Illawarra Regional Business Park
78 Tongarra Road, Albion Park

Proposed Business Park Subdivision – Concept Plan

Flora & Fauna Assessment Report

May 2007

Illawarra Regional Business Park
78 Tongarra Road, Albion Park

Proposed Business Park Subdivision – Concept Plan

Flora & Fauna Assessment Report

May 2007

F Dominic Fanning

Whelans InSites (Gunninah Environmental Consultants)
Level; 12, 80 Clarence Street Sydney NSW 2000
ph: 02 – 8234 8300 fax: 02 – 9262 6511 email: gecon@gunninah.com.au

ILLAWARA REGIONAL BUSINESS PARK
78 TONGARRA ROAD, ALBION PARK

PROPOSED BUSINESS PARK SUBDIVISION – CONCEPT PLAN

FLORA & FAUNA ASSESSMENT REPORT

May 2007

TABLE of CONTENTS

Whelans InSites (Gunninah Environmental Consultants)
Level; 12, 80 Clarence Street Sydney NSW 2000
ph: 02 – 8234 8300 fax: 02 – 9262 6511 email: gecon@gunninah.com.au

ILLAWARA REGIONAL BUSINESS PARK
78 TONGARRA ROAD, ALBION PARK

PROPOSED BUSINESS PARK SUBDIVISION – CONCEPT PLAN

FLORA & FAUNA ASSESSMENT REPORT

May 2007

PART A	**INTRODUCTION & INFORMATION BASE**

1 INTRODUCTION

1.1 Background

A substantial Business Park development is proposed on lands to the immediate west of the Illawarra Regional Airfield at Albion Park, south of Sydney in the Illawarra Region (Figure 1). The subject site is known as Lot B in DP 109816 and Lot 6 in DP 1100435 Tongarra Road, Albion Park, and occupies a total area of 74ha (not including that part of the land to the northwest of the Illawara Highway, which is not the subject of this development proposal).

The proposed subdivision and development of the site has been considered pursuant to Part 3A of the *Environmental Planning & Assessment Act 1979* (EP&A Act). The *Concept Plan* to which this *Flora & Fauna Assessment Report* is attached has addressed the Director-General's Requirements (DGRs) provided by the Department of Planning (DoP) for the project in November 2006.

1.2 Proposed Development

The proposed development for the subject site at 78 Tongarra Road, Albion Park is for the creation of a 47.4ha Business Park on farmlands which are currently grazed adjacent to the Illawarra Regional Airport at Albion Park (Figure 2). The proposed development also includes the rehabilitation and re-establishment of a substantial riparian zone and habitat corridor along Frazers Creek (including the major wetland on the subject site) within the *Environmental Management Zone* (EMZ), occupying a total of 21.5ha of land (Figure 3).

The proposal will require earthworks to be undertaken over a substantial proportion of the site to remove material from the more elevated areas and place it elsewhere on the site to provide flood-free land for the subsequent development activities. The earthworks will ultimately cover approximately 43.53% of the subject site at Albion Park, including the relocation of a portion of Frazers Creek (in the southern parts of the site). That activity will be the subject of consideration by the Department of Environment & Climate Change[1] (DECC), and the provision of a *Part 3A Permit* pursuant to the *Rivers & Foreshores Improvement Act 1948* (RFI Act).

Subsequent development of the site will involve the construction of an access road and the installation of services, and the subsequent construction of industrial or commercial premises on a total of 61 lots. As noted above, the project also involves the implementation of an extensive riparian and wetland regeneration program (in the Riparian 'Buffer' area) over approximately 15.43ha along Frazers Creek and within the wetlands on the site.

Following approval of the *Concept Plan* for the project, development of the site would be undertaken in four stages:

- Stages 1 and 2 - the conduct of earthworks and the placement of fill material on the development area south of the airport, the installation of services and the initiation of riparian rehabilitation works;

[1] The DECC incorporates the relevant part of the previous Department of Natural Resources (DNR).

- Stage 3 - construction of the first part of the road and the initial industrial lots in the southeastern part of the site;
- Stage 4 - construction of the remainder of the Business Park development south of the Illawarra Regional Airport; and
- Stage 5 - construction of the final parts of the Business Park development north of the east-west runway of the Illawarra Regional Airport.

Protection and enhancement of the riparian zones and wetlands through the western parts of the subject site (within the designated *Environmental Management Area* - EMA) will be undertaken from the initiation of Stage 1 of the project. Importantly, the Stage 1 works (and any subsequent works) will be undertaken in a manner which avoids adverse impacts upon the Riparian Buffer and wetlands.

1.3 Scope of this Report

The scope and objectives of this *Flora & Fauna Assessment Report* are:

- to describe the nature and condition of the subject site in terms of the native flora and fauna and their habitats present on the site and in the vicinity;
- to identify "*threatened species, populations and ecological communities, and their habitats*" which are or may be present, and which may be affected by the proposed development; and
- to address relevant statutory issues and matters raised in the DGRs for the proposed development including:
  - the relevant concerns pursuant to Section 5A (s.5A) of the EP&A Act;
  - the relevant concerns pursuant to Section 79C (s.79C) of the EP&A Act;
  - the *Fisheries Management Act 1948* (FM Act); and
  - the *Illawara Regional Strategy*.

Statutory issues relating to wetlands and watercourses are addressed in detail in a supplementary *Report* prepared for this project (Whelans InSites 2007).

2 INFORMATION BASE

Information on the flora and fauna of the subject site has been obtained from a variety of investigations and sources including:

- inspections of recent aerial photography;
- review of the Department of Environment & Conservation (DEC) *Wildlife Atlas*;
- Information contained in vegetation mapping of the locality by Shellharbour Council;
- field inspections of the subject site undertaken by the author of this *Report* on four occasions (in late 2006 and early 2007); and
- dedicated flora and fauna surveys of the subject site (Appendix A).

During the field inspections undertaken by the author of this *Report*, specific attention was paid to the condition of vegetation and ecological communities on the subject site, and the presence and location of threatened biota or their habitats, and of "*endangered ecological communities*" on the site.

The dedicated flora and fauna field surveys included extensive walked traverses of the subject site and the collection of an inventory of native plant and animal species. Particular attention was paid to the watercourse through the site (Frazers Creek), the two wetlands on the subject site and the patch of paperbark forest in the southeastern corner of the site.

3 EXISTING ENVIRONMENT

The subject site at Tongarra Road, Albion Park has long been used for agricultural and horticultural purposes. Most of the land has been cleared and grazed over a long period, and there is evidence of horticultural or pasture improvement activities at a number of locations on the site (Figure 4).

The site is gently undulating in nature, sloping generally away (to the north, west and south) from the Illawarra Regional Airport at Albion Park. There is a small elevated rise in the southeastern part of the subject site (Figure 4), but approximately half of the site (most of the western parts) are located below the 1:100 year flood line.

Frazers Creek flows in a northerly direction through the western parts of the subject site, leaving and then re-entering the site in the southwest (Figure 4). Most of Frazers Creek has only a sparse and highly modified riparian vegetation cover, as a result of the long established agricultural activities on the subject site. There are small stands of she-oaks along parts of the Creek, although most consist of isolated large specimens some of which (at the end of the airport runway) are regularly lopped.

Substantial parts of the Frazers Creek channel have been either artificially constructed or substantially modified in the past, as indicated by the straight lines of several of the channels (particularly in the northern half of the subject site). In addition, there are mounds of earth along the edge of the Frazers Creek channel at various locations on the subject site, indicating the use of excavators to deepen and possibly straighten the original natural channel.

The subject site supports two wetlands which have both been modified by earthworks and by ongoing cattle grazing. The southern wetland (located near the western boundary in the centre of the subject site and immediately southwest of the east-west runway of the airport) has been designated a *Coastal Wetland* (No. 382) pursuant to *State Environmental Planning Policy No. 14 – Coastal Wetlands* (SEPP 14). Detailed consideration of that wetland and the SEPP 14 boundary, and detailed analysis of the wetlands and watercourses on the site, is contained in a separate *Report* for the Illawarra Regional Business Park (Whelans InSites 2007).

A low flow channel has been constructed along the western side of the southern wetland on the subject site, and there is a mound of earth in the centre of the northern wetland. Both wetlands are subjected to regular and significant impacts from cattle grazing and physical disturbance.

There is a small patch of paperbark swamp forest in the southeastern corner of the site, near Tongarra Road. That vegetation has long been subjected to grazing activities, but is reasonably intact. The only other native vegetation present on the subject site at Albion Park is a stand of three large fig trees in the centre of the site (adjacent to the east-west runway of the airport).

4 FLORA and VEGETATION

4.1 Vegetation Types

The subject site at Albion Park supports five main vegetation types (Figure 4):

- the modified wetland vegetation in the two wetlands in the centre and in the north of the subject site;
- aquatic vegetation within Frazers Creek and (temporarily at least) within the etwlands on the site;
- the modified and artificial riparian vegetation along Frazers Creek (through the western parts of the site);
- the stand of paperbark swamp forest in the southeastern corner of the subject site; and
- the extensive areas of pasture and artificial vegetation through the majority of the site.

Wetland Vegetation

The two wetlands on the subject site support a variety of native and introduced wetland and semi-aquatic vegetation including sedges, rushes, aquatic and semi-aquatic herbs and introduced weeds. Typical species include Water Pepper, *Juncus usitatus* and Couch, but there are areas dominated by introduced weed species such as Paspalum, Kikuyu and *Juncus cognatus*.

Both of the wetlands are subjected to substantial grazing pressure and damage from cattle, and previous disturbances, but retain a predominantly native plant cover. The SEPP 14 wetland has an artificial low-flow channel excavated along its western edge and the northern wetland has been the subject of excavation activities and modification.

Notwithstanding the levels of disturbance or modification in both wetlands, the vegetation present has the characteristics of an "*endangered ecological community*" listed on the *Threatened Species Conservation Act 1995* (TSC Act) as Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (FWCF). It is to be noted that this community includes artificial sites as well as sites which have been highly modified, and is not confined to undisturbed or natural wetland habitats.

Aquatic Vegetation

Frazers Creek supports a modified aquatic and semi-emergent vegetation type along the watercourse. Much of this vegetation has been adversely affected by the long history of grazing and agricultural use of the land, but there are areas which are in reasonable condition and support a variety of native aquatic species (Appendix A).

Frazers Creek Riparian Vegetation

Most of the riparian zone along Frazers Creek has been highly modified as a consequence of the agricultural and other activities on the subject site. Most of the original riparian vegetation has been removed, and most (if not all) of that present along Frazers Creek on the subject site has either been planted or has been established following previous clearing of vegetation along the Creek.

As noted above, substantial portions of Frazers Creek are either entirely of artificial construction or have been modified by earthworks. Mounds of earth adjacent to straightened portions of the creek in the south of the site and for its full extent from the central wetland to the northeastern boundary indicate that most of the Creek within the site boundaries has either been straightened to form channels for the dissipation of floodwaters or has been artificially modified for that purpose.

The southern part of Frazers Creek on the subject site supports either pasture grasses, beds of reeds or stands of introduced and native shrub species. Grazing activities occur up to the top of bank of Frazers Creek along most of the subject site, and into the watercourse itself at its southern extremity.

In the northern parts of the subject site, there is a band of she-oaks along both banks of the Creek. Some of these have been artificially planted and those at the end of the east-west runway of the airport are regularly lopped to maintain a safe height for aeroplane activities. There is no natural or undisturbed riparian vegetation along Frazers Creek anywhere on the subject site at Albion Park.

Paperbark Swamp Forest

The small stand of swamp forest in the southeastern corner of the subject site (adjacent to Tongarra Road and the airport) has a canopy exclusively of the White Feather Honeymyrtle *Melaleuca decora*. The trees are of a uniform height and age, and are likely to be regrowth following either previous fire or clearing for agricultural purposes although the trees are mature and have recently flowered.

The understorey contains a mixture of introduced pasture grasses and native herbs and grasses, although it is predominantly of native species. The stand of vegetation is grazed and is surrounded by introduced pasture, developed sites and Tongarra Road.

This vegetation has many of the characteristics of the "*endangered ecological community*" known as Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (SSFCF). There are larger patches of this community to the east (east of the north-south runway of the Illawarra Regional Airport) and to the south, and the stand of vegetation on the subject site is isolated by surrounding cleared or developed lands, Tongarra Road and the airport.

Agricultural Lands

The majority of the subject site consists of introduced pasture and areas which had been previously subjected to horticultural and/or pasture improvement activities. Cattle grazing is still a feature of the subject site, with the farmhouse and farm buildings located in the southern parts of the site near Frazers Creek. There are also some derelict structures located in the central parts of the site (south of the western extremity of the east-west runway of the airport), along with three large fig trees which are clearly of some considerable age.

There are two other areas of disturbance on the subject site, being the sheds and associated disturbed portions of the site in the southeast (north of the function centre on Tongarra Road) and an area which has been disturbed by excavation and spoil dumping in the southeastern part of the site. The latter area is characterised by weeds and introduced plant species, with piles of rubble, debris and rubbish.

4.2 Plant Species

A total of 48 native plant species have been recorded on the subject site at Tongarra Road, Albion Park (Appendix B). Native plant species are concentrated in the swamp forest vegetation in the southeastern part of the subject site and within the wetlands on the subject site. Parts of Frazers Creek also support predominantly native species (particularly reeds and aquatic species), although most of the natural vegetation has long been removed or disturbed.

The majority of the subject site is characterised by introduced grasslands, agricultural pasture and horticultural areas, and these areas are dominated by introduced plant species. A total of 38 introduced plant species have been recorded on the subject site at Tongarra Road, Albion Park.

4.3 Threatened Plants and Endangered Ecological Communities

As noted above, the subject site supports disturbed and modified examples of two "*endangered ecological communities*" listed on the TSC Act:

- the FWCF community, which is present within the two wetlands on the subject site, albeit in a highly disturbed state in some parts; and
- the SSFCF community, which is located in the southeastern part of the subject site. As noted above, this small patch of the SSFCF community has been subjected to grazing activities over a long period, and is isolated from other stands of the community by surrounding agricultural lands, existing development (to the immediate west), Tongarra Road (to the south) and the Illawarra Regional Airport (to the immediate east).

No threatened plant species have been recorded on the subject site at Albion Park. Given the intensive and long-term agricultural activities which have been undertaken on the site, and given the high levels of disturbance of most of the subject site, it is not considered particularly likely that any of the threatened plant species known from the general locality would be present.

5 FAUNA and FAUNA HABITATS

5.1 Fauna Habitats

The subject site at Tongarra Road, Albion Park, displays five fauna habitat types as represented by the five plant communities present:

- wetlands, which in the case of the subject site are open ephemeral wetlands of sedges, rushes and semi-aquatic plants with no shrub or tree canopy;
- aquatic habitats along the highly modified Frazers Creek channel and (at times) in the wetlands on the site;
- riparian habitats along Frazers Creek, which contain some of the same elements as present in the wetlands;
- the small patch of woodland in the southeastern corner of the subject site, which possesses a tree canopy and a low groundcover stratum, but no shrub or midstorey strata; and
- the open pasture and grasslands of the agricultural parts of the subject site.

The farm buildings and structures also provide some limited potential habitat for certain native fauna species, particularly those which are adaptable and capable of using such artificial features (including individuals of a few threatened microchiropteran bats).

The habitat features and resources present on the subject site at Albion Park are common and widespread throughout the general locality, and are typical of the Illawarra region in general. None of the resources or habitat features are particularly restricted or uncommon, and the proposed development of the subject site provides for the retention of and enhancement of substantial areas of suitable habitat for the native fauna which would currently utilise the site.

A total of 26.6ha of the subject site is to be retained (Figures 2 and 5), and much of that area will be rehabilitated and managed for biodiversity conservation purposes.

5.2 Fauna Assemblage

The assemblage of native fauna species which would utilise the subject site at Albion Park and/or which could be present on occasions includes:

- species typical of wetland habitats some of which may also utilise habitats along Frazers Creek and/or the adjoining grasslands;
- fish and other aquatic species;
- species which are typical of watercourses and their riparian habitats;
- a number of species (particularly small birds) which typically utilise the dense canopy of the swamp forest in the southeastern corner of the subject site; and
- species which are typical of open grassland environments.

Most of the native fauna species which do or are likely to utilise the open grasslands, watercourse and riparian habitats, and the swamp woodland on the subject site, are relatively common to abundant, and are able to adapt to the modified and/or artificial environments present on the subject site (and in the vicinity).

Most of the native fauna assemblage likely to use the subject site consists of an array of wetland and open grassland bird species, with a few additional avian species frequenting the small area of woodland in the southeastern corner of the site. Microchiropteran bats and the Grey-headed Flying Fox are also certain to use the site, principally because of their high mobility and wide-ranging habits and the presence of suitable foraging resources (*eg* the figs for the Grey-headed Flying Fox and the wetlands for the Large-footed Myotis).

Because of the nature of the landscape and vegetation present, few native terrestrial mammals are expected to occur on the subject site at Albion Park, and the array of native reptile species is also likely to be extremely limited. Similarly, fauna typical of forest communities would be present to only a limited extent on the subject site given the small area of woodland present and the isolation of the subject site from surrounding woodland and forest vegetation.

The two wetlands on the subject site provide habitat and resources for a range of native species, particularly wetland and wading bird species (Appendix C), some of which would also utilise portions of Frazers Creek (particularly where there are dense reeds and/or grassy banks). Native fauna species which have typically been recorded in these environments on the subject site at Albion Park include the Spur-winged Plover, Straw-necked Ibis, White-faced Heron, Great Egret, Purple Swamp Hen, Black-winged Stilt, Pectoral Sandpiper and Sharp-tailed Sandpiper.

It is highly likely that a range of other wetland and wading birds would utilise the wetland habitats on the subject site either at appropriate times of the year (for migratory species) or under appropriate conditions and circumstances (*eg* when the wetlands are flooded and there is a substantial body of standing water).

A variety of reptile species would be expected to occur on the site, and the Garden Sun-skink and Red-bellied Black Snake were sighted during the field investigations. Species such as the Eastern Water Dragon and Eastern Long-necked Tortoise may also occur on the site along Frazers Creek.

Common amphibian species recorded on the site included the Common Eastern Froglet and the Striped Marsh Frog. Several other amphibian species would be likely to occur in the wetlands and along Frazers Creek, but no threatened amphibian species have been recorded or are likely.

Whilst some native fish species could potentially use the aquatic habitats along Frazers Creek, the habitats present are so highly modified, and the connectivity to the Lake so tenuous, that the watercourse does not in its current condition provide significant or particularly suitable habitat for any native fish species.

5.3 Threatened Species

No threatened fauna species have been recorded on the subject site at Albion Park during the site inspections or field investigations which have been undertaken to date. It is, however, highly likely that individuals of some threatened species would utilise habitats on the subject site on occasions at least, particularly:

- threatened microchiropteran bats, some of which are common and widespread and many of which would be capable of utilising parts of the subject site (particularly the watercourse, wetlands and woodland) for foraging purposes;
- individuals of the Grey-headed Flying Fox, which would doubtless feed on the fruits of the three fig trees adjacent to the airfield during the fruiting season of those trees; and
- individuals or groups of some threatened wetland bird species.

Given the nature and condition of the subject site, there is no likelihood that either a "*viable local population*" or even individuals of any threatened fauna species would be dependent on or reliant on the subject site and/or the habitats and resources present for their survival in this locality. Most of the threatened fauna species which could occur on the site are highly mobile and wide-ranging, and many are migratory (several of which migrate thousands of kilometres each year).

The Green & Golden Bell Frog has not been recorded from the subject site or the immediate vicinity, and the presence of the Plague Minnow in the wetlands reduces the potential value of these features for this species.

No threatened fish species are likely to occur in Frasers Creek, given the nature and condition of the subject site. In addition, the watercourse has been substantially modified, and has limited connectivity with Lake Illawarra. Furthermore, the proposal will enhance habitats and resources for native fish species.

6 IMPACT ASSESSMENT

6.1 General

The proposed development on the subject site at Tongarra Road, Albion Park will involve the re-modelling of much of the site (the 47.4ha designated for the Business Park development activities) and the subsequent construction of industrial or commercial buildings and associated features (such as a café, service station and the proposed motel) on the subject site.

The initial subdivision works will include:

- extensive earthworks within the Business Park footprint involving the excavation and relocation of material from more elevated parts of the site, and the importation and placement of fill material within the flood-prone lands;
- the construction of batter slopes from the Business Park footprint to the existing ground level, and their subsequent planting in accordance with the *Vegetation Management Plan* (VMP) for the project;
- the installation of relevant services and infrastructure including the service road, services (power, telecommunications, sewer, water and gas) and the provision of perimeter fencing;
- implementation of the *Landscape Plan* for the development footprint portion of the subject site; and
- implementation of the initial phase of the VMP for the project.

Approximately 36% (26.6ha) of the subject site is to be retained in an undeveloped condition following the Business Park subdivision works and subsequent development of the site. Most of the area to be retained is located in the western part of the subject site, and includes Frazers Creek and the two wetlands on the site (Figure 5). Of that area, approximately 11.95ha is to be rehabilitated and managed for biodiversity conservation purposes within a *Environmental Management Area* (EMA).

Physical disturbance to these features of the subject site at Albion Park will be avoided except that there is a requirement to replace a loop of Frazers Creek in the southwestern parts of the subject site with a shorter stretch of artificial (quasi-natural) channel, which is to be rehabilitated in accordance with the VMP for riparian vegetation purposes (Figures 2, 5 and 6).

Implementation of the VMP for the non-developed portion of the subject site at Albion Park is intended and designed specifically to provide a substantial benefit in rehabilitation of the wetlands and the riparian corridor which traverses the site in a northerly direction. As noted below, this approach contributes significantly to the achievement of the habitat linkage or 'corridor' goals of the *Illawara Regional Strategy*.

In its current condition, Frazers Creek has relatively little environmental value because of the extent and intensity of previous clearing and the ongoing agricultural activity. Whilst the wetlands on the subject site have somewhat greater environmental value, they are also affected adversely by existing agricultural practices (including pasture improvement and ongoing grazing). Development of the subject site as proposed will facilitate the rehabilitation of those areas of the subject site and the ongoing maintenance of natural vegetation and the newly created habitats on the site.

The rehabilitation of Frazers Creek will provide additional and enhanced habitat for native fish and other aquatic species, rather than imposing any adverse impacts upon such species or their habitats.

The proposed development also involves the retention of part of the stand of paperbark swamp forest in the southeastern corner of the site. Approximately half of that stand of vegetation is to be retained, and the area lost will be offset by the creation of additional areas of paperbark swamp forest within the riparian corridor along Frazers Creek in the western parts of the site (Figure 5).

In general terms, therefore, the proposed development for Business Park purposes of the subject site at Tongarra Road, Albion Park will involve:

- the conversion of approximately 47.4ha of existing agricultural and highly disturbed land to Business Park development land;
- the loss of approximately 0.5ha of modified paperbark swamp forest in the southeastern corner of the site (noting that this an example of an "*endangered ecological community*") and its replacement by additional areas of paperbark swamp forest within the *Environmental Protection Zone* (EPZ) along Frazers Creek to the north;
- the replacement of a loop of Frazers Creek (which is in part at least modified by previous earthworks activities) by a shorter stretch of watercourse, and rehabilitation of that portion of Frazers Creek;
- the replacement of 7.43ha of existing agricultural and degraded land with rehabilitated native vegetation and habitats; and
- the undertaking of a substantial riparian and wetland rehabilitation program (covering approximately 11.95ha) along Frazers Creek and within and around the wetlands on the subject site (Figures 2, 5 and 6).

The proposed development of the subject site at Tongarra Road, Albion Park will facilitate the implementation of a significant environmental management and rehabilitation program particularly along Frazers Creek and around the wetlands on the site. The environmental benefits which will be derived from the project as currently proposed, including with respect to the SEPP 14 wetland (see Whelans InSites 2007) substantially outweigh the adverse impacts which will be imposed as a result of the proposed Business Park subdivision and development of the site.

Detailed consideration of the wetlands and watercourse issues is contained in a complementary *Report* prepared for the project (Whelans InSites 2007).

6.2 Section 79C of the EP&A Act

The proposed development of the subject site at Tongarra Road, Albion Park is an appropriate and reasonable concept with respect to the potential for adverse impacts to be imposed upon the *"natural environment*".

Whilst the development as currently proposed involves some limited adverse impacts upon natural features (all of which are modified or are currently adversely affected by agricultural activities), the proposal also involves a substantial program of replanting and rehabilitation of habitats and environments within the subject site.

The direct adverse effects of the development as currently proposed on the 'natural environment' would include:

- the removal of approximately half of the paperbark swamp forest in the southeastern corner of the subject site; and
- the removal of a loop of Frazers Creek and its replacement by a shorter length of watercourse (noting the highly degraded and modified condition of that portion of Frazers Creek).

Conversely, the proposed development incorporates:

- replacement of the approximately 0.5ha of paperbark swamp forest with plantings of that community within the riparian zone on the subject site (utilising vegetation removed from the southeastern corner of the site);
- the removal of cattle and other adverse agricultural practices from the wetlands and Frazers Creek;
- complementary planting of earthworks on the development area adjacent to the wetlands to provide a vegetative buffer and associated plantings;

- the creation of a total of 11.95ha of rehabilitated and managed land on the site specifically for biodiversity conservation purposes; and
- the implementation of a long-term management regime to ensure permanent enhancement of the environmental circumstances on the site.

The proposed development incorporates appropriate measures including *Water Sensitive Urban Design* principles, as well as the rehabilitation of a substantial area of the site. The stormwater and water quality control system designed for the subject site is specifically intended to avoid the discharge of contaminated waters or sediment into Frazers Creek and to appropriately control water discharges into the wetlands on the site.

The proposed development will involve a net environmental benefit for the wetlands, watercourses and other habitats on the subject site at Albion Park, and for habitats and environments downstream (including Lake Illawarra). In terms of s.79C of the EP&A Act, the proposed development will provide an environmental benefit at this location.

6.3 Section 5A of the EP&A Act

The *NSW Threatened Species Conservation Act 1995* (TSC Act) has modified the *NSW Environmental Planning & Assessment Act 1979* (EP&A Act) by, *inter alia*, including a requirement to determine "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*". The relevant factors of Section 5A (s.5A) "*must be taken into account*" by a consent or determining authority when considering a *Development Application*, and in administering sections 78, 79C and 112 of the EP&A Act.

Section 5A of the EP&A Act was amended in October 2005 by substitution of the eight factors that had been contained in section 5A (s.5A) by seven amended factors. The prime focus of the amendments to Section 5A was to alter the consideration of impacts on habitat for threatened biota from a regional to a local perspective. The amendments also removed two of the less relevant factors from the original s.5A assessment.

The subject site at Albion Park supports two "*endangered ecological communities*":

- the FWCF community which is represented by the two wetlands on the subject site and probably parts of the modified channel of Frazers Creek where water flows are slow (particularly adjacent to the SEPP 14 wetland); and
- the SSFCF community, which is represented by the small stand of paperbark swamp forest in the southeastern corner of the site.

In terms of the relevant factors of section 5A (s.5A) of the EP&A Act, the proposed development of the subject site is not considered "*likely*" to impose a "*significant effect*" on these "*endangered ecological communities*" (Appendix D) because:

- approximately half of the SSFCF community in the southeast of the site is to be retained and managed in perpetuity for biodiversity conservation purposes. Whilst the remaining half of the community is to be removed, the protection and enhancement of the remnant will ensure the long-term survival of that community on the subject site. Thus, the "*local occurrence*" of the community (even if restricted to the subject site itself) will not be placed at "*risk of extinction*" by the development as currently proposed;
- the stand of that community on the subject site is not regarded as of particular conservation value or significance given its small size, isolated location and limited value by comparison with other larger patches in the immediate vicinity;
- the vegetation from the area of SSFCF to be removed will be used within the *Environmental Management Area* (EMA) on the site, to provide the basis for an alternative area of that community on the site;
- the SEPP 14 wetland on the subject site is to be protected by appropriate plantings and management regimes, and will be enhanced by the removal of weeds and the cessation of grazing by cattle; and

- the wetland in the northern part of the site which is to be retained in its current state, although cattle will be removed from that portion of the wetland on the subject site.

No threatened flora or fauna species have been recorded from the subject site at Albion Park, although a number of individuals of such species are likely to occur on the site on occasions at least. In particular, individuals of a range of threatened wetland and wading bird species could utilise the wetlands on the subject site under appropriate climatic circumstances or at appropriate times of the year (for migratory species). Additionally, individuals of a few other wide-ranging and highly mobile bird species could also utilise the subject site on occasions, although the habitats and resources present are currently of relatively little value for most such species (*eg* the Square-tailed Kite and Swift Parrot).

Several threatened microchiropteran bats are also likely to occur on the subject site, on occasions at least. Most of these species are highly mobile and wide-ranging, however, and many can utilise a range of wetland, grassland and open forest communities for foraging purposes. Some species can utilise old buildings for shelter or roosting purposes, but there are no hollow-bearing trees present on the site for those species which require that feature for roosting purposes.

With respect to the relevant factors of s.5A of the EP&A Act:

- it is not likely that the subject site supports a "*viable local population*" of any of the threatened species which could potentially occur on the site or in the vicinity. Whilst individuals or family groups of some species could potentially utilise the site on a regular basis (*eg* some microchiropteran bats) and individuals of some of the wetland and wading birds could utilise the wetlands present under appropriate circumstances, it cannot be considered likely that the site is of significance for the survival of a "*viable local population*" of any such species;
- by virtue of the substantial replanting and rehabilitation program which is part of the development, habitats and resources for those threatened biota which may occur on the subject site will both be retained and enhanced. It is anticipated that the proposed development will involve an increase in resources and habitat for potential threatened fauna species, rather than a decrease or a reduction in quality;
- no threatened plant species have been recorded on the subject site at Albion Park. Given the nature of the habitats present and the highly disturbed and modified condition of vegetation on the site, it is not considered likely that any threatened flora species would be present. In any case, substantial potential habitat for such species will be created as part of the development proposal; and
- the proposed development and the rehabilitation of vegetation on the site will increase the extent of vegetation and potential habitats, and will improve (or at least will not reduce) the connectivity of habitats and the ability for native fauna to disperse throughout the local environment.

On the basis of all of the considerations outlined above, as detailed in Appendix D of this *Report* (detailed s.5A *Assessments of Significance* for relevant threatened biota), the proposed development at Albion Park is not "*likely*" to impose a "*significant effect*" upon any "*threatened species, populations, or ecological communities, or their habitats*".

On that basis, there is no requirement for a preparation of a *Species Impact Statement* (SIS) for the proposal, nor any need for further consideration of threatened biota.

6.4 Illawarra Regional Strategy

The Department of Planning (DoP) has prepared the *Illawarra Regional Strategy* (in 2006) which *inter alia* addresses issues relating to the natural environment and the conservation of biodiversity in the Illawarra Region. The *Regional Strategy* is intended to "*support the maintenance and enhancement of the region's biodiversity*".

Urban development is to be directed away from areas known to be important for biodiversity conservation, and the impacts of development are to be offset by protecting and enhancing the long-

term viability of high value vegetation and habitat corridors, as well as rehabilitating degraded areas of high priority (*eg* riparian corridors). The *Regional Strategy* is intended to improve the "*environmental condition of Lake Illawarra*".

The *Regional Strategy* also identifies habitat corridors through the Illawarra region including:

- "*indicative DEC regional habitat corridors*" along the escarpment and between Lake Illawarra and Macquarie Pass; and
- "*other indicative habitat corridors*", including one minor corridor indicated in part across the southwestern parts of the subject site at Albion Park.

The corridor mapping in the *Illawarra Regional Strategy* is not precise, but the "*indicative habitat corridor*" on the site appears to coincide approximately with Frazers Creek, in the southwestern parts of the subject site at Albion Park (Figure 6). It is to be noted that Frazers Creek is also identified as a "*proposed riparian corridor in the city of Shellharbour*" in the *Nature Conservation Study Report* prepared for Shellharbour City Council by Kevin Mills & Associates (KMA 2000).

As indicated above, the subject site does not comprise part of a major "*habitat corridor*" as identified by DEC in the *Regional Strategy*, but Frazers Creek is identified as an "*other indicative habitat corridor*" in the *Regional Strategy* (Figures 7 and 8).

The substantial rehabilitation and ongoing management program which constitutes a part of the proposed development of the subject site at Albion Park constitutes a significant and substantial contribution to the establishment and long-term maintenance of a "*habitat corridor*" along Frazers Creek. In its current form, Frazers Creek on the subject site and on lands to the immediate north has very little habitat value because of the substantial modifications to the watercourse and the removal over a long period of native vegetation along the watercourse. The "*habitat corridor*" value of Frazers Creek in its current condition is extremely marginal, and most native fauna and flora species would not currently use Frazers Creek as habitat or for movement purposes.

The regeneration of vegetation along Frazers Creek and the rehabilitation of habitats along this "*corridor*" will achieve the goals of the *Illawarra Regional Strategy* with respect to that "*habitat corridor*" (at least within the subject site itself). In addition, the stormwater management regime for the Business Park will contribute in a positive manner to the improvement of Lake Illawarra by strict controls on contaminant and nutrient discharges. Uncontrolled agricultural activities, on the other hand, have the potential to result in degradation of water quality within Lake Illawarra downstream of the Macquarie Rivulet outlet into the lake.

7 IMPACT AMELIORATION and ENVIRONMENTAL MANAGEMENT

The impact amelioration and environmental management measures which are included as part of the proposed development for Business Park purposes of the subject site at Tongarra Road, Albion Park consist of three main elements:

- specific activities designed to avoid adverse impacts during earthworks and construction activities on the subject site (particularly regarding the discharge of sediment, erosion of watercourses and/or the discharge of contaminants into the natural environments);
- the implementation of a water management regime on the Business Park development site which controls stormwater flows and volumes, and which removes contaminants to ensure high water quality discharges from the developed part of the site; and
- the implementation of a comprehensive and substantial habitat regeneration and rehabilitation program along Frazers Creek and within wetlands on the subject site to facilitate the creation of a "*habitat corridor*" , as well as within the retained area of swamp forest in the southeastern corner of the site. Management of that portion of the subject site will be ensured by the implementation of a *Vegetation Management Plan* (VMP) for the site which is to be implemented in perpetuity by means of a *Deed of Agreement* or some other appropriate mechanism.

With respect to the need to ameliorate adverse impacts from the subdivision and subsequent development of the subject site at Albion Park, and with respect to the offsetting of the limited effects which will be imposed on the natural environment, it must be noted that the proposed development involves a substantial contribution to biodiversity conservation and the natural environment.

Essentially all of the subject site is currently highly modified by long-term agricultural activities, with most of the natural vegetation having long been cleared for grazing and horticultural purposes. The proposal at Tongarra Road, Albion Park includes a bush regeneration and rehabilitation program on approximately 12ha of the site. Furthermore, management of that rehabilitated land is to be ensured in perpetuity by the implementation of a *Deed of Agreement* which binds future landowners within the Business Park subdivision to ongoing maintenance of vegetation on the site.

As discussed above, the proposed Business Park subdivision and development of the subject site at Tongarra Road, Albion Park will provide a substantial net environmental benefit. The proposal will contribute in a positive manner to biodiversity conservation and the establishment and maintenance of habitat corridors or linkages through this landscape.

7.1 Earthworks and Construction Activities

Notwithstanding the disturbed and modified condition of most of the subject site at Albion Park, it will be of critical importance that the earthworks and construction activities are undertaken in a manner which avoids the imposition of adverse impacts upon the adjoining natural environment. In particular, it is crucial to avoid damage to or disturbance of the major wetland and the habitats along Frazers Creek (notwithstanding their disturbed and modified condition).

Specific features of the management regime to be implemented during the earthworks and construction activities on the subject site will be included within a *Construction Management Plan* to be prepared prior to the initiation of Stage 1 of the project. Specific measures to be implemented pursuant to the CMP during the excavation, filling and other earthworks activities on the subject site at Albion Park will include:

- marking the outer extent of fill and batter slopes using star pickets and orange safety mesh fencing to clearly identify the extent of acceptable physical disturbance;
- the placement of silt fences at the base of the exclusion fencing. Silt fences are to be installed at every location where there is the potential for sediment movement into the wetlands or watercourses, with a second supplementary silt fence (or fences) provided where the risk of sediment transport is highest (subject to advice of the project ecologist);
- the installation of protection fencing around that portion of the paperbark swamp forest in the southeastern corner of the subject site which is to be retained and protected, with a silt fence applied at the bottom of the fence;
- the collection of plant material and propagules from the paperbark swamp forest and the northern wetlands, and along Frazers Creek (other than that portion of the Creek which is to be removed) prior to earthworks or clearing activities. The collection of material, its propagation and maintenance, and its subsequent re-use will be undertaken by a bush regeneration contractor pursuant to the details contained in the VMP (see below);
- the provision of signage at 50m intervals along the protective fencing to ensure that earthworks and construction workers are alerted to the protection required within the *Conservation Zone* (EPZ) on the subject site; and
- the conduct of induction programs for all contractors prior to the commencement of works on the subject site.

In addition, the period of earthworks, excavation and fill placement on the subject site at Albion Park will involve the appointment of and monitoring by an environmental officer to monitor the effects of the works, identify issues or problems, and implement solutions where difficulties or breaches arise.

An array of additional measures will be required during the subsequent development of individual allotments within the Business Park subdivision and during the construction of the access roads and the placement of infrastructure. In addition to requirements to prevent sediment discharge from the fill

areas, particular issues which will need to be addressed during the construction of individual Business Park facilities within the project including:

- measures to prevent the discharge of pollutants or contaminants during construction activities;
- the identification of specific locations for waste materials, building materials, rubble and other physical items; and
- measures to ensure that construction workers are cognizant of the relevant issues and the need to undertake construction activities in an appropriate manner.

7.2 Stormwater Management and Water Quality Controls

A detailed stormwater management and water quality control regime has been developed for the Business Park project at Albion Park (Costin Rowe 2007) as part of the *Concept Plan* for this project. Specific and relevant issues which are addressed by that *Plan* include:

- measures to collect and re-use rainwater for appropriate purposes (toilet flushing and irrigation) on each allotment by 'on-site detention' (OSD) and 'on-site retention' (OSR) facilities, combined in the one tank;
- the collection of stormwater runoff within each allotment and its treatment prior to discharge either into the groundwater via infiltration or into the stormwater system. Treatment will include grated inlets, a gross pollutant trap, oil and grease capture and nutrient retention;
- the collection of stormwater from roads, and its treatment and detention using vegetated swales and GPTs prior to release;
- the location of stormwater release points along Frazers Creek with appropriate structures to prevent erosion of the channel; and
- the construction of an energy dissipator and water calming features at the upper end of the Creek, immediately below Tongarra Road.

The subsequent development of the Business Park will also involve the implementation of specific measures (related to the use of each allotment) to collect and treat any contamination or other possible discharges from each allotment. In addition, the runoff collection process will ensure that there is a detailed mechanism in place to deal with accidental spills of contaminants or pollutants.

7.3 Vegetation Management Plan

Of the total 74ha of the subject site at Albion Park, 47.4ha is proposed for development activities and the remainder (26.6ha or 35%) is to be retained and/or rehabilitated for biodiversity conservation purposes (Figure 5). Part of the retained portion of the subject site (11.95ha or 45%) is contained within the riparian and habitat rehabilitation areas (the *Environmental Management Area*) with 14.05ha to be retained as pasture or for agricultural purposes, or will be contained within the Road Reserve.

The *Environmental Management Area* (EMA) is to be rehabilitated for biodiversity conservation purposes and managed in perpetuity. It is to be noted that the overwhelming majority of the *Environmental Management Area* is currently agricultural land of little or no conservation value. However, some parts of the *Environmental Management Area* (the wetland areas) do have conservation value in their current condition, notwithstanding the high levels of disturbance and modification which have been derived from long-term agricultural and horticultural activities on the subject site.

Specific principles contained within the VMP for the subject site at Albion Park (see separate document by Whelans InSites) include:

- the protection of all retained vegetation on the subject site;

- the collection of vegetative material from areas which are to be disturbed or affected by construction activities;
- the removal of stock from the subject site;
- the control of introduced weeds and all introduced plants within the EMA;
- implementation of a substantial program of plantings and seed propagation of native species throughout the EMA;
- an ongoing program of maintenance of new plantings and improvement of natural vegetation; and
- a monitoring, reporting and response program to deal with the ongoing management of the site and the implementation of any measures which are required to deal with breaches or damage to the EMA.

The implementation of the VMP and the measures that it contains are to be the subject of *Deeds of Agreement* or some other appropriate mechanism, as detailed in the *Concept Plan*.

BIBLIOGRAPHY

Benson D, Howell J and McDougall L. 1996. *Mountain Devil to Mangrove: A Guide to Natural vegetation in the Hawkesbury - Nepean Catchment*. Royal Botanic Gardens, Sydney.

Benson D and McDougall L. 1991. *Rare Bushland Plants of Western Sydney*. Royal Botanical Gardens, Sydney.

Briggs JD and JH Leigh. 1996. *Rare or Threatened Australian Plants*. CSIRO, Australia.

Briggs JD and JH Leigh. 1988. *Rare or Threatened Australian Plants*. Special Publication 14. Australian National Parks & Wildlife Service.

Brooker MIH and Kleinig DA. 1990. *Field Guide to Eucalypts Volume 1 - South-eastern Australia*. Inkata Press, Melbourne.

Brouwer J and Garnett S (*eds*). 1990. *Threatened Birds of Australia*: *An Annotated List*. Royal Australasian Ornithologists Union Report No. 68.

Churchill S. 1998. *Australian Bats*. New Holland Publishers.

Cogger HG. 1992. *Reptiles and Amphibians of Australia*. AH & AW Reed, Sydney.

Concept Plan. 2007. *Illawarra Regional Business Park. Study in Support of State Significant Site and Concept Plan. Environmental Assessment Report*. Julius Bokor Architects, Sydney.

Costin & Rowe. 2007. *Illawarra Regional Business Park. Stormwater Management Plan*. Costin & Rowe, Sydney.

Costin & Rowe. 2007. *Illawarra Regional Business Park. Stormwater Management Plan*. Costin & Rowe, Sydney.

Department of Housing. 1998. *Managing Urban Stormwater: Soils and Construction.* Department of Housing, Sydney.

Fairley A and Moore P. 1989. *Native Plants of the Sydney District*. Kangaroo Press, Sydney.

Garnett ST and Crowley GM. 2000. *The Action Plan for Australian Birds.* Environment Australia, Canberra.

Hall LS and Richards GC. 1979. *Bats of Eastern Australia*. Queensland Museum Booklet No 12. Queensland Museum, Brisbane.

Harden G (e*d*). 1992. *Flora of NSW*. *Vol 3*. NSW University Press, Kensington.

Harden G (e*d*). 1993. *Flora of NSW. Vol 4*. NSW University Press, Kensington.

Harden G (e*d*). 2000. *Flora of NSW. Vol 1 (revised).* NSW University Press, Kensington

Harden G (e*d*). 2002. *Flora of NSW. Vol 2 (revised).* NSW University Press, Kensington

Higgins PJ (*ed*). 1999. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 4 - Parrots to Dollarbird.* Oxford University Press, Melbourne.

Higgins PJ and Davies SJJF (*eds*). 1996. *Handbook of Australian*, *New Zealand and Antarctic Birds*. *Volume 3 - Snipe to Pigeons*. Oxford University Press, Melbourne.

Higgins PJ, Peter JM and Steele WK (*eds*). 2001. *Handbook of Australian*, *New Zealand and Antarctic Birds*. *Volume 6 - Pardalotes to Shrike-thrushes*. Oxford University Press, Melbourne.

Higgins PJ and Peter JM (*eds*). 2002. *Handbook of Australian*, *New Zealand and Antarctic Birds*. *Volume 5 - Tyrant-flycatchers to Chats*. Oxford University Press, Melbourne.

Higgins PJ, Peter JM and Cowling SJ (*eds*). 2006. *Handbook of Australian*, *New Zealand and Antarctic Birds*. *Volume 7 Part A - Boatbill to Starlings*. Oxford University Press, Melbourne.

Higgins PJ, Peter JM and Cowling SJ (*eds*). 2006. *Handbook of Australian*, *New Zealand and Antarctic Birds*. *Volume 7 Part B - Boatbill to Starlings*. Oxford University Press, Melbourne.

Marchant S and Higgins PJ. 1990a. *Handbook of Australian, New Zealand & Antarctic Birds. Volume 1 Part A - Ratites to Ducks*. Oxford University Press, Melbourne.

Marchant S and Higgins PJ. 1990b. *Handbook of Australian, New Zealand & Antarctic Birds. Volume 1 Part B - Ratites to Ducks*. Oxford University Press, Melbourne.

Marchant S and Higgins PJ (*eds*). 1993. *Handbook of Australian*, *New Zealand and Antarctic Birds*. *Volume 2 - Raptors to Lapwings*. Oxford University Press, Melbourne.

McDonald RC, Isbell RF, Speight JG, Walker J and Hopkins M. 1990. *Australian Soil and Land Survey Field Handbook* (2nd Edition). Inkata, Melbourne.

Robinson L. 1991. *Field Guide to the Native Plants of Sydney*. Kangaroo Press, Sydney.

Robinson M. 1994. *A Field Guide to Frogs of Australia*. Australian Museum/Reed Books, Sydney.

Simpson K and Day N. 1998. *The Claremont Field Guide to the Birds of Australia (5th Edition)*. Penguin Books, Australia.

Slater P, Slater P and Slater R. 1989. *The Slater Field Guide to Australian Birds*. Weldon Publishing, Sydney.

Specht RL. 1988. Major Vegetation Formations in Australia. In *Ecological Biogeography of Australia*. Keast A (*ed*). Junk, The Hague.

Strahan R. (*ed*). 1995. *The Mammals of Australia*. Reed Books, Chatswood.

Whelans InSites. 2007a. *Illawarra Regional Business Park. 78 Tongarra Road, Albion Park. Proposed Business Park Subdivision – Concept Plan. Vegetation Management Plan*. Whelans InSites, Sydney.

Whelans InSites. 2007b. *Illawarra Regional Business Park. 78 Tongarra Road, Albion Park. Proposed Business Park Subdivision – Concept Plan. Waterways & Wetlands Report*. Whelans InSites, Sydney.

Whelans InSites. 2007c. *Illawarra Regional Business Park. 78 Tongarra Road, Albion Park. Proposed Business Park Subdivision – Concept Plan. EPBC Act Considerations Report*. Whelans InSites, Sydney.

Figure 1 Location of the subject site at Tongarra Road, Albion Park.

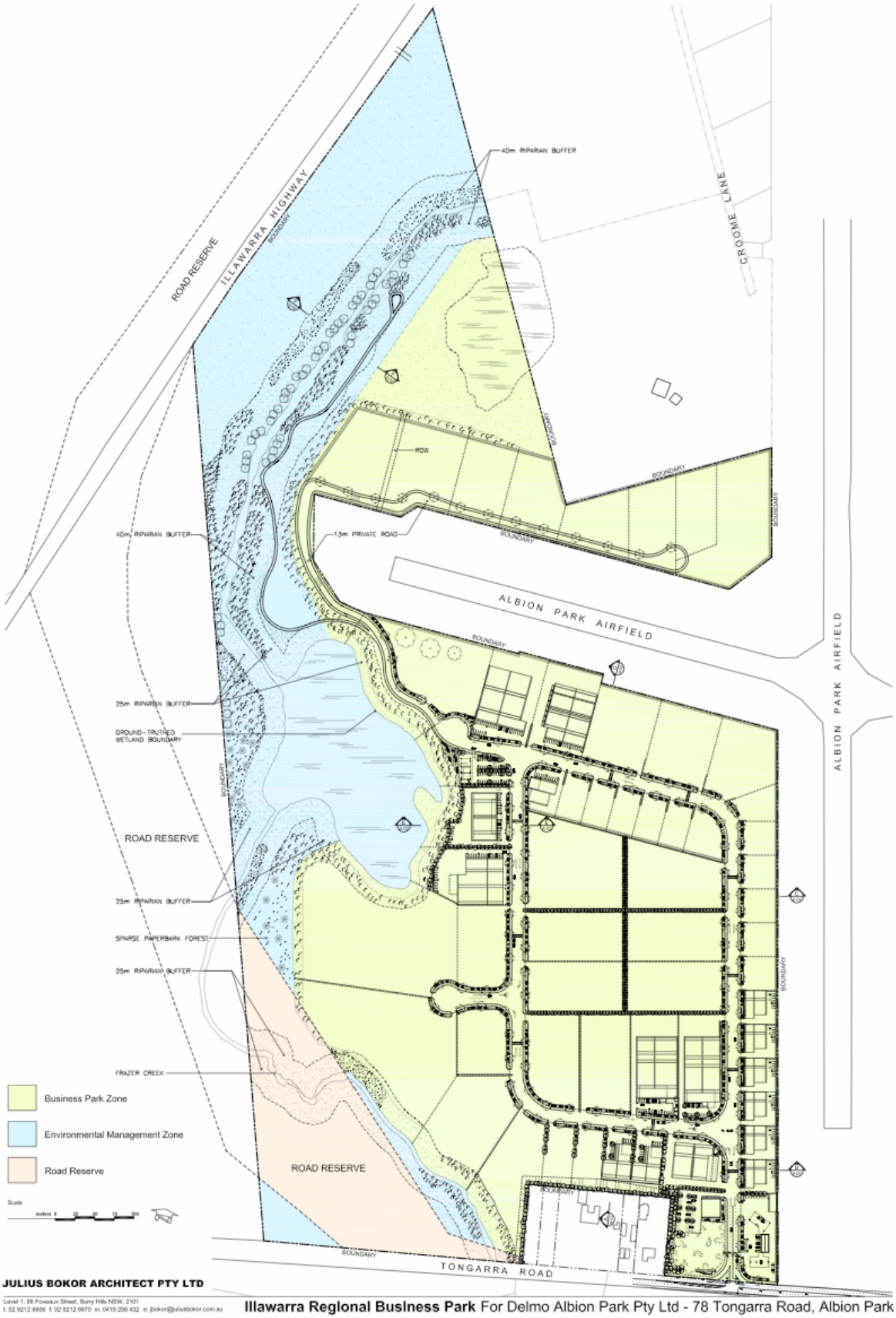


Figure 2 Land uses within the subject site at Tongarra Road, Albion Park.

Figure 3 Proposed zonings on the subject site at Tongarra Road, Albion Park.

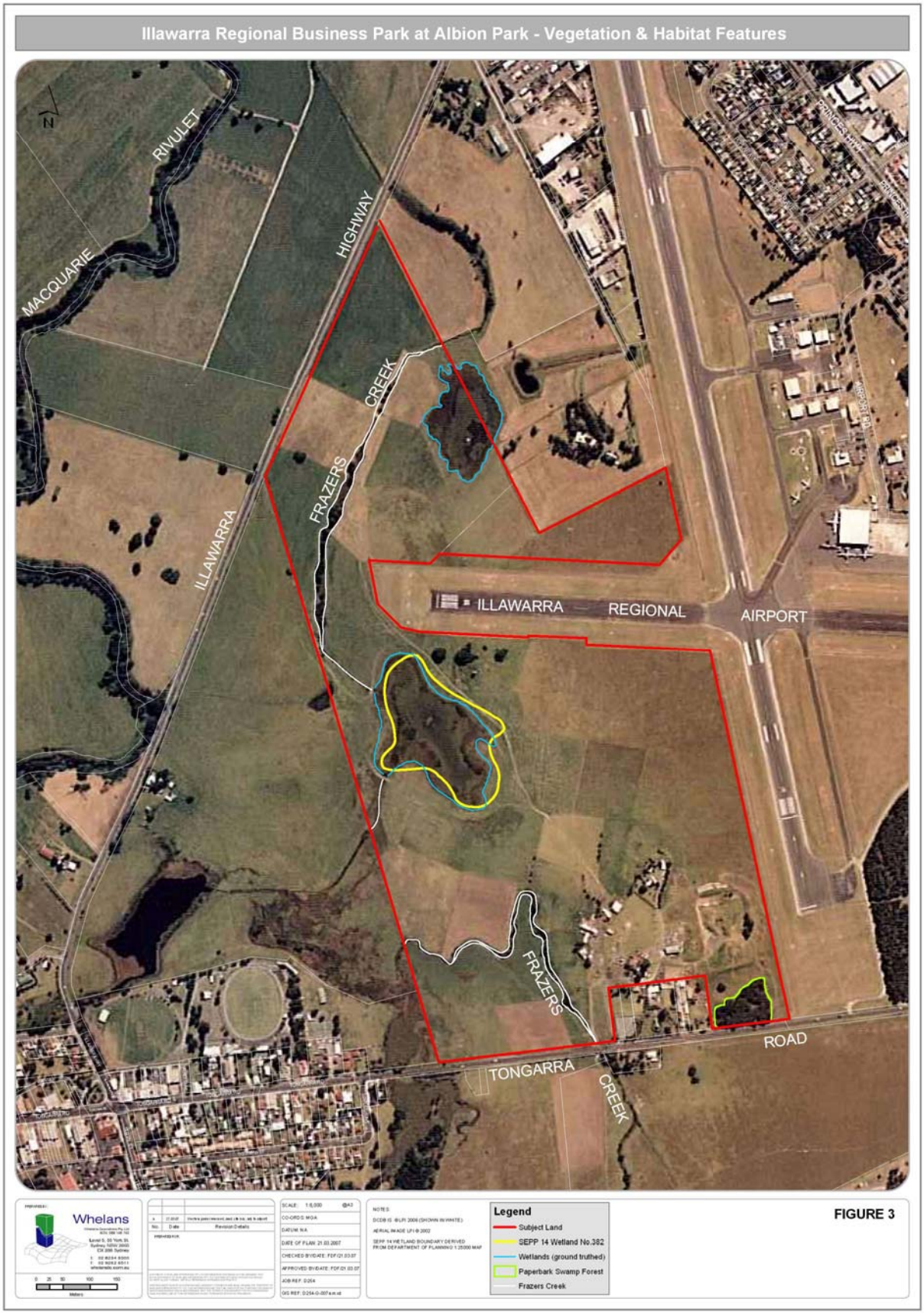


Figure 4 Aerial photograph of the subject site with the SEPP 14 and the actual wetland boundary on the subject site at Tongarra Road, Albion Park.

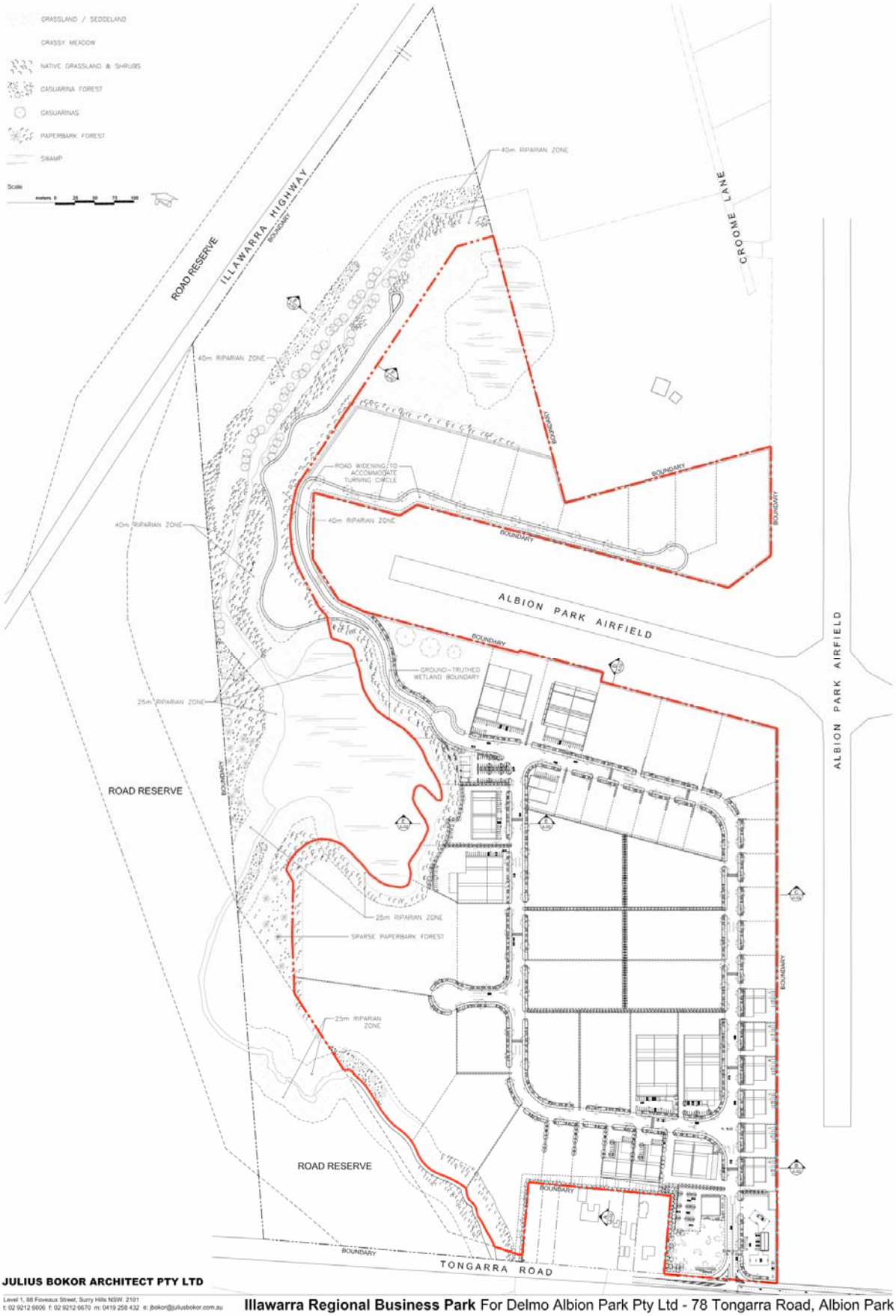


Figure 5 Development and conservation management areas on the subject site at Tongarra Road, Albion Park.

Figure 6 The riparian rehabilitation area on the subject site at Tongarra Road, Albion Park.

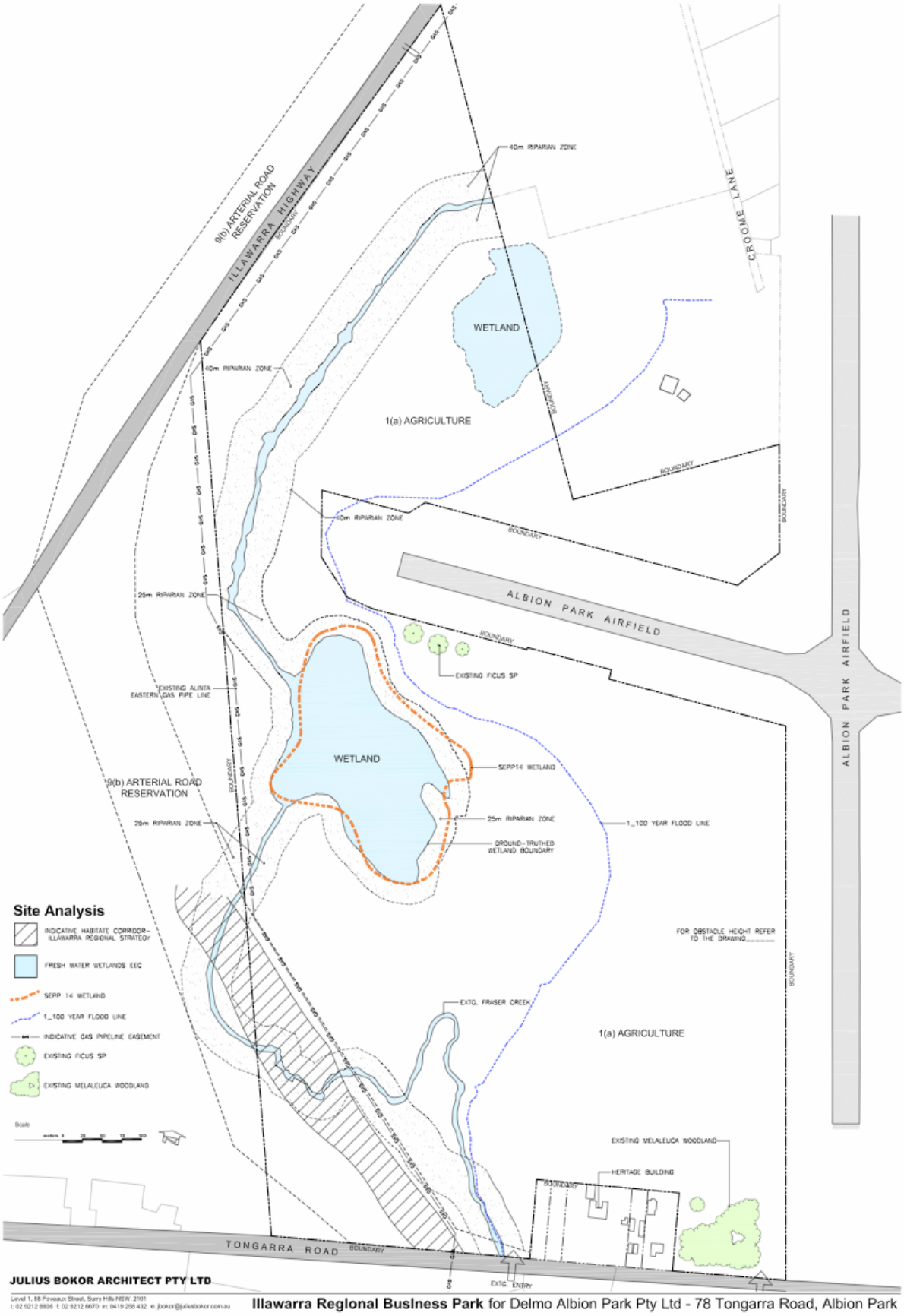


Figure 7 Development constraints on the subject site at Tongarra Road, Albion Park.

Figure 8 Aerial photograph of the subject site at Tongarra Road, Albion Park showing its context and the surrounding land uses.

Illawara Regional Business Park
78 Tongarra Road, Albion Park

Proposed Industrial Subdivision – Concept Plan

Flora & Fauna Assessment Report

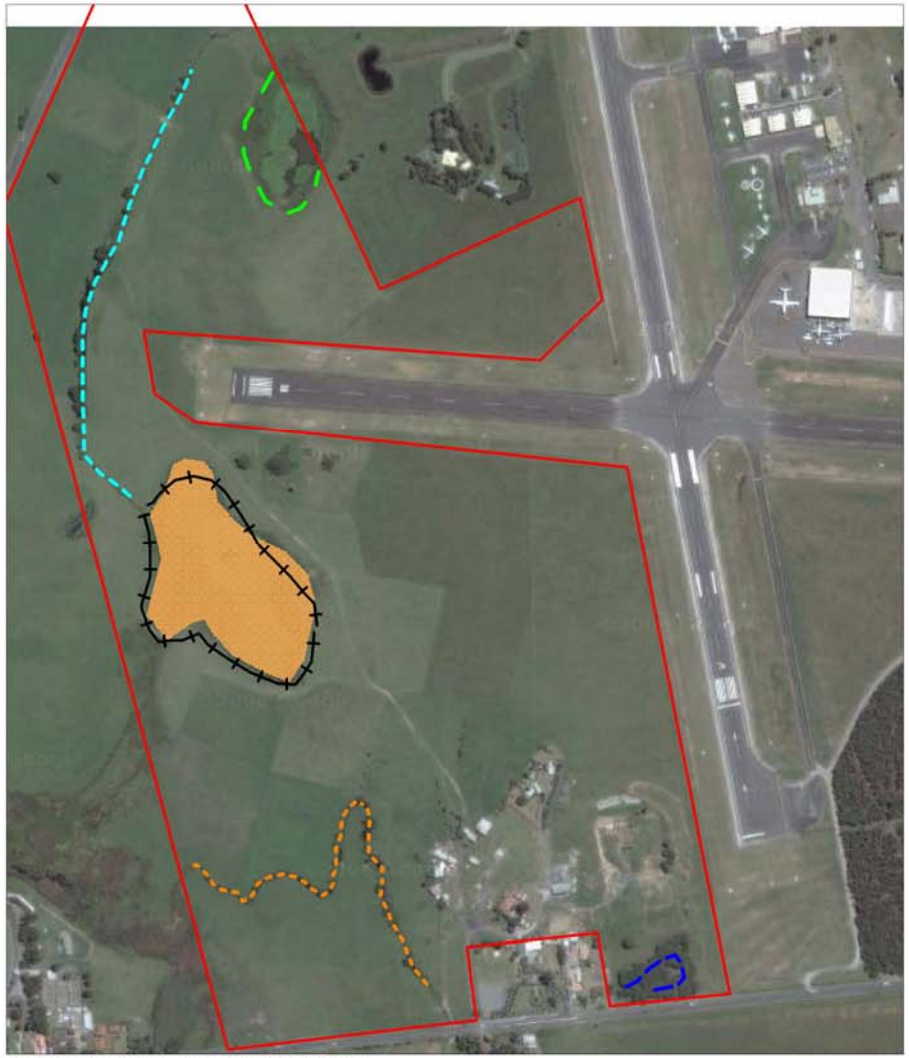
May 2007

APPENDIX A

Field Surveys on the Subject Site

Whelans InSites (Gunninah Environmental Consultants)

Level; 12, 80 Clarence Street Sydney NSW 2000
ph: 02 – 8234 8300 fax: 02 – 9262 6511 email: gecon@gunninah.com.au



LEGEND

- Study Area
- SEPP 14 Wetland

BIRD SURVEYS - 28 FEBRUARY 2007

- Survey 1 (0713 - 0750)
- Survey 2 (0800 - 0813)
- Survey 3 (0813 - 0837)
- Survey 4 (0840 - 0916)

FLORA SURVEYS - 28 FEBRUARY 2007

- Creek 1
- Creek 2
- Melaleuca decora
- Northern Wetland
- SEPP 14

N

PRINT DATE: 21 March 2007	CREATED BY: WB
SCALE: NOT TO SCALE	CHECKED BY: ED
MAP NO.	REVISION NO.
JOB NO: 06234	

Whelans Operations

Field Surveys

Albion Park

Andrews.Neil

Illawarra Regional Business Park
78 Tongarra Road, Albion Park

Proposed Industrial Subdivision – Concept Plan

Flora & Fauna Assessment Report

May 2007

APPENDIX B

Flora Species Recorded on the Subject Site

at Tongarra Road, Albion Park

Whelans INSITES (Gunninah Environmental Consultants)
Level 12/80 Clarence Street Sydney NSW 2000
ph: 02 – 8234 8326 fax: 02 – 9262 6511 email: gecon@gunninah.com.au

APPENDIX B Vascular plant species recorded at 78 Tongarra Road, Albion Park

KEY

* Introduced species

1 Creek 1
2 SEPP 14 Wetland
3 Creek 2
4 Northern Wetland
5 Melaleuca

Status	Scientific Name	Common Name	1	2	3	4	5
	ALLIACEAE						
*	*Nothoscordum borbonicum*	Onion Weed					✓
	AMARANTHACEAE						
-	*Alternanthera denticulata*	Lesser Joyweed					✓
	APIACEAE						
-	*Centella asiatica*	Pennywort					✓
*	*Foeniculum vulgare*	Fennel	✓				
	ASCLEPIADACEAE						
*	*Araujia hortorum*	Moth Plant	✓				
	ASPARAGACEAE						
*	*Myrsiphyllum asparagoides*	Florists Smilax					✓
	ASTERACEAE						
*	*Bidens pilosa*	Cobblers Pegs					✓
*	*Conyza albida*	Tall Fleabane	✓		✓		
*	*Delairea odorata*	Cape Ivy	✓				
-	*Gnaphalium sphaericum*						✓
*	*Hypochaeris radicata*	Catsear					✓
*	*Onopordum subsp. acanthium*	Scotch Thistle	✓		✓		
-	*Podolepis arachnoidea*	Clustered Copper-wire Daisy		✓	✓	✓	
*	*Senecio madagascariensis*	Fireweed	✓		✓		✓
*	*Taraxacum officinale*	Dandelion	✓				✓
	AZOLLACEAE						
-	*Azolla*sp.				✓	✓	
	CAPRIFOLIACEAE						
*	*Lonicera japonica*	Japanese Honeysuckle	✓				
	CASUARINACEAE						
	Casuarina cunnighamiana	River She-Oak	✓		✓		
	CHENOPODIACEAE						
-	*Einadia hastata*	Berry Saltbush					✓
-	*Einadia trigonos*	Fishweed					✓

APPENDIX B Vascular plant species recorded at 78 Tongarra Road, Albion Park

Status	Scientific Name	Common Name	1	2	3	4	5
	CLUSIACEAE						
-	*Hypericum gramineum*	Small St. Johns Wort					✓
	COMMELINACEAE						
-	*Commelina cyanea*		✓				✓
*	*Tradescantia fluminensis*	Wandering Jew	✓				
	CONVOLVULACEAE						
-	*Dichondra repens*	Kidney Weed	✓				✓
	CRASSULACEAE						
*	*Bryophyllum delagoense*	Mother-of-Millions	✓				
	CYPERACEAE						
-	*Carex longebrachiata*	Bergalia Tussock	✓				
-	*Cyperus exaltatus*	Giant Sedge		✓	✓		
-	*Cyperus gracilis*						✓
-	*Cyperus polystachyos*				✓		
*	*Cyperus sesquiflorus*						✓
-	*Eleocharis sphacelata*	Tall Spike-rush	✓	✓	✓		
-	*Fimbristylis dichotoma*						✓
-	*Schoenoplectus validus*		✓	✓			
	FABACEAE						
-	*Desmodium gunnii*						✓
	Faboideae						
-	*Glycine clandestina*						✓
-	*Glycine tabacina*		✓			✓	✓
*	*Trifolium repens*	White Clover					
	FABACEAE						
	Mimosoidae						
-	*Acacia parramattensis*	Parramatta Wattle	✓				
	HALORAGACEAE						
-	*Myriophyllum papillosum*	Common Watermilfoil	✓	✓			
	JUNCACEAE						
*	*Juncus cognatus*					✓	
-	*Juncus usitatus*		✓	✓		✓	✓
	LAMIACEAE						
-	*Plectranthus parviflorus*						✓
	LOBELIACEAE						
-	*Pratia purpurascens*	Whiteroot					✓
	LOMANDRACEAE						
-	*Lomandra longifolia*	Spiny-headed Mat-rush	✓				

APPENDIX B Vascular plant species recorded at 78 Tongarra Road, Albion Park

Status	Scientific Name	Common Name	1	2	3	4	5
	MALACEAE						
*	*Rhaphiolepis indica*	Indian Hawthorn	✓				
	MALVACEAE						
*	*Sida rhombifolia*	Paddys Lucerne					✓
	MARSILEACEAE						
-	*Marsilea mutica*			✓	✓		
	MENYANTHACEAE						
-	*Villarsia exaltata*				✓		
	MORACEAE						
-	*Ficus coronata*	Creek Sandpaper Fig			✓		
	MYRTACEAE						
-	*Acmena smithii*	Lilly Pilly			✓		
-	*Melaleuca decora*						
	OLEACEAE						
*	*Ligustrum sinense*	Small Leaved Privet	✓				✓
	ONAGRACEAE						
-	*Ludwigia* sp.				✓		
	OXALIDACEAE						
*	*Oxalis* sp.			✓			
-	*Oxalis perennans*						✓
	PITTOSPORACEAE						
-	*Pittosporum undulatum*	Pittosporum	✓				
	PLANTAGINACEAE						
*	*Plantago lanceolata*	Lambs Tongue					✓
	POACEAE						
*	*Briza maxima*	Quaking Grass					✓
*	*Bromus catharticus*	Prairie Grass					✓
*	*Chloris gayana*	Rhodes Grass					✓
-	*Cynodon dactylon*	Couch	✓	✓		✓	
-	*Echinopogon caespitosus*						✓
*	*Eleusine tristachya*	Goose Grass					✓
-	*Eragrostis leptostachya*	Paddock Lovegrass					✓
*	*Lolium perenne*	Perennial Ryegrass					✓
-	*Microlaena stipoides*						✓
-	*Paspalidium* sp.		✓	✓			
-	*Paspalidium distans*						✓
*	*Paspalum dilatatum*	Paspalum		✓			
*	*Pennisetum clandestinum*	Kikuyu Grass	✓	✓		✓	
-	*Phragmites australis*	Common Reed	✓				

APPENDIX B Vascular plant species recorded at 78 Tongarra Road, Albion Park

APPENDIX B Vascular plant species recorded at 78 Tongarra Road, Albion Park

Status	Scientific Name	Common Name	1	2	3	4	5
	POLYGONACEAE						
-	*Persicaria decipiens*	Slender Knotweed			✓		
-	*Persicaria hydropiper*	Water Pepper	✓	✓		✓	
*	*Rumex crispus*	Curled Dock					✓
	RANUNCULACEAE						
-	*Ranunculus* sp.	Buttercup		✓			
	ROSACEAE						
*	*Rubus fruticosis agg.*	Blackberry					✓
*	*Rubus ulmifolius*	Blackberry	✓				
	SALICACEAE						
*	*Salix alba*	White Willow			✓		
	SCROPHULARIACEAE						
-	*Veronica plebeia*	Trailing Speedwell					✓
	SINOPTERIDACEAE						
-	*Cheilanthes sieberi subsp. sieberi*						✓
	SOLANACEAE						
*	*Lycium ferocissimum*	African Boxthorn					
*	*Solanum mauritianum*	Wild Tabacco Bush	✓				
*	*Solanum nigrum*	Blackberry Nightshade	✓				
*	*Solanum psuedocapsicum*	Jerusalem Cherry	✓				
	TYPHACEAE						
-	*Typha orientalis*	Broad-leaved Cumbungi	✓		✓		
	URTICACEAE						
-	*Urtica incisa*	Stinging Nettle	✓				
	VERBENACEAE						
*	*Lantana camara*	Lantana	✓				✓
*	*Verbena bonariensis*	Purpletop	✓		✓		✓

Illawarra Regional Business Park
78 Tongarra Road, Albion Park

Proposed Industrial Subdivision – Concept Plan

Flora & Fauna Assessment Report

May 2007

APPENDIX C

Bird Species Recorded on the Subject Site

at Tongarra Road, Albion Park

Whelans INSITES (Gunninah Environmental Consultants)
Level 12/80 Clarence Street Sydney NSW 2000
ph: 02 – 8234 8326 fax: 02 – 9262 6511 email: gecon@gunninah.com.au

APPENDIX C Bird species recorded at 78 Tongarra Road, Albion Park

			Survey Location				Legal Status		
Species	**Common Name**	**#**	**1**	**2**	**3**	**4**	**TSC**	**EPBC**	**Native**
ANATIDAE									
Cygnus atratus	Black Swan	4	✓	✓	✓	·		M	✓
Chenonetta jubata	Australian Wood Duck	10+				✓		M	✓
Anas superciliosa	Pacific Black Duck	>20	✓	✓		✓		M	✓
Anas gracilis	Grey Teal	>20	✓	✓		✓		M	✓
Anas castanea	Chestnut Teal	>20	✓	✓		✓		M	✓
PODICIPEDIDAE									
Tachybaptus novaehollandiae	Australasian Grebe	2				✓			✓
Poliocephalus poliocephalus	Hoary-headed Grebe	3				✓			✓
PHALACROCORACIDAE									
Phalacrocorax varius	Pied Cormorant	>15	✓	✓	✓	✓			✓
ARDEIDAE									
Egretta novaehollandiae	White-faced Heron	2		✓		✓			✓
Ardea alba	Great Egret	4		✓	✓				✓
THRESKIORNITHIDAE									
Threskiornis spinicollis	Straw-necked Ibis	3	✓		✓				✓
Platalea regia	Royal Spoonbill	2		·	✓				✓
ACCIPITRIDAE									
Circus approximans	Swamp Harrier	1				✓		M	✓
RALLIDAE									
Porphyrio porphyrio	Purple Swamphen	2	✓						✓
SCOLOPACIDAE	(see Note #1)								
Calidris melanotos	Pectoral Sandpiper	>20	✓	✓	·	✓		M	✓
Calidris acuminata	Sharp-tailed Sandpiper	>20	✓	✓		✓		M	✓
RECURVIROSTRIDAE									
Himantopus himantopus	Black-winged Stilt	>20	✓	✓				M	✓

APPENDIX C Bird species recorded at 78 Tongarra Road, Albion Park

			Survey Location				Legal Status		
Species	**Common Name**	**#**	**1**	**2**	**3**	**4**	**TSC**	**EPBC**	**Native**
CHARADRIIDAE									
Vanellus miles	Masked Lapwing	>20	✓	✓	✓	✓		M	✓
LARIDAE									
Larus novaehollandiae	Silver Gull	>20	✓	✓		✓			-
COLUMBIDAE									
Streptopelia chinensis	Spotted Turtle-Dove	4	✓						✓
PSITTACIDAE									
Platycercus eximius	Eastern Rosella	2			✓				✓
MALURIDAE									
Malurus cyaneus	Superb Fairy-wren	5+			✓				✓
DICRURIDAE									
Grallina cyanoleuca	Magpie-lark	10	✓	✓	✓	✓			✓
Rhipidura leucophrys	Willie Wagtail	5+	✓		✓				✓
ARTAMIDAE									
Gymnorhina tibicen	Australian Magpie	>20	✓	✓	✓	✓			✓
CORVIDAE									
Corvus coronoides	Australian Raven		✓						✓
MOTACILLIDAE									
Anthus novaeseelandiae	Richard's Pipit	6			✓	✓			✓
HIRUNDINIDAE									
Hirundo neoxena	Welcome Swallow	5+	✓						✓
STURNIDAE									
Sturnus vulgaris	Common Starling	>20			✓	✓			X
Acridotheres tristis	Common Mynah	>20			✓	✓			X

Note #1 Most likely Pectoral Sandpiper due to flight call.

Note #2 Survey locations according to Appendix A of the *Flora & Fauna Assessment Report*.

Note #3 EPBC (*Commonwealth Environment Protection & Biodiversity Conservation Act 1999*)
M – Migratory species listed on the EPBC Act

Illawara Regional Business Park
78 Tongarra Road, Albion Park

Proposed Industrial Subdivision – Concept Plan

Flora & Fauna Assessment Report

May 2007

APPENDIX D

Section 5A Assessments of Significance

Whelans InSites (Gunninah Environmental Consultants)

Level; 12, 80 Clarence Street Sydney NSW 2000
ph: 02 – 8234 8300 fax: 02 – 9262 6511 email: gecon@gunninah.com.au

ILLAWARRA REGIONAL BUSINESS PARK
78 TONGARRA ROAD, ALBION PARK

PROPOSED INDUSTRIAL SUBDIVISION – CONCEPT PLAN

SECTION 5A ASSESSMENTS of SIGNIFICANCE

May 2007

1 INTRODUCTION

1.1 Statutory Considerations

The *NSW Threatened Species Conservation Act 1995* (TSC Act) has modified the *NSW Environmental Planning & Assessment Act 1979* (EP&A Act) by, *inter alia*, including a requirement to determine "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*". Section 5A (s.5A) identifies seven factors which "*must be taken into account*" by a consent or determining authority in administering Sections 78, 79C and 112 of the EP&A Act.

The factors contained within s.5A of the EP&A Act which "*must be taken into account*" in determining "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*" were amended in 2005, after proclamation of the *NSW Threatened Species Amendment Act 2002* (TSAA Act). This *Report* addresses the amended version of Section 5A and the relevant factors contained therein.

1.2 Section 5A - Factors for Consideration

The factors which "*must be taken into account*" pursuant to s.5A of the EP&A Act (as amended in 2005) are:

(a) in the case of threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
  (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
  (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

(d) in relation to the habitat of a threatened species, population or ecological community:
  (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and
  (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and
  (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

(f) whether the action proposed is consistent with the objectives or actions of a *Recovery Plan* or *Threat Abatement Plan*.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

2 INTERPRETATION & DEFINITIONS

2.1 The Guidelines

The Department of Environment & Conservation (DEC) has provided a set of *Threatened Species Assessment Guidelines* (dated August 2005) which provide advice regarding the interpretation and application of the amended Section 5A of the EP&A Act.

It is of critical importance to note that the *Guidelines* state *inter alia* that the "*assessment of significance*" should not be considered a "*pass or fail test*". Further, the *Guidelines* state that "*all factors must be considered and an overall conclusion must be drawn from all factors in combination*".

2.1 Definitions Contained in the Guidelines

Study Area

The *Guidelines* define the term "*study area*" as meaning "*the subject land and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account*".

Whilst that definition *per se* is not problematic, its further application within the *Guidelines* presents some anomalies and inappropriate definitions with respect to "*local populations*", "*local occurrences*" and the "*locality*", as discussed in some detail below.

The fundamental problem is that the definition of "*study area*" relies on an arbitrary artificial and/or cadastral basis, which rarely (if ever) bears any relationship to ecological attributes.

Local Population

With respect to "*threatened species*", the *Guidelines* define a "*local population*" of a species as "*the population that occurs in the study area*", noting the definition of "*study area*" discussed above.

This definition of "*local population*" is, in most instances, likely to be entirely inappropriate, arbitrary and devoid of any ecological basis (unless the solution discussed below is adopted) because:

- in most instances (indeed in the overwhelming majority of instances), the "*study area*" (being the area affected by the development activities, "*either directly or indirectly*") will have no relation whatsoever to the distribution of suitable habitat or the extent or distribution of a real 'population' of any native biota;
- confining the "*local population*" to the "*study area*" in almost all instances ignores the actual distribution of habitat for a species, the life cycle requirements of most fauna and flora, the actual or likely area of land and habitat occupied by a "*population*" of most species, and the circumstances of the particular site or "*study area*"; and
- in most instances, confining the "*local population*" to the "*study* area" would involve only a very small proportion of an ecologically valid or true "*local population*" of any native species.

In the case of migratory or highly mobile species for example (*eg* the Regent Honeyeater, Grey-headed Flying Fox and microchiropteran bats), confining the "*local population*" to the "*study area*" is nonsensical and ecologically meaningless (again unless the solution provided below is adopted).

Similar considerations apply to species which occupy large home ranges (such as the Osprey, Square-tailed Kite and Glossy Black Cockatoo). There is no ecological or scientifically valid rationale for confining the "*local population*" of such species to the "*subject site*" or the "*study area*".

The same considerations apply in addressing "*endangered populations*", which will in virtually no instance be confined to the "*study area*" (unless the "*study area*" includes the whole distribution of that population).

Local Occurrence

Similar problems arise with the definition of "*local occurrence*" in the consideration of "*endangered ecological communities*". The definition of "*local occurrence*" provided in the *Guidelines* is "*the community that occurs within the study area*".

Again, confining the "*local occurrence*" of an "*endangered ecological community*" to that area of "*the community that occurs within the study area*" is generally ecologically unsound and essentially meaningless, unless the solution described below is adopted.

In the first instance, the "*study area*" is an arbitrarily defined area, which will vary substantially depending on the size of the "*subject land*" and the proposed development. These matters are determined by cadastral boundaries rather than by the distribution of ecological features. As a consequence, there is (in most instances) no correlation between the true or ecological "*local occurrence*" of a community and that which is determined by its presence within a "*study area*".

The definition provided in the *Guidelines* for "*local occurrence*" would lead in many instances to the illogical and ecologically unsound situation where just one part of a stand of a community is contained within the defined "*local occurrence*" (because it is in the "*study area*") whilst the adjoining portion of the same community (located outside the "*study* area") is not part of the "*local occurrence*". Again, this situation pertains unless the solution described below is adopted.

Furthermore, definition of the "*local occurrence"* of an "*endangered ecological community*" as confined to a "*study area*" would lead in many instances to a case of *reductio ad absurdum*. Given that, in many instances, the development would require removal of all of the "*endangered ecological community*" located within the "*study area*" or within the "*subject site*", it must automatically follow that the "*action proposed*" would lead to the "*extinction*" of the defined "*local occurrence*". That necessarily follows even if the area of vegetation to be affected constitutes only a minute proportion of a very much larger contiguous portion or stand of the "*endangered ecological community*".

Locality

In respect of Factor (d) of s.5A, the *Guidelines* provide a definition of "*locality*" as being "*the habitat that occurs within the study area*". In the application of Factor (d), that definition generally will also be both ecologically unsound and potentially a case of *reductio ad absurdum* unless the term is redefined or interpreted in accordance with the solution described below.

Confining the "*locality*", and indeed the "*local population*" of a threatened species, to the "*study area*" makes no sense when addressing a proposed development in relation to the potential impacts upon species such as the Powerful Owl, Regent Honeyeater, Grey-headed Flying Fox or microchiropteran bats.

2.3 Potential Solution

One possible solution to the problems identified below is to consider the "*additional areas which likely to be affected … indirectly*" by the "*action proposed*" as including the total home ranges and/or distributions of the relevant "*threatened species, population or ecological communities*". On that basis, the "*study area*" extends as far as the distribution of suitable habitat for and/or the home ranges of the relevant threatened biota.

The only alternative would be to change the definitions provided in the *Guidelines*.

2.4 Definitions Used in this Assessment

Given the difficulties detailed above with respect to several of the definitions contained in the *Guidelines* provided for the *Assessment of Significance* by DEC (August 2005), an appropriate and ecologically sound series of definitions is utilised in this *Report*. These are based on ecological principles and on the solution to the quandary discussed above.

The "*local population*" of threatened fauna species is considered to include all individuals within the home range of those individuals using the subject site, as well as other pairs or individuals which are likely to interact with those present on the site. Significantly and most importantly, the "*local population*" of threatened fauna species is not limited to the individual or individuals which occur on the site.

Similarly, the "*local population*" of the threatened plant species recorded in the adjoining Reserve is not restricted to the "*study area*" as defined in the DEC *Guidelines*.

The "*local occurrence*" of the "*endangered ecological community*" present on the subject site at Berkeley Vale is regarded as including the stands of that community in the remaining peripheral vegetation on the subject site and the extensive tracts of that vegetation on adjoining lands to the immediate east and to the northeast and southeast.

The term "*locality*" is taken to be determined by the definitions for "*local population*" and "*local occurrence*" identified above. For some species, therefore, the "*locality*" may cover several thousand hectares and/or distances of up to (or even greater than) 50km.

3 FACTORS for CONSIDERATION

3.1 Swamp Sclerophyll Forest on Coastal Floodplains

Factor (a) Threatened Species and the Risk of Extinction

The Swamp Sclerophyll Forest on Coastal Floodplains in the NSW North Coast, Sydney Basin and South East Corner Bioregions (SSFCF) community is not a "*threatened species*".

Factor (b) Endangered Populations and the Risk of Extinction

The SSFCF community is not an "*endangered population*".

Factor (c) Endangered Ecological Communities and the Risk of Extinction

The SSFCF community is represented on the subject site by a small patch (less than 1ha) of paperbark swamp forest in the southeastern corner, adjacent to Tongarra Road. That stand of swamp forest vegetation is surrounded by agricultural pasture, areas of earthworks and fill dumping, existing development (dwellings to the west and the airfield to the east) and Tongarra Road (to the south). It is isolated from other larger patches of SSFCF vegetation in the vicinity by broad areas of cleared and disturbed land and by existing urban development.

The SSFCF community on the subject site is somewhat modified from its original condition as a consequence of previous and ongoing grazing by cattle. Nevertheless, the stand has a monotypic tree canopy of Swamp Paperbark *Melaleuca decora*, and a predominantly native understorey or groundcover of grasses, sedges and herbs. There are, however, a number of introduced species within the groundcover stratum including pasture grasses.

The proposed development on the subject site at Albion Park requires the removal of approximately half of the stand of SSFCF present. The remainder is to be protected and enhanced, with a program of weed removal, protection and the removal of grazing pasture.

By virtue of the implementation of protection and enhancement measures for the retained portion of the SSFCF vegetation on the subject site (by virtue of the VMP) and the replanting of and maintenance of an additional area of SSFCF vegetation within the riparian zone along Frazers Creek, it cannot be regarded as likely that the "*action proposed*" on the subject site at Albion Park would place that community on the site "*at risk of extinction*". Assuming that the "*local occurrence*" of the SSFCF community is restricted to that small isolated patch located on the subject site itself, the retention, protection and enhancement of approximately 0.5ha of that vegetation on the site as well as the supplementary planting and maintenance of an additional 1ha within the Frazers Creek riparian zone will ensure the survival of that "*local occurrence*" of the community.

With respect to the issues identified in Factor (c) regarding the SSFCF community on the subject site at Berkeley Vale and on the basis of the matters considered above:

- there will be only an extremely minor impact "*on the extent of the ecological community*"; and
- the proposed development will not "*substantially and adversely modify the composition of the ecological community*" given the extent of its retention in the immediate vicinity, and the implementation of an environmental management regime on the subject site.

It is to be noted in particular that the relevant consideration pursuant to Factor (c) of s.5A of the TSC Act is whether the "*local occurrence is likely to be placed at risk of extinction*" (emphasis added). It is not sufficient that there be simply some reduction in the extent of the community or a localised increase in impacts, but that the "*local occurrence*" of the SSFCF community be "*placed at risk of extinction*" (*ie* obliteration or permanent and total loss).

Factor (d) Habitat Removal, Modification, Fragmentation, Isolation and Importance

With respect to the issues raised in Factor (d) of s.5A in terms of the habitat for the SSFCF community:

- the extent of this community "*to be removed or modified as a result of the action proposed*" is small. Further, the area of the community to be removed from the site represents only a minute proportion of that present in the "*local occurrence*";
- the proposed action at Albion Park will not involve the "*fragmentation or isolation*" of any of the SSFCF community. Whilst the proposal does require the removal of approximately half of the stand present on the site, that stand is already substantially isolated from any other stands of the SSFCF community; and
- the area of SSFCF which is to be affected by the proposed development at Albion Park is not of "*importance*" to the survival of that community either on the subject site or in the locality in general. The benefits of retention, protection and long-term management of the remainder of that community on the site outweigh the adverse impacts of the removal of approximately half of the stand present. In addition, as noted above, vegetative material from that portion of the SSFCF community which is to be removed from the subject site will be used in creating additional stands of the community within the Frazers Creek riparian zone.

Factor (e) Critical Habitat – Direct and Indirect Effects

The TSC Act 1995 defines "*critical habitat*" as "*habitat declared to be critical habitat under Part 3*" of the Act. At the time of this *Report*, no "*critical habitat*" for the SSFCF community had been declared.

Factor (f) Recovery Plans and Threat Abatement Plans

There is currently no *Recovery Plan* with respect to the SSFCF community.

There are no relevant *Threat Abatement Plans* with respect to the impacts of the development with respect to the SSFCF community.

Factor (g) Key Threatening Processes

The only "*key threatening process*" of particular relevance to the SSFCF community in this instance is the "*clearing of native vegetation*", although a number of other "*key threatening processes*" may also be (theoretically at least) of relevance to a very limited extent.

With respect to the "*clearing of native vegetation*", approximately half of the SSFCF on the site is to be retained *in situ*, and there is to be a substantial replanting program of SSFCF within the CMA on the site. Further, the proposal will specifically avoid the imposition of other "*key threatening processes*" on the SSFCF present on the site.

On that basis, "*the action proposed*" will not relevantly "*result in the operation of, or increase the impact of, a key threatening process*".

CONCLUSIONS

The relevant factors which are required to be considered pursuant to s.5A of the EP&A Act in the determination of "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*" are discussed in detail above with respect to the SSFCF community.

Given the retention and rehabilitation of the SSFCF community on the subject site, the proposed development at Albion Park is not "*likely*" to impose "*a significant effect*" on this "*endangered ecological community*".

3.2 Freshwater Wetlands Forest on Coastal Floodplains

Factor (a) Threatened Species and the Risk of Extinction

The Freshwater Wetlands on Coastal Floodplains in the NSW North Coast, Sydney Basin and South East Corner Bioregions (FWCF) community is not a "*threatened species*".

Factor (b) Endangered Populations and the Risk of Extinction

The FWCF community is not an "*endangered population*".

Factor (c) Endangered Ecological Communities and the Risk of Extinction

The FWCF community is represented on the subject site by vegetation within the two wetlands (the northern wetland and the central SEPP 14 wetland) as well as some of the wetland vegetation along the modified portions of Frazers Creek in the vicinity of the SEPP 14 wetland. Although affected by weeds and introduced pasture grasses in places, and by the ongoing impacts of cattle grazing, the wetlands and their vegetation are valuable features of the local environment. They have been recognized from the outset as of conservation significance in the *Concept Plan* for the industrial development of the site.

The central SEPP 14 wetland is to be retained in its entirety, and is to be protected by silt fences and other appropriate measures during construction activities and subsequently by the planted embankments adjacent to the industrial subdivision. Furthermore, the removal of stock from that wetland and implementation of the VMP for the project (which will include weed removal and ongoing maintenance) will provide a net environmental benefit for the SEPP 14 wetland and its fauna assemblage.

The northern wetland on the subject site is of less value in its current condition by virtue of greater levels of existing disturbance including earthworks. However, the proposed industrial subdivision will retain that wetland notwithstanding its modified condition.

With respect to the issues identified in Factor (c) regarding the FWCF community on the subject site at Albion Park and on the basis of the matters considered above:

- there will be only an extremely minor impact "*on the extent of the ecological community*"; and
- the proposed development will not "*substantially and adversely modify the composition of the ecological community*" given the extent of its retention in the immediate vicinity, and the implementation of an environmental management regime on the subject site.

It is to be noted in particular that the relevant consideration pursuant to Factor (c) of s.5A of the TSC Act is whether the "*local occurrence is likely to be placed at risk of extinction*" (emphasis added). It is not sufficient that there be simply some reduction in the extent of the community or a localised increase in impacts, but that the "*local occurrence*" of the FWCF community be "*placed at risk of extinction*" (*ie* obliteration or permanent and total loss).

Factor (d) Habitat Removal, Modification, Fragmentation, Isolation and Importance

With respect to the issues raised in Factor (d) of s.5A in terms of the habitat for the FWCF community:

- the extent of this community "*to be removed or modified as a result of the action proposed*" is extremely limited, and most of the community will be enhanced by the proposal;

- the proposed action at Albion Park will not involve the "*fragmentation or isolation*" of any of the FWCF community. Indeed, implementation of the riparian zone rehabilitation program which is part of the proposed development will reduce fragmentation of this community through the landscape and will increase connectivity between the rehabilitated stands of FWCF on the subject site; and
- the area of FWCF which may be affected by the proposed development at Albion Park is not of "*importance*" to the survival of that community either on the subject site or in the locality in general. The benefits of retention, protection and long-term management of the majority of the subject site would outweigh any adverse impacts which may arise.

Factor (e) Critical Habitat – Direct and Indirect Effects

The TSC Act 1995 defines "*critical habitat*" as "*habitat declared to be critical habitat under Part 3*" of the Act. At the time of this *Report*, no "*critical habitat*" for the FWCF community had been declared.

Factor (f) Recovery Plans and Threat Abatement Plans

There is currently no *Recovery Plan* with respect to the FWCF community.

There are no relevant *Threat Abatement Plans* with respect to the impacts of the development with respect to the FWCF community.

Factor (g) Key Threatening Processes

The only "*key threatening process*" of particular relevance to the FWCF community in this instance is the "*clearing of native vegetation*", although a number of other "*key threatening processes*" may also be (theoretically at least) of relevance to a very limited extent.

With respect to the "*clearing of native vegetation*", virtually all of the FWCF community on the site is to be retained *in situ*, and there is to be a substantial replanting and rehabilitation program of the FWCF community within the CMA on the site. Further, the proposal will specifically avoid the imposition of other "*key threatening processes*" on the FWCF present on the site.

On that basis, "*the action proposed*" will not relevantly "*result in the operation of, or increase the impact of, a key threatening process*".

CONCLUSIONS

The relevant factors which are required to be considered pursuant to s.5A of the EP&A Act in the determination of "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*" are discussed in detail above with respect to the FWCF community.

Given the retention and rehabilitation of the FWCF community on the subject site, the proposed development at Albion Park is not "*likely*" to impose "*a significant effect*" on this "*endangered ecological community*".