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**Response to Director General's Requirements:**
**Mobbs Lane, Epping**

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## Contents

## 1.0 Introduction

Clements *et al.* (2005) prepared a flora assessment and tree survey report as part of the environmental assessment to support the approved Concept Plan (MP 05_0086) for the redevelopment of the Seven Network site at 61 Mobbs Lane, Epping (the Site, Figure 1).

This report has been prepared in response to the following Director-General's environmental assessment requirement for the Early Works Package (MP 08_0258) for the Epping Park project.

> *Key Issue 8: The EA should address impacts on flora and fauna, including threatened species, populations and endangered ecological communities and their habitats and steps taken to mitigate any identified impacts to protect the environment as per Concept Plan MP 05_0086.*

A separate report addressing fauna issues has been prepared by Ambrose Ecological Services Pty Ltd.

## 2.0 Previous findings

Clements *et al.* (2005) found that the vegetation on the approximately 8.9 ha Site consisted mainly of cleared mown grass with planted trees. From a review of the 2002, 1994, 1986, 1978, 1970, 1961, 1951 and 1930 historical aerial photographs, it was evident that the site has been largely cleared since at least 1930 and the majority of trees were planted after 1961.

NPWS (2002) mapped the vegetation communities of the Cumberland Plain using aerial photograph interpretation and limited ground survey. Polygon 6492 is mapped as occurring in the northern part of the western section of the Site, extending east on the TAFE property and west on Mobbs Lane Reserve (Figure 2). Polygon 6492 is described as:

| Vegetation Community | Polygon ID | Patch size (ha) | Polygon code | Reliability code |
|---|---|---|---|---|
| Turpentine-Ironbark Forest | 6492 | 2.13 | TX | 0 |

Polygon code TX denotes:
*<10% crown cover - agricultural - no major urban development.*

Polygon 6492 is mapped as adjoining an additional polygon of the same map unit along the mapped creek in Mobbs Lane Reserve. The mapped creek in Mobbs Lane Reserve flows south-east to Terrys Creek. Turpentine-Ironbark Forest is also mapped along Terrys Creek (Figure 2).

### 2.1 Conservation significance

The conservation significance of the communities and species recorded were assessed in Clements *et al.* (2005) at a:

- National level against the schedules of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act);

- State level against the schedules of the Threatened Species Conservation Act 1995 (TSC Act); and
- Regional level (species only) against Benson and Howell (1994) and Parramatta City Council (2003).

### 2.1.1 Communities

Clements *et al.* (2005) searched the listings of endangered ecological communities on the websites of Environment Australia (now the Commonwealth Department of Environment, Water, Heritage and the Arts) and National Parks and Wildlife Service (now NSW Department of Environment and Climate Change). Based on the mapped geology and soil landscape, it was found that:

- Of the two endangered ecological communities listed on the EPBC Act known to occur within 10 km of the Site, one of these, namely Cumberland Plain Woodland, could potentially occur on the Site; and
- Of the seven endangered ecological communities listed on the TSC Act recorded in the Parramatta LGA, three of these, namely Blue Gum High Forest, Cumberland Plain Woodland, and Turpentine Ironbark Forest in the Sydney Basin Bioregion, could potentially occur on the Site.

It was concluded that as most of the trees on the Site appear from historical aerial photographs to have been planted in the last 50 years and the understorey of the Site predominantly consists of mown lawns, it is unlikely that the Site supports any of the above Endangered Ecological Communities.

### 2.1.2 Species

Clements *et al.* (2005) searched the listings of threatened species using the search tools on the website of Environment Australia and the NPWS Wildlife Atlas and found:

- 16 plant species listed on the EP&BC Act recorded within a 10 km radius of the Site; and
- four plant species listed on the TSC Act recorded in the Parramatta LGA.

None of the listed species were recorded on the Site.

## 3.0 Vegetation in the west of the Site and in Council Reserve

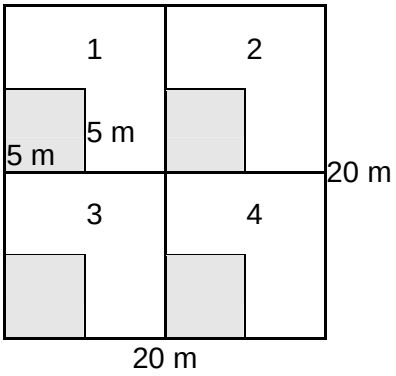
The vegetation in the west of the Site was sampled using one quadrat (Quadrat 1) and five Spot locations (A to E) on 8 July 2004 by Tony Rodd and Jane Rodd. The area was re-inspected on 20 February 2009 by Tony Rodd and Jane Rodd and on 23 February 2009 by Dr AnneMarie Clements and Tony Rodd. Additional vegetation data was recorded from one 20 m x 20 m quadrat in the south of the Site (Quadrat 2) (Figure 3).

In the Mobbs Lane Reserve and Fred Spurway Park to the west and south-west, vegetation data were recorded from one 20 m x 20 m quadrat (Quadrat A1) and one 10 m x 30 m transect (Quadrat A2) across the fragment and eight Spot locations (AA to AH) by Tony Rodd and Jane Rodd on 8 July 2004 and by Tony Rodd and Sian Wilkins on 3 August 2004 (Figure 4).

### 3.1 Methods

For the vegetation surveys in 2004 and 2009, standard procedures for obtaining data were used for the sampling areas and the spot locations.

Each 0.04 ha sampling area (Quadrats 1, 2, A1) consisted of four 10 m x 10 m contiguous subquadrats. For Quadrat A2, the sampling area was a 10 m wide x 30 m long transect diagonally across the maximum width of bushland (off the Channel 7 western fence to the southern edge of the grassy clearing). The data were recorded from contiguous 10 m x 10 m subquadrats. The layout of the 20 m x 20 m quadrats and subquadrats is as follows:




The layout for the 10 m x 30 m transect (Quadrat A2) was contiguous 10 m x 10 m subquadrats.

The relative frequency of plant species in the quadrats was assessed by recording the presence/absence of each species in four 5 m x 5 m subquadrats nested in the 10 m x 10 m subquadrats. The maximum height and number of individuals for each species greater than 2 m high was recorded in each of the 10 m x 10 m subquadrats. During the searches of the 10 m x 10 m subquadrats, additional ground layer species are recorded as “extra” species for the subquadrat, resulting in high intensity sampling of the 0.04 ha sampling area.

Given the fragmented and heterogenous nature of the vegetation, supplementary data were recorded from 13 Spot locations (A to E, AA to AH). The data consisted of recording species present within a 10 m radius of the spot locations.

The GPS co-ordinates of each sampling location were recorded using a hand-held *Garmin e-trex* and the approximate locations plotted on the most recent aerial image available on the NSW Department of Lands SIX Viewer (six.maps.nsw.gov.au accessed 2 March 2009).

In Quadrat 2 onsite, in addition to species data the percent projected foliage cover (percent cover) of the following vegetation strata was estimated:

- Native canopy trees
- Native midstorey trees
- Native shrubs
- Native grasses/graminoids
- Native herbs
- All exotic species

The percentage cover of exposed ground (bare soil and rock) and leaf litter was also recorded.

All sampling locations in 2004 and 2009 were photographed at the time of survey (Appendix 1).

In addition, some of the large trees on the adjoining TAFE land to the north were recorded and observed from the northern boundary of the Site near the helipad on 23 February 2009.

Nomenclature is consistent with Harden (1990-1993, 2002), Harden and Murray (2000) and subsequent taxonomic changes as published in *Telopea*, the Sydney Royal Botanic Gardens' journal of systematic botany, and in other Australian taxonomic literature. The Royal Botanic Gardens' PlantNET website (plantnet.rbgsyd.nsw.gov.au) incorporating Flora Online is the major source for updated taxonomy.

### 3.2 Observations in 2004 and 2009

There were 234 species (121 "native", 10 not native to Central Coast subdivision of NSW (Harden 1990-93, 2002) and 103 exotic) recorded in four quadrats (Quadrats 1, 2 onsite and A1, A2 offsite) and Spot locations (A to E onsite and AA to AH offsite) (Table 1, Figures 3 and 4).

**Onsite** in the west of the Site, there were 103 species (43 native, 5 not native to Central Coast subdivision of NSW, 55 exotic) recorded in two Quadrats (Quadrats 1 and 2) and five Spot locations (A to E).

**Quadrat 1**, located in the north-west, was surveyed in 2004. This Quadrat was between Tree 668 (planted *Eucalyptus saligna*) and Tree 665 (*Angophora floribunda*). Trees recorded in this quadrat included planted trees and possibly naturally regenerated *Angophora floribunda. Angophora floribunda* may have regenerated naturally, following intensive agriculture use (orchard and/or market garden) of this area visible on the 1951 aerial photograph (Figures 5 and 6). The numbers and maximum recorded heights of trees over 2 m in height in Quadrat 1 are tabulated as follows:

| **Subquadrat** | **1** | | **2** | | **3** | | **4** | |
|---|---|---|---|---|---|---|---|---|
| **Botanical name** | **no.** | **height** | **no.** | **height** | **no.** | **height** | **no.** | **height** |
| *Allocasuarina torulosa* | 2 | 9 m | | | | | 5 | 11 m |
| *Angophora floribunda* | 2 | 16 m | | | 5 | 15 m | | |
| *Eucalyptus microcorys* | 1 | 15 m | | | | | 1 | 17 m |
| *Eucalyptus pilularis* | 1 | 15 m | | | | | 5 | 11m |

There was a mown grass understorey beneath the trees, which was quite sparse due to the area being on dry, rather poor soil and moderately shaded. Of the 33 understorey species recorded, there were 17 native grass, sedge and herb species. *Microlaena stipoides* was recorded in all four subquadrats; *Carex inversa*, the lawn grass *Cynodon dactylon* and *Juncus homalocaulis* were each recorded in three of four subquadrats; and the remaining 13 species were recorded in one or two subquadrats.

Of the 16 exotic groundlayer species, *Axonopus affinis* (a common lawn grass of moist soil) and *Juncus capillaceus*, a naturalised rush, were recorded in all four subquadrats. The other 14 exotic groundlayer species included a seedling of *Cupressus* sp. and scattered occurrences of common garden weeds.

**Quadrat 2**, located in the south-west of the Site, was surveyed in February 2009. All of the trees appeared to be planted, except for *Pittosporum undulatum.* The number of individuals and maximum heights of trees over 2 m in height in Quadrat 2 are as follows:

| **Subquadrat** | **1** | | **2** | | **3** | | **4** | |
|---|---|---|---|---|---|---|---|---|
| **Botanical name** | **no.** | **height** | **no.** | **height** | **no.** | **height** | **no.** | **height** |
| *Acacia elata* | 1 | 2 m | | | 2 | 18 m | 2 | 17 m |
| *Allocasuarina torulosa* | 1 | 3 m | | | | | 5 | 11 m |
| *Callistemon viminalis* | | | 1 | 5 m | 1 | 4 m | | |
| *Eucalyptus microcorys* | | | | | 1 | 16 m | 1 | 18 m |
| *Eucalyptus pilularis* | 2 | 17 m | | | | | | |
| *Eucalyptus saligna* | 1 | 17 m | | | | | | |
| *Melaleuca armillaris* | 3 | 9 m | 1 | 9 m | | | | |
| *Olea europaea* subsp. *cuspidata* | 2 | 2 m | 1 | 7 m | | | | |
| *Pittosporum undulatum* | | | 1 | 7 m | 1 | 9 m | 1 | 4 m |

The percent projected foliage cover of the strata in Quadrat 2 were:

| **Strata** | **Percent cover** |
|---|---|
| Canopy of planted trees | 5% |
| Native subcanopy, including *P. undulatum* | 5% |
| Native shrubs | <1% |
| Native grasses/graminoids | 2% |
| Native herbs | <1% |
| Exotic | 40% |
| | |
| Litter | 60% |
| Bare soil | 0% |
| Rock | 0% |

Of the total 34 species recorded in Quadrat 2, there were 21 Australian native species, including trees and shrubs of the non-local native *Acacia baileyana* (Cootamundra Wattle), planted *Acacia elata*, possible native *Acacia floribunda*, planted *Allocasuarina torulosa*, the planted North Coast species *Callistemon viminalis* and *Eucalyptus microcorys*, planted *Eucalyptus pilularis* and *Eucalyptus saligna*, planted *Melaleuca armillaris* and local weedy native *Pittosporum undulatum.*

The native groundlayer component had a total percent cover of <3% which included the cosmopolitan grass species *Cynodon dactylon*. There were 11 native groundlayer species recorded: *Microlaena stipoides* in 4 of the 4 subquadrats; *Austrodanthonia racemosa*, *Dichondra repens* and *Glycine clandestina* in 3 of the 4 subquadrats; *Cynodon dactylon* and *Cyperus gracilis* in 2 of the 4 subquadrats; and *Entolasia marginata*, *Eragrostis brownii*, *Oplismenus aemulus*, *Veronica plebeia* and *Wahlenbergia gracilis* in 1 of the 4 subquadrats. Most of the native grass and herb species recorded occurred within 3 m of the fenceline adjoining Mobbs Lane.

The 13 exotic species (excluding non-local native species) had a total projected foliage cover of 40%. Most commonly recorded were the groundcover *Asparagus aethiopicus*, exotic grass *Ehrharta erecta*, the shrub/tree species *Ligustrum lucidum* and *Olea europaea* subsp. *cuspidata* and the sub-shrub *Sida rhombifolia*.

The vegetation recorded at the Spot locations A to E was described in Clements *et al.* (2005). From the composition data below the percentage of exotic species to total species recorded varied from 37% in Quadrat 2 to 76% in Spot location C.

| Sampling location | Location and vegetation | Total number of species | Native species | Non-local native species | Exotic species | % exotic species |
|---|---|---|---|---|---|---|
| **Quadrat** | | | | | | |
| 1 | NW corner | 37 | 20 | 1 | 16 | 43% |
| 2 | SW corner | 46 | 26 | 3 | 17 | 37% |
| **Spot location** | | | | | | |
| A | Palms planted on drainage line | 12 | 3 | 1 | 8 | 67% |
| B | Planted copse of trees close to western boundary | 24 | 7 | 2 | 15 | 63% |
| C | Planted copse of trees close to northern boundary | 17 | 4 | 0 | 13 | 76% |
| D | Planted copse of trees close to southern boundary | 25 | 14 | 2 | 11 | 44% |
| E | Planted trees in south-west corner | 23 | 7 | 0 | 16 | 70% |

In Quadrat 2, the percentage cover by exotic species was 40% with <14% sum total percentage of projected foliage cover of the native strata.

The south-west corner (Spot location E) was re-inspected in February 2009. The exotic *Pyrus calleryana* (Callery Pear) was the dominant tree.

At least 7 and probably 9 of the 43 "native" species recorded (naturally occurring in the Central Coast subdivision of NSW) in the two quadrats and five spot locations are likely to have been planted, namely:

| Species | Natural occurrence from PlantNET | Recorded in |
|---|---|---|
| *Acacia elata* | Grows in rainforest and wet sclerophyll forest in various situations on the escarpment ranges; from the Budawang Ra. north to the Bellinger River; widely cultivated with potential to escape into adjacent bushland under suitable conditions. | Quadrat 2 |
| *Brachychiton acerifolius* | Widespread in subtropical rainforest on the coast to the escarpment, north from the Shoalhaven R. | Spot location B |
| *Casuarina cunninghamiana* | Along permanent freshwater streams | Spot location B, C |
| *Casuarina glauca* | In brackish situations along coastal streams, somewhat farther inland along major river valleys. | Spot location B |

| Species | Natural occurrence from PlantNET | Recorded in |
|---|---|---|
| *Cynodon dactylon* | Widespread and very common; widely cultivated as a lawn grass and for pasture. | All sampling locations, except Spot location B |
| *Eucalyptus botryoides* | Locally abundant, in dry sclerophyll forest or woodland on alluvial flats or old beach dunes | Spot locations A and E |
| *Eucalyptus pilularis* | Widespread and often dominant, in wet sclerophyll or grassy coastal forest on lighter soils of medium fertility, north from Eden district. | Quadrat 1, 2, Spot location D |
| *Eucalyptus saligna* | Widespread and abundant, in wet forest on soils of moderate fertility, often on slopes; north from Port Jackson. | Quadrat 2, Spot location D – all likely to have been planted, based on apparent age |
| *Melaleuca armillaris* | Widespread in heath communities, often on headlands or coastal ranges. | Quadrat 2, Spot location D |

There were five non-local native species (not naturally occurring in the Central Coast subdivision of NSW) that must have been planted:

| Species | Natural occurrence | Recorded in |
|---|---|---|
| *Acacia baileyana* | endemic to the Temora-Cootamundra district; widely cultivated, often naturalised. | Quadrat 2 |
| *Callistemon viminalis* | Mostly grows along watercourses; chiefly in sandstone or granite areas, north from Moree and Grafton. | Quadrat 2, Spot location D |
| *Eucalyptus microcorys* | Abundant, in wet forest or rainforest margins on moderately to highly fertile soils often on slopes; north from near Cooranbong. | Quadrats 1 and 2, Spot locations B and D |
| *Livistona decipiens* | River banks, and coastal areas of central Queensland | Spot location A |
| *Schefflera actinophylla* | Rainforests of tropical eastern Queensland and the Northern Territory. | Spot location B |

**Offsite to the north** on the TAFE land, the canopy trees observed included *Eucalyptus paniculata* (Grey Ironbark), *E. pilularis* (Blackbutt) and *E. saligna* (Sydney Blue Gum). Based on their apparent age and growth form, some of these trees appeared to be remnant.

**Offsite to the west and south-west**, there were 189 species (103 “native”, 7 not native to Central Coast subdivision of NSW and 79 exotic) recorded in two quadrats (Quadrats A1 and A2) and eight Spot locations (AA to AH) in Mobbs Lane Reserve and Fred Spurway Park. In Fred Spurway Park, all of the trees west of the stream appear to be planted, with no obvious remnant trees.

The extent of native component in the vegetation offsite in the reserves was variable – from 73% in the planted and bush-regenerated areas of Mobbs Lane Reserve, to 6% in Fred Spurway Park.

| Sampling location | Location and vegetation | Total no. of species recorded | Exotic (including not native to Central Coast) | Native to Central Coast | Percent native |
|---|---|---|---|---|---|
| **Quadrat** | | | | | |
| A1 | Planted and bush regenerated | 90 | 24 | 66 | 73% |
| A2 | Planted and bush regenerated | 48 | 25 | 23 | 48% |
| **Spot location** | | | | | |
| AA | Some *E. saligna* appears remnant | 28 | 13 | 15 | 54% |
| AB | *E. saligna* <20 years old, probably planted | 21 | 9 | 12 | 57% |
| AC | Non-local native dominant | 17 | 16 | 1 | 6% |
| AD | Creek bed and banks | 24 | 18 | 6 | 25% |
| AE | 20 m upstream of Valley Road. *E. saligna* planted | 29 | 23 | 6 | 21% |
| AF | A few remnant *E. saligna* | 24 | 14 | 10 | 42% |
| AG | Scattered large remnant *E. saligna* | 19 | 6 | 13 | 68% |
| AH | North of Terry Road – concrete canal, no obvious remnant | 25 | 6 | 19 | 76% |

The number of individuals and maximum heights of trees over 2 m in height recorded in Quadrats A1 and A2, both in Mobbs Lane Reserve, are as follows:

**Quadrat A1**

| Subquadrat | 1 | | 2 | | 3 | | 4 | |
|---|---|---|---|---|---|---|---|---|
| **Botanical name** | **no.** | **height** | **no.** | **height** | **no.** | **height** | **no.** | **height** |
| *Acacia decurrens* | | | 1 | 4m | | | | |
| *Acacia falcata* | | | | | 3 | 4m | | |
| *Acacia fimbriata* | 1 | 5m | | | | | | |
| *Acacia floribunda* | 1 | 3m | 2 | 3m | | | | |
| *Acacia implexa* | | | | | 1 | 3m | | |
| *Acacia longifolia* | | | | | 1 | 3m | | |
| *Acacia parramattensis* | 2 | 6m | | | 1 | 6m | 1 | 6m |
| *Acmena smithii* | | | 1 | 2m | | | | |
| *Allocasuarina torulosa* | 1 | 3m | | | | | | |
| *Angophora floribunda* | | | | | 2 | 15m | | |
| *Breynia oblongifolia* | 1 | 2m | | | | | | |
| *Bursaria spinosa* | | | | | 1 | 3m | | |
| *Callistemon salignus* | 1 | 2m | | | | | 1 | 3m |
| *Dodonaea triquetra* | 1 | 2m | | | 2 | 3m | | |

| Subquadrat | 1 | | 2 | | 3 | | 4 | |
|---|---|---|---|---|---|---|---|---|
| **Botanical name** | **no.** | **height** | **no.** | **height** | **no.** | **height** | **no.** | **height** |
| *Elaeocarpus reticulatus* | 1 | 4m | | | | | | |
| *Eucalyptus saligna* | 6 | 18m | 7 | 11m | 5 | 17m | 4 | 3m |
| *Eucalyptus sp.* | | | | | 3 | 4m | | |
| *Glochidion ferdinandi* | | | 1 | 2m | | | | |
| *Hakea salicifolia* | 1 | 4m | | | | | | |
| *Melaleuca styphelioides* | 1 | 3m | 3 | 4m | | | 1 | 2m |
| *Omalanthus populifolius* | 3 | 4m | 4 | 4m | 4 | 5m | 4 | 5m |
| *Phyllanthus similis* | | | | | | | 1 | 3m |
| *Pittosporum revolutum* | | | 1 | 2m | | | | |
| *Pittosporum undulatum* | 5 | 8m | | | 2 | 7m | | |
| *Solanum mauritianum* | | | 1 | 6m | 1 | 4m | 1 | 4m |
| *Syncarpia glomulifera* | 1 | 13m | 1 | 2m | | | 2 | 5m |
| *Trema tomentosa* var. *viridis* | 1 | 4m | 5 | 4m | 1 | 3m | 2 | 4m |

**Quadrat A2**

| Subquadrat | 1 | | 2 | | 3 | |
|---|---|---|---|---|---|---|
| **Botanical name** | **no.** | **height** | **no.** | **height** | **no.** | **height** |
| *Acacia decurrens* | 1 | 3m | | | | |
| *Acacia falcata* | 7 | 3m | 1 | 3m | | |
| *Angophora floribunda* | 1 | 13m | 1 | 15m | | |
| *Eucalyptus saligna* | | | 3 | 16m | 2 | 2m |
| *Pittosporum undulatum* | | | 3 | 7m | 5 | 11m |

## 4.0 Conservation significance

### 4.1 Communities

Tozer (2003)/NPWS (2002) mapped Turpentine Ironbark Forest in the northern part of the western section of the Site, extending east on the TAFE property and west on Mobbs Lane Reserve. This community is also mapped in Fred Spurway Park and adjoining Terrys Creek further south.

Turpentine-Ironbark Forest is equivalent to:

- Turpentine-Ironbark Forest of the Sydney Basin Bioregion, a critically endangered ecological community under the Commonwealth EPBC Act; and
- Sydney turpentine-ironbark forest, an endangered ecological community under the NSW TSC Act.

Clements *et al.* (2005) concluded that as most of the trees on the Site appear from historical aerial photos to have been planted in the last 50 years and the understorey of the Site predominantly consists of mown lawns, it was unlikely that the Site supports any of the above Endangered Ecological Communities.

To further address Key Issue 8, the data has been compared with the Commonwealth Listing Advice on Turpentine-Ironbark Forest of the Sydney Basin Bioregion and the Final Determination of the NSW Scientific Committee for Sydney turpentine-ironbark forest.

### 4.1.1 Turpentine-Ironbark Forest of the Sydney Basin Bioregion

Turpentine-Ironbark Forest of the Sydney Basin Bioregion was gazetted as a critically endangered ecological community on 26 August 2005. The Commonwealth Listing Advice on Turpentine-Ironbark Forest of the Sydney Basin Bioregion lists the following characteristic species:

| **Characteristic species** | **Recorded on the Site?** | **Recorded offsite in Reserves?** |
|---|---|---|
| **Trees** | | |
| Cumberland Plain: | | |
| *Syncarpia glomulifera* | Planted landscape trees | Quadrat A1 and Spot location AF |
| *Eucalyptus paniculata* | No | No |
| *E. crebra* | No | No |
| *E. fibrosa* | No | No |
| *E. punctata* | No | No |
| | | |
| Plateaux shale caps: | | |
| *Eucalyptus paniculata* | No | No |
| *E. notabilis* | No | No |
| | | |
| Upper end of rainfall/elevation range: | | |
| *E. saligna* | Mainly planted individuals of *E. saligna,* with one probably remnant *E. saligna* to north of helipad (Tree no. 928) | **remnant** *E. saligna* in Spot locations AA, AF and AG **planted** *E. saligna* in Quadrats A1, A2 and Spot locations AB, AE and AH |
| *E. cypellocarpa* | No | No |
| *E. deanei* | No | No |
| *E. punctata* | No | No |
| **Total characteristic tree species recorded** | **one remnant *E. saligna* (Tree no. 928)** | **2** |
| | | |
| **Midstorey** | | |
| **Small trees:** | | |
| *Pittosporum undulatum* | Quadrat 2, Spot locations D and E | Quadrats A1 and A2, Spot locations AA, AD to AH |
| *Trema aspera* | No | No |
| *Acacia parramattensis* | in tree survey (Tree Nos 42, 44, 46, 49, 50, 784, 861, 865, 881, 882, 883, 885, 886, 887, 888, 1000, 1002) | Quadrat A1 |
| **Shrub layer:** | | |
| *Polyscias sambucifolia* | No | No |
| *Notelaea longifolia* | No | No |
| *Leucopogon juniperinus* | No | No |
| *Pittosporum revolutum* | No | Quadrat A1 |
| *Breynia oblongifolia* | No | Quadrat A1 |
| *Maytenus silvestris* | No | No |
| *Ozothamnus diosmifolius* | No | Quadrat A1 |

| Characteristic species | Recorded on the Site? | Recorded offsite in Reserves? |
|---|---|---|
| **Total characteristic midstorey species recorded** | **2** | **5** |
| | | |
| **Ground layer** | | |
| *Oplismenus aemulus* | Q1, Q2 and Spot location C | Spot location AA |
| *Pseuderanthemum variabile* | No | Quadrat A1, Spot location AA |
| *Echinopogon ovatus* | No | Quadrat A2 |
| *Microlaena stipoides* | Quadrats 1 and 2 and Spot locations D and E | Quadrats A1 and A2 |
| *Themeda triandra* (known as *T. australis* in NSW) | No | Quadrat A1 |
| **Total characteristic groundlayer species recorded** | **2** | **5** |

The Commonwealth Listing Advice contains a section on condition classes. The ecological community is limited to remnants that are relatively intact in condition, with:

| Requirement | Vegetation on the Site |
|---|---|
| The vegetation contains some characteristic components from all structural layers (tree canopy, small tree/shrub midstorey, and understorey). | One remnant tree of *E. saligna* to north of helipad (Tree no. 928)<br>Characteristic small trees/shrubs limited to *Pittosporum undulatum* recorded in Quadrat 2<br>Some characteristic groundlayer species present in Quadrats 1 and 2. |
| Tree canopy cover is greater than 10% and remnant size is greater than one hectare. These areas have the greatest conservation value and their high quality and size makes them most resilient to disturbance. | Canopy cover of remnant characteristic trees is <10%. |
| However, remnants with tree canopy cover less than 10% are also included in the ecological community, if the fragments are greater than one hectare in size and occur in areas of native vegetation in excess of 5 hectares in area. These areas enhance the potential for connectivity and viability of the ecological community. They support native flora and fauna species by facilitating gene flow among remnants and buffering against disturbance. | The area with canopy cover of remnant characteristic trees is <1 ha in size. |

*The ecological community excludes patches where either the native midstorey/understorey or native canopy trees are absent. Occurrences of isolated single trees or shrubs characteristic of the ecological community also are excluded from the ecological community. Although these degraded remnants may have some value as biodiversity reservoirs, the structure of*

*these patches has been so severely modified, that they fall outside the definition of the ecological community.*

At no location on the Site were characteristic components from all structural layers recorded. The only remnant characteristic tree recorded on the Site was *E. saligna* to the north of the helipad (Tree no. 928).

**In conclusion**, the vegetation on the Site falls outside the definition of the listed ecological community.

### 4.1.2 Sydney turpentine-ironbark forest

Sydney turpentine-ironbark forest was gazetted as an endangered ecological community on 16 October 1998.

> *1. The Sydney Turpentine-Ironbark Forest (STIF) is the name given to the plant community that is characterised by the following assemblage of species* [70 species listed]*:*

Of the 70 characteristic species, the following were recorded in each sampling location:

| Sampling location | Native species | STIF characteristic species | % of 70 characteristic STIF species | % STIF species of native species recorded |
|---|---|---|---|---|
| Q1 | 20 | 7 | 10% | 35% |
| Q2 | 26 | 9 | 13% | 35% |
| A | 3 | 0 | 0% | 0% |
| B | 7 | 0 | 0% | 0% |
| C | 4 | 2 | 3% | 50% |
| D | 14 | 5 | 7% | 36% |
| E | 7 | 3 | 4% | 43% |
| **Total onsite** | **43** | **10** | **14%** | **23%** |
| QA1 | 66 | 26 | 37% | 39% |
| QA2 | 23 | 10 | 14% | 43% |
| AA | 15 | 8 | 11% | 53% |
| AB | 12 | 4 | 6% | 33% |
| AC | 1 | 0 | 0% | 0% |
| AD | 6 | 3 | 4% | 50% |
| AE | 6 | 3 | 4% | 50% |
| AF | 10 | 2 | 3% | 20% |
| AG | 13 | 2 | 3% | 15% |
| AH | 19 | 5 | 7% | 26% |
| **Total offsite** | **105** | **31** | **44%** | **30%** |

> *2. The total species list of the community is considerably larger than that given in 1 (above), with many species present in only one or two sites or in very small quantity. In any particular site not all of the assemblage listed in 1 may be present. At any one time, seeds of some species may only be present in the soil seed bank with no above-ground individuals present. The species composition of the site will be influenced by the size of the site and by its recent disturbance history. The number of species and the above-ground*

*composition of species will change with time since fire, and may also change in response to changes in fire frequency.*

No additional comments.

*3. The structure of the community was originally forest, but may now exist as woodland or as remnant trees.*

Most of the trees on the Site have been planted in the last 50 years and the understorey of the Site predominantly consists of mown lawns. Of the 1019 trees surveyed by Clements *et al.* (2005), only 11 were considered likely to be remnant:

- nine *Angophora floribunda* located along the northern fenceline adjoining Grimes Lane (tree numbers 658, 663 to 668, 700 and 701); and
- two very large trees recorded to the north-east of the helipad: tree number 927, *Eucalyptus pilularis* (Blackbutt) and 928, *Eucalyptus saligna* (Sydney Blue Gum).

On further review of the historical aerial photographs, the north-west of the Site, where the nine *Angophora floribunda* considered likely to be remnant were recorded, appears in the 1951 photograph to support crop cultivation or orchard, with rectangular paddocks visible. There do not appear to be any trees in this area. The 1961 aerial photograph shows patches of low regrowth in the north-west of the Site (Figure 6).

In the Australian Natural Resources Atlas Glossary (website: www.anra.gov.au/ topics/salinity/pubs/national/salinity_glossary.html, accessed 12 March 2009), remnant vegetation is defined as 'vegetation remaining after an area has been cleared'. The *Angophora floribunda*, considered likely to be remnant by Clements *et al.* (2005), are probably regrowth from the soil seed bank following clearing associated with intensive agricultural use visible on the 1951 aerial photograph.

*4. Characteristic tree species in the STIF are Syncarpia glomulifera, Eucalyptus globoidea, Eucalyptus resinifera, Eucalyptus paniculata, Angophora costata and Angophora floribunda.*

Of the six characteristic tree species, the following were recorded:

| **Characteristic species** | **Recorded on the Site?** | **Recorded offsite in Reserves?** |
|---|---|---|
| *Syncarpia glomulifera* | Planted landscape trees | Quadrat A1 and Spot location AF |
| *Eucalyptus globoidea* | No | No |
| *Eucalyptus resinifera* | No | No |
| *Eucalyptus paniculata* | No | No |
| *Angophora costata* | In tree survey (tree numbers 24 (dead), 328, 369, 422, 655 and 697) Planted | |
| *Angophora floribunda* | Quadrat 1, in tree survey | Quadrats A1 and A2, Spot locations AA and AD |

Two of the characteristic tree species were recorded on the Site; the five living individuals of *Angophora costata* were considered likely to have been planted and of the 19 individuals of *Angophora floribunda,* nine located in the north-west of the Site

and along the northern fenceline adjoining Grimes Lane (tree numbers 658, 663 to 668, 700 and 701) were considered likely to be remnant and the remaining ten (tree numbers 40, 155, 156, 590, 690, 692 to 694, 715, 718 and 764) were considered likely to have been planted (Figure 5). However on further review of the historical aerial photographs, the north-west of the Site appears to support some sort of crop cultivation or orchard, with rectangular paddocks visible in 1951 (Figure 6). There do not appear to be any trees in this area in 1951.

> *5. Species composition varies between sites depending on geographical location and local conditions (e.g. topography, rainfall, exposure).*

No additional comments.

> *6. STIF occurs within the local government areas Ashfield, Auburn, Canterbury, Concord, Drummoyne, Leichhardt, Marrickville, Bankstown, Ryde, Hunters Hill, Baulkham Hills, Ku-ring-gai, Hornsby, Parramatta, Bankstown, Rockdale, Kogarah, Hurstville, Sutherland. The area is within the County of Cumberland and entirely within the Sydney Basin Bioregion.*

The Site is in the Parramatta LGA.

> *7. In many of these LGAs particularly in the inner western suburbs, only remnant trees may remain. These may have particular ecological and genetic significance and may be important sources of propagation material for use in rehabilitation projects.*

The nine trees of *Angophora floribunda* located along the northern fenceline adjoining Grimes Lane (tree numbers 658, 663 to 668, 700 and 701) were considered likely to be remnant by Clements *et al.* (2005). Observations of the 1951 and 1961 aerial photographs suggest these trees are regrowth following clearing in the north-west of the Site.

> *8. STIF typically occurs on areas with clay soils derived from Wianamatta Shale, or shale layers within Hawkesbury Sandstone.*

The geology of the Site was mapped as Ashfield Shale (map unit Rwa) in the south-west and Bringelly Shale (map unit Rwb) in the north-east by Herbert and West (1983).

> *9. Occurrences of STIF may occur on plateaus and hillsides and on the margins of shale cappings over sandstone.*

No additional comments.

> *10. STIF is referred to in Benson & Howell 1990 and in UBBS (1997). It includes vegetation described as map unit 9o of Benson (1992) and Benson & Howell (1994).*

**Benson and Howell (1990)** describe Turpentine-Ironbark Forest as occurring on the lower rainfall Wianamatta Shale soils of the inner western suburbs and on the north side from Ryde to Glenorie. The community extended from Glebe and Newtown westward to Auburn. The main tree species are *Syncarpia glomulifera, Eucalyptus globoidea, E. resinifera* and *E. paniculata.*

None of the main tree species listed by Benson and Howell (1990) occur as remnant trees on the Site. *Syncarpia glomulifera* was recorded onsite as planted landscape trees and recorded offsite in Mobbs Reserve (Quadrat A1) and adjoining Terrys Creek to the south (Spot location AF).

**UBBS (1997)** describe Turpentine-Ironbark Forest as occurring on Wianamatta Shale in areas of moderate rainfall on the Cumberland Plain and also on shale-capped ridges of the Hornsby Plateau. It was the characteristic community of the inner western part of Sydney, but extended westward to Landsdowne and Guildford. The main canopy species are *Syncarpia glomulifera* and *Eucalyptus paniculata.*

Neither of the main canopy species were recorded as remnant trees on the Site.

**Benson (1992)** mapped the natural vegetation of the Penrith 1:100 000 map sheet. Map unit 9o, Turpentine-Ironbark Forest, is described as occurring on the eastern edge of the map area near Bankstown as remnants. Tree species include *Syncarpia glomulifera, Eucalyptus fibrosa* and *E. globoidea.*

The Site is not on the Penrith 1:100 000 map sheet. None of the main canopy species were recorded on the Site. *Syncarpia glomulifera* was recorded onsite as planted landscape trees and recorded offsite in the Council Reserves.

**Benson and Howell (1994)** mapped the natural vegetation of the Sydney 1:100 000 map sheet. Map unit 9o, Turpentine-Ironbark Forest, is described as the characteristic forest vegetation of the inner western part of Sydney. Turpentine-Ironbark Forest is part of the shale-vegetation gradient from the higher-rainfall Blue Gum High Forest to the low rainfall Grey Box Woodland further west on the Cumberland Plain. The characteristic tree species are *Syncarpia glomulifera* and *Eucalyptus paniculata.*

The Site is on the Sydney 1:100 000 map sheet. Neither of the main canopy species were recorded on the Site. *Syncarpia glomulifera* was recorded onsite as planted landscape trees and recorded offsite in the Council Reserves.

> *11. STIF provides habitat for a number of plant species recognised as being of regional conservation significance in UBBS (1997). These include:…* [24 species listed]

Of the 24 listed plant species recognised as being of regional conservation significance in UBBS (1997), one was recorded on the Site, namely *Danthonia* (now *Austrodanthonia*) *racemosa* (Wallaby Grass), in Quadrat A1 and Spot location D. Another of the listed regionally significant species, *Einadia trigonos* (Fishweed) was recorded offsite in Mobbs Reserve, recorded in Spot location AA.

> *12. STIF has an understorey that may be either grassy and herbaceous or of a shrubby nature. STIF can have a dense understorey in areas that have not been burnt for an extended period of time.*

The understorey on the Site is regularly mown and dominated by exotic grass species. There is some native component in the understorey.

> *13. Adjacent communities on sandstone soils are generally part of the Sydney Sandstone Complex (see Benson & Howell 1990).*

No additional comments.

*14. It is estimated that only 0.5 % of the original area of STIF exists in the form of a number of remnants.*

No additional comments.

*15. Only small areas of STIF are presently included in conservation reserves.*

The vegetation sampled in Mobbs Lane Reserve has been bush regenerated and has components of STIF.

*16. Large areas of STIF have been cleared for agriculture and urban development. Remnants are small and scattered. Identified threats include: clearing, physical damage from recreational activities, rubbish dumping, grazing, mowing, weed invasion.*

The Site has been cleared since before 1930. The understorey is regularly mown and is dominated by exotic grasses.

*17. In view of the small size of existing remnants, the threat of further clearing and other known threats, the Scientific Committee is of the opinion that Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion is likely to become extinct in nature unless the circumstances and factors threatening its survival or evolutionary development cease to operate and that listing as an endangered community is warranted.*

No additional comments.

**In conclusion,** the only vegetation on the Site that may be considered to meet the criteria for Sydney turpentine-ironbark forest is the nine regrowth trees of *Angophora floribunda* located along the northern fenceline adjoining Grimes Lane (tree numbers 658, 663 to 668, 700 and 701) with a sparse mown grassy understorey of native and exotic species, as sampled in Quadrat 1.

The endangered ecological community profile for Sydney turpentine-ironbark forest (NPWS 2004) describes it as an open forest community with *Syncarpia glomulifera* and *Eucalyptus paniculata* as the dominant canopy trees. The descriptions of Turpentine-Ironbark Forest in Benson and Howell (1990), UBBS (1997), Benson (1992) and Benson and Howell (1994), as referred to in paragraph 10 of the Final Determination, list two or more of *Syncarpia glomulifera, Eucalyptus globoidea, E. resinifera* and *E. paniculata* as the dominant canopy species. None of these tree species were recorded as naturally occurring on the Site with *Syncarpia glomulifera* recorded onsite as planted landscape trees and offsite in the Council Reserves.

*Angophora floribunda* is listed in paragraph 4 as the last of six characteristic tree species. It is considered likely that the vegetation on Site was historically Sydney turpentine-ironbark forest and that the trees of *Angophora floribunda* are probably regrowth from the soil seed bank following historical clearing and modification of the north-west corner of the Site. This vegetation is highly degraded and only marginally meets the criteria listed in the final determination. Sydney turpentine-ironbark forest is restricted to the nine regrowth trees of *Angophora floribunda*, and the native component of the mown lawns under these trees.

The vegetation sampled in Mobbs Lane Reserve has been bush regenerated and has components of Sydney turpentine-ironbark forest.

### 4.2 Assessing the conservation significance of the vegetation on and off site using the diagnostic procedure of Tozer (2003)

Despite most of the trees on the Site appearing from historical aerial photographs to have been planted in the last 50 years, and the understorey consisting predominantly of mown lawns, the data recorded in the 0.04 ha sampling areas on the Site was compared with the lists of diagnostic species given in Tozer (2003) for the three Endangered Ecological Communities. The data recorded in the two 0.04 ha sampling areas in Mobbs Lane Reserve and Fred Spurway Park are also compared with Tozer (2003) for the same three communities.

Tozer (2003) used multivariate analysis of data from quantitative field surveys to identify 21 vascular plant communities occurring on and adjacent to the Cumberland Plain and Hornsby Plateau. Communities are described using structural features, habitat characteristics and diagnostic species. Diagnostic species are identified using statistical fidelity measures. On page 19 of Tozer (2003), it is noted that:

> *Lists of species published under Endangered Ecological Community determinations (TSC Act) and recent vegetation surveys … have proven difficult to utilise in the diagnosis of community type because no criteria exists to determine what minimum subset of species is required to confirm the presence of the community. This problem is addressed in this paper by specifying a minimum expected number of diagnostic species for each community based on individual frequencies. The minimum expected numbers were calculated as the lower bound of a one-tailed 95% confidence interval. Thus a 'true' sample of a community type is expected to contain the minimum number of diagnostic species in 95% of cases. Conversely, in 5% of cases a 'true' sample will not contain sufficient diagnostic species; thus leading to the erroneous conclusion that the site does not belong to the community type in question.*

Additionally, it is noted that:

> *A 'pass' result may be obtained for more than one of the candidate communities. In such cases the number of species by which the minimum was exceeded may be used to assess the closeness of the match to each of the possible candidates. A' fail' result (the test plot contains fewer species than the expected minimum) does not exclude the possibility that the test plot is a match, however the fewer positive species recorded, the less likely it is that the Map Unit is a match.*

The diagnostic species for each community type are listed and a minimum number must be present for positive identification of a map unit at a 95% confidence level.

Tozer (2003)/NPWS (2002) mapped Turpentine Ironbark Forest in the northern part of the western section of the Site, extending east on the TAFE property and west on Mobbs Lane Reserve. This community is also mapped in Fred Spurway Park and adjoining Terrys Creek further south.

The vegetation data recorded in the quadrats were tested against the diagnostic species criteria for Blue Gum High Forest, Cumberland Plain Woodland and Sydney Turpentine Ironbark Forest.

The Tozer (2003) communities are equivalent to Endangered Ecological Communities listed under the NSW Threatened Species Conservation Act 1995 as follows:

| Endangered Ecological Communities | Tozer (2003)/NPWS (2002) communities |
|---|---|
| Blue Gum High Forest | 152 – Blue Gum High Forest |
| Cumberland Plain Woodland | 9 – Shale Hills Woodland |
| Cumberland Plain Woodland | 10 – Shale Plains Woodland |
| Sydney Turpentine Ironbark Forest | 15 – Turpentine Ironbark Forest |

Appendix 1 of Tozer (2003) gives descriptions of the community types.

For the map units, the minimum number of native species required to carry out the tests and the minimum number of positive diagnostic species required for the three map units are:

| Map Unit | Minimum number of native species | Minimum number of positive diagnostic species |
|---|---|---|
| 152 – Blue Gum High Forest (BGHF) | 34 | 17 |
| 9 – Shale Hills Woodland (SHW) | 28 | 15 |
| 10 – Shale Plains Woodland (SPW) | 30 | 22 |
| 15 – Turpentine Ironbark Forest (TIF) | 33 | 18 |

For the four 0.04 ha quadrats, the number of native species recorded was compared with the minimum native species requirement for the Tozer (2003) map units and listed diagnostic species:

| Quadrat | No. native species | Can be validly tested (sufficient number of native species recorded) | Number of positive diagnostic species recorded | | | |
|---|---|---|---|---|---|---|
| | | | BGHF | SHW | SPW | TIF |
| **onsite** | | | | | | |
| Q1 | 20 | no | 2 | 7 | 7 | 5 |
| Q2 | 26 | no | 5 | 5 | 7 | 9 |
| **offsite** | | | | | | |
| QA1 | 66 | yes | 16 | 8 | 11 | 22 |
| QA2 | 23 | no | 3 | 6 | 6 | 5 |

Note: The sampling area for Quadrat A2 is 0.03 ha, not 0.04 ha.

Only Quadrat A1 meets the test for number of native species requirement for the Tozer (2003) testing to proceed. The planted and bush regenerated vegetation in Mobbs Reserve sampled in Quadrat A1 met the positive diagnostic species required for Turpentine Ironbark Forest at a 95% confidence interval.

The positive diagnostic species tests for Quadrats 1, 2 and A2 are invalid as the minimum native species requirement was not met. However some of the positive diagnostic species for each community were recorded:

- Quadrat 1 recorded two positive diagnostic species for Blue Gum High Forest, almost half to about one third of the minimum number of positive diagnostic species for the Cumberland Plain Woodland map units (Shale Hills Woodland and Shale Plains Woodland) and one third of the positive diagnostic species for Turpentine Ironbark Forest.
- Quadrat 2 recorded 9 of the minimum 18 positive diagnostic species for Turpentine Ironbark Forest highest proportion of positive diagnostic species was for Tozer (2003) map unit.

- Quadrat A2 recorded at most 40% of the minimum number of positive diagnostic species for any of the communities.

## 5.0 Conclusions & Recommendations

The conclusions of the flora assessments undertaken in 2005 and re-assessment in 2009 are as follows:

- Most of the trees on the Site appear from historical photos to have been planted in the last 50 years and the understorey of the Site predominantly consists of mown lawns;
- The most common species recorded were the cosmopolitan lawn grass *Cynodon dactylon* (Couch) and exotic lawn grass *Pennisetum clandestinum* (Kikuyu);
- The local native vegetation component on the Site is sparse, but its presence indicates there is some native seed in the soils of the less intensively mown area in the north-west of the Site, though insufficient to expect natural regeneration due to high competition from the exotic vegetation component.
- The remnants of the original vegetation recorded were nine trees of *Angophora floribunda* and scattered occurrences of understorey species in the west of the Site;
- The vegetation of the Site falls outside the definition of Turpentine-Ironbark Forest of the Sydney Basin Bioregion, a critically endangered ecological community under the Commonwealth EPBC Act;
- The only tree recorded on the Site characteristic of Turpentine-Ironbark Forest of the Sydney Basin Bioregion is Tree 928 located north of the helipad.
- The only vegetation on the Site that could be considered to meet the criteria in the Final Determination for Sydney turpentine-ironbark forest, an endangered ecological community under the NSW TSC Act, is the nine trees of *Angophora floribunda*located in the north-west of the Site and along the northern fenceline adjoining Grimes Lane (tree numbers 658, 663 to 668, 700 and 701) with a sparse mown grassy understorey of native and exotic species. The trees are probably regrowth post clearing.
- This vegetation that marginally meets the criteria for Sydney turpentine-ironbark forest is restricted to the regrowth trees, and the native component of the mown lawns under these trees.

ASPECT Studios has developed landscape plans for the site, including a Tree Removal Plan, incorporating the flora recommendations, with the following principles:

- *To remove dead trees and trees in poor health.*
- *To remove exotic trees, especially in the west of the site to prevent weed spread into adjacent bushland of Mobbs Lane Reserve.*
- *To retain likely to be remnant trees, where practicable.*
- *To restore/re-establish the native vegetation adjacent Mobbs Lane Reserve, including planting of local native trees grown from seed collected from likely remnant trees as part of a Vegetation Management Plan.*
- *To retain as many as practicable of the non-local native planted trees in good condition as landscape components, where appropriate.*
- *To propose a clear strategy for street tree planting using evergreen and native species.*
- *To propose locations for ornamental / exotic trees for seasonal colour within the residential component.*

We support the proposed landscape plans for the site , including the proposed tree removals and the approximately 700 new tree plantings within the development site. Together with the restoration plan, there will be a net conservation benefit to the Site and the adjoining Mobbs Lane Reserve.

In the letter from the NSW Department of Planning to Alistair Mein of McLachlan Lister Pty Ltd dated 25 March 2009, it stated that:

> *The Department will however require the submission of the further details under project application Mp 08_0258 to resolve the following issues:*
> *…*
> - ***Restoration plan** – for restoration of endangered ecological community in north western corner of the site and existing creek line between the site and Mobbs Lane.*
>
> …

We recommended that a restoration plan for a conservation area in the north-west of the Site adjoining Mobbs Lane Reserve be prepared prior to commencement of construction and include the following:

- clear aims to enhance, conserve and protect of the local native plants in the restoration area, as well as minimising risk to on site and adjoining bushland during and post construction;
- objectives;
- realistic targets;
- regular monitoring;
- regular reporting including corrective action requests and reassessment of targets as required.

The restoration plan works are to be carried out by qualified bush regenerators under the supervision of an Environmental Manager with at least 5 years experience in the reconstruction of ecosystems / restoration of degraded sites.

The restoration plan should aim to conserve and enhance local native vegetation in the conservation area adjoining the bushland of Mobbs Lane Reserve. In order to re-establish the local native bushland from the highly fragmented component currently existing on site, mostly mown grass and planted trees, will require:

- extremely careful weed management around the existing remnant vegetation components on the site (small number of local-native canopy trees and scattered individuals of groundcover species) to increase the vigour and spread of the individual;
- the seeds and/or cuttings from remnant components of the groundlayer and the canopy trees to be propagated for tubestock planting in the restoration area; and
- planting of tubestock of shrubs grown from seed collected from nearby Council managed remnant seed banks as no native shrub component was recorded on the site.

By careful vegetation management of the conservation area, in accordance with the restoration plan, the occurrence of local native species will be increased in number and cover to form a more viable patch of bushland in the long term. With time, the conservation area is to form a seed bank of the local native flora for use in the nearby bush regeneration areas under the control of Council and local bush regeneration groups.

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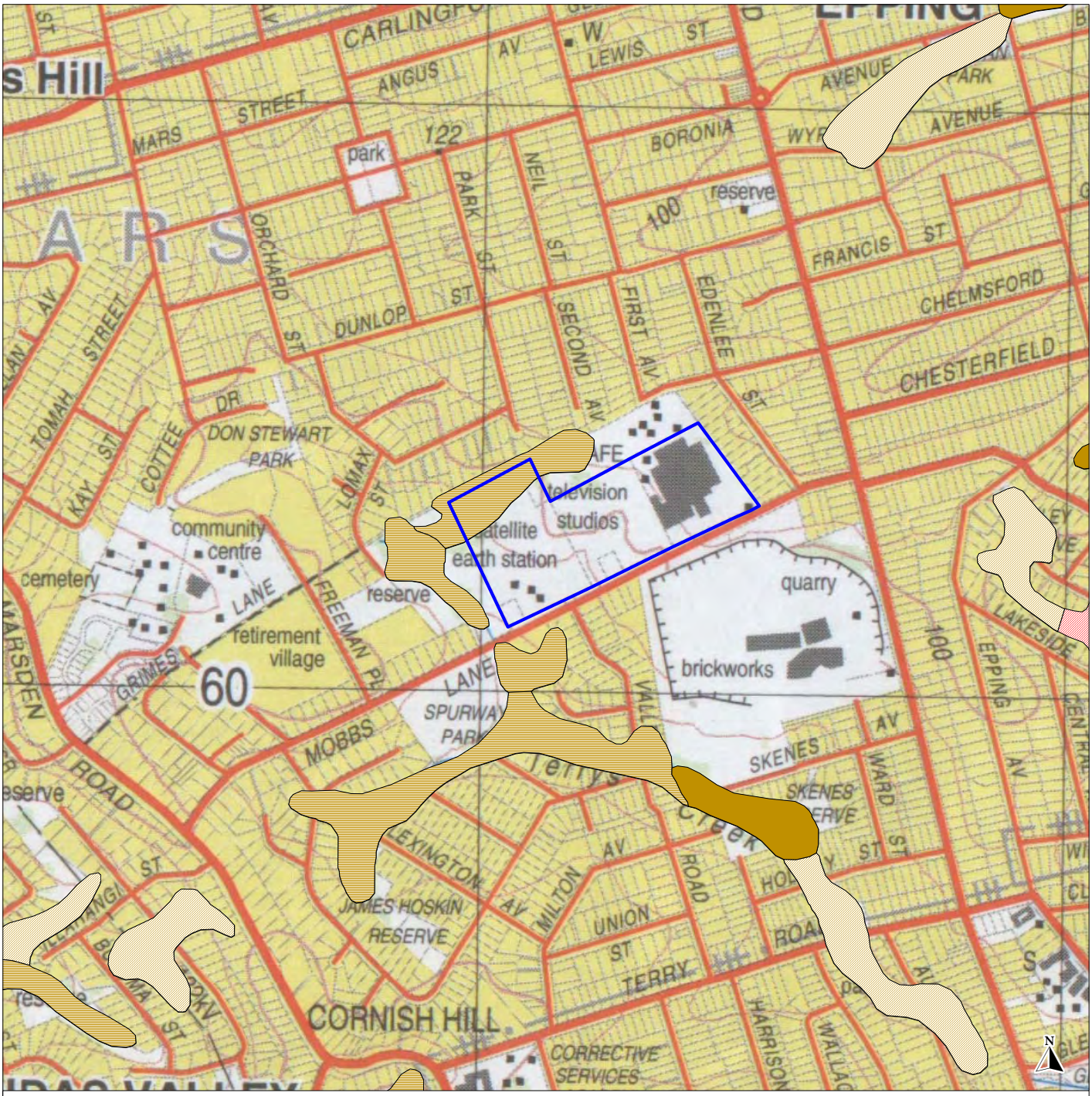
# Figures


**Legend**

Site boundary

Figure 1.
Location of the Site on the Parramatta River 1:25 000 topographic map




Legend

Site boundary

Turpentine-Ironbark Forest (>10 percent cover)

Turpentine-Ironbark Forest (<10 percent cover, urban areas)

Turpentine-Ironbark Forest (<10 percent cover)

0 200 400

metres

Figure 2.
NPWS (2002) vegetation mapping of the Site


Figure 3.
Sampling locations on the Site overlaid on aerial image from the NSW Department of Lands SIX Viewer accessed 2 March 2009


Figure 4.
Sampling locations offsite in Council reserves overlaid on aerial image from the NSW Department of Lands SIX Viewer accessed 2 March 2009


Legend

Site boundary

Angophora floribunda

Eucalyptus saligna

Eucalyptus pilularis

0 20 40

metres

Figure 5.
Approximate locations of trees considered likely to be remnant by Clements et al. (2005)



N

0 60 120

metres

Figure 6.
Location of the Site on the 1951 and 1961 aerial photographs

## Table 1. Species recorded in Quadrats 1 and 2 onsite, A1 and A2 offsite, Spot locations A to E onsite, AA to AH offsite

**Notes: 1. Asterisk before botanical name signifies exotic species, hash before botanical name signifies non-local native species.**
**2. Families are grouped under headings 1. Pteridophytes, 2. Gymnosperms, 3. Dicotyledons, 4. Monocotyledons.**

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| **1. Pteridophytes** | | | | | | | | | | | | | | | | | | |
| **Adiantaceae** | | | | | | | | | | | | | | | | | | |
| Adiantum aethiopicum | Common Maidenhair Fern | | | | | | | | 1 | | | | | | | | | |
| **Blechnaceae** | | | | | | | | | | | | | | | | | | |
| Blechnum cartilagineum | Gristle Fern | | | | | | | | 1 | | | | | | | | | |
| Doodia aspera | Prickly Rasp Fern | | | | | | | | 1 | | | | | | | | | |
| **Cyatheaceae** | | | | | | | | | | | | | | | | | | |
| Cyathea cooperi | Straw Tree-fern, Scaly Tree-Fern | | | | | | | | 2 | | | | | X | | | | |
| **Davalliaceae** | | | | | | | | | | | | | | | | | | |
| * Nephrolepis cordifolia | Fishbone Fern | | | | | | | | 1 | | | | | | | X | | |
| **Dennstaedtiaceae** | | | | | | | | | | | | | | | | | | |
| Dennstaedtia davallioides | Lacy Ground Fern | | | | | | | | 1 | | | | | | | | | |
| Hypolepis muelleri | | | | | | | | | 2 | | | | | | | | | |
| Pteridium esculentum | Bracken | | | | | | | | 2 | 1 | | | | | | | X | |
| **Pteridaceae** | | | | | | | | | | | | | | | | | | |
| Pteris tremula | Tender Brake | | | | | | | | 2 | | | | | | | | | |
| **Thelypteridaceae** | | | | | | | | | | | | | | | | | | |
| Christella dentata | Binung | | | | | | | | 2 | | | | | | | X | | |
| **2. Gymnosperms** | | | | | | | | | | | | | | | | | | |
| **Cupressaceae** | | | | | | | | | | | | | | | | | | |
| Callitris rhomboidea | Port Jackson Cypress-pine | | | | | | | | | | | | | | | X | | |
| * Cupressus sp. | | 1 | | | | | | | | | | | | | | | | |
| **Podocarpaceae** | | | | | | | | | | | | | | | | | | |
| * Afrocarpus falcatus | Outeniqua Yellowwood | | | | | | | | | | | | | | X | | | |

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
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| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| **3. Dicotyledons** | | | | | | | | | | | | | | | | | | |
| **Acanthaceae** | | | | | | | | | | | | | | | | | | |
| Pseuderanthemum variabile | | | | | | | | | 1 | | X | | | | | | | |
| * Thunbergia alata | Black-eyed Susan | | | | | | | | | | | | | X | | | | |
| **Apiaceae** | | | | | | | | | | | | | | | | | | |
| Centella asiatica | Indian Pennywort | | | | | | | | 1 | | | | | | | | | |
| Hydrocotyle peduncularis | | | | | | | | | 1 | | | | | | | | | |
| **Araliaceae** | | | | | | | | | | | | | | | | | | |
| * Hedera helix | Ivy, English Ivy | | | | | | | | | | | | | | | X | | |
| # Schefflera actinophylla | Queensland Umbrella Tree | | | | X | | | | | | | | | | | | | |
| **Asclepiadaceae** | | | | | | | | | | | | | | | | | | |
| * Araujia sericifera | Moth Vine, Cruel Plant | | | | X | | | | | | | | | X | | | | |
| **Asteraceae** | | | | | | | | | | | | | | | | | | |
| * Ageratina adenophora | Crofton Weed | | | X | X | | | | | | | | X | X | | X | | |
| * Bidens pilosa | Cobblers Pegs | 1 | | | | | | | 1 | 2 | | | | X | X | | | |
| * Chrysanthemoides monilifera subsp. m | Boneseed | | 4 | | | | | | | | | | | | | | | |
| * Cirsium vulgare | Black Thistle, Spear Thistle | | 1 | | | X | | | | | | | | | | | | |
| * Conyza albida | Tall Fleabane | 2 | 2 | | | | | | | | | X | | | | | | |
| * Erigeron karvinskianus | Bony-tip Fleabane | | | | | X | | | 1 | | | | | | | | | |
| Euchiton gymnocephalum | Creeping Cudweed | | 1 | | | | | | | | | | | | | | | |
| * Facelis retusa | | | | | | | | | | 1 | | | | | | | | |
| * Galinsoga parviflora | Potato Weed, Gallant Soldiers | | | | | | | | | | | | | | X | | | |
| * Gnaphalium coarctatum | Cudweed | 1 | | | | | X | X | 1 | 2 | | | | | | | | |
| * Hypochaeris radicata | Catsear, False Dandelion | 1 | 1 | | | X | X | X | | 2 | | | | | | | | |
| Ozothamnus diosmifolius | White Dogwood | | | | | | | | 1 | | | | | | | | | |
| * Roldana petasitis | Mexican Giant Groundsel | | | | | | | | | | | | | | | X | | |
| * Senecio madagascariensis | Fireweed, Madagascar Ragwort | | | | | | | | | 1 | | | X | | | | | |
| Sigesbeckia orientalis | Indian Weed | | | | | | | | | | X | | | | | | | |
| * Soliva sessilis | Bindii, Bindi-eye, Jo-Jo | | | | | | | X | | | | | | | | | | |
| * Sonchus oleraceus | Common Sow-thistle, Milk-thistle | 1 | | | | | | | 1 | | X | X | | | X | | | |
| * Taraxacum officinale | Dandelion | 1 | 1 | | | X | | | 1 | | | | | | X | | | |

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
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| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| **Basellaceae** | | | | | | | | | | | | | | | | | | |
| * Anredera cordifolia | Madeira Vine, Lamb's Tail, Jalap | | | | | | | | | | | | | X | X | X | | |
| **Bignoniaceae** | | | | | | | | | | | | | | | | | | |
| * Jacaranda mimosifolia | Jacaranda | | | | | | | | | | X | | | X | | | | |
| **Brassicaceae** | | | | | | | | | | | | | | | | | | |
| * Rorippa nasturtium-aquaticum | Watercress | | | | | | | | 1 | | | | | | X | | | |
| **Campanulaceae** | | | | | | | | | | | | | | | | | | |
| Wahlenbergia gracilis | Sprawling Bluebell | 1 | 1 | | | | X | | | | | | | | | | | |
| **Caprifoliaceae** | | | | | | | | | | | | | | | | | | |
| * Lonicera japonica | Japanese Honeysuckle | | | | | | | | | 1 | | | X | | | | | |
| **Caryophyllaceae** | | | | | | | | | | | | | | | | | | |
| * Stellaria media | Chickweed | | | | | | | | | | X | | | | X | | | |
| **Casuarinaceae** | | | | | | | | | | | | | | | | | | |
| Allocasuarina littoralis | Black She-Oak | | | | | | | | | | | | | | | | X | |
| Allocasuarina torulosa | Forest She-oak | 2 | 1 | | | | X | | 1 | | | | | | | | | |
| Casuarina cunninghamiana | River Oak, River She-oak | | | | X | X | | | | | | | | | | | | |
| Casuarina glauca | Swamp Oak, Swamp She-oak | | | | X | | | | | | | | | | | | | X |
| **Chenopodiaceae** | | | | | | | | | | | | | | | | | | |
| Einadia hastata | Berry Saltbush | | | | | | | | 1 | | | | | | | | | |
| Einadia trigonos subsp. trigonos | Fishweed | | | | | | | | | | X | | | | | | | |
| **Clusiaceae** | | | | | | | | | | | | | | | | | | |
| Hypericum gramineum | Small St Johns-wort | 1 | | | | | | | | | | | | | | | | |
| **Convolvulaceae** | | | | | | | | | | | | | | | | | | |
| Dichondra repens | Kidney-weed, Mercury Bay Weed | 1 | 3 | | | X | X | X | 1 | 1 | X | | | | | | | |
| * Ipomoea indica | Blue Morning Glory | | | | | | | | | | | | X | | | X | | |
| **Elaeocarpaceae** | | | | | | | | | | | | | | | | | | |
| Elaeocarpus reticulatus | Blueberry Ash | | | | | | | | 1 | | | | | | | | | X |
| **Euphorbiaceae** | | | | | | | | | | | | | | | | | | |
| Breynia oblongifolia | Coffee Bush | | | | | | | | 2 | | | | | | | | | |
| * Chamaesyce prostrata | Red Caustic Weed | | 1 | | | | | | | | | | | | | | | |

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
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| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| * Euphorbia peplus | Petty Spurge, Radium Plant | | | | | | | | | | | | | | X | | | |
| Glochidion ferdinandi | Cheese Tree | | | | | | | | 1 | | | | | | | | | X |
| Homalanthus populifolius | Bleeding heart, Native Poplar | | | | | | | | 4 | | X | | | | | | | X |
| Phyllanthus similis | | | | | | | | | 2 | | | | | | | | | |
| * Phyllanthus tenellus | | | | | | | | | 2 | | | | | | | | | |
| Poranthera microphylla | Small Poranthera | | | | | | | | | 1 | | | | | | | | |
| * Ricinus communis | Castor Oil Plant | | | | | | | | | | | | | | X | | | |
| **Fabaceae Caesalpinioideae** | | | | | | | | | | | | | | | | | | |
| * Senna pendula var. glabrata | | | | | X | | | | | | X | | X | X | X | | | |
| **Fabaceae Faboideae** | | | | | | | | | | | | | | | | | | |
| # Castanospermum australe | Queensland Black Bean, Moreton B | | | | | | | | | | | | | | | | X | |
| Desmodium varians | Slender Tick-trefoil | | | | | | | | | 2 | | | | | | | | |
| * Erythrina crista-galli | Cockspur Coral Tree | | | | | | | | | | | | | | X | | | |
| Glycine clandestina | Twining Glycine | 2 | 3 | | | | | | 2 | 2 | X | | | | | | | |
| Glycine tabacina | | | | | | | | | 2 | | | X | | | | | | |
| Kennedia rubicunda | Dusky Coral-pea | | | | | | | | | | | X | | | | | | |
| * Trifolium dubium | Yellow Suckling Clover | | | | | | | X | | | | | | | | | | |
| * Trifolium repens | White Clover | | | | | | | X | 1 | | | | | | | | | |
| **Fabaceae Mimosoideae** | | | | | | | | | | | | | | | | | | |
| # Acacia baileyana | Cootamundra Wattle | | 1 | | | | | | | | | X | | | | | | |
| Acacia decurrens | Black Wattle | | | | | | | | 1 | 1 | X | X | | | | | | |
| Acacia elata | Cedar Wattle | | 3 | | | | X | | | | | | | | | | | |
| Acacia falcata | Sickle Wattle | | | | | | | | 1 | 2 | | | | | | | | |
| Acacia fimbriata | Fringed Wattle | | | | | | | | 1 | | | | | | | | | |
| Acacia floribunda | White Sally | | 1 | | | | | | 2 | | | | | | | | | X |
| Acacia implexa | Hickory Wattle | | | | | | | | 1 | | | | | | | | X | |
| Acacia linifolia | Flax-leaved Wattle | | | | | | | | | | | X | | | | | | |
| Acacia longifolia | Sydney Golden Wattle | | | | | | | | 1 | | | | | | X | | | |
| Acacia parramattensis | Parramatta Green Wattle | | | | | | | | 3 | | | | | | | | | |
| **Fumariaceae** | | | | | | | | | | | | | | | | | | |
| * Fumaria sp. | Fumitory | | | | | | | | | | X | | | | | | | |
| **Gentianaceae** | | | | | | | | | | | | | | | | | | |
| Centaurium spicatum | Spike Centaury | | 1 | | | | | | | | | | | | | | | |

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
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| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| **Geraniaceae** | | | | | | | | | | | | | | | | | | |
| Geranium homeanum | Rainforest Cranesbill | 1 | | | | | | | 1 | | | | | | | | | |
| Geranium solanderi | Austral Cranesbill | | | | | | | | | | X | | | | | | | |
| **Haloragaceae** | | | | | | | | | | | | | | | | | | |
| Gonocarpus tetragynus | Common Raspwort | 1 | | | | | | | | | | | | | | | | |
| **Hamamelidaceae** | | | | | | | | | | | | | | | | | | |
| * Liquidambar styraciflua | Liquidambar, Sweet Gum | | | | | | | | | | | | | | | | | X |
| **Lamiaceae** | | | | | | | | | | | | | | | | | | |
| Plectranthus parviflorus | | | | | | | | | 1 | | | | | | | | | |
| **Lauraceae** | | | | | | | | | | | | | | | | | | |
| * Cinnamomum camphora | Camphor-laurel | | | | X | | | | | 1 | | | X | X | | X | | |
| **Lobeliaceae** | | | | | | | | | | | | | | | | | | |
| Lobelia alata | Angled Lobelia | | | | X | | | | | | | | | | | | | |
| **Malaceae** | | | | | | | | | | | | | | | | | | |
| * Cotoneaster serotinus | | | | | | | X | | | | | | | | | | | |
| * Crataegus monogyna | Hawthorn, May | | | | | | | | | 1 | | | | | | | | |
| * Pyracantha crenatoserrata | Yunnan Firethorn | | | | | X | | | | | | | | | | | | |
| **Malvaceae** | | | | | | | | | | | | | | | | | | |
| * Malva parviflora | Small-flowered Mallow | | | | | | | | | | | | | | X | | | |
| * Modiola caroliniana | Red-flower Mallow | 1 | | | X | X | | X | 1 | | X | | | | | | | |
| * Sida rhombifolia | Paddy's Lucerne | 3 | 4 | | | | X | X | 1 | 3 | X | X | X | | | | | |
| **Meliaceae** | | | | | | | | | | | | | | | | | | |
| Melia azedarach | White Cedar, Persian Lilac | | | | | | | | 1 | | | | | | | | | |
| **Moraceae** | | | | | | | | | | | | | | | | | | |
| Ficus coronata | Creek Sandpaper Fig | | | | | | | | 1 | | | | | | | | | |
| Ficus macrophylla | Moreton Bay Fig | | | | | | | | | | | | | | | | | X |
| Ficus rubiginosa | Port Jackson Fig, Rusty Fig | | | | | | | | | | | | | X | | | | |
| * Morus alba | Mulberry | | | | | | | | | | | | | | | X | | |
| **Myoporaceae** | | | | | | | | | | | | | | | | | | |
| Myoporum acuminatum | Boobialla, Corkwood | | | | | | | | | | | | | | | | X | |

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| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| **Myrtaceae** | | | | | | | | | | | | | | | | | | |
| Acmena smithii | Lilly-pilly | | | | | | | | 1 | | | | | | | X | X | X |
| Angophora floribunda | Rough-barked Apple | 2 | | | | | | | 1 | 2 | X | | | X | | | | |
| Austromyrtus dulcis | Midgenberry | | | | | | | | | | | | | | | | | X |
| Callistemon salignus | White Bottlebrush, Pink-tips | | | | | | | | 2 | | | | | | | | | |
| # Callistemon viminalis | Weeping Bottlebrush | | 2 | | | | X | | | | | | | | | | | |
| Corymbia maculata | Spotted Gum | | | | | | | | | | | | | | | | X | |
| # Eucalyptus bicostata | Eurabbie | | | | | | | | | | | | | | | | X | |
| Eucalyptus botryoides | Bangalay | | | X | | | | X | | | | | | | | | | |
| # Eucalyptus microcorys | Tallowwood | 2 | 2 | | X | | X | | | | | | | | | | | X |
| Eucalyptus pilularis | Blackbutt | 1 | 1 | | | | X | | | | X | | | | | X | | |
| Eucalyptus saligna | Sydney Blue Gum | | 1 | | | | X | | 4 | 2 | X | X | | | X | X | X | X |
| # Eucalyptus scoparia | Wallangarra White Gum | | | | | | | | | | | X | | | | | | |
| Eucalyptus sp. | | | | | | | | | 1 | | | | | | | | | |
| Lophostemon confertus | Brush Box | | | | | | | | | | | | X | | | | | |
| Melaleuca armillaris | Bracelet Honey-myrtle | | 2 | | | | X | | | | | | | | | | | |
| Melaleuca linariifolia | Flax-leaved Paperbark | | | | | | | | | | | X | | | | | | |
| Melaleuca quinquenervia | Broadleaved Paperbark | | | | | | | | | | | | | | | X | | |
| Melaleuca styphelioides | Prickly Paperbark | | | | | | | | 3 | | | | | | | X | | |
| Syncarpia glomulifera | Turpentine | | | | | | | | 3 | | | | | | | X | | |
| Syzygium australe | Brush Cherry | | | | | | | | | | | | | | | X | X | |
| **Nandinaceae** | | | | | | | | | | | | | | | | | | |
| * Nandina domestica | Sacred Bamboo | | | | | | | | | 1 | | | | | | | | |
| **Ochnaceae** | | | | | | | | | | | | | | | | | | |
| * Ochna serrulata | Mickey Mouse Plant | | | | | | | | 1 | | | | | X | | | | X |
| **Oleaceae** | | | | | | | | | | | | | | | | | | |
| * Ligustrum lucidum | Broad-leaved Privet | | 4 | | X | | | X | | 1 | X | | X | X | X | X | X | |
| * Ligustrum sinense | Small-Leaved Privet, Chinese Privet | | | | X | | | X | 2 | 1 | X | | X | X | | X | X | |
| * Olea europaea subsp. africana | African Olive | | 4 | | X | | X | | | | | | | | | | | |
| **Onagraceae** | | | | | | | | | | | | | | | | | | |
| Epilobium billardierianum subsp. cinere | Smooth Willow-herb | | 1 | | | | | | | | | | | | | | | |
| **Oxalidaceae** | | | | | | | | | | | | | | | | | | |
| * Oxalis corniculata | Yellow Wood-sorrel | | | | | | | X | | 1 | | | | | | | | |

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| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| * Oxalis debilis | | | | | | | | | | | X | | | | | | | |
| * Oxalis pes-caprae | Soursob | 1 | | | | | | | | | | | | | | | | |
| Oxalis sp. | | | | | | | | | | 1 | | | | | | | | |
| **Pittosporaceae** | | | | | | | | | | | | | | | | | | |
| Bursaria spinosa | Australian Boxthorn | | | | | | | | 2 | | | X | | | | | | |
| Citriobatus pauciflorus | Orange-thorn | | | | | | | | | | | | | | | | | X |
| Hymenosporum flavum | Native Frangipani | | | | | | | | | | | | | | | | X | |
| Pittosporum revolutum | Yellow Pittosporum | | | | | | | | 2 | | | | | | | | | |
| Pittosporum undulatum | Pittosporum | | 3 | | | | X | X | 2 | 2 | X | | | X | X | X | X | X |
| **Plantaginaceae** | | | | | | | | | | | | | | | | | | |
| * Plantago lanceolata | Plantain, Ribwort | 2 | | | | X | | | | 1 | | | X | | | | | |
| * Plantago major | Large Plantain | | | | | X | | | 1 | | | | | | | | | |
| Veronica plebeia | Creeping Speedwell | | 1 | | | | X | | | | | | | | | | | |
| **Polygonaceae** | | | | | | | | | | | | | | | | | | |
| Persicaria decipiens | Slender Knotweed | | | | X | | | | 1 | | | | | | | | | |
| * Rumex crispus | Curled Dock | | | | | | | | | | | | | | X | | | |
| **Primulaceae** | | | | | | | | | | | | | | | | | | |
| * Anagallis arvensis | Pimpernel | | | | | | | | | 1 | | X | | | | | | |
| **Proteaceae** | | | | | | | | | | | | | | | | | | |
| # Grevillea robusta | Silky Oak | | | | | | | | | | | | | X | | X | | X |
| Hakea salicifolia | Willow Hakea | | | | | | | | 1 | | | | | | | | | |
| # Macadamia tetraphylla | Macadamia Nut, Bopple Nut, Queen | | | | | | | | | | | | | | | | X | |
| **Ranunculaceae** | | | | | | | | | | | | | | | | | | |
| Clematis glycinoides | Headache Vine, Traveller's Joy, Old | | | | | | | | 1 | | | | | | | | | |
| * Ranunculus repens | Creeping Buttercup | | | | | | | | | | | | | X | X | | | |
| **Rosaceae** | | | | | | | | | | | | | | | | | | |
| * Duchesnea indica | Indian Strawberry | | | | | X | | | 1 | | | | | | | | | |
| * Pyrus calleryana | Callery Pear | | | | | | | X | | | | | | | | | | |
| **Rubiaceae** | | | | | | | | | | | | | | | | | | |
| * Richardia stellaris | Field Madder | | 1 | | | | | | | | | | | | | | | |
| **Salicaceae** | | | | | | | | | | | | | | | | | | |
| * Populus nigra cv. Italica | Lombardy Poplar | | | | X | | | | | | | | | | | | | |

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
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| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| * Salix babylonica | Weeping Willow | | | | | X | | | | | | | X | | X | | | |
| **Sapindaceae** | | | | | | | | | | | | | | | | | | |
| Cupaniopsis anacardioides | Tuckeroo | | | | | | | | | | | | | | | | X | X |
| Dodonaea triquetra | Hopbush | | | | | | | | 2 | | | | | | | | | |
| **Solanaceae** | | | | | | | | | | | | | | | | | | |
| Solanum americanum | Blackberry Nightshade, Glossy Night | | 1 | | | | | | | | | | | | | | | |
| Solanum aviculare | Kangaroo Apple | | | | | | | | 2 | | X | X | | | | | | X |
| * Solanum mauritianum | Tree Tobacco, Wild Tobacco | | | | | | | | 3 | | | | X | | | | | |
| * Solanum nigrum | Blackberry Nightshade | | | | | | | | 1 | 1 | | X | | | | | | |
| **Sterculiaceae** | | | | | | | | | | | | | | | | | | |
| Brachychiton acerifolius | Illawarra Flame-tree, Flame Kurrajo | | | | X | | | | | | | | | | | | X | |
| **Ulmaceae** | | | | | | | | | | | | | | | | | | |
| * Celtis sinensis | Chinese Hackberry, Chinese Nettle-t | | | | X | | | | | | | | | | | | | |
| Trema tomentosa var. viridis | Poison Peach, Peach-leaf Poison B | | | | | | | | 4 | | | | | | X | | | X |
| **Verbenaceae** | | | | | | | | | | | | | | | | | | |
| Clerodendrum tomentosum | Hairy Clerodendrum | | | | | | | | | | | | | | | | | X |
| * Lantana camara | Lantana | | | | | | | | 2 | 1 | X | | X | X | | | X | |
| * Verbena bonariensis | Purpletop | | | | | | | | | | X | | X | | | | | |
| * Verbena brasiliensis | | | | | | | | | | 1 | | | | | | | | |
| * Verbena officinalis | European Vervain | | | | | | | | 1 | | | | | | | | | |
| **Vitaceae** | | | | | | | | | | | | | | | | | | |
| Cayratia clematidea | Slender Grape | | | | | | | | 1 | | | | | | | | | X |
| Cissus antarctica | Kangaroo Vine | | | | | | | | | | | | | | | | | X |
| **4. Monocotyledons** | | | | | | | | | | | | | | | | | | |
| **Amaryllidaceae** | | | | | | | | | | | | | | | | | | |
| * Clivia sp. | | | | | | | | | | | | | | | | | | X |
| **Anthericaceae** | | | | | | | | | | | | | | | | | | |
| * Chlorophytum comosum | Spider Plant | | | | | | | | 1 | | | | | | | | | |
| **Araceae** | | | | | | | | | | | | | | | | | | |
| * Colocasia esculenta cv. Fontanesiana | Purple Taro | | | | | | | | | | | | | | X | | | |
| * Monstera deliciosa | Fruit-salad Plant, Guembe; | | | | | | | | | | | | | X | | | | |

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| * Philodendron bipinnatifidum | | | | X | | | | | | | | | | | | | | |
| * Zantedeschia aethiopica | Arum Lily, Calla Lily | | | | | | | | | | | | | | X | | | |
| **Arecaceae** | | | | | | | | | | | | | | | | | | |
| * Livistona chinensis | Chinese Fan Palm | | | X | | | | | | | | | | | | | | |
| # Livistona decipiens | Weeping Cabbage Palm, Ribbon Fa | | | X | | | | | | | | | | | | | | |
| * Phoenix canariensis | Canary Island Date | | 1 | X | X | | | | | | | | | | | | | |
| * Phoenix sp. | | | | | | | | | | | | | | X | | | | |
| * Syagrus romanzoffiana | Cocos Palm, Queen Palm | | | X | | | | | | | | | | | | | | |
| * Washingtonia robusta | Mexican Washingtonia, Cotton Palm | | | X | | | | | | | | | | | | | | |
| **Asparagaceae** | | | | | | | | | | | | | | | | | | |
| * Asparagus aethiopicus | Asparagus Fern | | 4 | | | | X | | | | | | | X | X | | | |
| **Asteliaceae** | | | | | | | | | | | | | | | | | | |
| * Cordyline australis | New Zealand Cabbage Tree | | | X | | | | | | | | | | | | | | |
| **Cannaceae** | | | | | | | | | | | | | | | | | | |
| * Canna indica | Indian Shot | | | | | | | | | | | | | | | X | | |
| **Commelinaceae** | | | | | | | | | | | | | | | | | | |
| Commelina cyanea | Blue Spiderwort | | | | | | | | 1 | | | | | X | | | | |
| * Tradescantia albiflora | Wandering Jew | | | | X | | | | 2 | | | | X | X | X | | X | |
| **Cyperaceae** | | | | | | | | | | | | | | | | | | |
| Carex breviculmis | | 1 | | | | | | | | 1 | | | | | | | | |
| Carex inversa | Knob Sedge | 3 | | | | | | X | 2 | | | | | | | | | |
| * Cyperus albostriatus | | | | | | | | | | | | | | | | | | X |
| Cyperus brevifolius | | | | | | | | | | 1 | | X | | | | | | |
| * Cyperus eragrostis | Drain Flat-sedge, Umbrella Sedge | | | | X | | | | 1 | | | | | | X | | | |
| Cyperus gracilis | Slender Sedge | 2 | 2 | | | | | X | | 2 | | X | | | | | | |
| * Isolepis prolifera | | | | | X | | | | | | | | | | | | | |
| **Iridaceae** | | | | | | | | | | | | | | | | | | |
| * Gladiolus sp. | | | | | | | | | | | | X | | | | | | |
| * Romulea rosea | Onion Grass | | | | | | | | | 2 | | X | | | | | | |
| * Sisyrinchium iridifolium | Blue Pigroot | | | | | | | | | | | X | | | | | | |
| **Juncaceae** | | | | | | | | | | | | | | | | | | |
| * Juncus capillaceus | | 4 | | | | | | X | | 2 | | | | | | | | |

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| Juncus homalocaulis | Wiry Rush | 3 | | | | | | | | | | | | | | | | |
| Juncus usitatus | | | | | X | | | | 1 | | | | | | | | | |
| **Lomandraceae** | | | | | | | | | | | | | | | | | | |
| Lomandra longifolia | Spiny-headed Mat-rush | | | | | | | | 4 | | | | | | X | | | X |
| **Musaceae** | | | | | | | | | | | | | | | | | | |
| * Musa sp. | | | | | | | | | | | | | | | | X | | |
| **Philesiaceae** | | | | | | | | | | | | | | | | | | |
| Eustrephus latifolius | Wombat Berry | | | | | | | | 2 | | | | | | | | | |
| **Phormiaceae** | | | | | | | | | | | | | | | | | | |
| Dianella caerulea | Blue Flax-lily | | 2 | | | | | | 4 | | | | | | | | | X |
| Dianella longifolia | Smooth Flax-lily | | | | | | | | 2 | 1 | | | | | | | | |
| Dianella revoluta | Blue Flax-lily, Spreading Flax-lily | | 1 | | | | | | 1 | 2 | | | | | | | | |
| **Poaceae** | | | | | | | | | | | | | | | | | | |
| Austrodanthonia racemosa | Wallaby Grass | 1 | 3 | | | | X | | | | | | | | | | | |
| Austrostipa ramosissima | Bamboo Speargrass | | | | | | | | 1 | | | | | | | | | |
| * Axonopus affinis | Narrow-leaved Carpet Grass | 4 | 1 | | | | X | X | 1 | 2 | | | | | | | | |
| Bothriochloa macra | | | | | | | | | | 1 | | | | | | | | |
| * Briza subaristata | | | 1 | | | | | | | 1 | | | | | | | | |
| * Bromus catharticus | Prairie Grass | | 1 | | | | X | | | 1 | | | | | | | | |
| Cymbopogon refractus | Barbed Wire Grass | | | | | | | | 1 | | | | | | | | | |
| Cynodon dactylon | Couch, Bermuda Grass | 3 | 2 | X | | X | X | X | | 1 | | | | | | | | |
| Dichelachne micrantha | Shorthair Plumegrass | | 1 | | | | | | | 1 | | | | | | | | |
| Echinopogon ovatus | Forest Hedgehog Grass | | | | | | | | | 1 | | | | | | | | |
| * Ehrharta erecta | Panic Veld-grass | 1 | 4 | | | X | | | 3 | | X | | X | | X | X | | |
| Entolasia marginata | Bordered Panic | 2 | 1 | | | | | | 2 | 2 | X | X | | | | | | |
| Eragrostis brownii | Brown's Lovegrass | | 1 | | | | X | | | | | | | | | | | |
| Eragrostis leptostachya | Paddock Lovegrass | 1 | | | | | | | | | | | | | | | | |
| Imperata cylindrica | Blady Grass | | | | | | | | | 2 | | | | | | | | |
| Lachnagrostis filiformis | Common Blown-grass | | 1 | | | | | | | | | | | | | | | |
| * Lolium perenne | Perennial Ryegrass | | | | | X | | | | | | | | | | | | |
| Microlaena stipoides | Weeping Grass, Meadow Rice-gras | 4 | 4 | | | | X | X | 4 | 3 | | | | | | | | |
| Oplismenus aemulus | Broad-leaved Basket Grass | 2 | 1 | | | X | | | | | X | | | | | | | |
| Oplismenus imbecillis | Narrow-leaved Basket Grass | | | | | | | | 2 | | | | | | | | | |
| Paspalidium distans | | 1 | | | | | X | | 1 | | | | | | | | | |

| Botanical name | Common name | On Site | | | | | | | Off Site | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | A | B | C | D | E | QA1 | QA2 | AA | AB | AC | AD | AE | AF | AG | AH |
| * Paspalum dilatatum | Paspalum | 1 | | | | | | X | | | | | | | | | | |
| * Pennisetum clandestinum | Kikuyu Grass | | 2 | X | X | X | X | X | | | | | | | | | | |
| * Setaria gracilis | Slender Pigeon Grass | 1 | | | | | | | | 1 | | | | | | | | |
| * Sporobolus africanus | Rat-tail Grass, Parramatta Grass | | | | | | | X | | 2 | | | | | | | | |
| Themeda australis | Kangaroo Grass | | | | | | | | 2 | | | | | | | | | |
| **Typhaceae** | | | | | | | | | | | | | | | | | | |
| Typha domingensis | Narrow-leaf Cumbungi, Bulrush | | | X | X | | | | | | | | | | X | | | |
| **Zingiberaceae** | | | | | | | | | | | | | | | | | | |
| * Alpinia zerumbet | Shell Ginger | | | | | | | | | | | | | X | | | | |

# Appendix 1

## Photographic record

**Sampling locations on the Site**

Quadrat 1


Quadrat 2

Spot location A

Spot location B

Spot location C

Spot location D

Spot location E

**Sampling locations offsite in Council reserves**

Quadrat A1 – Mobbs Lane Reserve

Quadrat A2 – Mobbs Lane Reserve

Spot location AA – Mobbs Lane Reserve

Spot location AB – Mobbs Lane Reserve

Spot location AC – Spurway Park

Spot location AD – adjoining Terrys Creek

Spot location AE – adjoining Terrys Creek

Spot location AF – adjoining Terrys Creek


Spot location AG – adjoining Terrys Creek


Spot location AH – adjoining Terrys Creek