

# **Statement of Environmental Effects**

625.711 RTA.244 Proposed Replacement of the Yarramundi Bridge

Over the Nepean River,

Yarramundi



Prepared for RTA Sydney Maintenance Contractors, Sydney Region

**Prepared by** Environmental Technology

Pod D Level 5 99 Phillip Street PARRAMATTA NSW 2124 Telephone: (02) 8837 0583 Facsimile: (02) 8837 0053

E-mail: Simone\_Garwood@rta.nsw.gov.au



L040515

November 2002





# **Document Controls**

| Business Unit Environmental Technology Branch   |             |        |                       |
|---|-------------|--------|-----------------------|
| WBS No.   | H/36310     |        |                       |
| Document<br>descriptionStatement of Environmental Effects - Proposed Replacement of YBridge over the Nepean River, Yarramundi |             |        | acement of Yarramundi |
|   | Name        | Signed | Date                  |
| Supervising<br>Manager  | David Corry |        | 29/11/02              |

| Person managing this document | Person(s) writing this document   |  |
|-------------------------------|-----------------------------------|--|
| Simone Garwood                | Simone Garwood and Natascha Arens |  |

| Location   | File   |  |
|--|--------|--|
| G:\Ops\Environ\PROJECTS\Proj0102\0516 - H 36310 Yarramundi\REF | IM4117 |  |
| Nov 2002\Report\Yarramundi Final.doc                           |        |  |

| Document Status | Date     |
|-----------------|----------|
| Final           | 29/11/02 |

© Roads and Traffic Authority Prepared by RTA Operations – Environmental Technology Branch

| Prepared for:                    | Prepared by:               |  |
|----------------------------------|----------------------------|--|
| Hamid Abadi                      | Environmental Technology   |  |
| RTA Sydney Maintenance Contracts | RTA Operations Directorate |  |
| BLACKTOWN NSW                    | Pod D Level, 99 Phillip St |  |
|                                  | PARRAMATTA NSW 2124        |  |

Cover Photo: Existing Yarramundi Bridge, 2002

# Contents

| 1   | PROPOSAL IDENTIFICATION   | 1  |
|---|---|--|
| 1.1<br>1.2<br>1.3   | Name of the Proposed Activity   | 1  |
| 2   | INTRODUCTION AND BACKGROUND   | 1  |
| 2.1<br>2.2  | Background to the Proposal  |  |
| 3   | PROPOSAL DESCRIPTION  | 3  |
| 3.1<br>3.2<br>3.3<br>3.4<br>3.5   | Location  Description of the Study Area and Surroundings  General Description of the Proposed Works  Source of Funds  Commencement and Period of Works  | 3<br>4                                       |
| 4   | STATUTORY REQUIREMENTS  | 5  |
| 4.1<br>4.2<br>4.3<br>4.4<br>4.5<br>4.6<br>4.7   | Zoning of the Proposed Activity Regional Environmental Plans (REPs) State Environmental Planning Policies (SEPPs) Confirmation Statement Protection of the Environment Operations Act Commonwealth Environment Protection and Biodiversity Conservation Act, 1999. Licences and Approvals | 5<br>6<br>6                                  |
| 5   | SPECIALIST STUDIES AND COMMUNITY / STAKEHOLDER INVOLVEMENT  | 8  |
| 5.1<br>5.2<br>5.3   | Specialist Studies  | 8  |
| 6   | STRATEGIC STAGE   | . 12   |
| 6.1<br>6.2  | General<br>Justification and Need for the Proposal  |  |
| 7   | CONCEPT STAGE   | . 13   |
| 7.1<br>7.2  | Objectives of the Proposal  |  |
| 8   | DESIGN CONSIDERATIONS   | . 15   |
| 8.1<br>8.2<br>8.3<br>8.4<br>8.5<br>8.6<br>8.7<br>8.8<br>8.9<br>8.10<br>8.11<br>8.12<br>8.13<br>8.14 | EXISTING ROAD AND BRIDGE  | 15<br>15<br>16<br>16<br>17<br>17<br>17<br>17 |
| 9   | ENVIRONMENTAL ASSESSMENT  |  |

| 0.1        |                | Crain Country Country                                      | 20 |
|------------|----------------|--|----|
| 9.1<br>9.2 |                | drm, Geology and Soils<br>Age, Hydrology and Water Quality |    |
| 9.2        | FLORA          | AGE, HYDROLOGY AND VVATER QUALITY                          |    |
| 9.4        | FAUNA          |  |    |
| 9.5        |                | e and Air Quality  |    |
| 9.6        |                | NOUS HERITAGE  |    |
| 9.7        |                | ndigenous Heritage   |    |
| 9.8        |                | and Vibration Effects                                      |    |
| 9.9        |                | MANAGEMENT AND MINIMISATION                                |    |
| 9.10       |                | Amenity, Landscaping and Urban Design                      |    |
| 9.11       |                | economic Considerations                                    |    |
| 9.12       |                | ative Environmental Effects                                |    |
| 9.13       |                | PLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT               |    |
| 10         | IMPLE          | MENTATION STAGE  | 36 |
| 10.1       | SUMMAI         | ry of Proposed Safeguards                                  | 36 |
| 11         | CLAU           | SE 228 AND EPBC ACT (1999) CHECKLIST                       | 44 |
| 11.1       | CLAUSE         | 228 (2) Checklist (NSW Legislation)                        | 44 |
| 11.2       |                | ACT (1999) CHECKLIST                                       |    |
| 12         | CERT           | IFICATION  | 48 |
| 13         | REFER          | RENCES   | 49 |
| List (     | of Figure      | es and Tables:   |    |
| Figui      | re I:          | Location of the Proposal and Study Area.                   |    |
| Table 5.1: |                | Government Authority Responses                             |    |
| Tabl       | e 9.1:         | Typical Spectator Noise Levels of Construction Plant Items |    |
| Tabl       | e <b>9.2</b> : | Principles of ESD applied to the Proposal                  |    |
| Tabl       | e 10.1:        | Site Specific Safeguards                                   |    |

Table II.I: Clause 228 Factors (NSW Legislation)

 Table II.2:
 EPBC Act Factors (Commonwealth Legislation)

#### List of Appendices:

Appendix A: Photographs of the Study Area

Appendix B: Concept Design

Appendix C: Results of Database Searches

Appendix D: Ecological Assessments (Flora, Fauna and Aquatic)

Appendix E: Non-Indigenous Heritage Assessment

Appendix F: Indigenous Heritage

Appendix G: Map of Potential Acid Sulphate Soils

Appendix H: Consultation

# I Proposal identification

# I.I Name of the Proposed Activity

Proposed Replacement of Yarramundi Bridge over the Nepean River, Yarramundi.

#### 1.2 Council Area

The Proposal is located within the Hawkesbury City Council and Penrith City Council Local Government Areas.

## 1.3 RTA Region

The Proposal is located within the RTA Sydney Region.

# 2 Introduction and background

This Statement of Environmental Effects (SEE) has been prepared by Environmental Technology Branch (RTA Operations Directorate) on behalf of the NSW Roads and Traffic Authority (RTA), Sydney Region. For the purposes of the proposed works, the RTA is the applicant/proponent and Hawkesbury City Council the consent authority under Part 4 of the Environmental Planning and Assessment (EP&A) Act 1979. The purpose of this SEE 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 has been undertaken in the context of Section 79 (c) of the Environmental Planning and Assessment Regulation 2000, the Threatened Species Conservation (TSC) Act 1995, the Fisheries Management Act 1994 and the (Commonwealth) Environment Protection and Biodiversity Conservation (EPBC) Act 1999. In doing so, this SEE helps fulfil the requirements of Part 4 of the EP&A Act.

The structure of this document is consistent with the RTA's Proforma 2 REF as presented in the RTA's Environmental Impact Assessment Policy, Guidelines and procedures, (RTA, April 2001).

The findings of the SEE would be considered when Council assesses the development application in accordance with the Heads of Consideration contained in Section 79 (c) of the EP&A Act.

# 2.1 Background to the Proposal

The Yarramundi Bridge is currently in poor condition due to repeated span failures, and has been reduced to a single lane 'Bailey Truss' over the failed spans, with temporary signalisation.

A previous works program and REF, prepared under the provisions of Part 5 of the EP&A Act, had been undertaken to investigate the repair of the bridge, however further deterioration since then necessitated the consideration of further options for the crossing. An options report was prepared to investigate options including repair and various replacement designs. The Proposal has been further refined during the consultation and concept design preparation stage.

# 2.2 Methodology

The method in which this document has been prepared is as follows:

- A site visit was undertaken on the 18<sup>th</sup> October 2002 by Mark Inskip of Sydney RTA Bridge Maintenance Contractors and Simone Garwood of RTA Environmental Technology to discuss relevant design and construction issues and identify any constraints to the Proposal.
- 2 Consultation was undertaken with the following authorities and RTA personnel:
  - NSW Department of Land and Water Conservation (DLWC)
  - NSW Environment Protection Authority (EPA)
  - Penrith City Council
  - Hawkesbury City Council
  - NSW Fisheries
  - Joseph Fanous RTA Regional Environmental Adviser, Sydney Region
- 3 A search was conducted on the following databases to identify any potential issues:
  - Australian Heritage Commission Register of National Estate
  - NSW Heritage Office State Heritage Register
  - RTA Heritage and Conservation Register
  - Council Heritage Listings
  - National Native Title Tribunal
  - NPWS Aboriginal Sites Register
  - NPWS Wildlife Atlas flora and fauna records
  - Environment Australia (EPBC Act) Database
- 4 A literature review and review of documentation was undertaken to determine issues relating to:
  - Geology, soils and landforms
  - Acid sulphate soils
  - Local Environment Plan (Zoning)
  - Regional Environmental Plans
  - State Environmental Planning Policies
  - Known sensitive sites
- 5 Specialist consultants were commissioned to undertake site specific studies of:
  - Terrestrial Flora, Fauna and Aquatic Ecology
  - Non-Indigenous Heritage
- 6. Assessment was undertaken in line with the RTA Environmental Impact Assessment Policy Gudelines Procedures, 2001 and current RTA policies.

# 3 Proposal Description

#### 3.1 Location

The Proposal area comprises Yarramundi Bridge over the Nepean River, Yarramundi. The bridge is a timber road bridge on the Springwood Road (Main Road 570) between Agnes Banks and Yarramundi. The region is located in the northwest of the Sydney Metropolitan area and southwest of the townships of Richmond and Windsor, Sydney.

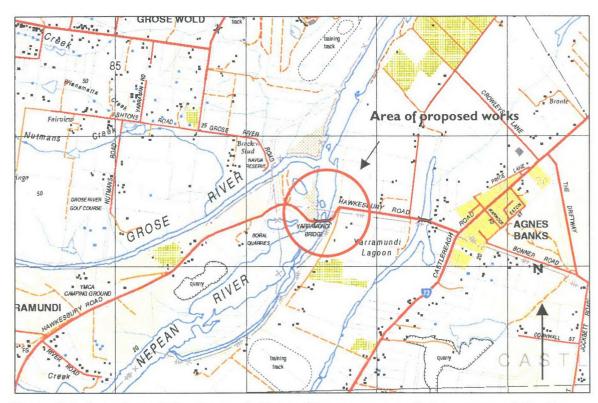


Figure 3-1: Location of the Proposal (Part of base map supplied courtesy of Pacific Access Pty. Ltd. 2000 - not too scale)

#### 3.2 Description of the Study Area and Surroundings

The Proposal is situated across the Nepean River and its associated floodplains. The Nepean River is within the Hawkesbury Lower Nepean Catchment and flows in a northerly direction from its headwaters in the Illawarra Range, joining the Hawkesbury River at the Grose River junction approximately 200m downstream from Yarramundi Bridge. The area consists of a diverse landscape of river channels, former quarried lagoons [pondlike body of water (Delbridge & Bernard, 1998)] and backwaters, wetlands, riverbanks and foreshores, sandy and gravel beaches, hills and swales of alluvial silts, levee banks and rock revetments.

The Proposal lies within a predominantly rural and disturbed riverine setting, surrounded by scattered disturbed riparian open forest and woodlands and extensive agricultural land ranging from orchids, turf farms, crops and market gardens, grazing and stud farms. The natural landscape of the area has been highly modified and degraded since European settlement, particularly as a result of past gravel and sand extraction and subsequent weed invasion.

Areas on the western approach of the river have undergone extensive landscape alterations during extractive industry activities undertaken by Boral Resources (NSW) Pty Limited between 1927 and 1989 (Landarc, 2002). Tilmunda Pastoral Company Pty Ltd further undertook extractive activities, between 1980 and 1988. This included areas on the left bank of the Nepean River south of Yarramundi Bridge.

# **APPENDIX A: Photographs**



**Plate I**: View of Yarramundi Bridge / Springwood Road across the Nepean River, facing west. The Proposed new bridge would be 4m edge to edge downstream of the existing bridge with minor road re-alignments.



**Plate 2**: View of Yarramundi Bridge facing west. This photo represents the window view in which the new bridge would be constructed across the Nepean River and associated channels.



**Plate 3**: View of existing temporary weir constructed (by RTA 2000) along the southwest section of the existing bridge across the associated flood channels. The photo also includes one of the concrete blocks scattered across the main channel, placed during extraction activities.



**Plate 4:** View of flooded channel above the temporary weir along the southwestern section of the existing bridge.

The Proposal falls within the newly gazetted Yarramundi Reserve, Crown land comprising of approximately 89 hectares of public open space, with Hawkesbury City Council appointed as the Trust Manager. The Reserve has been gazetted for the purpose of public recreation and environmental protection. The study area is popular for recreation and is used for both primary and secondary recreation including, fishing, swimming, picnics, canoeing and other related leisure activities. Springwood Road provides the main point of access to Yarramundi Reserve with two informal gravel hard stand areas for parking on the north western easement (upper terrace area) and south western (lower river side) of the road. A cable fence exists (installed by Hawkesbury City Council) along the western easements of Springwood Road and car-parks to prevent uncontrolled vehicular access and rubbish dumping. From both parking areas there are several unformed tracks leading to the Nepean River, Grose River and wetland areas. The tracks are prominent and are mostly of vehicle width. The RTA is provided access into the reserve for bridge maintenance purposes through a locked gate on the north-western easement.

Areas of sensitivity and conservation reserves within a 10km radius of the study area include Blue Mountains National Park, Agnes Banks Nature Reserve, Castlereagh Nature Reserve, Navua Reserve, Yarramundi Lagoon and the Grose River.

## 3.3 General Description of the Proposed Works

The NSW Roads and Traffic Authority (RTA) proposes to replace the existing Yarramundi Bridge over the Nepean River with a new low level concrete bridge on an adjacent alignment approximately 19m downstream from the existing bridge. It is also proposed that the existing bridge be removed following the completion of construction of the new bridge.

It is anticipated the Proposal would be undertaken in two stages. The first stage would be the construction of the new bridge and then the removal of the existing bridge. Construction of the new bridge would be located 19m edge to edge downstream from the existing bridge, 120m long and 11.65m wide consisting of 10 pre-stressed concrete spans. Each bridge span would be 12m long with 9 piers comprising of reinforced concrete headstock on three or two circular concrete columns that represent an extension of 900mm diameter bored cast-in-place concrete piles. Construction of the new bridge would require 2 to 3 piers to be situated in the main flow of the Nepean River. The bridge would have a deck level of 6.5m RL and maintain a level grading for the full length of the bridge. The new bridge is classified as a submerged bridge. That is, the deck level is below the 20 year ARI flood event. Features of the new bridge would include:

- 4.5m wide traffic lanes in each direction;
- A 1.8m wide shared cycleway / pedestrian footpath on the southern side of the bridge;
- · An aluminium traffic barrier separating the footpath and the southern bridge lane; and
- New re-aligned bridge approaches from the west and east along Springwood Road.

A general concept design plan of the new bridge is attached in Appendix B.

#### 3.4 Source of Funds

Funding would be provided from State funds under the State Bridge Structural Capacity Program.

#### 3.5 Commencement and Period of Works

It is anticipated that construction of the new bridge would commence once approval is granted (approximately end of February 2003) and would be carried over approximately a 10-month period, which would include the removal of the existing bridge and site rehabilitation works.

# **4 STATUTORY REQUIREMENTS**

# 4.1 Zoning of the Proposed Activity

The existing bridge is located on the boundary of two Local Government Areas (LGAs), Hawkesbury City Council and Penrith City Council.

Within the Hawkesbury LGA, the land is zoned 7 (d) – Environment Protection (Scenic) on the eastern side of the River and 7(d) I on the western side of the river. Recently portions of lands within these zones have been gazetted Crown Reserve, known as Yarramundi Reserve for the purpose of Public Recreation and Environment Protection. The Reserve covers an area of 89 hectares and includes lot number 188 – 191 inclusive DP 803295, Lot 90 DP786549 and Lots 57 and 293 DP751660. Council consent is required within those zonings and Yarramundi Reserve for the purpose of 'roadworks'.

Within the Penrith City Council LGA the land is zoned 7 – Environmental (Scenic Protection), under the Penrith LEP no. 201 (Rural Lands), to the south of the bridge. Under this zone roads are permitted with development consent. Portions of these lands also fall within the gazetted Crown Reserve. Therefore Council consent is required within that zoning and Yarramundi Reserve for the purpose of 'road works'. However, since Hawkesbury City Council is the sole Trust Manager for areas gazetted Yarramundi Reserve, consent from Penrith City Council for works within these areas is not required.

Penrith City Council's LEP no. 201 (Rural Lands) does not adopt the relevant Model Provisions, however Springwood Road is a Classified Road (Main Road No. 570). For that land not falling within Yarramundi Reserve the proposed bridge replacement is for the purpose of a "Classified Road" as defined in the Roads Act 1993. State Environmental Planning Policy (SEPP) 4 - Development Without Consent, Clause 11(c), allows the RTA to undertake the proposed works without Council consent.

# 4.2 Regional Environmental Plans (REPs)

#### REP 20 - Hawkesbury Nepean River (No. 2 - 1997).

REP No. 20 - Hawkesbury Nepean River (No. 2 - 1997). This document integrates planning with catchment management to protect the river system. The plan covers water quality, environmental sensitive areas, riverine scenic quality, agriculture and residential development.

The plan controls development that has the potential to impact on the river environment. The undertaking of "filling of land" as described in Paragraph (7) of Part 3, the undertaking of "land uses in or near a river" as described in Paragraph (15) of Part 3 and the undertaking of works in Conservation Area Sub-catchments would require consent under the REP.

Schedule 3 of REP 20 notes that SEPP 4 would permit the activity without consent if the development is considered to be of minor environmental impact, unless the development is located within an area marked on the map as of Regional Significance for scenic values. The Proposal is located within an area considered to be of Regional Scenic Significance. Consent would be required, as SEPP 4 is not applicable in areas of Crown Reserve (see Section 4.1) and areas of Regional Scenic Significance.

Therefore, based on the information provided above, consent would be required from the relevant Authority (Hawkesbury City Council) under REP 20.

# 4.3 State Environmental Planning Policies (SEPPs)

#### State Environmental Planning Policy No. 4

SEPP 4 — Development Without Consent and Miscellaneous Complying Development applies to this Proposal, under Penrith City Council's LEP. SEPP 4, clause II (c), allows development by public authorities, for the purposes of a classified road, without the need for formal development consent. However SEPP 4 does not apply to "land" which is reserved under an environmental planning instrument for use exclusively for a purpose referred to in Section 26(c) of the EP&A Act. Section

26(c) of the EP&A Act includes "reserving land for use for the purposes of open space, a public place or public reserve within the meaning of the Local Government Act 1993. The Local Government Act 1993 defines public reserve as including:

"A Crown reserve that is dedicated or reserved:

a) For public recreation.

being a Crown reserve in respect of which Hawkesbury Council has been appointed manager of a reserve trust for the reserve...". Therefore a Crown Development Application is required to be submitted to Hawkesbury City Council (as the Trust Manager), for that portion of the Proposal falling within Yarramundi Reserve.

SEPP 4 would apply, however to that part of the Proposal in Penrith City Council falling outside Yarramundi Reserve.

#### State Environmental Planning Policy No. 44

SEPP 44 (Koala Habitat Protection) applies to the Hawkesbury City Council Area, but not the Penrith City Council Area. No trees identified in Schedule 2 – Feed Trees, are to be removed as part of the Proposal, and no Development Application is to be lodged with Penrith City Council for the Proposal, therefore SEPP 44 does not apply.

#### 4.4 Confirmation Statement

For the purpose of the proposed works, Hawkesbury City Council is the consent authority for the Proposal for the reasons outlined in Section 4.1 & 4.2. This SEE would therefore accompany a Development Application (D.A) to Hawkesbury City Council to assist in its assessment under the provisions of Clause 79C of Part 4 of the EP&A Act.

It should be noted that the D.A is a "Crown D.A" under the provisions of Part 5A of the EP&A Act. Section 116C of Part 5A states that a consent authority for D.As submitted by the Crown (in this case the RTA) must not:

- Refuse consent; and
- Impose a condition of consent, without the written approval of the Minister for Planning.

#### 4.5 Protection of the Environment Operations Act

The Protection of the Environment Operations Act (PoEO) 1997 has repealed the following five Acts: Clean Air Act 1961, Clean Waters Act 1970, Pollution Control Act 1970, Noise Control Act 1975, and the Environmental Offences and Penalties Act 1989.

Section 120 comprises a general prohibition on the pollution of waters. The penalty to a corporation guilty of an offence under Section 120 – Prohibition of pollution of waters, Clauses 1-4 states that waters must not be polluted. The penalty to a corporation for causing water pollution can be up to \$250,000 and, in the case of a continuing offence, to a further penalty of \$120,000 for each day the offence continues. In the case of an individual the penalty can be up to \$120,000 and, in the case of a continuing offence, a further penalty of \$60,000 for each day the offence continues may apply.

Under the Act it is, however, a defence if the person establishes that:

- (a) the pollution was regulated by an environment protection licence held by the person or another person, and
- (b) the conditions to which that licence was subject relating to the pollution of waters were not contravened.

# 4.6 Commonwealth Environment Protection and Biodiversity Conservation Act, 1999

The Commonwealth Environmental assessment process is conducted under the provisions of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Under this legislation, any action that:

- has a significant impact on a matter of National Environmental Significance (an NES matter); or
- has a significant impact on Commonwealth land, requires Commonwealth environmental impact
  assessment and approval. If an action does not have one of these effects, it does not trigger the
  EPBC Act and assessment and approval is undertaken under NSW provisions only.

The assessment undertaken in accordance with the Commonwealth Administrative Guidelines for the EPBC Act (refer to Section 9.16) shows that the Proposal would not have or is unlikely to have any impact (direct or indirect) on Commonwealth land or on an NES matter. Therefore, the Proposal would not require referral to the Minister for the Environment, and approval would proceed under the NSW EP&A Act only.

# 4.7 Licences and Approvals

#### Water Management Act 1912

Should water for bridge and road works and associated ancillary works need to be drawn from any waterways, a permit would be required from the NSW Department of Land and Water Conservation.

Should it be required to modify existing weirs or construct any weirs or dams or undertake structural flood mitigation works, a licence would be required from the NSW Department of Land and Water Conservation under Part 2 of the Water Management Act 1912.

Any diversion of water apart from that for stock and domestic usage by a property adjacent to a natural waterway, must be licensed under the *Water Act* 1912.

#### Protection of the Environment Operations Act, 1997

The Proposal is not a scheduled activity under the PoEO Act. Under the PoEO Act, 1997, the RTA or the awarded Contractor(s) may apply for an Environment Protection Licence to carry out any activities which may result in water pollution. This may include the pumping of stagnant waters from the area downstream of the weir into the Nepean River.

#### NSW Fisheries Management Act, 1994

The Minister for Fisheries must be notified of any proposed dredging or reclamation works associated with the Proposal in accordance with **Section 199** of the *Fisheries Management Act*, 1994. Such works may include, but are not limited to, construction of temporary crossings/sidetracks, bridges and creek diversions.

A permit required from NSW Fisheries is required to temporarily or permanently block fish passage under **Section 219** of the Act. Examples include the bunding of waterways or the use of a silt fence across waterways.

# 5 SPECIALIST STUDIES AND COMMUNITY / STAKEHOLDER INVOLVEMENT

## 5.1 Specialist Studies

Two specialist studies were undertaken during February and March 2002 for the previous option (Option 5, March 2002) to construct a new low level bridge 25m down stream from the existing bridge on a new road alignment. Specialist studies undertaken included:

- a) Flora, Fauna and Aquatic Assessment by Lesryk Environmental Consultants (March 2002).
- b) Non Indigenous Heritage Assessment by Casey and Lowe Associates (April 2002).

The area of proposed works as described in this SEE falls within the same study area in which specialist studies were undertaken for the previous Proposal. Therefore it was considered further specialist studies would not be required for this Proposal. However it is expected that specific changes in the design of the bridge and proposed ancillary works would alter the level of potential impact on threatened fauna species and the aquatic environment, than initially assessed for. Hence a supplementary terrestrial fauna and aquatic assessment has been undertaken. The supplementary assessment includes a further impact assessment on the threatened bat species, Large-footed Myotis (Myotis adversus) listed as vulnerable on Schedule 2 of the TSC Act and potentially occurring threatened frog species listed under schedules of TSC Act and EPBC Act. The assessment also included further investigations and assessments of aquatic environments within the study area. Lesryk Environmental Consultant's also prepared the supplementary assessment, November 2002.

All outcomes and findings of the ecological assessments for the study area are provided Sections 9.3, 9.4 & 9.5. Complete copies of the reports can be referred to in **Appendix D.** A summary of the non-indigenous heritage assessment and its outcomes is provided in Section 9.8 of this SEE with a complete copy of the report detailed in **Appendix E.** 

# 5.2 Community Consultation and Involvement

Community and stakeholder consultation was undertaken as part of the design process for the previous Proposal (Option 5, March 202). Consultation involved correspondence with government authorities, site visits with Indigenous representatives, the undertaking of community displays and the provision of "Have your Say" form. A newsletter and concept design diagram of the proposed works were also placed on public display at Richmond Motor Registry, Hawkesbury Council Offices and Springwood Library.

Further community consultation involving a newsletter and concept diagram of the current preferred option discussed in this SEE was undertaken during November 2002.

# 5.3 Consultation with Government Agencies and Stakeholders

Relevant State Government agencies and stakeholders were contacted and provided the opportunity to comment on the Proposal. A summary of issues raised by agencies and stakeholders are detailed in **Table 5-1** and where they are addressed in the SEE.

Table 5-I Summary of issues raised by government authorities and stakeholders

|     | Issues Raised by Government Authorities and Stakeholders  | Where addressed in the REF |
|-----|---|----------------------------|
| N:  | SW Fisheries  |                            |
| Fis | response to the consultation letter dated 23/10/02 was received on the 13/11/2002. NSW heries has the following comments to make with regard to the proposed works. NSW heries specifically requested the SEE address the following:  |                            |
| •   | A description of aquatic vegetation, habitats, snags, gravel beds and any other protected threatened or dominate habitats;  | 9.3 & 9.4 8<br>Appendix D  |
| •   | Area, density and species composition of flora and fauna (maps included);   | 9.3 & 9.4 8<br>Appendix D  |
| •   | Effects of the Proposal on aquatic species / habitats in surrounding areas;   | 9.3 & 9.4 8<br>Appendix D  |
| •   | Potential impacts on fish species;  | 9.3 & 9.4 &<br>Appendix D  |
| •   | A statement on aquatic threatened species, populations and ecological communities and key threatening process as declared under the Fisheries Management Act, 1994;   | 9.3 & 9.4 &<br>Appendix D  |
| •   | Information on both upstream and downstream of the watercourse;   | 9.3 & 9.4 Appendix D       |
| •   | Details of the location of all component parts of the Proposal, including auxiliary infrastructure; size of area affected;  | 8                          |
| •   | Timetable for the construction of the Proposal; including various phases of construction;   | 3.5                        |
| •   | Aspects of the management of the Proposal, during and post construction;  | 10.1                       |
| •   | A plan of the study area, outlining landuses, streams, waterbodies, details of land tenure;   | 3 & 3.1                    |
| •   | For each freshwater body identified, outline its hydrological and stream morphology information;  | 9.2&<br>Appendix D         |
| •   | Describe and discuss significant habitat areas within the study area;   | 9.3 & 9.4<br>Appendix D    |
| •   | Indicate the location and nature and extent of habitat removal or modification which may result from the Proposal; and  | 9.3 & 9.4<br>Appendix D    |
| •   | Identify and discuss any potential for the Proposal to introduce fish barriers.   | 9.3 & 9.4<br>Appendix D    |
| N   | SW Department of Land and Water Conservation  |                            |
| sp  | response to the consultation letter dated 23/10/02 was received on the 13/11/2002. Site ecific comments were also provided to the RTA 4/2/2002 in response to consultation dertaken for the previous Proposal. NSW DLWC has the following comments to make with gard to the proposed works.   |                            |
| •   | No explanation has been provided as to why the RTA would change the original Proposal;  | noted                      |
| •   | The department supports aligning the new structure with the previously proposed route;  | noted                      |
| •   | Has the likelihood of the next flood generating large quantities of debris, been factored into the design of the bridge. Proposed piers in the river would act as debris traps, accumulating large quantities dead willow stems and <i>Egeria densa</i> (aquatic weed) and actually resemble a dam wall during periods of increased flow; | noted                      |

|    | Issues Raised by Government Authorities and Stakeholders  | Where<br>addressed in<br>the REF |
|----|---|----------------------------------|
| •  | The construction of a bridge spanning the river would be a better option in terms of bank stability and unrestricted flow;  | noted                            |
| •  | The Department does not prefer "rock filled mattresses, stone pitching, cement filled reverement mattress or similar". Soft engineering options such as rip-rap packed with soil or equivalent is recommended where possible as acceptable methods of scour protection for this or any other bridge proposal; | 9.1                              |
| •  | Consideration should be given to raising the deck level of the structure to cater for larger floods;  | noted                            |
| •  | Consideration of lengthening the bridge some 40m so that approach roads are not inundated until flood waters reach a level of some metres above the deck level;   | noted                            |
| •  | The north-western area described is not a "floodplain" it is an in-channel bar/bench and prone to inundation from very minor floods;  | noted                            |
| •  | Construction of a weir in this bench area is not appropriate, it has the potential for the channel surface to scour. DLWC requires that an alternate strategy be devised for access, subject to DLWC endorsement;   | 9.2                              |
| •  | Disturbance to the bed of the river, for its entirety, should be kept to an absolute minimum to construct the piers in a dry environment. Reducing the number of piers will reduce the problem;   | noted                            |
| •  | An assessment of any still water bodies in conjunction with the river would be required prior to any drainage activities;   | 9.2, 9.3, 9.4<br>& Appendix<br>D |
| •  | The abutments should be scour protected using rock rip-rap and be located suitable for deck level higher than that currently proposed;  | noted                            |
| •  | Decommissioning of the existing bridge structure should involve re-aligning abutments / river bank evenly with the new abutments/ new river bank alignment;   | noted                            |
| •  | RTA should prepare a "works plan" for the Proposal which fully addresses contingency matters in the event of flooding, whilst the site is disturbed;  | noted                            |
| •  | Any effect on riparian and native vegetation as a result of the Proposal would need to be addressed;  | 9.3 & 9.4                        |
| •  | DLWC requires the opportunity to review design drawings for the modified structure, and the rehabilitation plan, as soon as possible to avoid project delays;   | noted                            |
| •  | The RTA must reinstate appropriate fencing of the site to a level of better or equal security; and  | 9.11                             |
| •  | Gradients from the bridge must consider the availability of access north and south of the proposed road and safe entry into the reserve. Alternatively, access to one side with underpass available to the other side of the reserve.   | noted                            |
| Er | nvironment Protection Authority   |                                  |
| pr | response to the consultation letter dated 23/10/02 was received on the 8/11/02. NSW EPA ovided general comments on likely issues and management guidelines. Specific comments, nich should be addressed in the SEE include:   |                                  |
| •  | The impact of the Proposal on the existing road system; traffic congestion, public transport and induced traffic;   | 9.11                             |
| •  | The impact of the works on, and opportunities to improve, pedestrian & cycleway facilities & access to public transport;  | 9.11                             |
| •  | The environmental and cost savings possible by adopting energy efficiency measures;   | noted                            |
| •  | Possible cumulative environmental impacts and proposal to manage these;   | 9.12 & 10.1                      |
| •  | The effects of the development of the road on land use planning in the area;  | 9.10                             |

|    | Issues Raised by Government Authorities and Stakeholders   | Where<br>addressed in<br>the REF |
|----|--|----------------------------------|
| •  | Details of the potential noise and vibration impacts from construction activities;   | 9.8                              |
| •  | Describe and quantitatively assess the potential impacts of the Proposal on water quality and aquatic environment and provide mitigation measures;   | 9.2                              |
| •  | Indicate whether the proposed excavation areas could contain Acid Sulphate Soils;  | 9.1                              |
| •  | Development of a integrated soil and water management plan;  | 9.1 & 9.2                        |
| •  | Address air quality issues and describe proposed mitigation measures and safeguards;   | 9.5                              |
| •  | Identify & classify the types of waste materials generated and the different disposal strategies for each material in accordance with EPA guidelines;  | 9.9                              |
| •  | Investigate the cost of treatment and disposal of soil before works commence;  | noted                            |
| •  | Detailed assessment of the likely ecological impact of the Proposal on both terrestrial and aquatic communities and individual species;  | 9.3 & 9.4 &<br>Appendix D        |
| •  | Identification and assessment of remnant & regenerated vegetative communities for their value of habitat; and  | 9.3 & 9.4 &<br>Appendix D        |
| •  | Preparation of an Environmental Management Plan which would address environmental awareness and skills training for all works.   | 10.1                             |
| Pe | enrith City Council  |                                  |
|    | response to the consultation letter dated 23/10/02 was received on the 7/11/2002. Penrith ty Council has the following comments to make with regard to the proposed works.   | noted                            |
| •  | Council has no objections to the proposed works, although requested that a copy of the CEMP and PEMP would be forwarded to Penrith City Council for review before the commencement of works.   |                                  |
| Н  | awkesbury City Council   |                                  |
|    | response to the consultation letter dated 23/10/02. No response has been received from awkesbury City Council at the time of completing the SEE.   |                                  |
| D  | eerubbin Local Aboriginal Land Council   |                                  |
| Pr | ne Deeerubbin Local Aboriginal Council (DLALC) was contacted regarding the previous oposal and undertook a site visit 8 <sup>th</sup> March 2002 with the RTA's Aboriginal Program onsultant. The DLALC raised no issues or objections with the Proposal.        | Appendix F                       |
| D  | harug Tribal Aboriginal Corporation  |                                  |
| Pr | ne Darug Tribal Council Aboriginal Corporation (DTAC) was contacted regarding the original oposal and undertook a site visit 12 <sup>th</sup> April 2002 with the RTA's Aboriginal Program onsultant. The DTAC raised no issues or objections with the Proposal. | Appendix F                       |

# 6 Strategic Stage

#### 6.1 General

The Proposal is 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". Further, the RTA's environmental policy (June 2001) states that:

The RTA will demonstrate due diligence in the provision of its services, manage its work activities in a manner that is consistent with the principles of ecologically sustainable development, and will deliver continuous improvement in environmental performance.

# 6.2 Justification and Need for the Proposal

Due to the poor structural capacity condition and costly maintenance of the existing Yarramundi Bridge, a replacement bridge is required. The new bridge would improve traffic conditions and provide a better service to local community. The annual traffic growth rate for the area is 4.0%. It is anticipated that traffic in the area has increased due to the fast growing population and urban development along Springwood Road, west of Yarramundi Bridge. The new Bridge would assist in catering for this increased traffic.

The diminished structural capacity of the existing bridge has resulted in the bridge being operated as a one way bridge, with traffic signal controls at each end. This has resulted in unacceptable traffic delays as well as some community concerns with regards to security particularly for women at night.

Replacement of existing Yarramundi Bridge would provide the following benefits:

- An increase in the height of the deck by one metre, providing fewer traffic delays during periods of flooding;
- Wider, smoother lanes, providing more efficient travel for all motorists;
- A separate pedestrian/cyclist lane;
- Minimal maintenance requirements and greater durability to flooding;
- A design enabling ease and speed of construction and ensuring high quality;
- Reduced impact on soil and native vegetation; and
- · Reduced potential erosion of the stream-bed.

# 7 Concept Stage

# 7.1 Objectives of the Proposal

The objectives of the Proposal are to:

- Maintain and improve the existing road system;
- Reduce maintenance costs;
- Minimise environmental impacts on adjacent areas;
- Improve pedestrian and cyclist safety and access;
- Provide for four lanes of traffic; and
- Improve general safety road safety.

# 7.2 Options Considered

Several alternatives were examined for the proposed bridge replacement or the rehabilitation of the existing bridge. During June 2001 external consultants prepared an options report, identifying options for bridge replacement, bridge rehabilitation and road realignment possibilities. The options identified in the report include:

#### Option I: New high level bridge

A high level option using incremental launching. This option would be constructed using Super Tees. Option I provides the optimal alignment and is located approximately 125m downstream of the existing bridge. This alignment would provide a much higher level of service, Iin20 year flood event, than the existing bridge which has a I in I year flood event. This option eliminates the curves on both approaches, would have a bridge length of approximately 230m and an RL of I2.

#### Option 2: New bridge on similar alignment

Option 2 is at the existing level and on an alignment immediately downstream (5m) of the existing bridge. This Option would involve the construction of a Pre-Stressed Concrete plank bridge. This option would not eliminate the sharp curves on both approaches and retains an inherent safety problem. The bridge length would be approximately I20m and have an RL of 5.5. It would be unsatisfactory to provide a new bridge on a winding alignment with the same level of service as the existing bridge.

#### Option 3: New bridge constructed on the current bridge sub-structure

This option uses modular spans constructed on the current bridge sub-structure, with 7.6m spans. The bridge length would be 114m and the deck area would be 1200m². The bridge length would be approximately 120m with an RL of 5.5. Option 3 is not practical to construct as either a side track with Bailey Bridge would be required or the bridge would need to be reconstructed in halves. Demolition of half of the existing bridge would be very difficult and would require temporary barriers either surface mounted or side mounted. These factors make this option impractical. In addition, the uncertainty of the remaining life in condition of the existing bridge substructure makes this option unacceptable from a risk viewpoint.

#### Option 4: New bridge on the downstream low level curved alignment

This option uses a low level modular bridge approximately 12m downstream of the existing bridge. The bridge length would be approximately 160m with an RL of 5.3.

#### Option 5: New bridge on downstream improved alignment

The bridge would be 125m downstream of the existing bridge on an improved straightened alignment. The bridge would be 130m in length and would be low level with an RL of 5.3. The low level structure has a lower level of service (I in I year flood event) but an alternative route is available via Springwood.

#### Option 6: Rehabilitated bridge

This option utilises the existing substructure to support a new Stress Laminated Timber (SLT) deck. Although this option is the cheapest, it retains a significant maintenance commitment, in the order of \$20,000 per annum for superstructure works and \$100,000 every 5 years for substructure repairs. Regular inspection/maintenance of the substructure would be required. It is anticipated that the community would perceive little value for money in repairing a bridge which has required constant maintenance over the past ten years.

#### **Preferred Option**

After detailed consideration, the preferred option chosen is similar to option 2 above. The preferred option would be a bridge 20 metres in length with ten spans each with a length of 12 metres. The superstructure consists of Pre-Stressed Concrete planks (PSC) with a cast in place concrete deck. One advantage of the preferred option would be the provision of a deck level Im above the existing bridge deck. The clearance distance between the edge of new concrete bridge and the edge of existing bridge would be approximately 19m. This option is practical and has less impact on the existing road infrastructure and environmental conditions than the other options explored.

# 8.1 Existing Road and Bridge

The existing road, Springwood Road is a two lane single carriageway, posted at an 80km/h speed limit. The existing bridge is a timber structure, constructed in 1962, consisting of 15 spans each 7.62m, with an overall width of 7.5m between the timber kerbs. The structure consists of timber pile bents with 5 piles per bent and two 150x300mm capwales supporting the timber deck. During 1993 the bridge deck was rehabilitated adding an additional outer lamination to compensate for the effect of compression. It was estimated at the time that rehabilitation would provide a design life of approximately 25 to 30 years. However due to the poor condition of the bridge, spans 5 to 15 were 'tommed' (provided with temporary structural support) during October 2000, leaving 4 spans over the main river 'untommed' due to waterway restrictions. Due to further localised failure the bridge was reduced to operating as a single lane bailey bridge with portable signalisation. The existing bridge is beyond economic repair and therefore a new bridge is proposed to maintain and improve the local road system.

Currently the approaches to Yarramundi Bridge are regulated by a temporary signal system. This was due to be replaced by a set of 'Give Way' signs as a result of community dissatisfaction with the signal system, however the temporary signal system is still in place at the time of preparing this SEE.

# 8.2 Existing and Forecast Traffic

Springwood Road and Hawkesbury Road provide an important east-west link between Richmond and the townships of the Blue Mountains, particularly Springwood and Winmalee. The two roads form an alternative route to the Great Western Highway and is an important tourist road with vantage points for views over the Sydney Basin. Springwood Road is also an important route for local residents, some freight haulage and local businesses/establishments including the YMCA Yarramundi Youth Camp, Grace Lodge Conference Centre, Yarrawood Teachers Camp, River Park Christian Youth Camp and the local Bushfire Brigade. Many of these centres and camps rely on access across Yarramundi Bridge as coaches and buses are unable to travel down the steep escarpment along Hawkesbury Road.

The most recent traffic data recorded along Springwood Road, Yarramundi Bridge was in 1999. The average annual daily traffic recorded for the area was 4018 vehicles, with 15% classified as heavy vehicles. The annual traffic growth rate for the area is 4.0% with a tolerance of 3.2% lower or 4.8% higher. It is anticipated that traffic in the area has increased due to the fast growing population of residence and urban development along Springwood Road, west of Yarramundi Bridge.

#### 8.3 Additional Fill Material

The Proposal to construct the new bridge and minor road realignment would necessitate the excavation of approximately  $1600 \, \mathrm{m}^3$  of soil. Excavated soils would be used for the construction of embankments and road works. General earthworks have been designed to balance the volume of cut and fill required.

Total fill material required is estimated to be in the order of 1800m³, therefore additional fill material would be in the order of 200-500m³

#### 8.4 Truck Movements

The supply of materials for the construction of the new bridge would require on average two additional truck movements per day. During peak construction periods it is expected there would be up to 5 additional truck movements per day. The various types of materials that are likely to be imported to the site during construction includes:

- Concrete
- Steel scaffolding
- Plywood
- Timber
- Pavement base

- Handrails
- Precast concrete beams
- Gravel
- Drainage / Erosion protection material

## 8.5 Traffic Management

During construction of the Proposal traffic delays are likely to be experienced, including short-term closure of the existing bridge during specific work activities. It is anticipated that approval from RTA Traffic Management Centre would be sought prior to the any closure of the bridge including a further restriction on the load limit for heavy vehicles. Anticipated traffic delays likely to be experienced would not exceed 20 minutes outside of peak periods. Prior to the commencement of works thorough community consultation and notification processes (e.g. letterbox drop and signage) would be undertaken and would include the timing and expected length of traffic delays likely to be experienced. All traffic during the Proposal would be managed in accordance with Clause 6.4 of RTA's QA Specification G36.

#### 8.6 Design Parameters

Based on the RTA Strategic Concept Design Report, parameters for this Proposal would include the following:

- Construct a new low level submerged bridge approximately 19m downstream edge to edge from the existing Yarramundi Bridge;
- The new bridge would be 120m long, 11.65m wide, consisting of 10 pre-stressed concrete span;
- Span length would be 12m long with 9 piers comprising of reinforced concrete headstock on 2 or 3 circular concrete piles;
- 2-3 piers would be constructed in the main flow of the Nepean River;
- Provision of level grading for the full length of the bridge;
- Construction of the new bridge to be designed to SM1600 loading;
- Provision of clear spans that exceed 10m, so that floating debris passes beneath the bridge;
- A deck level of 6.5m RL consisting of PSC plank/reinforced concrete deck superstructure;
- 4.5m wide traffic lanes in each direction;
- A 1.8m wide shared cycleway / pedestrian footpath on the southern side of the bridge;
- Provision of an aluminium traffic barrier separating the footpath and the southern bridge lane;
- The provision of steel anchor bolts on the deck to restrain the effects of buoyancy; and
- No continuous kerbing on the bridge.

## 8.7 Design Constraints

The Proposal has the following constraints:

- The location of suitable bridge sites;
- Statutory environmental obligations;
- Development and pre-construction activities to be completed within the approved schedule;
- Provision for value for money bridge solution and reasonable return on investment into the project;
- The effects of flooding;

- Bridge spans must be greater than 10m long;
- Pre-stressed concrete spans can not extend past 12m in length, as such 2 3 piers would be required in the main flow of the Nepean River; and
- Limited funding.

## 8.8 Design Outcomes

- A replacement to the existing Yarramundi Bridge over the Nepean River;
- · Minor road realignment of bridge approaches; and
- Improved road safety;

# 8.9 Property Acquisition

Springwood Road, within the study limits is wholly within road reserve, however immediate surrounding lands are subject to Crown reserve and Local Government Land under Penrith City Council control. Where Crown lands or Crown reserves are considered needed, as part of a major project, the land would need to be acquired under the *Land Acquisition Act*, 1991. It is anticipated that the existing Springwood road reserve and land gazetted Crown Reserve is separated by the "cable fence" (erected by Hawkesbury City Council). However DLWC has informed that it is uncertain as to whether the cable fence is represented of true property boundaries.

#### 8.10 Utilities

Within the study area, a number of urban infrastructure items are present. This includes powerlines, water mains and street lighting. It is not known at this stage whether the relocation of utilities would be required. Any relocation of utilities would be negotiated with the appropriate service provider.

#### 8.11 Access

Plant and vehicle access to areas of proposed works on the western side of the river would be via a locked gate approximately 100m from the west abutment of Yarramundi Bridge, on the northern easement along Springwood Road. There are several unformed tracks leading from the main entrance to the western banks of the Nepean River, Grose River and wetland areas (see **Appendix A**). Such tracks would be utilised as entry and exit routes to the lower western portions of the Nepean riverbank, where construction works for the new bridge and removal of the existing bridge would be undertaken. No native vegetation or tree removal is anticipated for access on the western side of the river as the majority of the area is of open nature, consisting mainly of grasses. It is estimated that existing formed tracks are wide enough (greater than 2.5m wide) to allow for safe travel of vehicles and plant equipment without impacting upon vegetation within these areas.

Access for proposed works on the eastern approach of the Bridge would be via the north-eastern corner of the bridge abutment within a disturbed grassed unformed small parking area and access track, which appears to be created from during previous geotechnical works. It is anticipated the removal of vegetation (large proportion of weeds) and grubbing to stabilise surfaces would be required.

Should there be any change to access routes or the necessitate to create new tracks on either side of the riverbank the RTA Regional Environmental Adviser, Sydney region and DLWC would be contacted and consulted prior to the commencement of works.

# 8.12 Stockpile and Compound Site

Onsite temporary works associated with the Proposal would include a site office, equipment / plant, compound area and material stockpile sites. It is anticipated the compound site would require up to  $1000m^2$  of land and would be fenced for security and safety. Initial site works would potentially

involve site clearing and installation of environmental controls. Hard-stand areas would be provided for parking, storage and access. Portable toilets and washroom facilities would also be provided.

The working/storage areas available to the Contractor during the construction period would be the cleared area located on the north western side of the existing bridge outside of the highly flood prone land. Disposal of spoil on any land outside the limits described above would require the contractor to obtain the relevant owners consent and any environmental approvals.

Any other proposed locations for site compound or storage areas would require approval from RTA Regional Environmental Adviser, Sydney region, prior to their establishment. In addition, relevant landholders, DLWC and Hawkesbury City Council would be contacted and consulted. Parameters governing the location of the any additional compound site, plant storage area and stockpile sites would include the following environmental criteria:

- Where possible, more than 50m from any waterways;
- Low conservation significance for flora, fauna and indigenous or non-indigenous heritage;
- Minimum clearing of native vegetation;
- Where possible located in areas previously disturbed;
- Outside of the highly flood prone land; and
- Where possible ore than 250m from residential uses or other activities that may be affected by operational noise or other impacts of plant.

Proposed locations would not restrict any access to Yarramundi Reserve and / or public parking facilities located on the northwestern and southwestern alignments of Springwood Road, unless negotiated with relevant landholders, DLWC and Hawkesbury City Council. Any fencing affected by these establishments and / or during construction would be temporarily reinstated at the completion of each working day and permanently reinstated at the completion of the Proposal to a level of better or equal security.

#### 8.13 Construction Activities

The proposed works are anticipated to commence in late February 2003 and take approximately 10 months. Construction would follow normal RTA roadwork procedures including the following general activities. However, as the proposed works would be undertaken by a contractor, the exact work methods cannot be detailed at this stage.

- Introduction of mitigative measures as outlined in the CEMP and ESCP including establishment of
  erosion and sedimentation controls;
- Establishment of a site works compound;
- The draining/pumping of the backwater situated on the floodplain immediately northwest of the
  existing bridge between the main river channel and the western bank. This would be required to
  necessitate track access and working areas between the new bridge and the existing bridge during
  construction and would involve regular pumping out of water via approved environmental
  controls;
- The existing temporary weir (erected by RTA 2000) immediately southwest of the existing bridge would be used to prevent continuous seepage of water from the river into working areas;
- Construction of the bridge foundations and piers, from the constructed access road/causeway platform;
- The majority of spans would be constructed from the western side of the Nepean River (construction materials including bridge beams would be transported across the existing bridge).
- Bridge spans on the eastern side of the river would be constructed using access from the eastern embankment;

- The existing bridge would be removed on the completion of the new bridge. It is anticipated that this would be via removing the bridge timber members using excavators and cranes sitting on the deck of the new bridge and loading into trucks;
- Existing piers could be removed entirely or cut off at bed level.
- It is anticipated personnel and material deliveries during construction would use the existing bridge for access to the study area;
- Progressive site stabilisation and revegetation of disturbed areas;
- Provision of safety barriers and linemarking;
- Landscaping and revegetation works; and
- The existing temporary weir would be removed an the area rehabilitated upon completion of the construction and demolition works.

The construction method would be required to comply with the construction concepts and environmental management requirements presented in this SEE, and the Contractor(s) Environmental Management Plan for all works.

# 8.14 Construction Equipment

It is anticipated that the range of construction equipment likely to be used for the construction of the new bridge and the removal of the existing would include:

- Backhoe;
- Drilling rig;
- woodchippers;
- stump grinders
- chainsaws;
- excavators;
- loaders;
- trucks;
- Water tankers;

- Graders;
- Rollers;
- Small bulldozer;
- Cranes;
- Water Pumps and cement boom pumps
- Concrete pumps;
- Cement trucks;
- Bitumen spray truck;
- Service vehicles.

# 8.15 Work Force and Working Hours

The work force for the Proposal would be variable. Staff members would vary between approximately 10 and 25 depending on the stage of works during construction.

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

Should work be required outside of normal working hours, the procedure contained in the RTA's Environmental Noise Management Manual, 2001 "Practice Note vii — Roadworks Outside of Normal Working Hours" would be followed.

# 9 ENVIRONMENTAL ASSESSMENT

# 9.1 Landform, Geology and Soils

The site is located on the Cumberland Plain, within the active floodplain of the Nepean River. The landscape of the area is mainly level with minor (<10m) relief to meanders and scrolls, levees and back swamps. Natural elevations within the study area range from 5m to 15m Australian Height Datum (AHD). The natural topography on the western side of the river has been altered in the past from sand and gravel extractive activities.

Soils within the study region are of fluvial origin, classed as 'fr' Freemans Reach Soils Landscape composed of alluvium derived from the Narrabeen Group, Hawkesbury Sandstone and Wianamatta Group materials (Bannerman and Hazelton 1990, Bannerman et al. 1989). The landscape is dynamic with streambank erosion and deposition constantly occurring. The floodplain is subject to scour or sheet and rill erosion during floods and may be covered by varying depths of sedimentary materials as the water recedes. Dominant soils of the area are mainly deep brown sands and loams, which are highly erodible and have low capacity for water and nutrient retention.

The existing bridge is at the approximate upstream limit of tidal influence in the Nepean River (DLWC 2000), an indicator of the potential for Acid Sulphate Soil occurrence. The proposed works have been mapped as occurring in an area of Lacustrine and Alluvial landscapes with a Levee formation, with a no known Acid Sulphate Soils occurring greater than 4m elevation AHD. No obvious signs of Potential or Actual Acid Sulphate Soils were identified during the field investigation undertaken May 2002. An Acid Sulphate Soil Risk Map for the locality is provided in **Appendix H.** 

#### Potential Impacts

Due to the nature and location of the proposed works, the potential for soil disturbance is relatively high. Soil erosion and sedimentation has the potential to occur in the main channel of the river during driving of piers and on the lowers banks and floodplain through the construction of the bridge abutments and general construction and associated ancillary activities. During the decommissioning of the existing bridge the Proposal has the potential to further disturb the riverbed and sediments. It is anticipated at this stage, that all piers would be removed to a level below the river bed.

Soil disturbance and erosion also has the potential to occur where plant and vehicles require access into the reserve and working areas.

#### **Proposed Safeguards**

Soil Management Controls would be undertaken in accordance with the specifications set out in Section 6.5 of RTA's Environmental Protection (Management Plan) - QA Specification G36. In addition, the following site-specific controls would be undertaken to minimise potential impacts.

- An erosion and sedimentation control plan would be developed and incorporated into the CEMP.
  The plan would incorporate specifications outlines in the NSW Erosion and Sediment Control
  Handbook No. 2, identify areas requiring management controls, include inspection and checklist
  sheets and be reviewed by the RTA Regional Environmental Adviser, Sydney Region prior to the
  commencement of works;
- Maintenance and checking of the controls would be undertaken on a regular basis and records kept and provided at anytime upon request. Sediment would be cleared from behind barriers on a regular basis;
- Site rehabilitation of disturbed areas would be undertaken progressively as stages are completed;
- Hard-stand material would be in place, where applicable, to prevent the tracking of soil and mud onto pavement surfaces;
- Any material transported onto pavement surfaces would be swept and removed at the end of each working day;
- All stockpiles created during the Proposal would be managed in accordance with the RTA's Stockpile Management Procedures, 2001;

- Prior to the commencement of works, access routes would be negotiated with the relevant land managers DLWC and Hawkesbury City Council. All plant and vehicle access would be restricted to existing formed, identified tracks;
- If required, wooden platforms would be used as hard-stand for plant or machinery instead of introduced gravel or substrates;
- Works would not occur during periods of heavy rainfall; and
- Methods for scour protection, in particular for the bridge abutments would include soft engineering options such as rip-rap packed with soil or equivalent. All scour protection options would be consulted with DLWC during the detailed design stage.

# 9.2 Drainage, Hydrology and Water Quality

The study area falls within the lower Hawkesbury – Nepean Catchment / System which has been identified as one of five environmentally significant areas present within the Hawkesbury Local Government Area (Hawkesbury City Council). All runoff from surrounding areas drains directly into the River. No stormwater culverts or pipes were evident at the time of field investigations.

Within the study area, the Nepean River varies from approximately 10m wide consisting of a series of pools and riffle zones, lined with a narrow band (approximately 3m wide) of Casuarinas. The river flows into a large pool approximately 50m upstream of the existing bridge before diverting to the left (western) bank into an area of backwater and to the right (eastern) bank through the main channel of the river as a long series of riffles. The alignment of the new bridge would cross a riffle zone approximately 30m long commencing upstream of the existing bridge before reaching another pool 40m downstream. The depth of the river in this section of the channel varies, however it is estimated that it would be approximately <1m deep. The bed of the river consists of sand, pebbles, gravel beds and small boulders, these being approximately 30cm in diameter.

There is an area of backwater located on the northwestern side of the existing bridge. This backwater was once a flowing channel to the Grose River before the River's profile and configuration was significantly altered from extraction activities and altered flows from the construction of dams and weirs upstream. The western channel is currently only likely to flow during high periods of rainfall and floods. A temporary weir was constructed (by RTA, 2000), across the southern edge of the backwater to provide dry working areas for bridge rehabilitation works. Water from the river still seeps through the weir into the backwater. As part of these works a drainage channel was also constructed between the backwater and the river to the north east of the bridge. It is proposed that these features would be removed and the area rehabilitated and reinstated following the completion of construction of the new bridge and removal of the existing bridge.

The river is subject to occasional flooding with flood events recorded during 1817, 1864, 1867, 1961, 1978, 1987, 1988,1989 and 1990. Based on previous recorded flood events for the area it is evident that flooding within the area can occur at any time of the year (Landarc, 202).

#### Water Quality

Water quality testing of the main channel of the river and the backwater was undertaken as part of the supplementary ecological assessment of the study area. Due to time constraints the outcome of this assessment was not completed at the time of writing the SEE. The results of the water quality testing and the supplementary ecological assessment would be incorporated into the Project Environmental Management Plan (PEMP) for this Proposal.

#### Potential Impacts

The construction of 2 - 3 piers within the main channel of the Nepean River the Proposal has the potential to modify the hydrology of the river downstream and on the adjacent riverbanks. This could potentially include an increase in bank erosion and bank instability due to changes in the direction of flow, hence change in areas of deposition and scouring. Should the new bridge abutments be constructed closer to the river's edge, the Proposal has the potential to further increase bank instability and cause scouring.

Since the construction of the new bridge would be Im higher to that of the existing bridge, it is anticipated that the Proposal would slightly improve the level of disturbance experienced during high flows and floods.

The potential impacts on the water quality within the study area may include increased levels of turbidity, sedimentation, localised contamination, algal blooms and potential changes in chemical (pH, nutrients, dissolved oxygen and inorganic and organic contaminants) and physical parameters (light penetration, salinity & temperature). Impacts on water quality during construction have the potential to occur as a result of pile driving, sediment laden water and contaminated water entering water bodies, pollutants from fuels, hydraulic fluids, cement, pavement material and chemicals.

It is not proposed to undertake any construction activities from within the main channel of the river or undertake any benching in the river.

#### **Proposed Safeguards**

Hydrology and water quality controls would be undertaken in accordance with the specifications set out in Section 6.5 of the RTA's Environmental Protection (Management Plan) – QA Specification G36. In addition, the following site-specific mitigation measures would be implemented as part of the Proposal.

- If any activities likely to cause pollution of any waterways are to be undertaken, a licence would be obtained under the PoEO Act;
- Any water pumped from the backwater into the main river would be filtered to remove any algae prior to its discharge;
- Should the construction of coffer dams be required for the Proposal, the RTA Regional Environmental Adviser, Sydney region would be contacted for advice on further environmental requirements or assessment. This would include additional consultation with NSW Fisheries and DLWC:
- The bridge would be designed and constructed in such a way as to minimise disturbance to any
  waterways and in accordance with NSW Government's Flood Policy (1984) and in the
  Government's Floodplain Management Manual (2001). During the detailed design phase,
  consideration would be given to constructing the bridge abutments as far back from the river
  banks as possible;
- For the construction or modification of any weirs, a permit would be obtained from DLWC;
- The location of the new piers would be of a similar alignment to that of the existing piers to prevent potential impacts on the hydrology of the river;
- All fuel, chemicals and liquids would not be stored on the floodplain of the river or within 50m of any waterways. All fuels, chemical and liquids would be securely stored within a bunded area;
- NSW Fisheries and DLWC would be informed and consulted of any proposed scour protection methods to be used for the Proposal. Scour protection would be implemented where appropriate;
- There would be no realignment of the river or any waterways;
- Small stockpiles created during the proposed works would be replaced or removed at least 50m from any waterways at the end of each working day;
- The application of sprayed concrete would be carried out in a controlled manner via a boom pump to minimise overspray;
- Drop sheets would be used where appropriate during construction of the new bridge and removal of the existing bridge;
- Concrete trucks would not be permitted to wash out on site and would be directed to return to their depots for washing out;

- Water required for the proposed works would be brought in from offsite. Should it be necessary to extract water from any waterways, a permit would be sought from DLWC;
- An incident emergency spill plan would be developed and incorporated in the Contractor(s)
   Environmental Management Plan (CEMP). This would include measures to avoid spillages of fuels,
   chemicals and fluids onto the floodplain or into any waterways. An emergency spill kit would be
   kept onsite at all times;
- All mixing of aquifer waters would be avoided;
- No waste water would be disposed of on site unless treated by a certified process;
- No temporary or permanent sedimentation basin would be constructed for the Proposal. Should
  it at any stage, be required to do so, the RTA Regional Environmental Adviser, Sydney Region
  would be contacted and consulted and an additional impact assessment undertaken;
- All plant, vehicles and machinery would be refuelled offsite;
- In the event that Acid Sulfate Soils are encountered during works the management of ASS would be carried out in accordance with ASSMAC (1998) guidelines and strategies; and
- Weirs and a drainage line previously constructed during rehabilitation works on the existing bridge would be removed and rehabilitated as specified in the Review of Environmental Factors for proposed Yarramundi Bridge Repairs, Springwood Road, Agnes Banks, RTA 2000.

#### 9.3 Flora

Lesryk Environmental Consultants were engaged to undertake an ecological survey of the study area and adjoining areas for the previous Proposal (Option 5, March 2002). As part of the assessment, a desktop review of threatened flora species databases was undertaken (10km radius centred on the study area), along with a 3hr field survey conducted on the 9<sup>th</sup> January 2002 and literature review of previous studies undertaken in both the region and the Hawkesbury / Penrith Local Government Areas (**Appendix D**).

As the new Proposal falls within the same study area it was considered that a supplementary flora assessment was not required. However, all species recorded in the vicinity of the study area were checked against updated listings under schedules of the TSC Act and EPBC Act.

#### **Existing Environment**

Since European settlement the study area has been significantly modified and disturbed through the clearing of native vegetation for agricultural purposes while sand and gravel extraction activities significantly furthered altered any remaining riparian vegetation. Therefore the study area can be represented as highly degraded and impoverished (Landarc, 2002). The study area is dominated by exotic weed species throughout both its terrestrial and aquatic environments.

The western bank of the Nepean River is relatively open and barren with open grassed areas and scattered, mostly planted semi-mature and juvenile River She-oaks (*Casuarina cunninghamiana*). River She-oak remains the dominant local indigenous tree species within the study area.

Remnant native vegetation, namely riparian forest and woodlands occurs throughout the study area. The riparian forest located within the study area is considered to be Sydney Coastal River-flat Forest, an endangered ecological community listed under Part 3, Schedule I of the *Threatened Species Conservation Act*, 1995. This vegetation type occurs along both banks of the main river channel and the flood channel backwater on the western side of the river. Areas of Sydney Coastal River-flat Forest also occur both upstream and downstream of the study area and would have previously occurred in the highly disturbed weed infested area on the eastern side of the river.

A very small pocket of regenerating remnant vegetation also occurs within the large boulders on the south-western side of the existing Springwood Road Bridge. This area contains a number of native regenerating species with mesic and riverine rainforest affinities including Coachwood (Ceratopetalum apetalum) and Grey Myrtle (Backhousia myrtifola) (Landarc, 2002).

A list of plant species recorded within the study area during field investigations undertaken by LesryK Environmental Consultants is provided within Appendix I of the Ecological Assessment Report, **Appendix D** of this SEE.

#### **Threatened Flora**

At the time of the survey, no threatened grass species or orchids known from the locality or from the type of habitats present within the study area were identified during the survey. No species of national or state conservation significance on schedules of the TSC Act or EPBC Act were located during the survey. However nine (9) species considered to be vulnerable in Western Sydney, listed by the Western Sydney Urban Bushland Biodiversity Survey (NPWS, 1997), were recorded in the study area at the time of the survey. The majority of these species include groundcover aquatic plants and low sedges that occurred in a small flood channel (up to 10m wide) on the western side of the main river channel. One of these species (the Thin-leaved Naiad, *Najas tenuifolia*) is also considered regionally rare.

A desktop review (January 2002) of NPWS wildlife atlas database and EPBC database for threatened flora species of state and / or national significance identified a total of 30 plant species potentially occurring, within a 10km radius of the centre of the study area. However, no threatened flora species or species habitat were identified within the study area during field investigations.

One endangered ecological community, Sydney Coastal River-flat Forest listed under schedules of the TSC Act occurs within the study area. An 8-part test of significance was undertaken to asses the potential impacts of the previous Proposal (Option 5 March, 2002) on Sydney Coastal River-flat Forest. The assessment included the removal of approximately 0.2 hectares of Sydney Coastal River-flat Forest.

A further 8 part-test of significance for the new proposed bridge alignment was considered unwarranted as the area of Sydney Coastal River-flat Forest potentially impacted upon by the Proposal would be similar to that assessed for Option 5. However should the anticipated area of impact be increased (greater than 0.2 hectares), an additional 8-part test of significance for the endangered ecological community would be required.

Two Key Threatening Processes listed under Schedule 3 of the Threatened Species Conservation Act, 1995 were also considered for the previous (Option 5, March 2002) Proposal. These included the "clearing of native vegetation" and "alterations to the natural flow regimes of rivers and stream, and their floodplains and wetlands". It is not anticipated the clearing of vegetation for the Proposal (0.2 hectares) would be significant, nor would it alter natural flow regimes to the river, provided the new bridge and approaches has been designed not to change the existing flood characteristics.

## **Potential Impacts**

It is anticipated that the area of impact upon Sydney Coastal River-flat Forest for this Proposal would be 0.2 hectares (excluding weed infested vegetation), as anticipated for the previous option (Option 5). The area of riparian vegetation proposed to be removed is River She-Oak Forest which is part of the threatened ecological community, Sydney Coastal River-flat Forest. The areas above both banks of the River do not contain many characteristics of the River-flat Forest community and is dominated by weeds.

The outcome of the 8-part test undertaken as part of the ecological assessment (March 2002) concluded that the impact of this Proposal on threatened flora species, ecological communities, key threatening processes, plant populations or critical habitat is not likely to be significant. Therefore a flora Species Impact Statement is not required for the proposed works stated in this SEE.

Some indirect impact upon local native vegetation has the potential to occur through general construction activities for both construction of the new bridge and removal of the existing and access to working areas. The Proposal also has the potential to further promote the spread of noxious weeds and introduce new weed propagules to the area. This also includes the establishment of weeds further downstream.

Proposed Safeguards

Flora controls would be undertaken in accordance with the specifications set out in Section 6.9 of RTA's Environmental Protection (Management Plan) – QA Specification G36. In addition, the following site-specific mitigative measures and safeguards proposed by Lesryk Environmental Consultants would also be implemented as part of the Proposal:

- The bridge piers would be located to avoid and minimise the impacts on the River-flat Forest community and regionally vulnerable plant species by avoiding stands of *Casuarina cunninghamiana* and the small wetland areas;
- Bridge piers would not be located within any wetland areas;
- A vegetation management plan would be prepared by a qualified organisation to restore the areas
  of degraded River-flat Forest within the road reserve on the eastern and western sides of the
  river and the old bridge abutments. The planting would include Casuarina cunninghamiana and
  Eucalyptus tereticornis. The native species list in Appendix I of the ecological assessment report
  would provide a basis for regeneration works;
- A pre and post construction weeding program would be undertaken across the whole study area so that the spread of weeds into newly excavated / disturbed areas is minimised;
- Groundcover species would not be removed from the alignment corridor of the new bridge unless necessary for the construction of piers;
- To preserve flora and fauna habitat values, erosion and sediment control barriers would be erected on the downslope boundary of construction areas;
- Prior to the commencement of works, access routes would be staked and clearly marked and identified onsite and mapped. All vehicular access would be restricted to these planned routes.
   All access routes would be negotiated with DLWC;
- Trees requiring removal would be cut down and poisoned, rather than roots grubbed out of the ground;
- To minimise disturbance to surrounding vegetation, the removal of the existing timber bridge would be undertaken by a crane situated on the downstream side of the existing bridge;
- Should it be necessary to undertake works from the southern side of the existing bridge during its removal minimum vegetation would be removed;
- Areas of regionally significant vegetation occurring on the southern side of the existing bridge would be clearly marked onsite, mapped and fenced prior to the commencement of the Proposal;
- Trees within the vicinity of working areas, outside of the bridge alignment would be retained and
  protected during the Proposal. Vehicles and machinery would be parked in cleared areas and not
  under the dripline of retained vegetation or trees. Nor would retained vegetation or trees be
  smothered by stockpiles or by the storage of materials;
- Cleared native vegetation would be mulched and reused in rehabilitation works;
- All weeds removed would be collected, bagged and taken to an approved landfill facility;
- Soil potentially containing introduced grasses or weed propagules would not be used for the proposed works;
- All staff would be made aware of the identity and location of significant flora species and or vegetation communities within the study area prior to the commencement of works;
- Opportunities for weed establishment would be reduced by encouraging successful establishment
  of native grasses, shrubs and trees (as specified by the ecological report and plan of management
  for Yarramundi Reserve) and by minimising the amount of bare soil available for weed invasions;
  and

River, Yarramundi

 On completion of construction and the removal of the existing bridge, all redundant road surfaces / old bridge approaches would be regenerated within appropriate Sydney Coastal Riverflat Forest species.

#### 9.4 Fauna

LesryK Environmental Consultants were engaged to undertake an ecological survey of the study area and study locality for the previous Proposal (Option 5, March 2002). As part of the assessment, a desktop review of threatened fauna species databases was undertaken (10km radius centred on the study area), along with field surveys conducted on the 9<sup>th</sup> January 2002 and 17<sup>th</sup> January 2002. Literature review of previous studies undertaken in both the region and the Hawkesbury / Penrith Local Government Areas were also referred to (**Appendix D**).

A supplementary ecological assessment is being prepared to assess the impact of the Proposal on the aquatic habitat and water quality of the backwater situated on the floodplain immediately northwest of the existing bridge between the main river channel and the western bank. LesryK Environmental Consultants are currently undertaking this assessment and at the time of writing this SEE the assessment was incomplete. The draft recommendations made in the made in the assessment have been included in the mitigation measures listed below and the final copy of the assessment would be appended to this SEE on its completion.

#### **Existing Environment**

During field investigations, three (3) habitat types were identified within the study area. These included riparian woodlands, exotic grasslands and aquatic environments. Within the study area itself, the value of the riparian woodland is considered to be minimal, due to the small band width, the plant species present (trees which don't form hollows) and the high public access to the site. Although considered of minimal value the riparian woodlands do provided important habitat input into the Nepean River and associated water bodies. Exotic grasslands within the study area are also considered to be of minimal value, even though it may provide habitat opportunities for some native fauna particularly small invertebrates, reptiles and species with mobility (e.g. birds and bats) (Landarc, 2002).

During field investigations (January 2002) a number of birds, amphibians and reptiles were recorded. Of the fauna species located during the study, three (the Great Egret Ardea alba, the White-bellied Sea Eagle Haliaeetus leocogaster and the Rainbow Bee-eater Meerops ornatus), are listed as migratory birds under the Schedules of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. One species, the Large-footed Myotis Myotis adversus (a bat) is listed as vulnerable on Schedule 2 of the Threatened Species Conservation Act 1995 and another species, the Nankeen Night Heron Nycticorax caledonicus is listed as being of regional conservation value in Western Sydney.

It has been recorded that a seasonal colony of Grey-headed Flying fox (*Pteropus poliocephalus*) has established within a gallery habitat of weed the species Box Elder (*Acer negundo*) in the southern portion of Yarramundi Reserve. NPWS is currently monitoring the status and management of the colony and is developing a Draft Recovery Plan (Landarc, 2002).

#### **Potential Impacts**

It is anticipated the Proposal would have minimal impact upon fauna habitat. The trees species and number of trees requiring removal (River She-oaks) are not considered to be of essential resources for any native species, and their loss is not considered to compromise the overall value of the fauna corridor of those species recorded or expected found (Appendix D).

The impact of the Proposal was considered on the threatened ecological community and threatened species considered to have the potential to occur, in terms of the requirements of the *Threatened Species Conservation Act* 1995 and the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999.

No impacts considered significant under the definitions provided in the *EP&A Act 1979* (the 'eight part test') were found to occur. Consequently no further studies or referrals are considered to be required.

The potential impacts identified in the supplementary ecological assessment currently being undertaken by Lesryk Environmental Consultants (November 2002) would be appended to this SEE.

#### **Proposed Safeguards**

Fauna and fauna habitat controls would be undertaken in accordance with the specifications set out in Section 6.10 of RTA's Environmental Protection (Management Plan) – QA Specification G36. In addition, the following site-specific mitigative measures and safeguards proposed by Lesryk Environmental Consultants would also be implemented as part of the Proposal:

- During any vegetation or site clearing woody debris suitable for fauna habitat would be retained and replaced on site where appropriate, as the removal of any dead wood, trees and logs is listed as a Key Threatening Processes under the TSC Act.
- To provide supplementary resources for hollow dependant microchiropterans, the new bridge would be designed in a 'bat friendly' manner. Bat friendly features which would be considered for incorporation into the bridge design could include the incorporation of: crevices associated with expansion joints, hollows (30 millimetres in diameter), rough concrete surfaces to provide footholds and so forth (Hoye 1996, Bat Conservation International 2000). In regards to these features, when designing the bridge, discussions would be held between a qualified ecologist and the bridge engineer so that practical, useful solutions can be achieved.
- To minimise the disturbance of the works on the roosting colony of Long-eared Bats (Nyctophilus sp), the section of decking where these animals were recorded roosting would be removed and affixed to the new bridge structure.
- The relocated section of timber decking would be regularly monitored to ensure its continual use by microchiropterans. Monitoring would be undertaken for a period of two years with surveys being conducted at quarterly intervals. If, during the course of the monitoring program, microchiropterans are noted not to use this structure, alternate roosting sources would be considered.
- To maintain the long term presence of the Large-footed Myotis and Great Egrets foraging resources, areas upstream of the existing bridge crossing would not be disturbed.
- To ensure the long term occurrence of the freshwater sponges in the study area once the new bridge has been constructed, a percentage of the population that is present under the existing structure would be relocated downstream under the new structure. Prior to this occurring NSW Fisheries would be contacted to ensure that this mitigative measure complies with their regulations. The freshwater sponge relocation works would be monitored to ensure their effectiveness.
- No barriers to the movement of fish species would be established within the current channel of the Nepean River.
- To ensure that the value of the aquatic habitats is maintained, the works would:
  - not include the removal of any large woody debris;
  - not result in the erosion of any river banks;
  - not result in the sedimentation of the Nepean River;
  - not result in the restriction of any fish dispersal or movement patterns. The movement of fish species along this river should not be prevented during, or after the bridge construction;
  - not result in the disturbance of any aquatic habitat features; and
  - not be undertaken when fish species are likely to be spawning during the spring and summer months.
- Piers in the main channel of the River would:
  - be kept to the minimum number of piers necessary for the safe construction and operation of the project;
  - minimize the loss of aquatic habitats;
  - not present a barrier to fish movements;
  - not alter the flow patterns of the Nepean River;

- not result in any sediment transport or stream siltation; and
- not significantly alter the morphology of the river bed.

#### 9.5 Climate and Air Quality

The climate is generally mild with an average maximum temperature of 23.7°C and an average minimum of 10.9°C. On approximately forty-five days per year the temperature can be expected to reach 30°C and on thirty-two days it can be expected to drop below 2°C. The highest recorded maximum temperature is in February (47.8°C) and the lowest recorded minimum temperature is in July (-8.3°C). Average afternoon wind speeds range from 9.2 km/h in May, to 16.7 km/h in November. The mean number of rain days per month ranges from 6.4 to 11.2 (at least one day per week is likely to have rainfall). Summer has the highest average rainfall levels, winter the lowest (www.bom.gov.au – Richmond RAAF Base, site number 67033).

Air quality in the region can be considered to be good, as the area is essentially rural in nature, with no major construction or manufacturing works. Extractive industry, which may produce high dust levels, has ceased in the area directly surrounding the Proposal, however a facility may be operating over approximately 700m to the southwest.

#### Potential Impacts

Rain and occasional fog would be high risk factors during construction, with heavy local and regional rainfall providing the risk of flood. Although, based on the current status of the region's climate, it is unlikely this would occur. However should torrential and heavy rainfalls occur it would amplify construction problems with water draining off the pavement into working areas and then transporting high sediment loads into traversing drainage lines and the Nepean River. Access to the site may be restricted during flood events.

The Proposal is not expected to have any long-term impact on air quality, as it would not increase the carrying capacity of Springwood Road. However during the construction phase of the Proposal there is the potential for short term localised deterioration in air quality due to dust and particulates generated from disturbed surfaces, and emissions from construction equipment.

#### **Proposed Safeguards**

Air quality and potential impacts of climate on the Proposal would be managed through the implementation of safeguards details in Section 6.5 and 6.6 of the RTA's Environmental Protection (Management Plan) – QA Specification G36. In addition, the following site-specific controls would be undertaken to minimise potential impacts.

- Works would not be undertaken during periods of high rainfall or when the river waters rise considerably;
- Sufficient time would be allowed to vacate and clean up the site, prior to the commencement of heavy rainfalls or anticipated rise in water levels;
- Tailgates of all vehicles transporting materials to and from the site would be securely fixed prior to loading and immediately after loading;
- No burning of any timber or other combustible materials would occur; and
- Revegetation of disturbed surfaces would take place as soon as possible.

# 9.6 Indigenous Heritage

A search of the NSW NPWS Aboriginal Sites register identified 5 indigenous sites within the area of the Proposal. These included an axe-grinding groove and four open campsites. The nearest recorded site to the Proposal is approximately 550m to the south of the study area. No sites were recorded within the immediate vicinity of the proposed works. To determine the cultural significance of the area discussions and a site visit were held with the RTA's Aboriginal Program Consultant and representatives of the two relevant Land Council's (**Appendix F**). Based on their assessment it was concluded that due to the highly modified nature of the surrounding landscape within the study area, the potential for the location of artefacts was particularly low. In conclusion of their findings, further specialist archaeological investigations were not undertaken for the preparation of this SEE.

A search for Native Title was also undertaken for the Proposal (30/11/01). The region is within the Darug Tribal Aboriginal Corporation (DTAC) NC97/8 claim (**Appendix F**). No issues were raised regarding Native Title in correspondence with the DTAC.

# **Potential Impacts**

The Proposal has the potential to impact upon indigenous heritage items through excavation works during the construction of bridge abutments, driving of piers, construction of a temporary weir using surrounding materials and general ground disturbance throughout the Proposal. However, due to considerable alteration and disturbance to the surrounding and immediate landscape of the Proposal area, it is unlikely that the Proposal would have an impact upon any indigenous heritage within the vicinity of the Proposal. It is anticipated that any sites, relics or items of indigenous heritage likely to have been present, would have previously been destroyed or disturbed during initial road and bridge construction and from previous agricultural and extractive industry activities.

# **Proposed Safeguards**

Indigenous Heritage Controls would be undertaken in accordance with the specifications set out in Section 6.14 of the RTA's Environmental Protection (Management Plan) – QA Specification G36. In addition, the following site-specific controls would also be undertaken to minimise potential impacts.

- Should unexpected indigenous heritage items be uncovered during works, all works in the vicinity
  of the material would cease and the RTA's Aboriginal Program Consultant, NPWS and relevant
  LALC representative would be contacted. Works would not proceed until appropriate clearance
  has been received; and
- All personnel working on site would receive training in their responsibilities under the NPWS Act 1974.

# 9.7 Non-Indigenous Heritage

A desktop review was carried out for non-indigenous heritage items potentially occurring within the vicinity of the Proposal and to determine the heritage significance of Yarramundi Bridge. Results of database searches identified no items of heritage significance within an area of 500m of the Proposal. Several items were however identified near the study area within the areas of Agnes Banks and Yarramundi Lagoon. One item listed on the Register of the National Estate was recorded for Yarramundi, which is an indigenous site 550m south of the Proposal, as previously discussed in Section 9.7.

Yarramundi Bridge is a timber bridge built in 1962. The bridge is less than 50 years of age and is therefore not classified as a 'relic'. A search of heritage registers revealed that the existing bridge is not listed on the Commonwealth Register of National Estate, State Heritage Register, any Local Environmental Plan schedules or other registers, including the RTA's Section 170 Heritage and Conservation Register.

While undertaking a site visit with Colin Gale of the Darug Tribal Land Corporation the history of a number of concrete items in the active channel and on the riverbank was discussed. It was determined that the items may be the remnants of a bridge built in the post-war period by local

armed forces groups. To ensure that the Proposal would be undertaken in accordance with the principles of the *Heritage Act* 1977 a Heritage Assessment was commissioned, and undertaken by Casey and Lowe Associates (see **Appendix E**). In conclusion of the assessment, no items of heritage significance were sighted within the study area.

During field investigations (October 2002) a series of concrete blocks were also observed across the main channel of the river upstream and down stream of the existing bridge. It is suggested that these cement blocks are part of the "block wall" constructed and maintained by Boral Resources (NSW) Pty Limited as part of their permissive occupancy of Crown reserve. The walls were constructed to maintain the flow levels in the right bank channel of the Nepean River (Landarc, 2002). It is not anticipated these blocks would be of any heritage significance.

Other historic features potentially occurring within the river channel include the historic feature of "Yarramundi Falls", likely to be located immediately north of the existing bridge where three small rapids span the river bed opposite the small island. The "falls" were believed to be a series of cascades and rapids dropping (some 9 feet in height) through a boulder-strewn bed. The "falls" are of significance as it may have been the point at which Governor Phillip, in 1789, decided to turn back on the first European navigation of the lower reaches of the Hawkesbury River. It is expected that the "Yarramundi Falls" were removed during the early stages of sand and gravel extraction.

# Potential Impacts

Due to considerable alteration and disturbance to the landscape of the Proposal area and the fact that no items of heritage significant have been identified as occurring within the study area, the Proposal is not expected to have any impacts on items of non-indigenous heritage.

# **Proposed Safeguards**

Non-Indigenous Heritage Controls would be undertaken in accordance with the specifications set out in Section 6.15 of RTA's Environmental Protection (Management Plan) – QA Specification G36. In addition, the following site-specific controls would be undertaken to minimise potential impacts.

Should archaeological remains be uncovered or discovered during works, all works in the vicinity
of the material / item would cease and the RTA Regional Environmental Adviser, Sydney Region
and the NSW Heritage Office contacted. All staff working on the site would be made aware of
this procedure prior to the commencement of works.

# 9.8 Noise and Vibration Effects

Existing noise levels within the Proposal area are dominated by traffic along Springwood Road and noise from the Bailey Truss facility as vehicles cross over the bridge. The nearest dwelling to the proposed bridge is located approximately 150m east of the Proposal, while other surrounding residences are located greater than 400m away.

# **Operational Noise**

It is considered that the proposed works would result in a slight improvement in road traffic noise levels over the current road bridge arrangement as the existing Bailey Truss creates substantial noise levels and the temporary signalisation increases traffic delays and accompanying noise levels. The operation of the Proposal would lead to reduced noise levels from present levels and equal to those occurring prior to the Bailey Truss facilities being put in place. The Proposal is not considered a "new road" or "redeveloped road" under the RTA's Environmental Noise Management Guidelines (December 2001), therefore there are no noise level targets in the Environmental Criteria for Road Traffic Noise

### **Construction Noise**

Construction activities would be carried out in several stages involving earthworks, construction of the new bridge, drilling of piers, minor road realignment, laying of road base, road surfacing and removal of the existing bridge. The following information provides an outlines some of the typical spectator noise levels of construction plant items.

Table 9-1 Typical Spectator Noise Levels of Construction Plant Items

| Item                          | Sound Pressure Level at 7 meters dBA |  |  |
|-------------------------------|--------------------------------------|--|--|
| Bulldozer Cat D7, D9          | 88dBA                                |  |  |
| Grader, Cat 16                | 85dBA                                |  |  |
| Front-end Loader              | 90dBA                                |  |  |
| Vibrating Roller, 10-12 tonne | 89dBA                                |  |  |
| Backhoe                       | 88dBA                                |  |  |
| Concrete Vibrators            | 87dBA                                |  |  |
| Concrete Pump                 | 84dBA                                |  |  |
| Water Tanker                  | 88dBA                                |  |  |
| Concrete Saw                  | 93dBA                                |  |  |
| Dump Truck, 35 tonne          | 96dBA                                |  |  |
| Compactor, Cat 825            | 93dBA                                |  |  |

**Note**: These levels are  $L_{Aeq}$ , measured in accordance with AS 2012.1-1990 "Acoustics – Measurement of airborne noise emitted by earthmoving machinery and agricultural tractors – stationary test condition

Guidelines for assessment of construction noise are those established by the EPA in Chapter 171 of the EPA's *Environmental Noise Control Manual*. The EPA criteria for construction noise applicable to this Proposal (period of works 10 months) is as follows:

• For construction periods of greater than 26 weeks, the L10 level measured at residences is not to exceed the background noise level by more than **5dBA**.

Although at this stage no background noise levels have been recorded within the study area, it is anticipated that construction noise levels predicted for the Proposal would exceed the current EPA criteria for noise construction. The EPA recognises that construction operations are typically noisy and accept that noisy activities for short duration's may exceed the above criteria provided that the standards outlined in Chapter 82-3 of the EPA's *Environmental Noise Control Manual* are adhered to. With the closest residence located greater than 100m from proposed construction works and other local residence and businesses greater than 400m, it is not anticipated that construction noise as a result of the Proposal would cause any level of discomfort or result in adverse comment from nearby residences.

### **Vibration**

The main source of ground vibration from construction activities would be associated with the pile driving and minor excavation works. Typical ground vibration levels from driven piles are not likely to succeed 4mm/s (Pk). As a result of the distance (>100m) between construction activities and residential buildings in the study area, it is unlikely that construction plant and equipment would give rise to vibration levels exceeding the structural damage goal of 5mm/s (Pk). However, all works would be undertaken in a manner consistent with that described in EPA's Environmental Control Noise Manual and RTA's Environmental Noise Manual, 2001.

# Potential Impacts

The Proposal has the potential to increase existing noise levels during construction periods owing to drilling and the driving of piles, construction plant, excavation works, general construction activities and increased level of vehicle movements. It is not anticipated the Proposal would increase operational noise levels as it does not provide for significant changes in design and or alignment to increase traffic volumes or mix.

### Proposed Safeguards

The RTA adopts the noise criteria of the NSW EPA's Environmental Noise Control Manual (1999). Noise and Vibration Controls would be undertaken in accordance with the specifications set out in Sections 6.7 & 6.8 of RTA's Environmental Protection (Management Plan) – QA Specification G36. In addition, the following site-specific controls would be undertaken to minimise potential impacts.

 Background noise levels would be measured within the area of proposed works prior to the commencement of works so that construction noise levels are monitored with respect to EPA's goals and standards;

- For works performed outside of normal working hours, the procedures contained in the RTA's Environmental Noise Management Manual, 2001, "Practice Notes vii Roadworks Outside of Normal Working Hours" would be followed;
- Noise mitigation measures and best noise management practices would be developed and adopted by the Contractor(s) and staff during the Proposal and would be consistent with RTA's Environmental Noise Management Manual, 2001;
- Local residences would be contacted prior to works commencing (eg letterbox drop, door knock) and complaints contact number provided; and
- A complaints register would be developed and incorporated in the Contractor(s) Environmental Management Plan. The projects superintendent and RTA's Regional Environmental Officer, Sydney region would be advised of any complaints.

# 9.9 Waste Management and Minimisation

Waste products generated by the Proposal are likely to occur during the construction process and the removal of the existing bridge. Waste products generated from the construction of the new bridge and associated minor road realignment are likely to include pavement, asphalt, cement slurry, packaging, surplus soil, wastes associated with the operation and maintenance of machinery and general putrescible and non-putrescible wastes. Waste products likely to be generated during the demolition of the existing bridge would include steel, timbers, bolts, earth embankment and other associated bridge structure.

Demolition of the existing timber bridge would generate a large quantity of timber, some of which may have been treated. It is not anticipated that the bridge has been treated with chemicals, however, prior to demolition of the existing bridge, timber elements would be tested for chemicals such as lead based paint and Copper, Chromium and Arsenic. Timbers that have not been treated would be recycled by the RTA and / or Contractor.

# **Potential Impacts**

The Proposal has the potential to generate wastes and surplus materials that may not be able to be reused or recycled or avoided. During construction the Proposal has the potential to the impact upon surrounding environments and landscape through the storage and accumulation of wastes, and general littering.

# **Proposed Safeguards**

The RTA adopts the Resource Management Hierarchy principles embodied in the Waste Avoidance & Resource Recovery Act 2001 (WARR Act). The Resource Management Hierarchy principles of the WARR Act would be implemented as follows:

- a) Unnecessary resource consumption would be avoided as a priority;
- b) Avoidance would be followed by resource recovery (including reuse of materials, reprocessing, recycling, and energy recover);
- c) Disposal would be undertaken as a last resource.

Waste management would be undertaken in accordance with the specifications set out in Section 6.17 of the RTA's Environmental Protection (Management Plan) - QA Specification G36. In addition the following site-specific controls would be implemented.

All treated timber waste from the Proposal would be handled in the following manner, in accordance with NSW waste management legislation:

Lead Painted Timbers: Following the NSW EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes (1997), lead painted timbers are classified as inert waste under Table I of the guideline. If unable to be recycled or reused this waste would be sent to an appropriate licenced waste handling facility. For the

RTA's/contractor's assurance, a verification mechanism would be provided in the disposal contract that ensures that the waste is disposed of to an approved facility.

- 2) Timbers treated or suspected of being treated with creosote or Copper Chrome Arsenic (CCA): The RTA and / Contractor would recycle as much timber from the bridge as possible. The preferred option for disposal is for the timbers to be re-used by the RTA (2a)or sold for recycling to external bidder's (2b).
- **Re-use by the RTA:** Re-use of treated timbers by the RTA would require that a record of the timbers be kept. The timbers would be stored appropriately and records kept of their movement. It is essential that all timbers re-used by the RTA can be traced to ensure that they have been re-used appropriately. The timbers would be stored so that they are inaccessible to the public to prevent theft and inappropriate use of the timbers.
- **Sale of timbers to external bidders: Where timbers would not be re-used by the RTA,** re-use by external organisations is encouraged. In this case a public open tender would be used to seek interest in use of the timber. The tender documents would outline the volume of timber and state whether the timber is treated/potentially treated with creosote and/or CCA. The tender would also state whether the timber is unsuitable for domestic uses. The tenderers would provide the RTA and/or Contractor with information on the proposed use of the timber and the mechanisms to ensure that the timber is not used inappropriately.
- All bridge materials, surplus soils and all wastes generated from the Proposal would be stockpiled at the compound sites prior to re-use, recycling or disposal;
- All green waste generated from the removal of native vegetation would be mulched and reused in landscaping and rehabilitation works;
- Surplus soil material created as a result of the proposed works would be reused as part of the landscaping works post construction. Any waste material unable to be re-instated as part of the Proposal would be taken to an appropriately licensed landfill;
- Where reuse of materials, waste is not possible, waste would be minimised through recycling progressively from the study area. Recycling and non-recycling waste disposal facilities would be made available to staff / contractor(s) which would be disposed of to a licenced landfill on a regular basis;
- All working areas would be maintained and cleaned up at the end of each working day;
- Wastes would not be stored for long periods of time during the Proposal. Empty drums of fuels, oils and other chemicals or fluids would not be stored on site during the Proposal;
- Any contaminated wastes identified or generated during the Proposal would be removed to an EPA approved facility for the purpose of disposal;
- Waste types would be identified & classified and different disposal strategies for each material developed in accordance with EPA guidelines; and
- All necessary permits for the removal, transportation and disposal of contaminated waste would be obtained prior to any works being undertaken.

# 9.10 Visual Amenity, Landscaping and Urban Design

The study area consists of a rural, riverine setting. The immediate area is characterised by the Nepean River, associated floodplains and Yarramundi Bridge. The area has recently been gazetted Crown reserve for its high scenic and environmental values, which provides various active / passive and family based recreational opportunities. A plan of management is currently being prepared for the reserve, which includes the preparation of a vegetation management plan and landscape concept design plan. It is anticipated the reserve would undergo extensive rehabilitation works.

Previous rehabilitation works have been undertaken during the termination of extractive activities, however no landscaping or rehabilitation works have been undertaken within the area since 1989-1994 (Landacr, 2002).

There would be a temporary visual impact on the aesthetics quality of the local area through the presence of construction activities, machinery, vehicles and a working platform. However it is anticipated that the Proposal would have no reduction in the beneficial uses of the area short term or long term. It is anticipated that areas disturbed from the Proposal would be rehabilitated through extensive landscaping and revegetation works, which would be consistent with the Management Plan for Yarramundi Reserve (Hawkesbury City Council).

# **Proposed Safeguards**

It is anticipated the above issues would be minimised through the implementation of the safeguards outlined below.

- The number of native trees removed would be minimised;
- During the detailed design phase consultation would be undertaken with DLWC and Hawkesbury
   City Council with regards to proposed rehabilitation and landscaping works;
- Extensive landscaping and rehabilitation works would be undertaken in areas disturbed from the Proposal. These works would be consistent with criterion outlined in the Management Plan for Yarramundi Reserve (Hawkesbury City Council);
- All revegetation works would include the use of native plant and grass species local to the area as identified in the Yarramundi Reserve Management Plan; and
- All areas previously disturbed for the construction of temporary weirs would be rehabilitated with material returned to its surrounds or unless specified by representatives from DLWC or Hawkesbury City Council.

# 9.11 Socio-economic Considerations

Currently the structural status of the existing bridge does not meet national road standards and is only operating as a single lane bailey truss bridge with portable signalisation. Due to the poor condition of the existing bridge the thoroughfare of heavy vehicles along Springwood Road may be limited in the future should the bridge not be replaced. This would have a significant impact on local businesses operating within the area, that rely on the transportation of tourist coaches to travel across the bridge. Many heavy vehicles (coaches and buses) are unable to take the alternate route via the Great Western Highway, down along Hawkesbury Road / Springwood Road due to the dangerous and steep escarpment.

The restriction of access across the river would also impact upon on the local community, residents, public transport and the accessibility to Yarramundi Reserve. Yarramundi Reserve provides the opportunity for local and regional recreation with a focus on water-based, passive and nature based activities. It provides a natural setting for recreation activities including fishing, canoeing, swimming, nature-based study, educational activities and walking, which are all current popular uses of the area.

# **Potential Impacts**

It is anticipated the Proposal would improve the current situation along Springwood Road, as it would improve the level of transport efficiency between the Richmond and the lower and upper areas of the Blue Mountains. However during construction the Proposal has the potential to increase traffic delays along Springwood Road due to bridge closures and traffic alterations.

### Proposed Safeguards

Traffic controls would be undertaken in accordance with the specifications set out in Section 6.4 of the RTA's Environmental Protection (Management Plan) – QA Specification G36. In addition the following site-specific mitigation measures would be implemented as part of the Proposal:

- All fencing and gates impacted by the Proposal would be replaced where necessary and provided as per DLWC and Hawkesbury City Council requirements; and
- All access would be maintained to all local roads and adjoining properties during construction.

# 9.12 Cumulative Environmental Effects

The proposed replacement of Yarramundi Bridge over the Nepean River and the decommissioning of the existing bridge would likely have the following positive and negative cumulative environmental effects:

- Long term increase in road safety for motorists, cyclists and pedestrians;
- Reduction in traffic delays;
- Minor changes in stream morphology as a result in change of deposition; and
- Contribution to further spread of exotic terrestrial and aquatic plant species.

# 9.13 Principles of Ecologically Sustainable Development

The National Strategy for Ecologically Sustainable Development (NSESD) has been formulated to ensure ESD is accounted for in Proposals. There are 3 core objectives, these are:

- To enhance individuals' and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- To provide for equity within and between generations; and
- To protect biological diversity and maintain essential ecological processes and life-support systems.

These objectives are complemented with a number of guiding principles, which are considered in **Table 9-2** in terms of the Proposal.

Table 9-2 Principles of ESD applied to the Proposal

|      | Principle   | Consideration for Proposal   |  |  |  |
|------|---|--|--|--|--|
| i.   | Precautionary Principle   | Mitigation measures have been proposed which would minimise the impacts of the Proposal. None of the specialist studies undertaken identified any serious or irreversible damage.  |  |  |  |
| ii.  | Intergenerational Equity  | The Proposal considers future land use, and would improve safety for future motorists. Mitigation measures have been proposed to minimise impacts on the local environment to ensure that no further degradation would occur. River foreshore access would be maintained as part of the Proposal.  |  |  |  |
| iii. | Conservation of Biological<br>Diversity & Ecological<br>Integrity | The Proposal has avoided, where possible, disturbance to the local ecology. Where this has not been possible, mitigation measures have been included in this SEE to ensure the Proposal would not compromise biological diversity or ecological integrity.   |  |  |  |
| iv.  | Improved Valuation and Pricing of Environmental Resources         | The integrity of the Nepean River and its catchment is recognised as a valuable resource to the area in terms of its recreational value, commercial value, water quality and supply and life support systems for aquatic communities. The Sydney Coastal River-flat Forest is also recognised as a valuable resource in terms of its life support system for communities and its originally restricted and further reducing occurrence. To ensure that these resources remain, the Proposal addresses issues relevant to water quality and ecological integrity. Mitigation measures outlined in this SEE have been provided to ensure the value of these environmental resources is maintained. |  |  |  |

# 10 Implementation Stage

# 10.1 Summary of Proposed Safeguards

Environmental safeguards outlined in this document would be incorporated into the detailed design phase of the Proposal and as part of its construction and operation. These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. All safeguards described in this SEE and the Decision Report/ Conditions of Approval would be incorporated into the Project Environmental Management Plan (PEMP) and the Contractor's Environmental Management Plan (CEMP).

The PEMP and CEMP would be developed in accordance with the specifications set out in the RTA's Environmental Protection (Management Plan) - QA Specification G36. The PEMP would identify the requirements for compliance with relevant legislation, requirements for ensuring implementation of the environmental safeguards and development of self-assessment and auditing schedules.

In order that the potential impacts of the Proposal are minimised, a number of environmental safeguards have been identified as being appropriate to the works. These safeguards are provided in Table 10.1, which outlines additional site-specific requirements, which are not covered by G36 for inclusion in the PEMP. These safeguards would be implemented prior to construction, during construction and following construction. The PEMP and CEMP would be reviewed and certified by the RTA Environmental Adviser, Sydney Region prior to the commencement of works.

Table 10-1 Site Specific Safeguards

# **Potential Proposed Safeguards Impacts** Soil Erosion and An erosion and sedimentation control plan would be developed and Landform incorporated into the CEMP. The plan would incorporate specifications **Stability** outlines in the NSW Erosion and Sediment Control Handbook No. 2, identify areas requiring management controls, include inspection and checklist sheets and be reviewed by the RTA Regional Environmental Adviser, Sydney Region prior to the commencement of works; Maintenance and checking of the controls would be undertaken on a regular basis and records kept and provided at anytime upon request. Sediment would be cleared from behind barriers on a regular basis; Site rehabilitation of disturbed areas would be undertaken progressively as stages are completed; Hard-stand material would be in place, where applicable, to prevent the tracking of soil and mud onto pavement surfaces; Any material transported onto pavement surfaces would be swept and removed at the end of each working day; All stockpiles created during the Proposal would be managed in accordance with the RTA's Stockpile Management Procedures, 2001; Prior to the commencement of works, access routes would be negotiated with the relevant land managers DLWC and Hawkesbury City Council. All plant and vehicle access would be restricted to existing formed, identified tracks; If required, wooden platforms would be used as hard-stand for plant or machinery instead of introduced gravel or substrates; Works would not occur during periods of heavy rainfall; and

# **Proposed Safeguards**

 Methods for scour protection, in particular for the bridge abutments would include soft engineering options such as rip-rap packed with soil or equivalent. All scour protection options would be consulted with DLWC during the detailed design stage.

# Water Quality and Hydrology

- If any activities likely to cause pollution of any waterways are to be undertaken, a licence would be obtained under the PoEO Act;
- Any water pumped from the backwater into the main river would be filtered to remove any algae prior to its discharge;
- Should the construction of coffer dams be required for the Proposal, the RTA Regional Environmental Adviser, Sydney region would be contacted for advice on further environmental requirements or assessment. This would include additional consultation with NSW Fisheries and DLWC;
- The bridge would be designed and constructed in such a way as to minimise disturbance to any waterways and in accordance with NSW Government's Flood Policy (1984) and in the Government's Floodplain Management Manual (2001). During the detailed design phase, consideration would be given to constructing the bridge abutments as far back from the river banks as possible;
- For the construction or modification of any weirs, a permit would be obtained from DLWC;
- The location of the new piers would be of a similar alignment to that of the existing piers to prevent potential impacts on the hydrology of the river;
- All fuel, chemicals and liquids would not be stored on the floodplain of the river or within 50m of any waterways. All fuels, chemical and liquids would be securely stored within a bunded area;
- NSW Fisheries and DLWC would be informed and consulted of any proposed scour protection methods to be used for the Proposal. Scour protection would be implemented where appropriate;
- There would be no realignment of the river or any waterways;
- Small stockpiles created during the proposed works would be replaced or removed at least 50m from any waterways at the end of each working day;
- The application of sprayed concrete would be carried out in a controlled manner via a boom pump to minimise overspray;
- Drop sheets would be used where appropriate during construction of the new bridge and removal of the existing bridge;
- Concrete trucks would not be permitted to wash out on site and would be directed to return to their depots for washing out;
- Water required for the proposed works would be brought in from offsite. Should it be necessary to extract water from any waterways, a permit would be sought from DLWC;

# **Proposed Safeguards**

- An incident emergency spill plan would be developed and incorporated in the Contractor(s) CEMP. This would include measures to avoid spillages of fuels, chemicals and fluids onto the floodplain or into any waterways. An emergency spill kit would be kept onsite at all times
- All mixing of aquifer waters would be avoided;
- No waste water would be disposed of on site unless treated by a certified process;
- No temporary or permanent sedimentation basin would be constructed for the Proposal. Should it at any stage, be required to do so, the RTA Regional Environmental Adviser, Sydney Region would be contacted and consulted and an additional impact assessment undertaken;
- All plant, vehicles and machinery would be refuelled offsite;
- In the event that Acid Sulfate Soils are encountered during works the management of ASS would be carried out in accordance with ASSMAC (1998) guidelines and strategies; and
- Weirs and a drainage line previously constructed during rehabilitation works on the existing bridge would be removed and rehabilitated as specified in the Review of Environmental Factors for proposed Yarramundi Bridge Repairs, Springwood Road, Agnes Banks, RTA 2000.
- The bridge piers would be located to avoid and minimise the impacts on the River-flat Forest community and regionally vulnerable plant species by avoiding stands of *Casuarina cunninghamiana* and the small wetland areas;
- Bridge piers would not be located within any wetland areas;
- A vegetation management plan would be prepared by a qualified organisation to restore the areas of degraded River-flat Forest within the road reserve on the eastern and western sides of the river and the old bridge abutments. The planting would include Casuarina cunninghamiana and Eucalyptus tereticornis. The native species list in Appendix I of the ecological assessment report would provide a basis for regeneration works:
- A pre and post construction weeding program would be undertaken across the whole study area so that the spread of weeds into newly excavated / disturbed areas is minimised;
- Groundcover species would not be removed from the alignment corridor of the new bridge unless necessary for the construction of piers;
- To preserve flora and fauna habitat values, erosion and sediment control barriers would be erected on the downslope boundary of construction areas;
- Prior to the commencement of works, access routes would be staked and clearly marked and identified onsite and mapped. All vehicular access would be restricted to these planned routes. All access routes would be negotiated with DLWC;
- Trees requiring removal would be cut down and poisoned, rather than roots grubbed out of the ground;

# Flora

# **Proposed Safeguards**

- To minimise disturbance to surrounding vegetation, the removal of the existing timber bridge would be undertaken by a crane situated on the downstream side of the existing bridge;
- Should it be necessary to undertake works from the southern side of the existing bridge during its removal minimum vegetation would be removed;
- Areas of regionally significant vegetation occurring on the southern side of the existing bridge would be clearly marked onsite, mapped and fenced prior to the commencement of the Proposal;
- Trees within the vicinity of working areas, outside of the bridge alignment
  would be retained and protected during the Proposal. Vehicles and
  machinery would be parked in cleared areas and not under the dripline of
  retained vegetation or trees. Nor would retained vegetation or trees be
  smothered by stockpiles or by the storage of materials;
- Cleared native vegetation would be mulched and reused in rehabilitation works;
- All weeds removed would be collected, bagged and taken to an approved landfill facility;
- Soil potentially containing introduced grasses or weed propagules would not be used for the proposed works;
- All staff would be made aware of the identity and location of significant flora species and or vegetation communities within the study area prior to the commencement of works;
- Opportunities for weed establishment would be reduced by encouraging successful establishment of native grasses, shrubs and trees (as specified by the ecological report and plan of management for Yarramundi Reserve) and by minimising the amount of bare soil available for weed invasions; and
- On completion of construction and the removal of the existing bridge, all redundant road surfaces / old bridge approaches would be regenerated within appropriate Sydney Coastal River-flat Forest species.

### Fauna

- During any vegetation or site clearing woody debris suitable for fauna habitat would be retained and replaced on site where appropriate, as the removal of any dead wood, trees and logs is listed as a Key Threatening Processes under the TSC Act;
- To provide supplementary resources for hollow dependant microchiropterans, the new bridge would be designed in a 'bat friendly' manner. Bat friendly features which would be considered for incorporation into the bridge design could include the incorporation of: crevices associated with expansion joints, hollows (30 millimetres in diameter), rough concrete surfaces to provide foot-holds and so forth (Hoye 1996, Bat Conservation International 2000). In regards to these features, when designing the bridge, discussions would be held between a qualified ecologist and the bridge engineer so that practical, useful solutions can be achieved.

# **Proposed Safeguards**

- To minimise the disturbance of the works on the roosting colony of Long-eared Bats (Nyctophilus sp), the section of decking where these animals were recorded roosting would be removed and affixed to the new bridge structure.
- The relocated section of timber decking would be regularly monitored to
  ensure its continual use by microchiropterans. Monitoring would be
  undertaken for a period of two years with surveys being conducted at
  quarterly intervals. If, during the course of the monitoring program,
  microchiropterans are noted not to use this structure, alternate roosting
  sources would be considered.
- To maintain the long term presence of the Large-footed Myotis and Great Egrets foraging resources, areas upstream of the existing bridge crossing would not be disturbed.
- To ensure the long term occurrence of the freshwater sponges in the study area once the new bridge has been constructed, a percentage of the population that is present under the existing structure would be relocated downstream under the new structure. Prior to this occurring NSW Fisheries would be contacted to ensure that this mitigative measure complies with their regulations. The freshwater sponge relocation works would be monitored to ensure their effectiveness.
- No barriers to the movement of fish species would be established within the current channel of the Nepean River.
- To ensure that the value of the aquatic habitats is maintained, the works would:
  - not include the removal of any large woody debris;
  - not result in the erosion of any river banks;
  - not result in the sedimentation of the Nepean River;
  - not result in the restriction of any fish dispersal or movement patterns. The movement of fish species along this river should not be prevented during, or after the bridge construction;
  - not result in the disturbance of any aquatic habitat features; and
  - not be undertaken when fish species are likely to be spawning during the spring and summer months.
- Piers in the main channel of the River would:
  - be kept to the minimum number of piers necessary for the safe construction and operation of the project;
  - minimize the loss of aquatic habitats;
  - not present a barrier to fish movements;
  - not alter the flow patterns of the Nepean River;
  - · not result in any sediment transport or stream siltation; and
  - not significantly alter the morphology of the river bed.

| Potential Impacts              | Proposed Safeguards   |
|--------------------------------|---|
| Climate and Air<br>Quality     | <ul> <li>Works would not be undertaken during periods of high rainfall or when<br/>the river waters rise considerably;</li> </ul>   |
|                                | <ul> <li>Sufficient time would be allowed to vacate and clean up the site, prior to<br/>the commencement of heavy rainfalls or anticipated rise in water levels;</li> </ul>   |
|                                | <ul> <li>Tailgates of all vehicles transporting materials to and from the site would<br/>be securely fixed prior to loading and immediately after loading;</li> </ul>   |
|                                | <ul> <li>No burning of any timber or other combustible materials would occur;<br/>and</li> </ul>  |
|                                | <ul> <li>Revegetation of disturbed surfaces would take place as soon as possible.</li> </ul>  |
| Indigenous<br>Heritage         | <ul> <li>Should unexpected indigenous heritage items be uncovered during<br/>works, all works in the vicinity of the material would cease and the RTA's<br/>Aboriginal Program Consultant, NPWS and relevant LALC representative<br/>would be contacted. Works would not proceed until appropriate<br/>clearance has been received; and</li> </ul>                              |
|                                | <ul> <li>All personnel working on site would receive training in their<br/>responsibilities under the NPWS Act 1974.</li> </ul>   |
| Non-Indigenous<br>Heritage     | <ul> <li>Should archaeological remains be uncovered or discovered during works<br/>all works in the vicinity of the material / item would cease and the RTA<br/>Regional Environmental Adviser, Sydney Region and the NSW Heritage<br/>Office contacted. All staff working on the site would be made aware of<br/>this procedure prior to the commencement of works.</li> </ul> |
| Noise and<br>Vibration Effects | <ul> <li>Background noise levels would be measured within the area of proposed<br/>works prior to the commencement of works so that construction noise<br/>levels are monitored with respect to EPA's goals and standards;</li> </ul>   |
|                                | <ul> <li>For works performed outside of normal working hours, the procedures contained in the RTA's Environmental Noise Management Manual, 2001 "Practice Notes vii – Roadworks Outside of Normal Working Hours" would be followed;</li> </ul>  |
|                                | <ul> <li>Noise mitigation measures and best noise management practices would<br/>be developed and adopted by the Contractor(s) and staff during the<br/>Proposal and would be consistent with RTA's Environmental Noise<br/>Management Manual, 2001;</li> </ul>   |
|                                | <ul> <li>Local residences would be contacted prior to works commencing (egletterbox drop, door knock) and complaints contact number provided and</li> </ul>   |
|                                | <ul> <li>A complaints register would be developed and incorporated in the<br/>Contractor(s) Environmental Management Plan. The project<br/>superintendent and RTA's Regional Environmental Officer, Sydney region<br/>would be advised of any complaints.</li> </ul>  |
| Socio – economic               | <ul> <li>All fencing and gates impacted by the Proposal would be replaced where<br/>necessary and provided as per DLWC and Hawkesbury City Council<br/>requirements; and</li> </ul>   |
|                                | <ul> <li>All access would be maintained to all local roads and adjoining propertie<br/>during construction.</li> </ul>  |

# **Proposed Safeguards**

# Visual, Landscape and Urban Design

- The number of native trees removed would be minimised:
- During the detailed design phase consultation would be undertaken with DLWC and Hawkesbury City Council with regards to proposed rehabilitation and landscaping works;
- Extensive landscaping and rehabilitation works would be undertaken in areas disturbed from the Proposal. These works would be consistent with criterion outlined in the Management Plan for Yarramundi Reserve (Hawkesbury City Council);
- All revegetation works would include the use of native plant and grass species local to the area as identified in the Yarramundi Reserve Management Plan; and
- All areas previously disturbed for the construction of temporary weirs would be rehabilitated with material returned to its surrounds or unless specified by representatives from DLWC or Hawkesbury City Council.

# Waste Management & Minimisation

- Unnecessary resource consumption would be avoided as a priority;
- Avoidance would be followed by resource recovery (including reuse of materials, reprocessing, recycling, and energy recover);
- Disposal would be undertaken as a last resource.

All treated timber waste from the Proposal would be handled in the following manner, in accordance with NSW waste management legislation:

- I) Lead Painted Timbers: Following the NSW EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes (1997), lead painted timbers are classified as inert waste under Table I of the guideline. If unable to be recycled or reused this waste would be sent to an appropriate licenced waste handling facility. For the RTA's/contractor's assurance, a verification mechanism would be provided in the disposal contract that ensures that the waste is disposed of to an approved facility.
- 2) Timbers treated or suspected of being treated with creosote or Copper Chrome Arsenic (CCA): The RTA and / Contractor would recycle as much timber from the bridge as possible. The preferred option for disposal is for the timbers to be re-used by the RTA (2a)or sold for recycling to external bidder's (2b).
  - 2a) Re-use by the RTA: Re-use of treated timbers by the RTA would require that a record of the timbers be kept. The timbers would be stored appropriately and records kept of their movement. It is essential that all timbers re-used by the RTA can be traced to ensure that they have been re-used appropriately. The timbers would be stored so that they are inaccessible to the public to prevent theft and inappropriate use of the timbers.

# **Proposed Safeguards**

- 2b) Sale of timbers to external bidders: Where timbers would not be re-used by the RTA, re-use by external organisations is encouraged. In this case a public open tender would be used to seek interest in use of the timber. The tender documents would outline the volume of timber and state whether the timber is treated/potentially treated with creosote and/or CCA. The tender would also state as to whether the timber is unsuitable for domestic uses. The tenderers would provide the RTA and/or Contractor with information on the proposed use of the timber and the mechanisms to ensure that the timber is not used inappropriately
- All bridge materials, surplus soils and all wastes generated from the Proposal would be stockpiled at the compound sites prior to re-use, recycling or disposal.
- All green waste generated from the removal of native vegetation would be mulched and reused in landscaping and rehabilitation works;
- Surplus soil material created as a result of the proposed works would be reused as part of the landscaping works post construction. Any waste material unable to be re-instated as part of the Proposal would be taken to an appropriately licensed landfill;
- Where reuse of materials, waste is not possible, waste would be minimised through recycling progressively from the study area. Recycling and non-recycling waste disposal facilities would be made available to staff / contractor(s) which would be disposed of to a licenced landfill on a regular basis;
- All necessary permits for the removal, transportation and disposal of contaminated waste would be obtained prior to any works being undertaken;
- All working areas would be maintained and cleaned up at the end of each working day;
- Wastes would not be stored for long periods of time during the Proposal. Empty drums of fuels, oils and other chemicals or fluids would not be stored on site during the Proposal;
- Waste types would be identified & classified and different disposal strategies for each material developed in accordance with EPA guidelines; and
- Any contaminated wastes identified or generated during the Proposal would be removed to an EPA approved facility for the purpose of disposal.

### Consultation

 All outstanding issues raised in agency and authority consultation listed as noted in Table 5-1 of this SEE would be negotiated at the detailed design phase of the Proposal.

# 11 CLAUSE 228 AND EPBC ACT (1999) CHECKLIST

# II.I Clause 228 (2) Checklist (NSW Legislation)

The following section has been developed in accordance with Clause 228 of the EP&A Regulation to assist assessment under part 5 of the EP&A Act. It has been retained here to assist Council in its consideration under Clause 79 (c) of the EP&A Act. Those factors have been addressed in **Table 11-1** below to ensure that the likely impacts of the proposed activities on the natural and built environment are fully considered.

### Table II-I Clause 228 factors

| CLAUSE 228 FACTORS  | IMPACT         |
|---|----------------|
|   |                |
| a) Any environmental impact on a community?   |                |
| Short term negative impacts include the disruption to vehicular traffic for periods during construction and visual impact of the works during construction. However, these would be minimised through the implementation of controls and measures detailed in Section 9 of this document. | Short term -ve |
| In the long term, replacement of the bridge would benefit the community by providing a safe travel route combined with cyclist and pedestrian facilities.   | Long term +ve  |
| b) Any transformation of a locality?  |                |
| The Proposal would generally transform the locality in a positive manner by allowing for improved access and transport across the Nepean River, Yarramundi.   | Long term +ve  |
| c) Any environmental impact on the ecosystems of the locality?  |                |
| The Proposal has the potential to impact on riverine and aquatic ecosystems in the form of pollutants or sediments entering waterways. However, this impact would   | Short term -ve |
| be reduced to a minimum by the implementation of mitigation measures outlined in Section 9. It is not anticipated the Proposal would have any long-term impacts on the ecosystems of the locality.  | Long term nil  |
| d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?  |                |
| There would be a short term reduction of the aesthetic and recreational quality and value of the locality during construction, as parking arrangements and river  | Short term -ve |
| foreshore access may be restricted. There would be no reduction of scientific or other environmental quality or value of a locality as a result of this Proposal.   | Long term nil  |
| 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?  |                |
| The Yarramundi Bridge is not registered on the State Heritage Register. There would be no negative effects on any items of historical, aesthetic, cultural, scientific or social significance as a result of the Proposal.  | Nil            |

# f) Any impact on the habitat of any protected or endangered fauna?

No impact on the habitat of any protected or endangered fauna is anticipated as a result of the proposed works.

Nil

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

The Proposal would involve the removal of an area of an Endangered Ecological Community, however the impacts have been investigated in accordance with the eight part test and are not considered to be significant.

Nil

The Proposal would not endanger any species of animal, plant or other form of life living on land, in the water or in the air.

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

The Proposal would have long term positive effects on the environment through improvements to road traffic and pedestrian safety.

Long term +ve

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

There would be short term potential impacts on the environment as a result of the Proposal, including traffic delays, decrease in visual amenity, soil disturbance, clearing of vegetation and reduction in water quality during construction. These would be minimised through the implementation of safeguards outlined in Section 9 of this REF.

short term -ve

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

The Proposal would not cause any risk to the safety of the environment in the long term. There would be some disruption and a short term risk for motorist and worker safety during construction as the works would be undertaken in trafficked conditions. This disruption would be minimised through the implementation of a traffic management plan and mitigation measures as outlined in Section 9.

Short term -ve,

There would be no risk to the safety of the environment due to the mitigation measures to be introduced as part of the EMP to ensure no chemical or other spills occur in the waterways. Hazardous materials would not be stored at the site.

Long term nil.

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

The Proposal would restrict the use of the Nepean River in the immediate area for the duration of the works as in-stream construction would occur during the works. The restrictions would be less than 12 months in duration overall and not be continuous.

Short term -ve,

It is anticipated the Proposal would provide improved access to the reserve for the use of recreational activities.

Long term +ve

# Any pollution of the environment?

Water pollution through the sedimentation, increased turbidity and change in the water's chemical, physical and biological parameters has the potential to occur, during construction. However, this would be minimised through the implementation of safeguards outlined in Section 9 of this REF.

Short term -ve

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

Waste would be generated as a result of the Proposal. Waste from the bridge

Nil

timbers may be treated with Copper Chrome Arsenic. All waste would be disposed of in accordance with relevant legislation and guidelines detailed in Section 9 of this REF.

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

There would be no increased demand on resources, natural or otherwise which are, or are likely to become in short supply.

Nil.

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

The bridge replacement would improve safety and accessibility to the region for road users and visitors to the reserve in the long term.

Long term +ve

# 11.2 EPBC Act (1999) Checklist

An additional six factors must be considered as a requirement of the Commonwealth EPBC Act. Those six factors are addressed in **Table II-2** below to ensure that the likely impacts of the proposed activities on matters of national environmental significance are fully considered. A copy of the EPBC Act search is provided in Appendix C of this REF.

Table 11-2 Factor (Commonwealth Legislation)

|    | FACTOR  | IMPACTS |
|----|---|---------|
| a. | Any Environmental Impact on a World Heritage Property?  The Proposal is not located within and would not have an impact on a World Heritage Property. The nearest World Heritage Area is Blue Mountains National Park, located upstream of the Proposal.  | Nil     |
| b. | Any Environmental Impact on Wetlands of International Importance?  The Proposal would not have any impact on RAMSAR wetlands.   | Nil     |
| C. | Any Environmental Impact on Commonwealth Listed Threatened Species and Ecological Communities?  Potential impacts of the proposal on Commonwealth listed species and ecological communities have been investigated as part of the ecological assessment undertaken for this SEE. Although 2 threatened ecological communities and 28 threatened species have the potential to occur within a 10km radius of the study area, no impacts would occur as a result of the Proposal. | Nil     |
| d. | Any Environmental Impact on Commonwealth Listed Migratory Species?  Potential impacts of the Proposal on Commonwealth listed migratory species have been investigated as part of the ecological assessment undertaken for this SEE. Although 8 migratory species have the potential to occur within a 10km radius of the study area, no impacts would occur as a result of the Proposal.  | Nil     |
| e. | Does Any Part of the Proposal Involve a Nuclear Action?  No part of the Proposal involves a nuclear action.   | Nil     |
| f. | Any Environmental Impact on a Commonwealth Marine Area?  There would be no impact on Commonwealth Marine Areas.   | Nil     |
|    | In addition any Impact on Commonwealth Land?  | Nil     |

# 12 References

Landarc May, 2002. Yarramundi Reserve Draft Plan of Management, Community Issues. Published by Landarc Pty Limited.

LesryK Environmental Consultants, March 2002. Flora and Fauna Assessment Conducted in Relation to the Proposed Removal and Relocation of the Yarramundi Bridge Crossing over the Nepean River, Yarramundi NSW.

LesryK Environmental Consultants (2002) Targeted surveys for threatened terrestrial and aquatic fauna species, Nepean river crossing, Yarramundi, NSW. Report prepared for the NSW Roads and Traffic Authority by LesryK Environmental Consultants, Bundeena, NSW.

NSW Fisheries 1999. NSW Fisheries Policy and Guidelines for Bridges, Roads, Causeways, Culverts and Similar Structures. Guidelines published by NSW Fisheries;

NSW Fisheries 1999. NSW Fisheries Policy and Guidelines for Aquatic Habitat Management and Fish Conservation 1999. Guidelines published by NSW Fisheries;

RTA 2001. Stockpile Management Procedures. NSW Roads and Traffic Authority, Sydney, NSW;

RTA 2001. Environmental Impact Assessment Policy, Guidelines, Procedures. NSW RTA, Sydney;

RTA 2001. RTA Environmental Noise Management Manual. NSW RTA, Sydney;

RTA Operations, Environmental Technology, May 2002. Draft Review of Environmental Factors: Proposed replacement of the Yarramundi Bridge over the Nepean River at Yarramundi.

RTA Operations, Environmental Technology November 2000. Review of Environmental Factors: Proposed Yarramundi Bridge Repairs, Springwood Road, Agnes Banks.

# APPENDIX B: Concept Design



# ROADS AND TRAFFIC AUTHORITY OF NSW

MAIN ROAD No. 570

CITY OF HAWKESBURY

# YARRAMUNDI BRIDGE REPLACEMENT APPROACH ROADWORKS

# SCHEDULE OF DRAWINGS

COVER SHEET

SHEET 2 - INDEX

SHEET 3 - TYPICAL CROSS SECTIONS AND DETAILS

SHEET 4 - GENERAL ARRANGEMENT PLAN
SHEET 5 - ALIGNMENT CONTROL 0.000 TO 340.0

SHEET 6 - PAVEMENT PLAN

SHEET 7 - PAVEMENT PLAN
SHEET 7 - DESIGN CONTOURS

SHEET 8 - LONGITUDINAL SECTION

SHEET 9 - CROSS SECTIONS - 10.0 TO 40.0 SHEET 10 - CROSS SECTIONS - 50.0 TO 100.0

SHEET 11 - CRUSS SECTIONS - 50.0 TO 100.0

SHEET 11 - CRUSS SECTIONS - 190.0 TO 240.0

SHEET 12 - CROSS SECTIONS - 250.0 TO 300.0

SHEET 13 - CROSS SECTIONS - 310.0 TO 340.0

# ASSUCIATED DRAWINGS

BRIDGE OVER NEPEAN RIVER AT YARRAMUNDI

0570 091 BC 0170

# FOR TENDER

| B REVISED HORIZONTAL ALIGNMENT  |      | 20.11                | COMPUTER FILE REFERENCES   | GHD                           | RDADS AND TRAFFIC AUTHURITY UF N.S.W.                            |
|---------------------------------|------|----------------------|--|-------------------------------|--|
| A DRAFT - ISSUED FOR RTA REVIEW |      | 15.11                | BUNKEL MIDDET : CHO  | GITE                          | M.R. 570 - HAWKESBURY ROAD (SPRINGWOOD ROAD)                     |
| No AMENDMENT DETAIL SCALES      | AUTH | DATE<br>DATUM<br>AHD |  | DESIGNED. J.P.  ONEDKED. M.F. | HAWKESBURY CITY COUNCIL  YARRAMUNDI BRIDGE REPLACEMENT  INDEX 13 |
|                                 |      | GRID<br>ISG          | RDABLDC - START - 9(570,1860,A1,2:3651<br>FIRISH: 9(570,1860,A1,2:3651 | RECOMENCES.                   | FILE 02M5801 REG No. 0570 091 RC 3000 SHEET                      |
|                                 |      |                      |  |                               | DRAWN BY CADD DO NOT AMEND MANUALLY                              |



# M.R. 570 HAWKESBURY ROAD (SPRINGWOOD ROAD) HAWKESBURY CITY COUNCIL

# YARRAMUNDI BRIDGE REPLACEMENT

# APPROACH ROADWORKS 4.0 km SOUTH WEST OF RICHMOND

# Not to Scale OGGA WIGGO SITE OF WORK HAP REPRODUCED WITH THE PERPASSION OF URD. COPYRIGHT UNWERSAL PRESS FITY, LTD, DO 08-07-2).

| RECOMMENDE     | D FOR APPROVAL |
|----------------|----------------|
| DESIGN MANAGER | DATE           |
|                |                |

| CLIENT A        | PPROVAL |
|-----------------|---------|
| PROJECT MANAGER | DATE    |
| RS&TDM MANAGER  | DATE    |

# PREPARED BY



10 Bond Street, Sydney, NSW, 2000 Telephone (02) 9239 7100 Facsimile (02) 9239 7199 Ernaît: sydmoil@ghd.com.au

Gutteridge Haskins & Davey Pty Ltd - ACN 008 488 373

# CLIENT

ROADS AND TRAFFIC AUTHORITY NSW SYDNEY MAINTENANCE CONTRACTS SECTION

PLAN REGISTRATION No.

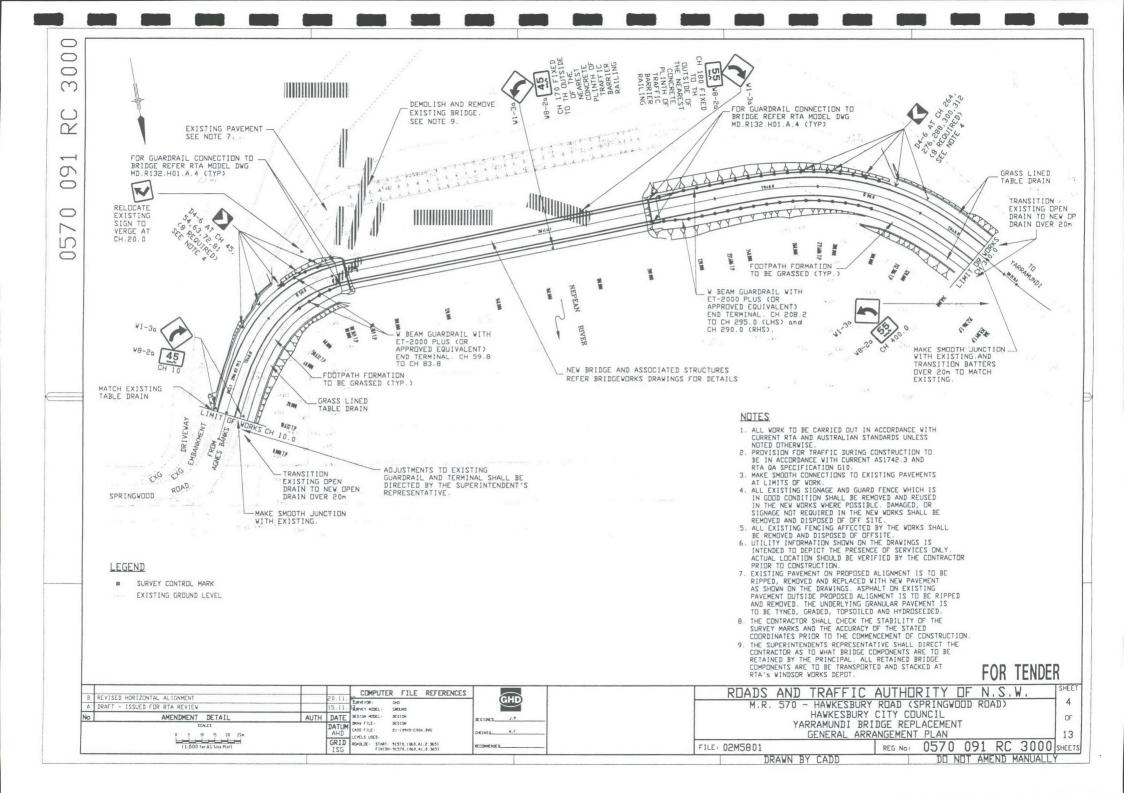
0570-091-RC-3000

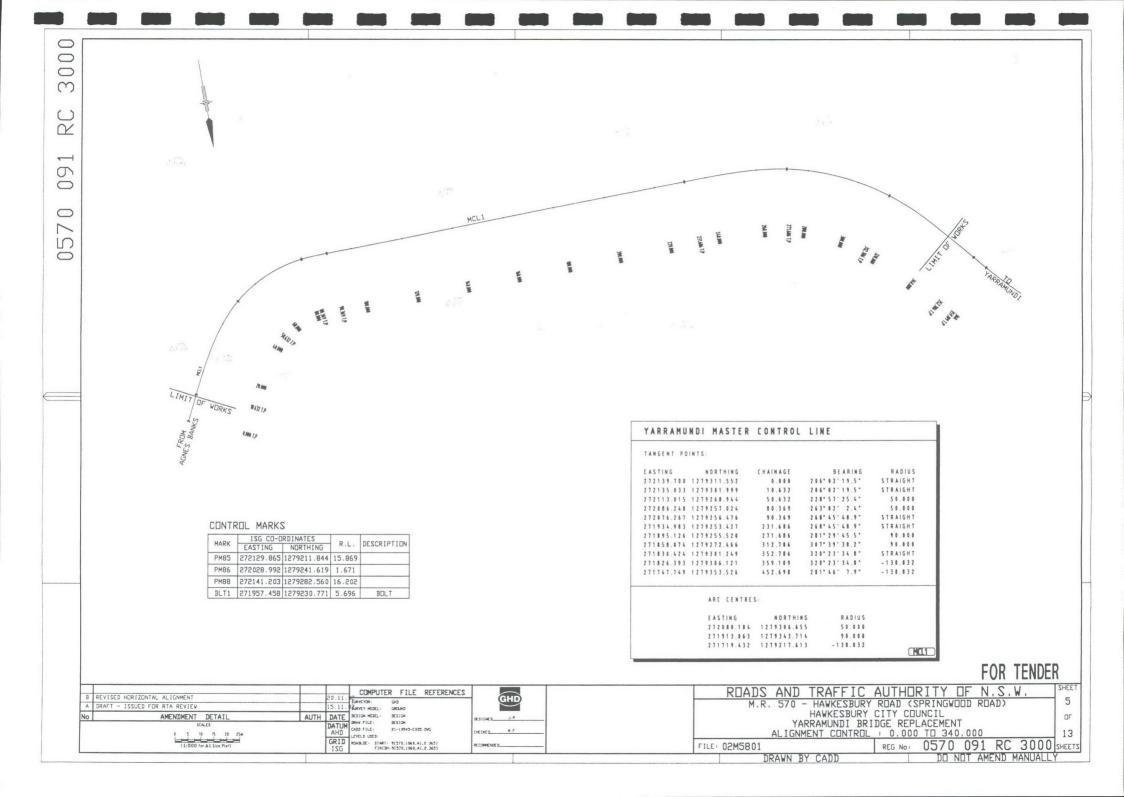
| FILE No.<br>02M5801   | ISSUE        | SHEET No. |
|-----------------------|--------------|-----------|
| CREATED<br>13/11/2002 | В            | 1 of 13   |
| RO                    | DADLOC CO-OF | RDINATES  |

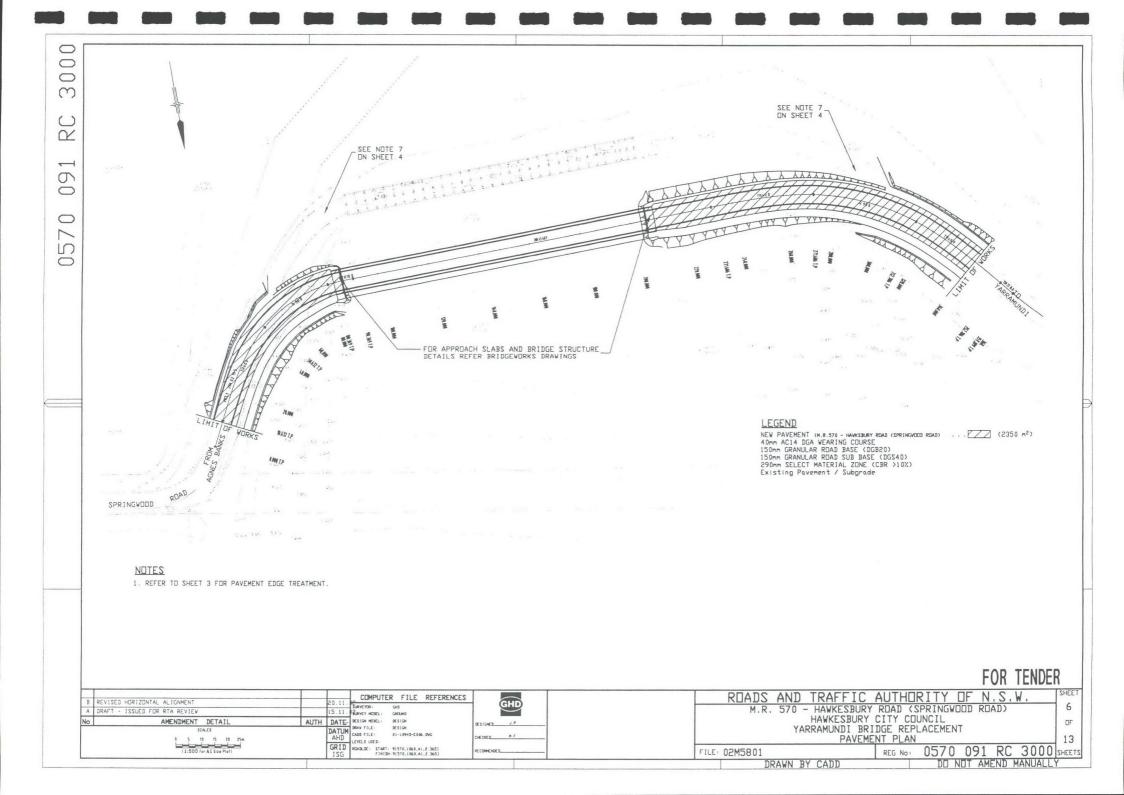
9[570,1060,A1,2.365] TO 9[570,1060,A1,2.385]

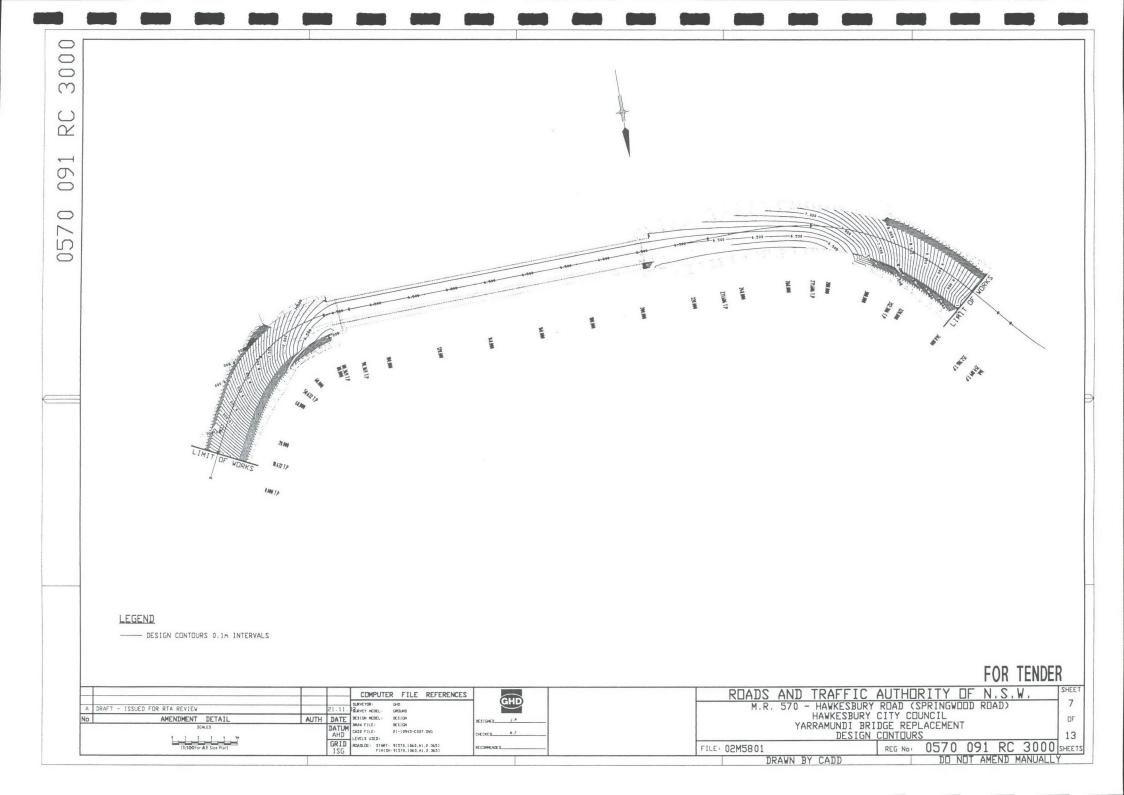
DRAWN BY CADD

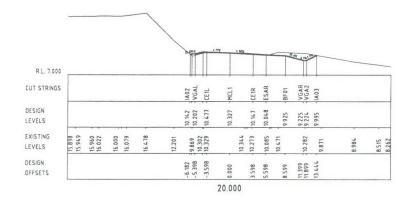
DO NOT AMEND MANUALLY

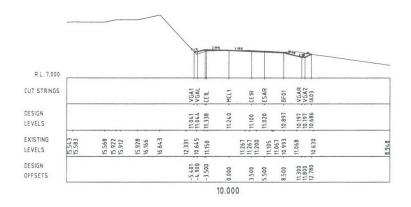


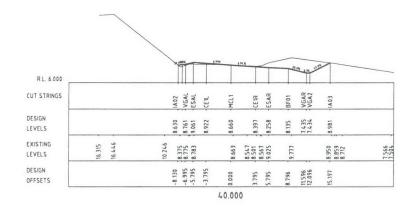


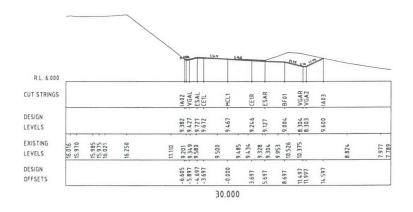






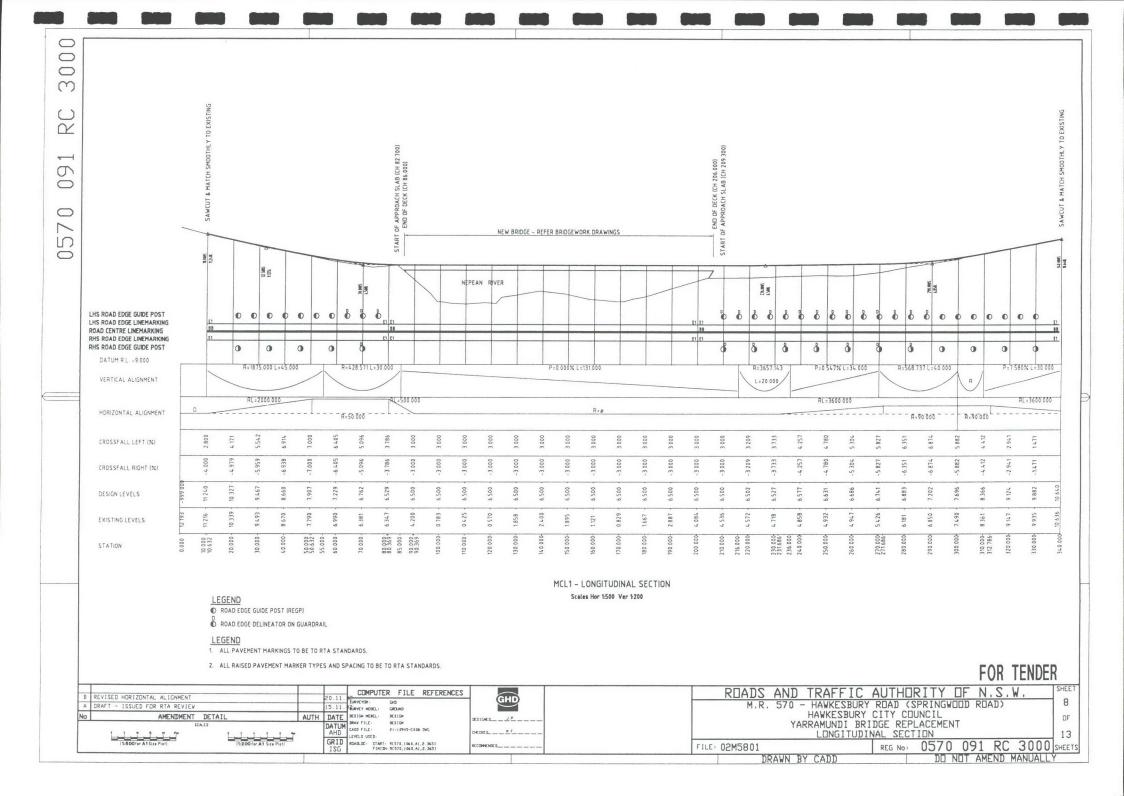


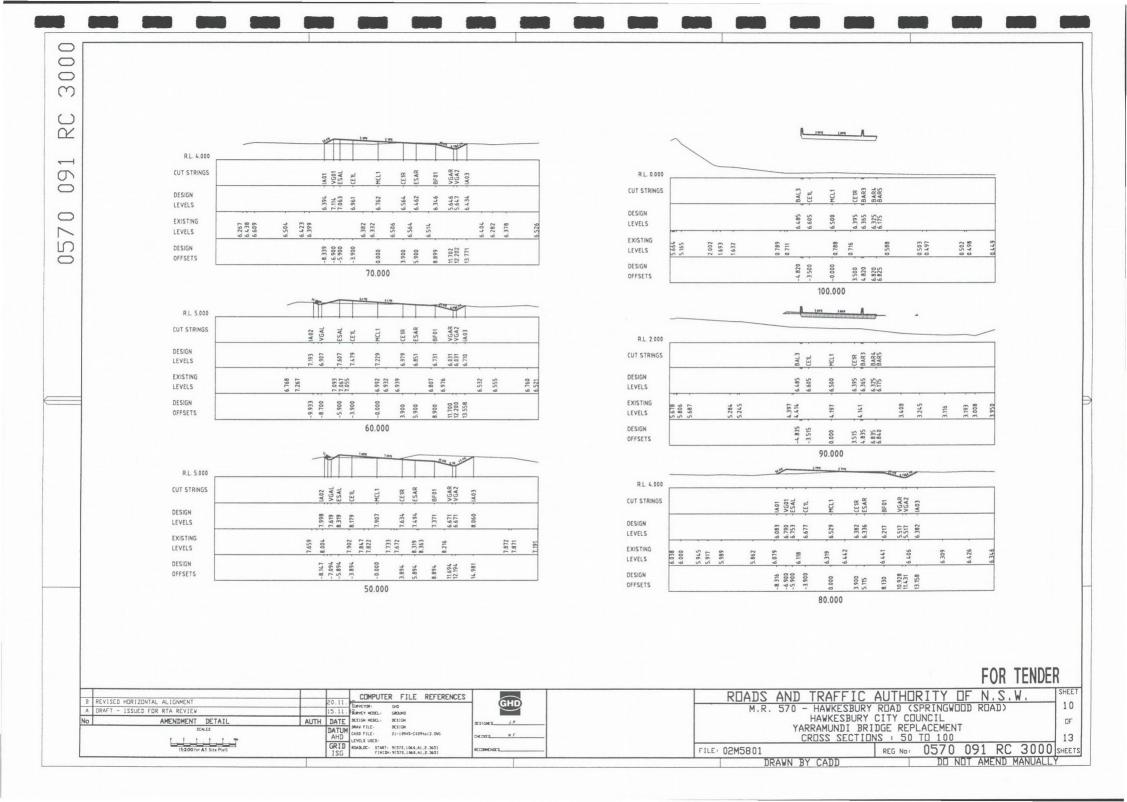


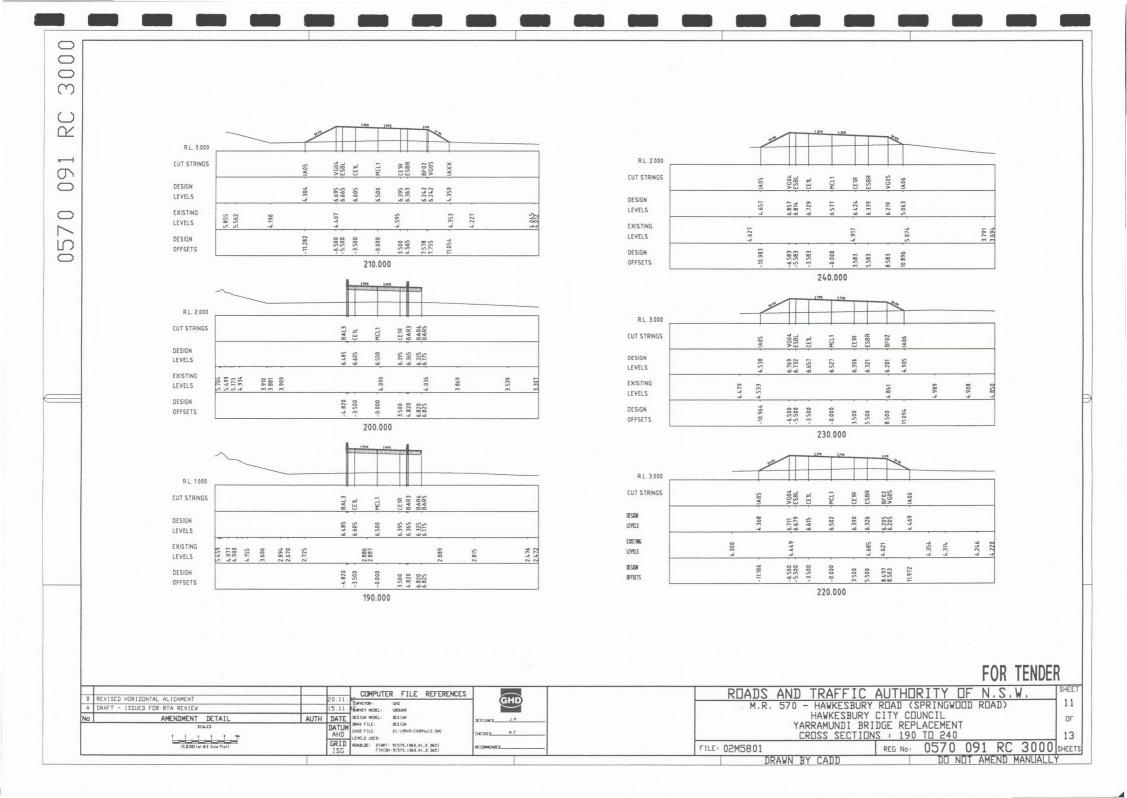


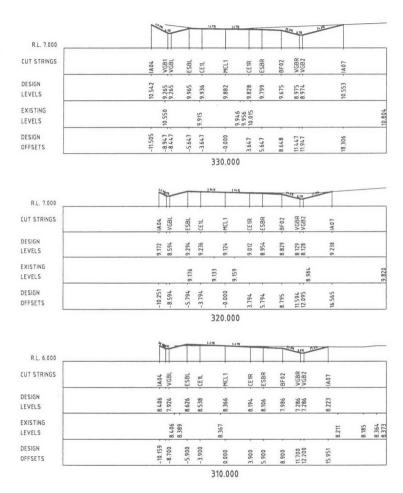
# FOR TENDER

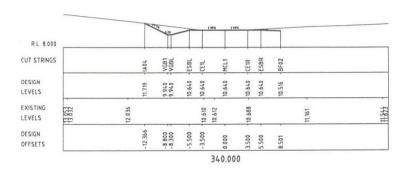
| B REVISED HORIZONTAL ALIGNMENT                               | 20.1      | COMPUTER FILE REFERENCES | GHD                        | 112120 1112 11111 120       | AUTHORITY OF N.S.W.   | SHEET |
|--|-----------|--------------------------|----------------------------|-----------------------------|---|-------|
| A DRAFT - ISSUED FOR RTA REVIEW  NO AMENDMENT DETAIL  SCALES | AUTH DAT  |                          | DESIGNED J.P. DECOTO. H.F. | HAWKESBURY                  | ROAD (SPRINGWOOD ROAD) CITY COUNCIL DGE REPLACEMENT NS : 10 TO 40 | 0F    |
| (1:200 for A1 Size Plat)                                     | GR1<br>1S | TD                       | RECOMENSES.                | FILE 02M5801  DRAWN BY CADD | REG NO: 0570 091 RC 3000  |       |











# FOR TENDER

| D. OCULOGO HODIZONIA ALIGNIGUE                                 | COMPUTER FILE REFERE                     | ENCES          | ROADS AND TRAFFIC AUTHORITY OF N.S.W.                 |
|--|--|----------------|---|
| B REVISED HORIZONTAL ALIGNMENT A DRAFT - ISSUED FOR RTA REVIEW | 15.11. Superty model. GROUND             | GHD            | M.R. 570 - HAWKESBURY ROAD (SPRINGWOOD ROAD) 13       |
| No AMENDMENT DETAIL  | AUTH DATE DESIGN MODEL DESIGN            | DESIGNED. J.P. | HAWKESBURY CITY COUNCIL YARRAMUNDI BRIDGE REPLACEMENT |
| SCALES   | AHD LEVELS USED                          | OEDED N.F      | CROSS SECTIONS : 310 - 340 13                         |
| (1:200 for A1 Size Plot)                                       | ISG PRADLOC: START: 9(570,1068,A1,2.365) | RECOMENDED.    | FILE: 02M5801 REG No: 0570 091 RC 3000 SHEETS         |
|  |  |                | DRAWN BY CADD DO NOT AMEND MANUALLY                   |

# **APPENDIX C:** Results of Database Searches

# Anvironment Protection and Biodiversity Conservation Act Online Database

Report created on: Thursday, Nov 28 2002

Report on: threatened ecological communities, threatened species, marine protected species,

migratory species and, Ramsar sites, Commonwealth areas, World Heritage Areas

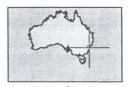
Search type: point

**Approx buffer :** 10 km (minimum buffer is approx 1km)

**Coordinates used:** 

Longitude Latitude

150.699 -33.61



view map

Threatened ecological communities

2 communities

Threatened species

28 species

**Migratory species** 

8 species

Marine protected species

8 species

World Heritage Areas [dataset information]

THE GREATER BLUE MOUNTAINS AREA

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]

Blue Mountains National Park

Agnes Banks Nature Reserve

Castlereagh Nature Reserve

**Regional Forest Agreements** 

Note: all RFA areas including those still under consideration have been included [dataset

information]

None found

### **Species and Community Report**

This report provides a general indication of the species and threatened communities that may occur in your nominated area

#### Threatened ecological communities

| Community Name                    | Status     | Type of Presence |
|-----------------------------------|------------|------------------|
| Cumberland Plain Woodlands        | Endangered |                  |
| Shale/Sandstone Transition Forest | Endangered |                  |

#### **Threatened species**

|          | Scientific Name                                      | Common Name   | Type of Presence  | Status     |
|----------|--|---|---|------------|
| Amphibia | Heleioporus<br>australiacus<br>(1973)                | Giant Burrowing Frog  | Species or species habitat likely to occur within area  | Vulnerable |
| Amphibia | Mixophyes balbus (1942)                              | Stuttering Frog   | Species or species habitat likely to occur within area  | Vulnerable |
| Amphibia | Mixophyes iteratus (1944)                            | Southern Barred Frog  | Species or species habitat likely to occur within area  | Endangered |
| Aves     | Lathamus discolor (744)                              | Swift Parrot  | Species or species habitat<br>likely to occur within<br>area - Derived from a<br>general distribution map<br>> 1 degree | Endangered |
| Aves     | Xanthomyza<br>phrygia<br>(430)                       | Regent Honeyeater   | Species or species habitat<br>likely to occur within<br>area - Derived from a<br>general distribution map<br>> 1 degree | Endangered |
| Mammalia | Chalinolobus<br>dwyeri<br>(183)                      | Large-eared Pied Bat,<br>Large Pied Bat   | Species or species habitat<br>likely to occur within<br>area - Derived from a<br>general distribution map<br>> 1 degree | Vulnerable |
| Mammalia | Dasyurus maculatus<br>maculatus (s. lat.)<br>(64476) | Spot-tailed Quoll,<br>Spotted-tail Quoll,<br>Tiger Quoll (south-east<br>mainland and<br>Tasmanian subspecies) | Species or species habitat likely to occur within area  | Vulnerable |
| Mammalia | Petrogale penicillata (225)                          | Brush-tailed Rock-<br>wallaby   | Species or species habitat<br>likely to occur within<br>area - Derived from a<br>general distribution map<br>> 1 degree | Vulnerable |

| Mammalia     | Potorous tridactylus tridactylus (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     | Pteropus poliocephalus (186)             | Grey-headed Flying-fox           | Species or species habitat likely to occur within area  | Vulnerable |
| Osteichthyes | Macquaria<br>australasica<br>(66632)     | Macquarie Perch                  | Species or species habitat likely to occur within area  | Endangered |
| Osteichthyes | Prototroctes<br>maraena<br>(26179)       | Australian Grayling              | Species or species habitat likely to occur within area  | Vulnerable |
| Plant        | Acacia bynoeana (8575)                   | Bynoe's Wattle, Tiny<br>Wattle   | Species or species habitat likely to occur within area  | Vulnerable |
| Plant        | Acacia gordonii (5031)                   |                                  | Species or species habitat likely to occur within area  | Endangered |
| Plant        | Allocasuarina glareicola (21932)         |                                  | Species or species habitat likely to occur within area  | Endangered |
| Plant        | Cynanchum elegans (12533)                | White-flowered Wax<br>Plant      | Species or species habitat likely to occur within area  | Endangered |
| Plant        | Dillwynia tenuifolia (13149)             |                                  | Species or species habitat<br>likely to occur within<br>area - Derived from a<br>general distribution map<br>> 1 degree | Vulnerable |
| Plant        | Epacris sparsa (16450)                   | -                                | Species or species habitat likely to occur within area  | Vulnerable |
| Plant        | Haloragodendron lucasii (6480)           | Hal                              | Species or species habitat likely to occur within area  | Endangered |
| Plant        | Melaleuca deanei (5818)                  | Deane's Melaleuca                | Species or species habitat likely to occur within area  | Vulnerable |
| Plant        | Micromyrtus<br>minutiflora<br>(11485)    |                                  | Species or species habitat likely to occur within area  | Vulnerable |
| Plant        | Olearia cordata (6710)                   |                                  | Species or species habitat likely to occur within area  | Vulnerable |
| Plant        | Persoonia nutans (18119)                 |                                  | Species or species habitat likely to occur within area  | Endangered |
|              |  |                                  |   |            |

| Plant    | Pomaderris brunnea (16845)             | Rufous Pomaderris  | Species or species habitat likely to occur within Vulnerable area |
|----------|--|--------------------|---|
| Plant    | Pultenaea glabra (11887)               |                    | Species or species habitat likely to occur within Vulnerable area |
| Plant    | Pultenaea parviflora (19380)           | -                  | Species or species habitat likely to occur within Vulnerable area |
| Plant    | Tetratheca<br>glandulosa<br>(2350)     |                    | Species or species habitat likely to occur within Vulnerable area |
| Reptilia | Hoplocephalus<br>bungaroides<br>(1182) | Broad-headed Snake | Species or species habitat likely to occur within Vulnerable area |

| Terrestrial species co                  | vered by migrator            | ry provisions of the EPBC Act, 1999   |
|---|------------------------------|---|
| Scientific Name                         | Common Name                  | Type of Presence  |
| Aves Haliaeetus<br>leucogaster<br>(943) | White-bellied<br>Sea-Eagle   | Species or species habitat likely to occur within area  |
| Aves Hirundapus<br>caudacutus<br>(682)  | White-throated<br>Needletail | Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree   |
| Aves Monarcha<br>melanopsis<br>(609)    | Black-faced<br>Monarch       | Breeding or breeding habitat likely to occur within area - Derived from a general distribution map > 1 degree |
| Aves Myiagra<br>cyanoleuca<br>(612)     | Satin Flycatcher             | Breeding or breeding habitat likely to occur within area  |
| Aves Rhipidura<br>rufifrons<br>(592)    | Rufous Fantail               | Breeding or breeding habitat likely to occur within area - Derived from a general distribution map > 1 degree |
| Aves Xanthomyza<br>phrygia<br>(430)     | Regent<br>Honeyeater         | Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree   |

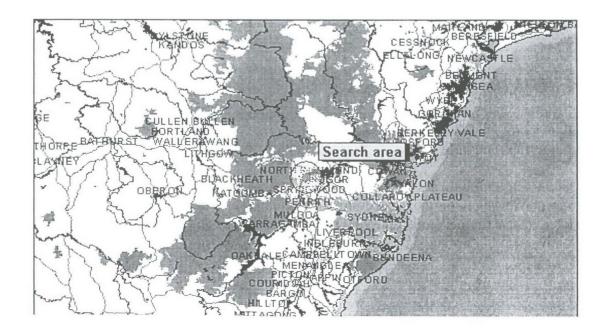
| Wetland species covered                          | l by migratory pro                | ovisions of the EPBC Act, 1999  |
|--|-----------------------------------|---|
| Scientific Name                                  | Common Name                       | Type of Presence  |
| Aves Gallinago<br>hardwickii<br>(863)            | Latham's Snipe,<br>Japanese Snipe | Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree |
| Aves Rostratula<br>benghalensis s. lat.<br>(889) | Painted Snipe                     | Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree |

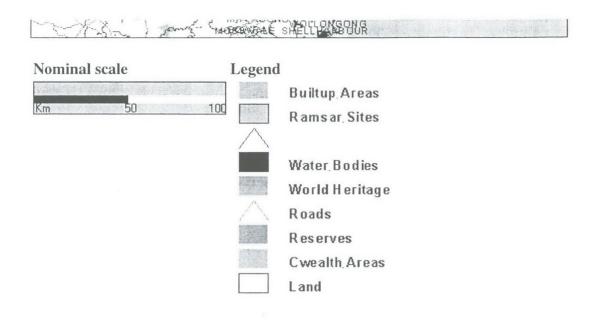
#### Species covered by marine provisions of the EPBC Act, 1999

| Scientific Name                                | Common Name                       | Type of Presence  | Status              |
|--|-----------------------------------|---|---------------------|
| Aves <u>Gallinago</u><br>hardwickii<br>(863)   | Latham's Snipe,<br>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><br>leucogaster<br>(943) | White-bellied<br>Sea-Eagle        | Species or species habitat likely to occur within area  | Listed              |
| Aves Hirundapus<br>caudacutus<br>(682)         | White-throated<br>Needletail      | Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree   | Overfly marine area |
| Aves Lathamus<br>discolor<br>(744)             | Swift Parrot                      | Species or species habitat likely to occur within area - Derived from a general distribution map > 1 degree   | Overfly marine area |
| Aves Monarcha<br>melanopsis<br>(609)           | Black-faced<br>Monarch            | Breeding or breeding habitat likely to occur within area - Derived from a general distribution map > 1 degree | Overfly marine area |
| Aves Myiagra<br>cyanoleuca<br>(612)            | Satin Flycatcher                  | Breeding or breeding habitat likely to occur within area  | Overfly marine area |
| Aves Rhipidura rufifrons (592)                 | Rufous Fantail                    | Breeding or breeding habitat likely to occur within area - Derived from a general distribution map > 1 degree | Overfly marine area |
| Aves Rostratula benghalensis s. lat. (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 occasionaly visit the Commonwealth marine area.

#### Map of area defined including buffer





### 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:

- o New South Wales National Parks and Wildlife Service
- o Department of Natural Resources and Environment, Victoria (Secretary)
- o Department of Primary Industries, Water and Environment, Tasmania
- o Department of Environment and Heritage, South Australia Planning SA
- o Parks and Wildlife Commission of the Northern Territory
- o Queensland Environment Protection Agency
- o Birds Australia
- o Australian Bird and Bat Banding Scheme
- o Australian National Wildlife Collection
- o Natural history museums of Australia
- o Queensland Herbarium
- o Royal Botanic Gardens and National Herbarium of NSW
- o Royal Botanic Gardens and National Herbarium of Victoria
- o Tasmanian Herbarium
- o State Herbarium of South Australia
- o Northern Territory Herbarium
- o Western Australian Herbarium
- o Australian National Herbarium, Atherton and Canberra
- o University of New England
- o 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

For further information see <a href="http://www.environment.gov.au/epbc">http://www.environment.gov.au/epbc</a>





#### What is the weather usually like?

- Climate Averages for Australian Sites -

#### Averages for RICHMOND RAAF

Make sure you understand what the Climate Averages are all about before you make use of the following information. A comma separated text file of these averages is also available for download which can be graphed in software such as a spreadsheet

| 067033<br>Latitude: |          | ND RAAL |         | de: 150 | .7794 E |      | Commence<br>vation: | ed: 192<br>19.0 |      |      | rd: 1994<br>NSW |      |      |    |
|---------------------|----------|---------|---------|---------|---------|------|---------------------|-----------------|------|------|-----------------|------|------|----|
| JAN                 | FEB      | MAR     | APR     | MAY     | JUN     | JUL  | AUG                 | SEP             | OCT  | NOA  | DEC             | ANN  | No.  |    |
| Mean Dail           | y Max Te | mp (de  | g C)    |         |         |      |                     |                 |      |      |                 |      |      |    |
| 29.6                | 28.6     | 27.0    | 23.9    | 20.3    | 17.6    | 17.2 | 18.8                | 21.6            | 24.5 | 26.8 | 28.7            | 23.7 | 55.1 | 83 |
| Mean no.            | Days, Ma | x >= 4  | 0.0 deg | C       |         |      |                     |                 |      |      |                 |      |      |    |
| 0.9                 | 0.6      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0  | 0.0                 | 0.0             | 0.0  | 0.2  | 0.6             | 2.4  | 45.3 | 83 |
| Mean no.            | Days, Ma | x >= 3  | 5.0 deg | C       |         |      |                     |                 |      |      |                 |      |      |    |
| 5.1                 | 3.0      | 1.3     | 0.0     | 0.0     | 0.0     | 0.0  | 0.0                 | 0.1             | 0.6  | 2.2  | 4.2             | 16.5 | 45.3 | 83 |
| Mean no.            | Days, Ma | x >= 3  | 0.0 deg | C       |         |      |                     |                 |      |      |                 |      |      |    |
| 13.8                | 10.6     | 7.0     | 1.3     | 0.0     | 0.0     | 0.0  | 0.1                 | 0.8             | 3.8  | 7.8  | 12.6            | 57.8 | 45.3 | 83 |
| Highest M           | ax Temp  | (deg C  | )       |         |         |      |                     |                 |      |      |                 |      |      |    |
| 47.8                | 43.7     | 41.9    | 38.2    | 30.0    | 26.8    | 27.6 | 32.8                | 35.9            | 40.4 | 43.6 | 43.6            | 47.8 | 56.5 | 86 |
| Mean Dail           | y Min Te | mp (de  | g C)    |         |         |      |                     |                 |      |      |                 |      |      |    |
| 17.4                | 17.4     | 15.5    | 11.8    | 7.9     | 5.1     | 3.6  | 5.0                 | 7.5             | 11.0 | 13.7 | 15.9            | 10.9 | 57.2 | 87 |
| Mean no.            | Days, Mi | n =< 2  | .0 deg  | C       |         |      |                     |                 |      |      |                 |      |      |    |
| 0.0                 | 0.0      | 0.0     | 0.1     | 2.1     | 7.3     | 12.4 | 8.3                 | 1.7             | 0.1  | 0.0  | 0.0             | 32.0 | 47.4 | 86 |
| Mean no.            | Days, Mi | n =< 0  | .0 deg  | C       |         |      |                     |                 |      |      |                 |      |      |    |
| 0.0                 | 0.0      | 0.0     | 0.0     | 0.4     | 2.8     | 5.3  | 2.6                 | 0.2             | 0.0  | 0.0  | 0.0             | 11.3 | 47.4 | 86 |

http://www.bom.gov.au/climate/averages/tables/cw\_067033.shtml

6/05/2002

Page 2 of 3

| Climate averages by number   |            |       |      |       |      |       |       |       |        |      |    |
|--|------------|-------|------|-------|------|-------|-------|-------|--------|------|----|
| Lowest Min Temp (deg C)<br>8.9 6.4 3.9 1.1   | -2.4       | -6.7  | -8.3 | -3.6  | -1.2 | 1.7   | 3.6   | 5.0   | -8.3   | 58.3 | 83 |
| Mean 9am Air Temp (deg C) 22.1 21.4 20.1 16.6  | 12.3       | 9.3   | 8.0  | 10.4  | 14.1 | 17.6  | 19.6  | 21.4  | 16.0   | 47.0 | 86 |
| Mean 9am Wet-bulb Temp (deg C)<br>18.9 18.8 17.5 14.5  | 10.8       | 8.0   | 6.6  | 8.3   | 11.0 | 13.9  | 15.7  | 17.6  | 13.4   | 46.9 | 85 |
| Mean 9am Dew Point Temp (deg C<br>16.7 17.2 15.6 12.7  | 9.3        | 6.4   | 4.7  | 5.7   | 7.6  | 10.3  | 12.4  | 14.7  | 11.1   | 46.9 | 85 |
| Mean         9am         Relative         Humidity         (%)           73         78         77         79 | 83         | 84    | 81   | 75    | 67   | 65    | 66    | 68    | 75     | 46.9 | 85 |
| Mean 9am Wind Speed (km/hr)<br>5.0 4.8 4.7 4.1   | 4.0        | 4.4   | 4.7  | 6.0   | 6.7  | 8.2   | 7.7   | 6.4   | 5.5    | 36.3 | 66 |
| Mean 3pm Air Temp (deg C) 28.0 27.3 25.9 23.1  | 10.4       | 16.8  | 16.5 | 18.0  | 20.7 | 23.1  | 25.2  | 27.4  | 22.6   | 44.3 | 81 |
| 28.0 27.3 25.9 23.1  Mean 3pm Wet-bulb Temp (deg C) 20.5 20.4 19.2 16.8                                      | 19.4       | 12.0  | 11.1 | 11.7  | 13.5 | 15.6  | 17.5  | 19.2  | 15.9   | 44.3 | 81 |
| Mean 3pm Dew Point Temp (deg C<br>15.5 16.0 14.4 11.6  | 9.3        | 6.9   | 5.0  | 4.6   | 6.0  | 8.7   | 11.1  | 13.3  | 10.2   | 44.3 | 81 |
| Mean 3pm Relative Humidity (%) 51 54 53 51   | 55         | 54    | 49   | 44    | 42   | 45    | 46    | 46    | 49     | 44.3 | 81 |
| Mean 3pm Wind Speed (km/hr)<br>13.5 12.6 11.9 10.7   | 9.2        | 10.1  | 11.5 | 14.6  | 16.5 | 16.3  | 16.7  | 15.4  | 13.2   | 33.7 | 61 |
| Mean Rainfall (mm)   | 7.2        | 10.1  | 11.5 | 14.0  | 10.5 | 10.5  | 10.7  | 13.4  | 13.2   | 33   | 01 |
| 93.3 105.6 92.1 70.3<br>Median (Decile 5) Rainfall (m  | 58.8<br>m) | 56.4  | 35.9 | 45.8  | 40.2 | 64.1  | 76.1  | 71.7  | 810.3  | 58.9 | 89 |
| 75.6 78.4 74.8 45.3 Decile 9 Rainfall (mm)   | 29.4       | 32.7  | 24.4 | 21.2  | 30.5 | 53.0  | 61.8  | 56.2  | 835.6  | 55   |    |
| 190.0 263.7 183.7 170.1 Decile 1 Rainfall (mm) 18.0 10.6 22.4 16.6   | 7.8        | 155.6 | 80.8 | 3.4   | 89.8 | 147.8 | 153.8 | 165.2 | 1092.9 | 55   |    |
| Mean no. of Raindays 10.9 11.1 11.2 9.1  | 8.5        | 8.1   | 6.4  | 7.5   | 7.6  | 9.6   | 10.3  | 9.9   | 110.3  | 58.7 | 89 |
| Highest Monthly Rainfall (mm) 322.9 421.6 342.9 317.6  | 391.8      |       |      | 346.4 |      | 210.6 | 395.8 | 235.2 | 110.5  | 58.9 | 89 |
| Lowest Monthly Rainfall (mm) 7.4 1.3 3.6 0.8   | 1.0        | 1.6   | 0.3  | 0.0   | 1.3  | 0.5   | 7.4   | 0.8   |        | 58.9 | 89 |
| Highest Recorded Daily Rain (m<br>118.1 172.2 163.8 163.1  |            | 107.7 | 86.9 | 199.6 | 97.8 | 82.8  | 104.4 | 77.2  | 199.6  | 58.8 | 89 |
| Mean no. of Clear Days<br>5.8 4.9 6.4 7.3  | 7.6        | 8.6   | 10.7 | 11.1  | 9.7  | 6.9   | 6.3   | 6.1   | 91.3   | 48.0 | 87 |
| Mean no. of Cloudy Days<br>12.9 12.4 12.2 9.6  | 10.4       | 9.4   | 7.2  | 7.4   | 8.2  | 11.0  | 11.3  | 11.2  | 123.2  | 48.0 | 87 |

Mean Daily Sunshine (hrs)
7.1 6.7 6.4 6.3 5.5 5.7 6.3 7.5 7.7 7.7 7.7 7.8 6.9 19.0 100

Maximum Wind Gust (km/hr)
105.5 114.8 122.4 88.9 96.5 109.4 126.0 111.2 116.6 114.8 109.4 135.4 135.4 27.8 53

Mean Daily Evaporation (num)
6.3 5.4 4.4 3.3 2.1 1.8 2.0 3.1 4.3 5.4 5.9 7.0 4.3 24.1 99

Last modified 28 May 2001

Home | Learn about Meteorology | Publications | News | About Us | Search | Help | Feedback Weather and Warnings | Climate | Hydrology | About Services | Registered Users | SILO

© Copyright Commonwealth of Australia 2002, Bureau of Meteorology (ABN 92 637 533 532)
Please note the Copyright Notice and Disclaimer relating to the use of the information on this site and our site Privacy Policy.
Users of these web pages are deemed to have read and accepted the conditions described in the Copyright Notice and Disclaimer.

WEATHER & WARNINGS | CLIMATE | HYDROLOGY | ABOUT SERVICES | REGISTERED USERS

Weather: National | Victoria | NSW | ACT | Queensland | South Aus | Western Aus | Nthn. Territory | Tasmania

#### Climate information for selected stations

Return to Australia Ma

Station name: Richmond RAAF (67033)

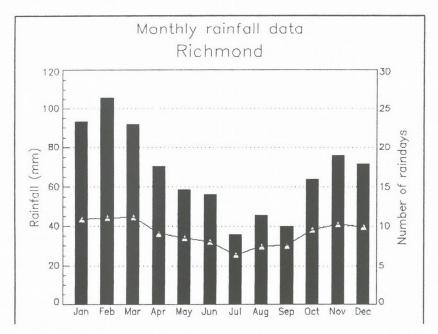
Elevation: 19 metres

Latitude: 33.60° South

Longitude: 150.78° East

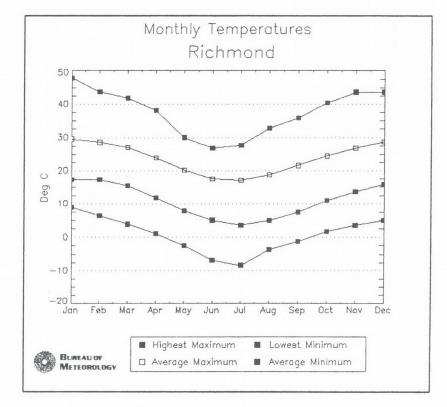


#### Monthly Rainfall and Raindays





#### **Monthly Temperature**



Home | Learn about Meteorology | Publications | News | About Us | Search | Help | Feedback Weather and Warnings | Climate | Hydrology | About Services | Registered Users | SILO

© Copyright Commonwealth of Australia 2002, Bureau of Meteorology (ABN 92 637 533 532)
Please note the Copyright Notice and Disclaimer relating to the use of the information on this site and our site <u>Privacy Policy</u>.
Users of these web pages are deemed to have read and accepted the conditions described in the Copyright Notice and Disclaimer.

7th October 2000

RTA Operation — Environmental Technology Level 3, Rothchild Ave ROSEBERY NSW 2018

Our Ref: ASR#8192

Dear Sir or Madam,

RE: Aboriginal sites search, Yarramundi Bridge, Agnes Banks.

PARKSA WILDLY STEPLY OF THE ST

NSW NATIONAL PARKS AND WILDLIFE SERVICE

Reference is made to your recent enquiry in respect to whether any Aboriginal sites are registered at the above location.

A search of the National Parks and Wildlife Service's (NPWS) Aboriginal Sites Register database has shown that 5 known Aboriginal sites is currently recorded in or near the proposed development area (refer attached report for any site details & the area that was searched).

The following qualifications apply to the Aboriginal Sites Register database;

- The database only includes recorded sites.
- Large areas of New South Wales have not been the subject of systematic survey or the recording of Aboriginal history. These areas may contain sites which are not currently listed on the Aboriginal Sites Register.
- Site records come from a variety of sources and are variable in their accuracy. When a
  database search identifies sites in or near the area it is recommended that the exact location
  of the sites be determined by relocation on the ground.
- The criteria used to search the database are derived from information provided by the client and assume that this information is correct.
- This information can only be used for the purpose it was requested for and can not be made available to the public.

You should be aware that all Aboriginal sites are protected under the National Parks and Wildlife Act 1974, regardless of their inclusion on the Sites Register, and it is an offence to damage or destroy them without the prior permission of the Director-General of the NPWS.

In determining development applications under the Environmental Planning and Assessment Act 1979, local councils must include matters relating to Aboriginal heritage in the decision making process. As part of this process, the NPWS may be asked for advice on whether an area proposed for development should be subject to Aboriginal heritage assessment. NPWS advice is broadly based on the following criteria;

1) The NPWS would normally recommend an Aboriginal heritage assessment under Applidge Street following circumstances:

PO Box 1967

Hussville NSW

Hurstville NSW 2320 Australia

Tel: (02) 9585 6444 Fax: (02) 9585 6555 www.npws.rsw.gov.au

Australian-made 100% recycled paper

- The Sites Register identifies sites in or near the development area, and these could be impacted during or after the development (this includes indirect impacts, such as increased run-off or sedimentation, changes in visitation, etc).
- The proposed development is likely to impact areas of bushland or undisturbed ground.
- The proposed development is likely to impact areas containing sandstone outcrops (greater than 1m<sup>2</sup>), rock shelters and overhangs, old growth trees, sand bodies, and ground adjacent to creeks, rivers, lakes and swamps.
- the proposed development is likely to impact an area of importance to the Aboriginal community not included in the above (eg. story places, buildings, missions, etc.)
- 2) The NPWS would <u>not</u> normally recommend an Aboriginal heritage assessment under the following circumstances:
- The proposed development is within land previously subject to intensive ground disturbance, such as quarrying, repeated market gardening, earthworks for pipelines, roads, sports fields etc. However it should be noted that sites could still occur in these context for example, ploughing generally impacts the top 20cm of ground and there is potential that undisturbed archaeological deposit may occur in areas where soil depth exceeds 20cm. Scarred trees may be located within road reserves and adjacent sport fields, etc.
- The development is within an existing residential or industrial area, or the redevelopment of an existing building is proposed, and the above criteria (listed in section 1) do not apply.

An Aboriginal heritage assessment would provide you with information about the location and significance of sites or sensitive areas, as well as advice on appropriate management options for these areas. It is recommended that an Aboriginal heritage assessment be carried out by a person qualified in undertaking Aboriginal heritage assessments. It is also recommended that the Aboriginal community (Local Aboriginal Land Council, Tribal Council etc) is contacted and its views sought on possible impacts to Aboriginal heritage.

If the proposed development area is found to contain an Aboriginal site, reference should be made to the NPWS requirements for Aboriginal heritage under the Integrated Development Approval Process (Environmental Planning & Assessment Amendment Act 1997).

If you wish to discuss this further, please contact Archaeologist, Phil Hunt, on (02) 9585 6677.

Yours faithfully

Paul Houston

Aboriginal Sites Registrar

Cultural Heritage Service Division

| 12         | 14             |
|------------|----------------|
| .01        | 7.0            |
| 14:08      | 17:02 FAX      |
| FAX        | FAX            |
| 0288370053 | 61 2 8837 0063 |
|            |                |

| ASR Sit       | e Search | Crite | eria |
|---------------|----------|-------|------|
| SileID (like) |          | Zone: | 56   |

| SileID (like) | Zone: 58           | District         |
|---------------|--------------------|------------------|
| AMGE:         | 285000 to 287500   | SiteType1:       |
| AMGN:         | 8277500 la 8278200 | SiteType2:       |
| Name(like):   |                    | SiteType3:       |
| Recorder:     |                    | Contact:         |
| Date from:    | to                 | DateModified: to |
| LGA:          |                    |                  |

### ASR Standard Site List - 8192

#### 7/10/2000 10:25:20

Local ALC:

| SiteID:   | SiteName:                      | Location: | Zone: | AMGE:  | AMGN: Check<br>Method: | Site Type:         | Recorder:   | Record Date: | Assoc. Report:    |              |
|-----------|--------------------------------|-----------|-------|--------|------------------------|--------------------|-------------|--------------|-------------------|--------------|
| 45-5-0229 | Grose Wold; Agnes Ba           |           | 56    | 285214 | 6277610                | Axe Grinding Groov | Taplin, R.  |              |                   | 197078       |
| 45-5-0283 | Agnes Banks; Yarramundi;       |           | 56    | 286576 | 6278094                | Open Camp Site     | Kohen, J.L. | 1/01/81      | 016 A : 23 (16 C) |              |
| 45-5-0443 | Yarramundi<br>2;Richmond;      |           | 56    | 285110 | 6277590                | Open Camp Site     | Нарр, G.    | 1/01/83      | 288214            | ENVIRONMEN   |
| 45-5-0444 | Yarramundi<br>1;Richmonmd;     |           | 56    | 285780 | 6277770                | Open Camp Site     | Нарр, G.    | 1/01/83      |                   | H            |
| 45-5-D525 | Yarramındi;YM/1;Ku<br>rrajong; |           | . 56  | 286560 | 6278240                | Open Camp Site     | Kohen, J.L. | 29/04/86     | 286664            | AL 18471 III |
|           |                                |           | 1     |        |                        | MG                 | A CONVERS   | TONS M       | ADE USANK         | KTA CH       |
|           |                                |           |       |        |                        |                    | GRIDLOC)    | PROGRAM      | 1.                |              |

NSW National Parks and Wildlife Service

\*\*\* End of Report \*\*\* Site Count: 5



# NATIONAL NATIVE TITLE TRIBUNAL

Your Ref: 00516 Our Ref: 320/02

30 November, 2001

Dear Sir/Madam

Level 25

GPO Box 9973, SYDNEY NSW 2001

25 Bligh Street

Telephone: (02) 9235 6300

O

SYDNEY NSW 2000 Facsimile: (02) 9233 5613

AUSTRALIA

Website: www.nntt.gov.au

#### Re: Your search request in relation to Penrith Local Government Area

Thank you for your letter of 27 November, 2001 regarding the above search request.

A search on 30 November, 2001 at 12.30pm of the Local Government Area 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 area you have nominated is;

| Register Type                      | NNTT Reference Numbers |
|------------------------------------|------------------------|
| National Native Title Register     | Nil.                   |
| Register of Native Title Claims    | NC97/8, NC97/7.        |
| Unregistered Claimant applications | Nil.                   |
| Register of Indigenous Land Use    | Nil.                   |
| Agreements                         |                        |

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 \$41.45. 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 you 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

Michelle Mann

Case Management Unit

### **RTA Operations Environmental Technology**



Level 3, 52 Rothschild Ave. Rosebery, NSW 2018 (PO Box K198, Haymarket, NSW 1238) Australia 

A POR BERTHARDS HE SHAPE TO STAN CONTROL OF STREET, STREET, STREET

Date: 27/11/2001

Reference No: 000516

| From:    | Julian Watson                | To:  | Registry                       |
|----------|------------------------------|--|--------------------------------|
| Phone:   | 8837 0581                    | Organisation:                              | National Native Title Tribunal |
| Fax:     | 8837 0053                    | Fax:                                       | 02 9233 5613                   |
| Email:   | julian_watson@rta.nsw.gov.au | No. of Pages:                              | 1 (including Cover Sheet)      |
| Subject: | Soarch Podliect              | . Sentral de la ser<br>La gentide de la SV |                                |

Hello

I would like to request searches for Native Title Claims, applications or agreements in: the state of the state of the state of the state of

The second secon

Penrith City LGA: and Hawkesbury City LGA.

Both of these are in NSW. Please do not hesitate to contact me in regards to this should you require any additional information.

Please note we have recently relocated our offices to Parramatta. Our current address is:

Octagon Bldg Lv5/99 Phillip St PARRAMATTA NSW 2124

In addition, I have an invoice from the NNTT and would like to check if it has been paid - No: 22300042 (\$62.40). Please advise and I will deal with as required.

Programme See 200 Julius See See See See

24 For Higher Office Dighters, Reptile

The solution was a signal of the

SACIONAL MANAGERY CARACT

and the companies of the companies and the companies

1.1 Bad Amera 我不管的。 唐 (中)。

Regards,

Julian Watson

#### CONFIDENTIALITY NOTICE FOR RECIPIENTS EXTERNAL TO THE RTA

The information contained in this facsimile is intended for the named recipient only. It may contain privileged and confidential Information. If you are not the Intended recipient, you must not copy, distribute, take any action in reliance on it, or disclose any details of the facsimile to any other person, firm or corporation. If you have received this facsimile in error, please notify us immediately by reverse charge call and return the original to us by mail. We will reimburse you any costs you may incur in notifying us and returning the original facsignile to us. Views expressed in the message are those of the individual sender and are not necessarily the views of the RTA...

TANK!





# Application Information and Extract from the Register of Native Title Claims

**Application Information** 

Application numbers:

Federal Court number:

NG6061/98

NNTT number:

NC97/8

Application name:

Darug Tribal Aboriginal Corporation

Registration history:

Registered from 12/05/1997 to 29/09/1999.

Registered from 13/12/2000.

NNTT map attached.

Register Extract (pursuant to s.186 of the Native Title Act 1993)

Application lodged with:

National Native Title Tribunal

Date application lodged:

12/05/1997

Date claim entered on Register.

13/12/2000

Applicants:

Angela Martin, Colin Rex Gale, Gordon William Morton

Address for service:

Eduard Neumann

Craddock, Murray & Neumann Solicitors

Level 2

255 Castlereagh Street SYDNEY NSW 2000 Phone: (02) 9283 4755 Fax: (02) 9283 4180

#### Area covered by the claim:

(a) The application area covers those parcels of land identified in the 21 page tenure/parcel identifier produced by the Surveyor General's Department and the accompanying maps, which include 18 AO size colour maps (1 locality plus 17 enlargements).

- (b) Subject to clauses (d) and (e) the area covered by the application excludes any land or waters covered
- a scheduled interest
- a freehold estate
- a commercial lease that is neither an agricultural lease nor a pastoral lease
- an exclusive agricultural lease or an exclusive pastoral lease
- a residential lease
- a community purposes lease
- a lease dissected from a mining lease as referred to in \$23B(2)(vii)
- any lease (other than a mining lease that confers a right of exclusive use over particular land or waters which was validly vested or granted on or before 23 December 1996.
- (c) Subject to clauses (d) and (e) the area covered by the application excludes any area covered by the valid construction or establishment of any public work commenced on or before 23 December 1996.
- (d) Where the act specified in (b) and (c) falls with the provisions of
- s23B(9) Exclusion of acts benefiting Aboriginal peoples or Torres Strait Islanders
- s23B(9A) Establishment of a national or state park
- s23B(9B) Acts where legislation provides for non-extinguishment
- s23B(9C) Exclusion of Crown to Crown grants and
- s23B(10) Exclusion by regulation

the area covered by the act is not excluded from this application.

- (e) Where an act referred to in clauses 2 and 3 covers land or waters referred to in
- s47 Pastoral leases held by native title claimants
- s47A Reserves etc covered by claimant applications and
- s47B Vacant crown land covered by claimant applications

the area covered by the act is not excluded from the application.

- (f) Where an area is covered by a previous non-exclusive possession act (s23F) the native title claim group does not claim the native title rights and interests set out in clause 1 of Attachment E to the exclusion of all others.
- (g) The area covered by the application excludes land where native title has been extinguished at common law.

#### Persons claiming to hold native title:

The native title claim group comprises all the members of the Darug Tribal Aboriginal Corporation and their descendants

#### Registered native title rights and interests:

The following Native Title Rights & Interests were entered on the Register on 13/12/2000:

- 1. Subject to paragraphs 2 5 below the applicants claim the following native title rights and interests in relation to area subject to application.
- (a) the right to possess, occupy, use and enjoy the claimed area
- (b) the right to make decisions about the use and enjoyment of the claimed area
- (c) the right of access to the claimed area
- (d) the right to control the access of others to the claimed area

- (e) the right to use and enjoy the resources of the claimed area
- (f) the right to control the use and enjoyment of others of resources of the claimed area
- (g) the right to trade in resources of the claimed area
- (h) (right not registered)
- (i) the right to maintain and protect places of importance under traditional laws, customs and practices in the claimed area
- (j) (right not registered)
- 2. With respect to those parts of the area the subject of the application which are, or have been the subject of a previous non-exclusive possession act within the meaning of s23F of the NTA, the applicants claim the native title rights and interests set out in 1 above subject to the rights and interests created in the "non exclusive possession act" which are not inconsistent with the rights and interests claimed and, in the case of rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.
- 3. With respect to those parts of the area the subject of the application which are, or have been, the subject of
- (a) a Category B intermediate period act within the meaning of \$232C
- (b) a Category C intermediate period act within the meaning of s232D or
- (c) a Category D intermediate period act within the meaning of s232E the applicants claim the native title rights and interests set out in 1 above subject to the rights and interests created in the "non exclusive possession act" which are not inconsistent with the rights and interests claimed and, in the case of rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.
- 4. With respect to those parts of the area the subject of the application which are, or have been the subject
- (a) a Category B past act within the meaning of s230
- (b) a Category C past act within the meaning of s231 or
- (c) a Category D past act within the meaning of s232
- the applicants claim the native title rights and interests set out in 1 above subject to the rights and interests created in the "non exclusive possession act" which are not inconsistent with the rights and interests claimed and, in the case of the rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of native title rights and interests which those inconsistent rights and interests cause.
- 5. The native title rights and interests identified above do not extend to ownership of any minerals, petroleum or gas which are wholly owned by the Crown.
- 6. The native title rights and interests identified above do not include a claim for exclusive occupation and use of off shore areas as defined by \$253.

#### Register attachments:

1. Tenure/Parcel Identifier (Available for inspection at the Sydney Registry of the Tribunal), Attachment B of the Application, 21 pages - A4, Attached 12/05/1997.

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.

| DESC | RIPTION            |               |              |                             |                     | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|------|--------------------|---------------|--------------|-----------------------------|---------------------|-------------------------|----------|--------|------------|--------------|-------|------|
| REF  | PARCEL IDENTIFIER  | PARISH        | LALC         | LGA                         | TYPE                | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 1    | 120/10//751628//// | BOWEN         | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 2    | 120/48//751664///  | WHEENY        | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | ALEXANDRIA    | LA PEROUSE   | RANDWICK                    | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | ALEXANDRIA    | LA PEROUSE   | WAVERLEY                    | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | ALEXANDRIA    | LA PEROUSE   | WOOLLAHRA                   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | ALEXANDRIA    | METROPOLITAN | SOUTH SYDNEY                | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | BANKSTOWN     | METROPOLITAN | STRATHFIELD                 | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | BEROWRA       | METROPOLITAN | HORNSBY                     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | BILPIN        | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS              | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | BOTANY        | LA PEROUSE   | RANDWICK                    | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | CASTLE HILL   | DEERUBBIN    | BAULKHAM HILLS              | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | CASTLEREAGH   | DEERUBBIN    | PENRITH                     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | COLO          | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | CONCORD       | METROPOLITAN | ASHFIELD                    | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | CONCORD       | METROPOLITAN | CONCORD                     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | COOMASSIE     | DEERUBBIN    | BLUE MOUNTAINS <sup>2</sup> | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | CORNELIA      | DEERUBBIN    | BAULKHAM HILLS              | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | FIELD OF MARS | DEERUBBIN    | PARRAMATTA                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | FIELD OF MARS | METROPOLITAN | HORNSBY                     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | FREDERICK     | METROPOLITAN | HORNSBY                     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | GIDLEY        | DEERUBBIN    | BLACKTOWN                   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | HAM COMMON    | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | HUNTERS HILL  | METROPOLITAN | HUNTERS HILL                | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 4    | 120//////          | HUNTERS HILL  | METROPOLITAN | RYDE                        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DESC | RIPTION           |             |              |                             |                     | HOLDER/VESTEE/          |       | RUSTEE | CONTACT AD | DRESS DETAILS | 3     |      |
|------|-------------------|-------------|--------------|-----------------------------|---------------------|-------------------------|-------|--------|------------|---------------|-------|------|
| REF  | PARCEL IDENTIFIER | PARISH      | LALC         | LGA                         | TYPE                | ORG/SURNAME             | GIVEN | TITLE  | ADDRESS1   | TOWN          | STATE | PC   |
| 4    | 120//////         | IRVINE      | DEERUBBIN    | BLUE MOUNTAINS <sup>3</sup> | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | IRVINE      | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS4             | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | KURRAJONG   | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | LINDEN      | DEERUBBIN    | BLUE MOUNTAINS <sup>S</sup> | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS              | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | MARRAMARRA  | METROPOLITAN | HORNSBY                     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | MEEHAN      | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | MERROO      | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | MINTO       | THARAWAL     | CAMPBELLTOWN                | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | NARELLAN    | THARAWAL     | CAMDEN                      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | NELSON      | DEERUBBIN    | BAULKHAM HILLS              | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | NEPEAN      | DEERUBBIN    | BLUE MOUNTAINS              | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120/////          | NORTH COLAH | METROPOLITAN | HORNSBY                     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | PETERSHAM   | METROPOLITAN | LEICHHARDT                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | PETERSHAM   | METROPOLITAN | MARRICKVILLE                | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | SOUTH COLAH | METROPOLITAN | HORNSBY                     | OTHER CROWN LAND    | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | ST GEORGE   | METROPOLITAN | CANTERBURY                  | OTHER CROWN LAND    | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | ST GEORGE   | METROPOLITAN | KOGARAH                     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | ST JAMES    | METROPOLITAN | SYDNEY                      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | ST LUKE     | GANDANGARA   | FAIRFIELD                   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | ST MATTHEW  | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | STRATHDON   | DEERUBBIN    | BLUE MOUNTAINS              | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 4    | 120//////         | WILBERFORCE | DEERUBBIN    | HAWKESBURY                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 5    | 120//////         | PETERSHAM   | METROPOLITAN | LEICHHARDT                  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |

| DESC | RIPTION           |               |              |                |                     | HOLDER/VESTEE/          |               | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|------|-------------------|---------------|--------------|----------------|---------------------|-------------------------|---------------|--------|------------|--------------|-------|------|
| REF  | PARCEL IDENTIFIER | PARISH        | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 5    | 120//////         | WOODFORD      | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 6    | 120//////         | COLO          | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 6    | 120//////         | CONCORD       | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 6    | 120//////         | CORNELIA      | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 6    | 120//////         | FREDERICK     | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 6    | 120//////         | MAROOTA       | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 6    | 120//////         | MARRAMARRA    | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 6    | 120//////         | MEEHAN        | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 6    | 120//////         | NORTH COLAH   | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 6    | 120//////         | ST GEORGE     | METROPOLITAN | CANTERBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 6    | 120//////         | ST GEORGE     | METROPOLITAN | HURSTVILLE     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 6    | 120//////         | WILBERFORCE   | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 7    | 120//////         | BILPIN        | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 7    | 120//////         | BOTANY        | LA PEROUSE   | BOTANY BAY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 7    | 120//////         | BOTANY        | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 7    | 120//////         | JAMISON       | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 7    | 120//////         | PETERSHAM     | METROPOLITAN | MARRICKVILLE   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 7    | 120//////         | ST MATTHEW    | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 7    | 120//////         | ST PETER      | THARAWAL     | CAMPBELLTOWN   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 8    | 120//////         | NOT_DEFINED   | NOT_DEFINED  | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 8    | 120//////         | NOT_DEFINED   | NOT_DEFINED  | WAVERLEY       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 8    | 120//////         | NOT_DEFINED   | NOT_DEFINED  | WOOLLAHRA      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 9    | 120//////         | HUNTERS HILL  | METROPOLITAN | RYDE           | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 10   | 120//////         | FIELD OF MARS | DEERUBBIN    | PARRAMATTA     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 11   | 120//////         | FIELD OF MARS | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES | 1             |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |

| DESC | RIPTION             |                |              |                |                     | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | CONTACT AD | DRESS DETAILS | 3     |      |
|------|---------------------|----------------|--------------|----------------|---------------------|-------------------------|----------|--------|------------|---------------|-------|------|
| REF  | PARCEL IDENTIFIER   | PARISH         | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1   | TOWN          | STATE | PC   |
| 11   | 120//////           | FREDERICK      | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 11   | 120//////           | LIBERTY PLAINS | METROPOLITAN | AUBURN         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 12   | 120////10024/3000// | ST GEORGE      | METROPOLITAN | - KOGARAH      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 13   | 120////1047/3000//  | HUNTERS HILL   | METROPOLITAN | HUNTERS HILL   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 14   | 120////10860/3000// | CONCORD        | METROPOLITAN | CONCORD        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 15   | 120////1107/2030/R/ | FIELD OF MARS  | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 16   | 120////11292/3000// | NEPEAN         | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 17   | 120////1159/3000/   | NELSON         | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 18   | 120////12386/3000// | HUNTERS HILL   | METROPOLITAN | RYDE           | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 19   | 120////14732/1603// | KURRAJONG      | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 20   | 120////15277/3000// | BOTANY         | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 21   | 120////15480/3090// | BLACKHEATH     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 22   | 120////1618/3000//  | ALEXANDRIA     | LA PEROUSE   | WAVERLEY       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 23   | 120////18846/3000// | PETERSHAM      | METROPOLITAN | MARRICKVILLE   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 24   | 120///1915/3000//   | ST GEORGE      | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 25   | 120////2248/3000//  | MENANGLE       | THARAWAL     | CAMPBELLTOWN   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 26   | 120////22865/3000// | JAMISON        | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 27   | 120////2508/3000//  | ALEXANDRIA     | LA PEROUSE   | WAVERLEY       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 28   | 120////268/858/R/   | ST JAMES       | METROPOLITAN | SYDNEY         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 29   | 120////2958/3000//  | CONCORD        | METROPOLITAN | ASHFIELD       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 30   | 120////3558/3000//  | ST GEORGE      | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 31   | 120///414/3000//    | CONCORD        | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 32   | 120///4294/3000//   | PETERSHAM      | METROPOLITAN | CANTERBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 33   | 120///5165/3000//   | PETERSHAM      | METROPOLITAN | MARRICKVILLE   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 34   | 120////5223/3000//  | ST GEORGE      | METROPOLITAN | HURSTVILLE     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |

| DESC | RIPTION              |                |              |                   |                     | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|------|----------------------|----------------|--------------|-------------------|---------------------|-------------------------|----------|--------|------------|--------------|-------|------|
| REF  | PARCEL IDENTIFIER    | PARISH         | LALC         | LGA               | TYPE                | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 35   | 120////578/3000//    | HAM COMMON     | DEERUBBIN    | HAWKESBURY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 36   | 120///7506/3000//    | ST GEORGE      | METROPOLITAN | HURSTVILLE        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 37   | 120////80/3000/R/    | FIELD OF MARS  | DEERUBBIN    | PARRAMATTA        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 39   | 120/1//182467////    | CONCORD        | METROPOLITAN | DRUMMOYNE         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 40   | 120/1//192764///     | BANKSTOWN      | GANDANGARA   | BANKSTOWN         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 41   | 120/1//34388////     | ALEXANDRIA     | LA PEROUSE   | WOOLLAHRA         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 42   | 120/1//39760////     | BOTANY         | LA PEROUSE   | RANDWICK          | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 43   | 120/1//592412////    | JAMISON        | DEERUBBIN    | BLUE MOUNTAINS 2  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 44   | 120/1//709431////    | FIELD OF MARS  | METROPOLITAN | PARRAMATTA        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 45   | 120/1//724350////    | CONCORD        | METROPOLITAN | DRUMMOYNE         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 48   | 120/1//820326////    | BANKSTOWN      | GANDANGARA   | BANKSTOWN         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 47   | 120/1//822201////    | CASTLE HILL    | DEERUBBIN    | BAULKHAM HILLS    | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 48   | 120/1//822268///     | LIBERTY PLAINS | GANDANGARA   | BANKSTOWN         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 49   | 120/1//824022////    | JAMISON        | DEERUBBIN    | BLUE MOUNTAINS    | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 50   | 120/1//848020////    | JAMISON        | DEERUBBIN    | BLUE MOUNTAINS    | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 51   | 120/1//848071///     | ST MATTHEW     | DEERUBBIN    | HAWKESBURY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 52   | 120/1//850403////    | ST JOHN        | DEERUBBIN    | HOLROYD           | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 53   | 120/1//867085////    | ST GEORGE      | METROPOLITAN | ROCKDALE          | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 54   | 120/1//965996////    | STLUKE         | GANDANGARA   | FAIRFIELD         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 55   | 120/1/22/758605////  | JAMISON        | DEERUBBIN    | BLUE MOUNTAINS    | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 56   | 120/1/26/758829////  | ST JOHN        | DEERUBBIN    | PARRAMATTA        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 57   | 120/10//751627////   | BLACKHEATH     | DEERUBBIN    | BLUE MOUNTAINS 7  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 58   | 120/10//829656///    | LIBERTY PLAINS | METROPOLITAN | BANKSTOWN         | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 59   | 120/10/20/758605//// | JAMISON        | DEERUBBIN    | BLUE MOUNTAINS 37 | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 60   | 120/10/9/758387////  | STRATHDON      | DEERUBBIN    | PENRITH           | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DES | CRIPTION                    |             |              |                |                     | HOLDER/VESTEE/          |       | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|-----|-----------------------------|-------------|--------------|----------------|---------------------|-------------------------|-------|--------|------------|--------------|-------|------|
| REF | PARCEL IDENTIFIER           | PARISH      | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 61  | 120/101//786384////         | SOUTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 62  | 120/103//752025////         | CORNELIA    | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 63  | 120/104//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 64  | 120/1051//752053////        | SOUTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 65  | 120/1052//752053////        | SOUTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 66  | 120/106//752029////         | FREDERICK   | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 67  | 120/1064//752015////        | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 68  | 120/109//752014////         | BEROWRA     | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 69  | 120/11//939734////          | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 70  | 120/1114//48270///          | CASTLE HILL | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 71  | 120/113//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 72  | 120/113//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 73  | 120/117//751662////         | STRATHDON   | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 74  | 120/118//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 75  | 120/118//752039/1919/2030// | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 76  | 120/12//774457////          | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 77  | 120/12//939734////          | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 78  | 120/120//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 79  | 120/121//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 80  | 120/122//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 81  | 120/123//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 82  | 120/125//752039/4104/2030// | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 83  | 120/126//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 84  | 120/127//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 85  | 120/127//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DES | CRIPTION                    |              |              |                |                     | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|-----|-----------------------------|--------------|--------------|----------------|---------------------|-------------------------|----------|--------|------------|--------------|-------|------|
| REF | PARCEL IDENTIFIER           | PARISH       | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 86  | 120/129//752039/1919/2030// | MAROOTA      | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 87  | 120/13//58560////           | CONCORD      | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 88  | 120/13//631041////          | ST PETER     | THARAWAL     | CAMPBELLTOWN   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 89  | 120/13//774457////          | JAMISON      | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 90  | 120/131//751635////         | COOMASSIE    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 91  | 120/132//751635////         | COOMASSIE    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 92  | 120/134//751658/2245/1507// | MERROO       | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 93  | 120/134//752021////         | CASTLEREAGH  | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 94  | 120/134//752039/2308/2030// | MAROOTA      | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 95  | 120/135//751658////         | MERROO       | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 96  | 120/135//752021////         | CASTLEREAGH  | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 97  | 120/136//752021////         | CASTLEREAGH  | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 98  | 120/137//752021////         | CASTLEREAGH  | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 99  | 120/138//752021////         | CASTLEREAGH  | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 100 | 120/14//3790////            | CONCORD      | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 101 | 120/14//842775////          | HUNTERS HILL | METROPOLITAN | RYDE           | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 102 | 120/144//751635////         | COOMASSIE    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 103 | 120/144//752014////         | BEROWRA      | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 104 | 120/144//752048////         | NORTH COLAH  | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 105 | 120/146//752021////         | CASTLEREAGH  | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 106 | 120/146//752048////         | NORTH COLAH  | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 107 | 120/147//752021///          | CASTLEREAGH  | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 108 | 120/148//47922////          | COOMASSIE    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 109 | 120/1492//752011////        | ALEXANDRIA   | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 110 | 120/15//16074////           | BEROWRA      | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DES | CRIPTION                     |             |              |                |                     | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | CONTACT AD | DRESS DETAILS | 3     |      |
|-----|------------------------------|-------------|--------------|----------------|---------------------|-------------------------|----------|--------|------------|---------------|-------|------|
| REF | PARCEL IDENTIFIER            | PARISH      | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1   | TOWN          | STATE | PC   |
| 111 | 120/15//57112////            | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 112 | 120/150//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 113 | 120/150//752025////          | CORNELIA    | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 114 | 120/151//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 115 | 120/152//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 116 | 120/155//752048////          | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 117 | 120/156//10177////           | BANKSTOWN   | GANDANGARA   | BANKSTOWN      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 118 | 120/1562//822233////         | ALEXANDRIA  | LA PEROUSE   | WAVERLEY       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 119 | 120/158//752048////          | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 120 | 120/16//3790////             | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 121 | 120/160//752014////          | BEROWRA     | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 122 | 120/160//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 123 | 120/161//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 124 | 120/1611//752011////         | ALEXANDRIA  | LA PEROUSE   | WAVERLEY       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 125 | 120/162//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 126 | 120/163//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 127 | 120/164//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 128 | 120/165//752014////          | BEROWRA     | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 129 | 120/165//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 130 | 120/166//752021///           | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 131 | 120/167//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 132 | 120/167//752025/8553/2030/R/ | CORNELIA    | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 133 | 120/17//77464////            | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 134 | 120/17//825649////           | PETERSHAM   | METROPOLITAN | MARRICKVILLE   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 135 | 120/171//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |

| DES | CRIPTION                    |             |              |                |                           | HOLDER/VESTEE/          | LESSEE/T      | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|-----|-----------------------------|-------------|--------------|----------------|---------------------------|-------------------------|---------------|--------|------------|--------------|-------|------|
| REF | PARCEL IDENTIFIER           | PARISH      | LALC         | LGA            | TYPE                      | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 136 | 120/173//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 137 | 120/173//752048////         | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 138 | 120/174//752048////         | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 139 | 120/175//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 140 | 120/176//47914////          | BEROWRA     | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 141 | 120/176//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 142 | 120/177//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER OTHER<br>CROWN LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 143 | 120/178//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 144 | 120/179//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 214  |
| 145 | 120/1799//822244////        | ALEXANDRIA  | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 146 | 120/18//825849////          | PETERSHAM   | METROPOLITAN | MARRICKVILLE   | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 147 | 120/18/1/758558////         | NELSON      | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 148 | 120/18/9/758387////         | STRATHDON   | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 149 | 120/180//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 150 | 120/181//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 151 | 120/181//752039/4107/2030// | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 152 | 120/182//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 153 | 120/182//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 154 | 120/183//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 155 | 120/183//752039/4106/2030// | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 156 | 120/184//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 157 | 120/185//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 158 | 120/186//39768////          | HAM COMMON  | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 159 | 120/186//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 160 | 120/1863//700001////        | ST JAMES    | METROPOLITAN | SYDNEY         | OTHER CROWN<br>LAND       | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DESC | RIPTION             |             |              |                |                     | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | CONTACT AD | DRESS DETAILS | 3     |      |
|------|---------------------|-------------|--------------|----------------|---------------------|-------------------------|----------|--------|------------|---------------|-------|------|
| REF  | PARCEL IDENTIFIER   | PARISH      | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1   | TOWN          | STATE | PC   |
| 161  | 120/187//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 162  | 120/188//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 163  | 120/189//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 164  | 120/190//751656//// | MEEHAN      | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 165  | 120/190//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 166  | 120/191//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 167  | 120/194//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 168  | 120/194//752025//// | CORNELIA    | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 169  | 120/197//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 170  | 120/198//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 171  | 120/198//752039//// | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 172  | 120/199//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 173  | 120/199//752048//// | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 174  | 120/2//216322////   | ST MATTHEW  | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 175  | 120/2//249704////   | BRINGELLY   | GANDANGARA   | LIVERPOOL      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 176  | 120/2//347829////   | GIDLEY      | DEERUBBIN    | BLACKTOWN      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 177  | 120/2//39760////    | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 178  | 120/2//41627///     | ALEXANDRIA  | LA PEROUSE   | WAVERLEY       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 179  | 120/2//562557////   | CONCORD     | METROPOLITAN | CONCORD        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 180  | 120/2//592412////   | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 181  | 120/2//982390////   | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 182  | 120/20//237206////  | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 183  | 120/20//57637////   | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 184  | 120/20/9/758387//// | STRATHDON   | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 185  | 120/200//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |

| DES | CRIPTION                    |             |              |                |                     | HOLDER/VESTEE/          |               | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|-----|-----------------------------|-------------|--------------|----------------|---------------------|-------------------------|---------------|--------|------------|--------------|-------|------|
| REF | PARCEL IDENTIFIER           | PARISH      | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 186 | 120/200//752039/4702/2030// | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 187 | 120/201//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 188 | 120/201//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 189 | 120/201//752039/4958/2030// | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 190 | 120/202//47644////          | MEEHAN      | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 191 | 120/202//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 192 | 120/202//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 193 | 120/203//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 194 | 120/205//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 195 | 120/206//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 196 | 120/206//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 197 | 120/206//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 198 | 120/207//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 199 | 120/208//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 200 | 120/208//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 201 | 120/208//752047/1423/2030// | NELSON      | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 202 | 120/209//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 203 | 120/21//57637////           | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 204 | 120/210//752021////         | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 205 | 120/210//752039////         | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 206 | 120/211//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 207 | 120/212//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 208 | 120/212//752025////         | CORNELIA    | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 209 | 120/213//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 210 | 120/214//751627////         | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DES | CRIPTION                     |             |              |                |                     | HOLDER/VESTEE/          | LESSEE/T      | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|-----|------------------------------|-------------|--------------|----------------|---------------------|-------------------------|---------------|--------|------------|--------------|-------|------|
| REF | PARCEL IDENTIFIER            | PARISH      | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 211 | 120/215//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               | İ      | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 212 | 120/216//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 213 | 120/217//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 214 | 120/218//752039////          | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 215 | 120/219//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 216 | 120/219//752039/7371/2030//  | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 217 | 120/22//939734////           | CONCORD     | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 218 | 120/220//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 219 | 120/221//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 220 | 120/222//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 221 | 120/223//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 222 | 120/224//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 223 | 120/225//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 224 | 120/226//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 225 | 120/228//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 226 | 120/229//751627////          | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 227 | 120/231//752021////          | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 228 | 120/231//752039////          | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 229 | 120/236//752048////          | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 230 | 120/237//751649/             | KURRAJONG   | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 231 | 120/240//752039////          | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 232 | 120/240//752048////          | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 233 | 120/241//752039////          | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 234 | 120/245//752025////          | CORNELIA    | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 235 | 120/247//752039/10609/2030// | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DESC | RIPTION              |             |              |                |                     | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | STEE CONTACT ADDRESS DETAILS |           |       |      |  |
|------|----------------------|-------------|--------------|----------------|---------------------|-------------------------|----------|--------|------------------------------|-----------|-------|------|--|
| REF  | PARCEL IDENTIFIER    | PARISH      | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1                     | TOWN      | STATE | PC   |  |
| 236  | 120/252//751662////  | STRATHDON   | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 237  | 120/258//729633////  | CORNELIA    | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 238  | 120/26//752040////   | MARRAMARRA  | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 239  | 120/260//859029////  | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 240  | 120/261//859029////  | NORTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 241  | 120/2658//752015//// | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 242  | 120/276//752021////  | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 243  | 120/277//752021////  | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 244  | 120/278//752021////  | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 245  | 120/2816//752015//// | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 246  | 120/295//752047////  | NELSON      | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 247  | 120/3//211148///     | BANKSTOWN   | GANDANGARA   | BANKSTOWN      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 248  | 120/3//39760///      | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 249  | 120/3//41627////     | ALEXANDRIA  | LA PEROUSE   | WAVERLEY       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 250  | 120/3//706164////    | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 251  | 120/3//820355////    | MEEHAN      | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 252  | 120/3//820392////    | MERROO      | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 253  | 120/3/9/758387////   | STRATHDON   | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 254  | 120/30//751627////   | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 255  | 120/30//751670////   | WOODFORD    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 256  | 120/302//729721////  | BANKSTOWN   | GANDANGARA   | BANKSTOWN      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 257  | 120/306//752047////  | NELSON      | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 258  | 120/32//751670////   | WOODFORD    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 259  | 120/323//751646////  | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |
| 260  | 120/324//751646////  | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878                   | BLACKTOWN | NSW   | 2148 |  |

| DESC | RIPTION             |             |           | HOLDER/VESTEE/LESSEE/TRUSTEE CONTACT ADDRESS DETAILS |                     |                         |       |       |            |           |       |      |  |
|------|---------------------|-------------|-----------|--|---------------------|-------------------------|-------|-------|------------|-----------|-------|------|--|
| REF  | PARCEL IDENTIFIER   | PARISH      | LALC      | LGA  | TYPE                | ORG/SURNAME             | GIVEN | TITLE | ADDRESS1   | TOWN      | STATE | PC   |  |
| 261  | 120/324//752021///  | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 262  | 120/325//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 263  | 120/326//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 214  |  |
| 264  | 120/326//752021//// | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 265  | 120/327//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 266  | 120/327//752021//// | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 267  | 120/328//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 268  | 120/329//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 269  | 120/33//751870////  | WOODFORD    | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | · NSW | 2148 |  |
| 270  | 120/330//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 271  | 120/330//752021//// | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 272  | 120/331//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 273  | 120/331//752021//// | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 274  | 120/332//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 275  | 120/333//47653////  | KURRAJONG   | DEERUBBIN | HAWKESBURY   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 276  | 120/333//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 277  | 120/333//752021//// | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 278  | 120/334//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 279  | 120/334//752021//// | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 280  | 120/335//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 281  | 120/335//752021//// | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 282  | 120/336//751646///  | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 283  | 120/336//752021//// | CASTLEREAGH | DEERUBBIN | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 284  | 120/337//751644//// | HARTLEY     | DEERUBBIN | BLUE MOUNTAINS                                       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |
| 285  | 120/337//751646//// | JAMISON     | DEERUBBIN | BLUE MOUNTAINS                                       |                     | STATE LANDS<br>SERVICES |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |  |

| DESC | RIPTION             |             |              |                |                     | HOLDER/VESTEE/          | LESSEE/T      | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|------|---------------------|-------------|--------------|----------------|---------------------|-------------------------|---------------|--------|------------|--------------|-------|------|
| REF  | PARCEL IDENTIFIER   | PARISH      | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 286  | 120/338//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 287  | 120/339//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 288  | 120/339//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 289  | 120/340//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 290  | 120/340//752021///  | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 291  | 120/341//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 292  | 120/341//752021//// | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 293  | 120/342//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 294  | 120/343//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 295  | 120/344//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 296  | 120/346//752021///  | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 297  | 120/347//752021///  | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 298  | 120/348//752021///  | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 299  | 120/354//751648//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 300  | 120/354//752021///  | CASTLEREAGH | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 301  | 120/355//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 302  | 120/356//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 303  | 120/357//751648//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 304  | 120/357//752056//// | ST GEORGE   | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 305  | 120/358//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 306  | 120/359//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 307  | 120/359//752056//// | ST GEORGE   | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 308  | 120/360//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 309  | 120/361//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 310  | 120/362//751646//// | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DESC | RIPTION              |                |              |                |                     | HOLDER/VESTEE/          | LESSEE/T      | RUSTEE | CONTACT AD   | DRESS DETAILS | S     |      |
|------|----------------------|----------------|--------------|----------------|---------------------|-------------------------|---------------|--------|--------------|---------------|-------|------|
| REF  | PARCEL IDENTIFIER    | PARISH         | LALC         | LGA 90         | TYPE                | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1     | TOWN          | STATE | PC   |
| 311  | 120/371//751627////  | BLACKHEATH     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 312  | 120/382//751627////  | BLACKHEATH     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 313  | 120/383//751627////  | BLACKHEATH     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 314  | 120/387//752047////  | NELSON         | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 315  | 120/395//752047////  | NELSON         | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 316  | 120/4//41627////     | ALEXANDRIA     | LA PEROUSE   | WAVERLEY       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 317  | 120/4//57637////     | CONCORD        | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 318  | 120/4//739331///     | PROSPECT       | DEERUBBIN    | BLACKTOWN      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 319  | 120/4/9/758387////   | STRATHDON      | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 320  | 120/401//752011////  | ALEXANDRIA     | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 321  | 120/41//752025////   | CORNELIA       | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 322  | 120/410//752056////  | ST GEORGE      | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 323  | 120/411//752056////  | ST GEORGE      | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 324  | 120/412//721589////  | ST PETER       | THARAWAL     | CAMPBELLTOWN   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 , | BLACKTOWN     | NSW   | 2148 |
| 325  | 120/412//752056////  | ST GEORGE      | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 326  | 120/422//752056////  | ST GEORGE      | METROPOLITAN | HURSTVILLE     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 327  | 120/4310//752015//// | BOTANY         | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 328  | 120/434//752056////  | ST GEORGE      | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 329  | 120/456//752036////  | LIBERTY PLAINS | GANDANGARA   | BANKSTOWN      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 330  | 120/46//751627////   | BLACKHEATH     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 331  | 120/46//752016////   | BRINGELLY      | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 332  | 120/469//752056////  | ST GEORGE      | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 333  | 120/478//752056////  | ST GEORGE      | METROPOLITAN | ROCKDALE       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 334  | 120/4789//752015//// | BOTANY         | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |
| 335  | 120/4807//752015//// | BOTANY         | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878   | BLACKTOWN     | NSW   | 2148 |

· \*

| DESC | RIPTION              |                | A LANGUAGE CONTROL OF SECURITIES AND ADDRESS OF SECURITIES AND ADDRESS OF SECURITIES AND ADDRESS OF SECURITIES | manufactured ( Manufactured Amplication and Am |                     | HOLDER/VESTEE/          |               | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|------|----------------------|----------------|--|--|---------------------|-------------------------|---------------|--------|------------|--------------|-------|------|
| REF  | PARCEL IDENTIFIER    | PARISH         | LALC   | LGA  | TYPE                | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 336  | 120/481//752056////  | ST GEORGE      | METROPOLITAN   | HURSTVILLE   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 337  | 120/4858//752015//// | BOTANY         | LA PEROUSE   | RANDWICK   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 338  | 120/494//704503////  | CONCORD        | METROPOLITAN   | CONCORD  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 339  | 120/4A//57637////    | CONCORD        | METROPOLITAN   | DRUMMOYNE  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 340  | 120/5//57637////     | CONCORD        | METROPOLITAN   | DRUMMOYNE  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 341  | 120/5//739331////    | PROSPECT       | DEERUBBIN  | BLACKTOWN  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 342  | 120/5//746934////    | LIBERTY PLAINS | METROPOLITAN   | STRATHFIELD  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 343  | 120/5/9/758387////   | STRATHDON      | DEERUBBIN  | PENRITH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 344  | 120/500//751627////  | BLACKHEATH     | DEERUBBIN  | BLUE MOUNTAINS   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 345  | 120/509//729627////  | CONCORD        | METROPOLITAN   | CONCORD  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 346  | 120/518//751646////  | JAMISON        | DEERUBBIN  | BLUE MOUNTAINS   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 347  | 120/518//752056////  | ST GEORGE      | METROPOLITAN   | KOGARAH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 348  | 120/519//752056////  | ST GEORGE      | METROPOLITAN   | KOGARAH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 349  | 120/520//752058////  | ST GEORGE      | METROPOLITAN   | KOGARAH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 350  | 120/521//752056////  | ST GEORGE      | METROPOLITAN   | KOGARAH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 351  | 120/522//751646////  | JAMISON        | DEERUBBIN  | BLUE MOUNTAINS   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 352  | 120/522//752056////  | ST GEORGE      | METROPOLITAN   | KOGARAH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 353  | 120/5229//809179///  | BOTANY         | LA PEROUSE   | RANDWICK   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 354  | 120/523//751627////  | BLACKHEATH     | DEERUBBIN  | BLUE MOUNTAINS   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 355  | 120/523//752056////  | ST GEORGE      | METROPOLITAN   | KOGARAH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 356  | 120/524//752056////  | ST GEORGE      | METROPOLITAN   | KOGARAH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 357  | 120/5244//820345//// | BOTANY         | LA PEROUSE   | RANDWICK   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 358  | 120/5245//820345//// | BOTANY         | LA PEROUSE   | RANDWICK   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 359  | 120/525//752056////  | ST GEORGE      | METROPOLITAN   | KOGARAH  | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 360  | 120/5255//824002//// | BOTANY         | LA PEROUSE   | RANDWICK   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DESC | RIPTION              |           |              |          | HOLDER/VESTEE/LESSEE/TRUSTEE CONTACT ADDRESS DETAILS |                         |       |  |            |           |       |      |
|------|----------------------|-----------|--------------|----------|--|-------------------------|-------|--|------------|-----------|-------|------|
| REF  | PARCEL IDENTIFIER    | PARISH    | LALC         | LGA      | TYPE   | ORG/SURNAME             | GIVEN | TITLE  | ADDRESS1   | TOWN      | STATE | PC   |
| 361  | 120/526//752056////  | ST GEORGE | METROPOLITAN | KOGARAH  | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 362  | 120/5263//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 363  | 120/5264//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 364  | 120/5265//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 365  | 120/5266//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 366  | 120/5267//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 367  | 120/5268//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 368  | 120/5269//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 369  | 120/5270//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 370  | 120/5271//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 371  | 120/5272//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 372  | 120/5273//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       | Marine Or colonia, sid IV Rodridos Alexandriados | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 373  | 120/5274//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 374  | 120/5275//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 375  | 120/5276//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 376  | 120/5277//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 377  | 120/5278//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 378  | 120/5279//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 380  | 120/5280//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 381  | 120/5281//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 382  | 120/5282//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 383  | 120/5283//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 384  | 120/5284//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 385  | 120/5285//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 386  | 120/5286//824057//// | BOTANY    | LA PEROUSE   | RANDWICK | OTHER CROWN<br>LAND                                  | STATE LANDS<br>SERVICES |       |  | PO BOX 878 | BLACKTOWN | NSW   | 2148 |

| DESC | RIPTION              |             |              |                |                     | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|------|----------------------|-------------|--------------|----------------|---------------------|-------------------------|----------|--------|------------|--------------|-------|------|
| REF  | PARCEL IDENTIFIER    | PARISH      | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 387  | 120/5287//824057//// | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 388  | 120/5288//824057//// | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 389  | 120/5289//824057//// | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 390  | 120/529//752056////  | ST GEORGE   | METROPOLITAN | ROCKDALE       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 391  | 120/5295//824070//// | BOTANY      | LA PEROUSE   | BOTANY BAY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 392  | 120/530//752056////  | ST GEORGE   | METROPOLITAN | KOGARAH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 393  | 120/533//752056////  | ST GEORGE   | METROPOLITAN | HURSTVILLE     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 394  | 120/534//752056////  | ST GEORGE   | METROPOLITAN | HURSTVILLE     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 395  | 120/535//752056////  | ST GEORGE   | METROPOLITAN | HURSTVILLE     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 396  | 120/541//751827////  | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 399  | 120/545//822284////  | JAMISON     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 400  | 120/553//47342////   | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 401  | 120/56//752015////   | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 402  | 120/57//752015////   | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 403  | 120/575//752053////  | SOUTH COLAH | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 404  | 120/58//752015////   | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 405  | 120/59//752015////   | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 406  | 120/594//752015////  | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 407  | 120/596//752049////  | PETERSHAM   | METROPOLITAN | MARRICKVILLE   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 408  | 120/597//752049///   | PETERSHAM   | METROPOLITAN | MARRICKVILLE   | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 409  | 120/598//752015////  | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 410  | 120/6//2006////      | BLACKHEATH  | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 411  | 120/6//752039////    | MAROOTA     | DEERUBBIN    | BAULKHAM HILLS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 412  | 120/6/9/758387////   | STRATHDON   | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 413  | 120/60//752015////   | BOTANY      | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

¥-

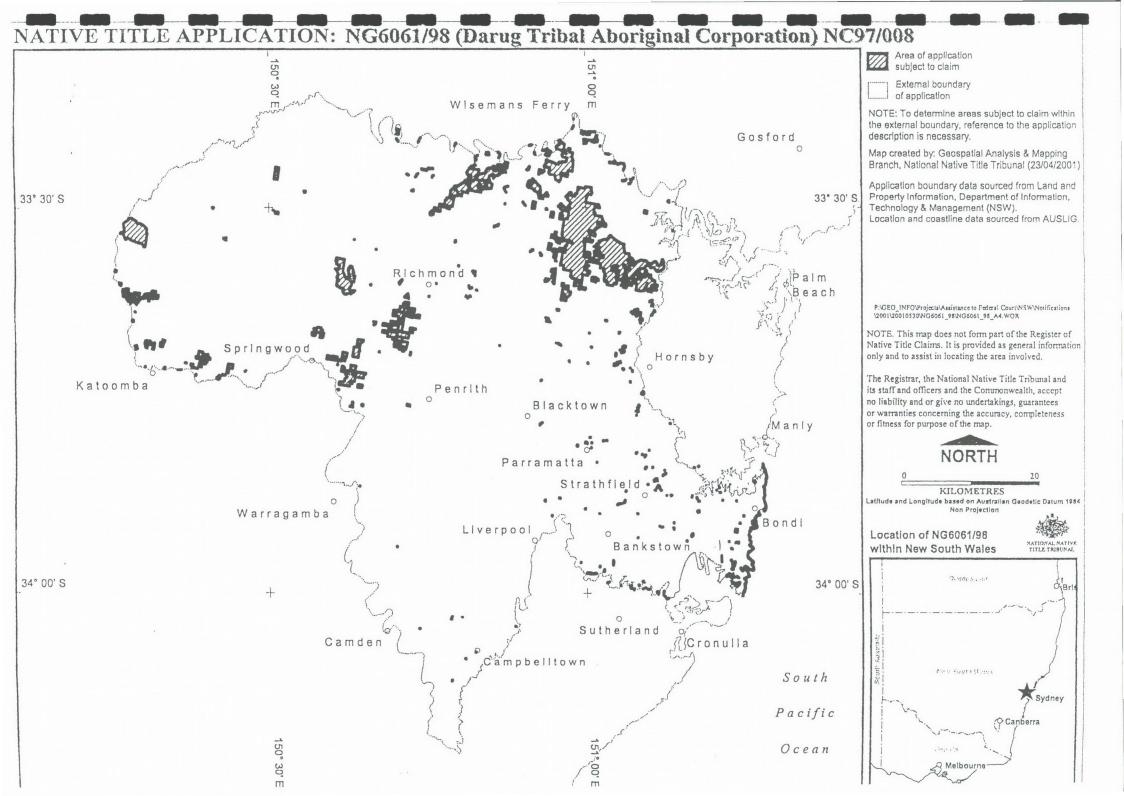
\*

| DESC | RIPTION             |              |              |                |                     | HOLDER/VESTEE/          | LESSEE/T      | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|------|---------------------|--------------|--------------|----------------|---------------------|-------------------------|---------------|--------|------------|--------------|-------|------|
| REF  | PARCEL IDENTIFIER   | PARISH       | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 414  | 120/601//39962////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 415  | 120/61//752015////  | BOTANY       | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 416  | 120/610//752015//// | BOTANY       | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 417  | 120/62//752015////  | BOTANY       | LA PEROUSE   | RANDWICK       | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 418  | 120/64//751635////  | COOMASSIE    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 419  | 120/642//728440//// | PETERSHAM    | METROPOLITAN | CANTERBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 420  | 120/65//751635////  | COOMASSIE    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 421  | 120/66//752021////  | CASTLEREAGH  | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 422  | 120/7//2562////     | CONCORD      | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 423  | 120/7//57637////    | CONCORD      | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 424  | 120/7/9/758387////  | STRATHDON    | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 425  | 120/711//47216///   | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 426  | 120/712//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 427  | 120/713//47218///   | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 428  | 120/714//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 429  | 120/715//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 430  | 120/716//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 431  | 120/717//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 432  | 120/719//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 433  | 120/720//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 434  | 120/721//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 435  | 120/722//47216////  | PETERSHAM    | METROPOLITAN | LEICHHARDT     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 436  | 120/723//752053//// | SOUTH COLAH  | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 437  | 120/756//752035//// | HUNTERS HILL | METROPOLITAN | RYDE           | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 438  | 120/79//751627////  | BLACKHEATH   | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DESC | RIPTION             |               |              |                |                     | HOLDER/VESTEE/          | LESSEE/T      | RUSTEE | CONTACT AD | DRESS DETAIL | S     |      |
|------|---------------------|---------------|--------------|----------------|---------------------|-------------------------|---------------|--------|------------|--------------|-------|------|
| REF  | PARCEL IDENTIFIER   | PARISH        | LALC         | LGA            | TYPE                | ORG/SURNAME             | GIVEN<br>NAME | TITLE  | ADDRESS1   | TOWN         | STATE | PC   |
| 439  | 120/8//57637////    | CONCORD       | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 440  | 120/8/9/758387////  | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 441  | 120/80//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 442  | 120/80//751656////  | MEEHAN        | DEERUBBIN    | HAWKESBURY     | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 443  | 120/81//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 444  | 120/817//752028//// | FIELD OF MARS | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 445  | 120/818//752028//// | FIELD OF MARS | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 446  | 120/82//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 447  | 120/84//751827////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 448  | 120/85//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 449  | 120/85//751860///   | NEPEAN        | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 450  | 120/86//40224////   | NEPEAN        | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 451  | 120/86//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 452  | 120/87//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 453  | 120/88//40226////   | NEPEAN        | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 454  | 120/88//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 455  | 120/89//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 456  | 120/9//57112///     | CONCORD       | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 457  | 120/9/9/758387////  | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 458  | 120/90//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 459  | 120/91//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 460  | 120/94//751635////  | COOMASSIE     | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 461  | 120/962//752053//// | SOUTH COLAH   | METROPOLITAN | HORNSBY        | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 462  | 120/97//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |
| 463  | 120/98//751627////  | BLACKHEATH    | DEERUBBIN    | BLUE MOUNTAINS | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES |               |        | PO BOX 878 | BLACKTOWN    | NSW   | 2148 |

| DESC | RIPTION             |               |              |                |                             | HOLDER/VESTEE/          | LESSEE/T | RUSTEE | CONTACT AD | DRESS DETAILS | S     |      |
|------|---------------------|---------------|--------------|----------------|-----------------------------|-------------------------|----------|--------|------------|---------------|-------|------|
| REF  | PARCEL IDENTIFIER   | PARISH        | LALC         | LGA            | TYPE                        | ORG/SURNAME             | GIVEN    | TITLE  | ADDRESS1   | TOWN          | STATE | PC   |
| 464  | 120/?//55267////    | CONCORD       | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 465  | 120/A//368101////   | CONCORD       | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 466  | 120/PT6//57637////  | CONCORD       | METROPOLITAN | DRUMMOYNE      | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | BOTANY        | LA PEROUSE   | RANDWICK       | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | CONCORD       | METROPOLITAN | CONCORD        | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | FIELD OF MARS | METROPOLITAN | PARRAMATTA     | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | HAM COMMON    | DEERUBBIN    | HAWKESBURY     | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | HUNTERS HILL  | METROPOLITAN | RYDE           | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | HUNTERS HILL  | METROPOLITAN | UNINCORPORATED | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | ST GEORGE     | METROPOLITAN | KOGARAH        | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | ST JOHN       | DEERUBBIN    | PARRAMATTA     | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | ST MATTHEW    | DEERUBBIN    | HAWKESBURY     | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 467  | 130//////           | WILBERFORCE   | DEERUBBIN    | HAWKESBURY     | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 468  | 130//////           | NOT_DEFINED   | NOT_DEFINED  | WAVERLEY       | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 469  | 130/1//119108////   | ALEXANDRIA    | LA PEROUSE   | RANDWICK       | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 470  | 130/2//119108////   | ALEXANDRIA    | LA PEROUSE   | RANDWICK       | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 471  | 130/3//119108////   | ALEXANDRIA    | LA PEROUSE   | RANDWICK       | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 472  | 130/7A/10/11608///  | BANKSTOWN     | GANDANGARA   | BANKSTOWN      | STATUS<br>UNKNOWN           | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 474  | 120/12/9/758387//// | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 475  | 120/13/9/758387//// | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 476  | 120/14/9/758387//// | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROTHER<br>CROWN LAND | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 477  | 120/15/9/758387//// | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 478  | 120/16/9/758387//// | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 479  | 120/17/9/758387//// | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |
| 480  | 120/18/9/758387//// | STRATHDON     | DEERUBBIN    | PENRITH        | OTHER CROWN<br>LAND         | STATE LANDS<br>SERVICES |          |        | PO BOX 878 | BLACKTOWN     | NSW   | 2148 |

| DESCRIPTION |                        | ION    |            |          |                     | HOLDER/VESTEE/LESSEE/TRUSTEE CONTACT ADDRESS DETAILS |       |       |            |           |       |      |
|-------------|------------------------|--------|------------|----------|---------------------|--|-------|-------|------------|-----------|-------|------|
| REF         | PARCEL IDENTIFIER      | PARISH | LALC       | LGA      | TYPE                | ORG/SURNAME  | GIVEN | TITLE | ADDRESS1   | TOWN      | STATE | PC   |
| 481         | 120/013/35//251284//// | BOTANY | LA PEROUSE | RANDWICK | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES                              |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |
| 482         | 120/8//251284////      | BOTANY | LA PEROUSE | RANDWICK | OTHER CROWN<br>LAND | STATE LANDS<br>SERVICES                              |       |       | PO BOX 878 | BLACKTOWN | NSW   | 2148 |





#### NATIONAL NATIVE TITLE TRIBUNAL

## Application Information and Extract from the Register of Native Title Claims

Application Information

Application numbers:

Federal Court number:

NG6060/98

NNTT number:

NC97/7

Application name:

Gundungurra # 6

Registration history:

Registered from 29/04/1997.

Register Extract (pursuant to s.186 of the Native Title Act 1993)

Application lodged with:

National Native Title Tribunal

Date application lodged:

29/04/1997

Date claim entered on Register:

29/04/1997

Applicants:

Ms Elsie Stockwell, Ms Pamela Stockwell

Address for service:

Mr Eduard Neumann

Craddock Murray and Neumann

Level 2

255 Castlereagh Street SYDNEY NSW 2000 Phone: 02 9283 4755 Fax: 02 9283 4180

#### Area covered by the claim:

(a) Commencing at 150.52997 east longitude and 34.591636 south latitude, approximately 15.5 kilometres east south east of Moss Vale, the application traverses clockwise starting in a south-westerly direction, passing through points 2 to 36,765 of the following geographic coordinates [forming part of Attachment "B" of the application]. They are in decimal degrees and referenced to Australian Geodetic Datum 1984 (AGD84). These coordinates are based on the position of spatial reference data sourced by Land

- Information Centre, Department of Information Management and Technology, New South Wales as of 18 May 1999.
- (b) Subject to clauses (d) and (e) the area covered by the application excludes any land or waters covered
- (i) a scheduled interest;

(ii) freehold estate;

(iii) a commercial lease that is neither an agricultural lease nor a pastoral lease;

(iv) an exclusive agricultural lease or an exclusive pastoral lease;

(v) residential lease;

(vi) a community purposes lease;

(vii) a lease dissected from a mining lease as referred to in \$23B(2)(vii);

(viii) any lease (other than a mining lease) that confers a right of exclusive use over particular land or waters:

which was validly vested or granted on or before 23 December 1996.

- (c) Subject to clauses (d) and (e) the area covered by the application excludes any area covered by the valid construction or establishment of any public work, where the construction or establishment of the public work commenced on or before 23 December 1996.
- (d) Where the act specified in (b) and (c) falls within the provisions of
- (i) s23B(9) Exclusion of acts benefiting Aboriginal peoples or Torres Strait Islanders;

(ii) s23B (9A) - Establishment of a national or state park;

(iii) s23B (9B) - Acts where legislation provides for non-extinguishment;

(iv) s23B (9C) - Exclusion of Crown to Crown grants; and

(v) s23B (10) - Exclusion by regulation,

the area covered by the act is not excluded from this application.

(e) Where an act referred to in clauses (b) and (c) covers land or waters referred to in:

s47 - Pastoral leases held by native title claimants;

s47A - Reserves etc covered by claimant applications; and

s47B - Vacant crown land covered by claimant applications,

the area covered by the act is not excluded from the application.

- (f) Where an area is covered by a previous non-exclusive possession act (s 23F) the native title claim group does not claim possession, occupation, use and enjoyment to the exclusion of all others.
- (g) The area covered by the application excludes land where native title has been extinguished at common law.
- (h) The area covered by the application excludes areas covered by prior Gundungurra claims filed with the National Native Title Tribunal being NC96/7, NC96/27, NC96/30, NC96/36 and 97/4.

#### Persons claiming to hold native title:

The members of the Gundungurra Tribal Council Aboriginal Corporation

#### Registered native title rights and interests:

The following Native Title Rights & Interests were entered on the Register on 23/06/2000: 1. Subject to (2) - (5) below, the full and free enjoyment of the following native title rights and interests are claimed in relation to the land and waters the subject of the application:

- a. A right to possess, occupy, use and enjoy the claim area;
- b. A right to make decisions about the use and enjoyment of the claim area;
- c. A right of access to the claimed area;
- d. A right to control the access of others to the claimed area;
- e. The right to control the use and enjoyment of others of resources of the claimed area.
- 2. With respect of those parts of the area the subject of the application which are, or have been, the subject of a previous non-exclusive possession act within the meaning of s 23F of the Native Title Act 1993, the native title rights and interests area set out in (1) are claimed subject to the rights and interests created in the 'non-exclusive possession act' which are not inconsistent with the rights and interests claimed and, in the case of rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.
- 3. With respect to those parts of the area the subject of the application which are, or have been, the subject of:
- a. a category B intermediate period act within the meaning of \$232C of the Native Title Act 1993;
- b. a category C intermediate period act within the meaning of \$232D of the Native Title Act 1993;
- c. a category D intermediate period act within the meaning of s232E of the Native Title Act 1993;

the native title rights and interests claimed are those set out in (1) above subject to the rights and interests created in the non-exclusive possession act which are not inconsistent with the rights and interests claimed and, in the case of any rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.

- 4. With respect to those parts of the area of the application which are, or have been, the subject of:
- a. a category B past act within the meaning of \$230 of the Native Title Act 1993;
- b. a category C past act within the meaning of s231 of the Native Title Act 1993;
- c. a category D past act within the meaning of \$232 of the Native Title Act 1993;

the native title rights and interests claimed area those set out in (1) above subject to the rights and interests created in the non-exclusive possession act which are not inconsistent with the rights and interests claimed

- and, in the case of any rights granted which are inconsistent with the rights and interests claimed, subject to any extinguishment or suspension of the native title rights and interests which those inconsistent rights and interests cause.
- 5. The native title rights and interests identified above do not extend to ownership of any minerals, petroleum or gas which are wholly owned by the Crown.
- 6. The native title rights and interests identified above do not include a claim for exclusive occupation and use of offshore areas as defined by \$253 of the Native Title Act 1993.

#### Register attachments:

1. Attachment "A": Map of Application Area, 1 page - A4, Attached 23/06/2000.

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.

## NATIVE TITLE APPLICATION

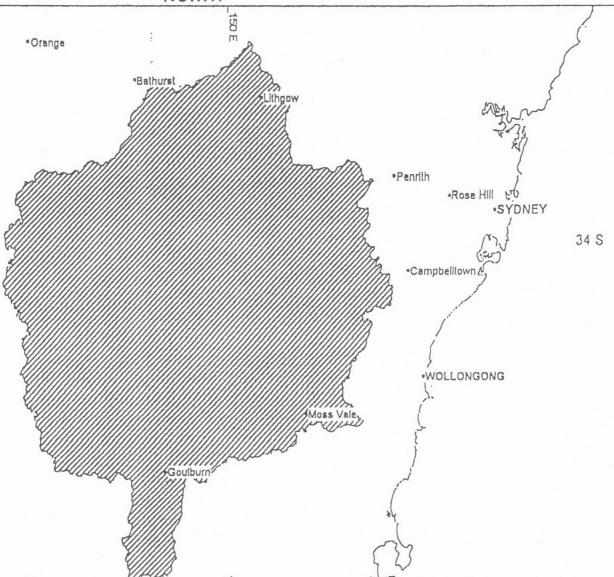
as at 18/05/1999

Map created from data sourced from Land Information Centre, DIM&T, NSW by Geospatial Information Unit, National Native Title Tribunal

KILOMETRES

Latitude and Longitude based on Australian Geodetic Datum 1984

NORTH



NC97/007 (NG6060/98).

Gundungurra #6 Application Area = 18682.37 sqkm

Location of NC97/007 Within New South Wales & ACT



4 page.





### NATIONAL NATIVE TITLE TRIBUNAL

## Claimant Application Summary

| Application numbers                       | Federal Court number: NG6061/98 NNTT number: NC97/8  |
|---|--|
| Application name                          | Darug Tribal Aboriginal Corporation  |
| Name of body where application filed      | National Native Title Tribunal   |
| Date application filed                    | 12/05/1997   |
| Current stage(s)                          | Notification Complete  |
| Applicants                                | Angela Martin, Colin Rex Gale, Gordon William Morton   |
| Address for service                       | Eduard Neumann Craddock, Murray & Neumann Solicitors Level 2 255 Castlereagh Street SYDNEY NSW 2000 Phone: (02) 9283 4755 Fax: (02) 9283 4180  |
| Persons claiming to hold native title     | The native title claim group comprises all the members of the Darug Tribal Aboriginal Corporation and their descendants  |
| Native title rights and interests claimed | 1. Subject to paragraphs 2 - 5 below the applicants claim the following native title rights and interests in relation to area subject to application.  (a) the right to possess, occupy, use and enjoy the claimed area  (b) the right to make decisions about the use and enjoyment of the claimed area  (c) the right to access to the claimed area  (d) the right to control the access of others to the claimed area  (e) the right to use and enjoy the resources of the claimed area  (f) the right to control the use and enjoyment of others of resources of the claimed area  (g) the right to trade in resources of the claimed area  (h) the right to receive a portion of any resources taken by others from the claimed area  (i) the right to maintain and protect places of importance under traditional laws, customs and practices in the claimed area  (i) the right to maintain, protect and prevent the misuse of cultural knowledge of the common law holders associated with the claim area.  2. With respect to those parts of the area the subject of the application which are, or have been the subject of a previous non-exclusive possession act within the meaning of \$23F of the NTA, the applicants claim the native title rights and interests set out in 1 above subject to the rights and interests created in the "non exclusive possession act" which are not inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.  3. With respect to those parts of the area the subject of the application which are, or have been, the subject of  (a) a Category B intermediate period act within the meaning of \$232C  (b) a Category D intermediate period act within the meaning of \$232D or  (c) a Category D intermediate period act within the meaning of \$232D to the rights and interests claim the native title rights and interests set out in 1 above subject to the rights and interests created in the "non exclusive possession act" which are not inconsistent. |

with the rights and interests claimed and, in the case of rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.

- 4. With respect to those parts of the area the subject of the application which are, or have been the subject of
- (a) a Category B past act within the meaning of s230
- (b) a Category C past act within the meaning of s231 or
- (c) a Category D past act within the meaning of s232

the applicants claim the native title rights and interests set out in 1 above subject to the rights and interests created in the "non exclusive possession act" which are not inconsistent with the rights and interests claimed and, in the case of the rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of native title rights and interests which those inconsistent rights and interests cause.

- 5. The native title rights and interests identified above do not extend to ownership of any minerals, petroleum or gas which are wholly owned by the Crown.
- 6. The native title rights and interests identified above do not include a claim for exclusive occupation and use of off shore areas as defined by \$253.

#### Area

Jurisdiction: New South Wales

Location: Certain Identified Parcels of Crown Land in Greater Metropolitan Sydney (see

21 page tenure table and 18 AO size maps)

Local government region(s): Ashfield Municipal Council, Auburn Council, Bankstown City Council, Baulkham Hills Shire Council, Blacktown City Council, Blue Mountains City Council, Botany Bay City Council, Burwood Council, Camden Council, Campbelltown City Council, Canterbury City Council, City of Canada Bay Council, Fairfield City Council, Lithgow City Council, Hawkesbury City Council, Holroyd City Council, Hornsby Shire Council, Hunter's Hill Municipal Council, Hurstville City Council, Kogarah Municipal Council, Ku-ring-gai Council, Leichhardt Municipal Council, Liverpool City Council, Marrickville Council, Parramatta City Council, Penrith City Council, Randwick City Council, Rockdale City Council, Ryde City Council, South Sydney City Council, Strathfield Municipal Council, Sydney City Council, Waverley Council, Wollondilly Shire Council, Woollahra Municipal Council

ATSIC region(s): Binaal Billa Regional Council, Sydney Regional Council, Many Rivers Regional Council

Representative A/TSI body(s): NSW Aboriginal Land Council

Land/water and/or sea: Land/Water

Area covered by the claim (as detailed in the application):

Information identifying the boundaries of:

- a) the area covered by the application; and
- b) any areas within those boundaries that are not covered by the application.
- (a) 18 x AO size colour maps (1 x locality & 17 x enlargements), 1 x A3 locality map and a 21 page tenure/parcel identifier produced by the Surveyor General's Department have been filed with the National Native Title Tribunal. The 21 page tenure/parcel identifier is "Attachment C".
- (b) Subject to clauses (d) and (e) the area covered by the application excludes any land or waters covered by:
- (i) a schedule interest;
- (ii) a freehold estate;
- (iii) a commercial lease that is neither an agricultural lease nor a pastoral lease;
- (iv) an exclusive agricultural lease or an exclusive pastoral lease;
- (v) a residential lease;
- (vi) a community purpose lease;
- (vii) a lease dissected from a mining lease as referred to in s23B(2)(vii);
- (viii) any lease (other than a mining lease) that confers a right of exclusive use over particular land or waters;

which was validly vested or granted on or before 23 December 1996.

(c) subject to clauses (d) and (e) the area covered by the application excludes any area

|                          | covered by the valid of  | construction or establishment of any public work, where the  |  |  |  |  |
|--------------------------|--|--|--|--|--|--|
|                          |  | ishment of the public work commenced on or before 23 December  |  |  |  |  |
|                          | (i) s23B(9) - Exclusion<br>(ii) s23B(9A) - Establi<br>(iii) s23B99B) - Acts v<br>(iv) s23B(9C) - Exclus  | cified in (b) and (c) falls within the provision of n of acts benefiting Aboriginal peoples or Torres Straight Islanders; ishment of a national or state park; where legislation provides for non-extinguishment; sion of Crown to Crown grants; and |  |  |  |  |
|                          | (v)s23B(10) - Exclusion the area covered by the  | on by regulation,<br>ne act is not excluded from this application.   |  |  |  |  |
|                          | s47 - Pastoral leases h<br>s47 A - Reserves etc co<br>s47B - Vacant crown  | red to in clauses 2 and 3 covers land or waters referred to in: leld by native title claimants; overed by claimant applications; and land covered by claimant applications, he act is not excluded from the application.                             |  |  |  |  |
|                          | title claim group does   | overed by a previous non-exclusive possession act (s 23F) the native not claim the native title rights and interests set out in clause 1 of exclusion of all others.   |  |  |  |  |
|                          | (g) The area covered lextinguished at comm   | by the application excludes land where native title has been non law.  |  |  |  |  |
| Registration information | Please refer to the Register of Native Title Claims/National Native Title Register (as appropriate) for registered details of this application  Date claim entered on Register of Native Title Claims:  13/12/2000 |  |  |  |  |  |
|                          | Registration test sta<br>Accepted for registrat  |  |  |  |  |  |
|                          | Registration history<br>Registered from 12/0<br>Registered from 13/1   | 5/1997 to 29/09/1999.  |  |  |  |  |
| Attachments              |  | ntifier (Available for inspection at the Sydney Registry of the t B of the Application, 21 pages - A4, Attached 12/05/1997.  |  |  |  |  |
|                          | NNTT map attached.   |  |  |  |  |  |
|                          |  |  |  |  |  |  |
| NNTT contact details     | Case manager:<br>Address:  | Nicole Maher<br>National Native Title Tribunal<br>Level 25<br>25 Bligh Street<br>SYDNEY NSW 2000   |  |  |  |  |
| NNTT contact details     |  | National Native Title Tribunal<br>Level 25<br>25 Bligh Street  |  |  |  |  |
| NNT'T contact details    |  | National Native Title Tribunal<br>Level 25<br>25 Bligh Street<br>SYDNEY NSW 2000<br>GPO Box 9973   |  |  |  |  |



## Claimant Application Summary

| Application numbers                       | Federal Court number: NG6060/98 NNTT number: NC97/7  |
|---|--|
| Application name                          | Gundungurra Tribal Council Aboriginal Corporation # 6  |
| Name of body where application lodged     | National Native Title Tribunal   |
| Date application lodged                   | 29/04/1997   |
| Current stage(s)                          | Notification Complete, In Mediation  |
| Applicants                                | Ms Elsie Stockwell, Ms Pamela Stockwell  |
| Address for service                       | Mr Eduard Neumann Craddock Murray and Neumann Level 2 255 Castlereagh Street SYDNEY NSW 2000 Phone: 02 9283 4755 Fax: 02 9283 4180   |
| Persons claiming to hold native title     | The members of the Gundungurra Tribal Council Aboriginal Corporation   |
| Native title rights and interests claimed | <ol> <li>Subject to (2) - (5) below, the full and free enjoyment of the following native title rights and interests area are claimed in relation to the land and waters the subject of the application:         <ol> <li>A right to possess, occupy, use and enjoy the claim area;</li> <li>A right to make decisions about the use and enjoyment of the claim area;</li> <li>A right of access to the claimed area;</li> <li>A right to control the access of others to the claimed area;</li> <li>The right to control the use and enjoyment of others or resources of the claimed area;</li> <li>The right to trade in resources of the claimed area;</li> <li>The right to receive a portion of any resources taken by others from the claimed area;</li> <li>The right to maintain, protect and prevent the misuse of cultural knowledge of the common law holders associated with the claimed area.</li> </ol> </li> <li>With respect of those parts of the area the subject of the application which are, or have been, the subject of a previous non-exclusive possession act within the meaning of s 23F of the Native Title Act 1993, the native title rights and interests area set out in (1) are claimed subject to the rights and interests created in the 'non-exclusive possession act' which are not inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.</li> </ol> |
|   | 3. With respect to those parts of the area the subject of the application which are, or have been, the subject of:   |

- a. a category B intermediate period act within the meaning of s232C of the Native Title Act
- b. a category C intermediate period act within the meaning of s232D of the Native Title Act
- c. a category D intermediate period act within the meaning of s232E of the Native Title Act

the native title rights and interests claimed are those set out in (1) above subject to the rights and interests created in the non-exclusive possession act which are not inconsistent with the rights and interests claimed and, in the case of any rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.

- 4. With respect to those parts of the area of the application which are, or have been, the subject of:
- a. a category B past act within the meaning of s230 of the Native Title Act 1993;
- b. a category C past act within the meaning of s231 of the Native Title Act 1993;
- c. a category D past act within the meaning of s232 of the Native Title Act 1993;

the native title rights and interests claimed area those set out in (1) above subject to the rights and interests created in the non-exclusive possession act which are not inconsistent with the rights and interests claimed and, in the case of any rights granted which are inconsistent with the rights and interests claimed, subject to any extinguishment or suspension of the native title rights and interests which those inconsistent rights and interests cause.

- 5. The native title rights and interests identified above do not extend to ownership of any minerals, petroleum or gas which are wholly owned by the Crown.
- 6. The native title rights and interests identified above do not include a claim for exclusive occupation and use of offshore areas as defined by s253 of the Native Title Act 1993.

#### Area

Jurisdiction: New South Wales

Location: Land and waters in the area from the Blue Mountains south to Goulburn, following the Lachlan River west to Newbridge and then north to Mt Davidson. Local government region(s): Bathurst City Council, Blayney Shire Council, Blue Mountains City Council, Boorowa Shire Council, Camden Council, Campbelltown City Council, Cowra Shire Council, Crookwell Shire Council, Evans Shire Council, Goulburn City Council, Lithgow City Council, Gunning Shire Council, Liverpool City Council, Mulwaree Shire Council, Oberon Shire Council, Penrith City Council, Tallaganda Shire Council, Wingecarribee Shire Council, Wollondilly Shire Council ATSIC region(s): Binaal Billa Regional Council, Sydney Regional Council, Queanbeyan

Regional Council Representative A/TSI body(s): NSW Aboriginal Land Council

Land/water and/or sea: Land/Water

Area covered by the claim (as detailed in the application):

- (a) Commencing at 150.52997 east longitude and 34.591636 south latitude, approximately 15.5 kilometres east south east of Moss Vale, the application traverses clockwise starting in a south-westerly direction, passing through points 2 to 36,765 of the following geographic coordinates. They are in decimal degrees and referenced to Australian Geodetic Datum 1984 (AGD84). These coordinates are based on the position of spatial reference data sourced by Land Information Centre, Department of Information Management and Technology, New South Wales as of 18 May 1999.
- (b) Subject to clauses (d) and (e) the area covered by the application excludes any land or waters covered by:

(i) a scheduled interest; (ii) freehold estate; (iii) a commercial lease that is neither an agricultural lease nor a pastoral lease; (iv) an exclusive agricultural lease or an exclusive pastoral lease; (v) residential lease; (vi) a community purposes lease; (vii) a lease dissected from a mining lease as referred to in s23B(2)(vii); (viii) any lease (other than a mining lease) that confers a right of exclusive use over particular land or waters; which was validly vested or granted on or before 23 December 1996. (c) Subject to clauses (d) and (e) the area covered by the application excludes any area covered by the valid construction or establishment of any public work, where the construction or establishment of the public work commenced on or before 23 December 1996. (d) Where the act specified in (b) and (c) falls within the provisions of (i) s23B(9) - Exclusion of acts benefiting Aboriginal peoples or Torres Strait Islanders; (ii) s23B (9A) - Establishment of a national or state park; (iii) s23B (9B) - Acts where legislation provides for non-extinguishment; (iv) s23B (9C) - Exclusion of Crown to Crown grants; and (v) s23B (10) - Exclusion by regulation, the area covered by the act is not excluded from this application. (e) Where an act referred to in clauses (b) and (c) covers land or waters referred to in: s47 - Pastoral leases held by native title claimants; s47A - Reserves etc covered by claimant applications; and s47B - Vacant crown land covered by claimant applications, the area covered by the act is not excluded from the application. (f) Where an area is covered by a previous non-exclusive possession act (s 23F) the native title claim group does not claim possession, occupation, use and enjoyment to the exclusion of all others. (g) The area covered by the application excludes land where native title has been extinguished at common law.

(h) The area covered by the application excludes areas covered by prior Gundungurra claims filed with the National Native Title Tribunal being NC96/7, NC96/27, NC96/30, NC96/36 and 97/4.

| registered details of this application  Date claim entered on Register of Native Title Claims: 29/04/1997 |
|---|
| Registration test status: Accepted for registration   |
| Registration history: Registered from 29/04/1997.   |

Document Prepared: 30/11/2001 12:45 NC97/7 - 3 -

29/04/1997.

| NNTT contact details | Case manager: | Andrew Solomon                 |  |
|----------------------|---------------|--------------------------------|--|
|                      | Address:      | National Native Title Tribunal |  |
|                      |               | Level 25                       |  |
|                      |               | 25 Bligh Street                |  |
|                      |               | SYDNEY NSW 2000                |  |
|                      |               | GPO Box 9973                   |  |
|                      |               | SYDNEY NSW 2001                |  |
|                      | Phone:        | (02) 9235 6300                 |  |
|                      |               | Freecall 1800 640 501          |  |
|                      | Fax:          | (02) 9233 5613                 |  |
|                      | Web page:     | www.nntt.gov.au                |  |
|                      |               |                                |  |

- 4 -

## **APPENDIX D:** Ecological Assessments

# FLORA AND FAUNA ASSESSMENT CONDUCTED IN RELATION TO THE PROPOSED REMOVAL AND RELOCATION OF THE YARRAMUNDI BRIDGE CROSSING OVER THE NEPEAN RIVER, YARRAMUNDI, NSW

**MARCH 2002** 

#### **TABLE OF CONTENTS**

| PART A INTRODUCTION AND SETTING  | 3  |
|--|----|
| 1. Introduction  |    |
| Environmental Setting  | 3  |
| PART B FLORA SURVEY  | 5  |
| 3. Methods   | 5  |
| 3.1 Identification And Naming Of Plant Species                               |    |
| 3.2 Classification Of Communities  |    |
| 3.3 Conservation Significance of Vegetation                                  |    |
| 3.4 Literature Review  |    |
| 3.5 Field Survey Strategy  |    |
| 3.6 Limitations to the Survey  |    |
| 4. Results   | 6  |
| 4.1 Plant Species  |    |
| 4.2 Plant Communities  |    |
| 5. Discussion  |    |
| 5.1 Conservation Value Of The Vegetation                                     |    |
| 5.2 Likely Impacts of the Proposal and Mitigation Measures                   |    |
| 6. Eight Part Test   |    |
| 6.1 Sydney Coastal River-flat Forest   |    |
| 6.2 Expected Impact On Sydney Coastal River-flat Forest                      | 13 |
|  |    |
| PART C FAUNA SURVEYS   | 13 |
|  |    |
| 7. Literature Review and Field Guides  |    |
| 8. Field Survey Methods  |    |
| 8.1 Daytime Survey Methods   |    |
| Habitat Types Available For Native Fauna Species                             | 10 |
| 9.1 Riparian Woodlands   |    |
| 9.1.1 Value of Riparian Woodlands for Native Fauna                           | 18 |
| 9.2 Exotic Grasslands  |    |
| 9.2.1 Value of the Exotic Grassland for Native Fauna                         | 18 |
| 9.3 Aquatic Environments   | 19 |
| 9.3.1 Value of Aquatic Environment for Native Fauna                          | 19 |
| 10. Wildlife Corridors and Vegetation Links                                  | 19 |
| 11. Field Survey Results   |    |
| 11.1 Threatened Species Consideration  |    |
| 11.1.1 Great Egret (Ardea alba)  |    |
| 11.1.2 White-bellied Sea Eagle (Haliaeetus leucogaster)                      |    |
| 11.1.3 Rainbow Bee-eater (Merops ornatus)                                    |    |
| 11.1.4 Large-footed Myotis (Myotis adversus)                                 |    |
| 11.2 Regionally Significant Species Consideration                            |    |
| 11.3 Protected Species Consideration   |    |
| 12. Species Recorded In The Study Region During Previous Studies             |    |
| 13. Ecological Assessments   |    |
| 13.1 Commonwealth Legislative Considerations                                 | 27 |
| 13.2 State Legislative Considerations  |    |
| 13.2.1 State Environmental Planning Policy No. 44 - Koala Habitat Protection |    |
| 13.2.2 Section 5A of the Environmental Planning and Assessment Act 1979      |    |
| 13.2.3 Expected Impact On The Large-footed Myotis                            |    |
| 13.2.4 Fisheries Management Act 1994   |    |
|  |    |

| 13.2.4 Fisheries Management Act 1994  |                          |
|---|--------------------------|
| PART D CONCLUSIONS AND RECOMMENDATIO  | NS33                     |
| 14. Conclusions   |                          |
| 16. Bibliography  | 37                       |
| List of Figures Figure 1: Study boundaries, location and area. Figure 2: Vegetation communities and fauna survey locations.   | after pg 3<br>after pg 8 |
| Photographic Record Of Study Area   | after pg 17              |
| List of Tables  Table 1: Plant species of national conservation significance potentially occurring in the study area.  Table 2: Additional Scheduled fauna species known to have been recorded within the Hawkesbury and Penrith Local G Areas. | previously pg 25         |
| List of Appendices  Appendix 1 : Plant species recorded in the study area.  Appendix 2 : Fauna observed, or known to occur within the study in  | pg 40<br>region. pg 42   |

#### PART A INTRODUCTION AND SETTING

#### 1. Introduction

At the request of the NSW Roads and Traffic Authority (RTA) an assessment of the potential impacts on the vascular flora and both terrestrial and aquatic vertebrate fauna communities occurring in the vicinity of Yarramundi Bridge, 4.25 kilometres south west of the township of Richmond NSW, has been undertaken (Figure 1). The study has been undertaken as the RTA proposes to construct a new crossing over the Nepean River, 125 metres downstream of the existing Yarramundi timber bridge (Figure 1). The study location and proposed new road alignment are shown in Figure 1.

The new bridge is required as a localised failure occurred during July 2001 in the deck of the existing timber bridge, this resulting in the application of a ten tonne load limit. To permit the movement of traffic across the existing timber bridge, a single lane temporary bailey bridge has been placed across the failed spans, with vehicle movements being controlled by traffic signals. The proposed works are required to meet current secondary road width and load standards. The new bridge would be located on an improved road alignment, thereby increasing driver sight distances and road safety standards.

To permit the construction of a new river crossing, the RTA would have to excavate an 80 metre wide cutting on the eastern bank of the Nepean River, and a 20 metre wide cutting on the western.

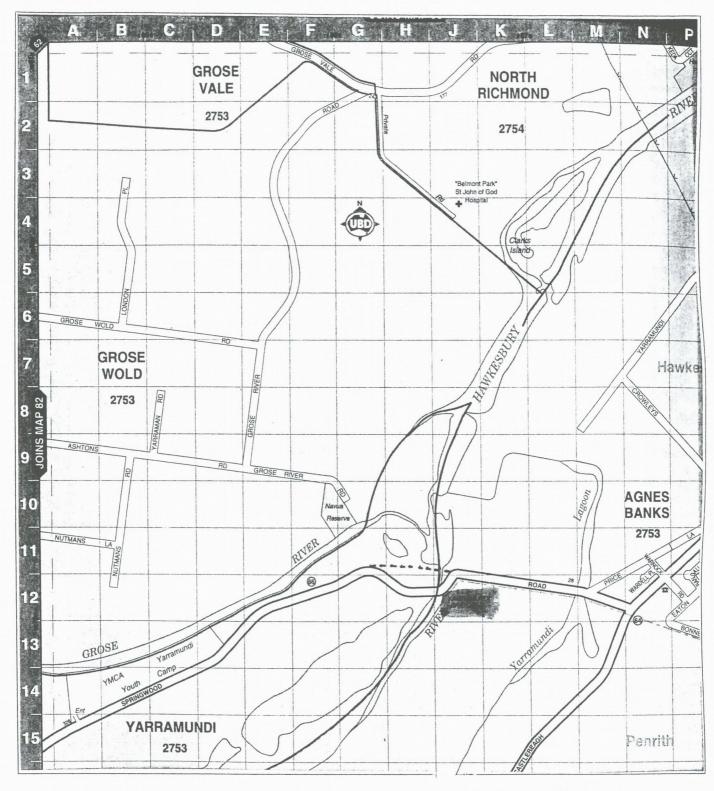
The proposed road works may include the removal of the existing timber bridge, and therefore the ecological impacts associated with this have also been considered as part of the current study.

For the purposes of this investigation, the study area is considered to include all the lands which occur within an area 50 metres downstream of the proposed new river crossing and 25 metres upstream of the existing timber bridge. Unless a portion of this area is specifically referred to, this area will hereafter be referred to as either the study area or study site.

The assessment of possible impacts associated with the proposed road works is based on a field survey of the study area, a literature review of previous studies undertaken in both the region and the Hawkesbury / Penrith Local Government Areas, the consultation of standard databases and the consideration of the objectives of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the New South Wales *Environmental Planning and Assessment Act 1979*, NSW *National Parks and Wildlife Act 1974*, NSW *Threatened Species Conservation Act 1995*, NSW *Fisheries Management Act 1994* and State Environmental Planning Policy No 44 (SEPP 44) – Koala Habitat Protection.

#### 2. Environmental Setting

The study area is located on, and adjacent to, Springwood Road, within the Hawkesbury Local Government Area, approximately 4.25 kilometres south west of the township of Richmond. At this location, Yarramundi Bridge crosses the Nepean River and an expanse of pebbles which presumably forms part of the river's floodplain. This floodplain area appears to be significantly disturbed by the past sand and gravel extractive industry. Yarramundi Bridge is approximately 125 metres long and 15 metres wide, the bridge currently being a single lane timber structure with timber decking and piers. Due to its degrading condition, substantial work has been done on the bridge to reinforce and strengthen it, the works including the provision of new timber beams and steel girders. To permit the movement of local traffic, a bailey bridge has been erected on top of the existing bridge. At the time of the field



**KEY**---- approximate alignment of proposed new river crossing.

FIGURE 1: Study location and area.

Source: UBD (9<sup>th</sup> Edition 1997)

Scale 1: 20,000



investigation, the vegetation which occurs within the western sections of the study area had been affected by fire, this fire removing a large percentage of the ground cover and understorey plants.

In the vicinity of the study area, the Nepean River flows in a north easterly direction, eventually draining into the Hawkesbury River. Within the study area, the Nepean River is approximately 60 metres wide, and is lined by a narrow band (approximately 3 metres wide) of Casuarinas. At the time of the field survey, the Nepean River was flowing, and, based on a visual inspection, the water quality appeared to be good. The Nepean/Hawkesbury River System has been identified as one of five environmentally significant areas present within the Hawkesbury Local Government Area (Hawkesbury Shire Council 2001). In relation to the study area itself, the western foreshore of the Nepean River has been substantially altered by extensive extractive industry practices in the past.

Upstream and downstream of the study area, beyond the limits of the likely works area, open expanses of water are present. During the field investigations, these large pools were observed to be utilised by a range of water birds, and as a recreational facility by fishers and canoeists. Whilst conducting the nocturnal surveys, the number of recreational fishers using the site was high, these taking advantage of fish rising to feed. Within the study area, the fishers occupied a number of locations both along the western bank of the Nepean River, and within the river channel itself.

Within the study area, a number of urban infrastructures are present, these including powerlines, water mains, street lighting, car parking facilities which permit access to the western side of the Nepean River and bitumen roads. Landuses which surround the study area include farming properties which consist of turf farms and market gardens to the east and south east, urban area to the north and north east, a quarry to the south west, and semi-rural farming properties to the west.

Through consultation of Bannerman and Hazelton (1990) the site rests on the active floodplain of the Nepean River, with the natural topography of this region generally being flat. The geology of the floodplain consists of Alluvial deposits derived from the Narrabeen, Hawkesbury sandstone and Wianamatta group materials (Bannerman and Hazelton 1990). The soil in this region is deep brown sands and loams, apedal to moderately structured and friable. The fertility of the soil is low with a very low capacity for water and nutrient retention. The soils erosion hazard is high (Bannerman and Hazelton 1990).

Natural topographies within the study area are a moderately sloping gradient on the west side of the river and a fairly steep rise on the eastern. Natural elevations within the site range from 5 metres Australian Height Datum (AHD) in the vicinity of the Nepean River, to 15 metres AHD within the western sections of the study site. As mentioned, it is noted that the topography and character of the western portion of the study area has been significantly altered as a result of past extraction works.

Annual average rainfall in the region is 807.1 millimetres with the greatest falls being experienced during the summer months (Bureau of Meteorology, UWS Hawkesbury, 2002). Average temperatures range between a winter low of approximately 10.5°C to a summer high of around 23.9°C (Bureau of Meteorology, UWS Hawkesbury, 2002).

The lands which occur to the north and south west of the current Nepean River crossing forms part of an area established as a conservation reserve. The Reserve (Yarramundi Reserve) covers an area of 89 hectares and has been established with the aim of Public Recreation and Environmental Protection (environmental protection including the wetland and riparian corridor areas). In the surrounding study region, two National Parks also exist these being the Blue Mountains National Park to the west and Wollemi National Park to the north.

The study area lies within the Central Coast botanical sub-division (Harden 1990-93).

#### PART B FLORA SURVEY

#### 3. METHODS

#### 3.1 Identification And Naming Of Plant Species

Plant identifications were made according to nomenclature in Harden (1990, 1991, 1992 and 1993).

#### 3.2 Classification Of Communities

Vegetation communities and stands are described according to Benson and Howell (1990) and revised by the Western Sydney Urban Bushland Biodiversity Survey (NPWS 1997) and the Native Vegetation Maps of the Cumberland Plain Western Sydney (NPWS 2000).

#### 3.3 Conservation Significance of Vegetation

The conservation significance of individual species, populations and ecological communities is established in the state and national context with reference to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the NSW *Threatened Species Conservation Act 1995* and Briggs and Leigh (1996). In the regional context, the conservation significance is established with reference to the Western Sydney Urban Bushland Biodiversity Survey (NPWS 1997).

#### 3.4 Literature Review

In addition to the above-mentioned published botanical literature, previous botanical studies conducted in the locality and other general references were searched for descriptions of similar vegetation types, and for recordings of plant species and communities of national or regional conservation significance known from the area. The studies referenced were:

- a flora and fauna assessment prepared in the Agnes Banks area (LesryK Environmental Consultants 2001);
- a flora and fauna assessment prepared in relation to the undertaking of proposed road works along Londonderry Road, Londonderry (LesryK Environmental Consultants 1999);
- a flora and fauna assessment of a proposed subdivision, Springwood Road, Yarramundi (LesryK Environmental Consultants 1996a);
- a flora and fauna, vegetation community and habitat assessment of the Gross Wold area (LesryK Environmental Consultants 1996);
- Hawkesbury Shire Council's State Of The Environment Effects (Hawkesbury Council 1996); and
- Penrith Shire Council's State Of The Environment Report (Penrith City Council 2000).

In addition, the Environment Australia Online Database (Environment Australia January 2002) and National Parks and Wildlife Service's Atlas of New South Wales Wildlife Database (NPWS January 2002) (search area 10 x 10 kilometres centred on study area) were also accessed for previous recordings of plant species of conservation significance within the district.

#### 3.5 Field Survey Strategy

A general botanical survey of the study area and adjacent habitats was carried out by John Speight (B.Sc.) on 9 January 2002. The entire study area within the boundaries of the proposed development and adjacent habitats was surveyed on foot. Survey efforts targeted sites that were less disturbed and had a higher potential to support plant species of conservation significance. The foot survey of vegetation used the 'Random Meander Method' described by Cropper (1993). This method is considered the most effective for detecting plant species of conservation significance, and involves walking randomly throughout the study site while ensuring that the full range of potential habitats are surveyed, and recording every plant species seen (Cropper 1993). Approximately 3 hours was spent actively surveying the study area.

#### 3.6 Limitations to the Survey

The study area is highly disturbed by weeds and past earthworks activities, and is generally open with a high ground visibility. The only limitation to the survey is the short 'snapshot' time frame whereby only those species with vegetative parts were able to be seen and identified. Some grass species may not have been growing at this time of year and therefore been overlooked. In other circumstances, some native orchid species can also be overlooked when they do not have above ground parts growing.

In this survey, no threatened grass species or orchids are known from the locality or from the type of habitats present and none would have been overlooked during the survey. Some exotic species may not have been growing during the survey and may have been missed but this is not a constraint or limitation to the survey outcomes.

#### 4. RESULTS

#### 4.1 Plant Species

A list of plant species recorded within the study area is provided in Appendix 1. It is not a comprehensive list of all the exotic species present, but is a comprehensive list of those native species present.

No species of national or state conservation significance listed by Briggs and Leigh (1996) or on the Schedules to either the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the NSW *Threatened Species Conservation Act 1995* were located during the survey.

Nine (9) species considered to be vulnerable in Western Sydney, listed by the Western Sydney Urban Bushland Biodiversity Survey (NPWS 1997), were recorded in the study area. These are indicated in Appendix 1.

Through consultation of the National Parks and Wildlife Service's Atlas of New South Wales Wildlife Database (NPWS January 2002) and the Environment Australia Online Database (January 2002) thirty (30) plant species of state and/or national conservation significance were identified as having been previously recorded in the Hawkesbury and Penrith Local Government Areas. These species are listed in Table 1 below, along with the habitats they occur in and their likely occurrence in the habitats present within the study area. During the field survey, none of these plants were recorded within or adjacent to the study area.

**TABLE 1.** Plant species of state and/or national conservation significance potentially occurring in the study area.

| SPECIES  | HABITAT AND LIKELY OCCURRENCE   |
|--|---|
| Acacia bynoeana                                  | Occurs in woodland and forest, often in rocky situations (Harden 1993). Not likely to occur.  |
| Acrophyllum australe                             | Grows in damp crevices in sandstone, usually near waterfalls. Restricted to the Blue Mtns, near Springwood, Linden, Woodford and Lawson (Harden 1990). Would not occur.   |
| Allocasuarina glareicola                         | Restricted to a few small known populations in Castlereagh Woodland in the Penrith area.  Outlier population (1 plant) recorded from Voyager Point (NPWS 1997). Not likely to occur.  |
| Acacia gordonii                                  | Grows on rock platforms on ridgetops and rocky spurs of Hawkesbury Sandstone (Benson and McDougall 1996). Would not occur.  |
| Acacia pubescens                                 | Usually grows in open sclerophyll woodland and forest on clay soils, Bilpin to Georges River area, also Woodford (Harden 1991). Not likely to occur.  |
| Asterolasia elegans                              | Grows in wet sclerophyll forest on moist hillsides (Harden 1991). Would not occur.  |
| Cynanchum elegans                                | Grows in rainforest gullies, scrub and scree slopes (Harden 1992). Would not occur.   |
| Dillwynia tenuifolia                             | Grows in red sandy to clay soils, sometimes gravelly on Tertiary alluvium (Benson and McDougall 1996). Not likely to occur.   |
| Epacris sparsa                                   | Grows in sandy soil among rocks beside the Grose River (Harden 1992). Potential to occur.   |
| Eucalyptus benthamii                             | Grows along the Nepean River in tall open forest with <i>E. baueriana</i> , <i>Angophora subvelutina</i> and <i>E. elata</i> . Sandy alluvial deep yellow sand or brown-yellow deep sandy loam (Benson and McDougall 1998). Potential to occur.                 |
| Grevillea juniperina subsp<br>juniperina         | Has a restricted range occurring on red sandy to clay soils – often lateritic on Wianamatta Shale and Tertiary alluvium in Cumberland Plain Woodland and Castlereagh Woodland (Final Determination NPWS 1999). Would not occur.                                 |
| Kennedia retrorsa                                | Grows in sheltered sites, generally north facing and in rocky areas in dense vine thicket of<br>Kennedia or in wet eucalypt forest with Eucalyptus deanei or along creeks with<br>Leptospermum polygalifolium (Benson and McDougall 1996). Not likely to occur. |
| Lasiopetalum joyaceae                            | Grows in heath on sandstone; Hornsby Plateau (Final Determination NPWS 1999). Would not occur.  |
| Leucopogon fletcheri sub<br>fletcheri            | sp. Grows in woodland on lateritic soils in the Springwood area (Harden 1992). Would not occur.   |
| Melaleuca deanei                                 | Grows on broad flat ridgetops, dry ridges and slopes of sandstone in slerophyll forest (Benson and McDougall 1998). Would not occur.  |
| Micromyrtus minutiflora                          | Grows in dry sclerophyll forest in the western part of Cumberland Plain (Harden 1991). Not likely to occur.   |
| Olearia cordata                                  | Grows in dry open sclerophyll forest on sandstone derived soils. (Benson and McDougall 1994) Not likely to occur.   |
| Persoonia acerosa                                | Occurs in the central Blue Mountains and grows in heaths and dry sclerophyll forest in well drained soils of sandstone admixtures, laterite and gravel (Blombery and Maloney 1992). Would not occur.  |
| Persoonia hirsuta                                | Occurs in woodlands and dry sclerophyll forest on sandstone or very rarely on shale (Final Determination NPWS 1998). Would not occur.   |
| Persoonia hirsuta subsp. nov. ? Yengo National P |   |
| Persoonia marginata                              | Grows in dry sclerophyll eucalypt forest in heavier clayey, gravelly loam derived from Permian rocks, on low ridges (Blombery and Maloney 1992). Would not occur.   |
| Persoonia nutans                                 | Occurs in shrub-woodland and grows in (Tertiary) alluvial sands, gravels and laterites (Blombery and Maloney 1992). Would not occur.  |
| Pimelea spicata                                  | Grows on shale soils on the coast from Lansdowne to Shellharbour and inland to Penrith (Harden 1990). Would not occur.  |
| Pomaderris brunnea                               | Grows in open forest. Confined to the Colo River and upper Nepean River (Harden 1990). Would not occur.   |
| Prostanthera cineolifera                         | Grows in sclerophyll forest. Would not occur.   |
| Pultenaea parviflora                             | Grows in sandy to clay soils Tertiary alluvium, on the Cumberland Plain (Benson and McDougall 1996). Would not occur.   |
| Pterostylis saxicola                             | Grows in small pockets of shallow soil on sandstone rock shelves above cliff lines, in shale/sandstone transition or shale vegetation communities (Final Determination NPWS 1998). Would not occur.   |
| Velleia perfoliata                               | Grows on sandstone ridges, rock platforms and rocky hillsides in heath (Benson and McDougall 1997). Would not occur.  |
| Tetratheca glandulosa                            | Grows in sandy or rocky heath or scrub (Harden 1992). Would not occur.  |
| Zieria involucrata                               | Grows in wet sclerophyll forest, chiefly in the lower Blue Mountains (Harden 1991). Would   |

#### 4.2 Plant Communities

All of the vegetation within the study area has been modified and degraded by land clearing for quarrying and road construction. The majority of the study area consists of previously cleared and now weed dominated land, with an area of native riparian forest along the main Nepean River channel, flood channels and billabongs.

The area has been previously mapped by Benson (1992) on the Penrith 1:100,000 scale map sheet as Cleared land. The National Parks and Wildlife Service (2000) has mapped the study area on the 1:25,000 scale as Sydney Coastal River-flat Forest - Riparian Forest (non-eucalypt). This corresponds to the results of the current survey. Sydney Coastal River-flat Forest is an endangered ecological community listed on Schedule 1, Part 3 of the NSW *Threatened Species Conservation Act 1995*. It is not listed on the Schedules to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

On the eastern side of the River the River-flat Forest has been replaced by a weed-dominated community of Gleditisia *Gleditisia triacanthos*, dense Kikuyu Grass *Pennisetum clandestinum* and Balloon Vine *Cardiospermum grandiflorum*. On the western side of the River, a filled area is vegetated by a weed community dominated by Paddy's Lucerne *Sida rhombifolia*, Cobbler's Pegs *Bidens pilosa* and the native Couch Grass *Cynodon dactylon*, with scattered native shrubs including Parramatta Green Wattle *Acacia parramattensis*, White Cedar *Melia azederach* and Coast Myall *Acacia binervia*. Further downslope on a flood channel of the River, Native Tussock *Poa labillardieri* forms a dense grass cover.

A detailed description of the Sydney Coastal River-flat Forest community is provided below, while its location is mapped in Figure 2.

River She-Oak Forest Casuarina cunninghamiana – Acacia parramattensis (Sydney Coastal River-flat Forest)

#### Occurrence

This vegetation type occurs along both banks of the main Nepean River channel and the flood channel on the western side of the River. The community also occurs up stream and downstream of the study area. The community would have occurred in the now weed infested area on the eastern side of the River but has been displaced by invasive weeds.

#### **Structure and Condition**

Trees to 15 metres in height, with a very sparse shrub layer and sparse to dense groundcover layer. The community is generally in good condition except for areas of dense Wandering Jew *Tradescantia albiflora*. The weed species Paddy's Lucerne *Sida rhombifolia*, Verbena *Verbena bonariensis* and Cobbler's Pegs *Bidens pilosa* are common. Woody weeds such as Thorn Apple *Datura ferox* occur scattered throughout the drier areas. The native species diversity was relatively high given the disturbed nature of the locality.

#### Common Species (\*= exotic species)

#### **Trees**

The tree stratum consists of River Oak Casuarina cunninghamiana and Weeping Willow Salix babylonica\*.

#### Shrubs:

Parramatta Green Wattle Acacia parramattensis, White Sally Acacia floribunda and Pink Pavonia Pavonia hastata (a naturalised non-native).





FIGURE 2: Vegetation communities and fauna survey locations.



#### Groundcovers:

The groundcover is dominated by grasses in areas where Casuarina does not occur (the higher, dry and sandy flood channel area on the western side of the main channel), and by aquatic sedges and herbs under the canopy of the Casuarina forest. Common native species include: Native Tussock *Poa labillardieri*, Mat Rush *Lomandra longifolia*, *Centella asiatica*, Spotted Knotweed *Persicaria decipiens*, Knotweed *Persicaria lapathifolium*, Water Couch *Paspalum distichum*, *Meuhlenbeckia gracillima*, Creeping Christian *Commelina cyanea*, Common Couch *Cynodon dactylon*, Common Rush *Juncus usitatus* and Spreading Sneezeweed *Centipida minima*. Common weeds are: Wandering Jew *Tradescantia albiflora*\*, Paddy's Lucerne *Sida rhombifolia*\*, Cobbler's Pegs *Bidens pilosa*\* and Kikuyu Grass *Pennisetum clandestinum*\*.

#### 5. DISCUSSION

#### 5.1 Conservation Value Of The Vegetation

No plant species of state or national conservation significance were located within or adjacent to the study area.

Nine (9) species considered to be regionally vulnerable in Western Sydney, listed by the Western Sydney Urban Bushland Biodiversity Survey (NPWS 1997), were recorded in the study area. One of these, Thin-leaved Naiad *Najas tenuifolia*, is considered to be regionally rare (NPWS 1997).

The majority of these vulnerable species are groundcover aquatic plants and low sedges that occurred in a small flood channel (up to 10m wide) on the western side of the main river channel. The bridge alignment would directly affect approximately half of this wetland area, though the impacts would depend on where a bridge pier is to be located in relation to the wetland. If a pier is located in or close to the wetland, the vegetation would need to be cleared. If a pier is located away from the wetland, the vegetation could remain and the potential indirect impacts mitigated through best practice procedures. Thin-leaved Naiad occurred in other parts of the study area and would not be directly affected by the relocation of the bridge or road approaches.

Most of these species occur along most sections of the Nepean River (Howell, McDougall and Benson 1995), and the removal of some of these plants from the study site is unlikely to cause a significant impact on the local population of the species. However, measures to minimise the loss of these species should be undertaken.

Sydney Coastal River-flat Forest is listed as an endangered ecological community under Part 3, Schedule 1 of the *Threatened Species Conservation Act 1995*. An estimated 91% of the pre-1750 area of River-fat Forest has been cleared. The remaining portion of this vegetation type is not conserved. The stands within the study area are continuous with adjacent stands of the same vegetation type along the River.

The condition of the community varies from a structurally and species diverse condition in the main channel and adjacent floodplain, to areas that have been physically disturbed by earthworks and are highly degraded by weeds on the higher parts of the River banks.

The areas above both banks of the River do not contain many characteristics of the original River-flat Forest community. The area on the western side of the River has been quarried and appears to be a filled embankment. The eastern side of the River appears to have been part of a farm and has been physically disturbed by the existing road approach cuttings. The eastern side of the River is vegetated almost entirely by a dense and diverse weed community.

Neither of these areas are likely to contain a viable soil seed bank of characteristic species of the River-flat Forest community due to the significant physical disturbance, and on the eastern bank, the length of time the area has been weed infested. Natural regeneration of the River-flat Forest community would not occur, with any revegetation of this community requiring the clearing of weeds and the planting of native species.

#### 5.2 Likely Impacts of the Proposal and Mitigation Measures

The proposed construction of a new bridge over the Nepean River would result in the removal of approximately 2000m<sup>2</sup> or 0.2 hectares of Sydney Coastal River-flat Forest within the main River channel, from the bottom of the eastern bank to the bottom of the western River bank. It does not include the weed infested vegetation upslope of the eastern bank, or the disturbed area above the western River bank. Both these areas are highly degraded and would not be expected to regenerate to a structure approximating a natural River-flat Forest community without replanting.

Some indirect impacts on the creek vegetation outside the construction zone could also occur, including sedimentation and the trampling of adjacent vegetation by construction machinery and personnel. These indirect impacts could be easily controlled by installing and maintaining effective erosion and sediment controls, and by fencing areas of vegetation that are to be retained.

The bridge piers should not be located in the main channel of the River, or in any areas vegetated by River She-oak *Casuarina cunninghamiana*. This would avoid direct impacts on those wetland areas previously identified as containing the majority of the regionally vulnerable plant species. If the design of the bridge necessitates the location of bridge piers in the wetland areas, the impacts should be reduced by:

- · minimising the area to be cleared,
- installing effective temporary erosion control fences,
- · delineating the construction zone;
- only clearing from within the delineated construction zone; and
- not allowing personnel or machinery to enter the wetland areas outside the construction zone.

Where a part of the wetland is to be constructed over, but a pier not located within the wetland, only trees should be removed and as much of the groundcover species as possible should be left unaffected. The trees should be cut down and poisoned, rather than the roots grubbed out to avoid extensive disturbance to the wetlands.

The removal of the existing timber bridge is expected to be undertaken in sections by crane, operating from both the bridge deck and the river-bank beside the bridge. Clear areas are available on the northern (downstream) side of the bridge where vehicles and heavy machinery would not significantly affect the vegetation. Work should be undertaken from this side only, since the southern (upstream) side of the bridge is heavily vegetated. The vegetation in this area is weed dominated with some common native species, but the unnecessary disturbance of any vegetation should be avoided until restoration works are undertaken. If it is necessary to work from the southern side of the bridge, the minimum amount of vegetation should be removed and effective erosion controls be implemented.

The whole of the area within the road reserve on the eastern bank of the River, and the old bridge corridor should be weeded and regenerated by planting endemic native species. A qualified bush regeneration organisation should undertake the work. The sandy floodplain areas could also be incorporated into the regeneration works and be planted with *Casuarina cunninghamiana*, although it is expected that the understorey would always be invaded by weeds from upstream areas during flooding.

#### 6. EIGHT PART TEST

An eight-part test under Section 5A of the *Environmental Planning and Assessment Act 1979* is designed to determine "whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats" listed on the Schedules to the *Threatened Species Conservation Act 1995*, and consequently, whether a Species Impact Statement is required. This eight-part test therefore refers only to those species, populations or ecological communities listed on the Schedules to the *Threatened Species Conservation Act 1995*. It does not refer to ROTAP species, or species of local or regional conservation significance. These species have been considered in previous sections of the report.

#### 6.1 Sydney Coastal River-flat Forest

(a) "...in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction..."

No threatened plant species listed on Schedules 1 or 2 of the *Threatened Species Conservation Act 1995* occur in the study area.

(b) "...whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised..."

No endangered population listed on Schedule 1 (Part 2) of the *Threatened Species Conservation Act 1995* occurs in the study area.

(c) "...in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed..."

Within the study area, the endangered Sydney Coastal River-flat Forest ecological community occurs within the main channel of the Nepean River and the flood channel of the western side of the River. It also occurs upstream and downstream of the study area.

Because River-flat Forest is restricted to a narrow band along waterways, the community has always been naturally restricted in its extent. Urban development has also further reduced the size and quality of the River-flat Forest remnants by concentrating urban runoff into waterways, making most of the creeks in the Sydney Basin weed infested and littered with rubbish.

Although the removal of approximately 2000m<sup>2</sup> (0.2 hectares) of River-flat Forest from the site would not be considered to constitute a significant impact in terms of the regional distribution of the community at this time, the removal of small areas of Sydney Coastal River-flat Forest continues and it is unknown how many small areas are being destroyed. In itself, the removal of this area may not be significant at either a local or regional level, but it is crucial to minimise the total area to be cleared and to design the Proposal to restrict clearing to the absolute minimum. This may include in this instance the groundcover species within the bridge alignment corridor being left un-cleared between the locations of the bridge piers. The area within the road reserve should be revegetated with species characteristic of the endangered River-flat Forest community at the completion of the construction.

(d) "...whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community..."

The removal of this portion of River-flat Forest would not result in the isolation of adjacent stands of vegetation and all pollination and seed dispersal mechanisms would still be able to operate.

(e) "...whether critical habitat will be affected..."

No habitat critical to the survival of a threatened species, population or community of plants would be affected by the proposed works.

(f) "...whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region..."

At a local level, due to its inclusion in the adjacent Yarramundi Nature Reserve, this community is considered to be locally conserved.

In the region, River-flat Forest is not considered to be adequately represented in any of the nature conservation reserves.

(g) "...whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process..."

Two Key Threatening Processes listed on Schedule 3 of the *Threatened Species Conservation Act 1995* apply to the Proposal. These are:

- "Clearing of native vegetation", and
- "Alteration to the natural flow regimes of rivers and streams, and their floodplains and wetlands".

#### "Clearing of native vegetation"

No practical direction as to what is being assessed under this Key Threatening Process is provided in the Final Determination. However, the National Parks and Wildlife Service Threatened Species Unit advises that the Determination only applies to areas containing a threatened species (including endangered populations and ecological communities) and is meant to assess whether the area being cleared or destroyed is significant.

As previously mentioned, while the clearing of the vegetation in the corridor is not considered significant in the local or regional context, the minimum possible area should be cleared, and other areas within the road reserve revegetated.

"Alteration to the natural flow regimes of rivers and streams, and their floodplains and wetlands".

The RTA has advised that the new bridge and approaches would be designed so as not change the existing flood characteristics exhibited in this part of the River. No additional afflux would occur and no change to inundation periods are expected.

(h) "...whether any threatened species, populations or ecological community is at the limit of its known distribution..."

The study area is near the north-western limit of the distribution range of the River-flat Forest in the Sydney Basin, but other stands occur along the Grose River to the west and the Hawkesbury River to the north.

#### 6.2 Expected Impact On Sydney Coastal River-flat Forest

The proposed removal of 0.2 hectares of Sydney Coastal River-flat Forest in the study area would not result in a significant reduction in the area of the community within the Sydney region, and is not considered to constitute a significant impact. Consequently, the preparation of a flora Species Impact Statement is not considered necessary. However, as previously mentioned it is crucial to minimise the area to be cleared and to avoid the unnecessary clearing of groundcover species within the bridge alignment corridor.

#### PART C FAUNA SURVEYS

#### 7. Literature Review and Field Guides

Prior to the undertaking of any field work, previous studies conducted in the region and known databases were consulted to identify the diversity of fauna species known for, or potentially occurring in, the study region. These species are ones which may utilise the study area on occasion but were not observed, recorded or indicated during the site investigations. The undertaking of a literature search also ensures that the results from surveys conducted during different climatic, seasonal and date periods are also considered and drawn upon as required. This approach therefore increases the probability of considering the presence and possible impacts on all known and likely native species, particularly those of conservation concern.

The identification of known, or potentially occurring, native species within this part of the Hawkesbury Local Government Area, particularly those listed under the Schedules to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the NSW *Threatened Species Conservation Act 1995* and the NSW *Fisheries Management Act 1994*, also permits the tailoring of the field survey strategies to the detection of these animals, their necessary habitat requirements, and the selection of the most appropriate survey techniques.

The studies and reports referred to in this document include:

- a list of freshwater fish species which are known to be present within the Hawkesbury and Nepean River systems (Harris and Gehrke 1997, NSW Fisheries, January 2002);
- Hawkesbury City Council's State Of The Environment Effects (Hawkesbury City Council 1996);
- Penrith City Council's State Of The Environment Report (Penrith City Council 1997);
- fauna lists prepared for the Western Sydney Region (NPWS 1997);
- a flora and fauna assessment prepared in the Agnes Banks area (LesryK Environmental Consultants 2001);
- a flora and fauna assessment prepared in relation to the undertaking of proposed road works along Londonderry Road, Londonderry (LesryK Environmental Consultants 1999);
- a flora and fauna assessment of a subdivision proposed, Springwood Road, Yarramundi (LesryK Environmental Consultants 1996a); and

• a flora and fauna, vegetation community and habitat assessment of the Grose Wold area (LesryK Environmental Consultants 1996b).

In addition to these documents, the Environment Australia Online Database (Environment Australian January 2002) and National Parks and Wildlife Service's Atlas of New South Wales Wildlife Database (NPWS January 2002) (search area 10 x 10 kilometres centred on study area) were also accessed.

Other reports and documents referred to are provided within the bibliography section of this report.

All these databases and reports were reviewed and drawn upon where relevant. While reviewing these documents, particular attention was paid to identifying records of species listed under the Schedules of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the NSW *Threatened Species Conservation Act 1995* and the NSW *Fisheries Management Act 1994*, species which have been recorded in the region and which, based on the similarities of fauna habitats in this area, may therefore occur within, or in the vicinity of, the boundaries of the study area.

Field guides and standard texts used were:

- Cogger (1992) reptiles and frogs;
- Simpson and Day (1999) birds;
- Strahan (1995) mammals;
- Churchill (1998) insectivorous bats;
- Triggs (1996) identification of scats, tracks and markings; and
- McDowall (1996) freshwater fish.

The naming of native species recorded or known for the region follows those presented in these documents.

The conservation significance of animals observed or expected is made with reference to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the NSW *Threatened Species Conservation Act 1995* and the NSW *Fisheries Management Act 1994*, while their regional and local status was determined through reference to the National Park's *Fauna of Western Sydney* (NPWS 1997), and discussions held with the NSW Fisheries.

#### 8. Field Survey Methods

A survey of the study area (as indicated in Figure 1) was undertaken by Deryk Engel (B.Env.Sc.HONS) and Peter Hawkins (B.Eng.Env.) on the 9 of January and Deryk Engel on the 17 January 2002. The climatic conditions experienced during the field investigations were clear skies, little or no wind and warm to hot temperatures and mild to warm, overcast with a southerly breeze respectively. The strategy employed for the field investigation involved traversing the study area and adjacent habitats by foot, with detailed searches being conducted within areas which had the potential to be of conservation concern. To ensure that a representative diversity of fauna species were recorded, thereby identifying the value of the habitats present, the likely fauna assemblages and the range of threatened species which may occur, searches were conducted both during the day, and from dusk onwards.

By the completion of the site inspections, approximately seven (7) person hours of active searches had been accumulated, active searches being defined as the time spent actively searching for observations/evidence of fauna species. Given the physical condition and size of the study area, this length of survey time is considered more than adequate when endeavouring to determine both the diversity of native species present, their associated habitats and the conservation status of both of these.

Given the open nature of the site, access to all parts of the likely development area were good to above average, with visibility in each of the habitat types present being moderate to high. During the field survey, no limitations to the success of the study were encountered.

To determine the diversity of native species present within the study area at the time of the field investigation, a number of standard survey methods were employed. These techniques were:

- The direct observation of those fauna species present within, adjacent to, or flying over the study area;
- Spotlighting;
- Echolocation detection using Anabat II detectors;
- Litter and ground debris searches for reptiles and frogs;
- Diurnal and nocturnal call identifications;
- · Analysis of any carnivore scats which contained bone and hair material; and
- The identification of indirect evidence, such as tracks, scratchings and scats.

Where required, further explanation of these methods is provided in Sections 8.1 and 8.2, while Figure 2 provides the location of each method employed.

The presence of likely aquatic vertebrate species, particularly those of National and State conservation concern, was determined through reference to listings provided for the Hawkesbury-Nepean River and its catchment by the NSW Fisheries, past reports and studies, consultation of standard texts and the Environment Australia Online Database (Environment Australia January 2002). These listing were combined with an assessment of the aquatic habitats present within, and adjacent to, the study area and a consideration of the value of these to be significant for native fish species. As part of the current study, no in-stream fish surveys were undertaken, these being beyond the scope of the works required.

### 8.1 Daytime Survey Methods

While conducting the field investigations an adaptation of the 'Random Meander Method' described by Cropper (1993) was used, this method being modified so that it is suitable for fauna surveys. By undertaking the assessment using this strategy, all fauna habitats present within and adjacent to the study area were identified and surveyed, and the majority of resident species recorded.

During the daytime searches, logs, urban refuse and other suitable ground debris material was turned and any leaf litter accumulations investigated. These habitat features were surveyed to identify any sheltering frogs or reptiles.

The habitat features associated with Yarramundi Bridge were also searched to identify any sheltering, nesting or roosting animals. During these searches, due to recent findings regarding the occupation of timber bridges by microchiropterans, some of which are listed under the Schedules to the *Threatened Species Conservation Act* 1995 (Hoye 1996, LesryK Environmental Consultants 2001), habitat features important to these animals were sought. These features include sheltering and roosting sites, these being in the form of bolt holes, splits in timber beams and piers, sheltering crevices and so forth. Where these were identified, and access was possible, they were searched with a hand held torch to detect any sheltering or roosting microchiropterans, or identify any evidence in the form of bat guano, which indicated their presence. While conducting the bridge surveys, a range of possible roosting hollows (0.1-600 mm) in diameter) were observed.

While undertaking the field surveys, efforts were made to document the diversity, structure and value of the habitats present within, and adjacent to, the study area for those protected, as defined under the NSW National Parks and Wildlife Act 1974, and threatened, species observed, recorded, or expected to occur based on past studies and known distribution patterns. This involved assessing the structure of the vegetation associations and fauna habitats present and determining their significance for native species, particularly those of national, state and regional conservation concern. While conducting the habitat assessments, efforts were made to identify features such as hollows within the bridge supports and abutments, in-stream aquatic features, known feed trees, mature trees with hollows, connectivity of fauna corridors, wetlands, other suitable aquatic environments and other habitat features important to the life cycle requirements of those threatened species known or likely to occur in the study region.

### 8.2 Nocturnal Survey Methods

A nocturnal survey of the study area was undertaken on the 17 January 2002. The weather conditions experienced during this session were overcast skies, mild to warm temperatures and slight southerly breezes.

During the nocturnal survey, stands of native vegetation present within the study area were spotlighted. While conducting the spotlighting session, bridge supports, roads, paths and walking tracks were targeted, and a 100 watt hand held spotlight used. The spotlighting session commenced on dusk, thereby endeavouring to detect any species leaving roosting sites or broadcasting territorial calls, and lasted for approximately two (2) hours. During the spotlighting session, efforts were made to target habitats considered suitable for nocturnal animals, particularly those species of conservation significance identified as occurring within the study region during the literature review process. These habitat features include water bodies, hollow bearing trees, bridge supports, beams and piers and riparian woodlands.

During the spotlighting session, the identification of microchiropterans, using Anabat II echolocation detectors, was undertaken. Microchiropterans are small insectivorous bats approximately 4 cm long and weighing around 8 grams. These animals make up approximately 40% of Australia's total mammal fauna assemblage, and are therefore a significant component of our native species. The detectors used to identify the presence of these species within the study area were placed at three locations, these being:

- under the existing Yarramundi Bridge between piers eleven (11) and twelve (12),
- under the existing Yarramundi Bridge adjacent to pier five (5), and
- within the riparian woodland, which lines the western bank of the Nepean River, downstream of the existing timber bridge.

At the first two sites surveyed, the detectors were turned on fifteen minutes prior to dusk, thereby endeavouring to detect any microbats which may have been leaving any roosting sites which occur in associated with the existing timber bridge. The third site was surveyed to determine the foraging value of the riparian vegetation. All detectors were left in place for 45 minutes per site, with a total time of two hours and fifteen minutes of bat detecting being obtained. Any signals obtained using this method were sent to FBN Bat Surveys, Newcastle, for analysis.

While conducting the daytime searches of the timber structures associated with Yarramundi Bridge, a range of possible microchiropteran roosting hollows (0.1 – 600 mm in diameter) were observed. In relation to these, most were covered by cobwebs, the presence of which is an indicator that the hollows are not being used by large species. Even though cobwebs and no bat guano or other scats were observed near any of the possible microchiropteran roosting sites recorded, while conducting the nocturnal survey, several of the more likely roosting areas were 'stag' watched. This

involved a researcher sitting in close proximity to these features and listening for, and observing, using a low wattage torch, any microchiropterans leaving these sites. This technique has proved effective for detecting roosting microchiropterans during other insectivorous bat surveys conducted at other timber bridge sites within NSW (LesryK Environmental Consultants 2001).

Based on the results of the literature and database search, and given the nature of the habitats present within, and adjacent to, the study area, and the likely extent of the works, it was not considered necessary to under take any call playbacks for threatened frogs or owls. As such, these techniques were not employed during the nocturnal survey.

During the spotlighting session, the identification of any distinctive calls, including frogs, owls and vocal mammal species, was also undertaken, with all calls heard being identified in the field.

By the completion of the nocturnal survey, two (2) hours of night work had been accumulated.

### 9. Habitat Types Available For Native Fauna Species

Three habitat types available for use by native species are present within the study area, these being:

- riparian woodlands,
- exotic grasslands, and
- aguatic environments.

Descriptions of the structure and therefore value of these for native species are provided below, along with an indication of their location. For reference, a photographic record of each habitat type has also been provided.

### 9.1 Riparian Woodlands

The riparian woodlands occur as a band of vegetation, approximately 2 to 3 metres wide, adjacent to the Nepean River. The woodland supports Casuarinas and exotic Willow trees, 10 to 15 metres in height, none of which contain any hollows suitable for the roosting or breeding needs of hollow dependant native animals. Throughout the study area, and both upstream and downstream of the proposed river crossing, the tree canopy is continuous. The riparian community is also continuous north and south of the study area, its width varying in association with the adjacent landuse practices and the development history of the region. Within this habitat type, the understorey layer is composed of a sparse layer of both native and exotic shrubs and saplings, these being up to 5 metres in height. The ground cover is composed of a high density layer of exotic grasses and weeds, these reaching a height of approximately 1 metre. Leaf litter, ground and flood borne debris is also present, these habitat features being important for reptiles, frogs and the invertebrates they feed on.

This community is typical of the structure, development and character of the Hawkesbury Nepean riparian forests observed throughout this region.

To permit the construction of the proposed new river crossing approximately twenty (12) native, and three (3) exotic semi- mature to mature trees would require removal.

28/03/2002

### 9.1.1 Value of Riparian Woodlands for Native Fauna

The riparian woodlands would be considered as having high local and regional conservation value due to its function as a fauna corridor (Hawkesbury City Council 1997). The general connectivity of the vegetation canopy throughout the study region would assist the movement of several native species as they disperse along the Nepean River. Within the study area itself, the value of the riparian woodland is considered to be minimal, due to the small band width, the plant species present (ie trees which don't form hollows) and the high public access to the site. The trees which would be removed to permit the relocation of Yarramundi Bridge are not considered to be a significant resources for any native species, and their loss is not considered to compromise the overall value of the fauna corridor for those species recorded or expected (refer to Section 10.0). Though narrow, the riparian woodland would provide inputs into the Nepean River itself (ie branches, leaf litter), these benefiting the diversity of fish species present. The riparian vegetation would also consolidate the river banks, reducing the effects of erosion.

### 9.2 Exotic Grasslands

The exotic grasslands occur beyond the limits of the riparian woodland, east and west of the Nepean River. This habitat type continues to extend beyond the limits of the study area.

The exotic grasslands which occur to the west of the Nepean River supports a sparse to high density layer of exotic grasses and weeds, these being to one metre in height. Within this habitat type clumps of Casuarina and Acacia saplings have established, these being approximately eight metres in height. Isolated individuals of both of these species are also present at a number of locations throughout the exotic grassland. Within this habitat type, the tree canopy is not continuous. The exotic grassland has been recently affected by a fire, this removing most of the ground cover and understorey vegetation. The western section of the exotic grassland also appears to have also been affected through the dumping of construction waste and the levelling of the landscape. The importation of fill material appears to have increased the incidents of weed infestation.

Though restricted, it appears that the area is used by off road vehicles.

A section of the western grassland forms part of the Nepean River floodplain, this presumably being scoured and eroded during flood periods.

East of the Nepean River, the exotic grassland supports a high density layer of weeds, grasses and vines. Isolated exotic and native saplings, five metres in height are present. Vines cover much of the vegetation present, thereby reducing the penetration of light and preventing the growth of seedlings. A line of exotic trees is present at the eastern limit of the study area, these being approximately fifteen (15) metres in height, None of these trees appear to support any suitable roosting hollows. To the east, the exotic grassland appears to have been cleared for grazing purposes.

### 9.2.1 Value of the Exotic Grassland for Native Fauna

The exotic grasslands are considered to be of minimal value for native species. The resources present within habitat type are not considered to be of any value for any native species and no resident populations of native animal would be adversely disturbed through the further modification or development of this area. No species listed under either the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or NSW *Threatened Species Conservation Act 1995* are considered to rely on or occur as resident populations within the exotic grasslands, and none were recorded within this habitat type during the field investigations. The further

# PHOTOGRAPHIC RECORD OF STUDY AREA



Photo 1: Looking upstream along the Nepean River towards the existing Yarramundi Bridge. New river crossing proposed to be located in the vicinity of exposed rocks (centre of photograph). Note structure riparian vegetation.



Photo 2: Looking east, towards the Nepean River, through the exotic grasslands.

# PHOTOGRAPHIC RECORD OF STUDY AREA



Photo 3: Structure of exotic grasslands which line the eastern bank of the Nepean River. Photograph taken facing along the proposed alignment for the new river crossing.

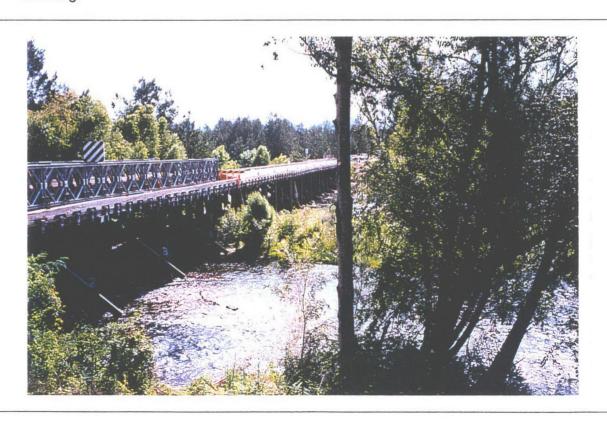


Photo 4: Yarramundi Bridge.

development of the exotic grasslands is not considered to trigger the need for a Species Impact Statement or the referral of the matter to the Federal Minister for the Environment.

### 9.3 Aquatic Environments

The Nepean River is the only aquatic habitat type present within the study area. This river flows into the Hawkesbury 250 metres downstream of the existing bridge. As mentioned, within the study area, the Nepean River is approximately 60 metres wide, with the eastern bank being steeper than the western. Throughout the study area the river bed consists of sand, pebbles, gravel beds and small boulders, these being approximately 30 centimetres in diameter. At the time of the field survey, the Nepean River's depth near the proposed river crossing was approximately half a metre. A medium to high density layer of submerged aquatic vegetation was observed, as was the presence of emergent plants at several locations within the study area. Within the alignment of the proposed river crossing, one log was observed, this appearing to have been deposited during a 'recent' flooding event. Within the study area a number of large concrete blocks were found, these being approximately 1 m³ in size, these presumably an indicator of a former weir.

Within the study area, a variety of fish species were observed these encompassing a range of age classes. The observation of these fish, in association with the aquatic habitats present, would indicate that the Nepean River is an important breeding site for native fish species.

At the time of the field survey the Nepean River supported waters which were clear and running fast.

### 9.3.1 Value of Aquatic Environment for Native Fauna

Based on the results of the field survey, combined with the observation of a variety of fish species within the study area, the Nepean River is considered to be an important habitat type. This aquatic environment would meet the life cycle needs of a number of aquatic associated species, including fish, invertebrates and water birds. The Nepean River would also permit the dispersal and migration of fish species during spawning and breeding periods, and also offer drinking opportunities for a number of terrestrial animals. The Nepean River is therefore considered to have high ecological value.

### 10. Wildlife Corridors and Vegetation Links

The main fauna dispersal and movement corridor in the vicinity of the study area would be the Nepean River and its associated riparian woodlands. These habitat features provide opportunities for the north – south movement of native species, linking in with more densely vegetated bushland areas and those riparian communities which are present throughout the study region.

The Nepean River itself would provide opportunities for the dispersal and movement of fish species, particularly during breeding periods.

The works would require the removal of approximately twelve native trees. Given the assemblage of species recorded, and those expected to be present based on the outcomes of the literature search, the removal of these trees is not considered to compromise the movement or dispersal patterns of these animals. The height and width of the proposed bridge is expected to be similar to the existing timber structure, thereby permitting the easy movement of ground and lower storey traversing species. As they do with the existing structure, flying species would also be able to negotiate and traverse over the new bridge.

The proposed new river crossing would include:

- the establishment of three (3) concrete piers within the active channel of the Nepean River:
- the establishment of seven (7) concrete piers on the western floodplain; and
- the construction of the western section of the proposed road on a filled batter structure.

During the course of the bridge construction, the placement of temporary structures within the channel of the Nepean River itself may also be required, though the form of these structures was not known at the time of report preparation.

As such, the proposed relocation of Yarramundi Bridge could have an adverse impact on the movement patterns of aquatic species during the construction phase of the project. The placement of piers within the river channel is also expected to affect the character of the aquatic habitats, along with altering the flow patterns experienced by this section of the river. To mitigate these impacts measures have been presented in Section 15.0 of this report to ensure that no aquatic species or their habitats are affected.

### 11. Field Survey Results

As would be expected for such a highly disturbed site, few native terrestrial species were recorded. Those that were recorded were four (4) native mammals, thirty six (36) native birds, three (3) amphibians and one (1) reptile (Appendix 2). In addition to these a number of introduced animals were also recorded, or indicated as occurring, within the study area (Appendix 2).

In regards to the detection of those native species recorded:-

- the four (4) microchiropterans were all identified for the site through use of the Anabat detectors, these animals being recorded both under the existing Yarramundi Bridge and in association with the adjacent riparian woodlands. During the field survey, no microchiropterans were recorded within the study area on dusk, thereby implying that none are using this area as a roosting resource. While undertaking the spotlighting survey, microchiropterans were observed foraging for insects over the Nepean River. As such, the study area is only considered to meet the foraging and movement needs of those microchiropterans recorded or expected;
- the Eastern Water Skink (Eulamprus quoyii) was recorded while conducting ground debris searches under the existing bridge;
- the three (3) frogs, the Common Eastern Froglet (Crinia signifera), Leseur's Tree Frog (Litoria lesueurii) and Eastern Dwarf Tree Frog (Litoria fallax), were all either heard calling from within the reed beds which occur within, and adjacent to the study area, or, were hand captured during the leaf litter and ground debris searches; and
- all birds were observed within, adjacent to or flying over the study area, or identified from their distinct calls.

Although not specifically targeted, whilst conducting the nocturnal survey an eel (Anguilla sp), Gudgeon (Hypseleotris sp), crayfish and a variety of fingerlings were observed in close proximity to the existing timber bridge. The diversity and age classes of aquatic species observed is considered to indicate that this section of the Nepean River is important to the breeding requirements of fish.

In relation to the two carnivore scats collected, analysis of these indicated that foxes (*Vulpes vulpes*) were feeding on House Mice (*Mus musculus*), Rabbits (*Oryctolagus cuniculus*), birds, insects and plant material.

Of those animals recorded by the completion of the field survey;

- three, the Great Egret (Ardea alba), White-bellied Sea-Eagle (Haliaeetus leucogaster) and Rainbow Bee-eater (Merops ornatus), are listed as migratory birds under the Schedules to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999;
- one, the Large-footed Myotis (Myotis adversus), is listed as Vulnerable on Schedule 2 of the NSW Threatened Species Conservation Act 1995; and
- one, the Nankeen Night Heron (*Nycticorax caledonicus*), is listed as being of regionally conservation value in the Western Sydney Region.

In relation to the recording of these species:

- the Great Egret was observed foraging along the river banks beyond the limits of the study area;
- the White-bellied Sea-Eagle was seen flying over the study area;
- a flock of Rainbow Bee-eater were observed flying northwards along the Nepean River on dusk;
- the Large-footed Myotis was recorded approximately 20 minutes after dusk both under the existing Yarramundi Bridge, and in association with the riparian woodland; and
- a Nankeen Nigh Heron was flushed from its roosting site within the riparian woodlands, approximately 50 metres north of the proposed new river crossing.

Further consideration of the possible impacts associated with the proposed road works on these species is given in Section 11.1 - 11.2.

By the completion of the field survey, no microchiropterans were recorded roosting in association with the existing Yarramundi Bridge and none were observed leaving this structure during the stag watching phase of the nocturnal survey. While surveying the existing bridge, no indirect evidence, such as bat guano or other scats, were observed in any likely roosting or sheltering sites.

It is acknowledged that a number of the species recorded within the study area during the current investigation occur within the Families of birds listed as migratory under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Appendix 2). These species were observed in association with their documented habitat types, these records being made within, or in association with, the riparian woodlands and Nepean River. The native 'migratory' species recorded include the Pacific Black Duck (*Anas superciliosa*), Australian Wood Duck (*Chenonetta jubata*) and Masked Lapwing (*Vanellus miles*), none of which are considered to be migratory in Australia. In relation to these species, it is not considered that the proposed bridge replacement at Yarramundi, would result in the significant removal of any areas or habitats of importance for these animals.

### 11.1 Threatened Species Consideration

### 11.1.1 Great Egret (Ardea alba)

The Great Egret is distributed throughout Australia and is found in association with lakes, swamps, rivers and dams (Frith 1997). Though listed under international migratory bird agreement, in Australia, the Great Egret is a sedentary bird which does not migrate northwards during the winter months. The Great Egret is a solitary and territorial waterbird which forages within waters which are up to 30 centimetres deep (Kingsford 1991). Within these areas, this bird will mainly feed on fish, though insects, crustaceans and amphibians will also be taken. The Great Egret breeds during the early summer months, a stick nest being constructed within trees at a height of up to 15 metres (Frith 1997). Breeding occurs within communal nesting areas between the months of October and December and March to May (Kingsford 1991).

During the field survey, no Great Egret roosting colonies were recorded within, or in the vicinity of, the study area. Giving consideration to the habitat needs of this species, its movement patterns and its recording within the study area, it is not expected that the proposed bridge works would have an adverse impact on this species, its populations, habitats or movement patterns. The works would not result in a reduction in the availability of this species foraging resources, nor the presentation of any barriers to its movement patterns.

### 11.1.2 White-bellied Sea Eagle (Haliaeetus leucogaster)

The White-bellied Sea Eagle is associated with coastal areas and bays all around Australia, though it can also be found in inland areas of large rivers, lakes and swamps (Frith 1997). It spends most of its time soaring above these water bodies hunting for fish, tortoises, sea snakes and waterfowl. Occasionally, rabbits will also be taken. This species forms permanent pairs which construct stick nests. These nests are usually located 30 metres plus above the ground in trees or on coastal cliffs (Frith 1997).

During the course of the field investigations one individual of this species was observed flying over the study area. Within the study region, it is expected that the White-bellied Sea Eagle forages along the Hawkesbury River system, this species being observed during one of its foraging periods. It is considered that no significant area of habitat utilised by this species for foraging, roosting or nesting occurs within or adjacent to the study site and as such, this species would not be significantly impacted upon as a result of the proposed bridge replacement. The proposed bridge removal and relocation works would therefore not adversely affect this species of national conservation concern, and thus the referral of the matter to the Federal Minister of the Environment for further consideration or approval is not required.

### 11.1.3 Rainbow Bee-eater (*Merops ornatus*)

The Rainbow Bee-eater occurs throughout mainland Australia except in cooler areas of the extreme south east and south west. Through most of its range it occurs as a breeding migrant although resident populations can be found in northern Australia. This pale blue and green bird has a long curved black bill with a blue-edged black eye stripe and a black tail with extended central feathers. The preferred habitat of this species is open country with the availability of suitable breeding places, in areas of sandy or loamy soils. These areas include sand dunes, river banks, sand pits, mangroves and occasionally rainforest canopies and woodlands while migrating. Nesting sites can be found dug into a sandy bank or bare flat ground, consisting of a tunnel up to 1 metre long with a diameter of approximately 50 millimetres. The breeding season is between November and January in the south and between

September and July in the north. The Rainbow Bee-eater feeds on wasps, bees, dragonflies, damsel flies, beetles and other insects of similar sizes (Frith 1997).

This species was observed flying over the study area. Though suitable habitat for the breeding requirement of this species is present within the study area, no resident individuals were recorded. The removal and relocation of Yarramundi Bridge is therefore not considered to have a detrimental impact on this bird, or its necessary habitat requirements. The works would not present any barriers to the migratory patterns of the Rainbow Bee-eater nor would it result in the significant reduction of any possible foraging or roosting resources.

### 11.1.4 Large-footed Myotis (Myotis adversus)

The Large-footed Myotis is primarily a coastal species and is generally distributed from south-eastern South Australia, through Victoria, New South Wales, Queensland, the Northern Territory and the top of Western Australia (Churchill 1998). Commonly a cave dweller, the Large-footed Myotis will also utilise tree hollows, dense vegetation, mines, tunnels and stormwater drains. Roosts are usually located close to, or in proximity of, water, with colonies of between 10 and several hundred individuals being present (Churchill 1998). Roosting sites are located within a number of habitat types, as long as these are near water. The Large-footed Myotis forages mostly over water, feeding on insects and fish which are caught by "raking" the water's surface. This bat will also catch prey while flying. Prey species include moths, water boatmen, mayflies, water striders and crickets. Within New South Wales, breeding occurs once a year with a single young being born in November – December (Churchill 1998).

The main threats to this species is expected to be the disturbance of colonies, particularly during the colder months when it would be hibernating, and the reduction of water quality within streams known to be used as a foraging resource.

Within the boundaries study area, no Large-footed Myotis colonies were recorded or indicated. Though possible roosting habitat is present, particularly in association with the existing timber bridge, no individuals were recorded in association with this structure. Individuals of this species were observed foraging approximately 20 metres upstream of the existing timber bridge, over a larger expanse of open water. The proposed works would not have a detrimental impact on this area, or the foraging resources it provides. The presence of the Large-footed Myotis within the study area is not considered to be adversely affected by the proposed works, no significant foraging or roosting sites being removed or adversely affected.

### 11.2 Regionally Significant Species Consideration

Based on the observations made during the field survey, and the information provided within the documented literature, with only a relatively small area of riparian woodland being destroyed, the proposed road works are not considered to result in the removal or further fragmentation of any significant habitat areas or fauna corridors for the Nankeen Night Heron (*Nycticorax caledonicus*). When flushed, this species was observed to easily traverse over the existing timber bridge structure, the individual seeking shelter in the riparian vegetation which occurs upstream of the study area. During the field survey, no evidence to suggest that this bird is breeding within, or inclose proximity to, the study area was observed. Beyond the limits of the works, suitable habitat for the foraging and sheltering needs of this species is present. As such, the occurrence of the Nankeen Night Heron is not considered to be adversely affected or altered by the proposed works, such that it is placed at further risk of decline.

### 11.3 Protected Species Consideration

The remainder of the native species recorded are protected, as defined under the NSW National Parks and Wildlife Act 1974, though expected to be common to abundant throughout the region. Based on the observations made during the field survey, and the information provided within the documented literature, these species would mainly be dependant and associated with the riparian woodlands and aquatic environments, no significant components of which would be altered or affected by the proposed bridge works. Therefore, no resources important to these species would be significantly affected or altered such that these native animals would become locally displaced or affected. The works will not have an adverse cumulative impact when associated with other projects being undertaken in the vicinity of the study area. Due to the 'small scale' of the works proposed, in-conjunction with the retention of the main area of riparian woodland and the main features of the Nepean River (combined with the close proximity of Yarramundi Reserve), it is not considered that the works would result in the removal or further fragmentation of any important habitat areas or fauna corridors. As such, the occurrence of those protected native species recorded for the study area during the field survey is not considered to be adversely affected or altered by the proposed bridge replacement at Yarramundi.

### 12. Species Recorded In The Study Region During Previous Studies

Fauna surveys and compilation lists prepared for the region have identified an additional eighteen (18) native mammals, two hundred and eleven (211) native birds, nine (9) native reptiles, fourteen (14) native frogs, fifteen (15) native fish and one (1) threatened invertebrate (Appendix 2). Of those species previously recorded:

- Thirty (30) are listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (Table 2);
- Twenty three (23) are listed under the Schedules to the NSW *Threatened Species Conservation Act* 1995 (Table 2); and
- Forty five (45) are identified as being of regional conservation concern within the Western Sydney region (Appendix 2).

Of those threatened species previously recorded within the surrounding region (as identified in Table 2), it is noted that the mammals, frogs and invertebrates are all associated with eucalypt woodlands. These animals rely on these areas for the resources they provide, including features such as sandstone incised drainage lines, tree hollows, mature intact woodlands and leaf litter and ground debris accumulations. Within the boundaries of the likely development area, no components of these features are present, no eucalypt woodlands being present within the study area. As such, none of these species are expected to occur as a viable resident population within, or inclose proximity to the study area, and none are likely to occur as transient individuals. As such, none of the mammals, frogs or invertebrates previously recorded in the region would occur within the study area and none would be affected by the proposal such that they, their populations, communities or habitats would be significantly affected.

Similarly the works would not have a detrimental impact on any of the woodland associated birds previously recorded in the region, the proposal not removing any significant resources suitable for the life cycle requirements of these species. Individuals of the woodland birds may, on occasion, traverse over the study area, but the works would not have an adverse impact on these movement or foraging patterns.

**TABLE 2.** Additional Scheduled fauna species known to have been previously recorded within the Hawkesbury and Penrith Local Government Areas.

# Legislation

EPBC Act 1999 – Commonwealth Environment Protection and Biodiversity Conservation Act 1999. TSC Act 1995 – NSW Threatened Species Conservation Act 1995.

| COMMON NAME               | SCIENTIFIC NAME          | LEGISLATION                    |
|---------------------------|--------------------------|--------------------------------|
| MAMMALS                   |                          |                                |
| Spotted-tailed Quoll      | Dasyurus maculatus       | TSC Act 1995                   |
| Koala                     | Phascolarctos cinereus   | TSC Act 1995                   |
| Common Bentwing-bat       | Miniopterus schreibersii | TSC Act 1995                   |
| Yellow-bellied Glider     | Petaurus australis       | TSC Act 1995                   |
| Squirrel Glider           | Petaurus norfolcensis    | TSC Act 1995                   |
| BIRDS                     |                          |                                |
| Buff-banded Rail          | Gallirallus philippensis | TSC Act 1995                   |
| Cattle Egret              | Ardea ibis               | EPBC Act 1999                  |
| Black Bittern             | Ixobrychus flavicollis   | TSC Act 1995                   |
| Australasian Bittern      | Botaurus poiciloptilus   | TSC Act 1995                   |
| Little Curlew             | Numenius minutus         | EPBC Act 1999                  |
| Wood Sandpiper            | Tringa glareola          | EPBC Act 1999                  |
| Common Sandpiper          | Actitis hypoleucos       | EPBC Act 1999                  |
| Common Greenshank         | Tringa nebularia         | EPBC Act 1999                  |
| Marsh Sandpiper           | Tringa stagnatilis       | EPBC Act 1999                  |
| Latham's Snipe            | Gallinago hardwickii     | EPBC Act 1999                  |
| Black-tailed Godwit       | Limosa limosa            | TSC Act 1995 and EPBC Act 1999 |
| Sharp-tailed Sandpiper    | Calidris acuminata       | EPBC Act 1999                  |
| Pectoral Sandpiper        | Calidris melanotus       | EPBC Act 1999                  |
| Red-necked Stint          | Calidris ruficollis      | EPBC Act 1999                  |
| Long-toed Stint           | Calidris subminuta       | EPBC Act 1999                  |
| Curlew Sandpiper          | Calidris ferruginea      | EPBC Act 1999                  |
| Buff-breasted Sandpiper   | Tryngites subruficollis  | EPBC Act 1999                  |
| Ruff                      | Philomachus pugnax       | EPBC Act 1999                  |
| Oriental Pratincole       | Glareola maldivarum      | EPBC Act 1999                  |
| Painted Snipe             | Rostratula benghalensis  | TSC Act 1995 and EPBC Act 1999 |
| Bush Stone-curlew         | Burhinus grallarius      | TSC Act 1995                   |
| Grey Plover               | Pluvialis squatarola     | EPBC Act 1999                  |
| Double-banded Plover      | Charadrius bicinctus     | EPBC Act 1999                  |
| White-winged Black Tern   | Chlidonias leucoptera    | EPBC Act 1999                  |
| Caspian Tern              | Sterna caspia            | EPBC Act 1999                  |
| Square-tailed Kite        | Lophoictinia isura       | TSC Act 1995                   |
| Swamp Harrier             | Circus approximans       | EPBC Act 1999                  |
| Major Mitchell's Cockatoo | Cacatua leadbeateri      | TSC Act 1995                   |
| Superb Parrot             | Polytelis swainsonii     | TSC Act 1995 and EPBC Act 1999 |
| Swift Parrot              | Lathamus discolor        | TSC Act 1995 and EPBC Act 1999 |
| Powerful Owl              | Ninox strenua            | TSC Act 1995                   |
| Barking Owl               | Ninox connivens          | TSC Act 1995                   |
| White-throated Needletail |                          |                                |
|                           | Hirundapus caudacutus    | EPBC Act 1999                  |
| Speckled Warbler          | Chthonicola sagittata    | TSC Act 1995                   |
| Regent Honeyeater         | Xanthomyza phrygia       | TSC Act 1995 and EPBC Act 1999 |
| Black-chinned Honeyeater  | Melithreptus gularis     | TSC Act 1995                   |
| Painted Honeyeater        | Grantiella picta         | TSC Act 1995                   |
| Yellow Wagtail            | Motacilla flava          | EPBC Act 1999                  |
| Rufous Songlark           | Cincloramphus mathewsi   | EPBC Act 1999                  |

| COMMON NAME                 | SCIENTIFIC NAME         | LEGISLATION   |
|-----------------------------|-------------------------|---------------|
| Brown Songlark              | Cincloramphus cruralis  | EPBC Act 1999 |
| Clamorous Reed-warbler      | Acrocephalus stentoreus | EPBC Act 1999 |
| Amphibians                  |                         |               |
| Red-crowned Toadlet         | Pseudophryne australis  | TSC Act 1995  |
| Invertebrates               |                         |               |
| Cumberland Plain Land Snail | Meridolum corneovirens  | TSC Act 1995  |

In relation to the water associated birds, based on their documented life cycle requirements, if present near the study area, the majority would be recorded utilising the larger open expanses of water which occur north and south of the proposed river crossing. The wetland birds are usually not associated with fast running rivers, such as those present within the study area (Kingsford 1991, Frith 1997, NPWS 1999). Other wetland birds require reed beds and other aquatic vegetation, no major components of which were recorded. Some of the birds may occasionally fly over or traverse along the Nepean River, the proposed bridge essentially being a replication of the existing structure, the birds expected to be adaptable to this feature.

Of the previously recorded water associated birds, it is considered that only the Cattle Egret *Ardea ibis* and Black Bittern *Ixobrychus flavicollis*, could potentially occupy the riparian vegetation which occurs within the study area. This consideration is based on the recording of similar water associated birds during the field survey, these having similar habitat requirements to the Cattle Egret and Black Bittern.

The Cattle Egret is a communal bird which mainly forages in wet pastures in groups of two to twenty (Frith 1997). Within these areas, this bird mainly feeds on a variety of insects and occasionally, small aquatic animals (Kingsford 1991). The Cattle Egret roosts and nests colonially in trees and shrubs which line water ways, the nesting colonies incorporating other water birds (Frith 1997). Breeding occurs at all times of the year (Kingsford 1991).

During the field survey no Egret roosting colonies were recorded within, or in the vicinity of, the study area, the study area considered likely to only constitute non-breeding, foraging habitat. The proposed road and bridge works will not limit the amount of potential foraging habitat available for this species (if present), nor will it present any significant barriers to its movement patterns. The works will not have an adverse impact on this species, such that it, its populations and habitats are placed at risk of extinction.

The Black Bittern is distributed throughout the wet coastal areas of New South Wales, Queensland, the Northern Territory and Western Australia (Frith 1977). Within Australia its conservation status is considered to be secure (Garnett 1992, Garnett 1993), though in New South Wales it is listed as being Vulnerable under Schedule 2 of the *TSC Act 1995*. Favouring casuarina-lined watercourses the Black Bittern, is in decline due to the loss of its necessary habitat (Garnett 1993). A crepuscular species, the Black Bittern builds it's nest on a branch overhanging water within riparian vegetation (Kingsford 1991). Foraging occurs in short marshy aquatic vegetation, where fish and invertebrates are fed upon (Kingsford 1991). The clearing of this vegetation, trampling of habitat by domestic livestock, drainage of swamps and degradation of streams have all contributed to the decline of this species (Marchant and Higgins 1990, Kingsford 1991, Garnett 1993).

During the field survey, no individuals of this species were flushed. Similarly, no characteristic bittern nests were observed. The width of the riparian vegetation within the study area itself is considered to be minimal, and would not be expected to meet the sheltering needs of this bird. As such, if present within the study area, this species is only expected to use the site as a non-breeding, foraging habitat. Given the amount of vegetation proposed to be removed, it is not considered that the proposed road and bridge works would limit the extent of potential foraging or roosting habitat available for

this species. Similarly, the works would not present a significant barrier to the movement patterns of the Black Bittern, this bird expected to already be adaptable to the presence of the existing Yarramundi Bridge. As such, if present, it is not considered that the works would have an adverse impact on this species, such that it, its populations and habitats are placed at risk of extinction.

Beyond the limits of the likely bridge crossing, better developed and more structurally diverse aquatic and riparian habitats are present, these being more suitable for the life cycle needs of both of these threatened water associated birds.

## 12.1 Regionally Significant Species

The restriction of the works to the alignment proposed is not considered to have a significant impact on any stands of woodland or any fauna dispersal corridors. The works would not cause a significant removal or isolation of any woodland, nor would they have any long term indirect impacts on the quality of these habitats. The incorporation of suitable fauna underpasses within the bridge design would ensure that connectivity along the riparian woodland is maintained. As such, it is not considered that the proposed bridge replacement and relocation works would have an impact on the status of any residential populations of any of the regionally significant species.

#### 13. ECOLOGICAL ASSESSMENTS

### 13.1 Commonwealth Legislative Considerations

During the field investigations three (3) species, the Great Egret (*Ardea alba*), White-bellied Sea-Eagle (*Haliaeetus leucogaster*) and Rainbow Bee-eater (*Merops ornatus*), listed under the Schedules of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* were recorded. Giving consideration to the habitat requirements of these species, and their recorded locations during the field survey, it is not considered that any would be adversely affected by the current proposal. The current proposal would not remove any significant foraging or breeding sites, nor would it present a barrier to the movement patterns of these species. When looking at the large home ranges of these birds and the abundance of suitable habitats which occur in the surrounding region, it is not considered that any of these species would be significantly impacted upon as a result of the proposed bridge removal and relocation works. As such, the works are not considered to have a significant impact on any species which are of National Environmental Significance. Therefore, it is not considered that the matter would require referral to the Federal Minister of the Environment for further consideration or approval.

### 13.2 State Legislative Considerations

### 13.2.1 State Environmental Planning Policy No. 44 - Koala Habitat Protection

The Hawkesbury Local Government Area is identified under Schedule 1 – Local Government Areas of State Environmental Planning Policy No 44 (SEPP 44) – Koala Habitat Protection. This policy seeks to encourage the proper conservation and management of areas that provide habitat for Koalas.

Within, and adjacent to the study area, no eucalypt trees were recorded. As such, the study area, is not considered to constitute either Potential or Core Koala habitat as indicated by the definitions provided under SEPP 44. Therefore the proposed bridge replacement at Yarramundi would not be considered as significantly affecting any Koala populations or their habitat areas, and therefore a Plan of Management for the conservation and management of areas of Koala habitat is not required to be prepared as part of the current proposal.

### 13.2.2 Section 5A of the Environmental Planning and Assessment Act 1979

The potential impacts associated with the proposed removal and relocation of Yarramundi Bridge, Yarramundi, on the state listed species of conservation concern recorded during the field survey, this being the Large-footed Myotis (*Myotis adversus*), is considered using the 'eight part test' as provided under Section 5A of the *Environmental Planning and Assessment Act 1979*. These criteria are designed to determine "whether there is likely to be a significant effect on (this) threatened species, (its) populations, ecological communities, or habitats", and consequently, whether a Species Impact Statement is required.

(a) "...in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction..."

Though individuals of the Large-footed Myotis were observed to be foraging within and adjacent to the study area, based on the investigation of any sites of possible roosting and breeding habitat, it is not considered that any locally viable populations of this species are significantly reliant upon habitat resources present within the study area. The removal of the existing timber bridge, and several trees from the riparian community, would not limit the extent of any possible roosting habitat available for this species. Similarly, the proposed works are not considered to reduce the extent of any available foraging resources. Therefore, the works would not have a significant impact on this threatened species, such that a locally viable population of the Large-footed Myotis would be placed at risk of extinction.

(b) "...whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised..."

The Large-footed Myotis is not listed as an endangered population under Part 2, Schedule 1 of the *Threatened Species Conservation Act 1995*. There are no endangered fauna populations listed under this Schedule which are applicable to the Hawkesbury Local Government Area.

(c) "...in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed..."

The removal of a timber bridge and up to twelve Casuarina trees is not considered to adversely affect a significant area of known habitat for this species from the region. The works would not limit the extent of foraging or roosting habitat available to the Large-footed Myotis from the region. No regionally significant habitat would be affected by the proposed works.

(d) "...whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community..."

The proposed bridge works would not isolate any currently interconnecting or proximate areas of habitat suitable for use by the Large-footed Myotis. During the field survey this species was observed to successfully negotiate and traverse under the existing bridge, this structure not hindering any of its movement or foraging patterns. Therefore, the works would not result in any dispersal, movement or foraging corridors being adversely affected.

(e) "...whether critical habitat will be affected..."

No habitats considered critical to the life cycle needs of the Large-footed Myotis were recorded within, or in close proximity to, the boundaries of the study area. The area is not listed as critical habitat under Part 3 Division 1 of the *Threatened Species Conservation Act 1995*. There is no critical habitat within the sphere of influence of the proposed road works.

(f) "...whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region..."

Due to a lack of published research, it is not known whether the Large-footed Myotis is adequately represented in any of the surrounding conservation reserves or similar protected areas. Although this is the case, it is not expected that the Large-footed Myotis would rely upon those habitats present within the study area such that the removal of these would compromise the viability of a resident local population of this species.

(g) "...whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process..."

Currently eight threatening processes for mainland New South Wales are listed under the NSW *Threatened Species Conservation Act 1995*, these being predation by the introduced Plague Minnow *Gambusia holbrookii*, predation by the European Red Fox *Vulpes vulpes*, predation by the Feral Cat *Felis catus*, invasion by *Chrysanthemoides monilifera*, high frequency fires, anthropogenic climate change, bushrock removal and clearing of native vegetation. Of the first seven of these, none are directly or indirectly applicable to the current proposal.

Based on discussions held with R. Humphries, Manager Central Threatened Species Unit, NPWS (pers.comm. 22/11/2001), it is noted that Key Threatening Processes only relate to their impacts on listed threatened species, populations, ecological communities or their habitats.

The current proposal will result in the clearance of some native vegetation, though the loss of this is not considered to have an adverse impact on either the Large-footed Myotis' roosting of foraging habitats. The vegetation present within the study area is not considered to be important for the life cycle needs of the Large-footed Myotis, no resources significant for this species being removed, altered or affected. The loss of approximately twelve native trees would not be considered a significant impact on the presence of the Large-footed Myotis.

A preliminary determination has also been made to list the *alteration of the natural flow regimes of rivers and streams and their floodplains and wetlands* as a Key Threatening Process on Schedule 3 of the *Threatened Species Conservation Act 1995*. Alterations of natural flow regimes has a variety of impacts, one of which is the reduction of habitat and foraging resources available for invertebrate species. The proposed bridge works would involve the establishment of piers within the existing river channel, and the placement of a batter on the western floodplain. Although the works would result in the disruption of a section of the aquatic habitats present within the study area, the impacts of these works, and their possible alterations of the flow rates within the Nepean River, are not considered to reduce the extent of foraging habitat or resources available for the Large-footed Myotis. Given the presence of large open bodies of water beyond the limits of the study area, the proposed bridge removal and relocation works are not considered to significantly affect the invertebrate compositions of the region, thereby reducing the extent of prey species available.

(h) "...whether any threatened species, populations or ecological community is at the limit of its known distribution..."

The Large-footed Myotis does not reach its distribution limits in the vicinity of the study area.

### 13.2.3 Expected Impact On The Large-footed Myotis

The proposed bridge removal and relocation works are not considered to have a significant impact on the local status of the Large-footed Myotis. The works would not remove any roosting or breeding sites and no foraging areas would be significantly affected. The works would not present a barrier to the dispersing or movement patterns of this species. Therefore it is not considered that the proposed removal and relocation of Yarramundi Bridge would have a significant impact on this threatened species, its populations, ecological communities or habitats. Therefore, the preparation of a Species Impact Statement which further considers the impacts of the works on this species is not required.

### 13.2.4 Fisheries Management Act 1994

The potential impacts associated with the proposed removal and relocation of the Yarramundi Bridge on aquatic species is considered using the eight part test as provided under Division 6, Subdivision 1 of the *Fisheries Management Act 1994*. These criteria are designed to determine "whether the action proposed is likely to significantly affect threatened species, populations or ecological communities, or their habitats", and consequently, whether a Species Impact Statement is required.

The following assessment has been made on the assumption that any works associated with the bridge removal and construction would:

- only use floating pontoons, barges or gantries to access the bridge supports;
- not require the erection of any temporary or permanent barriers which would prevent the movement of fish species;
- not require any dredging or instream habitat modification / alteration; and
- not require the placement of any fill material into the river.

Unless specified (eg vertebrate fish species), definitions employed follow those provided within the *Fisheries Management Act 1994*.

The eight part test is usually only undertaken if a threatened species has been recorded during the field investigation, or if habitat suitable for the needs of a threatened species are likely to be removed as part of a proposal. Although this is the case, a generic 'eight part test' has been undertaken to ensure that greater consideration has been given to the current proposal and its potential to have an adverse impact on the aquatic environments and native fish species present.

(a) "...in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction..."

No locally viable populations of any threatened freshwater fish have been previously recorded within the study region. In relation to the study area itself, the structure of the aquatic habitats present are not considered significant for any of the threatened freshwater fish previously and historically recorded in the surrounding region. As such,

the works are not considered to place a locally viable population of any threatened fish at risk of extinction.

(b) "...in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised..."

Endangered populations refers to those populations listed under Part 2 of Schedule 4 of the *Fisheries Management Act 1994*. Within the study region, no endangered fish populations are present.

(c) "...in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed..."

The proposed bridge works would not result in the removal, modification or isolation of any significant areas of known habitat from the study region, for any threatened fish, their populations or communities. No areas of regionally important habitat would be adversely affected either directly or indirectly by the undertaking of the proposed bridge works.

(d) "...whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community..."

The proposed relocation of Yarramundi Bridge would not result in the isolation of any currently interconnecting or proximate areas of habitat for any threatened fish, their populations or communities. The proposed works would not require the erection of any permanent barriers which would prevent the movement of fish species along the Nepean River. No areas of regionally important habitat would be adversely affected either directly or indirectly by the proposed bridge works.

(e) "...whether critical habitat will be affected..."

The area is not listed as critical habitat. Currently there are no areas of critical habitat listed under Part 7A, Division 3 of the *Fisheries Management Act 1994*. No habitats considered critical to the life cycle needs of any freshwater threatened species are considered to be affected by the proposed road works.

(f) "...whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region..."

No aquatic conservation reserves are known to be present along the Nepean River.

(g) "...whether the action proposed is of a class of action that is recognised as a threatening process..."

Three threatening processes are listed under the NSW Fisheries Management Act 1994, these being the:

- degradation of native riparian vegetation along New South Wales water courses;
- removal of large woody debris; and

 introduction of fish to freshwaters within a river catchment outside their natural range.

A preliminary determination has also been made to list the *installation and operation of instream structures that modify flow* as a Key Threatening Process under the *Fisheries Management Act 1994*. In relation to this Key Threatening Process, it is noted that this only relates to dams, weirs and so forth, bridges and other similar structures being excluded.

As with the terrestrial fauna, it is noted that these Key Threatening Processes only relate to their impacts on listed threatened aquatic species, populations, ecological communities or their habitats.

Whilst undertaking the literature review, no threatened fish species were identified as having been previously recorded within the study region. Within the limits of the study area, no habitats important to any threatened fish were observed.

In relation to the listed Key Threatening Processes, the works would result in the removal and possible degradation of some riparian vegetation. Given the scale of the proposal, the width of the riparian woodlands, the extent of similar riparian resources beyond the limits of the work and the extent of riparian disturbance as a result of the recreational use of the site, it is not considered that the vegetation clearance that is proposed would have a detrimental impact on any fish species or their habitats.

To ensure due diligence, and giving consideration to the value of the site as a nursery / fish foraging resource, it is recommended that the works:

- not include the removal of any large woody debris;
- not require the grubbing out of the casuarina root systems;
- not result in the erosion of any river banks;
- not result in the sedimentation of the Nepean River;
- not result in the restriction of any fish dispersal or movement patterns. The movement of fish species along this river should not be prevented during, or after the bridge construction;
- not result in the disturbance of any aquatic habitat features; and
- not be undertaken when fish species are likely to be spawning during the spring and summer months.

In accordance with the objectives of the Fisheries' Aquatic Habitat Management and Fish conservation Policy and Guidelines (Fisheries 1998), where possible, no piers should be located within the active section of the river channel. As such, a single span structure should be adopted, with piers being located on the river banks and across the flood plain.

If the use of piers is required, it is recommended that these:

- a) be kept to the minimum number necessary for the safe construction and operation of the project;
- b) minimize the loss of aquatic habitats;
- c) not present a barrier to fish movements;
- d) not alter the flow patterns of the Nepean River;
- e) not result in any sediment transport or stream siltation; and
- f) not significantly alter the morphology of the river bed.
- (h) "...whether any threatened species or ecological community is at the limit of its known distribution..."

The study area does not occur at the distribution limits of any threatened fish species.

### 13.2.5 Expected Impact On Aquatic Species

The proposed removal and relocation of Yarramundi Bridge, Yarramundi, is not considered to have an adverse direct impact on any threatened aquatic species, such that their populations, ecological communities or habitats would be significantly affected. No threatened fish species would be significantly affected such that the viability of a local population of that species, or its habitat, would be compromised. As such, it is not considered necessary that a Species Impact Statement for threatened fish be prepared.

During the construction phase of the project, the works, particularly any activities associated with the establishment of any new bridge piers, may have an adverse impact on the habitats and presence of fish species. The establishment of the piers would remove a portion of the aquatic habitats present, as well as temporarily preventing the movement of fish species. Indirect impacts such as increased turbidity and bank erosion, thereby affecting downstream habitats, may also occur. To mitigate these impacts, recommendations have been presented in Section 15.0 of this report.

# PART D CONCLUSIONS AND RECOMMENDATIONS

#### 14. Conclusions

The Yarramundi Bridge replacement is not considered to affect, threaten or have an adverse impact on any Scheduled species listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. Therefore, it is not considered that the matter would require referral to the Federal Minister of the Environment for consideration or approval.

The Proposal would not cause a significant impact on the endangered Sydney Coastal River-flat Forest. However, the bridge piers should be located to avoid and minimise the impacts on the River-flat Forest community and regionally vulnerable plant species by avoiding stands of *Casuarina cunninghamiana* and the small wetland areas.

A vegetation management plan should be prepared by a qualified organisation to regenerate the River-flat Forest community in areas that are currently weed infested or otherwise disturbed.

Within the areas of likely disturbance, the fauna habitats present are considered to be of low to moderate ecological value. These areas would not be significantly important for any of the threatened fauna species listed under the NSW *Threatened Species Conservation Act 1995* recorded or previously identified in the study region. The relocation of Yarramundi Bridge would not result in any of these threatened animals, their populations, ecological communities, or habitats being significantly impacted upon such that a viable population of that species is placed at risk of extinction. Similarly, the works would not fragment, disturb or alter any movement or dispersal corridors, or isolate any proximate areas of suitable habitat. Therefore, giving consideration to the assessment criteria's listed under Section 5A of the NSW *Environmental Planning and Assessment Act 1979*, the preparation of a Species Impact Statement for any recorded or potentially occurring threatened fauna is not be required.

The preparation of a Species Impact Statement, which further considers the impacts of the proposal on those threatened aquatic species and their populations previously recorded, or potentially occurring, in the region, is not required. No threatened fish species or populations are considered to occur in close proximity to the study area such that the proposed bridge removal and replacement works would have either a direct or indirect impact on these animals, their habitats or populations.

No Koala populations are considered to occur in close proximity to the study area. The area is not considered Potential or Core Koala habitat. Giving consideration to the objectives of SEPP 44, it is not considered that the proposed works would require the preparation of a Plan of Management for Koalas, or the adoption of any other mitigative measures.

Based on the results of the flora and fauna surveys and the literature review, it is not considered that there are any ecological constraints to the proposal to replace the Yarramundi Bridge, Yarramundi, proceeding as planned. The proposed works would not significantly affect any populations of native plants or animals such that they are placed at risk of extinction. Similarly the works would not remove or significantly affect any habitats of local, regional, state or national conservation concern.

### 15. Recommendations

- A Species Impact Statement is not required to be prepared for the proposal.
- During construction, the boundary of the road approaches and the bridge alignment corridor should be clearly fenced using temporary fencing and erosion control devices, to prevent access beyond the final road boundary area. All excavation and other work should be carried out from within the delineated road construction zone.
- A pre- and post construction weeding program should be undertaken across the whole of the study area so that the spread of weeds into newly excavated areas is minimised.
- A vegetation management plan should be prepared by a suitably qualified bushland regeneration organisation to restore the areas of degraded River-flat Forest within the road reserve on the eastern and western sides of the River and the old bridge alignment. The planting should include Casuarina cunninghamiana and Eucalyptus tereticomis. The native species listed in Appendix 1 would provide a good basis for regeneration works.
- Groundcover species should not be removed from the alignment corridor of the bridge unless necessary for the construction of a pier.
- To preserve the flora and fauna habitat values of drainage lines that occur within and adjacent to the study area, it is recommended that:
  - erosion and sediment barriers be erected on the downslope boundary of the construction zone;
  - regular inspection of erosion and sediment structures should be undertaken
    to ensure their adequacy and effectiveness. Where these are identified as
    being inadequate or in need or repair, this should be undertaken
    immediately; and
  - the boundary of the construction zone should be fenced to ensure vehicles and machinery do not enter or park in vegetated areas outside the construction zone.
- During construction activities, construction vehicles should be restricted in their movements to the delineated construction zone.
- To provide supplementary resources for hollow dependant microchiropterans, the
  new bridge should be designed in a 'bat friendly' manner. Bat friendly features
  which should be considered for incorporation into the bridge design could include
  the incorporation of: crevices associated with expansion joints, hollows (30
  millimetres in diameter), rough concrete surfaces to provide foot-holds and so

forth (Hoye 1996, Bat Conservation International 2000). In regards to these features, when designing the bridge, discussions should be held between a qualified ecologist and the bridge engineer so that practical, useful solutions can be achieved.

- Bridge piers should not be located in the main channel of the River, or in any areas vegetated by River She-oak Casuarina cunninghamiana.
- If the design of the bridge necessitates the location of bridge piers in the wetland it is recommended that the impacts be reduced by:
  - · minimising the area to be cleared;
  - installing effective temporary erosion control fences;
  - delineating the construction zone;
  - only clearing from within the delineated construction zone; and
  - not allowing personnel or machinery to enter the wetland areas outside the construction zone.
- Where a part of the wetland is to be constructed over, but a pier not located within the wetland, it is recommended that only trees be removed, and as much of the groundcover species as possible should be retained. The trees should be cut down and poisoned, rather than the roots grubbed out to avoid extensive disturbance to the wetlands.
- If required, it is recommended that the removal of the timber bridge be undertaken by crane. The crane should be located on the northern (downstream) side of the bridge, thereby not significantly affect any native vegetation. If it is necessary to work from the southern side of the bridge, the minimum amount of vegetation should be removed and effective erosion controls be implemented.
- To ensure that the value of the aquatic habitats is maintained, it is recommended that the works:
  - not include the establishment of any piers within the active channel of the Nepean River;
  - not include the removal of any large woody debris;
  - not result in the erosion of any river banks;
  - not result in the sedimentation of the Nepean River;
  - not result in the restriction of any fish dispersal or movement patterns. The movement of fish species along this river should not be prevented during, or after the bridge construction;
  - not result in the disturbance of any aquatic habitat features; and
  - not be undertaken when fish species are likely to be spawning during the spring and summer months.
- If the use of piers is required, it is recommended that these:
  - be kept to the minimum number of piers necessary for the safe construction and operation of the project;
  - minimize the loss of aquatic habitats;
  - not present a barrier to fish movements:
  - not alter the flow patterns of the Nepean River;
  - not result in any sediment transport or stream siltation; and
  - not significantly alter the morphology of the river bed.
- Vehicles and machinery should not be parked or stored in the vicinity of trees or any areas of natural vegetation to be retained, nor in the proximity of any drainage lines. These areas should be avoided to prevent compaction of the soil, sedimentation of drainage lines and damage to trees.

- It is recommended that effective temporary erosion and sedimentation control measures be implemented during the construction and maintained during the early operational stages of the proposal. These measures should include the use of silt fences and hay bales during the construction operations. These filters should be regularly maintained throughout the construction phase and should not be removed until all exposed surfaces are stabilised. To ensure these measures and other sediment control measures are implemented, it is recommended that an Erosion and Sedimentation Control Plan be prepared.
- No polluted or sediment laden stormwater runoff from any work areas should be allowed to flow straight into the Nepean River without first being filtered.
- Cleared native vegetation should be mulched and used in rehabilitation works undertaken after construction.
- Weeds plants that are removed should not be mulched but taken to an approved Council waste facility.
- Newly exposed surfaces should be sealed as soon as possible in order to reduce the potential for soil erosion.
- Any site offices or work compounds should be located away from the banks of the Nepean River, within areas already cleared by past disturbance practices.
- All contaminants should be collected and removed from the construction areas.

### 16. Bibliography

- Bannerman, S.M. and Hazelton, P.A. (1990) Soil Landscapes of the Penrith 1:100,000 Sheet. Soil Conservation Service of NSW, Sydney, NSW.
- Bat Conservation International (2000) Creating Bat-friendly Bridges and Culverts. Bat Conservation International, Texas. Paper available at www.batcon.org.
- Benson, D.H. (1992) The Natural Vegetation Of The Penrith 1:100,000 Map Sheet. In *Cunninghamia* 2(4).
- Benson, D. and Howell, J. (1990) *Taken for Granted: The Bushland of Sydney and its Suburbs.* Royal Botanic Gardens, Sydney
- Benson, D. and McDougall, L. (1994) Ecology of Sydney plant species. Part 2: Dicotyledon families Asteraceae to Buddlejaceae. In *Cunninghamia* Volume 3 (4).
- Benson, D. and McDougall, L. (1996) Ecology of Sydney plant species. Part 4: Dicotyledon family Fabaceae. In *Cunninghamia* Volume 4 (4).
- Benson, D. and McDougall, L. (1997) Ecology of Sydney plant species. Part 5: Dicotyledon families Flacourtiaceae to Myrsinaceae. In *Cunninghamia* Volume 5 (2).
- Benson, D. and McDougall, L. (1998) Ecology of Sydney plant species. Part 6: Dicotyledon family Myrtaceae. In *Cunninghamia* Volume 5 (4).
- Blombery, A.M and Maloney, B. (1992) *The Proteaceae of the Sydney Region*. Kangaroo Press, Kenthurst.
- Briggs, J. and Leigh, J. (1996) Rare or Threatened Australian Plants. CSIRO Publishing, Collingwood, Victoria.
- Bureau of Meteorology (2002) *Bureau of Meteorology Climate Averages*. http://www.bom.gov.au/climate/averages. [Accessed 24 January 2002].
- Churchill, S. (1998) Australian Bats. Reed New Holland, Frenches Forest, NSW.
- Cogger, H. (1992) Reptiles and Amphibians of Australia. Reed Books, Chatswood, NSW.
- Costermans, L. (1996) Native trees and shrubs of South-eastern Australia. Landsdowne Publishing, Sydney, NSW.
- Cropper, S. (1993) Management of Endangered Plants. CSIRO, Melbourne.
- Ehmann, E. (1997) Threatened Frogs of New South Wales: Habitats, status and conservation. Frog and Tadpole Study Group, Sydney, NSW.
- Environment Australia (2002) Environment Protection and Biodiversity Conservation Act Online Databases.

  http://www.environment.gov.au/epbc/db/index.html [Accessed 8 January 2002].
- Frith, H.J. (Ed) (1997) Complete Book of Australian Birds. Readers Digest, Surry Hills, NSW.
- Garnett, S. (1992) *The Action Plan For Australian Birds*, Australian National Parks and Wildlife Service Endangered Species Program Project Number 121 Australian Museum.
- Garnett, S. (1993) (Ed) *Threatened and Extinct Birds of Australia RAOU Report Number 82*, Royal Australian Ornithologists Union, Victoria.

- Harden, G. (Ed) (1990-1993) Flora of New South Wales Vols 1,2,3 and 4. NSW University Press, Kensington, NSW.
- Harris, J.H. and Gehrke, P.C. (1997) Fish and Rivers in Stress. The NSW Rivers Survey. NSW Fisheries Office of Conservation and the Cooperative Research Centre for Freshwater Ecology and Resources and Conservation Assessment, Cronulla, NSW.
- Hawkesbury City Council (2000) State of the Environment Report. Hawkesbury City Council.
- Hoye, G. (1996) The Exclusion and subsequent re-establishment of a colony of Fishing Bats <u>Myotis adversus</u> at Stockton Creek Bridge near Morisset, New South Wales. Report prepared for the Roads and Traffic Authority by FBN Bat Surveys, Belmont, NSW.
- Kingsford, R. (1991) Australian Waterbirds: A Field Guide. Kangaroo Press, Kenthurst, NSW.
- LesryK Environmental Consultants (1996a) Flora and Fauna Assessment of Proposed Subdivision, "Nepean Park", Springwood Road, Yarramundi. Report prepared for McKinlay Morgan and Associates by LesryK Environmental Consultants, Bundeena.
- LesryK Environmental Consultants (1996b) Habitat Assessment of Grose Wold Area, Hawkesbury Local Government Area. Report prepared for Hawkesbury City Council by LesryK Environmental Consultants, Bundeena.
- LesryK Environmental Consultants (1999) Flora and Fauna Assessment of Five Culvert Sites in Relation to Proposed Flood Mitigation Works, Londonderry Road, Londonderry. Report prepared for the NSW Roads and Traffic Authority by LesryK Environmental Consultants, Bundeena.
- LesryK Environmental Consultants (2001) Flora and Fauna Assessment in Relation to Proposed Road Works, Wilshire Road, Agnes Banks. Report prepared for Webb, McKeown and Associates on behalf of Penrith City Council by LesryK Environmental Consultants, Bundeena.
- Marchant, S. and Higgins, P.J. (1990) *Handbook of Australian*, New Zealand & Antarctic Birds Vol 1 Ratites to Ducks Oxford University Press, Melbourne.
- McDowell, R.M. (1996) Freshwater Fishes of South-Eastern Australia. Reed Books, Chatswood, NSW.
- NSW Fisheries (1998) *Policy and Guidelines: Aquatic Habitat Management and Fish conservation.* (Eds A.K.Smith and D.A.Pollard). NSW Fisheries, Sydney.
- NSW Fisheries (2002) NSW Fisheries Fish Files Online Database. https://203.174.130.105/fishfiles/index.pl [Accessed 8 January 2002].
- National Parks and Wildlife Service (1997) Native Flora of Western Sydney: Urban Bushland Biodiversity Survey. National Parks and Wildlife Service, Hurstville.
- NSW National Parks and Wildlife Service (1999) *Threatened Species Management Species Information*. NSW National Parks and Wildlife Service, Hurstville, NSW.
- National Parks and Wildlife Service (2000). Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney. NSW National Parks and Wildlife Service, Hurstville, NSW.
- NSW National Parks and Wildlife Service (2002) Atlas of NSW Wildlife Database. http://wildlifeatlas.npws.gov.au [Accessed 8 January 2002].

- Penrith City Council (2000) State of the Environment Report. Penrith City Council.
- Simpson, K. and Day, N. (1999) Field Guide to the Birds of Australia. Version 6. Penguin Books Australia, Victoria.
- Strahan, R. (Ed) (1995) The Mammals of Australia. Reed Books, Chatswood, NSW.
- Triggs, B. (1996) *Tracks, Scats and Other Traces : A Field Guide To Australian Mammals.*Oxford University Press, Melbourne.

# APPENDIX 1. Plant species recorded in the study area.

Species occurring within the boundaries of the study area, Nepean River, Yarramundi (see Figure 1).

## Key:

Column 1 = Plant species considered vulnerable/regionally significant in the Western Sydney context (as per NPWS 1997).

\* = Introduced (weed) species.

| FAMILY                | GENUS SPECIES                     | 1        |
|-----------------------|-----------------------------------|----------|
| FILICOPSIDA           |                                   |          |
| Azollaceae            | Azolla pinnata                    | <b>✓</b> |
|                       |                                   |          |
| MAGNOLIOPSIDA -       |                                   |          |
| MAGNOLIIDAE           |                                   |          |
| Amaranthaceae         | Alternathera philoxeroides        |          |
| Apiaceae              | Apium leptophyllum *              |          |
|                       | Centella asiatica                 |          |
|                       | Foeniculum vulgare *              |          |
| Asteraceae            | Bidens pilosa *                   |          |
|                       | Calotis cuneifolia                | 1        |
|                       | Centipeda minima                  |          |
|                       | Circium vulgare *                 |          |
|                       | Conyza albida *                   |          |
|                       | Conyza bonariensis *              |          |
|                       | Coreopsis lanceolata *            |          |
|                       | Crepis capillaris *               |          |
|                       | Hypochaeris radicata *            |          |
|                       | Lactuca serriola *                |          |
|                       | Sonchus oleraceus *               |          |
|                       | Senecio madagascariensis *        |          |
|                       | Taraxacum officinale *            |          |
|                       | Tagetes minuta *                  |          |
|                       | Verbesina enceliodes *            |          |
| Asclepiadaceae        | Araujia hortorum *                |          |
|                       | Gomphocarpus fruiticosus *        |          |
| Basellaceae           | Anredera cordifolia *             |          |
| Boraginaceae          | Heliotropium amplexicaule *       |          |
| Brassicaceae          | Brassica rapa *                   |          |
|                       | Capsella bursa-pastoris *         |          |
| Cactaceae             | Opuntia elatior *                 |          |
| Callitrichaceae       | Callitriche stagnalis             |          |
| Campanulaceae         | Wahlenbergia gracilis             |          |
| Casuarinaceae         | Casuarina cunninghamiana          |          |
|                       | Casuarina glauca                  |          |
| Chenopodiaceae        | Chenopodium album *               |          |
| Commelinaceae         | Commelina cyanea                  |          |
|                       | Tradescantia albiflora *          |          |
| Euphorbiaceae         | Ricinus communis *                |          |
| Fabaceae:             | Gleditsia triacanthos *           |          |
| Caesalpinioideae      |                                   |          |
| Fabaceae: Faboidea    | Glycine tabacina                  |          |
|                       | Trifolium repens *                |          |
| Fabaceae: Mimosoideae | Acacia binervia                   |          |
|                       | Acacia floribunda                 |          |
|                       | Acacia parramattensis             |          |
| Malvaceae             | Pavonia hastata                   |          |
|                       | Sida rhombifolia *                |          |
| Meliaceae             | Melia azederach var. australasica |          |

| FAMILY                      | GENUS SPECIES                         | 1 |
|-----------------------------|---------------------------------------|---|
| Myrtaceae                   | Callistemon salignus                  |   |
| Oleaceae                    | Ligustrum sinense *                   |   |
| Onagraceae                  | Ludwigia peploides ssp. montevidensis |   |
| Oxalidaceae                 | Oxalis pres-caprae *                  |   |
| Phytolaccacaea              | Phytolacca octandra *                 |   |
| Plantaginaceae              | Plantago lanceolata *                 |   |
| Polygonaceae                | Muehlenbeckia gracillima              |   |
|                             | Rumex crispus *                       |   |
|                             | Persicaria decipiens                  |   |
|                             | Persicaria lapathifolia               |   |
|                             | Ranunculus pleibeius                  | 1 |
| Rosaceae                    | Rubus ulmifolius species complex *    |   |
| Rubiaceae                   | Richardia brasiliensis *              |   |
| Salicaceae                  | Salix babylonica *                    |   |
| Solanaceae                  | Datura ferox *                        | - |
| Columbodae                  | Solanum nigrum *                      |   |
| Verbenaceae                 | Verbena bonariensis *                 | _ |
| Verberiaceae                | Lantana camara *                      | _ |
| MAGNOLIOPSIDA -<br>LILIIDAE | Lantana Camara                        |   |
| Cyperaceae                  | Bolboschoenus fluviatilis             |   |
|                             | Cyperus difformis                     | 1 |
|                             | Cyperus eragrostis *                  |   |
|                             | Cyperus polystachyos                  | 1 |
|                             | Schoenoplectus mucronatus             | 1 |
|                             | Schoenoplectus validus                | 1 |
| Juncaceae                   | Juncus continuus                      |   |
|                             | Juncus usitatus                       |   |
| Lomandraceae                | Lomandra longifolia                   |   |
| Nadjadaceae                 | Najas tenuifolia                      | 1 |
| Poaceae                     | Avena fatua *                         |   |
|                             | Chloris gayana *                      |   |
|                             | Cynodon dactylon                      |   |
|                             | Glyceria maxima                       |   |
|                             | Imperata cylindrica var. major        | _ |
|                             | Lolium perrene *                      |   |
|                             | Oplismenus aemulus                    |   |
|                             | Paspalum dilatatum *                  |   |
|                             | Paspalum distichum                    |   |
|                             | Pennisetum clandestinum *             |   |
|                             | Poa labillardieri                     | - |
|                             | Setaria sp. *                         |   |
|                             | Sporobulus creber *                   |   |
|                             | Stenotaphrum secundatum *             |   |

## Source of Records:

- 1 = Species recorded during present study.
- 2 = NPWS (January 2002).
- 3 = LesryK Environmental Consultants (2001).
- 4 = LesryK Environmental Consultants (1999).
- 5 = LesryK Environmental Consultants (1996a).
- 6 = LesryK Environmental Consultants (1996b).
- 7 = NSW Fisheries (January 2002).

### Key:

- indicates each species recorded during each past study, or listed within standard databases.
- indicates individual species listed under the Schedules to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.
- # indicates species listed under the NSW Threatened Species Conservation Act 1995.
- indicates species listed under the NSW Fisheries Management Act 1994.
- ∇ indicates regionally significant species (NPWS 1997).
- indicates introduced species.

| COMMON NAME             | SCIENTIFIC NAME          | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------------|--------------------------|---|---|---|---|---|---|---|
| MAMMALS                 |                          |   |   |   |   |   |   |   |
| ∇ Short-beaked Echidna  | Tachyglossus aculeatus   |   | х |   |   |   |   |   |
| # Spotted-tailed Quoll  | Dasyurus maculatus       |   | х |   |   |   |   |   |
| ∇ Long-nosed Bandicoot  | Perameles nasuta         |   | х |   |   |   |   |   |
| # Koala                 | Phascolarctos cinereus   |   | X |   |   |   |   |   |
| # Yellow-bellied Glider | Petaurus australis       |   | Х |   |   |   |   |   |
| Sugar Glider            | Petaurus breviceps       |   | Х |   |   |   |   |   |
| # Squirrel Glider       | Petaurus norfolcensis    |   | Х |   |   |   |   |   |
| ∇ Greater Glider        | Petauroides Volans       |   |   |   | X |   |   |   |
| Common Ringtail Possum  | Pseudocheirus peregrinus |   | Х |   |   |   |   |   |
| Common Brushtail Possum | Trichosurus vulpecula    |   | Х | Х | X | Х | X |   |
| ∇ Eastern Grey Kangaroo | Macropus giganteus       |   | Х |   |   |   |   |   |
| ∇ Common Wallaroo       | Macropus robustus        |   |   |   |   | Х |   |   |
| ∇ Swamp Wallaby         | Wallabia bicolor         |   | Х | Х |   |   | Х |   |
| Gould's Wattled Bat     | Chalinolobus gouldii     |   | Х |   |   |   |   |   |
| Chocolate Wattled Bat   | Chalinolobus morio       | X | х |   |   |   |   |   |
| # Common Bentwing-bat   | Miniopterus schreibersii |   | Х |   |   |   |   |   |
| # Large-footed Myotis   | Myotis adversus          | X | Х |   |   |   |   |   |
| Long-eared Bat          | Nyctophilus sp           | X |   |   |   |   |   |   |
| Eastern Broad-nosed Bat | Scotorepens orion        | X |   |   |   |   |   |   |
| Little Forest Bat       | Vespadelus vulturnus     |   | Х |   |   |   |   |   |
| Freetail Bat            | Mormopterus sp.1         |   | х |   |   |   |   |   |
| * House Mouse           | Mus musculus             |   | X |   |   |   |   |   |
| * Black Rat             | Rattus rattus            |   | X | х |   |   | X |   |
| * Fox                   | Vulpes vulpes            | X |   | Х |   | X | Х |   |
| * Dog                   | Canis familiaris         |   |   | х |   |   |   |   |
| * Feral Cat             | Felis catus              |   | X | X |   |   |   |   |
| * Rabbit                | Oryctolagus cuniculus    |   | X | X |   | X | X |   |
| * Brown Hare            | Lepus capensis           |   | X |   |   |   |   |   |
| * Horse                 | Equus caballus           |   | X | Х |   |   |   |   |
| * Pig                   | Sus scrofa               |   | X |   |   |   |   |   |
| * Goat                  | Capra hircus             |   | X |   |   |   |   |   |
| BIRDS                   |                          |   |   |   |   |   |   |   |

| COMMON NAME                | SCIENTIFIC NAME             | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|----------------------------|-----------------------------|---|---|---|---|---|---|---|
| ∇ Stubble Quail            | Coturnix pectoralis         |   | х |   |   |   |   |   |
| ∇ Brown Quail              | Coturnix ypsilophora        |   | Х |   |   | X |   |   |
| ∇ King Quail               | Coturnix chinensis          |   | X |   |   |   |   |   |
| ∇ Painted Button-quail     | Turnix varia                |   | X |   |   |   |   |   |
| Red-chested Button-quail   | Turnix pyrrhothorax         |   | X |   |   |   |   |   |
| Australian Pelican         | Pelecanus conspicillatus    | X | X |   |   |   | Х |   |
| Darter                     | Anhinga melanogaster        | Х | Х |   |   |   |   |   |
| Pied Cormorant             | Phalacrocorax varius        |   |   | Х |   |   | Х |   |
| Little Pied Cormorant      | Phalacrocorax melanoleucos  | X | X | X |   |   | X |   |
| Great Cormorant            | Phalacrocorax carbo         |   | Х |   |   |   |   |   |
| Little Black Cormorant     | Phalacrocorax sulcirostris  |   | Х |   |   |   | X |   |
| ∇ Great Crested Grebe      | Podiceps cristatus          |   | X |   |   |   |   |   |
| Hoary-headed Grebe         | Poliocephalus poliocephalus |   | х |   |   |   |   |   |
| Australasian Grebe         | Tachybaptus novaehollandiae | X | X |   |   | X | X |   |
| Black Swan                 | Cygnus atratus              |   | X | X |   |   |   |   |
| Plumed Whistling Duck      | Dendrocygna eytoni          |   | Х |   |   |   |   |   |
| Australian Shelduck        | Tadorna tadornoides         |   | х |   |   |   |   |   |
| Pacific Black Duck         | Anas superciliosa           | X | Х | X | X | х | X |   |
| * Mallard                  | Anas platyrhynchos          | X | X |   |   |   |   |   |
| Grey Teal                  | Anas gracilis               |   | х |   |   |   |   |   |
| Chestnut Teal              | Anas castanea               |   | х |   |   |   |   |   |
| Hardhead (White-eyed Duck) | Aythya australis            |   | х |   |   |   |   |   |
| Australian Wood Duck       | Chenonetta jubata           | X | X | X | X | X | X |   |
| Freckled Duck              | Stictonetta naevosa         |   | X |   |   |   |   |   |
| Australasian Shoveler      | Anas rhynchotis             |   | X |   |   |   |   |   |
| ∇ Musk Duck                | Biziura lobata              |   | x |   |   |   |   |   |
| Pink-eared Duck            | Malacorhynchus membranaceus |   | X |   |   |   |   |   |
| # Buff-banded Rail         | Gallirallus philippensis    |   | X |   |   |   |   |   |
| Lewin's Rail               | Rallus pectoralis           |   | X |   |   |   |   |   |
| Baillon's Crake            | Porzana pusilla             |   | X |   |   |   |   |   |
| Australian Spotted Crake   | Porzana fluminea            |   | х |   |   |   |   |   |
| Spotless Crake             | Porzana tabuensis           |   | X |   |   |   |   |   |
| Dusky Moorhen              | Gallinula tenebrosa         | X | X | X |   | X | Х |   |
| Purple Swamphen            | Porphyrio porphyrio         |   | x | - |   |   | х |   |
| Eurasian Coot              | Fulica atra                 | X | X | X |   |   | X |   |
| White-necked Heron         | Ardea pacifica              |   | x |   |   |   |   |   |
| White-faced Heron          | Egretta novaehollandiae     | X | X | X | X | X | Х |   |
| □ Cattle Egret             | Ardea ibis                  |   | x |   |   |   | X |   |
| □ ∇ Great Egret            | Ardea alba                  | X | х | X |   |   | X |   |
| Little Egret               | Egretta garzetta            |   | X |   |   |   |   |   |
| Intermediate Egret         | Ardea intermedia            |   | x |   |   |   |   |   |
| ∇ Nankeen Night Heron      | Nycticorax caledonicus      | X | X |   |   |   |   |   |
| Little Bittern             | Ixobrychus minutus          |   | X |   |   |   |   |   |
| # Black Bittern            | Ixobrychus flavicollis      |   | X |   |   |   |   |   |
| # Australasian Bit         | Botaurus poiciloptilus      |   | X |   |   |   |   |   |
| ∇ Glossy Ibis              | Plegadis falcinellus        |   | X |   |   |   |   |   |
| Australian White Ibis      | Threskiornis molucca        |   | Х | X |   |   | X | - |
| Straw-necked Ibis          | Threskiornis spinicollis    | 1 | X | X |   |   | X |   |
| Royal Spoonbill            | Platalea regia              | 1 | X | X |   |   |   |   |
| Yellow-billed Spoonbill    | Platalea flavipes           | 1 | X | - |   |   |   | - |
| □ ∇ Little Curlew          | Numenius minutus            | 1 | X |   | - | - |   | - |
| □ ∇ Wood Sandpiper         | Tringa glareola             | 1 | X |   | - |   |   | - |
| □ ∇ Common Sandpiper       | Actitis hypoleucos          | - | X | - | - |   | V | - |
| u + Common Canapide        | , willo rijporodooo         | 1 | 1 | 1 | 1 |   | X | 1 |

| COMMON NAME                    | SCIENTIFIC NAME                             | 1  | 2 | 3 | 4 | 5 | 6 | 7        |
|--------------------------------|---|----|---|---|---|---|---|----------|
| □ ∇ Marsh Sandpiper            | Tringa stagnatilis                          |    | X |   |   |   |   |          |
| ∇ Latham's Snipe               | Gallinago hardwickii                        |    | Х |   |   | X |   |          |
| # Black-tailed Godwit          | Limosa limosa                               |    | Х |   |   |   |   |          |
| □ ∇ Curlew Sandpiper           | Calidris ferruginea                         |    | Х |   |   |   |   |          |
| □ ∇ Sharp-tailed Sandpiper     | Calidris acuminata                          |    | Х |   |   |   |   |          |
| ☐ Pectoral Sandpiper           | Calidris melanotus                          |    | X |   |   |   |   |          |
| □ ∇ Red-necked Stint           | Calidris ruficollis                         |    | X |   |   |   |   |          |
| □ ∇ Long-toed Stint            | Calidris subminuta                          |    | Х |   |   |   |   |          |
| □ ∇ Buff-breasted Sandpiper    | Tryngites subruficollis                     | +  | X |   |   |   |   |          |
| □ ∇ Ruff                       | Philomachus pugnax                          |    | X |   |   |   |   |          |
| # Painted Snipe                | Rostratula benghalensis                     | +  | X |   |   |   |   |          |
| □ ∇ Oriental Pratincole        | Glareola maldivarum                         | +  | X |   |   |   |   |          |
| Australian Pratincole          | Stiltia isabella                            | +  | X |   |   |   |   |          |
| # Bush Stone-curlew            | Burhinus grallarius                         | +  | X |   | _ |   |   |          |
| Masked Lapwing                 | Vanellus miles                              | X  | X | X | X |   | X |          |
| Banded Lapwing                 | Vanellus tricolor                           | +^ | X | ^ | ^ |   | ^ |          |
| □ ∇ Grey Plover                | Pluvialis squatarola                        | +  | X |   |   |   | - |          |
| Red-kneed Dotterel             | Erythrogonys cinctus                        | +  | X |   |   | - |   | -        |
| □ Double-banded Plover         | Charadrius bicinctus                        | +  | X | - |   | - |   | -        |
| ∇ Red-capped Plover            | Charadrius ruficapillus                     | +- | - | _ | _ | - | - | -        |
| Red-necked Avocet              | Recurvirostra novaehollandiae               | +- | X |   | - |   |   | -        |
| Black-fronted Dotterel         |   | +  | X |   | - |   | - | -        |
|                                | Elseyornis melanops                         | +  | X | - |   |   | X | -        |
| Black-winged Stilt Silver Gull | Himantopus himantopus Larus novaehollandiae | +- | X |   |   | - | - | -        |
| Whiskered Tern                 |   | +  | X | - | - | - | - | $\vdash$ |
|                                | Chlidonias hybrida                          | +  | X |   |   |   | _ | -        |
| ☐ White-winged Black Tern      | Chlidonias leucoptera                       | +- | X | _ |   | - | - | -        |
| Caspian Tern                   | Sterna caspia                               | +  | Х | _ |   | _ |   | -        |
| Gull-billed Tern               | Sterna nilotica                             | -  | X | - |   | - | _ | -        |
| Black-shouldered Kite          | Elanus axillaris                            | X  | X | X |   | - | X | -        |
| # Square-tailed Kite           | Lophoictinia isura                          | +  | X | - | - | - |   | -        |
| Black Kite                     | Milvus migrans                              | +  | X | _ |   |   | - | -        |
| ∇ Whistling Kite               | Haliaster sphenurus                         | +- | X | - |   | - | X | -        |
| □ ∇ White-bellied Sea-Eagle    | Haliaeetus leucogaster                      | X  | X | _ |   | _ | X | -        |
| ∇ Wedge-tailed Eagle           | Aquila audax                                |    | _ | _ | X | _ | X | _        |
| Brown Goshawk                  | Accipiter fasciatus                         |    | X | X |   | _ | X | _        |
| ∇ Little Eagle                 | Hieraaetus morphnoides                      | -  | X |   |   |   | X |          |
| Pacific Baza                   | Aviceda subcristata                         |    | X |   |   |   | X |          |
| Collared Sparrowhawk           | Accipter cirrhocephalus                     |    | X |   |   |   | X |          |
| Spotted Harrier                | Circus assimilis                            | 1  | X |   |   |   |   |          |
| ☐ Swamp Harrier                | Circus approximans                          |    | X |   |   |   |   |          |
| Black Falcon                   | Falco subniger                              |    | X |   |   |   |   |          |
| ∇ Peregrine Falcon             | Falco peregrinus                            |    | X |   |   |   | X |          |
| Australian Hobby               | Falco longipennis                           |    | X |   |   |   | X |          |
| Brown Falcon                   | Falco berigora                              |    | X |   |   |   |   |          |
| Nankeen Kestrel                | Falco cenchroides                           |    | X | X | X |   | X |          |
| * Rock Dove                    | Columba livia                               |    | X |   |   |   | X |          |
| * Spotted Turtle-Dove          | Streptopelia chinensis                      | X  | Х | X | X | X | Х |          |
| ∇ Brown Cuckoo-Dove            | Macropygia amboinensis                      |    |   |   |   |   | X |          |
| ∇ Peaceful Dove                | Geopelia striata                            |    | X |   |   | X | х |          |
| Diamond Dove                   | Geopelia cuneata                            |    | X |   |   |   |   |          |
| ∇ Bar-shouldered Dove          | Geopelia humeralis                          |    | X |   |   |   | X |          |
| ∇ Common Bronzewing            | Phaps chalcoptera                           |    | X | X |   | X | X |          |
| Crested Pigeon                 | Ocyphaps lophotes                           | 1  | X |   |   | X | X | -        |

| COMMON NAME                   | SCIENTIFIC NAME           | 1 | 2   | 3 | 4 | 5                                     | 6 | 7        |
|-------------------------------|---------------------------|---|-----|---|---|---------------------------------------|---|----------|
| Wonga Pigeon                  | Leucosarcia melanoleuca   |   | X   |   |   |                                       | X |          |
| Yellow-tailed Black-Cockatoo  | Calyptorhynchus funereus  |   | Х   |   |   |                                       | X |          |
| Galah                         | Eolophus roseicapilla     | X | Х   | Х | X | X                                     | X |          |
| Long-billed Corella           | Cacatua tenuirostris      |   | X   |   |   |                                       | Х |          |
| Little Corella                | Cacatua sanguinea         |   | X   |   |   |                                       | X |          |
| # Major Mitchell's Cockatoo   | Cacatua leadbeateri       |   | X   |   |   |                                       |   |          |
| Sulphur-crested Cockatoo      | Cacatua galerita          | X | X   | Х | X | X                                     | X |          |
| Rainbow Lorikeet              | Trichoglossus haematodus  |   | Х   |   |   |                                       | X |          |
| Little Lorikeet               | Glossopsitta pusilla      |   | Х   |   |   | Х                                     | X |          |
| Australian King Parrot        | Alisterus scapularis      |   | Х   |   |   |                                       |   |          |
| ☐ # Superb Parrot             | Polytelis swainsonii      |   | Х   |   |   |                                       |   |          |
| ☐ # Swift Parrot              | Lathamus discolor         |   | X   |   |   |                                       |   |          |
| Crimson Rosella               | Platycercus elegans       |   | X   |   |   | Х                                     | Х |          |
| Eastern Rosella               | Platycercus eximius       |   | X   |   | X | X                                     | Х |          |
| Red-rumped Parrot             | Psephotus haematonotus    | X | X   | Х |   |                                       | X |          |
| Pallid Cuckoo                 | Cuculus pallidus          |   | X   |   |   |                                       | Х |          |
| Brush Cuckoo                  | Cuculus variolosus        |   | X   |   |   | х                                     | X |          |
| Fan-tailed Cuckoo             | Cuculus flabelliformis    |   | x   |   |   |                                       | X |          |
| Horsfield's Bronze-Cuckoo     | Chrysococcyx basalis      |   | X   |   |   |                                       | X |          |
| Shining Bronze-Cuckoo         | Chrysococcyx lucidus      |   | X   |   |   |                                       | X |          |
| Common Koel                   | Eudynamys scolopacea      |   |     |   |   | х                                     | X |          |
| Channel-billed Cuckoo         | Scythrops novaehollandiae |   | X   |   |   | х                                     | X |          |
| # Powerful Owl                | Ninox strenua             |   | X   |   |   |                                       |   | T        |
| Southern Boobook              | Ninox novaeseelandiae     |   |     |   |   |                                       | X |          |
| # Barking Owl                 | Ninox connivens           |   | ×   |   |   |                                       |   |          |
| Barn Owl                      | Tyto alba                 |   | X   |   |   |                                       |   |          |
| Tawny Frogmouth               | Podargus strigoides       |   | X   |   |   |                                       | х | $\vdash$ |
| Australian Owlet-nightjar     | Aegotheles cristatus      | X |     |   |   |                                       | X | $\vdash$ |
| □ ∇ White-throated Needletail | Hirundapus caudacutus     |   | X   |   |   |                                       | X |          |
| ∇ Fork-tailed Swift           | Apus affinis              |   | X   |   |   |                                       |   | $\vdash$ |
| Azure Kingfisher              | Alcedo azurea             | X | X   | X |   | X                                     | X |          |
| Laughing Kookaburra           | Dacelo novaeguineae       |   | X   | X |   | X                                     | X |          |
| Sacred Kingfisher             | Todiramphus sancta        |   | X   |   |   | X                                     | X |          |
| ☐ Rainbow Bee-eater           | Merops ornatus            | X | X   |   |   |                                       | X | $\vdash$ |
| Dollarbird                    | Eurystomus orientalis     |   | X   |   |   |                                       | X | $\vdash$ |
| Varied Sittella               | Daphoenositta chrysoptera |   | X   |   |   |                                       | X | -        |
| White-throated Treecreeper    | Cormobates leucophaeus    |   | X   |   |   | X                                     | X | -        |
| Superb Fairy-wren             | Malurus cyaneus           | X | X   | X | X | X                                     | X | +        |
| Varigated Fairy-wren          | Malurus lamberti          |   | X   | - | - |                                       |   | H        |
| Spotted Pardalote             | Pardalotus punctatus      |   | X   |   |   | X                                     | X |          |
| Striated Pardalote            | Pardalotus striatus       |   | X   |   |   |                                       | X | -        |
| White-browed Scrubwren        | Sericornis frontalis      | X | X   |   |   |                                       | X |          |
| ∇ # Speckled Warbler          | Chthonicola sagittata     | - | X   |   |   |                                       | _ | $\vdash$ |
| Weebill                       | Smicrornis brevirostris   |   | X   | - |   |                                       | X | $\vdash$ |
| White-throated Gerygone       | Gerygone olivacea         |   | X   | - |   |                                       | X | $\vdash$ |
| Brown Gerygone                | Gerygone mouki            |   | X   | - |   |                                       | X | 1        |
| Brown Thombill                | Acanthiza pusilla         |   | X   | - |   |                                       | X | +        |
| Yellow Thombill               | Acanthiza nana            | X | X   | X | X | X                                     | X | +-       |
| Striated Thornbill            | Acanthiza lineata         | X | X   | X | X | X                                     | X | -        |
| ∨ Buff-rumped Thornbill       | Acanthiza reguloides      | ^ | X   | 1 | _ | ^                                     | X | -        |
| ✓ Yellow-rumped Thornbill     | Acanthiza chrysorrhoa     | - | -   | - | - | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | - | -        |
| Red Wattlebird                | Anthochaera carunculata   |   | X   | - | - | X                                     | X | -        |
| Little Wattlebird             | Anthochaera chrysoptera   | X | X   | X | - | -                                     | X | -        |
|                               | entrollaria Chivellulara  |   | 1 Y |   |   |                                       | Y | 4        |

| COMMON NAME                   | SCIENTIFIC NAME              | 1 | 2 | 3 | 4        | 5   | 6 | 7        |
|-------------------------------|------------------------------|---|---|---|----------|-----|---|----------|
| ☐ # Regent Honeyeater         | Xanthomyza phrygia           |   | X |   |          |     |   |          |
| Blue-faced Honeyeater         | Entomyzon cyanotis           |   | X |   |          |     |   |          |
| Bell Miner                    | Manorina melanophrys         |   | Х |   |          |     | X |          |
| Noisy Miner                   | Manorina melanocephala       |   | Х | Х | X        | X   | X |          |
| Lewin's Honeyeater            | Meliphaga lewinii            |   |   | X |          | X   | X |          |
| Yellow-faced Honeyeater       | Lichenostomus chrysops       |   | Х | Х | X        | Х   | X |          |
| White-eared Honeyeater        | Lichenostomus leucotis       |   | X | X |          |     |   |          |
| Yellow-tufted Honeyeater      | Lichenostomus melanops       |   | X |   |          | X   |   |          |
| ∇ Fuscous Honeyeater          | Lichenostomus fuscus         |   | X |   |          |     |   |          |
| White-plumed Honeyeater       | Lichenostomus penicillatus   |   | X |   | X        |     | X |          |
| ∇ # Black-chinned Honeyeater  | Melithreptus gularis         |   | X |   |          |     | - |          |
| Brown-headed Honeyeater       | Melithreptus brevirostris    | + | X |   |          | х   |   |          |
| White-naped Honeyeater        | Melithreptus lunatus         | - | X |   |          | ^   | X |          |
| White-cheeked Honeyeater      | Phylidonyris nigra           | - | X | - |          |     | ^ |          |
| New Holland Honeyeater        | Phylidonyris novaehollandiae | - | - | _ |          |     |   |          |
| Tawny-crowned Honeyeater      | Phylidonyris melanops        | - | X | X | -        | - V |   | -        |
|                               |                              | - | X | - | -        | X   |   | -        |
| # Painted Honeyeater          | Grantiella picta             | - | X |   |          | _   |   | -        |
| Eastern Spinebill             | Acanthorhynchus tenuirostris | - | X | X | X        | X   | X | _        |
| Scarlet Honeyeater            | Myzomela sanguinolenta       |   | X |   | _        |     | X | _        |
| Eastern Whipbird              | Psophodes olivaceus          |   | X |   |          |     | X |          |
| Rose Robin                    | Petroica rosea               |   | X |   |          |     | X |          |
| ∇ Scarlet Robin               | Petroica multicolor          |   | X |   |          |     |   |          |
| ∇ Red-capped Robin            | Petroica goodenovii          |   | X |   |          |     |   |          |
| Eastern Yellow Robin          | Eopsaltria australis         |   | X | X |          |     | X |          |
| ∇ Jacky Winter                | Microeca fascinans           |   | Х |   |          | Х   | Х |          |
| ∇ Crested Shrike-tit          | Falcunculus frontatus        |   | X | X |          |     | Х |          |
| Grey Shrike-thrush            | Colluricincla harmonica      | X | X | X | X        | X   | X | Г        |
| Golden Whistler               | Pachycephala pectoralis      |   | X | X |          |     | х |          |
| Rufous Whistler               | Pachycephala rufiventris     |   | X |   |          | х   | X |          |
| Grey Fantail                  | Rhipidura fuliginosa         |   | X | X |          | X   | X |          |
| Rufous Fantail                | Rhipidura rufifrons          |   | - | - |          |     | X |          |
| Willie Wagtail                | Rhipidura leucophrys         | × | X |   | X        | X   | X |          |
| Leaden Flycatcher             | Myiagra rubecula             | - | _ | - | <u> </u> |     | X |          |
| Satin Flycatcher              | Myiagra cyanoleuca           | - | X |   |          |     | ^ |          |
| ∇ Restless Flycatcher         | Myiagra inquieta             | + | X | - |          | X   | X |          |
| Black-faced Monarch           | Monarcha melanopsis          | + | X | - | -        | ^   | - | $\vdash$ |
| Magpie-lark                   | Grallina cyanoleuca          | × | - | X | X        | _   | X | -        |
| Spangled Drongo               | Dicrurus bracteatus          | ^ | X | ^ | ^        | X   | X |          |
| Olive-backed Oriole           |                              | - | X | - | -        | _   |   | -        |
| Satin Bowerbird               | Oriolus sagittatus           | - | X | - | -        | _   | X | -        |
|                               | Ptilonorhynchus violaceus    | - | X | - |          |     | X | -        |
| Black-faced Cuckoo-shrike     | Coracina novaehollandiae     | + | X | X | X        | X   | X | -        |
| ∨ White-bellied Cuckoo-shrike | Coracina papuensis           |   | X |   | _        |     | X | _        |
| Cicadabird                    | Coracina tenuirostris        |   | X | _ |          |     | Х |          |
| ∇ White-winged Triller        | Lalage sueurii               |   | X |   |          | X   | X |          |
| Masked Woodswallow            | Artamus personatus           |   | X |   |          |     |   |          |
| White-browed Woodswallow      | Artamus superciliosus        |   | X |   |          |     | Х |          |
| Dusky Woodswallow             | Artamus cyanopterus          |   | X |   |          | X   | X |          |
| Grey Butcherbird              | Cracticus torquatus          |   | X | X | X        |     | X |          |
| Pied Butcherbird              | Cracticus nigrogularis       |   |   |   |          | X   |   |          |
| Australian Magpie             | Gymnorhina tibicen           | X | X | X | X        | X   | X |          |
| Pied Currawong                | Strepera graculina           |   | X | X |          | X   | Х |          |
| Australian Raven              | Corvus coronoides            | X | X | X | X        | X   | X |          |
| ∇ White-winged Chough         | Corcorax melanorhamphos      | 1 | X | 1 |          |     | X | -        |
| White-backed Swallow          | Cheramoeca leucosternus      | + | X | 1 | -        |     |   | -        |

| COMMON NAME                                     | SCIENTIFIC NAME                              | 1   | 2  | 3  | 4 | 5  | 6   | 7  |
|---|--|-----|----|----|---|----|-----|----|
| Welcome Swallow                                 | Hirundo neoxena                              | X   | Х  | X  | X | X  | Х   |    |
| Tree Martin                                     | Hirundo nigricans                            |     | X  |    |   |    | X   |    |
| Fairy Martin                                    | Hirundo ariel                                |     | X  |    |   |    | X   |    |
| Richard's Pipit                                 | Anthus novaeseelandiae                       |     | X  |    |   | X  | Х   |    |
| □ Yellow Wagtail                                | Motacilla flava                              |     | X  |    |   |    |     |    |
| Singing Bushlark                                | Mirafra javanica                             |     | Х  |    |   |    |     |    |
| Skylark   | Alauda arvensis                              |     | X  |    |   |    | Х   |    |
| □ ∇ Rufous Songlark                             | Cincloramphus mathewsi                       |     | X  |    |   |    |     |    |
| □ ∇ Brown Songlark                              | Cincloramphus cruralis                       |     | X  |    |   | х  |     |    |
| Clamorous Reed-warbler                          | Acrocephalus stentoreus                      | X   | X  |    |   |    | X   |    |
| Golden-headed Cisticola                         | Cisticola exilis                             | ×   | X  |    |   |    |     |    |
| Tawny Grassbird                                 | Megalurus timoriensis                        |     | X  | X  |   |    |     |    |
| Little Grassbird                                | Megalurus gramineus                          |     | X  | -  |   |    |     | -  |
| * House Sparrow                                 | Passer domesticus                            |     | X  |    | Х |    | X   | 1  |
| * European Goldfinch                            | Carduelis carduelis                          |     | X  | -  | _ |    | X   | -  |
| Double-barred Finch                             | Taeniopygia bichenovii                       |     | X  | X  |   | X  | X   | -  |
| ∇ Zebra Finch                                   | Taeniopygia guttata                          |     | X  | X  |   | ^  | X   | +  |
| ✓ Plum-headed Finch                             | Neochmia modesta                             | -   | X  | 1^ | - |    | ^   | +  |
| Red-browed Finch                                | Neochmia temporalis                          | - V | -  | X  | X | -  | - V | +  |
| * Nutmeg Mannikin                               | Lonchura punctulata                          | X   | X  | +  | X | -  | X   | +  |
|   | Lonchura castaneothorax                      | _   | X  | -  | - |    | X   | +  |
| ∇ Chestnut-breasted Mannikin     Mistlete shird |  |     | X  | -  | - | -  | -   | +  |
| Mistletoebird                                   | Dicaeum hirundinaceum                        | -   | X  | +  | - | -  | X   | +  |
| Silvereye * Red-whiskered Bulbul                | Zosterops lateralis                          | X   | X  | -  | - | -  | X   | +- |
|   | Pycnonotus jocosus                           | X   | X  | X  | X | -  | X   | +  |
| * Common Blackbird                              | Turdus merula                                |     | -  | -  | X | -  | X   | +  |
| * Common Starling                               | Sturnus vulgaris                             | X   | X  | -  | X | X  | X   | +  |
| * Common Myna                                   | Acridotheres tristis                         | X   | X  | X  | X | X  | X   | +  |
| REPTILES  |  |     |    | _  | _ | _  |     | 1  |
| Eastern Snake-necked Turtle                     | Chelodina longicollis                        |     | X  |    | X |    |     | 1  |
| Wood Gecko                                      | Diplodactylus vittatus                       |     | X  |    |   |    |     | 1  |
| Common Scaly-foot                               | Pygopus lepidopodus                          |     | X  |    |   |    |     | 1  |
| Jacky Lizard                                    | Amphibolurus muricatus                       |     | X  | X  |   | X  |     | 1  |
| Eastern Water Dragon                            | Physignathus lesueurii                       |     | X  | -  |   | X  |     | 1  |
| ∇ Bearded Dragon                                | Pogona barbata                               |     | X  |    |   |    |     |    |
| ∇ Lace Monitor                                  | Varanus varius                               |     | X  | X  |   |    |     |    |
| Wall Skink                                      | Cryptoblepharus virgatus                     |     | X  |    |   |    |     |    |
| Striped Skink                                   | Ctenotus robustus                            |     | X  | X  |   |    |     |    |
| Copper-tailed Skink                             | Ctenotus taeniolatus                         |     | X  |    |   | X  |     |    |
| Yellow-bellied Skink                            | Eulamprus tenuis                             |     | X  |    |   |    |     | T  |
| Eastern Water Skink                             | Eulamprus quoyii                             | X   | X  |    | X | X  |     | T  |
| Grass Skink                                     | Lampropholis delicata                        |     | X  | X  |   |    | X   | T  |
| Garden Skink                                    | Lampropholis guichenoti                      |     | X  | X  | X |    | X   | T  |
| Eastern Blue-tongued Lizard                     | Tiliqua scincoides                           |     | X  | X  |   |    |     | I  |
| ∇ Red-naped Snake                               | Furina diadema                               |     | X  |    |   |    |     | T  |
| Red-bellied Black Snake                         | Pseudechis porphyriacus                      |     | X  |    |   |    | X   | T  |
| Eastern Brown Snake                             | Pseudonaja textilis                          |     | X  |    |   |    | X   | T  |
| ∇ Black-naped Snake                             | Suta spectabilis                             |     | ×  |    |   | T  |     | T  |
| Bandy Bandy                                     | Vermicella annulata                          |     | X  |    |   |    |     | +  |
| AMPHIBIANS                                      |  |     | T  | T  | T | T  |     | +  |
| Common Eastern Froglet                          | Crinia signifera                             | X   | X  | X  | X | X  | X   | +  |
| Eastern Banjo Frog                              | Limnodynastes dumerilii                      | 1^  | X  | +  | 1 | 1^ | 1   | +  |
| ∇ Ornate Burrowing Frog                         | Limnodynastes dumeniii Limnodynastes ornatus |     | X  | +  | + | +  | -   | +  |
| Striped-marsh Frog                              | Limnodynastes peronii                        |     | 1^ | X  | - | +  | -   | 1  |

| COMMON NAME                   | SCIENTIFIC NAME            | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------------------|----------------------------|---|---|---|---|---|---|---|
| Spotted Grass Frog            | Limnodynastes tasmaniensis |   | Х | Х |   |   |   |   |
| # Red-crowned Toadlet         | Pseudophryne australis     |   | Х |   |   |   |   |   |
| ∇ Smooth Toadlet              | Uperoleia laevigata        |   | X |   |   |   |   |   |
| ∇ Green Tree Frog             | Litoria caerulea           |   | X | Х | X |   |   |   |
| Bleating Tree Frog            | Litoria dentata            |   | X |   |   | X |   |   |
| Leseur's Tree Frog            | Litoria lesueuri           | X |   |   |   |   |   |   |
| Eastern Dwarf Tree Frog       | Litoria fallax             | Х | X |   |   |   |   |   |
| Peron's Tree Frog             | Litoria peronii            |   | X |   |   |   | X |   |
| * Cane Toad                   | Bufo marinus               |   | X |   |   |   |   |   |
| INVERTEBRATES                 |                            |   |   |   |   |   |   |   |
| # Cumberland Plain Land Snail | Meridolum corneovirens     |   | X |   |   |   |   |   |
| FISH                          |                            |   |   |   |   |   |   |   |
| Shortfinned Eel               | Anguilla australis         |   |   |   |   |   |   | X |
| Longfinned Eel                | Anguilla reinhardtii       |   |   |   |   |   |   | X |
| Rainbow Trout                 | Oncorhynchus Mykiss        |   |   |   |   |   |   | X |
| Australian Smelt              | Retrepinna semoni          |   |   |   |   |   |   | X |
| Australian Bass               | Macquaria novemaculeata    |   |   |   |   |   |   | X |
| Freshwater Mullet             | Myxus petardi              |   |   |   |   |   |   | X |
| Sea Mullet                    | Mugil Cephalus             |   |   |   |   |   |   | X |
| Flathead Gudgeon              | Philypnodon grandiceps     |   |   |   |   |   |   | X |
| Stripped Gudgeon              | Gobiomorphus australis     |   |   |   |   |   |   | X |
| Firetail Gudgeon              | Hypseleotris galii         |   |   |   |   |   |   | X |
| Western Carp Gudgeon          | Hypseleotris Klunzingeri   |   |   |   |   |   |   | X |
| Catfish                       | Tandanus tandanus          |   |   |   |   |   |   | X |
| * Carp                        | Cyprinus carpio            |   |   |   |   |   |   | X |
| * Goldfish                    | Carassius auratus          |   |   |   |   |   |   | X |
| * Eastern Gambusia            | Gambusia holbrooki         |   |   |   |   |   |   | X |

## APPENDIX E: Non-Indigenous Heritage

## **Statement of Heritage Impact**

## Yarramundi Bridge Replacement

Report to

## RTA Operations Environmental Technology

**April 2002** 

CASEY & LOWE ASSOCIATES

Archaeology & Heritage

420 Marrickville Road, Marrickville NSW 2204 Tel: (02) 9568 5375 Fax: (02) 9572 8409

#### Statement of Heritage Impact Yarramundi Bridge Replacement

#### **Statement of Heritage Impact for:**

The replacement of Yarramundi Bridge, Yarramundi and Agnes Banks, NSW.

#### Date prepared:

11th April 2002.

#### Heritage Listings:

The bridge and the land on either side are not subject to any heritage listings.

#### Statement Prepared by:

This Statement of Heritage Impact was prepared by Tony Lowe and reviewed by Mary Casey of Casey & Lowe Associates for Environmental Technology, Operations Directorate, NSW RTA.

#### Background:

The RTA's preferred option is to replace the current bridge with a new bridge on a straightened alignment (Fig. 3). The existing bridge is a timber bridge built in 1962. Due to structural defects in the bridge deck, the bridge is restricted to one lane.

A new bridge option means impacts on the eastern and western banks of the Hawkesbury/Nepean River by road approaches and the new bridge construction. The RTA commissioned this non-indigenous heritage study to establish whether these works would impact on items of heritage significance. The brief specifically mentioned a series of concrete blocks in the river channel and on the eastern bank, and other features such as fencing.

#### **Description of Item:**

The land on either side of the bridge will be impacted by the construction of new road approaches. On the eastern side the heavily overgrown riverbank slopes steeply up to the existing road (Fig. 1). No items of heritage significance were sighted during the inspection of this area.

A series of concrete blocks in the river channel and eastern bank are said to be from a post-war army bridge. These were not sighted during this consultant's site visit. At the time of the visit the river was flowing with some volume and quantities of weed and debris had snagged on various objects in the river, possibly obscuring the blocks. The blocks reported in the eastern bank were not sighted.

The western bank has been impacted by extractive industries and presents as a highly modified landscape. The area is characterised by grasses and native regrowth (Fig. 2). No items of heritage significance were sighted during the inspection of this area.

#### Significance of Item:

No items of heritage significance were sighted during the inspection of the study area or identified during the search of heritage registers (Register of the National Estate and State Heritage Inventory).

Mr Sean Perry, Manager Parks and Gardens, Hawkesbury Council, was contacted but knew of no items of concern within the area to be impacted. Mr Perry said he would contact staff on Council's Heritage Committee but no other response was received from Council. An enquiry to Ms Michelle Nichols, Council librarian with knowledge of local bridges, did not reveal any relevant information.

The concrete blocks in the river channel, if they do belong to a post-war army bridge, are unlikely to fall under the provisions of the *Heritage Act* 1977 (amended) in terms of age (older than 50 years). If they were older than fifty years, the remains would be assessed as having little or no heritage significance or research potential.

#### Statement of Significance:

No items of heritage significance have been identified in the area to be impacted by the proposed works.

#### **Methodology for Mitigating Impacts:**

No impacts on heritage items have been identified.

The proposal impacts on the heritage significance of the item in the following way: No impacts on heritage items have been identified.

#### List of figures:

- Figure 1: Overgrown nature of eastern bank of river.
- Figure 2: Modified western bank of river.
- Figure 3: Proposed new road alignment and bridge location.



Figure 1: Overgrown nature of eastern bank of river.



Figure 2: Modified western bank of river.

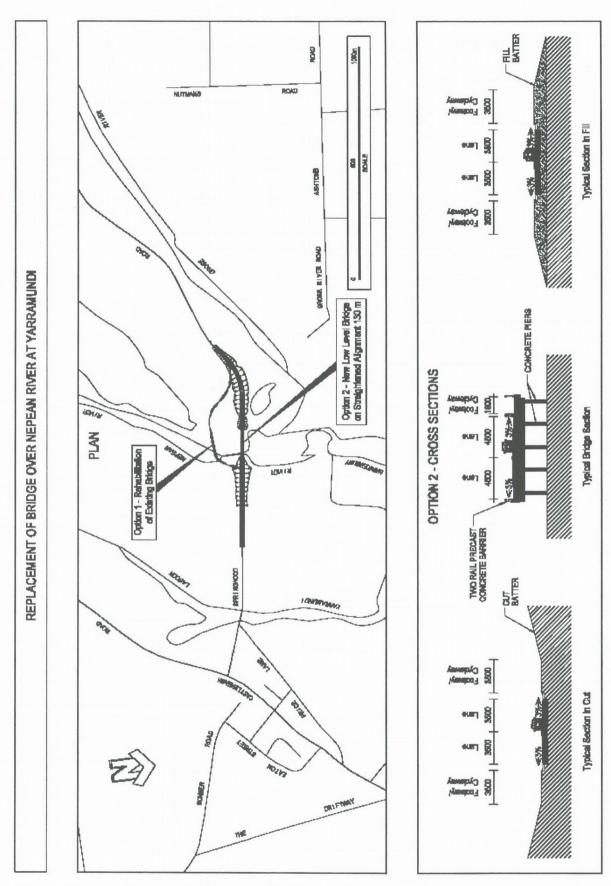


Figure 3: Proposed new road alignment and bridge location.

## **APPENDIX F: Indigenous Heritage**

Nigel Robinson Nigel\_Robinson@rta.nsw.gov.au 80796

#### Yarramundi Bridge, agnes Banks - Aboriginal Cultural Assessment

Julian,

Please find enclosed the Deerubbin Local Aboriginal Land Council report & invoice for the new bridge alignment.

Regards,

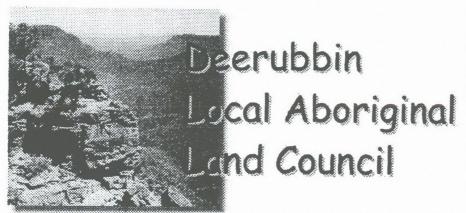
Nigel Robinson

Aboriginal Program Consultant Aboriginal Programs Branch

Corporate Services Directorate

3 April 2002

**JULIAN WATSON** 



5/271 Beames Ave P.O. Box V184 Mt Druitt Village NSW 2770, Australia

Ph: (02) 9832 2457 Fax: (02) 9832 2496

Email:- Staff@Deerubbin.org.au Web: http://www.deerubbin.org.au

Nigel Robinson Aboriginal Program Consultant Roads & Traffic Authority Pod H, Level 6 110 George Street, Parramatta NSW 2124

ACHA: 930

22 March, 2002

SUBJECT: Aboriginal Cultural Heritage Assessment:

East/West Approach Areas of Proposed New
Springwood Road Bridge, at Yarramundi/Agnes Banks.

Dear Mr Robinson,

As you aware, a representative of the Deerubbin Local Aboriginal Land Council (DLALC) (Steven Randall) inspected the above land areas, on the 8 March, 2002, to undertake an assessment of Aboriginal cultural heritage, and, to evaluate the likely impact on the proposed development on the cultural heritage of the land.

DLALC representative, Steven Randall, reports, that, the surveyed area was highly disturbed as a result of past sandmining, gravel removal on the western bank and intensive ploughing of the eastern bank.

No Aboriginal cultural material (in the form of stone artefacts, for example) was found. The area was checked for possible scarred trees. None were found. The was also checked for possible rock platforms in the bridge corridor. None were found.

DLALC, therefore, has no objections to the proposed development on the grounds of Aboriginal cultural heritage.

Should you require any further information, please do not hesitate to contact me on 9832-2457.

Yours Faithfully

Executive Officer)

DARUG TRIBAL ABORIGINAL CORPORATION

[Incorporating Darug Link Associating Inc.]

P.O. BOX 441

BLACKTOWN

2148

ABN -GST no. 77 184 151 969

28-1-02 Nigel Robinson Aboriginal Program Section P.O. Box 3035 Parramatta 2124

Re: Aboriginal Culural Assessment .

Yarramundi Bridge Option 2 -

Springwood Road Agnes Banks.

I visited this site with youself and the Heritage consultant on Friday 25-1-02 and discussed with you my personal knowlede of the area, which dates prior to the sand and gravel extraction of the immediate surrounds, with the resultant damage to the river alignment as we now know it, and any possible Aboriginal sites on the west bank, and to knowledge of the road being constructed as a military road during the war [ an alternative to Penrith and North Richmond bridges if they were damaged? ].

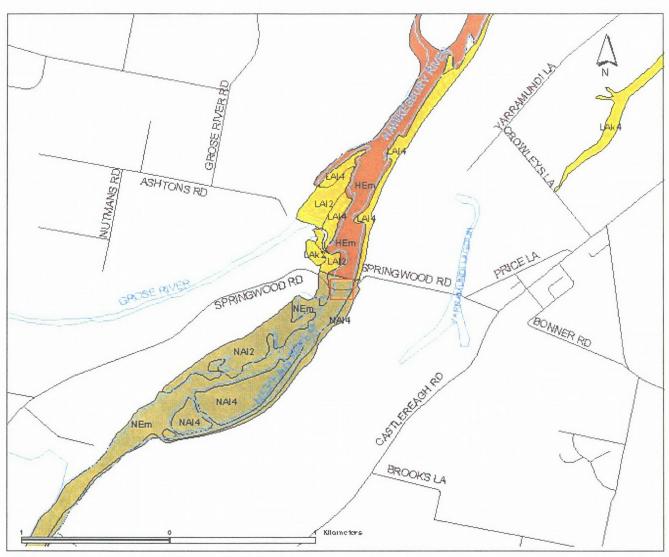
With this in mind we explored the possibility of the site of the original roadway, and its possible impacts on the eastern escarpment - and any possible Aboriginal sites etc that may have existed there. As you are now aware, 2 large concrete footings were located that would appear to fit this scenario, which would appear to rule out any possible intact soil in the immediate vicinty of thr proposed earthworks.

Therefore I do not believe that there are any constraints on Aboriginal Cultural grounds to impede this development.

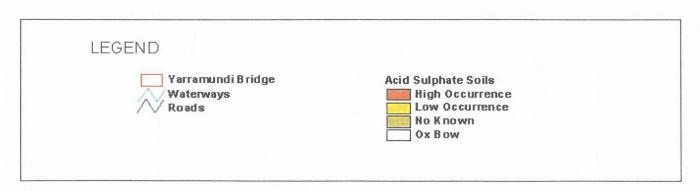
Yours Faithfully Colin Gale

## APPENDIX G: Acid Sulphate Soil Map

### Acid Sulphate Soil Risk Map, Yarramundi Bridge.



Wap Data Copyright 2002 Teistra Corporadon Limited and universal Press Pty Ltd Department of Land & Water Conservation, 4.5 W, August 2002



## **APPENDIX H: Consultation**





Our ref: PN2-10-2016A

7 November 2002

General Manager
Roads and Traffic Authority
Attn: Simone Garwood
Environmental Officer
Environmental Technology RTA Operations
Pod D, Level 5,
99 Phillip Street
PARRAMATTA NSW 2124

Dear Ms. Garwood

Re: Yarramundi Bridge Replacement.

Thank you for your letter dated 23 October 2002 concerning the replacement of the Yarramundi Bridge on the Hawkesbury River.

NSW Fisheries has a role in the assessment of the proposal. Under Section 199 of the *Fisheries Management Act, 1994* the Roads and Traffic Authority as a 'public authority' does not require a permit to 'dredge/reclaim', however, as discussed in our telephone conversation NSW Fisheries requirement must be adhered to.

With regards to the proposed structure NSW Fisheries requires information on:

- 1) The draining of the water situated on the floodplain between the main channel and the western bank
- 2) Details of the temporary weir including the time it is to be in place
- 3) Fish passage alternatives concerning the weir
- 4) Details of the construction abutments
- 5) Detail of the excavation and backfill of the abutments
- 6) Damage to aquatic vegetation
- 7) Riparian clearing

HEAD OFFICE

- 8) A copy of the Contractors Environmental Management Plan
- 9) Details of the erosion and sediment controls
- 10) Copy of the Rehabilitation Plan for the site
- 11) Copy of the Maintenance Plan for the site

This information can be dealt with in a Statement of Environmental Effects (SEE).

Details of the requirements of NSW Fisheries can be sourced from the NSW Fisheries *Policy and Guidelines Aquatic Habitat Management and Fish Conservation 1999* and the *Policy and Guidelines for Bridges, Roads etc*. Both these documents are available at the NSW Fisheries website – <a href="https://www.fisheries.nsw.gov.au">www.fisheries.nsw.gov.au</a> – under 'Conservation' and then 'Polices and Plans'.

The requirements below are to be conducted by a person with suitable qualification in a professional **Aquatic Study**.

- A **description** of aquatic vegetation, habitats, snags, gravel beds and any other protected threatened or dominate habitats at the proposed site,
- Area, density and species composition of flora and fauna (maps included)
- Effects of proposal on aquatic species/habitats in surrounding areas,
- Potential impacts on fish species
- NSW Fisheries requires a statement on **Aquatic Threatened Species**, populations and ecological communities and key threatening processes as declared under the *Fisheries Management Act 1994*. (This information is also available at the NSW Fisheries website).
- NSW Fisheries requires information on both upstream and downstream of the watercourse.

NSW Fisheries request the SEE considers the following as and if it relates to the site:

#### **Definitions**

The definitions given below are relevant to these requirements:

**Fish** means any part of marine, estuarine or freshwater fish or other aquatic animal life at any stage of their life history (whether alive or dead). Fish include oysters and other aquatic molluscs, crustaceans, echinoderms and beachworms and other aquatic polychaetes.

*Marine vegetation* means any species of plant that at any time in its life must inhabit water (other than fresh water).

*Waters* refers to all waters including tidal waters below mean high water mark as well as flowing streams, irregularly flowing streams, gullies, rivers, lakes, coastal lagoons, wetlands and other forms of natural or man made water bodies on both private and public land.

#### **Useful Information**

To help you in the preparation of an EIS, the publication "Guidelines for the Assessment of Aquatic Ecology in EIA" (Draft 1998) produced by the Department for Urban Affairs and Planning may prove useful in outlining appropriate procedures and methodologies for conducting aquatic surveys.

#### Matters to be Addressed

#### 1. Description of proposal

The SEE must include the information outlined below:

Details of the proposal must be provided, including (where relevant):

- details of the location of all component parts of the proposal, including any auxiliary infrastructure;
- the timetable for construction of the proposal;
- details of various phases of construction (eg. clearing, earthworks, temporary structures, diversions, cofferdams);
- the size of the area affected (both surface area and/or stream length, as relevant); and
- aspects of the management of the proposal, both during construction and after completion, which relate to impact minimisation.

A topographic map of the locality at a scale of 1:25 000 should be provided. This map should detail the location of all component parts of the proposal, any areas locally significant for threatened species (such as aquatic reserves), and areas of high human activity (such as townships, regional centres and major roads).

A plan of the study area must be provided. This plan should show:

- the locations and types of land uses present within the study area;
- the locations of all streams and all other water bodies within the study area; and
- land tenure details for all land parcels within the study area.

For each freshwater body identified on the plan, the plan should include, either by annotation or by an accompanying table, hydrological and stream morphology information such as:

- flow characteristics, including any seasonal variations,
- bed substrate, and
- bed width.

For each marine or estuarine area identified on the plan, the plan should include, either by annotation or by an accompanying table, hydrological and stream morphology information such as:

- tidal characteristics
- · bed substrate, and
- · depth contours

A recent aerial photograph (preferably colour) of the locality (or reproduction of such a photograph) should be provided, if possible. This aerial photograph should clearly show the subject site and indicate the scale of the photograph.

#### General Requirements

- Area, which may be affected either directly or indirectly by the development or activity should be identified and shown on an appropriately scaled map (and aerial photographs).
- Description of aquatic vegetation snags, gravel beds and any other protected, threatened or dominant habitats should be presented.
- Area, density and species composition should be included and mapped.
- Identification of recognised recreational and commercial fishing grounds, aquaculture farms and/or other waterways users.
- · Presented maps or plans, should include:
  - An appropriate legend
  - A scale
  - Orientation marks
  - Reference point marked in a recognised Co-ordinate system

#### Dredging and reclamation activities

- Purpose of works
- Type(s) of marine vegetation in the vicinity of the proposed works
- Distance of adjacent marine vegetation from the outer boundary of the proposed works
- Method of dredging to be used
- Duration of dredging works
- Time of dredging works
- Dimension of area to be dredged
- Depth of dredging activities
- Nature of sediment to be dredged
- · Method of marking area subject to works
- Environmental safeguards to be used during and after works
- Measures for minimising harm to fish habitat under the proposal
- Spoil type and source location for reclamation activities
- Method of disposal of dredge material
- Location and duration of spoil stockpiling, if planned
- Volume of material to be extracted or placed as fill

#### 2. Initial assessment

A list of threatened species, endangered populations and endangered ecological communities must be provided. In determining these species, consideration must be given to the habitat types present within the study area, recent records of threatened species in the locality and the known distributions of these species.

In describing the locality in the vicinity of the proposal, discussion must be provided in regard to the previous land and water uses and the effect of these on the proposed site. Relevant historical events may include land clearing, agricultural activities, water abstraction/diversion, dredging, de-snagging, reclamation, siltation, commercial and recreational activities.

A description of habitat including such components as stream morphology, in-stream and riparian vegetation, water quality and flow characteristics, bed morphology, vegetation (both aquatic and adjacent terrestrial) water quality and tide/flow characteristics must be given. The condition of the habitat within the area must be described and discussed, including the presence and prevalence of introduced species. A description of the habitat requirements of threatened species likely to occur in the study area must be provided.

In defining the proposal area, discussion must be provided in regard to possible indirect effects of the proposal on species/habitats in the area surrounding the subject site: for example, through altered hydrological regimes, soil erosion or pollution. The study area must extend downstream and/or upstream as far, as is necessary to take all potential impacts into account.

**Please Note:** Persons undertaking aquatic surveys may be required to hold or obtain appropriate permits or licences under relevant legislation. For example:

Fisheries Management Act 1994

- Permit to take fish or marine vegetation for research or other authorised purposes (Section 37)
- Licence to harm threatened (aquatic) species, and/or damage the habitat of a threatened species (Section 220ZW).

Animal Research Act 1985:

Animal Research Authority to undertake fauna surveys.

I recommend that, prior to any field survey activities taking place, those persons proposing to undertake those activities give consideration to their obligation to obtain appropriate permits or licences which may be required in the specific context of the proposed survey activities.

#### 3. Assessment of likely impacts

The REF must:

- · describe and discuss significant habitat areas within the study area;
- outline the habitat requirements of threatened species likely to occur in the study area;
- indicate the location, nature and extent of habitat removal or modification which may result from the proposed action;
- discuss the potential impact of the modification or removal of habitat;
- identify and discuss any potential for the proposal to introduce barriers to the movement of fish species; and
- describe and discuss any other potential impacts of the proposal on fish species or their habitat.

For all species likely to have their lifecycle patterns disrupted by the proposal to the extent that individuals will cease to occupy any location within the subject site, the SEE must describe and discuss other locally occurring populations of such species. The relative significance of this location for these species in the general locality must be discussed in terms of the extent, security and viability of remaining habitat in the locality.

#### 4. Ameliorative measures

The SEE must consider how the proposal has been or may be modified and managed to conserve fisheries habitat on the subject site and in the study area.

In discussing alternatives to the proposal, and the measures proposed to mitigate any effects of the proposal, consideration must be given to developing long term management strategies to protect areas within the study area which are of particular importance for fish species. This may include proposals to restore or improve habitat.

Any proposed pre-construction monitoring plans or on-going monitoring of the effectiveness of the mitigation measures must be outlined in detail, including the objectives of the monitoring program, method of monitoring, reporting framework, duration and frequency.

In the event of a request for concurrence or consultation of the Director of NSW Fisheries, one (1) copy of the REF should be provided to NSW Fisheries in order for the request to be processed.

It should be noted that NSW Fisheries has no regulatory or statutory role to review draft REFs unless they are accompanied by or are requested as part of a licence application under Part 7A of the FM Act. However, NSW Fisheries is available to provide advice to consent and determining authorities regarding Fisheries' opinion as to whether the

requirements have been met if requested, pending the availability of resources and other statutory priorities.

Should you require any further information on these requirements please contact me on (02) 9492 9403.

Yours sincerely

Brian Hill

Conservation Manager

Our Reference: SRF7553; SR381/04

: David Gathercole, 9995 6840

EPA

Ms S. Garwood **NSW RTA** Level 5, Pod D 99 Phillip Street PARRAMATTA NSW 2124

**Sydney Regions** 

Dear Ms Garwood,

#### YARRAMUNDI BRIDGE REPLACEMENT

Thank you for your facsimile to the Environment Protection Authority (EPA) requesting input into the development of a Statement of Environmental Effects (SEE) for the proposed replacement of the Yarramundi Bridge.

The EPA has considered your request and suggests the following comments for review in the development of the SEE.

I trust that this information is of assistance to you and if you have any enquiries please contact David Gathercole on 9995 6840.

Yours sincerely,

Susanna Savolainen

A/Principal Officer Sydney Planning

SMismala 8/11/02

# ENVIRONMENT PROTECTION ISSUES TO BE ADDRESSED IN THE PREPARATION OF A STATEMENT OF ENVIRONMENTAL EFFECTS (SEE) FOR THE PROPOSED REPLACEMENT OF THE YARRAMUNDI BRIDGE

#### **GENERAL COMMENTS**

The EPA has received limited information on this proposal. Therefore, the following environmental protection issues are stated in a broad context. The EPA would require further information, including *inter alia* construction methods and proposed hours of construction in order to identify specific environmental protection issues.

The EPA considers that the SEE should provide an overall environment protection perspective. Some issues which should be addressed are listed below:

- the impact of the proposal on the existing road system, traffic congestion, public transport and induced traffic;
- the impact of the works on, and opportunities to improve, pedestrian and cycleway facilities and access to public transport;
- the environmental and cost savings possible by adopting energy efficiency measures;
- the possible cumulative environmental impacts and proposals to manage these cumulative impacts; and,
- the effects of the development of the road on land use planning in the area.

The Planning NSW "EIS Guideline: Roads and Related Facilities" (1996) is a useful background document. In particular see section 6E: Specific requirements for an EIS – The Environmental Issues.

#### **ENVIRONMENTAL ISSUES**

#### Noise and Vibration Issues

The primary objective is the maintenance of residential amenity. The assessment of impacts and discussion of mitigation measures should address both the construction and operational phases. An assessment of the impacts of maximum noise levels and the likely frequency of such events should be included.

The following guidelines may be useful in the preparation of the SEE:

- EPA's Environmental Noise Control Manual;
- EPA's Environmental Criteria for Road Traffic Noise; and,
- Road and Traffic Authority's Environmental Noise Management Manual.

Baseline information should be provided for all properties likely to be affected in order to allow evaluation of the projected noise and vibration impacts of the proposal. This could include one week of valid noise data. Noise descriptors of  $LA_{90}$  (background noise levels),  $LA_{10}$  and  $LA_{eq}$  (equivalent continuous noise level) should be used and collected in a manner that is not affected by rain or winds greater that 5 m/s.

Guidelines for construction noise take into account the fact that these activities are transient and that noise from construction activities is often difficult to limit even with good control measures.

Potential impacts of the development upon the Nepean River should be taken into careful consideration.

An integrated soil and water management plan should be developed to prevent an increase in pollutant loads being exported from the site both during construction and operation. The following documents will assist in the development of the plan:

- EPA Managing Urban Stormwater: Treatment Techniques (1997);
- EPA Managing Urban Stormwater: Council Handbook (draft) (1997);
- NSW Dept of Housing: Managing Urban Stormwater, Soils and Construction (the blue book) (1998).

#### Issues that should be considered are listed below:

- the potential for water pollutants to be generated;
- measures to be taken to collect, store and treat stormwater, wash down water, wheel wash water, etc;
- options for water re-use on the site;
- materials storage areas, ponds or beds for slurry or other materials;
- management methods to ensure that earthworks do not export sediment from the site;
- separating clean water from contaminated water;
- protect existing natural drainage lines and the banks of water bodies;
- measures to prevent litter entering water courses eg; trash racks, and details of permanent gross pollutant traps or other water pollution control devices proposed for the operational stage;
- proposed controls for refuelling facilities during construction eg, oil separators, emergency absorbent booms or pillows;
- identification of any significant effects on hydrological conditions and appropriate hydrological studies:
- monitoring proposals; and,
- consideration of the impact of the proposal on upstream and downstream flooding taking into account any existing flood plain management plans.

#### Air Quality Issues

Air quality issues that should be considered in the SEE for the construction works include:

- emissions of dust generated by activities such as earthmoving, excavation, loading and vehicle traffic (particularly from unsealed roads and surfaces);
- wind erosion from exposed surfaces and stockpiles; and,
- assessment of the impact of exhaust emissions from vehicles and other motorised equipment being operated on-site.

An air quality management plan should be developed for the site to describe proposed mitigation measures and safeguards to control dust generation and to minimise impact on nearby receptors.

Mitigation measures and safeguards referred to in the SEE should include:

- properly maintained equipment, designed and operated to control the emission of smoke, dust, fume and other objectionable material into the atmosphere;
- spraying of earthworks, roads and other surfaces as necessary with water or other suitable liquids and the provision of dust suppression equipment;
- all working areas, access roads and disturbed areas to be stabilised as soon as practicable to minimise the generation of wind blown dust;

• ensuring that spoil storage areas are managed appropriately to minimise erosion and ensure that adequate sediment controls are in place.

#### Flora and Fauna

The SEE should include a detailed assessment of the likely ecological impact of the proposal on both terrestrial and aquatic communities and individual species. Remnant and regenerated vegetative communities should be identified and assessed for their value as habitat, and wildlife corridors surveyed for rare or endangered flora and fauna species. For detailed advice, contact the National Parks and Wildlife Service and Department of Fisheries, but in general the following issues should be addressed:

- maximise retention of remnant native vegetation by minimising the area of vegetation disturbance;
- utilise local seed stock for planting wherever possible;
- maximise linkages between areas of biodiversity value;
- take special care where road corridors are adjacent to National Parks;
- · consider the need for fauna corridors; and,
- rehabilitate sites when work is complete.

#### **Environmental Management Plan**

The EPA strongly recommends the preparation of an environmental management plan to guide environmental performance during the project. This plan should address environmental awareness and skills training for all workers, including contractors, working on the project. In addition, the EPA suggests that the Plan should cover the issues listed above, and include the following important components:

- appropriate mitigation measures to ensure that operations do not cause unacceptable pollution, cause an unacceptable risk to public health or impact on the amenity of surrounding residents;
- clearly defined and appropriate environmental objectives, referring to relevant guidelines and standards;
- adequate environmental monitoring and reporting programs to ensure that performance is assessed against environmental objectives; and,
- clear and appropriate contingency strategies.



## remum Rywithi City Council



Our Ref: Contact: Telephone:

Level 5, I PARRAN

RTA - Er

Dear Sir/

Attention

Yarramı

Thank-yo Council l

For Build Protectio



Anthony Price (02) 4732 7527

vironmental Technology od D Street

IATTA NSW 2124

Simone Garwood

Madam

ndi Bridge Replacement

u for the invitation to comment on the proposed replacement of Yarramundi bridge. as no objection, although it would be appreciated if you could supply a copy of the ental Management Plan after it is prepared for Council's review.

ling Approvals & Environment

n Manager

Received Alilor.

The Roads and Traffic Authority Environmental Technology Level 5 Pod D 99 Phillip St Parramatta NSW 2124

Attention: Simone Garwood



Contact: J Phone: (Fax: (

John Filocamo (02) 9895 6254 (02)9895 6227

jfilocamo@dlwc.nsw.gov.au
Our Ref: Mn00R58

Your Ref: H/36310

12 November 2002

Dear Simone

#### Re: Yarramundi Bridge Replacement - new option along current alignment

Reference is made to your letter of 23 October 2002 requesting comments from the Department. These comments should be read in conjunction with the general comment provided in the department's letter of 4 February 2002.

As you are aware a Plan of Management (POM) has been jointly commissioned by Hawkesbury City Council and Department of Land and Water Conservation (DLWC) and is being undertaken by LandArc. If the original proposal is changed, the POM, which is close to finalisation, will be require significant amendments. The amendments will require further funding for the project which was not previously anticipated. Further funds may be sought from the RTA to complete the POM project.

No explanation has been given as to why would RTA want to change the original proposal which involves removing the bend in the road on the eastern side and providing a much safer river crossing for motorists. It understood that the local community will raise concerns as to this new option and concerns that the building of the new bridge will be further delayed. The department also supports aligning the new structure with the previously proposed route, to remove the dangerous bends on both approaches.

As this river system has not flooded significantly since January 1992, there will be a large amount of debris included in the next significant flood event. Has this large quantity of woody debris been factored into the bridge design? The proposed 2 or 3 piers in the main flow of the Nepean River will act as debris traps during floods, causing diversions of flow into the banks nearby. A bridge spanning the river without piers would be a better option in terms of bank stability and unrestricted flow or a least minimising the number of piers to two.

Considerable works have been carried out recently to control the Noxious Weed known as Black Willow (*Salix nigra*) which is present in large numbers upstream from the bridge at Yarramundi. These works have involved stem injecting the trees and leaving them in place to erode over time. There are perhaps 10,000 stems present, now mostly dead and brittle. These willows have most colonised since the last significant flood in 1992. They have a very shallow root system and evidence has been seen that they peel of the sand or cobble bars and

beds during increased flows. The absence of leaves will provide less of a drag when water levels rise and it is thought that impacts downstream have been significantly reduced by the willow control works, however, the sheer number of stems still present poses some threat when the next flood event occurs.

There is also an added threat imposed because of the water weed (*Egeria densa*). This submerged weed is present in very large quantities upstream from the bridge and all the way to Penrith Weir. During raised water levels earlier this year, this weed was deposited against trees, sometimes bending them in the flow of the water with the added weight of the weed. This may be an important factor when combined with dead willow stems present and other large woody debris accumulating against the piers of the bridge. The combined effect may actually resemble a dam wall during periods of increased flow.

The Department does not prefer "rock filled mattresses, stone pitching, cement-filled revetment mattress or similar", for works in relation to riparian areas. Soft engineering options such as rip-rap packed with soil or equivalent is recommended where possible as acceptable methods of scour protection for this or any other bridge proposal. Section designers should be advised of the Departments requirements.

Consideration should also be given to raising the deck level of the structure to cater for larger floods. Approach roads do not become inundated until flood waters reach a level of some metres above the deck level of the existing structure. This will necessitate lengthening the structure some 40 metres.

The NW area described is not a "floodplain", it is an in-channel bar/bench and prone to inundation from very minor floods. Construction of a "weir" in this bench area is not appropriate - disturbance to the relatively stable imbricated armour layer of the bench will create the potential for the channel surface to scour. DLWC requires that an alternative strategy be devised for access - temporary corduroy or whatever subject however to DLWC endorsement. Disturbance to the bed of the river, for its entirety, should be kept to an absolute minimum to construct the piers in a dry environment. Reducing the number of piers will reduce the problem. An assessment of any stillwater bodies in conjunction with the river would be required prior to any drainage activities.

Abutments should be scour protected using rock rip-rap. Abutments should be located suitable for a deck level higher than that currently proposed. Decommissioning of the existing structure should involve re-aligning abutments/river bank evenly with the new abutments/new river bank alignment.

RTA needs to prepare a "works plan" for the project which fully addresses contingency matters in the event of flooding, whilst the site is disturbed.

The Department of Land and Water Conservation has not assessed Native Vegetation present in the new proposal area. However, a significant regeneration area of rainforest species has been found in amongst boulders south of the existing bridge. Any effect on riparian and Native Vegetation as a result of the new proposal would need to be addressed.

DLWC requires the opportunity to review design drawings for the modified structure, and the rehabilitation plan, as soon as possible, to avoid project delays.

If you wish to discuss these matters further please ring me on 9895 6254.

Yours sincerely

John Filocamo

Sen Land Manager-Surveyor, Land Access

John Filiamo