANT	NS	LOCAL
28	7	1916	Original Wallarah bridge built	ARCHAEOLOGICAL	NS	SCIENTIFIC



REF	MAP	YEAR	SITE	STATUS	WYONG SHIRE COUNCIL SIG	REPORT SIG
29	1	1930	All Saints Church, Anzac Road Tuggerah	EXTANT	LOCAL	LOCAL
30	2C	1945	World War II memorials.	EXTANT	LOCAL	LOCAL

## 7.4 Medium sensitivity

The shaded table entries refer to those sites within or close to the RTA corridor.

**Table 2 : Sites with medium archaeological, scientific sensitivity**

REF	MAP	YEAR	SITE	STATUS	WYONG SHIRE COUNCIL SIG	REPORT SIG
3	2C	1900	The Chapman second store	EXTANT	NS	REGIONAL
4	2C	1908	Shop complex, Pacific High way near Alison Road	ARCHAEOLOGICAL	NS	HISTORICAL
6	2C	1909	Bell's Cordial Factory	ARCHAEOLOGICAL	NS	HISTORICAL
12	2C	1920	Masonic Hall	ARCHAEOLOGICAL	NS	HISTORICAL
13	2C	1920	The new Royal Hotel	EXTANT	NS	LOCAL
14	2C	1921	Wilkinson's Store, post fire	EXTANT	NS	LOCAL
15	2C	1925	Warner castellated building, railway station	EXTANT	REGIONAL	REGIONAL
16	3C	1930	"Acropolis" home	EXTANT	NS	LOCAL

## 7.5 Low sensitivity

The shaded table entries refer to those sites within or close to the RTA corridor.



Table 3 : Sites with low archaeological, scientific sensitivity

REF	MAP	YEAR	SITE	STATUS	WYONG SHIRE COUNCIL SIG	REPORT SIG
1	4	0	Pollock Avenue might have been the pathway for Aborigines between Wyong River and Kanwal	ARCHAEOLOGICAL	NS	ABORIGINAL
2	4	1850	The Pollock Avenue track serviced early settlers as a stock route.	ARCHAEOLOGICAL	NS	HISTORICAL
3	1	1870	Joseph Lees, the first butcher	ARCHAEOLOGICAL	NS	HISTORICAL
4	2C	1870	The first Chapman store	ARCHAEOLOGICAL	NS	HISTORICAL
5	2B	1870	Trees at the bank of Wyong River - Camphor laurels, Illawarra Flame Tress and Weeping Willows.	EXTANT	NS	LOCAL
6	2C	1870	Warner Avenue "T" intersection	GONE	NS	NS
7	2C	1870	Wyong Dam	GONE	NS	NS
8	2C	1880	Bank of New South Wales	ARCHAEOLOGICAL	NS	HISTORICAL
9	2C	1886	The Breckenridge General Store	ARCHAEOLOGICAL	NS	HISTORICAL
10	2C	1887	Watt's Concert Hall	ARCHAEOLOGICAL	NS	HISTORICAL
11	1	1888	The village of Tuggerah	EXTANT	NS	LOCAL
12	2C	1888	Steam engine tanks Wyong railway platform	GONE	NS	NS
13	1	1890	"Tuggerah Lakes Station"	EXTANT	NS	REGIONAL
14	2C	1900	Bailey's butcher.	ARCHAEOLOGICAL	NS	HISTORICAL
15	2C	1900	The timber yard around the railway station	ARCHAEOLOGICAL	NS	HISTORICAL
16	1	1900	The Tuggerah Lakes Hotel	EXTANT	NS	LOCAL



REF	MAP	YEAR	SITE	STATUS	WYONG SHIRE COUNCIL SIG	REPORT SIG
17	3C	1900	Golf Course	EXTANT	NS	NS
18	2C	1906	The Commercial Bank at the south west corner of Alison Road and Pacific Highway.	ARCHAEOLOGICAL	NS	HISTORICAL
19	2C	1909	Bowcock blacksmith	ARCHAEOLOGICAL	NS	HISTORICAL
20	2C	1911	Early post office	EXTANT	NS	LOCAL
21	2C	1911	Commercial Hotel, transferred to Hely Street	EXTANT	NS	LOCAL
22	2C	1911	Traffic bridge over railway to Howarth Street..	EXTANT	NS	LOCAL
23	2C	1912	Lloyd farrier	ARCHAEOLOGICAL	NS	HISTORICAL
24	2C	1923	The Coronet "Picture Palace"	ARCHAEOLOGICAL	NS	HISTORICAL
25	5C	1924	The Anglican Church of St Mary	EXTANT	NS	LOCAL
26	2C	1925	Wyong Motors	ARCHAEOLOGICAL	NS	HISTORICAL
27	2C	1928	William Arthur Chapman residence	ARCHAEOLOGICAL	NS	HISTORICAL
28	2C	1928	Commonwealth Bank	ARCHAEOLOGICAL	NS	HISTORICAL
29	2C	1930	The old Rural Bank	EXTANT	REGIONAL	REGIONAL
30	2C	1936	The Astra Theatre	ARCHAEOLOGICAL	NS	HISTORICAL
31	2C	1936	Boggs blacksmith	ARCHAEOLOGICAL	NS	HISTORICAL
32	7	1945	Present Wallarah bridge	EXTANT	NS	LOCAL
33	2C	?	Brisbane Water Ambulance Service.	EXTANT	LOCAL	LOCAL



## 8. Conservation and legislation issues

- ◇ Archaeological sites are protected under legislation for heritage, Aboriginal sites and environmental assessment and planning. Under the current provisions of Part V of the NSW *Environmental Planning and Assessment Act 1979*, proponents who do not require development consent are therefore not prohibited under the provisions of an environmental planning instrument. This applies to RTA who would not require an assessment of environmental heritage nor Aboriginal archaeology under this Act.
- ◇ In the interests of environmental heritage best practice, the following points are listed in consideration of heritage issues in general. These may aid the principal consultants, Sinclair Knight Merz, to come to a decision about route options because they generally reflect the approach of the consultant in this report.

### 8.1 Heritage and "European" sites

- ◇ Under the *Heritage Act (HA) 1977*, environmental heritage is defined as "those buildings, works, relics or places of historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance for the State" (HA 1977 s.4(1)).
- ◇ During a major review of the heritage system in 1998, now passed before both houses of NSW Parliament, the NSW Heritage Office has instigated a State Heritage Register, available over the World Wide Web. This register will eventually be a comprehensive register of items of State Heritage significance. When complete, the Register will include all items under Conservation Orders as well as items of State significance in other State registers.
- ◇ A central feature of the amendments is the recognition that heritage management is shared with local councils.
- ◇ The amendments also strengthen requirements for State government agencies to lead by example in heritage protection by adopting sound conservation and management practices to maintain the heritage significance of their heritage assets.
- ◇ Minimum standards in heritage conservation must be upheld by owners of items on the Register in areas of weatherproofing, fire, vandalism, and essential maintenance.
- ◇ The new system is designed to be two-tiered, with a strong focus on significance as the basis for decisions and a reliance on community consultation and involvement.
- ◇ Councils may identify significant items of environmental heritage through the drafting of a Local Environmental Plan or alternatively through the Director of Urban Affairs and Planning including the items in a Regional Environmental Plan.
- ◇ Since 1985, the Planning Minister under section 117 of the *Environmental Planning and Assessment Act* determined that conservation provisions must be included in future (excluding existing) draft Local Environmental Plans, which cover: buildings, works, relics or places of heritage significance. Areas of ecological significance.
- ◇ If any owner of environmental heritage wants it made subject to a Conservation Order, he or she can apply to the Minister to decide whether or not to recommend a Conservation Order or special Environmental Planning Instrument under the *Environmental Planning and Assessment Act*. The Department of Urban Affairs and Planning must complete this within 12 months.



## 8.2 Aboriginal sites

- ◇ All Aboriginal archaeological sites in NSW are protected under the *National Parks and Wildlife Act 1974*. However the planning mechanism for protecting the sites extends to three tiers of government (Commonwealth, State and Local) and 4 layers of planning control (Federal, State, Regional, and Local).
- ◇ At the Commonwealth level of government, the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* can protect specifically identified items of heritage which have been reported to the Minister. Under the Act, the Minister can issue interim or permanent conservation orders to protect sites or areas of assessed significance.
- ◇ At the State level, in addition to the *National Parks and Wildlife Act 1974*, the *Environmental Planning and Assessment Act 1979* requires Council during the development consent process (Section 90) to consider the impact of that development upon the environment which includes items of scientific and cultural significance including archaeological sites. Aboriginal sites are also protected under the *Heritage Act 1977*, where Interim and Permanent Conservation Orders may be evoked to protect the sites, as described above.
- ◇ At the regional level, the Regional Environmental Plan (REP) provides some awareness of the need to protect sites. For example, the Hunter Regional Environmental Plan 1989 lists items of heritage significance, and directs that the Local Environmental Plan (LEP) be referred to when outlining the conditions for development consent.
- ◇ At local planning level, the Local Environmental Plans (LEPs) can make specific provision to protect archaeological sites as zones for allocated activities. As a condition for development consent, Councils may stipulate that the proponent would need to commission a thorough archaeological investigation of sensitive areas prior to issuing a development consent.

## 9. Discussion

Although this report has attempted to provide an overview for planning purposes only, the content has touched upon (albeit cursorily) information that would normally be covered in a local government heritage study or a full archaeological assessment. Most of the sites described above should in some way be assessed for their significance, using government guidelines, since their significance has only been given a tentative classification under the criteria.

In general, the assessment has covered four major types of sites:

- ◇ Sites that are unequivocal in their heritage significance ("Significant sites")
- ◇ Sites that may have a different significance to that presented here should they be appraised fully ("Sites requiring further investigation")
- ◇ Sites and areas that may provide scientific data, ie have archaeological potential, in the future ("Archaeological potential")
- ◇ Areas which may have significance for Aboriginal people based on intangible evidence ("Aboriginal perspectives").



In addition to the four categories above, other community issues about sites have been considered.

## 9.1 Significant sites

**Table 4 : Extant significant sites based on heritage criteria. Ordered by report significance, then Wyong Council significance, then year.**

MAP	YEAR	SITE	WYONG SIG	REPORT SIG
2C	1886	The Wyong River pier bridge (concrete and steel)	NS	STATE
2C	1888	Former public school	REGIONAL	REGIONAL
2C	1888	Railway and station master's cottage	NS	REGIONAL
1	1890	"Tuggerah Lakes Station"	NS	REGIONAL
2C	1892	The old Court House	REGIONAL	REGIONAL
2C	1898	The Literary Institute (School of Arts)	NS	REGIONAL
2C	1900	The Chapman second store	NS	REGIONAL
2C	1904	Coffee Palace	REGIONAL	REGIONAL
2B	1910	Pioneer Dairy	REGIONAL	REGIONAL
2C	1925	Warner castellated building, railway station	REGIONAL	REGIONAL
2C	1870	Trees at the bank of Wyong River - Camphor laurels, Illawarra Flame Tree and Weeping Willows.	NS	LOCAL
Off map	1870	Tacoma fishing industry Fisherman's Cooperative Society	NS	LOCAL
1	1888	The village of Tuggerah	NS	LOCAL



MAP	YEAR	SITE	WYONG SIG	REPORT SIG
1	1900	The Tuggerah Lakes Hotel	NS	LOCAL
2C	1906	St James Church of England, St Cecelia's	LOCAL	LOCAL
2C	1907	Former Methodist church	LOCAL	LOCAL
2C	1911	Early post office	NS	LOCAL
2C	1911	Commercial Hotel, transferred to Hely Street	NS	LOCAL
2C	1911	Traffic bridge over railway.	NS	LOCAL
2C	1912	Grand Hotel	NS	LOCAL
5C	1912	Rosedale homestead , Kanwal Post Office.	NS	LOCAL
2C	1920	The new Royal Hotel	NS	LOCAL
2C	1921	Wilkinson's Store, post fire	NS	LOCAL
5C	1924	The Anglican Church of St Mary	NS	LOCAL
2C	1930	The old Rural Bank	REGIONAL	REGIONAL
1	1930	All Saints Church, Anzac Road Tuggerah	LOCAL	LOCAL
3C	1930	"Acropolis" home	NS	LOCAL
2C	1945	World War II memorials.	LOCAL	LOCAL
	1945	Present Wallarah bridge	NS	LOCAL
2C	?	Brisbane Water Ambulance Service.	LOCAL	LOCAL



## 9.2 Extant sites requiring further investigation

The following sites require further investigation should they be under threat from the road upgrading.

Table 5 : Extant sites requiring further investigation , pending development threat

MAP	YEAR	SITE	REPORT SIGNIFICANCE
2B	1886	The Wyong River pier bridge (concrete and steel)	STATE
2C	1888	Railway and station master's cottage	REGIONAL
1	1890	"Tuggerah Lakes Station"	REGIONAL
2C	1904	Coffee Palace	REGIONAL
2B	1910	Pioneer Dairy	REGIONAL
2C	1925	Warner castellated building, railway station	REGIONAL
1	1888	The village of Tuggerah	LOCAL
1	1900	The Tuggerah Lakes Hotel	LOCAL
2C	1911	Traffic bridge over railway.	LOCAL
2C	1912	Grand Hotel	LOCAL
5C	1912	Rosedale homestead , Kanwal Post Office.	LOCAL
2C	1920	The new Royal Hotel	LOCAL
2C	1921	Wilkinson's Store, post fire	LOCAL



MAP	YEAR	SITE	REPORT SIGNIFICANCE
5C	1924	The Anglican Church of St Mary	LOCAL
2C	1930	The old Rural Bank	LOCAL
3C	1930	"Acropolis" home	LOCAL
1	1930	All Saints Church, Anzac Road Tuggerah	LOCAL
2C	?	Brisbane Water Ambulance Service.	LOCAL

### 9.3 Archaeological potential requiring further investigation

Table 6 : Sites of archaeological potential that require further investigation, pending development threat

MAP	YEAR	SITE	REPORT SIGNIFICANCE
7	0	Flanks of Wallarah Creek, potential sites.	ABORIGINAL
7	0	Open space Opposite Charmhaven Avenue	ABORIGINAL
8B	1826	A portion of the old Newcastle road.	SCIENTIFIC
2B	1870	The Wyong Wharves	SCIENTIFIC
2B	1890	Alison Rowing Club	SCIENTIFIC
2B	1903	Wooden truss bridge	SCIENTIFIC
7	1916	Original Wallarah bridge	SCIENTIFIC



## 9.4 Aboriginal perspectives

As well as wanting to see that sites are investigated or preserved for their archaeological potential, Aboriginal groups have expressed an interest in preserving sites for their intangible qualities.

One such site was open space located near Charmhaven Avenue, between Lakehaven and Charmhaven, on the join between RTA Maps 6 and 7. The wish to have this space considered for its qualities was expressed by the representatives of the Darkinjung Local Aboriginal Land Council. The team could not find any artefacts, but there was a general feeling of familiarity and connection with the land that might be outside the limits of scientific explanation.

This sentiment, when firmly and truthfully expressed, is as valid a criterion as those described above under heritage significance. For this reason, the consultant will respect the wishes in the final recommendations.

Land Rights claims are also relevant to Aboriginal perspectives. These claims have been made by the Darkinjung Local Aboriginal Land council to the NSW Department of Land and Water Conservation under the *NSW Land Rights Act 1984*. One such claim over Portion 60 Parish Munmorah, County Northumberland Claim 5531 6/12/1995, lies between Pacific Highway and the Freeway west of Wallarah and Spring Creeks and as such does not impact upon the current study.

## 9.5 General community perspectives

It is important to note under this heading that any heritage assessment must be accompanied by an adequate consideration of the community perspective. In addition to the need for community consultation, the local community may also be a good source of historical and oral information.

## 10. Recommendations

In view of the site information outlined in the text, tables and maps above, the report would like to recommend to the principal consultant, Sinclair Knight Merz, on behalf of the proponent RTA:

1. That the Table 5 : Extant sites requiring further investigation , pending development threat and Table 6 : Sites of archaeological potential that require further investigation, pending development threat become a discussion point for RTA and Sinclair Knight Merz as a basis for considering route options.
2. That RTA attempt to avoid sites rather than consider applications to the Heritage Office or NSW National Parks and Wildlife Service for site destruction.
3. That RTA and Darkinjung Local Aboriginal Land Council discuss the Aboriginal significance of the vacant space at the end of Charmhaven Avenue near Lakehaven, so that an informed decision may be reached by RTA as to its future management with respect to route upgrading.
4. That a thorough archaeological surface investigation be undertaken for the significant sites in Table 5 : Extant sites requiring further investigation , pending development threat and Table 6 : Sites of archaeological potential that require further investigation, pending development threat.



5. That Darkinjung Local Aboriginal Land Council and Wyong Shire Council receive copies of this report.

## 11. Acknowledgments

I would like to thank the following people for their assistance in this study:

- ◇ Tom Longworth, Sinclair Knight Merz, for making the aerial photographs available.
- ◇ Peter Marler, Wyong Shire Council, for a discussion about heritage matters and for making the draft LEP schedule available to me.
- ◇ Darkinjung LALC representatives Ivan Goolagong and Peter McKay, for a stimulating field study.
- ◇ Debbie Anderson, Wyong Shire Library for assisting me in locating local references.

Signed



Heritage consultant  
prisma heritage

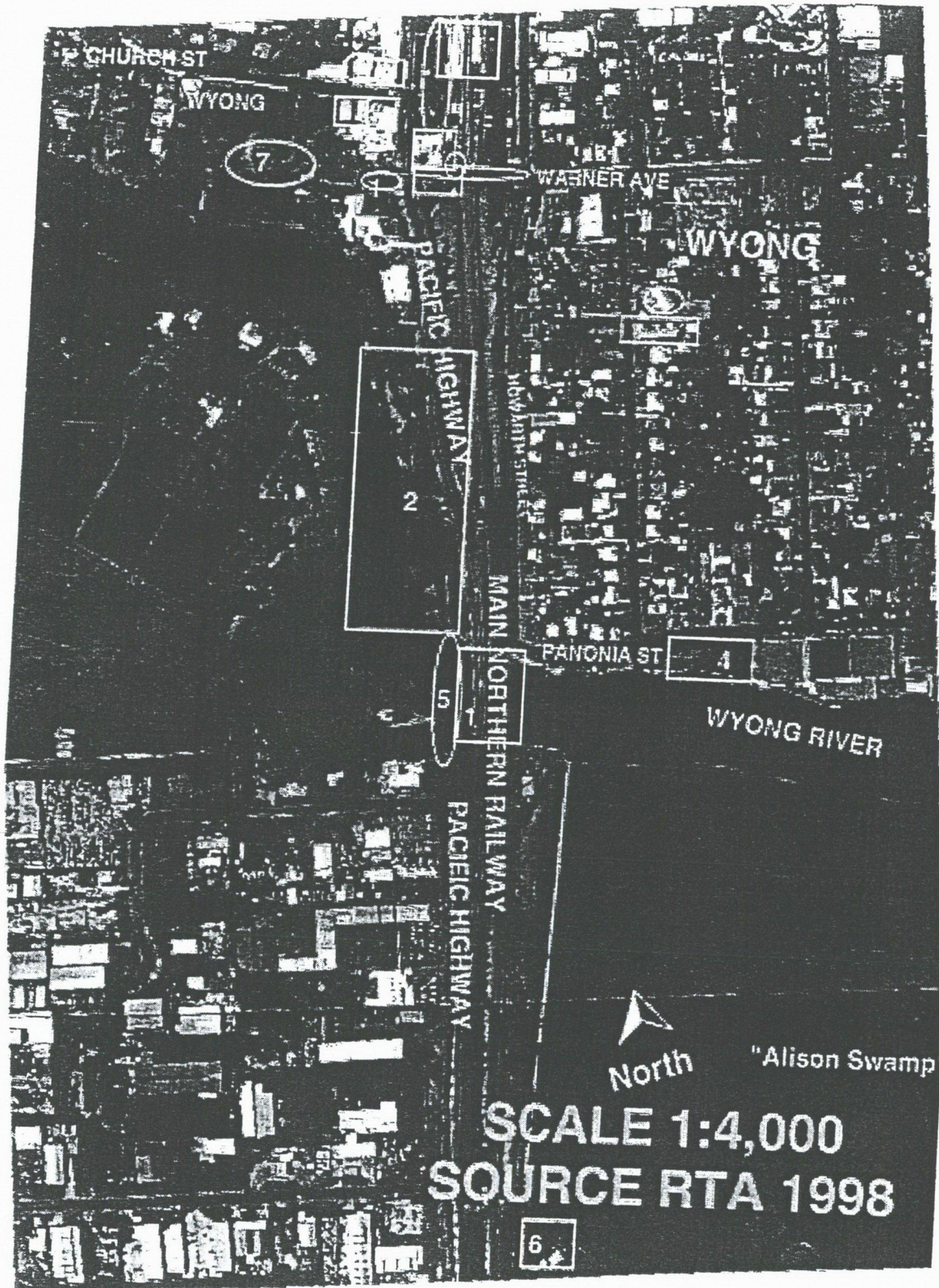
5/2/99



## 12. Bibliography

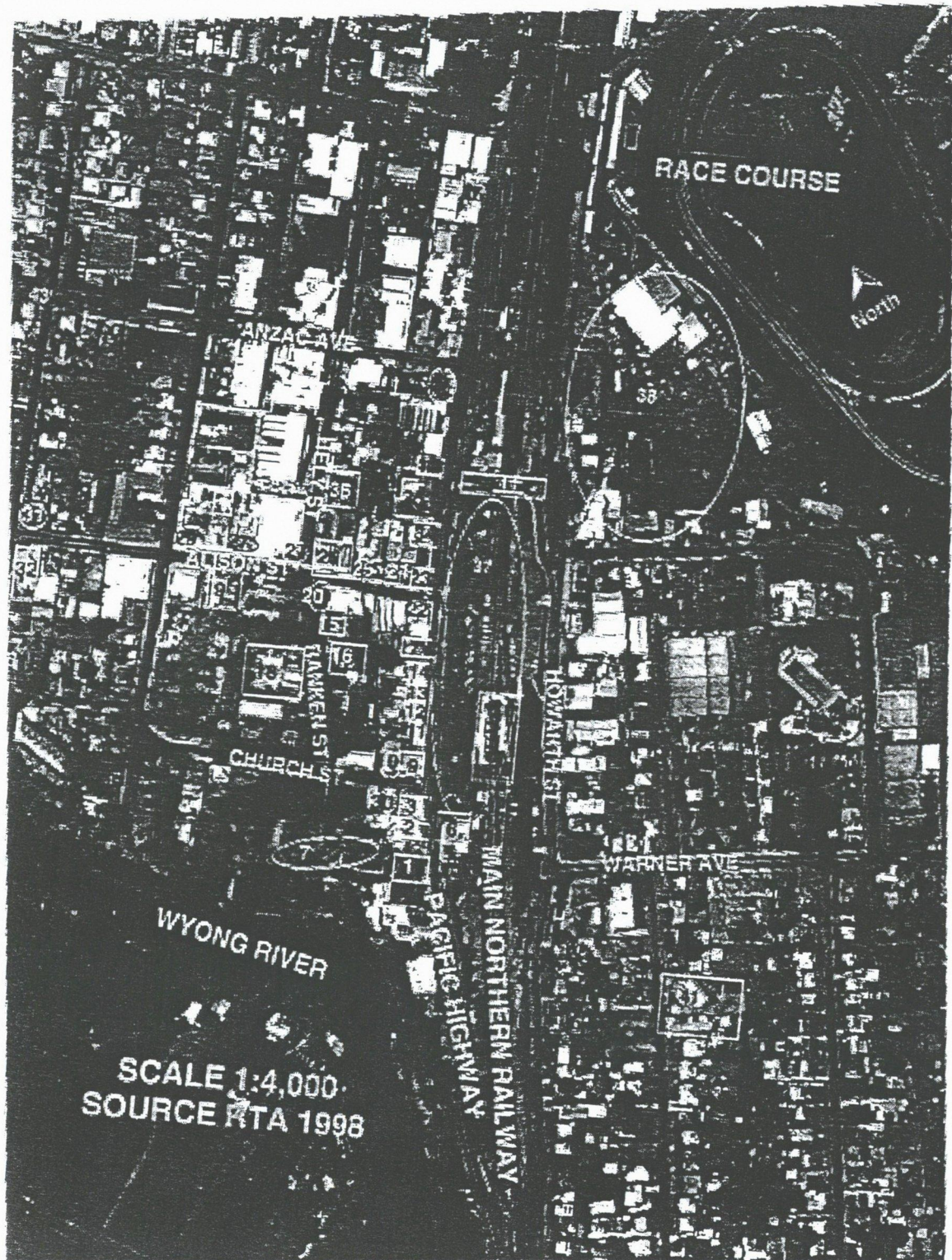
- Bennett, FC 1969. *An historical tour of Wyong and district*. Wyong Shire Historical Society.
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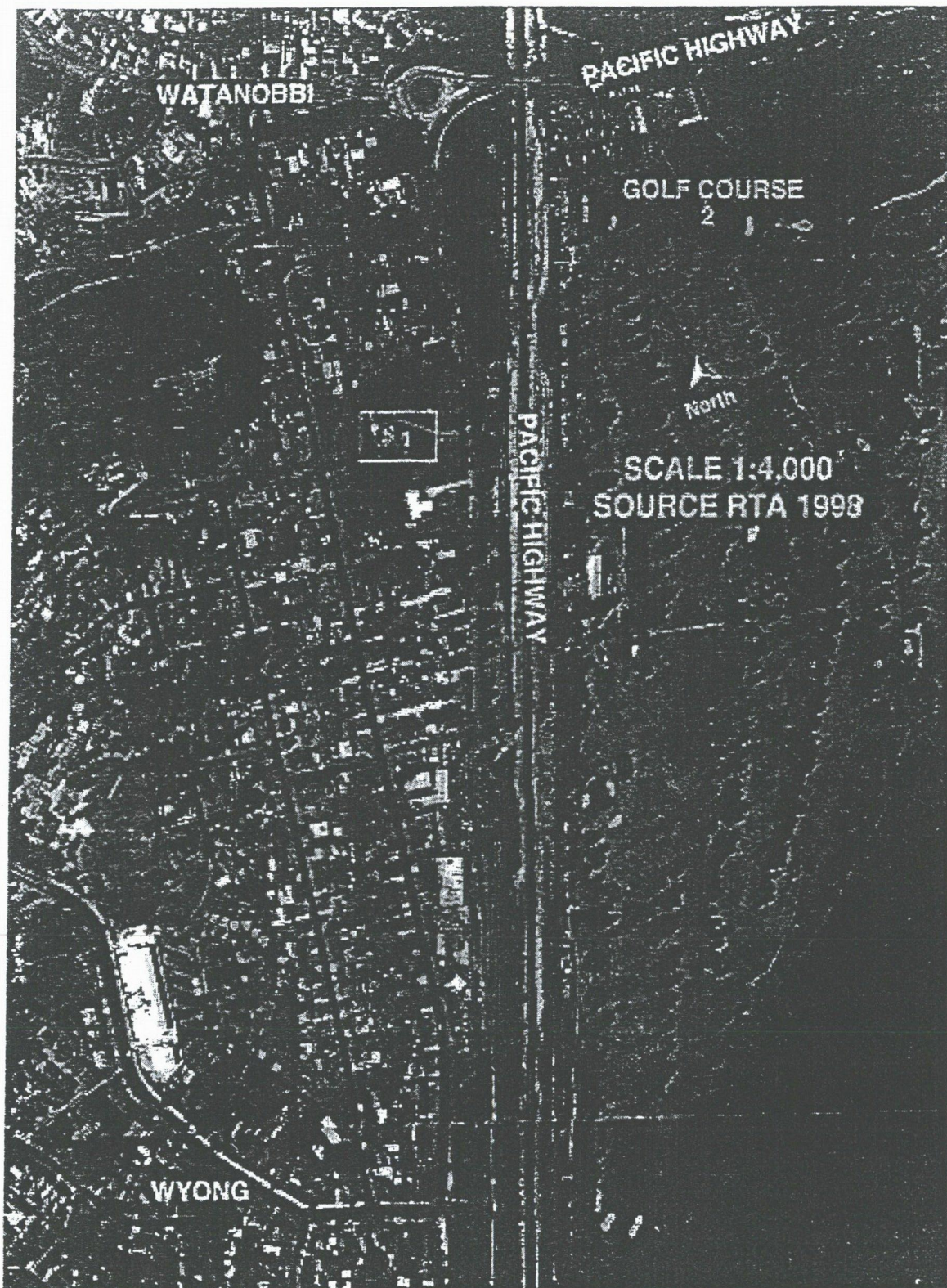
Map 2B : Wyong River crossing, part B. Original scale 1:4,000 reduced 70%, source : RTA 1998





Map 2C : Wyong River crossing, part C. Original scale 1:4,000 reduced 70%, source : RTA 1998





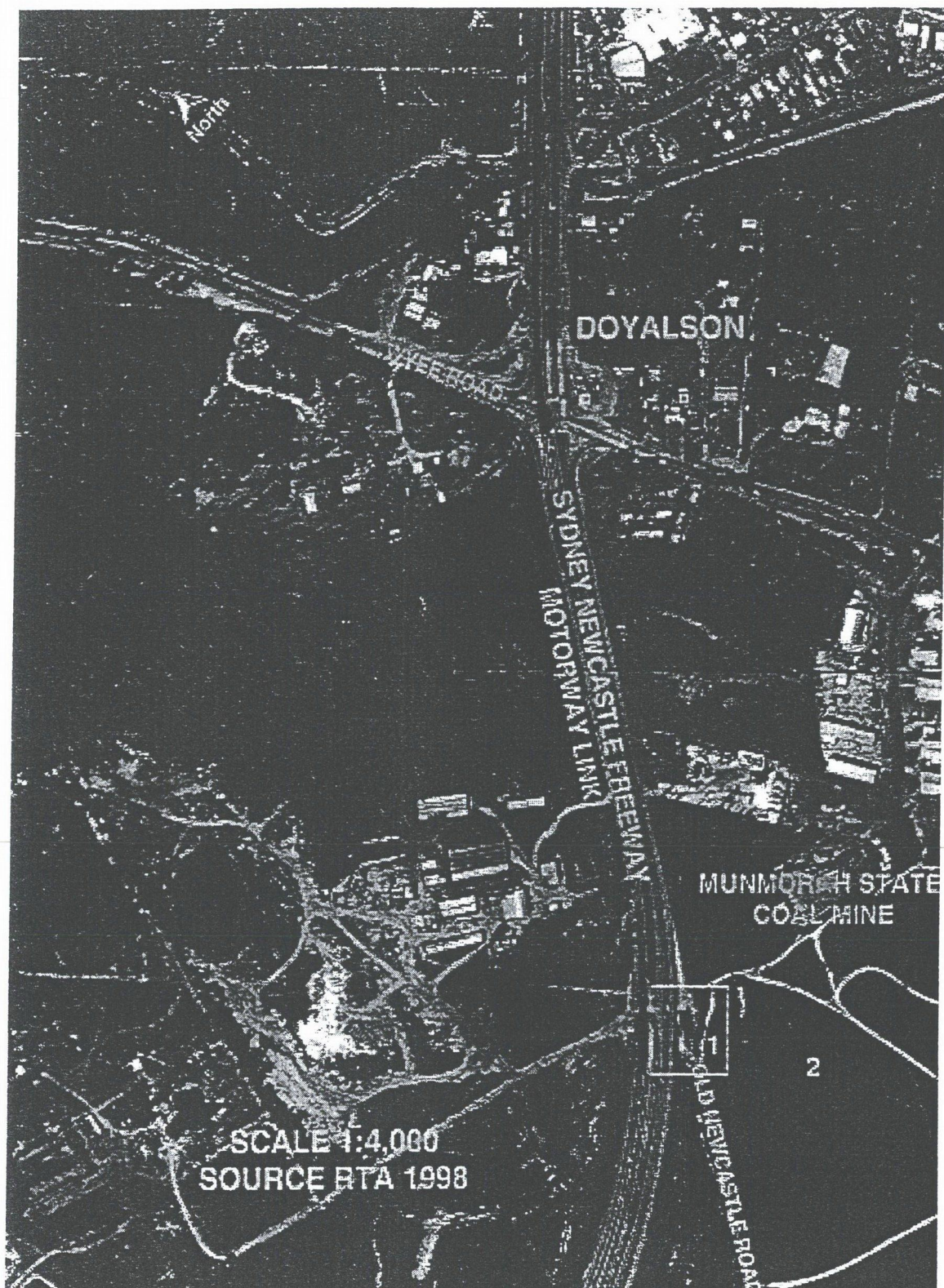
Map 3C : Wyong, part C. Original scale 1:4,000 reduced 70%, source : RTA 1998





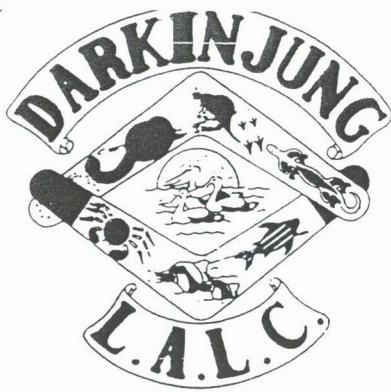
Map 5C : Kanwal, part C. Original scale 1:4,000 reduced 70%, source : RTA 1998





Map 8B : F3 connection and Norah Road at Doyalson, part B. Original scale 1:4,000 reduced 70%, source : RTA 1998.

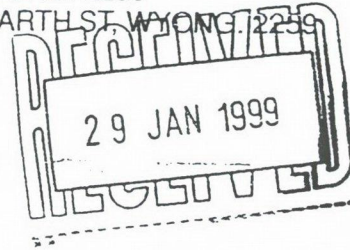




# DARKINJUNG LOCAL ABORIGINAL LAND COUNCIL

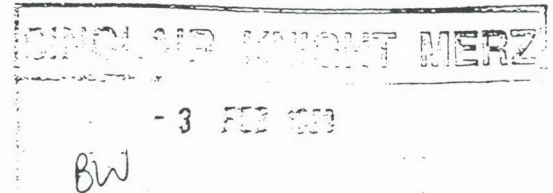
P.O. BOX 401, WYONG. 2259  
SHOP 3, 61 HOWARTH ST. WYONG. 2259

TELEPHONE: (02) 4351 2930  
FAX: (02) 4351 2946



28 January 1999

Attention: Brian Watson  
Sinclair Knight & Mertz  
Suite 9, 125 Bull Street  
NEWCASTLE WEST NSW 2259



Dear Brian

## Survey Report 99/01 Site Survey at Pacific Highway Tuggerah to Doyalson

We refer to the inspection taken on the 12 December 1998 with our site officer in respect of Pacific Highway Tuggerah to Doyalson. The purpose of this survey is for the locating of any unknown sites to avoid future damage.

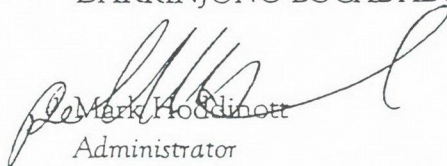
Travelling north from Tuggerah there were no indications of any sites of cultural value. It is noted an area of red ochre and of yellow ochre was found ½ klm south of Wallarah Creek that may indicate a site in the area.

As a result of the inspection we outline the following findings and recommendation:

1. Darkinjung Local Aboriginal Land Council has no objections to the proposed road works.
2. If any sites are discovered during operations that Darkinjung Local Aboriginal Land Council is to be contacted immediately.

Should you have any further questions in relation to this matter do not hesitate to contact Christine Hammond.

Yours sincerely,  
DARKINJUNG LOCAL ABORIGINAL LAND COUNCIL

  
Mark Hoddinott  
Administrator

Ps. Our account costs as agreed is enclosed



# Appendix K

## Background and Database Searches



## Register of the National Estate Database



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**Sites within or near 'kanwal'**

**No records retrieved for search**

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The Register of the National Estate has been compiled since 1976. The Commission is in the process of developing and/or upgrading official statements of significance for places listed prior to 1991.

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**Sites within or near 'wyongah'**

**No records retrieved for search**

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**Sites within or near 'wadalba'**

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## Register of the National Estate Database



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### Sites within or near 'wyong'

#### Found 3 records:

- [Alison Homestead](#), Alison Rd, Wyong, NSW ([Registered](#))
  - [Felton Mathews Tree](#), Old Maitland Rd, Wyong, NSW ([Registered](#))
  - [Old Maitland Road Section](#), Old Maitland Rd, Kangy Angy, NSW ([Registered](#))
- 

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Movable He  
Multicultur  
Natural Her

## Listing Heritage Items

### ▶ State Heritage Register Search Results

## Items listed on the State Heritage Register

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The search results can be re-sorted by clicking on the **(sort)** option at the top of each column.

<b>Item Name (sort)</b>	<b>Address (sort)</b>	<b>Suburb (sort)</b>	<b>LGA (sort)</b>	<b>SHR</b>
Noraville, Hargraves House	3 Elizabeth Drive	Noraville	Wyong	0013:
St Barnabas Anglican Church	Yarramalong Road	Yarramalong	Wyong	0020:
Weatherboard Cottage and gardens	100 Shirley Street	Ourimbah	Wyong	0006:

There was a total of **3** records matching your search criteria.

**Note:** The Heritage Office seeks to keep the State Heritage Register (SHR) up to date, however the latest listings may not yet be check with the NSW Heritage Office for the most recent listings.

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### Hunter Region

Barrington Bridge over Barrington River	<a href="#">4300161</a>
Beckers Bridge over Webbers Creek, Gresford West	<a href="#">4300128</a>
Bulga Bridge over Wollombi Brook	<a href="#">4300181</a>
Clarencetown Bridge over Williams River	<a href="#">4063</a>
Cooreei Bridge over Williams River	<a href="#">4300177</a>
Dunmore Bridge over the Paterson River	<a href="#">9544</a>
Elderslie Bridge over Hunter River	<a href="#">14311</a>
Fitzgerald Bridge over Hunter River, Aberdeen	<a href="#">14109</a>
Fitzgerald Bridge over Williams River	<a href="#">4300313</a>
Gostwyck Bridge over Paterson River at Paterson	<a href="#">4016</a>
Hexham Bridge	<a href="#">11526</a>
Hinton Bridge over Paterson River	<a href="#">9528</a>
Kayuga Bridge over Hunter River, Muswellbrook	<a href="#">11196</a>
Luskintyre Bridge over Hunter River	<a href="#">4300305</a>
Martin Bridge over the Manning River	<a href="#">4300300</a>
Middle Falbrook Bridge over Glennies Creek	<a href="#">4300131</a>
Monkerai Bridge over Karuah River	<a href="#">4300133</a>
Morpeth Bridge over the Hunter River	<a href="#">9702</a>
Paterson River Road Bridge	<a href="#">3931</a>
Redbourneberry Bridge over Hunter River	<a href="#">4300304</a>
Vacy Bridge over Paterson River	<a href="#">3951</a>
Yarrawa Bridge over Goulburn River	<a href="#">4300170</a>

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**WYONG SHIRE**  
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#### Local Environmental Plan

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[→ Community Plan](#)
[→ Plans of Management](#)
[→ Section 94 Contribution Plans](#)
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[→ Tree Policy](#)
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[→ Shaping the Central Coast Action Plan](#)

## LOCAL ENVIRONMENTAL PLAN

[Quick Find](#)

### Wyong Local Environmental Plan 1991

The Local Environmental Plan aims to promote the management, development, conservation and economic use of the resources of the Shire of Wyong; protect the environment; and to provide a comprehensive planning instrument for the S

The Local Environmental Plan has been broken into five separate PDF files

1.	<a href="#">Table of Provisions</a> (PDF - 132 KB)
2.	<a href="#">Part 1 - Preliminary</a> (PDF - 300 KB) <ul style="list-style-type: none"> <li>- Citation</li> <li>- Aims, objectives etc.</li> <li>- Land to which plan applies</li> <li>- Relationship to other environmental planning instruments</li> <li>- Repeal of certain local environmental plans</li> <li>- Adoption of model provisions</li> <li>- Definitions</li> <li>- Consent authority</li> </ul>
3.	<a href="#">Part 2 - General restrictions on development of land</a> (PDF - 380 KB) <ul style="list-style-type: none"> <li>- Zones indicated on the map</li> <li>- Zone objectives and development control table</li> <li>- What is exempt and complying development?</li> </ul>
4.	<a href="#">Part 3 - Special Provisions</a> (PDF - 477 KB) <ul style="list-style-type: none"> <li>- Division 1: General</li> <li>- Division 2: Rural, Conservation, Scenic Protection and Environmental Protection</li> <li>- Division 3: Residential and Business</li> <li>- Division 4: Industrial</li> <li>- Division 5: Recreational and Special Uses</li> <li>- Division 6: Miscellaneous</li> </ul>
5.	<a href="#">Part 4 - Schedule 1, 2, 3</a> (PDF - 198 KB) <ul style="list-style-type: none"> <li>- Schedule 1: Heritage items</li> <li>- Schedule 2: Development for certain additional purposes</li> <li>- Schedule 3: Classification or reclassification of public land as operational land</li> </ul>



Clicking on the links above will download a document in Adobe Acrobat (.pdf). You need to [download a free copy of Adobe Acrobat Reader](#) to read documents.

Page last updated: 30/09/2002

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Email : [wsc@wyong.nsw.gov.au](mailto:wsc@wyong.nsw.gov.au)



**SCHEDULE 1 - HERITAGE ITEMS (Clause 7(1))**

DESCRIPTION OF HERITAGE ITEM MANNER			SIGNIFICANCE		
ON			NUMBERED		
MAP			HERITAGE		
<i>STREET NAME</i>	<i>NO.</i>	<i>ITEM</i>		<i>NO.</i>	<i>MAP/ SHEET</i>
<b>CEDAR BRUSH CREEK</b>					
Brush Creek Road		Barn	Regional	1	1/1
<b>DOORALONG</b>					
Dooralong Road		Former St Anne's Church	Local	2	2/1
Dooralong Road		Community Hall	Local	3	2/1
Dooralong Road	RMB 859	Dwelling	Local	4	2/1
Dooralong Road		Primary School	Local	5	2/1
<b>GLENNING VALLEY</b>					
Livistona/Glenning Roads	32A	Dwelling	Local	6	3/1
Palm Springs Avenue	14	Dwelling	Local	7	3/1
<b>GOROKAN</b>					
Nichols Avenue	19	Dwelling	Local	8	4/1
The Corso	1	Dwelling	Local	9	4/1
<b>JILLIBY</b>					
Little Jilliby Road		Jilliby Public School	Local	10	5/1
Jilliby Road		Jilliby Cemetery	Regional	11	6/1
Jilliby Road		Silo	Regional	12	6/1
<b>KANGY ANGY MOUNTAIN</b>					
Old Maitland Road		Old Maitland Road	Regional	13	7/1
<b>LONG JETTY</b>					
Gordon Street	6	Dwelling	Local	14	8/1
Surf Street	25	Dwelling	Local	15	9/1
The Entrance Road		Long Jetty Hotel	Local	16	9/1
The Entrance Road	264	Shop	Local	17	8/1
Tuggerah Parade		Long Jetty	Regional	18	8/1
<b>MARDI</b>					
Collies Road		Road Bridge	Local	19	10/1
Mardi Road	RMB 312	Dwelling	Local	20	10/1
<b>NORAH HEAD</b>					
Bush Street		Lighthouse and Building	Regional	21	11/1
<b>NORAVILLE</b>					
Elizabeth Drive	3-7	Dwelling ("Hargraves House")	State	22	12/1



Cnr Wilfred Barrett Drive &  
Oleander Street

Noraville Cemetery and  
Hargraves' Grave

Regional 23 12/1



DESCRIPTION OF HERITAGE ITEM MANNER			SIGNIFICANCE		
ON			NUMBERED		
MAP			HERITAGE		
<i>STREET NAME</i>	<i>NO.</i>	<i>ITEM</i>		<i>NO.</i>	<i>MAP/ SHEET</i>
<b>OURIMBAH</b>					
Brownlee Street		Sawmill	Regional	24	13/1
Chittaway Road	23	Dwelling	Local	26	13/1
Jaques Road		Utility structure	Regional	25	14/1
Ourimbah Creek Road	RMB 1860	Dwelling	Local	27	15/2
Pacific Highway		Primary School	Local	28	13/1
Pacific Highway		Railway Station	Regional	29	14/1
Pacific Highway	21	Shop	Local	30	14/1
Pacific Highway		World War 1 Monument	Local	31	14/1
Station Street		Post Office and Residence	Local	32	14/1
<b>PALMDALE</b>					
Palmdale Road	RMB 4580	Dwelling	Local	33	16/2
<b>RAVENSDALE</b>					
Ravensdale Road	RMB 1446	Dwelling	Local	34	17/2
Ravensdale Road		Former Public School	Local	35	17/2
Ravensdale Road	RMB 1477	Silos	Regional	36	18/2
<b>SOUTH TACOMA</b>					
South Tacoma Road		Boatshed	Local	37	19/2
South Tacoma Road	11 & 13	Dwellings	Local	38	19/2
South Tacoma Road	14	Dwelling	Local	39	19/2
South Tacoma Road		Former Primary School	Local	40	19/2
<b>THE ENTRANCE</b>					
Coral Street	1	Shop	Local	41	20/2
Denning Street		Police Station/Former Ambulance Station	Local	42	21/2
Marine Parade		Surf Club Building	Regional	43	22/2
Marine Parade		World War 1 Monument	Local	44	22/2
The Entrance Road		Our Lady of the Rosary Catholic Church	Local	45	21/2
The Entrance Road		Shops/Residence	Local	46	20/2
The Entrance Road		The Entrance Hotel	Regional	47	20/2
The Entrance Road		The Lakes Hotel	Local	48	21/2
<b>THE ENTRANCE NORTH</b>					
Hargraves Street	21	Dwelling (Former Kiosk)	Local	49	23/2
Hutton Road	33	Dwelling	Local	50	23/2
<b>TUGGERAH</b>					
Anzac Road		All Saints Anglican Church	Local	51	24/2



Pacific Highway

Pioneer Dairy

Regional 52 25/2

**TUMBI UMBI**

Eric Malouf Close

Dwelling

Local 53 26/2



DESCRIPTION OF HERITAGE ITEM MANNER			SIGNIFICANCE		
ON			NUMBERED		
MAP			HERITAGE		
STREET NAME	NO.	ITEM		NO.	MAP/ SHEET
<b>WARNERVALE</b>					
Warnervale Road		Former Methodist Church	Local	54	27/2
Warnervale Road		Shop/Residence	Regional	55	28/2
<b>WYONG</b>					
Alison Road	46	Dwelling	Local	56	29/3
Alison Road		Former Court House	Regional	57	29/3
Alison Road		Police Station and Quarters	Local	58	29/3
Alison Road	14-16	Retail Store	Regional	59	29/3
Boyce Avenue		Guest House (Formerly "Hakone")	Regional	60	30/3
Byron Street		St Cecilia's Catholic Church Group	Local	61	31/3
Cape Road		Dwelling ("Alison Homestead)	Regional	62	10/1
Church Street		Former Public School	Regional	63	29/3
Church Street		World War 1 & 2 Monument	Local	64	29/3
Cnr Church Street & Pacific Highway		Shops	Regional	65	29/3
Cnr Hely Street/Anzac Avenue		Council Building	Local	73	29/3
Hope Street	6, 28 & 34	Dwellings	Local	66	29/3
Pacific Highway		Brisbane Water Ambulance Station	Local	67	29/3
Pacific Highway	98	Former Rural Bank	Regional	68	29/3
Pacific Highway		Shopping Complex	Regional	69	29/3
Pacific Highway		Wyong Railway Station	Regional	70	29/3
Rankens Court		Former Methodist Church	Local	71	29/3
Rankens Court		Commercial Office Building	Regional	72	29/3
<b>WYONGAH</b>					
Tuggerawong Road	88	Dwelling	Local	74	32/3
<b>WYONG CREEK</b>					
Boyd's Lane		Dwelling ("Bangalow")	Regional	75	34/3
Kidman's Lane, Off Yarramalong Road		Road Bridge	Local	76	33/3
Kidman's Lane	RMB 1135	Dwelling (Gracemere")	Regional	77	33/3
Yarramalong Road		Community Hall	Regional	78	34/3
Yarramalong Road	RMB 1216	Dwelling (Former "Ebenezer Cottage")	Regional	79	34/3



Yarramalong Road		Dwelling	Regional	80	34/3
Yarramalong Road		Dwelling (Former "Salmon House")	Regional	81	35/3
Yarramalong Road		Dwelling ("Hillview")	Regional	82	35/3
Yarramalong Road	RMB 1156	Dwelling ("Marabilla")	Regional	83	34/3
Yarramalong Road	RMB 1172	Silos and Farm Shed	Regional	84	34/3
Yarramalong Road		Wyong Creek Public School	Regional	85	33/3

DESCRIPTION OF HERITAGE ITEM MANNER			SIGNIFICANCE		
ON			NUMBERED		
MAP			HERITAGE		
STREET NAME	NO.	ITEM		NO.	MAP/ SHEET
YARRAMALONG					
Yarramalong Road		Community Hall	Regional	86	36/3
Yarramalong Road		Dwelling (“Homeleigh”)	Regional	87	36/3
Yarramalong Road		Dwelling (Former School Residence)	Regional	88	36/3
Yarramalong Road		Dwelling (Former “Linga Longa Guest House”)	Regional	89	36/3
Yarramalong Road		Yarramalong Public School	Regional	90	36/3
Yarramalong Road		Retail Store and Residence	Regional	91	36/3
Yarramalong Road		St Barnabas Church and Cemetery	Regional	92	36/3





## Facsimile from Cultural Heritage Division

**To:** RTA Matthew Mate

**Fax No:** 49240342

**From:** Vanessa Atkins

**Date:** 01/04/03

**No. of Pages to follow:** 3

**Re:** Aboriginal Site Search

The originals will be sent in the mail.

**If you do not receive all the pages, please  
Telephone or fax immediately**

### **"Privacy and Confidentiality Notice"**

The information contained in this facsimile is intended for the names recipients only. It may contain privileged and confidential information and if you are not an intended recipient, you must not copy, distribute or take any action in reliance on it. If you have received this facsimile in error, please notify us immediately by a telephone call to (02) 9585-6453 and return the original to the sender by mail. We will reimburse you for the postage.

**Telephone:** (02) 9585-6345      **Facsimile:** (02) 9585-6325  
**Address:** Head Office Level 6, 43 Bridge Street Hurstville,  
P.O. Box 1967, Hurstville, 2220





Your Ref:  
Our Ref: AHIMS #7443

RTA  
59 Darby St  
Newcastle NSW 2300

Wednesday, 2 April 2003

Attention: Matthew Mate

Dear Sir or Madam:

NSW  
NATIONAL  
PARKS AND  
WILDLIFE  
SERVICE

ABN 30 841 387 271

**Re: AHIMS Search for the following area at Kanwal  
Zone 56 Eastings: 357500-359500 Northings: 6317500-6319500**

I am writing in response to your recent inquiry in respect to Aboriginal objects and Aboriginal places registered with the NSW National Parks and Wildlife Service (NPWS) at the above location.

A search of the NPWS Aboriginal Heritage Information Management System (AHIMS) has shown that no Aboriginal objects and Aboriginal places are recorded in or near the above location. Please refer to the attached report for details.

The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.

The following qualifications apply to an AHIMS search:

- AHIMS only includes information on Aboriginal objects and Aboriginal places that have been provided to NPWS;
- Large areas of New South Wales have not been the subject of systematic survey or recording of Aboriginal history. These areas may contain Aboriginal objects and other heritage values which are not recorded on AHIMS;
- Recordings are provided from a variety of sources and may be variable in their accuracy. When an AHIMS search identifies Aboriginal objects in or near the area it is recommended that the exact location of the Aboriginal object be determined by re-location on the ground; and
- The criteria used to search AHIMS are derived from the information provided by the client and NPWS assumes that this information is accurate.

All Aboriginal places and Aboriginal objects are protected under the *National Parks and Wildlife Act 1974* (NPW Act) and it is an offence to destroy, damage or deface them without the prior consent of the NPWS Director-General. An Aboriginal object is considered to be known if:

- It is registered on AHIMS;
- It is known to the Aboriginal community; or
- It is located during an investigation of the area conducted for a development application.

Head Office  
43 Bridge Street  
PO Box 1967  
Hurstville NSW  
2220 Australia  
Tel: (02) 9585 6444  
Fax: (02) 9585 6555  
[www.npws.nsw.gov.au](http://www.npws.nsw.gov.au)



If you are considering undertaking a development activity in the area subject to the AHIMS search, NPWS would recommend that an Aboriginal Heritage Assessment be undertaken. You should consult with the relevant consent authority to determine the necessary assessment to accompany your development application.

Yours Sincerely



Vanessa Atkins  
Aboriginal Information Officer  
Information Systems Unit  
Cultural Heritage Division  
Phone: (02) 9585 6345  
Fax: (02) 9585 6325



# AHIMS

Aboriginal Heritage Information Management System

## List of Sites (List - Short)

ahims7443

Grid Reference Type = AMG Zone = 56 Easting From = 357500 Easting to = 359500 Northing From = 6317500 Northing to = 6319500 Feature Search Type = AHIMS Features

<u>Site ID</u>	<u>Site Name</u>	<u>Grid.Ref</u> <u>Type</u>	<u>Zone</u>	<u>Easting</u>	<u>Northing</u>	<u>Site Features</u>	<u>Site Types</u> (recorded prior to June 2001)	<u>Recording</u> (Primary)	<u>Reports</u> (Catalogue Number)
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Number of Sites :0

Page 1 of 1

02/04/2003 14:03:28

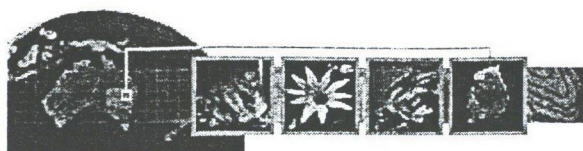
This information is not guaranteed to be free from error omission. The NSW National Parks and Wildlife Service and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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AHD OPERATIONS

02004





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### Search Results

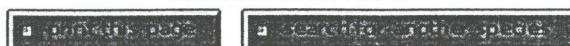
**Your selection:** Flora, threatened species, recorded since 1980, Selected Area - 151.41544446, -33.277579375, 151.5071446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41529453, -33.277579375, 151.50729453, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:26 PM (Collection database last updated 25/03/2003)

	Map	Scientific Name	Common Name	<u>Legal Status</u>	Count	Info
Fabaceae (Mimosoideae)						
		Acacia bynoeana	Bynoe's Wattle	E1	7	
Myrtaceae						
		Angophora inopina		V	18	
		Callistemon linearifolius		V	1	
		Eucalyptus camfieldii	Hear-leaved Stringybark	V	2	
Orchidaceae						
		Cryptostylis hunteriana	Leafless Tongue Orchid	V	2	
Proteaceae						
		Grevillea parviflora subsp. parviflora		V	1	
Tremandraceae						
		Tetratheca juncea		V	28	

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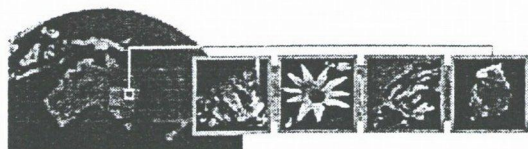


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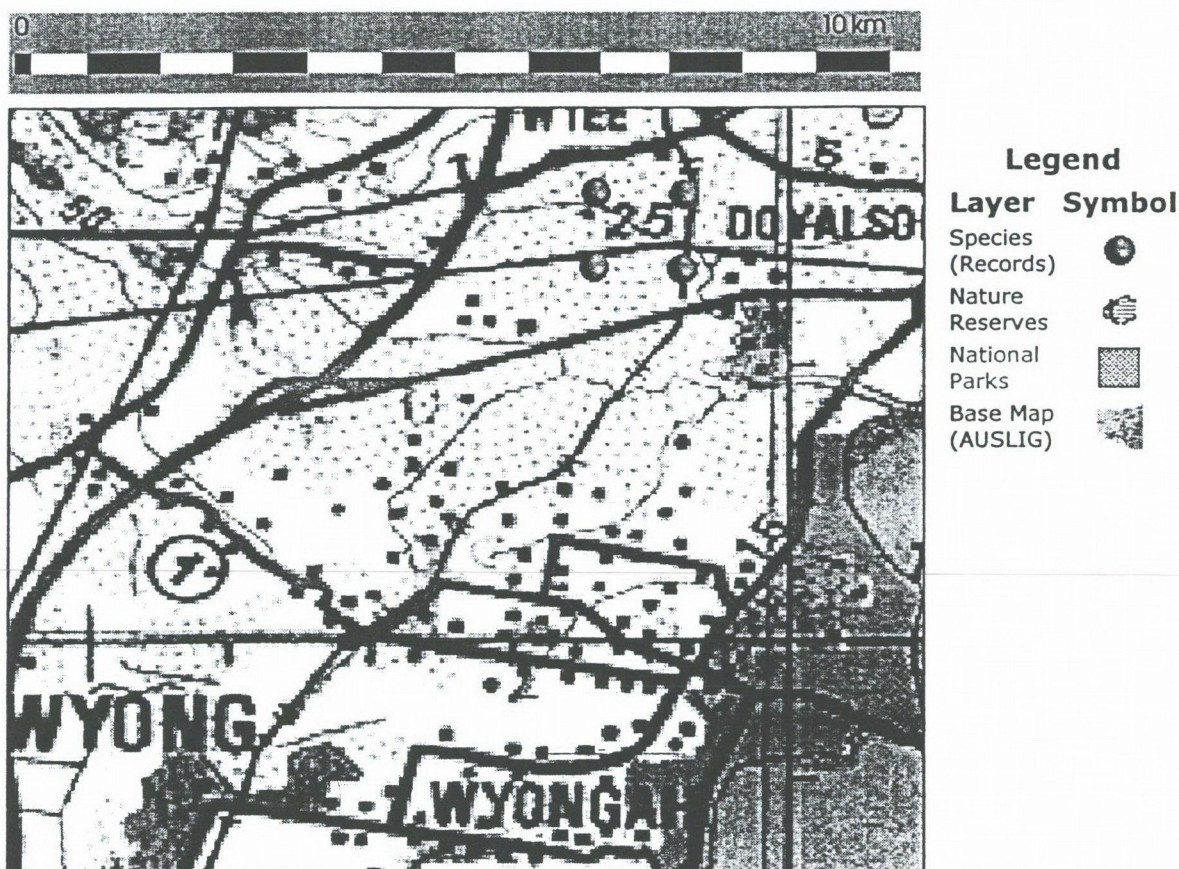
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## Sighting Results

**7 recorded sightings for selection:** Flora, *Acacia bynoeana* (Bynoe's Wattle), recorded since 1980, Area - 151.41529453,-33.277579375,151.50729453,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41529453, -33.277579375, 151.50729453, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:28 PM (Collection database last updated 25/03/2003)



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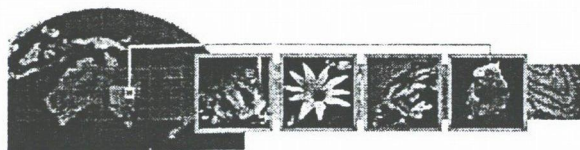


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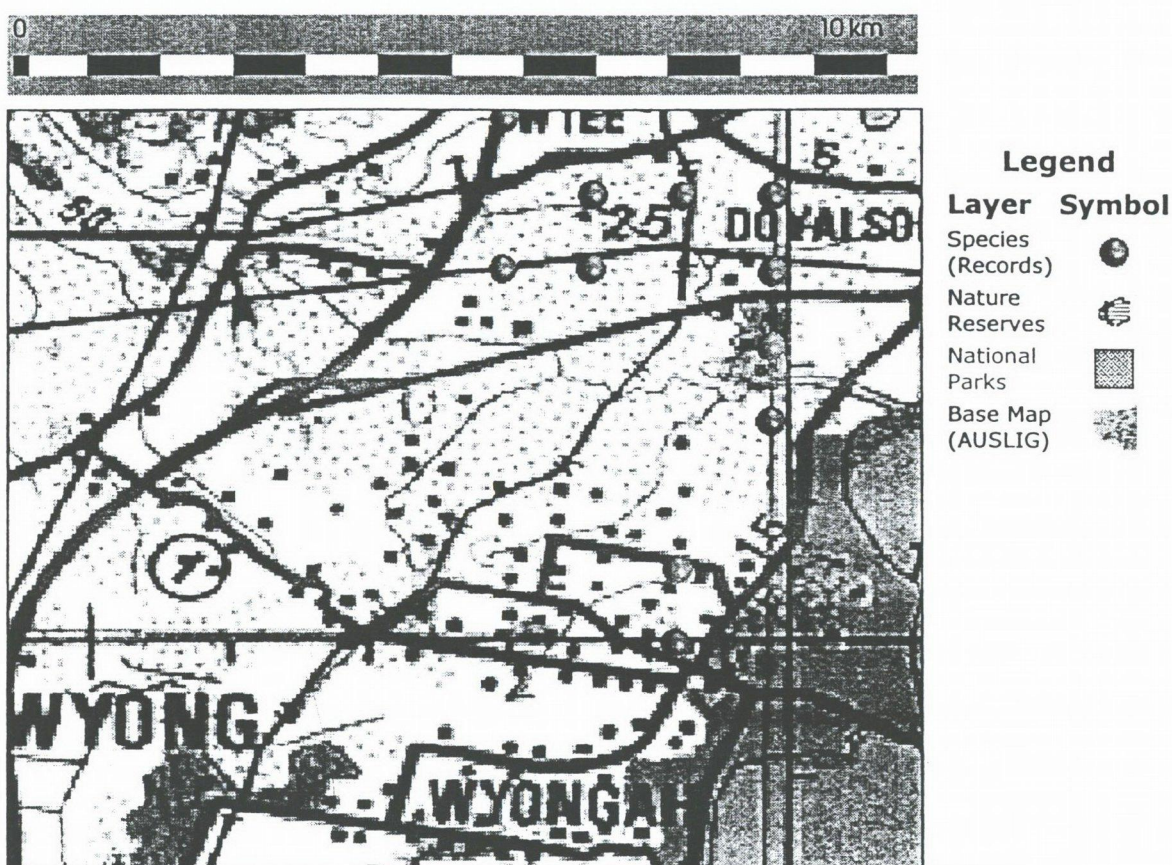


### Sighting Results

**18 recorded sightings for selection:** Flora, *Angophora inopina* (Bynoe's Wattle), recorded since 1980, Area - 151.41529453,-33.277579375,151.50729453,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41529453, -33.277579375, 151.50729453, -33.185579374999996.

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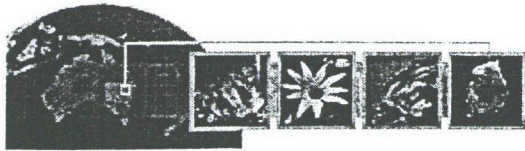


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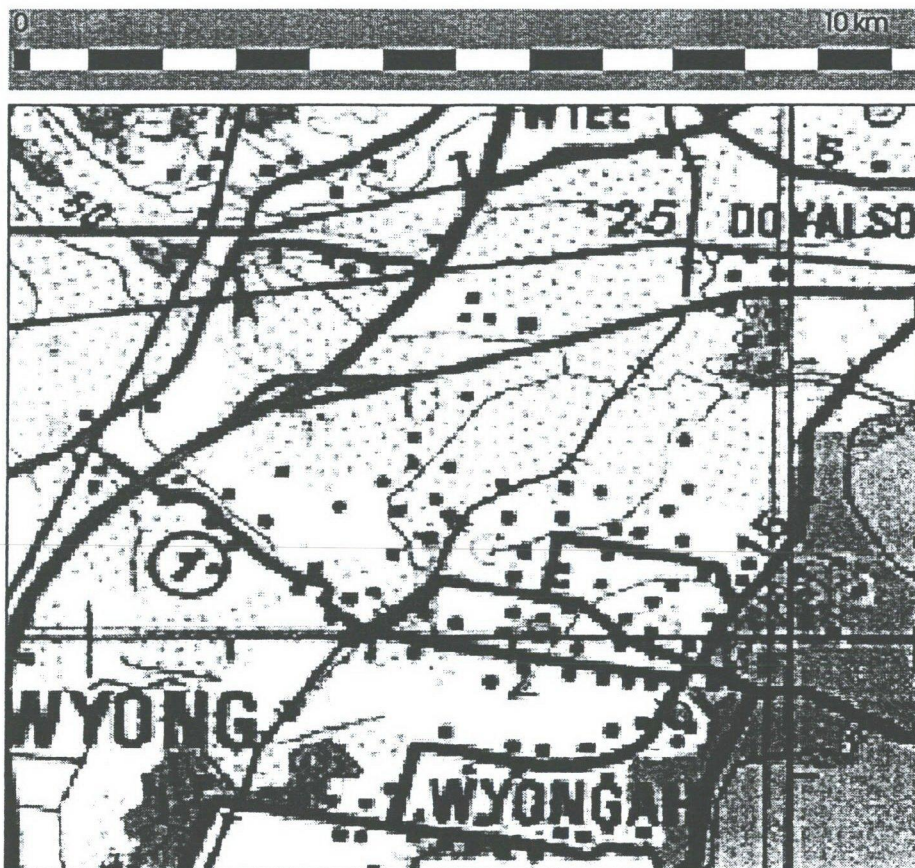
[NPWS home](#)

## Sighting Results

**1 recorded sightings for selection:** Flora, *Callistemon linearifolius* (Bynoe's Wattle), recorded since 1980, Area - 151.41529453,-33.277579375,151.50729453,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41529453, -33.277579375, 151.50729453, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:29 PM (Collection database last updated 25/03/2003)



Legend	
Layer	Symbol
Species (Records)	
Nature Reserves	
National Parks	
Base Map (AUSLIG)	

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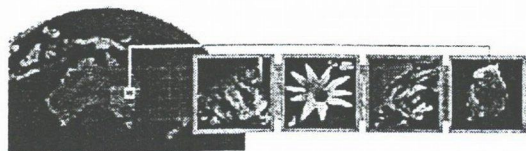


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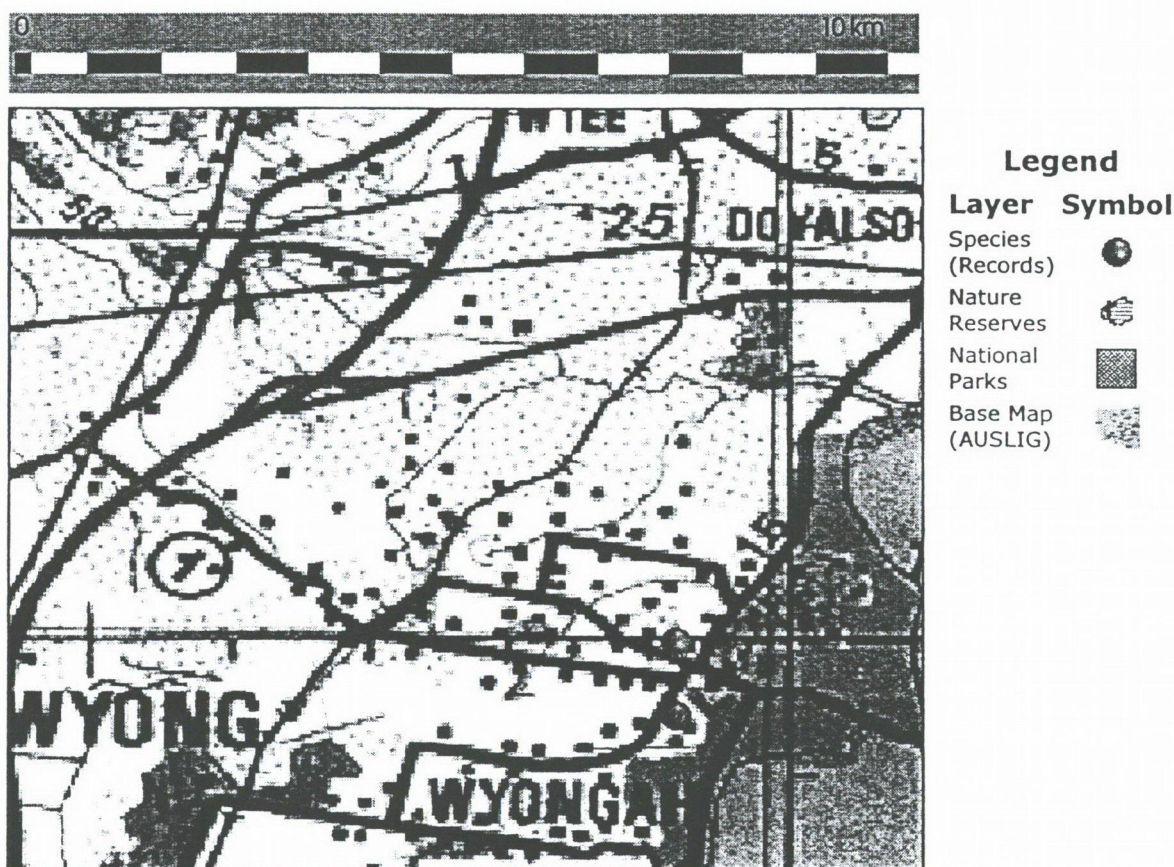
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### Sighting Results

**2 recorded sightings for selection:** Flora, *Eucalyptus camfieldii* (Hear-leaved Stringybark), recorded since 1980, Area - 151.41529453, -33.277579375, 151.50729453, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41529453, -33.277579375, 151.50729453, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:31 PM (Collection database last updated 25/03/2003)



**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



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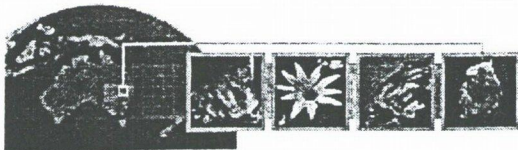
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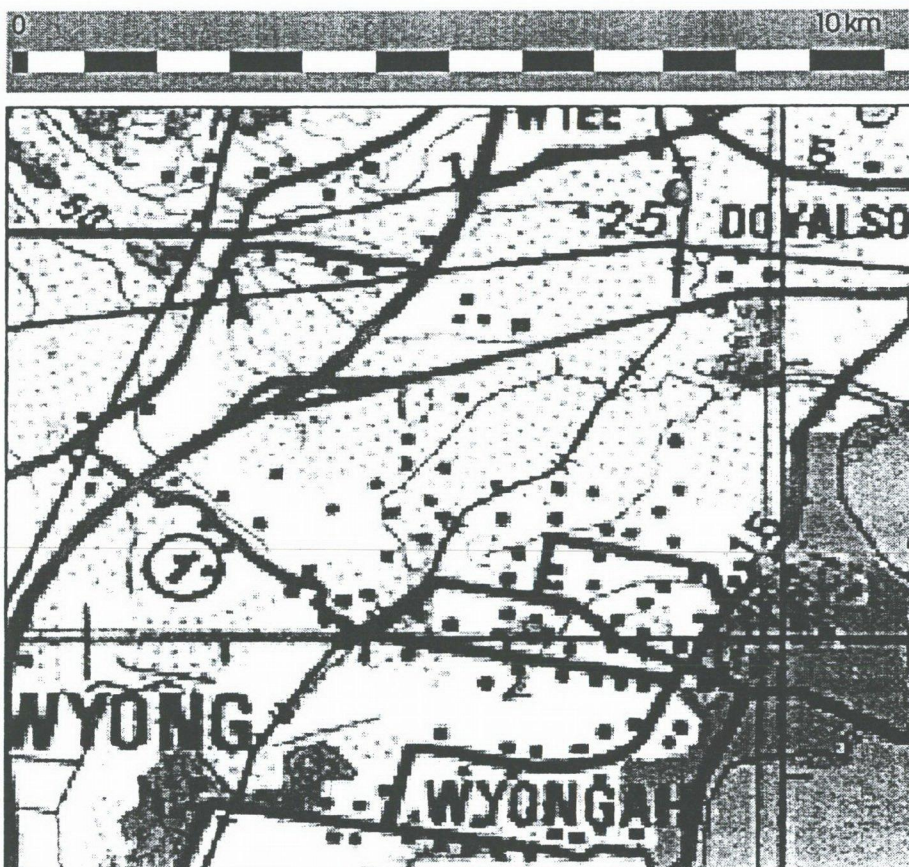
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## Sighting Results

**2 recorded sightings for selection:** Flora, *Cryptostylis hunteriana* (Leafless Tongue Orchid), recorded since 1980, Area - 151.41529453, -33.277579375, 151.50729453, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41529453, -33.277579375, 151.50729453, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:32 PM (Collection database last updated 25/03/2003)



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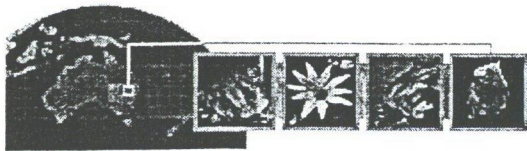


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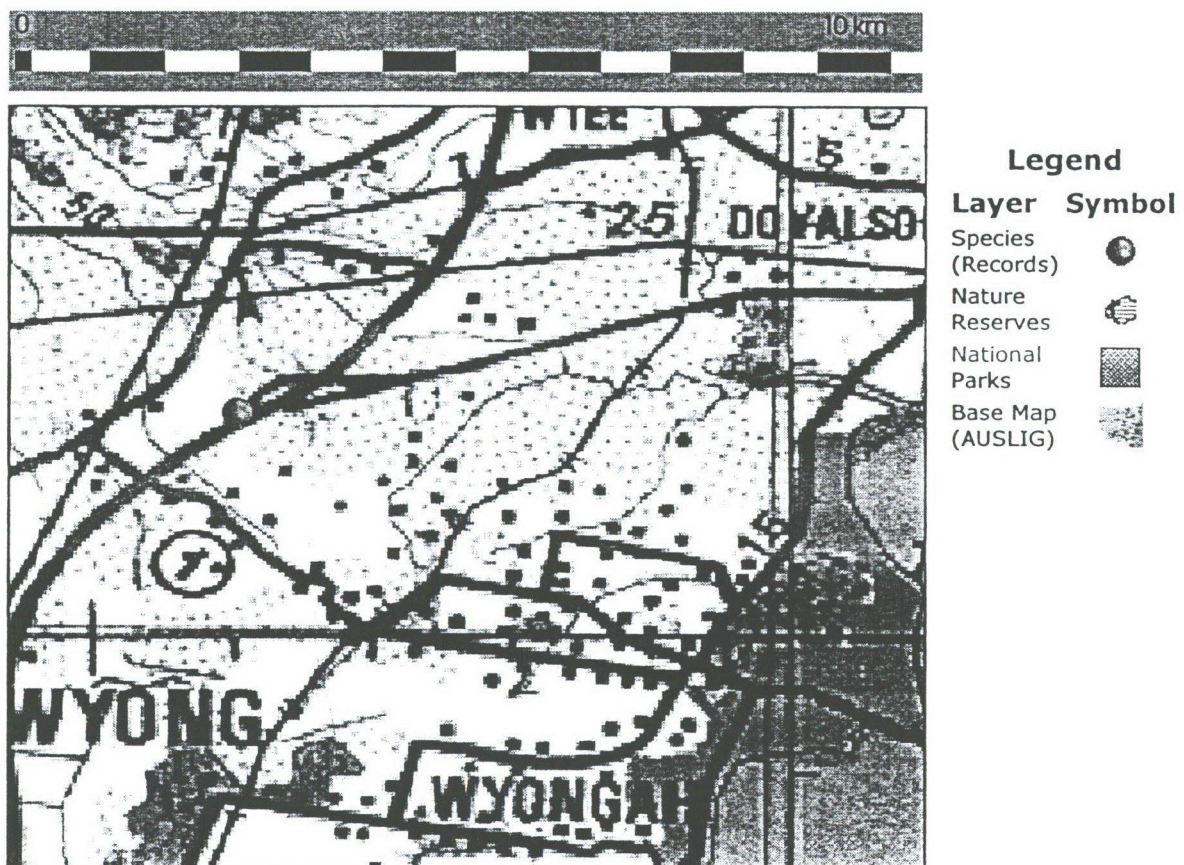


### Sighting Results

**1 recorded sightings for selection:** Flora, *Grevillea parviflora subsp. parviflora* (Leafless Tongue Orchid), recorded since 1980, Area - 151.41529453,-33.277579375,151.50729453,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41529453, -33.277579375, 151.50729453, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:33 PM (Collection database last updated 25/03/2003)



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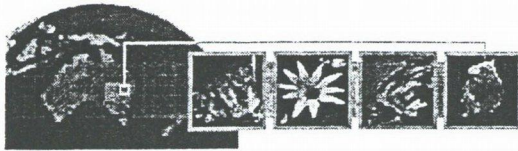


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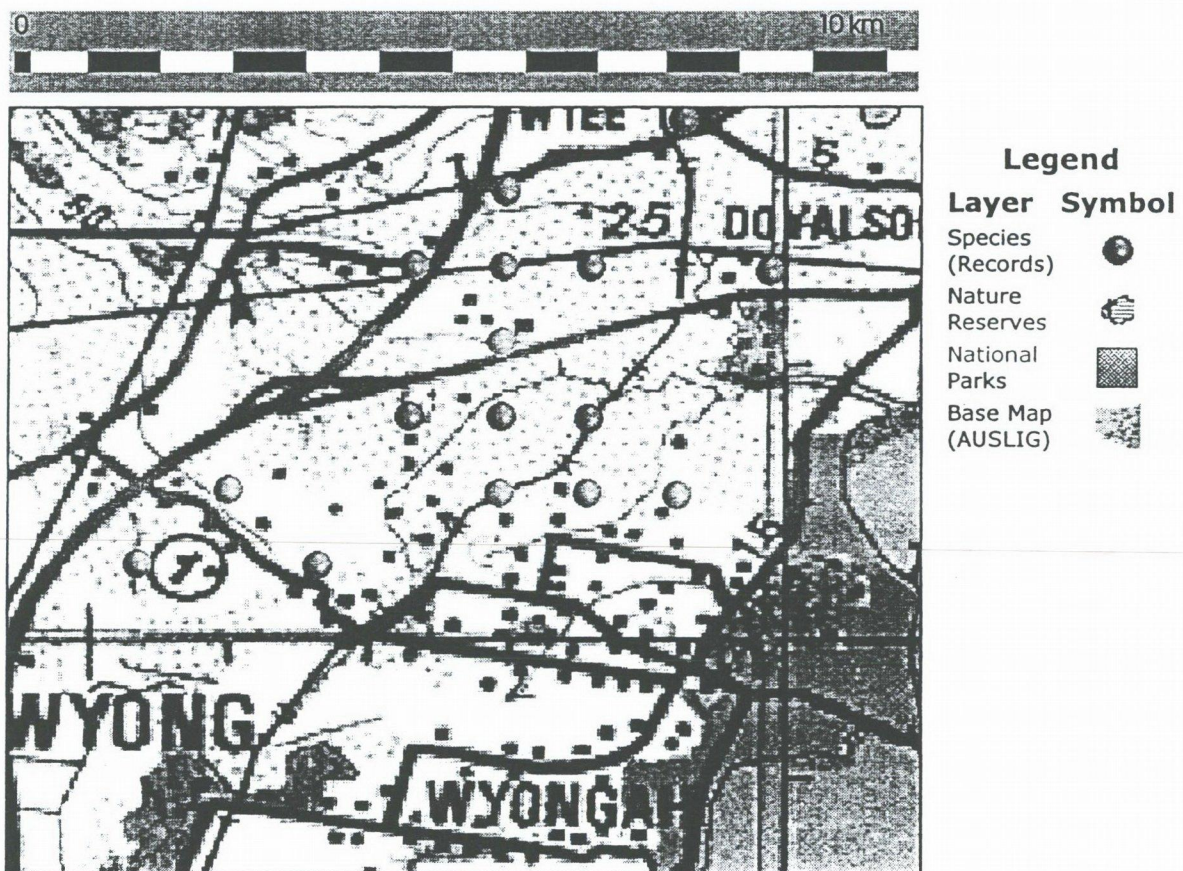


### Sighting Results

**28 recorded sightings for selection:** Flora, *Tetratheca juncea* (Leafless Tongue Orchid), recorded since 1980, Area - 151.41529453, -33.277579375, 151.50729453, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41529453, -33.277579375, 151.50729453, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:34 PM (Collection database last updated 25/03/2003)



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[search for another species](#)

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## Appendix S: NPWS Wildlife Atlas – Fauna Search

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## Search Results












**Your selection:** Fauna, threatened species, recorded since 1980, Selected Area - 151.43181663, -33.35505082236842, 151.49047229, -33.10810792763158

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:20 PM (Collection database last updated 25/03/2003)

<b>Amphibia</b>	Map Scientific Name	Common Name	<u>Legal Status</u>	Count	Info
Hylidae					
	 Litoria aurea	Green and Golden Bell Frog	E1	2	
	 Litoria brevipalmata	Green-thighed Frog	V	2	
Myobatrachidae					
	 Crinia tinnula	Wallum Froglet	V	12	
	 Mixophyes iteratus	Giant Barred Frog	E1	1	
<b>Aves</b>	Map Scientific Name	Common Name	<u>Legal Status</u>	Count	Info
Ardeidae					
	 Botaurus poiciloptilus	Australasian Bittern	V	2	
Cacatuidae					
	 Calyptorhynchus lathami	Glossy Black-Cockatoo	V	4	
Ciconiidae					
	 Ephippiorhynchus asiaticus	Black-necked Stork	E1	4	
Columbidae					
	 Ptilinopus superbus	Superb Fruit-Dove	V	1	
Strigidae					
	 Ninox strenua	Powerful Owl	V	1	
Tytonidae					
	 Tyto novaehollandiae	Masked Owl	V	3	
<b>Mammalia</b>	Map Scientific Name	Common Name	<u>Legal Status</u>	Count	Info
Molossidae					



	 <i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V	8	
Petauridae					
	 <i>Petaurus norfolcensis</i>	Squirrel Glider	V	33	
Phascolarctidae					
	 <i>Phascolarctos cinereus</i>	Koala	V	2	
Pteropodidae					
	 <i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	3	
Vespertilionidae					
	 <i>Miniopterus australis</i>	Little Bentwing-bat	V	2	
	 <i>Miniopterus schreibersii</i>	Common Bentwing-bat	V	17	
	 <i>Myotis adversus</i>	Large-footed Myotis	V	3	
	 <i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	6	

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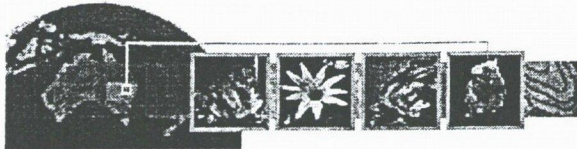
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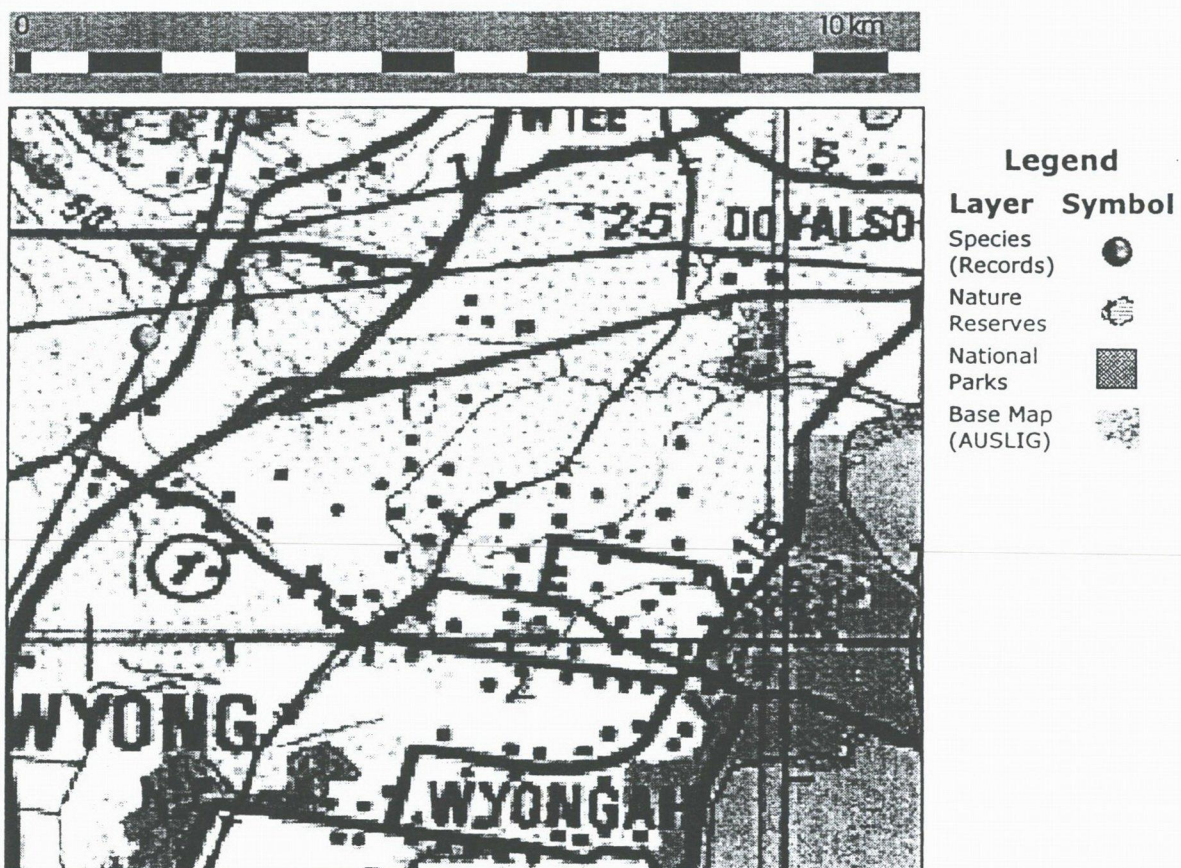
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## Sighting Results

**2 recorded sightings for selection:** Fauna, *Litoria aurea* (Green and Golden Bell Frog), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 3:59 PM (Collection database last updated 25/03/2003)



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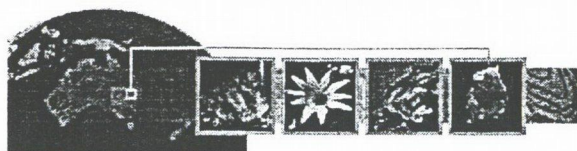


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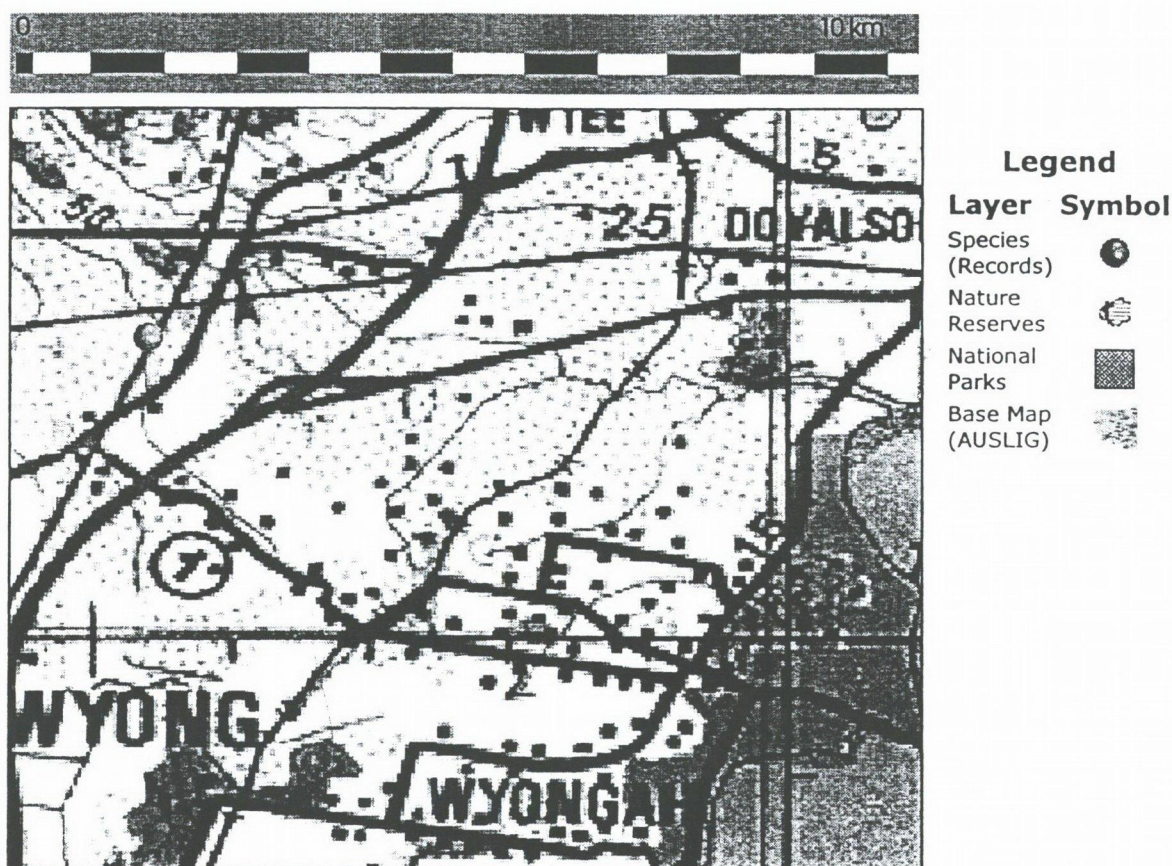
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### Sighting Results

**2 recorded sightings for selection:** Fauna, *Litoria brevipalmata* (Green-thighed Frog), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:02 PM (Collection database last updated 25/03/2003)



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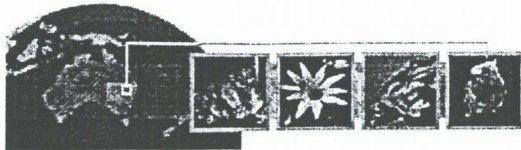


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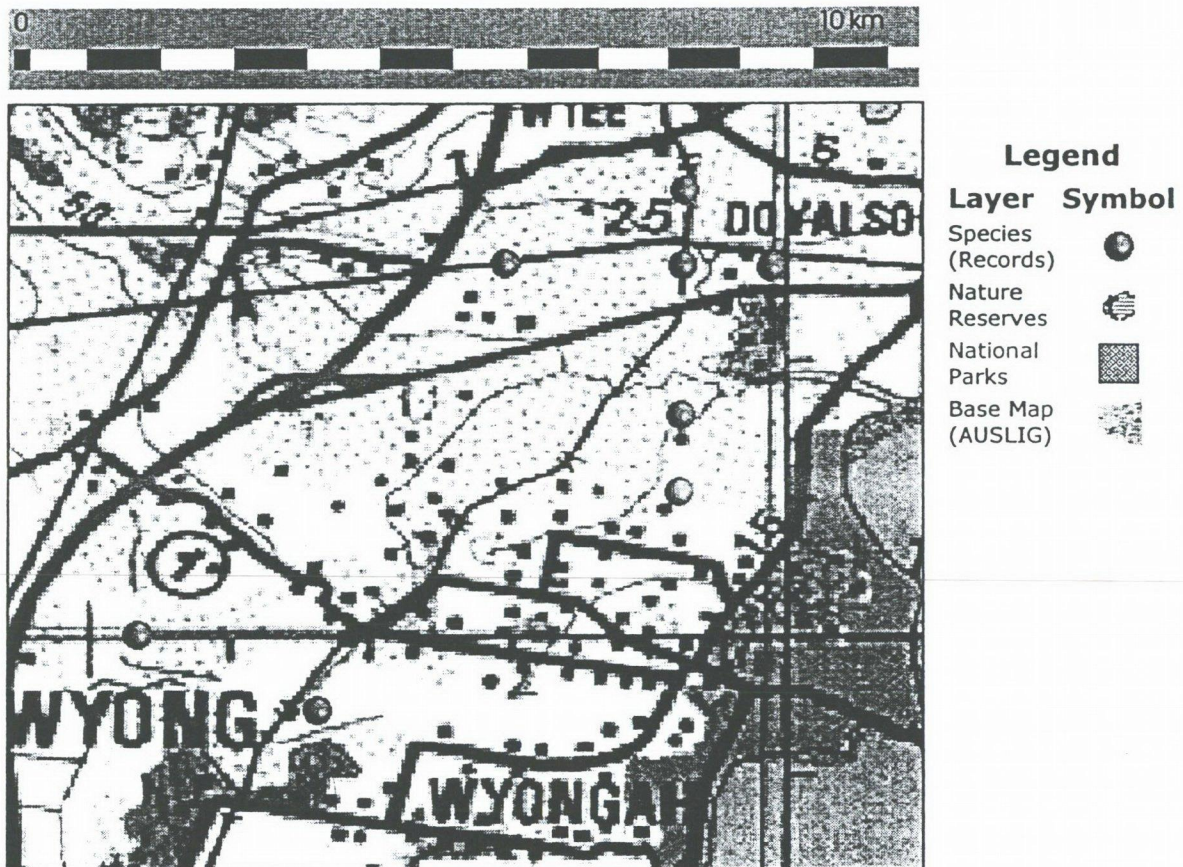


## Sighting Results

**12 recorded sightings for selection:** Fauna, *Crinia tinnula* (Wallum Froglet), recorded since 1980, Area - 151.41514446, -33.277579375, 151.50714446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:04 PM (Collection database last updated 25/03/2003)



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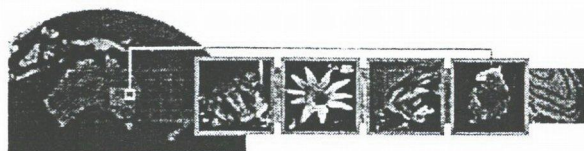


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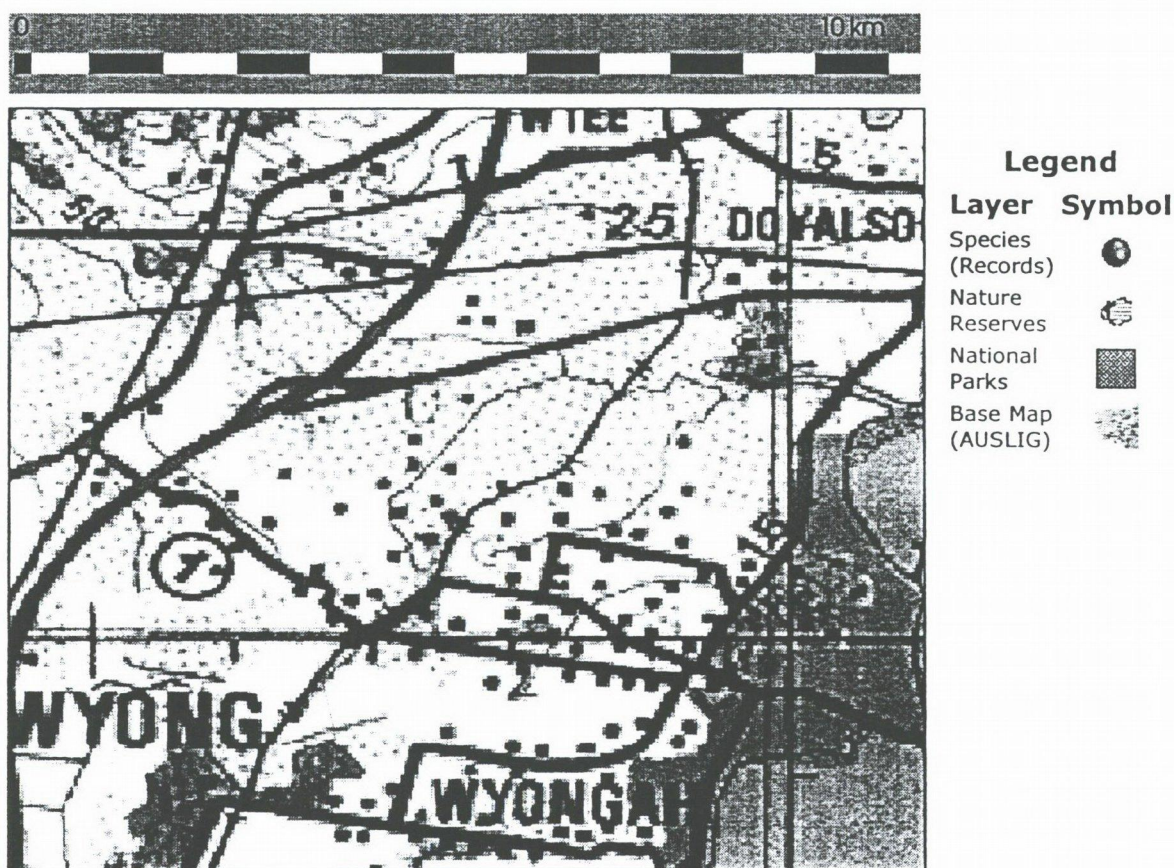


### Sighting Results

**1 recorded sightings for selection:** Fauna, *Mixophyes iteratus* (Giant Barred Frog), recorded since 1980, Area - 151.41514446, -33.277579375, 151.50714446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:05 PM (Collection database last updated 25/03/2003)



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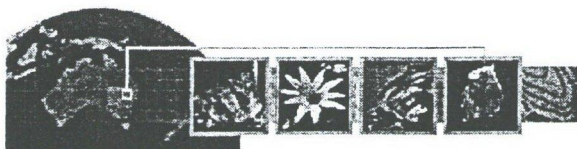


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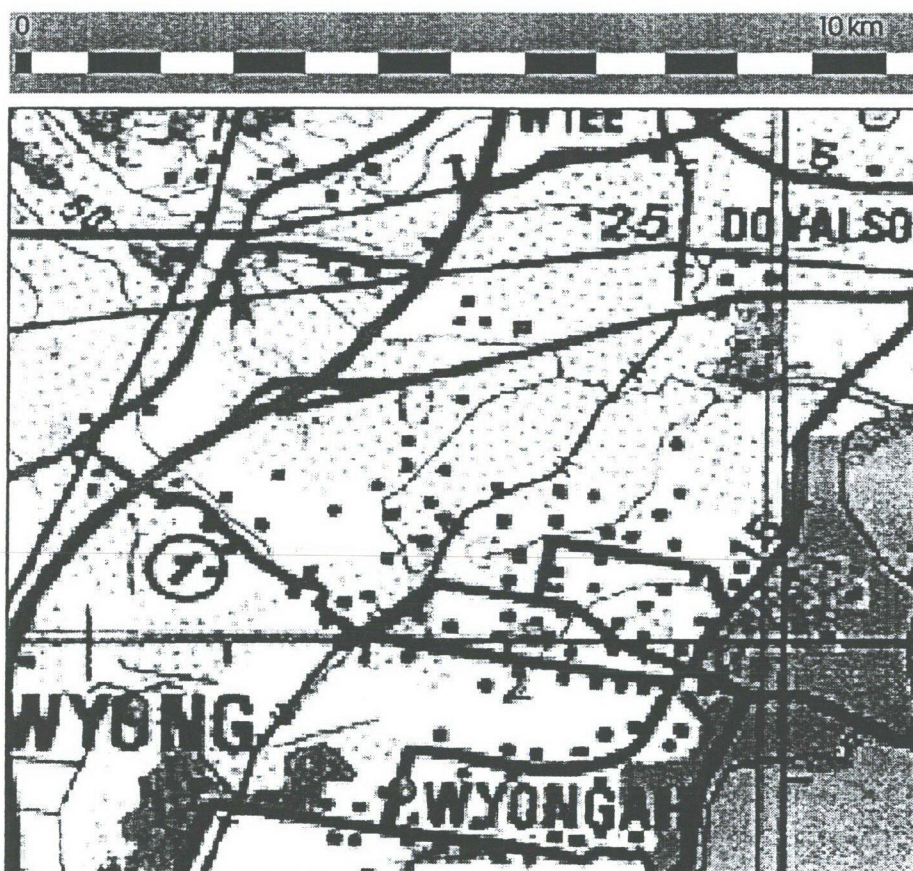


## Sighting Results

**2 recorded sightings for selection:** Fauna, *Botaurus poiciloptilus* (Australasian Bittern), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:06 PM (Collection database last updated 25/03/2003)



- Legend**
- | Layer             | Symbol |
|-------------------|--------|
| Species (Records) |        |
| Nature Reserves   |        |
| National Parks    |        |
| Base Map (AUSLIG) |        |

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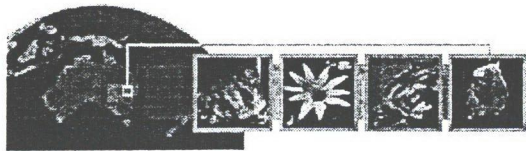


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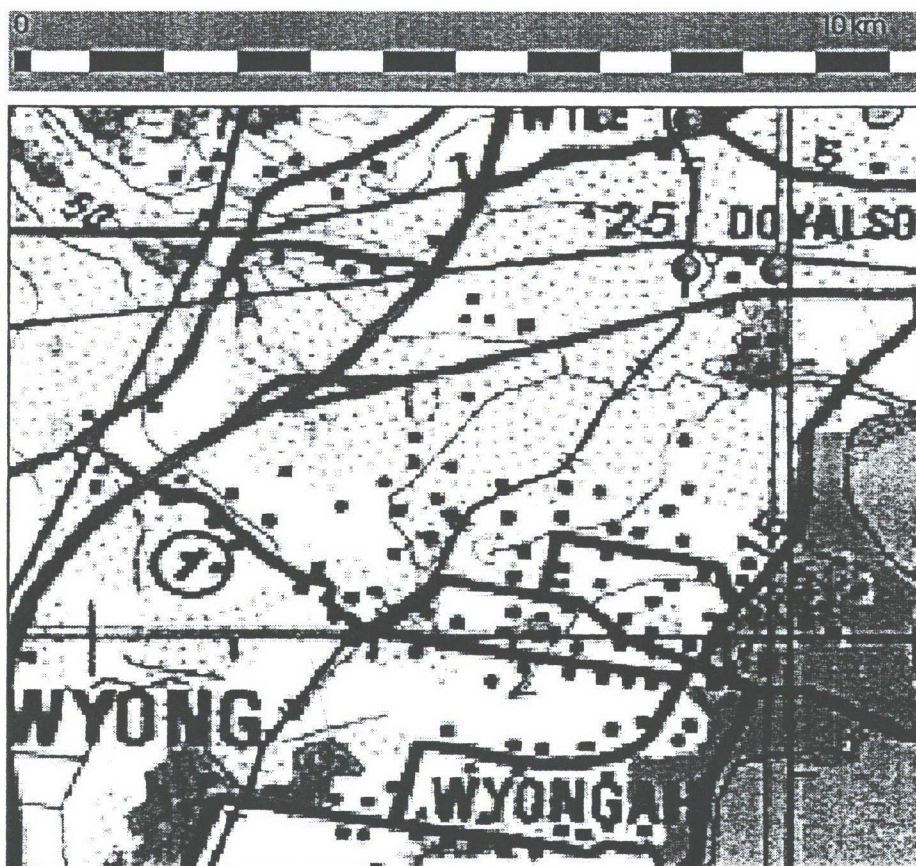


### Sighting Results

**4 recorded sightings for selection:** Fauna, *Calyptorhynchus lathami* (Glossy Black-Cockatoo), recorded since 1980, Area - 151.41514446, -33.277579375, 151.50714446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:07 PM (Collection database last updated 25/03/2003)



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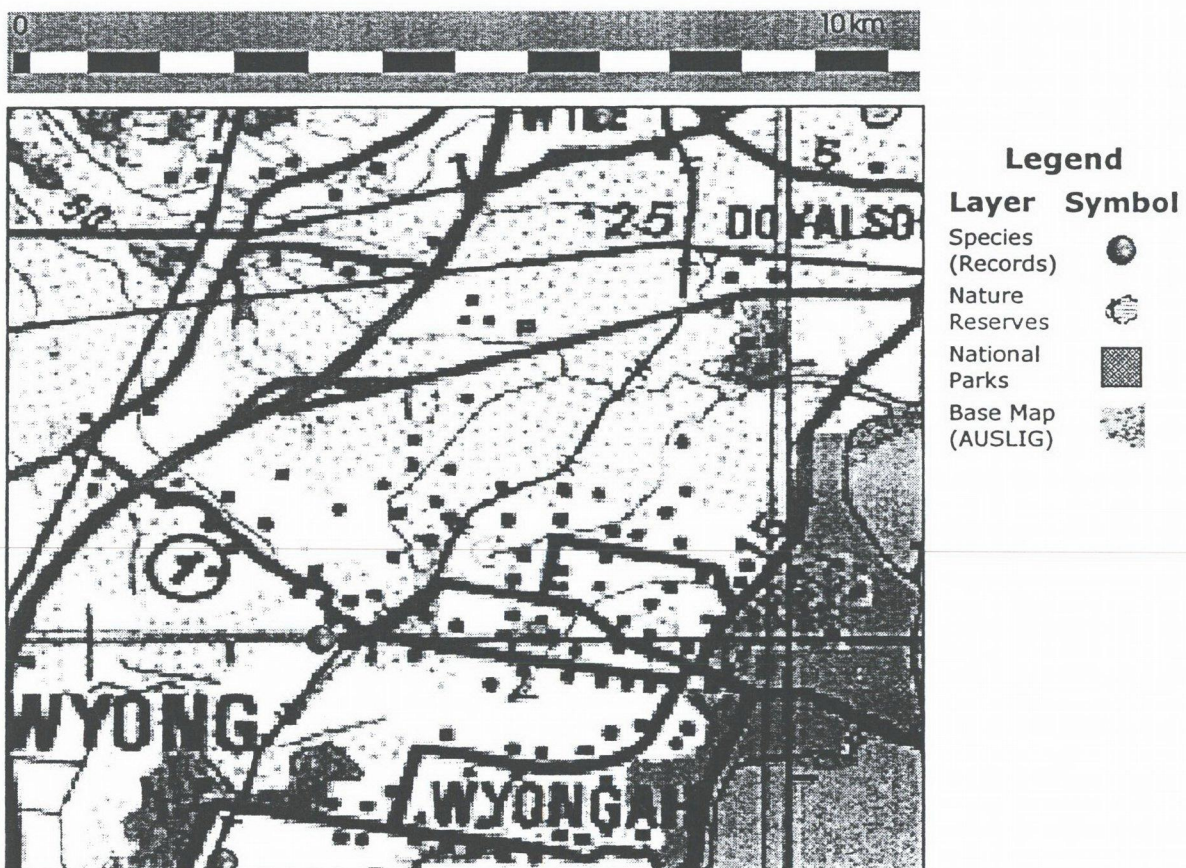
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## Sighting Results

**4 recorded sightings for selection:** Fauna, *Ephippiorhynchus asiaticus* (Black-necked Stork), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:07 PM (Collection database last updated 25/03/2003)



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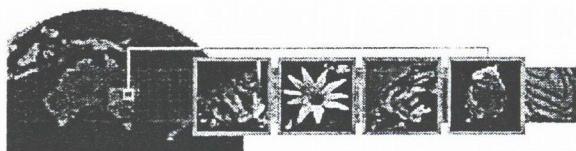


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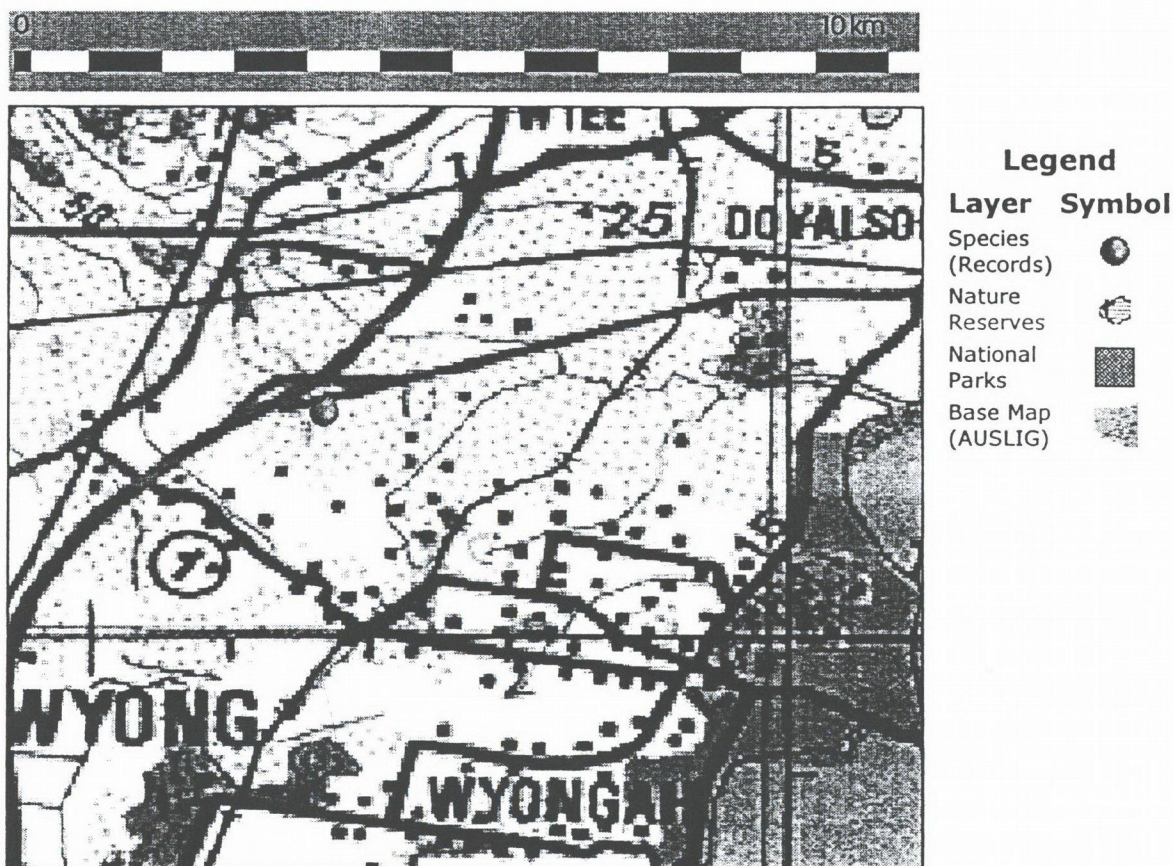


### Sighting Results

**1 recorded sightings for selection:** Fauna, *Ptilinopus superbus* (Superb Fruit-Dove), recorded since 1980, Area - 151.41514446, -33.277579375, 151.50714446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:09 PM (Collection database last updated 25/03/2003)



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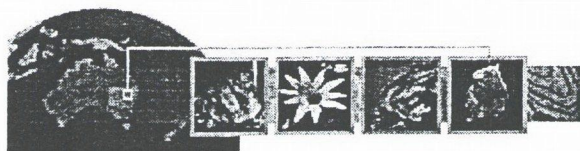


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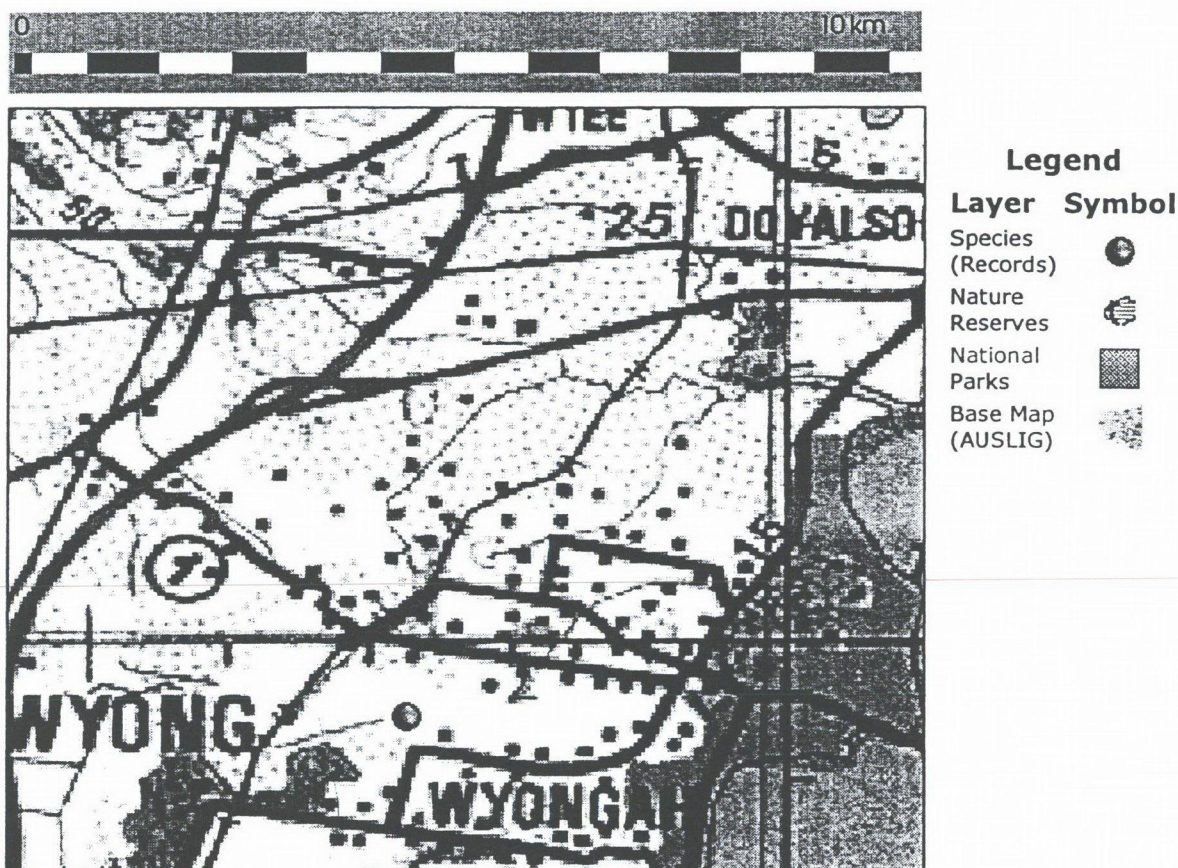


### Sighting Results

**1 recorded sightings for selection:** Fauna, *Ninox strenua* (Powerful Owl), recorded since 1980, Area - 151.41514446, -33.277579375, 151.50714446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:10 PM (Collection database last updated 25/03/2003)



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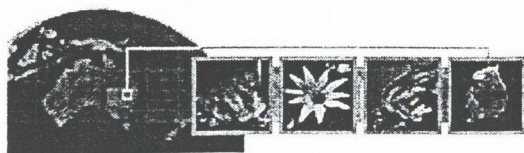


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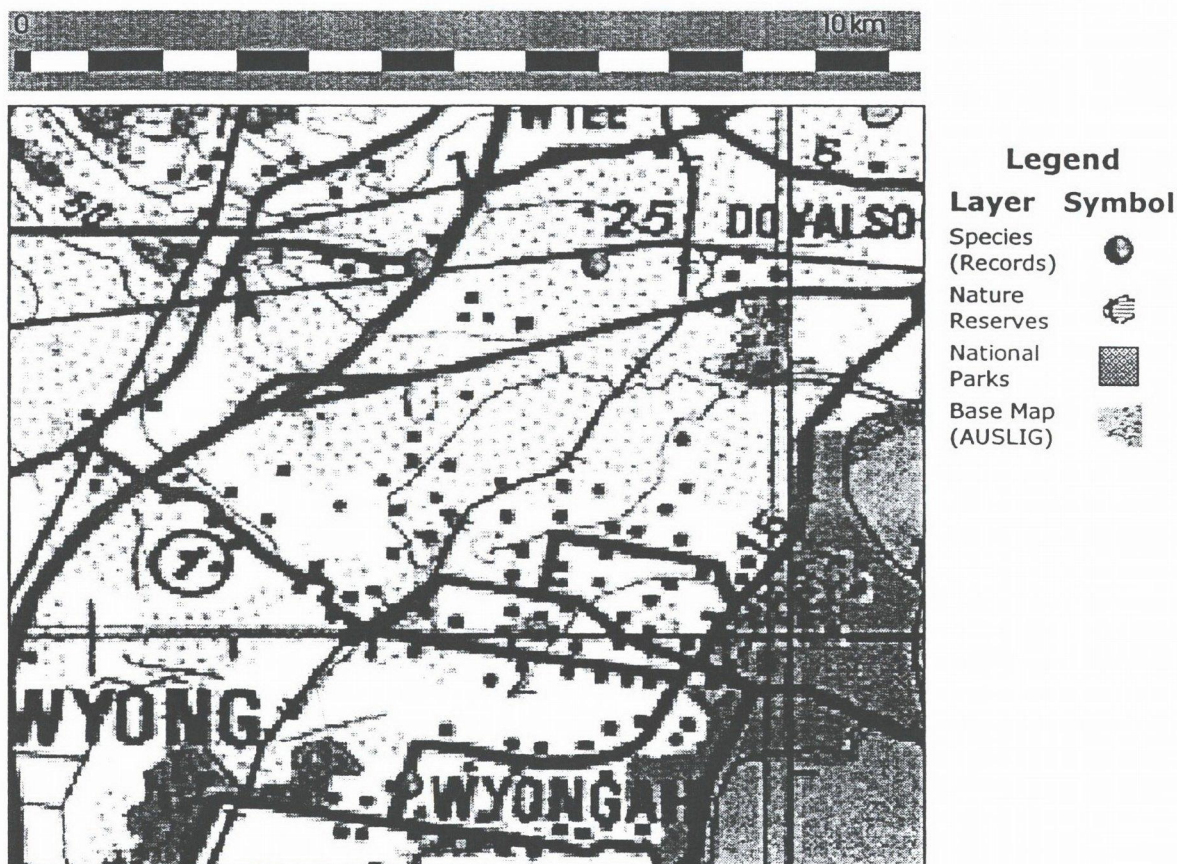


### Sighting Results

**3 recorded sightings for selection:** Fauna, *Tyto novaehollandiae* (Masked Owl), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:11 PM (Collection database last updated 25/03/2003)



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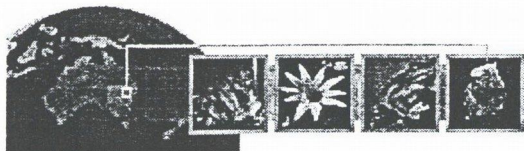
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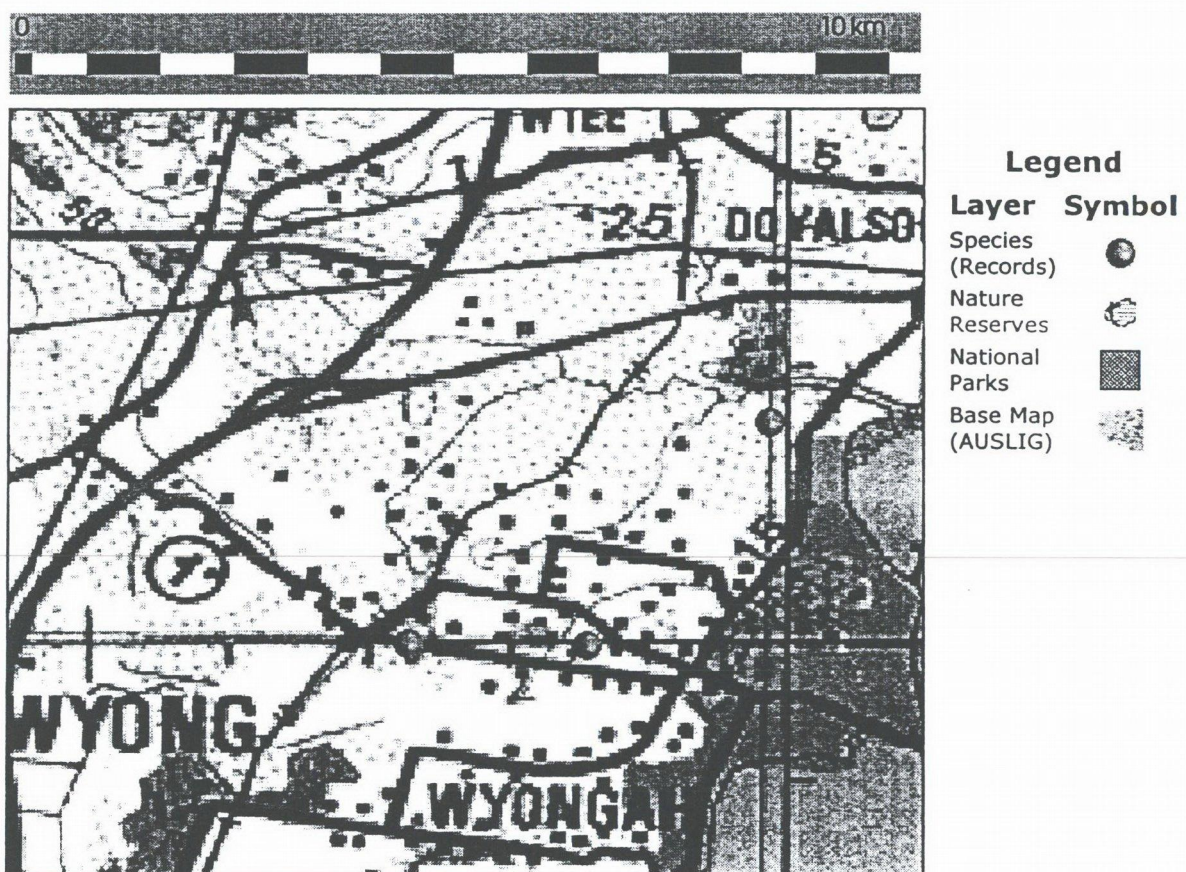


### Sighting Results

**8 recorded sightings for selection:** Fauna, *Mormopterus norfolkensis* (Eastern Freetail-bat), recorded since 1980, Area - 151.41514446, -33.277579375, 151.50714446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:12 PM (Collection database last updated 25/03/2003)



**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



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## NSW National Parks & Wildlife Service atlas of nsw wild

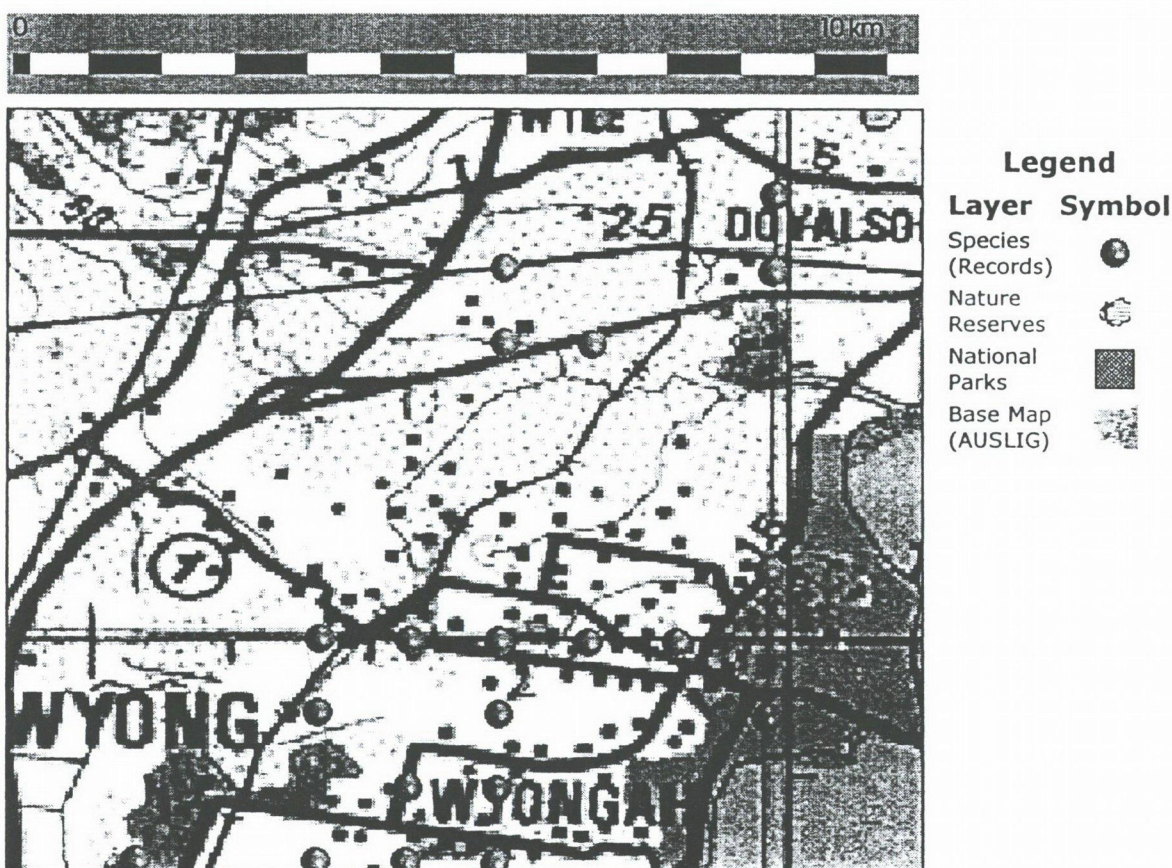
[NPWS home](#)

### Sighting Results

**33 recorded sightings for selection:** Fauna, *Petaurus norfolcensis* (Squirrel Glider), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.1855793749999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.1855793749999996.

Report generated on Fri 28/03/2003 - 4:13 PM (Collection database last updated 25/03/2003)



**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



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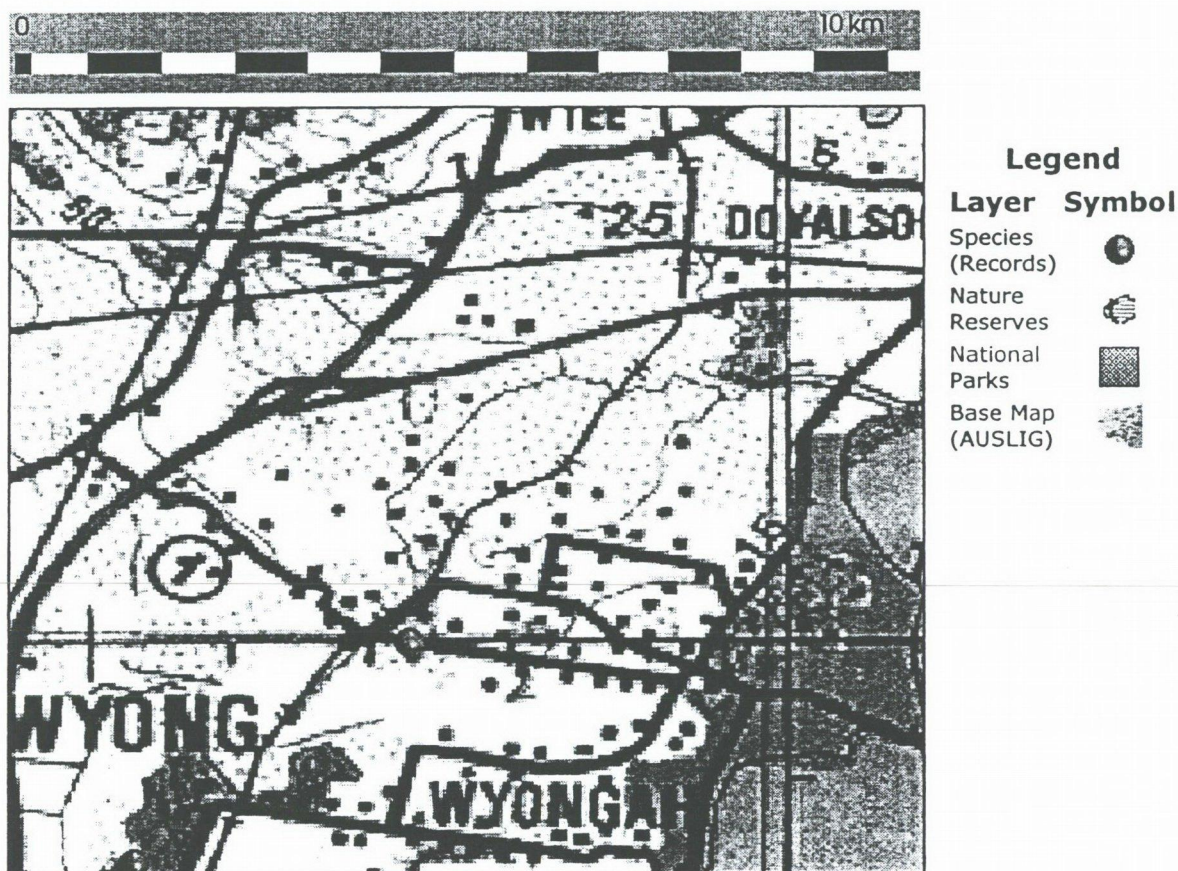


### Sighting Results

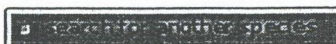
**2 recorded sightings for selection:** Fauna, *Phascolarctos cinereus* (Koala), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:14 PM (Collection database last updated 25/03/2003)



**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



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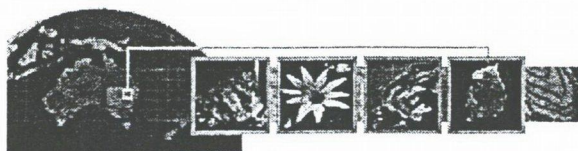


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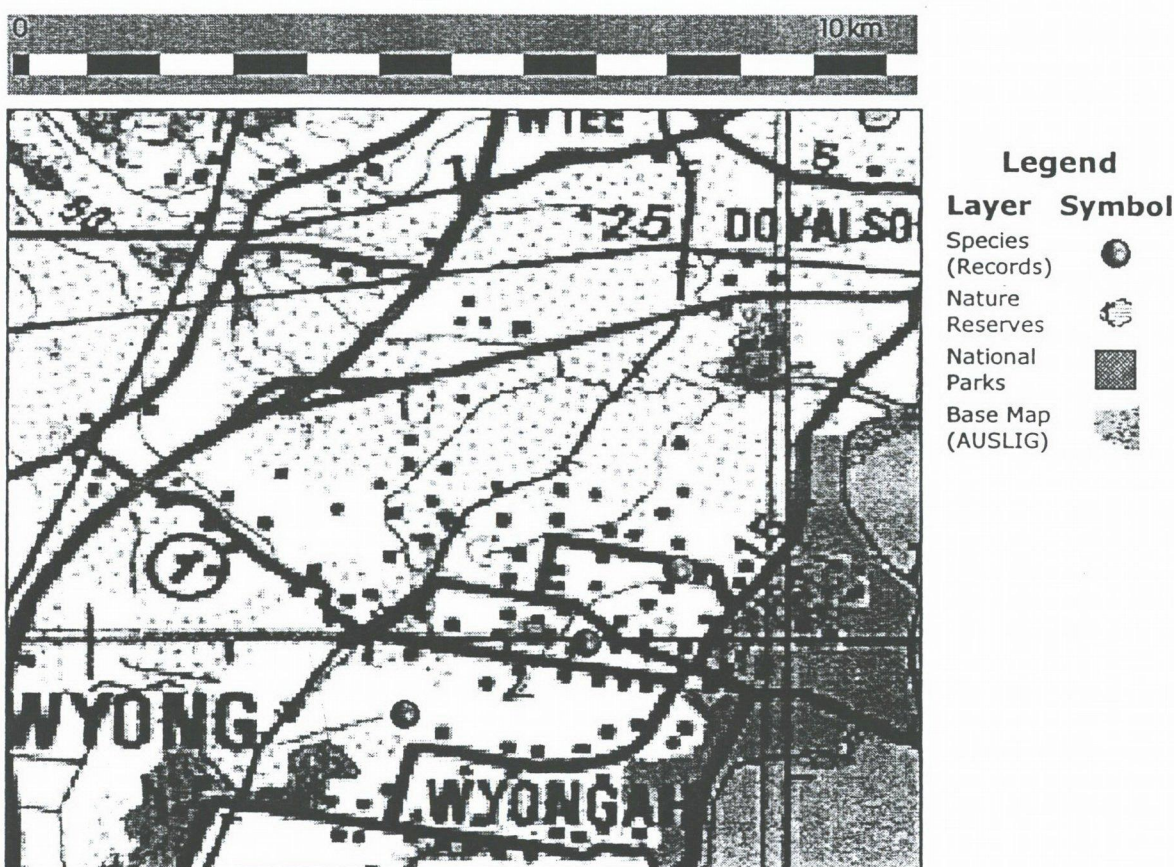
[NPWS home](#)

### Sighting Results

**3 recorded sightings for selection:** Fauna, *Pteropus poliocephalus* (Grey-headed Flying-fox), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:16 PM (Collection database last updated 25/03/2003)



**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



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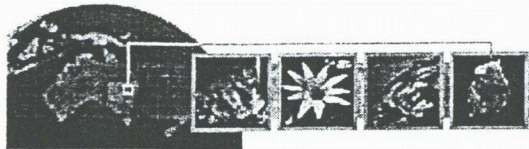


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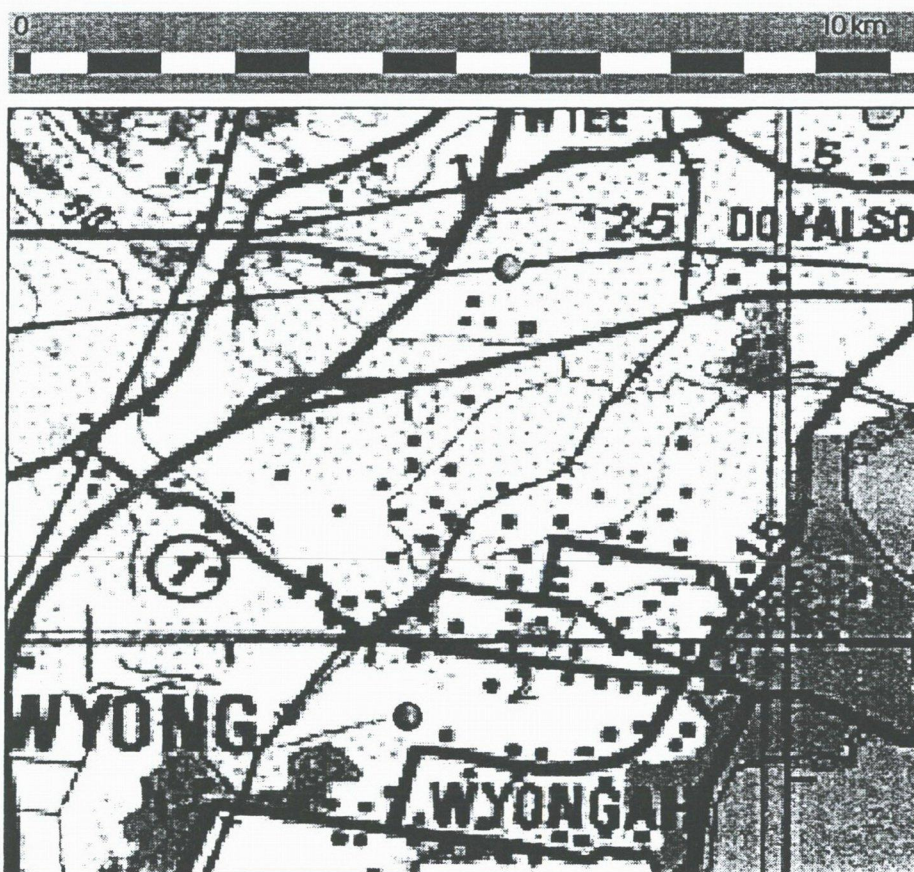


## Sighting Results

**2 recorded sightings for selection:** Fauna, *Miniopterus australis* (Little Bentwing-bat), recorded since 1980, Area - 151.41514446, -33.277579375, 151.50714446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:16 PM (Collection database last updated 25/03/2003)



**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



**DISCLAIMER:** The Atlas of New South Wales Wildlife contains data from a number of sources including government agencies, non-government organisations and private individuals. These data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Find out [more about the Atlas](#).

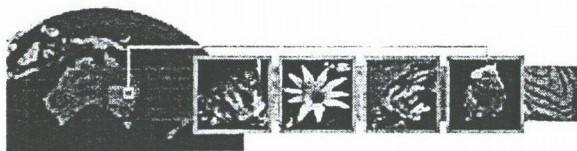


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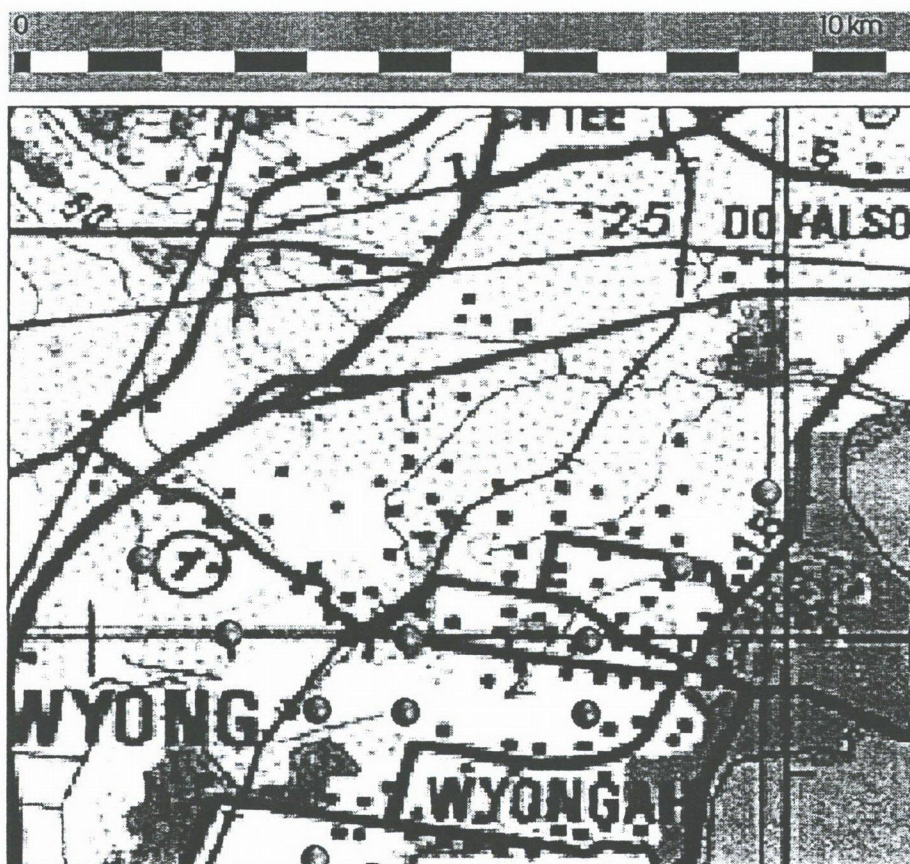
[NPWS home](#)

### Sighting Results

**17 recorded sightings for selection:** Fauna, *Miniopterus schreibersii* (Common Bentwing-bat), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:17 PM (Collection database last updated 25/03/2003)



Legend	
Layer	Symbol
Species (Records)	
Nature Reserves	
National Parks	
Base Map (AUSLIG)	

**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



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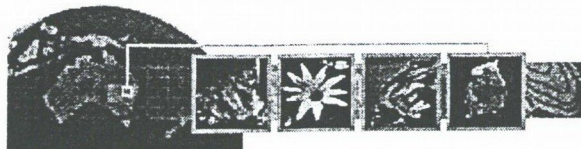


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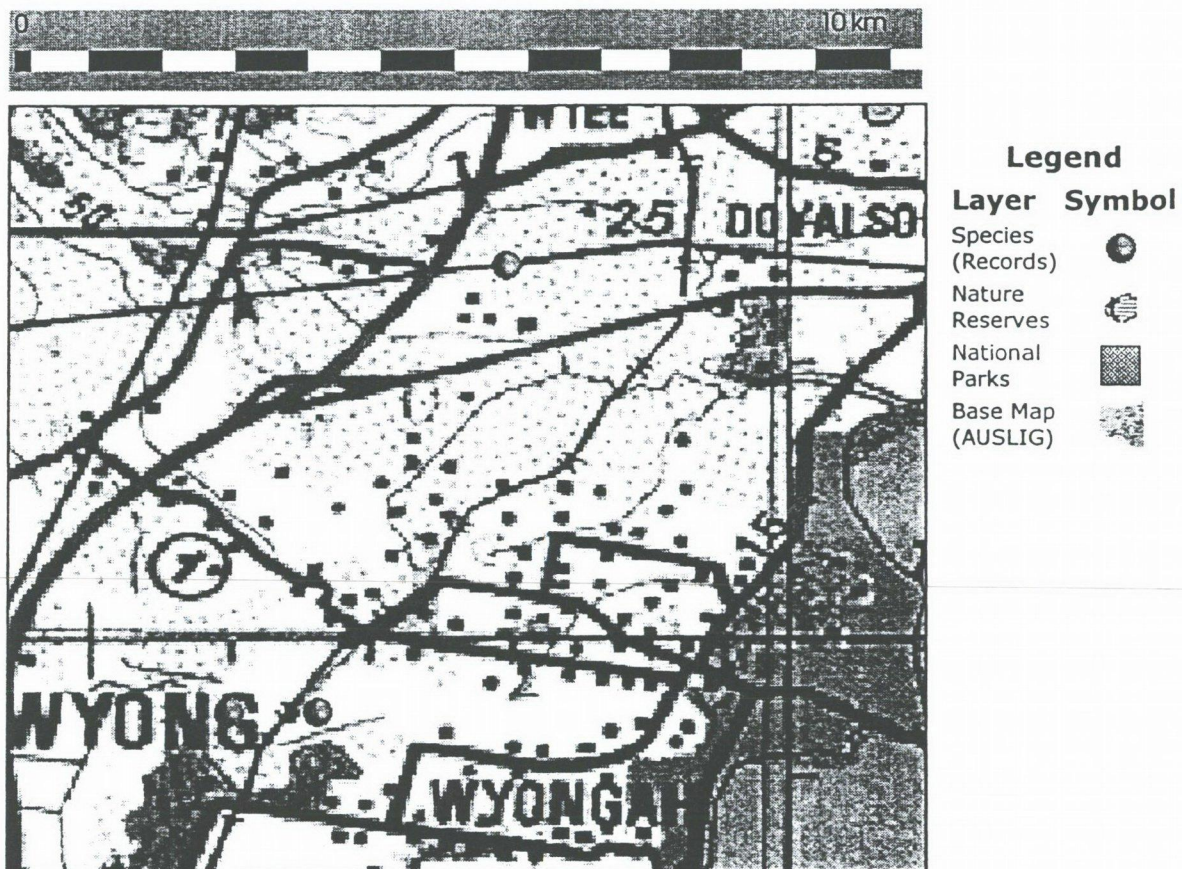


### Sighting Results

**3 recorded sightings for selection:** Fauna, *Myotis adversus* (Large-footed Myotis), recorded since 1980, Area - 151.41514446,-33.277579375,151.50714446,-33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:19 PM (Collection database last updated 25/03/2003)



**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



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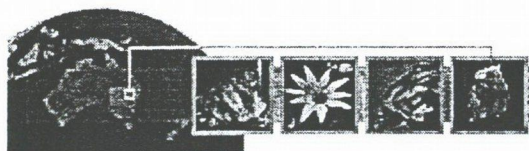


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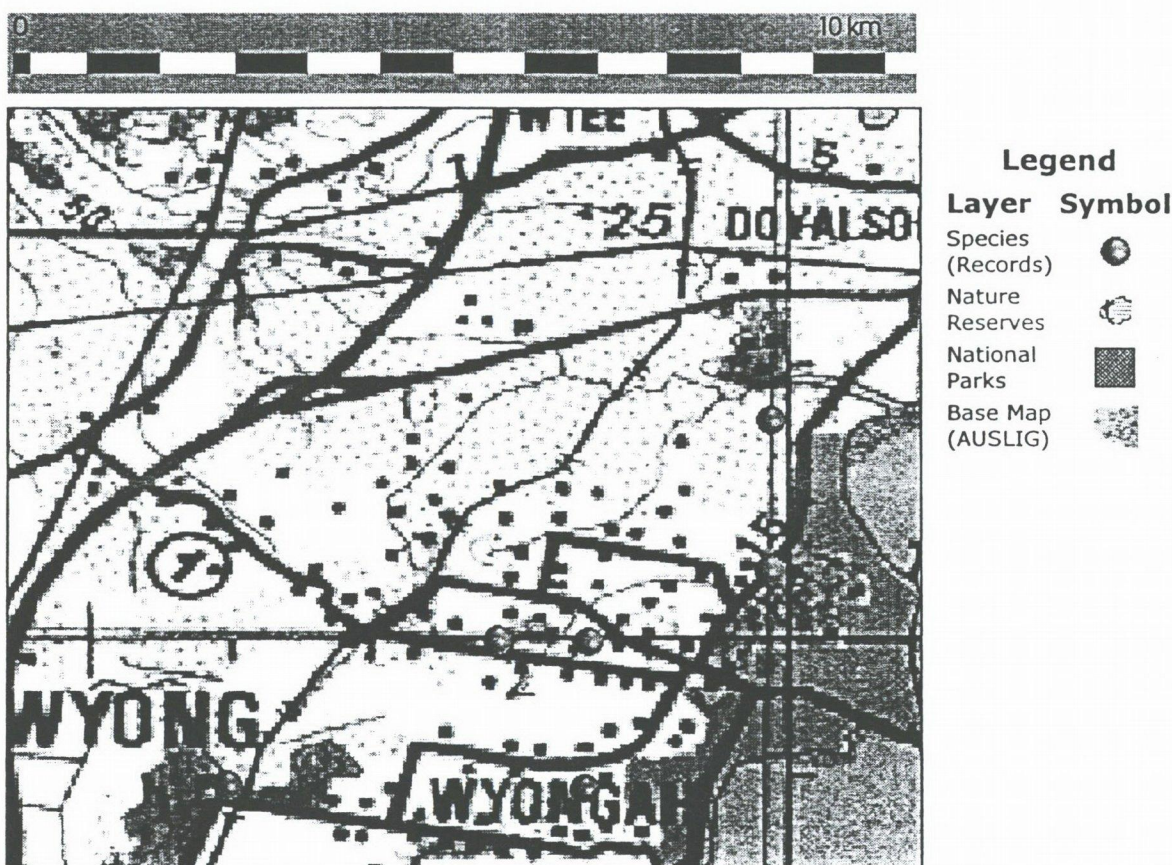


### Sighting Results

**6 recorded sightings for selection:** Fauna, *Scoteanax rueppellii* (Greater Broad-nosed Bat), recorded since 1980, Area - 151.41514446, -33.277579375, 151.50714446, -33.185579374999996

**Note:** You've selected a very small area. The atlas application will not search a user-defined area less than 10km x 10km. **Your search area has been expanded to approximately 10km x 10km.** New extent= 151.41514446, -33.277579375, 151.50714446, -33.185579374999996.

Report generated on Fri 28/03/2003 - 4:19 PM (Collection database last updated 25/03/2003)



**Hint:** If you intend carrying out more than one search of the Atlas, remember to use the 'search for another species' button (not the browser back button) to reset the search screen.



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**Report created on :** Monday, Feb 17 2003

**Report on :** threatened ecological communities, threatened species, marine protected species, migratory species and , Ramsar sites, Commonwealth areas, World Heritage Areas

**Search type :** area

**Approx buffer :** 1 km (minimum buffer is approx 1km)

**Coordinates used :**

Longitude Latitude

151.480 -33.25

151.480 -33.26

151.484 -33.26

151.484 -33.25



[view map](#)

---

**Threatened ecological communities**

0 communities

**Threatened species**

16 species

**Migratory species**

10 species

**Marine protected species**

10 species

---

**World Heritage Areas** [[dataset information](#)]

None found

**Ramsar sites** [[dataset information](#)]

None found

**Commonwealth areas**

**Note:** The database on Commonwealth areas is incomplete and includes only Commonwealth marine areas and Commonwealth reserves

None found

---

**Extra Information**

**Conservation reserves** [[dataset information](#)]

None found

**Regional Forest Agreements**

**Note:** all RFA areas including those still under consideration have been included [[dataset information](#)]

Lower North East NSW RFA

---

**Species and Community Report**



This report provides a general indication of the species and threatened communities that may occur in your nominated area

### Threatened species

	Scientific Name	Common Name	Type of Presence	Status
Amphibia	<u>Heleioporus australiacus</u> (1973)	Giant Burrowing Frog	Species or species habitat likely to occur within area	Vulnerable
Amphibia	<u>Litoria aurea</u> (1870)	Green and Golden Bell Frog	Species or species habitat likely to occur within area	Vulnerable
Amphibia	<u>Mixophyes iteratus</u> (1944)	Southern Barred Frog	Species or species habitat likely to occur within area	Endangered
Aves	<u>Lathamus discolor</u> (744)	Swift Parrot	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Endangered
Aves	<u>Xanthomyza phrygia</u> (430)	Regent Honeyeater	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Endangered
Mammalia	<u>Chalinolobus dwyeri</u> (183)	Large-eared Pied Bat, Large Pied Bat	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Vulnerable
Mammalia	<u>Dasyurus maculatus maculatus</u> (s. lat.) (64476)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (south-east mainland and Tasmanian subspecies)	Species or species habitat likely to occur within area	Vulnerable
Mammalia	<u>Petrogale penicillata</u> (225)	Brush-tailed Rock-wallaby	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Vulnerable
Mammalia	<u>Potorous tridactylus tridactylus</u> (66645)	Long-nosed Potoroo (SE mainland)	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Vulnerable
Mammalia	<u>Pteropus poliocephalus</u> (186)	Grey-headed Flying-fox	Species or species habitat likely to occur within area	Vulnerable
Plant	<u>Angophora inopina</u> (64832)	-	Species or species habitat likely to occur within area	Vulnerable
Plant	<u>Caladenia tessellata</u> (2119)	Thick-lipped Spider-orchid, Daddy Long-legs	Species or species habitat likely to occur within area	Vulnerable
Plant	<u>Cryptostylis hunteriana</u> (19533)	Leafless Tongue-orchid	Species or species habitat likely to occur within area	Vulnerable
Plant	<u>Eucalyptus</u>	Camfield's Gum, Hair-	Species or species habitat	



	<u>camfieldii</u> (15460)	leaved Stringybark	likely to occur within area	Vulnerable
Plant	<u>Tetratheca juncea</u> (21407)	-	Species or species habitat likely to occur within area	Vulnerable
Reptilia	<u>Hoplocephalus bungaroides</u> (1182)	Broad-headed Snake	Species or species habitat likely to occur within area	Vulnerable

---

#### Terrestrial species covered by migratory provisions of the EPBC Act, 1999

	Scientific Name	Common Name	Type of Presence
Aves	<u>Haliaeetus leucogaster</u> (943)	White-bellied Sea-Eagle	Species or species habitat likely to occur within area
Aves	<u>Hirundapus caudacutus</u> (682)	White-throated Needletail	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree
Aves	<u>Monarcha melanopsis</u> (609)	Black-faced Monarch	Breeding or breeding habitat likely to occur within area - Derived from a general distribution map > 1 degree
Aves	<u>Myiagra cyanoleuca</u> (612)	Satin Flycatcher	Breeding or breeding habitat likely to occur within area
Aves	<u>Rhipidura rufifrons</u> (592)	Rufous Fantail	Breeding or breeding habitat likely to occur within area - Derived from a general distribution map > 1 degree
Aves	<u>Xanthomyza phrygia</u> (430)	Regent Honeyeater	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree

---

#### Wetland species covered by migratory provisions of the EPBC Act, 1999

	Scientific Name	Common Name	Type of Presence
Aves	<u>Calidris acuminata</u> (874)	Sharp-tailed Sandpiper	Species or species habitat likely to occur within area
Aves	<u>Charadrius mongolus</u> (879)	Lesser Sand Plover, Mongolian Plover	Species or species habitat likely to occur within area
Aves	<u>Gallinago hardwickii</u> (863)	Latham's Snipe, Japanese Snipe	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree
Aves	<u>Rostratula benghalensis s. lat.</u> (889)	Painted Snipe	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree

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#### Species covered by marine provisions of the EPBC Act, 1999

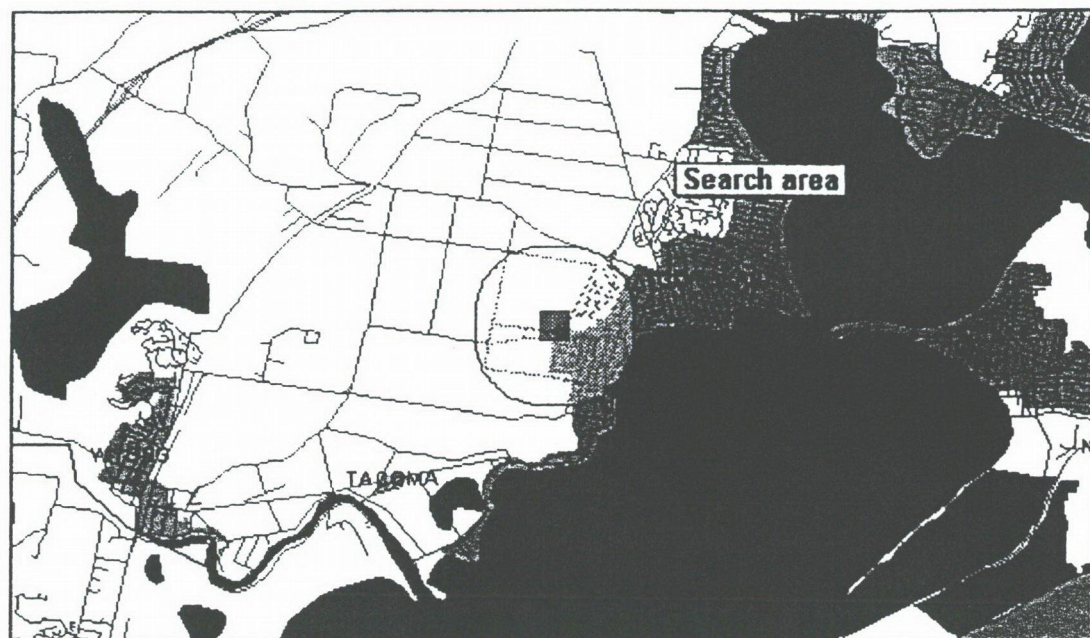


	Scientific Name	Common Name	Type of Presence	Status
Aves	<u>Calidris</u> <u>acuminata</u> (874)	Sharp-tailed Sandpiper	Species or species habitat likely to occur within area	Listed
Aves	<u>Charadrius</u> <u>mongolus</u> (879)	Lesser Sand Plover, Mongolian Plover	Species or species habitat likely to occur within area	Listed
Aves	<u>Gallinago</u> <u>hardwickii</u> (863)	Latham's Snipe, Japanese Snipe	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Overfly marine area
Aves	<u>Haliaeetus</u> <u>leucogaster</u> (943)	White-bellied Sea- Eagle	Species or species habitat likely to occur within area	Listed
Aves	<u>Hirundapus</u> <u>caudacutus</u> (682)	White-throated Needletail	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Overfly marine area
Aves	<u>Lathamus</u> <u>discolor</u> (744)	Swift Parrot	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Overfly marine area
Aves	<u>Monarcha</u> <u>melanopsis</u> (609)	Black-faced Monarch	Breeding or breeding habitat likely to occur within area - Derived from a general distribution map > 1 degree	Overfly marine area
Aves	<u>Myiagra</u> <u>cyanoleuca</u> (612)	Satin Flycatcher	Breeding or breeding habitat likely to occur within area	Overfly marine area
Aves	<u>Rhipidura</u> <u>rufifrons</u> (592)	Rufous Fantail	Breeding or breeding habitat likely to occur within area - Derived from a general distribution map > 1 degree	Overfly marine area
Aves	<u>Rostratula</u> <u>benghalensis s.</u> <u>lat.</u> (889)	Painted Snipe	Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree	Overfly marine area

Species with a \*\* in the status field are predominantly non-marine, however they are known to overfly or occasionally visit the Commonwealth marine area.

### Map of area defined including buffer

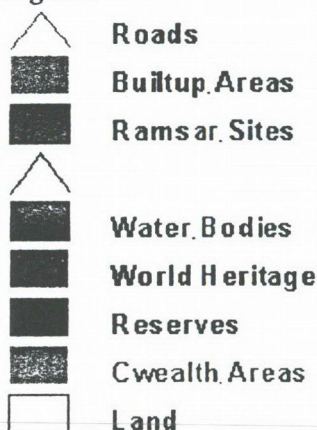




Nominal scale



Legend



## Aknowledgements

This database has been compiled from a range of data sources. Environment Australia acknowledges the following custodians who have contributed valuable data and advice:

- New South Wales National Parks and Wildlife Service
- Department of Natural Resources and Environment, Victoria (Secretary)
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Queensland Environment Protection Agency
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
- Royal Botanic Gardens and National Herbarium of NSW



- Royal Botanic Gardens and National Herbarium of Victoria
- Tasmanian Herbarium
- State Herbarium of South Australia
- Northern Territory Herbarium
- Western Australian Herbarium
- Australian National Herbarium, Atherton and Canberra
- University of New England
- Other groups and individuals

ANUCLIM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution.

Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

See log of system/dataset changes

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For further information see <http://www.environment.gov.au/epbc>



Department of the Environment

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# NATIONAL NATIVE TITLE TRIBUNAL

Your Ref: H/37962/C/01  
Our Ref: 15903AK

5 September 2002

RTA Operations  
Environmental Technology  
PO Box 3035  
PARRAMATTA NSW 2150

Level 25  
25 Blich Street  
SYDNEY NSW 2000  
AUSTRALIA  
GPO Box 9971, SYDNEY NSW 2001  
Telephone: (02) 9235 6300  
Facsimile: (02) 9233 5613  
Website: www.nntt.gov.au

Dear Sir/Madam

**Re: Your search request in relation to Wyong and Lake Macquarie  
Local Government Areas**

Thank you for your letter of 29 August, 2002 regarding the above search request.

A search on 4 September 2002 at 12.30pm of the Local Government Areas nominated in your request indicates that the nearest active claimant native title determination application, determination of native title or Registered Indigenous Land Use Agreement to the specific areas you have nominated is;

Register Type	NNTT Reference Numbers
National Native Title Register	Nil.
Register of Native Title Claims	NC02/7.
Unregistered Claimant applications	Nil.
Register of Indigenous Land Use Agreements	Nil.

Please note that there may be a delay of up to 48 hours between a claimant native title application being lodged in the Federal Court and its transferral to the Tribunal. As such the information contained in this search, in relation to unregistered claimant applications, may not show claimant applications recently lodged or amended in the Federal Court.

I have enclosed for your reference the relevant register extracts and/or summary of the application and attachments that should assist you in determining if your interests are affected. I have also included an information sheet detailing the differences between the Register of Native Title Claims extract and the application summary together with an information sheet on the Tribunals search service.

**Search and/or geospatial analysis charges**

The charge for a search of the registers/applications summary is \$21.45 per 15 minutes and \$7.15 per 5 minutes thereafter and a photocopying charge of \$0.50 per A4 page and \$1.00 per A3 page. For this search this amount is \$25.45. A debit advice notice will be forwarded to you.

**Tribunal accepts no liability for reliance on enclosed information**

The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it.

Should you require any further information, please do not hesitate to contact me on (02) 9235 6300.

Yours sincerely

Adam Knapp

Case Management Unit

FOR MORE INFORMATION, PLEASE CONTACT FREECALL 1800 640 501





## NATIONAL NATIVE TITLE TRIBUNAL

### Application Information and Extract from the Register of Native Title Claims

---

#### Application Information

<b>Application numbers:</b>	Federal Court number:	N6008/2002
	NNTT number:	NC02/7
<b>Application name:</b>	Wonnarua People	
<b>Registration history:</b>	Registered from 04/07/2002.	

---

#### Register Extract (pursuant to s.186 of the *Native Title Act 1993*)

<b>Application filed with:</b>	Federal Court of Australia
<b>Date application filed:</b>	04/06/2002
<b>Date claim entered on Register:</b>	04/07/2002

<b>Applicants:</b>	Mr Thomas Oliver Miller
<b>Address for service:</b>	NSW Native Title Services Ltd PO Box 2105 STRAWBERRY HILLS NSW 2012 Phone: 02-93103188 Fax: 02-93104177

#### Area covered by the claim:

All those areas of land within Mineral Lease Application Nos. 186 and 190 but excluding any land covered by past or present freehold title or by previous exclusive possession acts as defined by section 23B of the Native Title Act (1993) (C'th).

#### Persons claiming to hold native title:

The following families and their descendants are the descendants of Sarah Madoo who was born at Singleton in or about 1840: Waters, Miller, Lester, Hinton, Cavanagh, Hickey, Perry, Samuels, Robinson, Murphy, Saunders,



**Registered native title rights and interests:**

The following Native Title Rights & Interests were entered on the Register on 04/07/2002:

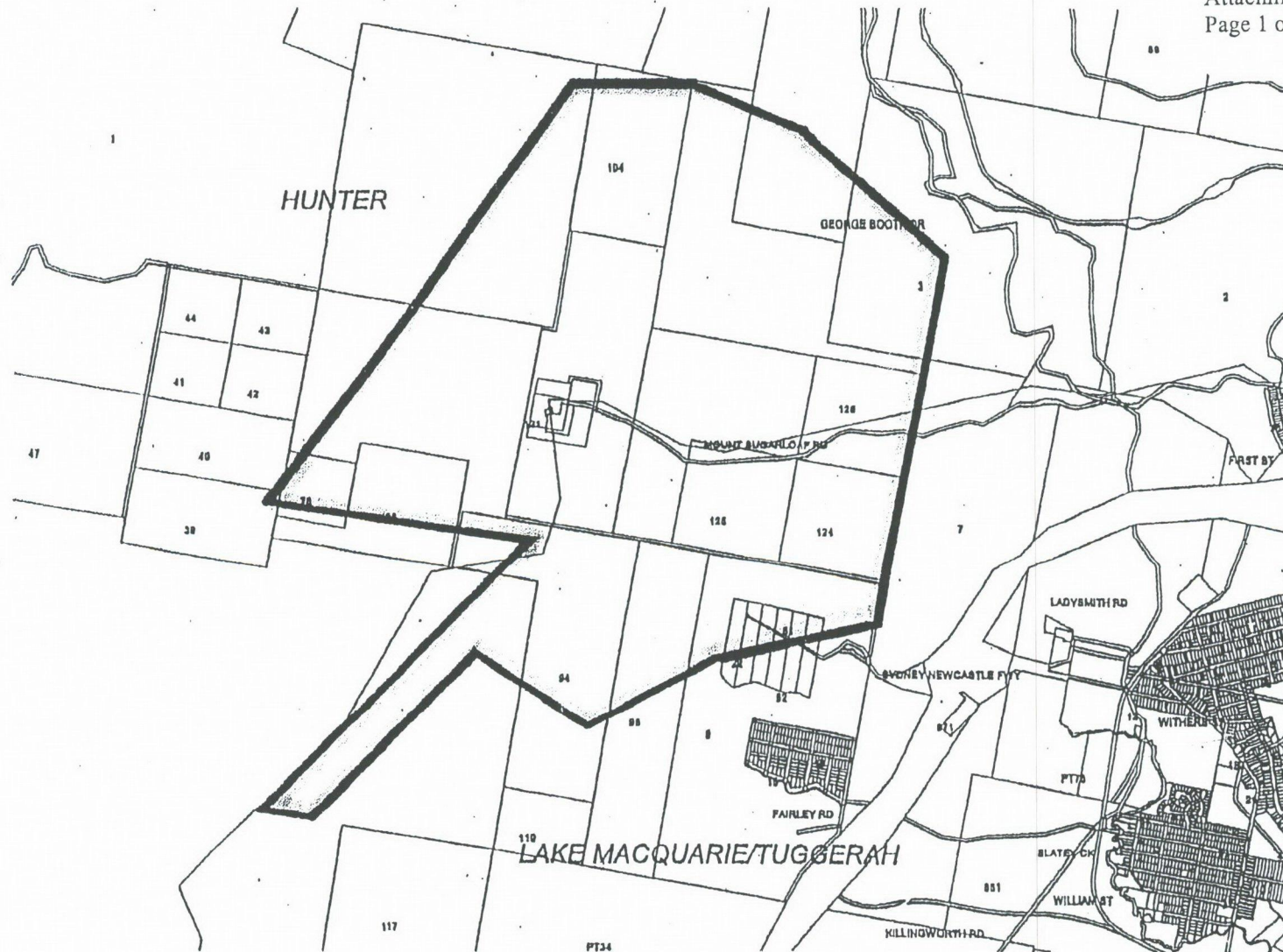
1. Subject to paragraph 3, 4, and 5 of the application (Attachment E), a right of possession, occupation, use and enjoyment of the area covered by the application as against the whole world.
2. Further and in the alternative to paragraph 1 and subject to paragraphs 3, 4 and 5 below, in relation to the area covered by the application:
  - a) the right to own the determination area;
  - b) the right to possess the determination area;
  - c) the right to occupy the determination area;
  - d) the right to use and enjoy the determination area;
  - e) the right to make decisions about the use and enjoyment of the determination area;
  - f) the right to control the access of others to the determination area;
  - g) the right use and enjoy resources of the determination area including, but not limited to:
    - i) the right to hunt and fish on or from the land and waters, and to collect food from the land and waters;
    - ii) the right to take items from the land, and waters such as timber, stones, resin, and shells and to make such things as shelter, tools and hunting implements;
    - iii) the right to manage animals, plants and minerals on the determination area;
  - k) the right to maintain and protect places of importance under traditional laws, customs and practices in the determination area;
  - m) the right to speak for the determination area;
  - n) the right to conduct ceremonies on the land and waters;
  - o) the right of free access to the determination area for the purpose of satisfying the right identified in the preceding sub-paragraphs.

**Register attachments:**

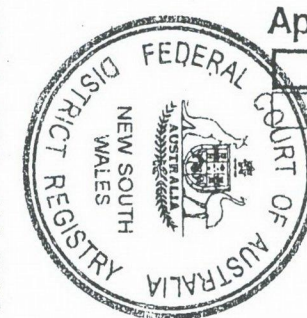
1. Schedule of Application received - NC02/7 Wonnarua Attachment "C" Nos. 186 and 190 , Attachment C of the Application, 2 pages - A4, Attached 04/06/2002.

*Note: The Register may, in accordance with s.188 of the Native Title Act 1993, contain confidential information that will not appear on the Extract.*





MLA 186

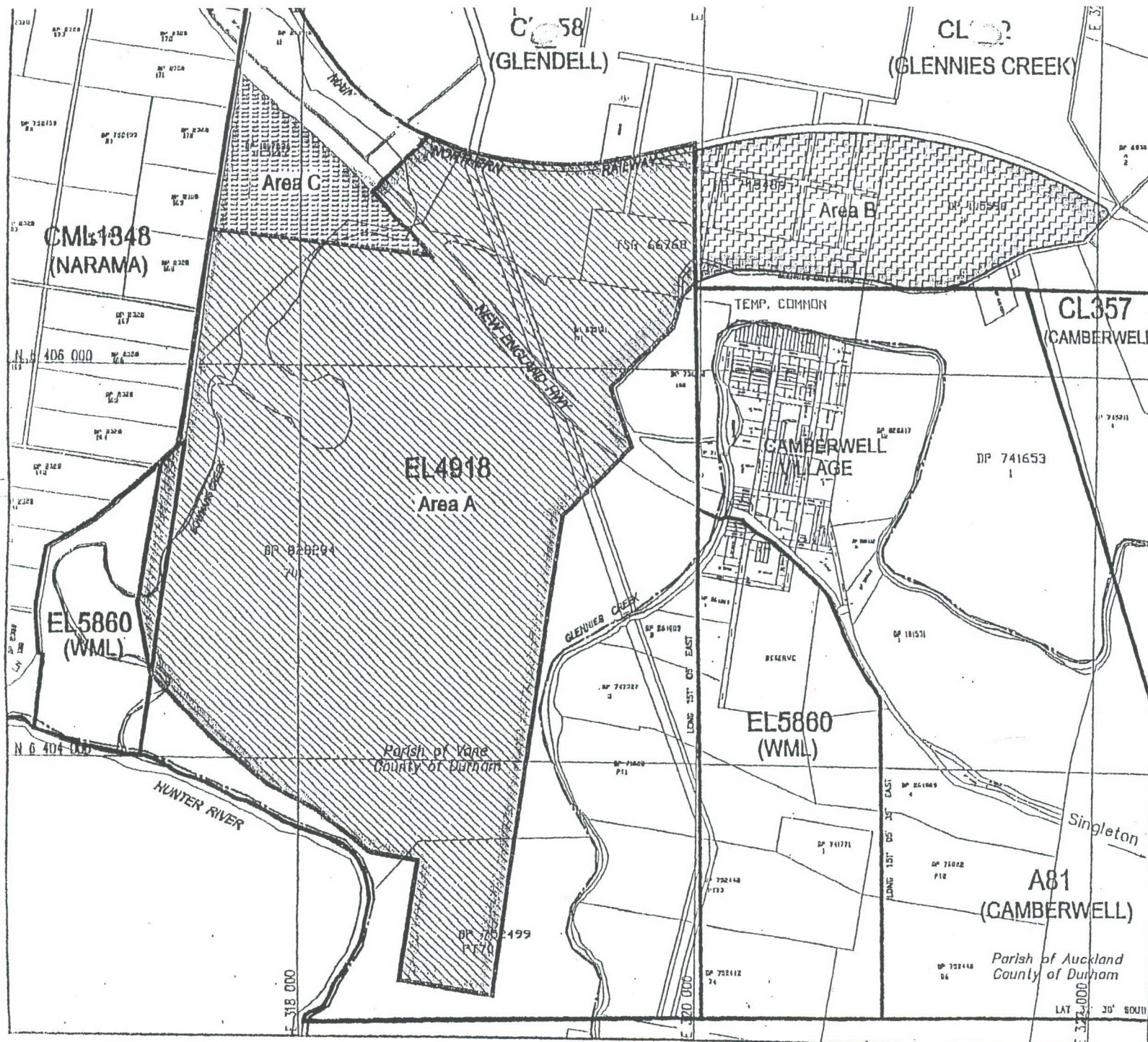


Application shapes  
 [ ] MLA  
 [ ] Catchment Area



SCALE 1:40000

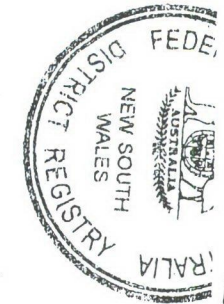




- Legend**
- Area A** Embraces the surface and land below to an unlimited depth.
  - Area B** Embraces the surface and land below to a depth of 20 metres.
  - Area C** Embraces the stratum from a depth of 106.68 metres below the surface to an unlimited depth.

N6008/2002 (NC02/7)  
 Schedule of Application received - NC02/7 Wonnamara Attachment  
 "C" Nos. 186 and 190  
 Attachment C of the Application  
 Page 2 of 2, A4, 04/06/2002

applica  
 8.



White Mining Limited

**ASHTON COAL PROJECT**  
 Mining Lease Application Plan  
 October 2001

SCALE	1:20,000	DATE	31/10/2001
DRAWN	JF	FIG. No.	MLA002
CHECKED			
Co-Resources P/L Singleton NSW		End File Reference MLA002.dwg	





# NATIONAL NATIVE TITLE TRIBUNAL

## Claimant Application Summary

Application numbers	Federal Court number: N6008/2002 NNTT number: NC02/7
Application name	Wonnarua People
Name of body where application filed	Federal Court of Australia
Date application filed	04/06/2002
Current stage(s)	Pre Notification
Applicants	Mr Thomas Oliver Miller
Address for service	NSW Native Title Services Ltd PO Box 2105 STRAWBERRY HILLS NSW 2012 Phone: 02-93103188 Fax: 02-93104177
Persons claiming to hold native title	<p>The following families and their descendants are the descendants of Sarah Madoo who was born at Singleton in or about 1840:</p> <p>Waters Miller Lester Hinton Cavanagh Hickey Perry Samuels Robinson Murphy Saunders Phillips O'Connor Swan</p> <p>See also Attachment M(as per application filed in Federal Court).</p>
Native title rights and interests claimed	<p>1. Subject to paragraph 3, 4, and 5 below, a right of possession, occupation, use and enjoyment of the area covered by the application as against the whole world.</p> <p>2. Further and in the alternative to paragraph 1 and subject to paragraphs 3, 4 and 5 below, in relation to the area covered by the application:</p> <p>a)the right to own the determination area; b)the right to possess the determination area; c)the right to occupy the determination area; d)the right to use and enjoy the determination area; e)the right to make decisions about the use and enjoyment of the determination area; f)the right to control the access of others to the determination area; g)the right use and enjoy resources of the determination area including, but not limited to: i)the right to hunt and fish on or from the land and waters, and to collect food from the land and waters;</p>



- ii) the right to take items from the land, and waters such as timber, stones, resin, and shells and to make such things as shelter, tools and hunting implements;
- iii) the right to manage animals, plants and minerals on the determination area;
- h) the right to control the use and enjoyment of others of resources of the determination area;
- i) the right to trade in resources of the determination area;
- j) the right to receive a portion of any resources taken by others from the determination area;
- k) the right to maintain and protect places of importance under traditional laws, customs and practices in the determination area;
- l) the right to maintain, protect and prevent the misuse of cultural knowledge of the Common Law Holders associated with the determination area;
- m) the right to speak for the determination area;
- n) the right to conduct ceremonies on the land and waters;
- o) the right of free access to the determination area for the purpose of satisfying the right identified in the preceding sub-paragraphs;

3. The rights and interests claimed in paragraphs 1 and 2 above (the native title rights and interests) are:

- a) Subject to the rights and interests of those lawfully exercising rights and interests which have been validly created and vested in them by the State of New South Wales; and
- b) Subject to the rights and interests of those lawfully exercising rights and interests which have been validly created or vested in them by the Commonwealth of Australia.

4. Further and in the alternative to paragraph 3 and subject to paragraph 5 below

a. If

i) The area covered by the application or part of the area covered by the application is or was the subject of a "Previous Non-Exclusive Possession Act" as defined in the Native Title Act (1993) (C'th); and

ii) The Previous Non-Exclusive Possession Act involved the grant of rights and interests which were not inconsistent with the rights and interests claimed in paragraph 1 and/or 2 above; then

The native title rights and interests claimed under paragraphs 1 and/or 2 are claimed subject to the rights and interests granted under the Previous Non-Exclusive Possession Act (as provided by section 23G(1)(a) of the Native Title Act (1993) (C'th);

b. If

i) The area covered by the application or a part of the area covered by the application is or was the subject of a Previous Non-Exclusive Possession Act as defined by section 23F of the Native Title Act (1993) (C'th); and

ii) The Previous Non-Exclusive Possession Act involved the grant of rights and interests which were inconsistent with the rights and interests claimed in paragraphs 1 and/or 2 above but did not extinguish them; then

the rights and interests claimed under paragraphs 1 and/or 2 are claimed subject to any suspension of them during the currency of the Previous Non-Exclusive Possession Act as provided by section 23G(1)(b)(ii) of the Native Title Act (1993) (C'th);

c. If

i) The area covered by the application or a part of the area covered by the application is or was the subject of a "Category B Past Act" as defined by section 230 of the Native Title Act (1993) (C'th) or a "Category B Intermediate Period Act" as defined by section 232C of



	<p>the Native Title Act (1993) (C'th); and</p> <p>ii) The Category B Past Act or the Category B intermediate Period Act involved the grant of rights and interests which were not inconsistent with the rights and interests claimed in paragraphs 1 and/or 2 above; and</p> <p>iii) The Category B Past Act or the Category B Intermediate Period Act was not a Previous Non-Exclusive Possession Act; then</p> <p>Those rights and interests referred to in paragraphs 1 and/or 2 which are not inconsistent with the rights and interests granted under the Category B Past Act or the Category B Intermediate Period Act are claimed;</p> <p>d. If</p> <p>i) The area covered by the application or a part of the area covered by the application is or was the subject of:</p> <p>(1) a "Category C Past Act" as defined by section 231 of the Native Title Act (1993) (C'th); or</p> <p>(2) a "Category C Intermediate Period Act" as defined 232D of the Native Title Act (1993) (C'th); or</p> <p>(3) a Category D Past Act" as defined by section 232 of the Native Title Act (1993) (C'th); or</p> <p>(4) a Category D Intermediate Period Act" as defined by section 232E of the Native Title Act (1993) (C'th); and</p> <p>ii) The Category C Past Act, Category C Intermediate Period Act, Category D Past Act and/or Category D Intermediate Period Act referred to in the preceding sub-paragraph was not a Previous Non- Exclusive Possession Act; then</p> <p>Subject to the operation of the "Non-extinguishment Principle" as defined by section 238 of the Native Title Act (1993) (C'th), those rights and interests claimed under paragraph 1 and/or 2 are claimed.</p> <p>5. Native title rights and interests are not claimed in respect of:</p> <p>a. Any land excluded from the application area within the boundaries of the area covered by the application by Schedule B;</p> <p>b. Any minerals, petroleum or gas which are wholly owned by the Crown.</p> <p>Details of the activities in exercise of those rights and interests are provided in schedule F.</p> <p>See also Attachment M (as per application filed in Federal Court).</p>
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<b>Area</b>	<p><b>Jurisdiction:</b> New South Wales</p> <p><b>Location:</b> All the areas of land within Mineral Lease Applications nos. 186 and 190, near Singleton NSW.</p> <p><b>Local government region(s):</b> Cessnock City Council, Lake Macquarie City Council, Singleton Shire Council</p> <p><b>ATSIC region(s):</b> Sydney Regional Council</p> <p><b>Representative A/TSI body(s):</b> NSW Native Title Services</p> <p><b>Land/water and/or sea:</b> Land/Water</p> <p><b>Area covered by the claim (as detailed in the application):</b> All those areas of land within Mineral Lease Application Nos. 186 and 190 but excluding any land covered by past or present freehold title or by previous exclusive possession acts as</p>
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	defined by section 23B of the Native Title Act (1993) (C'th).
<b>Registration information</b>	<p><i>Please refer to the Register of Native Title Claims/ National Native Title Register (as appropriate) for registered details of this application.</i></p> <p><b>Date claim entered on Register of Native Title Claims:</b> 04/07/2002</p> <p><b>Registration test status:</b> Accepted for registration</p> <p><b>Registration history:</b> Registered from 04/07/2002.</p>
<b>Attachments</b>	1. Schedule of Application received - NC02/7 Wonnarua Attachment "C" Nos. 186 and 190 , Attachment C of the Application, 2 pages - A4, Attached 04/06/2002.
<b>NNTT contact details</b>	<p><b>Case manager:</b> Anoushka Lenffer</p> <p><b>Address:</b> National Native Title Tribunal Level 25 25 Bligh Street SYDNEY NSW 2000</p> <p>GPO Box 9973 SYDNEY NSW 2001</p> <p><b>Phone:</b> (02) 9235 6300 Freecall 1800 640 501</p> <p><b>Fax:</b> (02) 9233 5613</p> <p><b>Web page:</b> <a href="http://www.nntt.gov.au">www.nntt.gov.au</a></p>



# Appendix L

## Ecological Report



## **REPORT ON ECOLOGICAL CONSIDERATIONS RELEVANT TO THE ALIGNMENT OF THE PROPOSED PACIFIC HIGHWAY UPGRADE FROM TUGGERAH TO DOYALSON**

Report prepared by: Ecotone Ecological Consultants Pty Ltd for Sinclair Knight Merz

7<sup>th</sup> August, 1998

### **INTRODUCTION**

This assessment was undertaken to identify and assess the potential ecological constraints on the proposed four lane upgrade of a section of the Pacific Highway from Tuggerah to Doyalson within the New South Wales (NSW) central coast. The assessment includes identification of habitat areas considered to have potential to support the occurrence of threatened flora and fauna species, in addition to areas that provide for high species diversity. The primary objective of this assessment being to determine the need for additional detailed studies to support an assessment under Section 5A of the Environmental Planning and Assessment Act, 1979.

The assessment was based on an ecological investigation of the floral significance and fauna habitat attributes of land bordering this section of the highway. A corridor of approximately 50 metres width was examined, which is largely contained within modified grazing land, urban residential and commercial land, although some relatively large remnant vegetation areas occur as well as scattered remnant tree cover along the road verge.

Following the determination of the preferred widening alignment options for the highway upgrade, detailed surveys may be required to investigate the ecology and biodiversity of identified priority areas. The results of these surveys can then be utilised for a definitive Assessment of Significance of Threatened Species in accordance with Section 5A of the Environmental Planning and Assessment Act 1979, and formulation of ameliorative and protective measures for the proposal.

### **METHODOLOGY**

Prior to the field inspections, a review of the records of threatened flora and fauna species accounts within the locality (i.e. ten-kilometre radius of the study area) was undertaken. This involved a review of records held within the National Parks and Wildlife Service, Atlas of NSW Wildlife Database for the Gosford (9131) and Lake Macquarie (9231), 1: 100 000 Map sheets. Additionally, previously published reports and ecological studies, general distribution texts for specific threatened species, Ecotone Ecological Consultants records, and other sources were also examined.



As a result of this review, eleven (11) threatened flora species and thirty-five (35) threatened fauna species have been identified as occurring within the general study locality:

Threatened Flora	-	<i>Chamaesyce psammogeton</i>
	A Wattle	<i>Acacia bynoeana</i>
	A Paperbark	<i>Melaleuca biconvexa</i>
	Apple Gum	<i>Angophora inopina</i>
	Heart-leaved Stringybark	<i>Eucalyptus camfieldii</i>
	Pokolbin Mallee	<i>Eucalyptus pumila</i>
	Magenta Lily-Pilly	<i>Syzygium paniculatum</i>
	An Orchid	<i>Caladenia tessellata</i>
	An Orchid	<i>Diuris praecox</i>
	An Orchid	<i>Cryptostylis hunteriana</i>
	Black-eyed Susan	<i>Tetratheca juncea</i>
Threatened Fauna	Wallum Froglet	<i>Crinia tinnula</i>
	Giant Burrowing Frog	<i>Heleioporus australiacus</i>
	Stuttering Frog	<i>Mixophyes balbus</i>
	Giant Barred Frog	<i>Mixophyes iteratus</i>
	Red-crowned Toadlet	<i>Pseudophryne australis</i>
	Green and Golden Bell Frog	<i>Litoria aurea</i>
	Green Thighed Frog	<i>Litoria brevis</i>
	Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>
	Australasian Bittern	<i>Botaurus poiciloptilus</i>
	Black Bittern	<i>Dupetor flavicollis</i>
	Black-necked Stork	<i>Ehippiorhynchus asiaticus</i>
	Glossy Black-Cockatoo	<i>Calyptrorhynchus lathamii</i>
	Superb Fruit-Dove	<i>Ptilinopus superbus</i>
	Woompoo Fruit-Dove	<i>Ptilinopus magnificus</i>
	Rose-crowned Fruit-Dove	<i>Ptilinopus regina</i>
	Powerful Owl	<i>Ninox strenua</i>
	Sooty Owl	<i>Tyto tenebricosa</i>
	Masked Owl	<i>Tyto novaehollandiae</i>
	Painted Honeyeater	<i>Grantiella picta</i>
	Regent Honeyeater	<i>Xanthomyza phrygia</i>
	Comb-crested Jacana	<i>Irediparra gallinacea</i>
	Swift Parrot	<i>Lathamus discolor</i>
	Osprey	<i>Pandion haliaetus</i>
	Bush Stone-Curlew	<i>Burhinus magnirostris</i>
	Yellow Bellied Glider	<i>Petaurus australis</i>
	Koala	<i>Phascolarctos cinereus</i>
	Tiger Quoll	<i>Dasyurus maculatus</i>
	Squirrel Glider	<i>Petaurus norfolkensis</i>
	Common Planigale	<i>Planigale maculata</i>
	Large-footed Myotis	<i>Myotis macropus</i>
	Eastern Little Mastiff Bat	<i>Mormopterus norfolkensis</i>
	Common Bent-wing Bat	<i>Miniopterus schreibersii</i>
	Great Pipistrelle	<i>Falsistrellus tasmaniensis</i>
	Greater Broad-nosed Bat	<i>Scoteanax ruepelli</i>
	Yellow-bellied Sheath-tail Bat	<i>Saccolaimus flaviventris</i>



An additional sixteen (16) species of oceanic and estuarine birds have also been recorded from the locality, however the habitats types present within the study area are not compatible with the preferred habitat types of these species and they are therefore not regarded as potential subject species for the purposes of the current assessment. These species include: Gould's Petrel, Kermadec Petrel, Providence Petrel, Flesh-footed Shearwater, Little Shearwater, Pied Oystercatcher, Sooty Oystercatcher, Greater Sand-Plover, Lesser Sand-Plover, White Tern, Little Tern, Sanderling, Broad-billed Sandpiper, Great Knot, Terek Sandpiper, Black-tailed Godwit.

#### *Preliminary Field Assessments*

The objective of preliminary field assessments was to determine (on the basis of ecological attributes) the preferred road widening alignment along the Pacific Highway, between Tuggerah and Doyalson, so that minimal habitat loss and impact on threatened species may be achieved from the proposed works.

The field assessment comprised of a cursory visual examination of the habitats present along this route. Intact patches of remnant bushland were identified and examined, with the aim of assessing the floral and faunal attributes of each of these areas and determine the potential for the above mentioned threatened flora and fauna species to occur within these areas.

#### **Results and Discussion**

The study corridor is dominated by predominately cleared residential land, remnants of natural bushland and regenerating derivatives of locally indigenous vegetation in previously cleared lands. Several areas contain moderate quality native vegetation, with some being of reasonably good to high quality considering the location in terms of proximity to extensive urban development areas. However the majority of the corridor is dominated by cleared, modified lands with small-scattered vegetative remnants along the roadside. The management of tree cover during the proposed works is an important consideration due to the severely fragmented and degraded nature of the vegetation communities of the locality.

From the field assessments, several areas have been identified as containing threatened flora species or considered to have good potential to support threatened flora and fauna species that are known from the locality. These areas are described below, as well as highlighted on the attached Figures 1a & 1b. The following discussion includes a brief summary on the preferred alignment option considered best suited for widening of the road, based on the ecological attributes present and the minimal afforded impact on the prevailing habitat areas.



**Area A:** *Floral Attributes*

Generally good quality open forest habitat dominated by Scribbly Gum (*Eucalyptus haemastoma*), Smooth-barked Apple (*Angophora costata*) and Red Bloodwood (*Corymbia gummifera*). A heath-like understorey was of moderate to high species diversity. A population of Black She-oak (*Allocasuarina littoralis*) was also present. Threatened flora species that have potential to occur within this section, include:- *Angophora inopina*, *Acacia bynoeana* & *Tetratheca juncea*.

*Faunal Attributes*

The section contains occasional tree hollows, a high percentage of groundcover, and flowering Wattles. Appears to provide good quality foraging habitat for the Glossy Black-Cockatoo as well as the Koala, moderate quality habitat for the Squirrel Glider.

*Preferred Alignment Option*

Whilst the eastern side of the highway exhibits some connectivity this is largely limited by intersecting roads and cleared lands. In contrast habitat on the western side is of better condition, larger in size, and appears to exhibit better connectivity with proximal bushland. Preferred option lies along the eastern side of the side of the road.

**Area B:** *Floral Attributes*

Moderate quality open forest, dominated by Scribbly Gum, Smooth-barked Apple, Bloodwood and Stringybark (*Eucalyptus capitellata*). Also common below the tree canopy were Black She-oak and Sydney Golden Wattle (*Acacia longifolia*). The northern end of this section contains scattered Swamp Mahogany (*Eucalyptus robusta*) & Forest Red Gum (*Eucalyptus tereticornis*), with several large, mature trees present.

*Faunal Attributes*

Occasional tree hollows, dense groundcover, flowering Wattles, Swamp Mahogany and Forest Red Gum. Good habitat for common frog species occurs in the drainage line and low-lying depressions. The presence of abundant Black She-oaks provides foraging habitat for the Glossy Black-Cockatoo, and the above flowering species provides good quality habitat for Squirrel Gliders, and Koalas.

*Preferred Alignment Option*

As the eastern side of the existing Highway is relatively free of any significant area of natural vegetation it would therefore represent the best option for widening of the road.



**Area C:**      *Floral Attributes*

High quality open forest on both sides of existing Highway, dominated by mature Forest Red Gum and Swamp Mahogany in the northern section, with the more elevated southern section dominated by Smooth-barked Apple. A dense understorey, including Sydney Golden Wattle and Bracken (*Pteridium esculentum*), with scattered Broad-leaved Paperbark (*Melaleuca quinquenervia*) was also present. The Threatened species *Angophora inopina* was present within this section and to the north of Wallarah Creek. Other Threatened species that have potential to occur include:- *Tetratheca juncea* (southern section) and Orchid species.

*Faunal Attributes*

The presence of Forest Red Gum and winter flowering Swamp Mahogany provides very good quality habitat for the Squirrel Glider and Koala. Additionally, both the Regent and Painted Honeyeater could be reasonably expected to utilise this habitat during the flowering period. The site also exhibits habitat with potential to be utilised by the Powerful Owl, for foraging and possibly nesting. Furthermore, given the close proximity of Wallarah Creek (adjoining the site) the potential exists for the Osprey to perch and possibly nest in this area, although the presence of suitably large trees for this purpose has not been investigated to date, and may need to be examined in specific detail.

*Preferred Alignment Option*

This particular area, immediately south of Wallarah River, contains good quality habitat on both sides of the road, and as such, represents a priority area requiring a more comprehensive survey to assist in a definitive assessment on the preferred alignment option.

**Area D:**      *Floral Attributes*

Good quality open Forest dominated by Scribbly Gum, Red Bloodwood, Smooth-barked Apple and Brown Stringybark with a generally sparse shrub and sub-tree layer, which included Sydney Golden Wattle and Sieber's Paperbark (*Melaleuca sieberi*). Potential Threatened flora species which may occur include:- *Angophora inopina*, *Tetratheca juncea* & orchids.

*Faunal Attributes*

Occasional large, mature trees with hollows, large fallen and hollowed logs. Comprises good percentage of groundcover vegetation providing excellent habitat for small ground dwelling mammals, although the threatened Common Planigale is not expected to occur. Marginal Squirrel Glider habitat, not considered critical. Given the abundance of Scribbly Gum (*E. haemastoma*) the Koala can be reasonably expected to occur, although the status of this animal in the locality is not known.



*Preferred Alignment Option*

The preferred alignment option in this area would be on the eastern side of the road, fronting the residential area. However some scope exist for widening of the road on both sides as the value of the habitat on the western side appears to increase as distance from the road increases to the west.

**Area E:**

*Floral Attributes*

Recently burnt and currently regenerating open forest community. Generally dominated by Spotted Gum (*Eucalyptus maculata*), Ironbark and Smooth-barked Apple (several Large & mature containing hollows). A sub-tree layer comprised predominantly of Paperbark, particularly Ball Honeymyrtle (*Melaleuca nodosa*). An open, but diverse heath-like understorey containing many herbs, grasses and Grass Trees (*Xanthorrhoea* sp.) was also present. Swamp Mahogany was present, but in low numbers.

*Faunal Attributes*

Squirrel Gliders have been recorded previously within this bushland patch adjoining Lake Haven Shopping Centre (Ecotone Ecological Consultants, pers.obs). The site provides moderate quality habitat for this species, given the presence of a few Swamp Mahogany and good-sized tree hollows for denning. Indeed, the species may be utilising this area for denning purposes (Boris Branwhite, pers.comm.).

*Preferred Alignment Option*

Given the known presence of threatened species on the eastern side of the road, it is suggested that widening of the road occupy the western road verge. However, the western side of the road also contains an extensive bushland area, which provides potential habitat for the Squirrel Glider. Therefore, consideration should be given in allowing the retention of suitably sized trees along the road verge on either side of the road to allow Squirrel Gliders to glide across the road. The proposed four-lane road will create obvious difficulties for the species, which can safely and accurately glide distances of between 30 and 50 metres. If possible the preferred option for this area would be to separate the road with a median strip either designed to accommodate existing trees or modified so that indigenous tree species can be planted in the median.



**Area F:**      *Floral Attributes*

An isolated pocket of good quality woodland / open forest, located on the eastern side of the highway, dominated by Scribbly Gum, Red Bloodwood and Brown Stringybark. The Threatened flora species, *Angophora inopina*, has been identified as occurring at this location and just to the north adjacent to the industrial estate. Other Threatened flora species, which have the potential to occur are, *Acacia bynoeana*, *Tetratheca juncea* and Orchids.

*Faunal Attributes*

The relatively small size of this remnant patch and the isolated nature of the site suggest that it may be too small to be of any significance to threatened fauna species known from the locality. Additionally winter flowering eucalypts appear to be absent and therefore the site provides very limited value as a foraging resource for dependent fauna species. However scattered reasonably sized tree hollows were observed, and there remains some potential, albeit limited for occupation by the Squirrel Glider. Given the relatively open nature of the understorey vegetation, potential exists for foraging on the site by the Masked Owl, however nesting potential for this species does not occur in this area. Given the dominance of Scribbly Gum (*E.haemastoma*) a Schedule 2 Food Tree for the Koala (SEPP 44 – Koala Habitat Protection, potential Koala habitat does occur in this area.

*Preferred Alignment Option*

The preferred option for widening of the road in this area would be on the eastern side of the road, particularly as individuals of the Threatened plant species, *Angophora inopina*, are present.

**Area G:**      *Floral Attributes*

The highway at this point crosses a small creekline, which consists of riparian vegetation, dominated by Swamp She-oak (*Casuarina glauca*) and scattered young Forest Red Gum. An understorey comprised of various shrubs (e.g. Sydney Golden Wattle), and numerous herbs and grasses. Areas of swamp heath are present. There is potential for the Threatened flora species *Melaleuca biconvexa* to occur.

*Faunal Attributes*

The creekline and associated depressional soak area appears to be too heavily polluted to attract or support any of the threatened frog species recorded from the area. Although provides some habitat value for common frog species, including the Common Eastern Froglet (*Crinia signifera*) recorded during the preliminary field surveys. The presence of an abundance of Swamp She-oak provides some potential for foraging



activities by the Glossy Black-Cockatoo, however more extensive and better quality areas occur throughout the wider study area, and this small site is not considered critical. The presence of scattered Forest Red Gums and potential nest hollows may provide some potential, albeit limited for the Squirrel Glider, however the habitat is marginal particularly in comparison with other areas in the locality.

*Preferred Alignment Option*

The preferred option for widening of the road in this area would be to utilise the south side of the road, as this patch of bushland is much smaller in size and contains few of the values considered to potentially attract the above mentioned threatened fauna species. Attention could be paid to providing effective drainage under the road and possibly investigating measures to reduce the obvious pollution impacts occurring to the creekline.

**Area H:**

*Floral Attributes*

Moderate quality open forest remnant, dominated by Spotted Gum, Ironbark and a small number of Forest Red Gum. An understorey predominantly comprising of Paperbark (*Melaleuca* sp.) covered much of the remnant. A small north-south creekline and several small freshwater soaks are present, containing both swamp and riparian species. There is potential for the Threatened flora species *Melaleuca biconvexa* to occur.

*Faunal Attributes*

Contains marginal habitat for the Wallum Froglet, and the relatively small size of the area and lack of connectivity with other similar habitat types suggest that the species would probably not occur. Also marginal Squirrel Glider habitat, better represented south of the road.

*Preferred Alignment Option*

Habitat south of the road is comparatively better quality. Suggest widening on the north side.

**Area I:**

*Floral Attributes*

The north and west of the highway at this point is dominated by swamp forest comprising primarily of Swamp She-oak and Paperbark (e.g. *Melaleuca styphelioides* & *M. nodosa*).

The south and east of the highway is dominated by degraded open forest comprising an overstorey of Spotted Gum, Brown Stringybark and Ironbark. The shrub layer was generally sparse. Potential Threatened flora species which may occur include, *Melaleuca biconvexa* & *Cryptostylis hunteriana*.



#### *Faunal Attributes*

A large, well-vegetated dam is situated on the north side of the road, within private land. This dam, is located approximately 50 metres from the existing road verge and appears to contain good quality habitat for the Green and Golden Bell Frog (*Litoria aurea*). Additional threatened species are not expected to occur, albeit for the slight possibility of occasional visits by the Glossy Black-Cockatoo, given the presence of Swamp She-oaks. However, habitat for this species is represented extensively throughout the locality and this area is not considered optimum.

#### *Preferred Alignment Option*

The current alignment of the existing road and the generally low quality of the habitat suggest that the widening proposal for this section of highway may occur on the southern side of the road. This alignment will effectively ensure that the dam situated on private land is not encroached and therefore will remain at its current distance from the road.

### CONCLUSION

From the field assessment of the study corridor, it is considered unlikely that the majority of the habitat areas contain critical habitat features for any of the threatened flora and fauna species that have been recorded from the locality. However, some areas were identified as locally significant based on the presence of threatened flora species and potential to support threatened fauna species. These areas are described below.

#### *Fauna*

From a fauna perspective, the area identified as Area C and adjoining Wallarah Creek, is clearly a remnant habitat of high priority and worthy of further investigation. This area is dominated by Swamp Mahogany (*Eucalyptus robusta*) and Forest Red Gum (*Eucalyptus tereticornis*) and both these species are highly significant, in that they represent important feeding resources for several threatened fauna species, including the Koala, Squirrel Glider, Regent Honeyeater and Painted Honeyeater. The presence of this habitat type and the lack of additional habitat areas of equal quality within the locality suggest that this remnant patch may be critical to the life-cycle events of the above mentioned fauna species. However, the faunal diversity of this remnant is currently not known and therefore further survey and investigation may be required, to assist in determining the likely impacts of the proposal on threatened species.

Additionally, the area identified as Area E (see Figure 1a) adjoining the Lake Haven Shopping Village car-park, is known to provide habitat for the Squirrel Glider, as individuals of the species have previously been recorded feeding and denning on the site (Boris Branwhite pers.comm.). However, this relatively small and isolated patch of



remnant is likely to be only infrequently visited by Squirrel Gliders, whose occupation may be largely restricted to the flowering period of the Swamp Mahogany, which was recorded on the site in very low numbers. Nonetheless, the species is known to utilise this habitat area and is likely to also use the habitat on the opposite, western side of the highway, which is of similar composition and quality. In order to preserve the current means of access by Squirrel Gliders to the habitat on both sides of the highway, it is vital to retain suitably large-sized trees flanking the road, at distances considered appropriate for allowing the continued facilitation of movement by gliders across the proposed four lane road. Consideration may be given to providing a median strip in this section of the road with the aim of establishing trees in the median, which may assist gliders in successfully crossing the road.

It is unknown whether threatened species are critically reliant on either of these remnant patches, although the areas represent good quality remnant bushland in an otherwise heavily modified locality, and as such may be locally significant. Therefore, further survey work and assessment is necessary, to determine the significance of these areas and assess the impact that removal of vegetation may present to threatened species recorded and known from the area.

#### *Flora*

Several sections along the existing highway exhibit good to high quality native vegetation remnants, although some of these are isolated pockets, the majority have (or create) links with the wider area. All areas indicated in Figures 1a & 1b (sections A-I) should be thoroughly examined for potential Threatened flora species, in particular are the areas of better quality indicated in figure 1a.

Consideration for the Threatened flora species, *Angophora inopina*, which is known from the site, should be examined and alternatives for its management, within the context of this development, explored (e.g. road re-alignment to avoid specimens, seed collection, propagation & replanting). Several specimens of this species are located within the existing road easement adjacent to the highway (Figure 1a).

Using the map of the distribution of habitats within the study corridor, a preferred alignment for widening of the road, in relation to ecological issues, has been identified. This is presented as Figures 1a & 1b. This alignment is designed to minimise the potential environmental / ecological impacts of the proposed four-lane upgrade.

**Note:** After visual inspection, it was noted that very little native vegetation occurs within the southern section of this route, Tuggerah to just north of Wyong. As a result, a figure indicating preferred alignments and ecological concerns for this section of the highway was not produced.



Table 1. Fauna Species Recorded during Preliminary Field Surveys

Common Name	Scientific Name
<b>Birds</b>	
Australian Magpie-lark	<i>Grallina cyanoleuca</i>
Crested Pigeon	<i>Ocyphaps lophotes</i>
Scaly-breasted Lorikeet	<i>Trichoglossus chlorolepidotus</i>
Spotted Pardalote	<i>Pardalotus punctatus</i>
Australian Magpie	<i>Gymnorhina tibicen</i>
Pied Currawong	<i>Strepera graculina</i>
Galah	<i>Cacatua roseicapilla</i>
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>
White-cheeked Honeyeater	<i>Phylidonyris nigra</i>
White-naped Honeyeater	<i>Melithreptus lunatus</i>
Brush Wattlebird	<i>Anthochaera chrysoptera</i>
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>
Spotted Turtle-Dove *	<i>Streptopelia chinensis</i>
Noisy Minor	<i>Manorina melanophrys</i>
<b>Mammals</b>	
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>
Red-necked Wallaby	<i>Macropus rufogriseus</i>
<b>Amphibians</b>	
Common Eastern Froglet	<i>Crinia signifera</i>



Figure 1a. INITIAL FLORA & FAUNA INVESTIGATIONS ALONG THE STUDY ROUTE

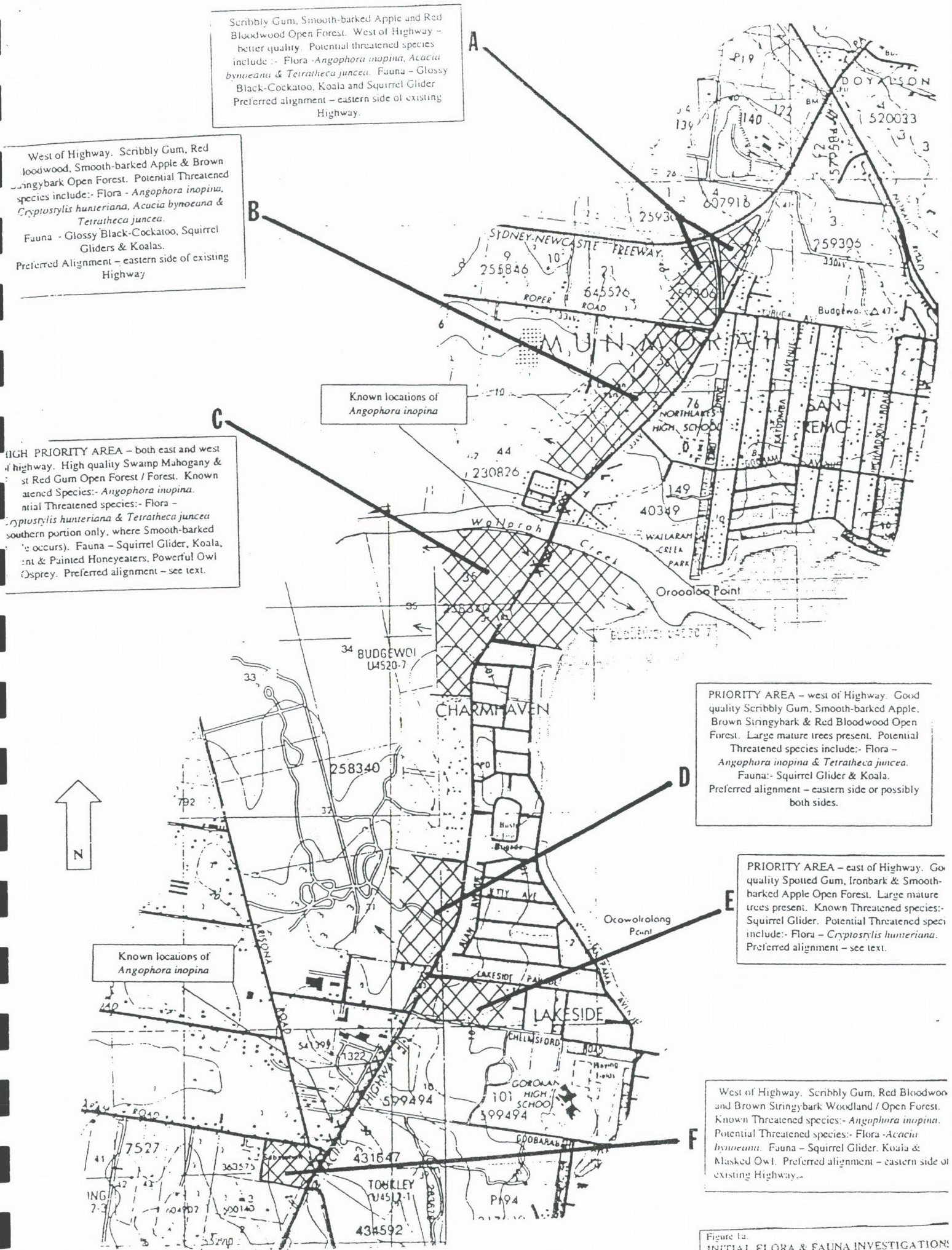


Figure 1a. INITIAL FLORA & FAUNA INVESTIGATIONS ALONG THE STUDY ROUTE  
Ecological Considerations Relevant to the Alignment of the Proposed Pacific Highway Upgrade from Tuggerah to Dawson



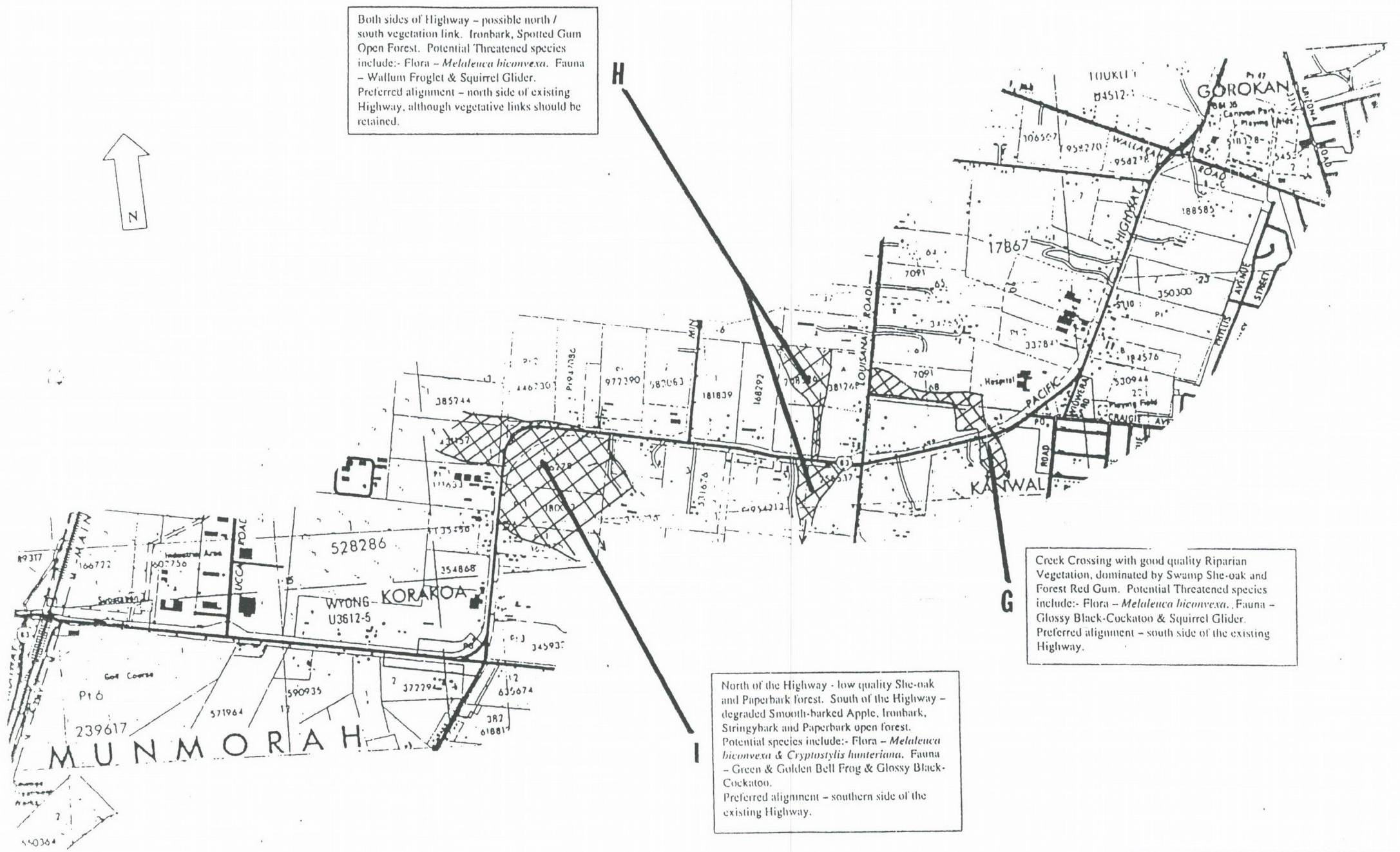


Figure 1b.  
**INITIAL FLORA & FAUNA INVESTIGATIONS  
 ALONG THE STUDY ROUTE**

Ecological Considerations Relevant to the Alignment of the Proposed Highway Upgrade from To... to Doyalson	Pa
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