

Appendix 9

Flora and Fauna Assessment

**Flora and Fauna Assessment,
Proposed Materials Recycling Facility
Lot 6 D.P. 1065574
Newbridge Road, Moorebank.**

February 2010

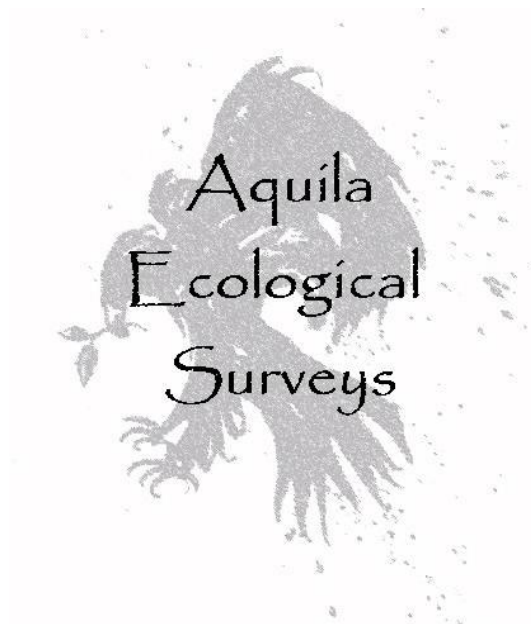


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1. Introduction and Recommendations

Moorebank Recyclers Pty Ltd is proposing to develop a materials recycling facility Lot 6 D.P. 1065574 Newbridge Road, Moorebank. AES was contracted to undertake a fauna and flora assessment of the proposed development site. The aims of this assessment are to:

- Describe the terrestrial fauna and flora of the site
- Determine the ecological impacts of the proposal particularly in relation to threatened species, populations or ecological communities¹, or their habitats as per the Director-general of the Department of Planning's requirements under section 75(f) of the *Environmental Planning and Assessment Act 1979*;
- Determine whether the land is "potential" or "core" koala habitat" with regard to *State Environmental Planning Policy No. 44 (Koala Habitat Protection)*; and
- Determine impacts in relation to the Commonwealth *Environment Protection and Biodiversity Conservation Act (EPBC Act)*, 2000.

As the proposal is being prepared under Part 3A of the *Environmental Planning and Assessment Act 1979*, there is no requirement to assess the proposal in relation Section 5A of the act (the seven-part test) which determines whether there is likely to be significant impact on threatened species, populations or ecological communities, or their habitats and hence whether a Species Impact Statement is required).

The main findings of the assessment are as follows:

- Most of the site is composed of already deposited fill, which is vegetated with introduced weeds and herbs.
- A number of endangered ecological communities listed on the *TSC Act* occur adjacent to the subject site. These are Cooks River- Castlereagh Ironbark Forest, Swamp Oak Floodplain Forest, Shale-Gravel Transition Forest, Castlereagh Swamp Woodland and Riverflat Eucalypt Forest. Of these, Shale/Gravel Transition Forest is part of the *EPBC Act*-listed endangered ecological community Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. As the proposal would be confined to already cleared areas of the site, it is considered unlikely that there would be any impact on these endangered ecological communities.
- No threatened flora species were recorded during the field survey.
- No threatened fauna species were recorded during the field survey. Surrounding woodland and forest habitats are suitable for the following threatened species listed on the *TSC Act*: Grey-headed Flying-fox, Eastern False Pipistrelle, Greater Broad-nosed Bat, Eastern Little Mastiff-bat, Common Bentwing Bat and Cumberland Land Snail. Whilst this is the case the proposed development is unlikely to have any direct or indirect impacts upon these species.
- The land is neither "potential koala habitat" nor "core koala habitat" for the purposes of SEPP 44. A Koala Management Plan need not be prepared.
- Given that environmental safeguards can readily be adopted to protect significant vegetation and fauna habitat adjacent to the project site (see section 6 of this report), it is considered that the proposed development is unlikely to have a significant effect on threatened species, populations or ecological communities, or their habitats.

¹ i.e. those species, populations and communities listed on the *Threatened Species Conservation Act 1995 (TSC Act)*.

- In regard to those endangered ecological communities, threatened species and migratory species listed on the *Environment Protection and Biodiversity Conservation Act*, no matters of National Environmental Significance would be affected. Therefore, referral to the Federal Department of the Environment to determine whether the proposal is a controlled action is not required.

2. Methodology

2.1 Literature Review

Prior to undertaking the field survey a review of literature relevant to the subject site and wider local area and region was undertaken. Documents and databases reviewed included:

- Vegetation mapping of the Cumberland Plain (NPWS 2002a) and subsequent updating of vegetation community descriptions (Tozer 2003);
- Regional vegetation mapping and description (Tozer et al 2006);
- The Western Sydney Urban Bushland Biodiversity Survey (NPWS 2008);
- Point records of the Atlas of NSW Wildlife (DECCW 2009a); and
- Liverpool City Council's Biodiversity Strategy.

2.2 Field Survey

Fieldwork was undertaken on 18 April 2002 using the following methods. The site was revisited on 22 February 2010 to check the accuracy of notes made at that time and to determine whether there had been any significant changes to the site's ecological characteristics.

2.2.1 Vegetation

The vegetation of the site is described based on the dominant tree species and the height and cover of the tree layer following Specht (1970). Plants not readily identified in the field were collected for identification using standard texts. Checks were made against the Schedules 1 and 2 of the Threatened Species Conservation Act, Briggs & Leigh (1995) and James *et al* (1999) for species of conservation significance.

2.2.2 Fauna

The vegetation community descriptions were used to describe the different fauna habitats that occur at the site. The habitat surrounding the site was also investigated to gain an appreciation of the relative importance of the habitat that occurs on the site.

Notes were made of specific sources of native fauna food and shelter, such as dense shrubs, flowering trees, tree hollows and rock outcrops. The presence, or lack, of particular fauna habitat requirements was noted to enable predictions of species that would be likely to utilise the site.

A search was made for indirect evidence of mammal presence such as droppings, burrows, tracks, diggings and bones. Habitat types and the degree of disturbance were assessed to enable predictions of mammal species presence.

A reptile search was undertaken throughout the site. This involved looking under rocks, bark, fallen timber and leaf litter, with particular attention given to rock outcrop areas. Debris found near moist habitats was checked for the presence of frogs and the types of moist habitats present were noted to allow predictions of frog species likely to occur.

A search was undertaken for the threatened Cumberland Land Snail (*Meridolum corneovirens*) by looking under debris and around the bases of trees.

n.b. In regard to threatened species a precautionary approach has been taken i.e. if there are proximate records of the species and suitable habitat present it is assumed that the species inhabits the site at least on an occasional basis.

3. Results

3.1 Literature Review

Vegetation Mapping

In 2002 the NSW National Parks and Wildlife Service completed vegetation mapping of the Cumberland Plain (NPWS 2002a), which includes the subject site. Descriptions of the communities that accompanied this mapping (NPWS 2002b) were updated by Tozer (2003) and both studies were incorporated into mapping and description of south-eastern NSW (Tozer *et al* 2006).

Within and adjacent to the site, the NPWS (2002a) mapping (Figure 1) indicates the presence of the following vegetation communities:

- Cooks River – Castlereagh Ironbark Forest
- Shale/Gravel Transition Forest
- Alluvial Woodland
- Castlereagh Swamp Woodland

This mapping indicates that some of the Alluvial Woodland within the site has a canopy cover of less than 10%. This generally indicates that such vegetation is in a degraded condition.

Cooks River – Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Castlereagh Swamp Woodland are all endangered ecological communities listed under these names on the *TSC Act*. Alluvial Woodland is a component of the *TSC Act*-listed endangered ecological community River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions.

Shale/Gravel Transition Forest is part of the EPBC Act-listed endangered ecological community, Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest.

Figure 1. Vegetation mapping of the site and vicinity (NPWS (2002a)).



Legend

- Cooks River – Castlereagh Ironbark Forest
- Shale/Gravel Transition Forest
- Alluvial Woodland
- Castlereagh Swamp Woodland
- Mangroves/Saltmarsh
- Canopy cover < 10%

Threatened Flora Species

A review of point records of the Atlas of NSW Wildlife (DECCW 2010a) indicated that the following threatened flora species have been detected within a five-kilometre radius of the site.

Table 1. Locally occurring threatened flora species.

Species	EPBC Act	TSC Act	Habitat (DECCW 2010b)
Woronora Beard-heath* <i>Leucopogon exolasius</i>	V	V	Woodland on sandstone along the upper Georges River area and in Heathcote National Park.
Downy Wattle* <i>Acacia pubescens</i>	V	V	Woodland and open forest, in a variety of plant communities, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. Soils are characteristically gravelly soils, often with ironstone.
Spiked Rice-flower * <i>Pimelea spicata</i>	E	E	On the Cumberland Plain associated with Grey Box and Ironbark on well-structured clay soils
<i>Callistemon linearifolius</i> Netted Bottlebrush	V	V	Rock platforms in dry sclerophyll forest on the coast and adjacent ranges.
Small-flower Grevillea <i>Grevillea parviflora</i> subsp. <i>parviflora</i>	V	V	In a range of vegetation types from heath and shrubby woodland to open forest on sandy or light clay soils usually over thin shales.
Nodding Geebung * <i>Persoonia nutans</i>	E	E	Confined to Aeolian and alluvial sediments and occurs in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland.
Hairy Geebung <i>Persoonia hirsuta</i>	E	E	Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.
<i>Pomaderris prunifolia</i>		EP ²	Known from only three sites within the listed local government areas, at Rydalmere, within Rookwood Cemetery and at The Crest of Bankstown.
Narrow-leafed Wilsonia <i>Wilsonia backhousei</i>		V	Saltmarsh
<i>Allocasuarina glauca</i>	E	E	Castlereagh woodland on tertiary alluvial gravels.
Small Pale Grass-lily <i>Caesia parviflora</i> var. <i>minor</i>		E	Heath, woodland and forest on sandstone.

Key

V – Vulnerable; E – Endangered; EP – endangered population.

² in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas.

Threatened Fauna Species

A review of point records of the Atlas of NSW Wildlife (DECCW 2010a) indicated that the following threatened fauna species have been detected within a five-kilometre radius of the site.

Table 2 Locally Occurring Threatened Fauna

Scientific Name	Status		Habitat
	EPBC Act	TSC Act	
Green and Golden Bell Frog <i>Litoria aurea</i> *	V	E	Permanent or ephemeral freshwater ponds with dense fringing vegetation
Red-crowned Toadlet <i>Pseudophryne australis</i>		V	Clean first order streams in heaths, woodlands and forests on sandstone derived soils
Bush Stone-curlew <i>Burhinus grallarius</i>		V	Mangroves, saltmarshes and woodlands; Single record of an injured bird at Condell Park.
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>		V	Wetlands and their margins
Square-tailed Kite <i>Lophoictinia isura</i>		V	Large areas of woodland
Swift Parrot <i>Lathamus discolor</i> *	E	E	Winter migrant feeding on flowering eucalypts and lerp.
Barking Owl <i>Ninox connivens</i>		V	Nests in large tree hollows. Forages in open forest and woodland
Powerful Owl <i>Ninox strenua</i>		V	Nests in large tree hollows. Forages in open forest and woodland
Regent Honeyeater <i>Xanthomyza phrygia</i> *	E	E	Winter migrant feeding on flowering eucalypts and lerp.
Black-chinned Honeyeater <i>Melithreptus gularis</i>		V	Grassy woodlands
Koala <i>Phascolarctos cinereus</i>		V	Forest and woodlands containing suitable eucalypts
Eastern Pygmy-possum <i>Cercartetus nanus</i>		V	Heaths and woodlands
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	V	V	Flowering and fruiting trees
Yellow-bellied Sheath-tail-bat <i>Saccolaimus flaviventris</i>		V	Roosts in tree hollows; forages in forests and woodlands and their margins
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>		V	Roosts in tree hollows; forages in forests and woodlands and their margins
Eastern Little Mastiff-bat <i>Mormopterus norfolkensis</i>		V	Roosts in tree hollows; forages in forests and woodlands and their margins
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>		V	Roosts in tree hollows; forages over forests
Eastern Bent-wing Bat <i>Miniopterus schreibersii oceanensis</i>		V	Roost in caves, mines, tunnels etc; forages over woodlands and forests
Cumberland Land Snail <i>Meridolum corneovirens</i>		E	Intact forests and woodlands on the Cumberland Plain

Key

V – Vulnerable

E – Endangered

3.2 Survey Results

3.2.1 Flora

3.2.1(a) Vegetation Description

The distribution of the vegetation communities on site is illustrated on Figure 2 (overleaf).

Cleared Area

Most of the site is already cleared and covered with a significant depth of fill. Vegetation that has colonised the fill is mostly introduced grasses and weeds such as Kikuyu (*Pennisetum clandestinum*), Paspalum (*Paspalum dilatatum*), Couch (*Cynodon dactylon*) and Cudweed (*Conyza sp.*).

Wattle Scrub

The batter slope east of the cleared area is vegetated with Green Wattle (*Acacia decurrens*) to six metres with occasional Swamp Oak (*Casuarina glauca*) and a dense understorey of introduced shrub and groundcover species.

Ironbark Open Forest

To the west of the site on land owned by Boral Quarries is an extensive stand of open forest dominated by Mugga (*Eucalyptus sideroxylon*), Broad-leaved Ironbark (*E.fibrosa*), Forest Red Gum (*E.tereticornis*) and Woollybutt (*E.longifolia*) with an understorey of Paperbarks (*Melaleuca decora* & *M.nodosa*). A small area of this forest protrudes onto the subject site about 250 metres north of the south-west boundary.

Here there are large Muggas and Forest Red Gum with a Paperbark understorey and grassy groundcover of Three-awn Spear Grass (*Aristida vagans*) and Weeping Meadow Grass (*Microlaena stipoides*). A Parramatta Red Gum (*E.parramattensis*) is also present.

Woollybutt – Blue Box Open Forest

This community occurs along the southern boundary and extends about 100m north along the western boundary. It is composed of Woollybutt, Blue Box (*Eucalyptus baueriana*) and Narrow-leaved Ironbark (*E.crebra*) to 25 metres tall with a small tree layer to 12m of *Melaleuca decora*. The groundcover is dominated by Blackberry (*Rubus ulmifolius*) and Balloon Vine (*Cardiospermum grandiflorum*) to 2m.

Cabbage Gum Open Forest

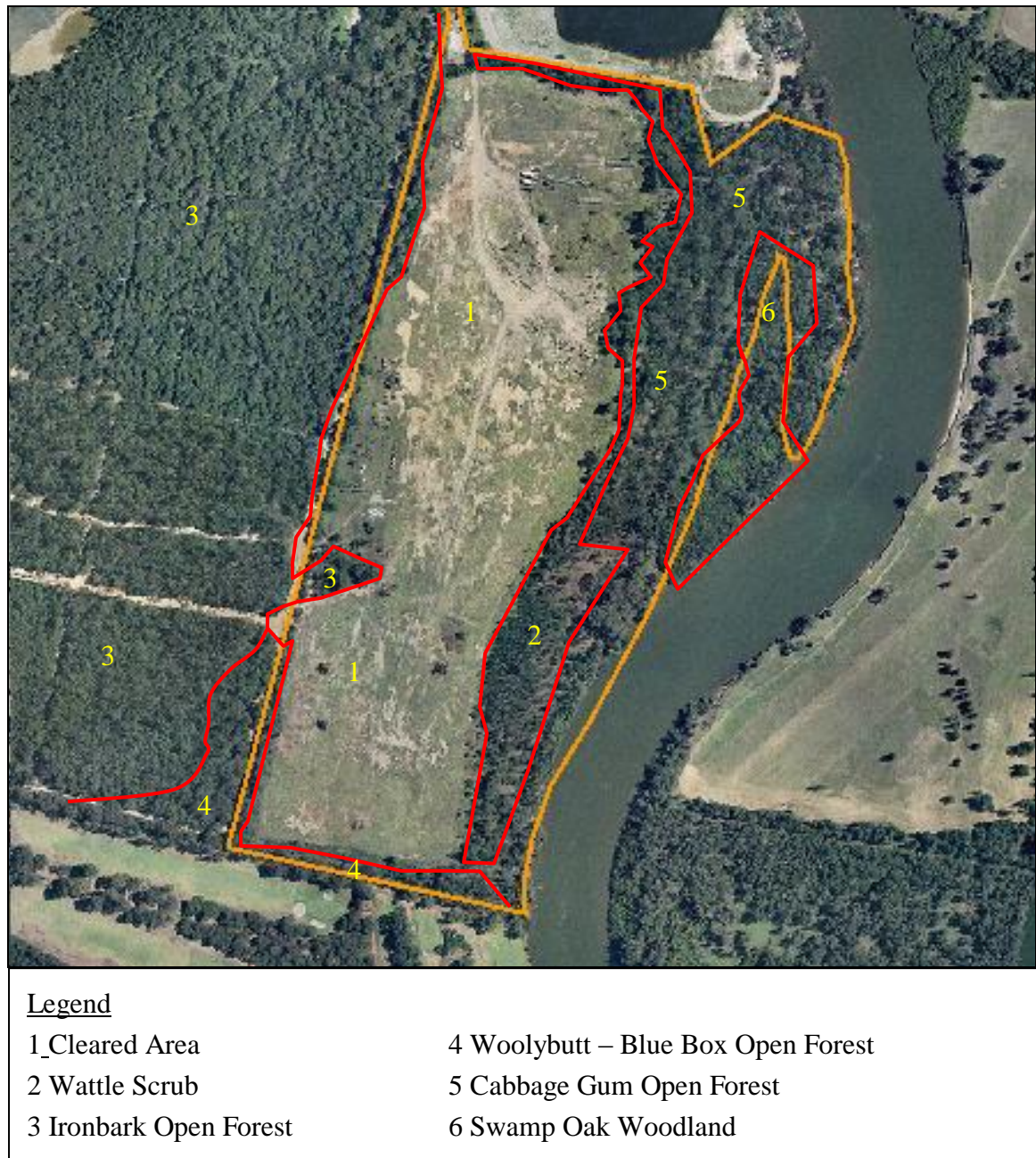
For a distance of about 50 metres east of the Wattle Scrub is an alluvial bench vegetated with open forest dominated by Cabbage Gum (*Eucalyptus amplifolia*) to 22 metres tall along with Grey Box (*E.moluccana*) and Forest Red Gum. There is a small tree layer of Green Wattle (*Acacia decurrens*), Cherry Ballart (*Exocarpus cupressiformis*), *Melaleuca decora*, *M.styphelioides* and Swamp Oak (*Casuarina glauca*).

There is a sparse, discontinuous shrub layer of Blackthorn (*Bursaria spinosa*) to two metres tall. The groundcover includes a variety of native grasses and herbs including Weeping Meadow Grass, Basket Grass (*Oplismenus imbecillis*), *Entolasia marginata* and Scurvy Weed (*Commelina cyanea*).

Weed infestation is moderate to high with African Love Grass (*Eragrostis curvula*), Florists Smilax (*Asparagus asparagoides*), Morning Glory (*Ipomoea indica*) and Balloon Vine (*Cardiospermum grandiflorum*) being common to abundant.

This community also covers the levee bank immediately adjacent to the Georges River.

Figure 2. Vegetation of the site.



Swamp Oak Woodland

Between the Cabbage Gum Open Forest and the river is a swampy, saline depression. This is vegetated with a stand of Swamp Oak to 18 metres tall above Sea Rush (*Juncus kraussii*) and

Native Reed (*Phragmites australis*). Other saltmarsh plants, such as Austral Seablite (*Suaeda australis*) and Sea Celery (*Apium prostratum*), are also present.

3.2.1(b) Conservation Significance of the Vegetation

The Woollybutt – Blue Box Open Forest and Ironbark Open Forest are examples of Castlereagh Ironbark Forest of NPWS (2002b) and Tozer (2003). Castlereagh Ironbark Forest is an endangered ecological community listed on the *TSC Act* as Cooks River-Castlereagh Ironbark Forest.

The Cabbage Gum Open Forest is an example of Alluvial Woodland of NPWS (2002b) and Tozer (2003). Alluvial Woodland is a component of the *TSC Act*-listed endangered ecological community Riverflat eucalypt Forest on Coastal Floodplains.

Swamp Oak Woodland is also part of the Alluvial Woodland of NPWS (2002b) and Tozer (2003). However, due to the dominance of Swamp oak, it is part of the *TSC Act*-listed endangered ecological community Swamp oak floodplain forest³

3.2.1(c) Threatened Flora Species

No threatened flora species were detected at the subject site. In relation to those threatened species listed in Table 1, none are considered likely to be present in the soil seedbank as most of the site is heavily modified and what remains intact is small in area.

3.2.2 Fauna

3.2.2(a) Fauna Habitat

As most of the site is cleared and heavily modified it is only able to support a narrow range of fauna species. These are mostly birds that are either introduced or native species adapted to open habitats.

The woodland and open forest habitats that surround the site have a number of features that favour habitation by a range of fauna species. These are:

- Hollows and cavities in some of the large trees, which could be used by insectivorous bats, arboreal marsupials, and a wide range of birds.
- Patches of dense understorey vegetation provide protective cover for small birds.
- Large trees providing roosting area for birds of prey. During the field survey a Peregrine Falcon (*Falco peregrinus*) was detected in one of the Muggas in the Ironbark Forest and a White-bellied Sea-eagle (*Haliaeetus leucogaster*) in a Cabbage Gum in the River-flat Forest.
- Depressions in the Cabbage Gum Open Forest may fill with rainwater and form small, ephemeral ponds suitable for habitat by some frog species. The Mosquito Fish (*Gambusia affinis*) was detected in local freshwater ponds, precluding the likelihood of the threatened Green and Golden Bell occurring.

³ of the NSW North Coast, Sydney Basin and South East Corner bioregions.

3.2.2(b) Threatened Fauna

No threatened fauna species were detected during the field survey.

It is considered likely that a number of those forest and woodland-dependent species listed in Table 2 would occur in the adjoining forest and woodland. However, as the proposed development is confined to already cleared areas of the site, it is unlikely to have any impact on such habitats or their component species.

4. Impacts of the Proposed Development

4.1 Environmental Planning & Assessment Act

Developments assessed under Part 3A of the *Environmental Planning & Assessment Act* are exempt from the provisions of the *Threatened Species Conservation Act*. i.e. there is no requirement to undertake seven-part tests (Section 5A of the EP&A Act) to determine whether a proposed development would have a significant effect on threatened species, populations or communities, or their habitat.

Instead, draft guidelines for threatened species assessment have been prepared by DEC (now DECCW) & DPI (2005). The objective of the assessment process is to provide information to enable decision makers to ensure that developments deliver the following environmental outcomes:

1. Maintain or improve biodiversity values (i.e. there is no net impact on threatened species or native vegetation).
2. Conserve biological diversity and promote ecologically sustainable development.
3. Protect areas of high conservation value (including areas of critical habitat).
4. Prevent the extinction of threatened species.
5. Protect the long-term viability of local populations of a species, population or ecological community.
6. Protect aspects of the environment that are matters of national environmental significance.

The proposed development would be confined to already cleared or modified areas of the site. The only vegetation removal would be along the access road where some small Swamp Oaks, Cabbage Gums and Melaleucas that have established along the disturbed edges. Therefore, it is considered that the required environmental outcomes would be achieved.

Access from Brickmakers Drive would require the construction of an access road through an area of intact native vegetation characterised by a canopy of Cabbage Gum, Swamp Oak and *Melaleuca decora* above Saw Sedge (*Gahnia clarkei*) and Cumbungi (*Typha orientalis*). It is therefore part of the *TSC Act*-listed endangered ecological community River-flat eucalypt forest on coastal floodplains. However, as part of the Liverpool City Council Strategy for the development of the Moorebank Precinct, Council has determined that this section of the Precinct is that preferred for access to Brickmakers Drive by landowners to the east. This has been designed in close consultation with the then DEC. Therefore, the impacts of this facet of the proposed development have not been assessed in this report.

4.2 State Environmental Planning Policy No. 44 (Koala Habitat Protection)

SEPP 44 aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.

Schedule 1 of this policy lists the local government areas affected by it. Liverpool Local Government Area is included in Schedule 1. Under Part 2 Clause 7 of the SEPP an assessment of the proposed development was undertaken to ascertain its suitability as Koala habitat. The procedures involved in such an assessment are outlined in SEPP 44 - Koala Habitat Protection.

Step 1 - Is the land potential Koala habitat? - No

Under the definitions of the policy "Potential koala habitat" means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.

Forest Red Gum is the only tree species on site which is listed in Schedule 2 of the SEPP. It constitutes less than 15% of the trees occurring on the land. Therefore, under the SEPP, there is no need to proceed to Step 2 to determine whether the land is "core koala habitat" [i.e. an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population]. Regardless of the "15% rule", no evidence of a resident population of the species was found on the land.

Therefore, the Proposal may proceed without a plan of management being prepared for the Koala.

4.3 Environment Protection and Biodiversity Conservation Act

No biota listed as matters of National Environmental Significance occur or are likely to occur at the site.

5. Environmental Management Measures and Safeguards

To minimise the likelihood of the proposed development having any impacts on those State and Commonwealth listed endangered ecological communities that adjoin the site (and associated fauna habitats), the following measures are recommended:

- erection and maintenance of sediment control fences along the eastern edge of the previous landfill area
- vegetating the batters of the disturbed area of the site with locally occurring native plant species
- continued suppression of weeds in the previous landfill area.

References

Briggs, J.D., & Leigh, J.H., (1995), *Rare or Threatened Australian Plants*. CSIRO Publishing, Collingwood.

Department of Environment and Conservation & Department of Primary Industries (2005) *Draft Guidelines for Threatened Species Assessment*. DEC & DPI.

Department of Environment, Climate Change and Water (2010a) *Atlas of NSW Wildlife: Point records for the Penrith 1:100,000 map sheet*. NSW Department of Environment and Climate Change, Hurstville, NSW.

Department of Environment, Climate Change and Water (2010b) *Threatened species, populations and ecological communities*. http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_species.aspx. [Accessed February 2010].

James, T., McDougall, L. & Benson, D.H. (1999), *Rare Bushland Plants of Western Sydney*. Royal Botanic Gardens, Sydney.

NPWS (2002b), *Interpretation Guidelines for the Native Vegetation of the Cumberland Plain, Western Sydney*. NSW National Parks and Wildlife Service, Hurstville.



Neil Kennan
Nexus Environmental Planning Pty Ltd
PO Box 212
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15/02/2013

Re Proposed Materials Recycling Facility Lot 6 D.P. 1065574, Newbridge Road, Moorebank.

Dear Neil

Thank you for forwarding the letter from Liverpool City Council to the Department of Planning and Infrastructure detailing their concerns regarding the Draft Environmental Assessment of the above site.

In relation to the Flora and Fauna Assessment report (FFA) I prepared in 2010 (Aquila Ecological Surveys 2010), Council raises the following issues:

- An up to date assessment should be undertaken that gives due consideration to the *Draft Threatened Biodiversity Survey and Assessment: Guidelines for development and activities* (Department Environment and Conservation 2004);

Response

Given the nature of the proposal and the cleared nature of the site within which it is proposed, it is considered that the level of survey undertaken was adequate. An updated report that considers any changes to threatened species listings could be prepared but it is considered unlikely that there would be any change to the conclusion that the proposal is unlikely to have a significant effect on threatened species, populations, communities, or their habitats.

- Clarification of whether an area of Ironbark Open Forest described on Page 7 of the FFA would be cleared;

Response

As mentioned on Page 10 of the FFA, “the proposed development would be confined to already cleared or modified areas of the site.” The area of Ironbark Open Forest would be retained.

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- Whether remnant shrubs and/or trees within the cleared area are native and whether they represent habitat;

Response

Some native shrubs do occur within the cleared area. However, they only represent limited habitat for native fauna species as they are fragmented from larger intact areas of habitat.

- The need to assess the likely impact of the proposal on the White-bellied Sea-eagle, which is listed as migratory on the *Environment Protection and Biodiversity Conservation Act 1999* and is therefore a matter of national environmental significance;

Response

It is agreed that impacts on this species in relation to the EPBC Act should have been assessed in the FFA. An assessment following the Commonwealth Government's Guidelines is attached at the rear of this letter.

- In relation to the Green and Golden Bell Frog, a species listed as endangered on the *Threatened Species Conservation Act 1995 and the EPBC Act*, a consideration of the direct and indirect impacts of the proposal on the species and proposed mitigation measures;

Response

In the FFA it was stated "Depressions in the Cabbage Gum Open Forest may fill with rainwater and form small, ephemeral ponds suitable for habitat by some frog species. The Mosquito Fish (*Gambusia affinis*) was detected in local freshwater ponds, precluding the likelihood of the threatened Green and Golden Bell occurring."

It could be argued that the presence of Mosquito Fish reduces the likelihood of the presence of the Green and Golden Bell Frog rather than precluding it. Therefore, assessments of likely impacts on this species are also attached at the rear of this letter.

It is still considered that the proposal is unlikely to have a significant effect on this species. Nevertheless, bio-retention swales proposed to treat stormwater run-off from the site (Evans and Peck 2010) could be enhanced as Green and Golden Bell Frog habitat by the placement of protective cover such as woody debris, rocks or even concrete to provide protective cover.

- and that the FFA draws on any relevant control plans for the Environmental Management Plan.

Response

Should it be considered necessary, the FFA can readily be amended to represent relevant site control plans.

In summary, it is considered that the requirements of Liverpool City Council can be readily met and do not alter the conclusion that the proposal is unlikely to have a significant effect on threatened species, populations or communities listed on the *TSC Act* or Matters of National Environmental Significance listed on the *EPBC Act*.

Yours Truly

A handwritten signature in black ink, reading "Paul Burcher". The script is fluid and cursive, with the first name "Paul" and last name "Burcher" clearly distinguishable.

Paul Burcher

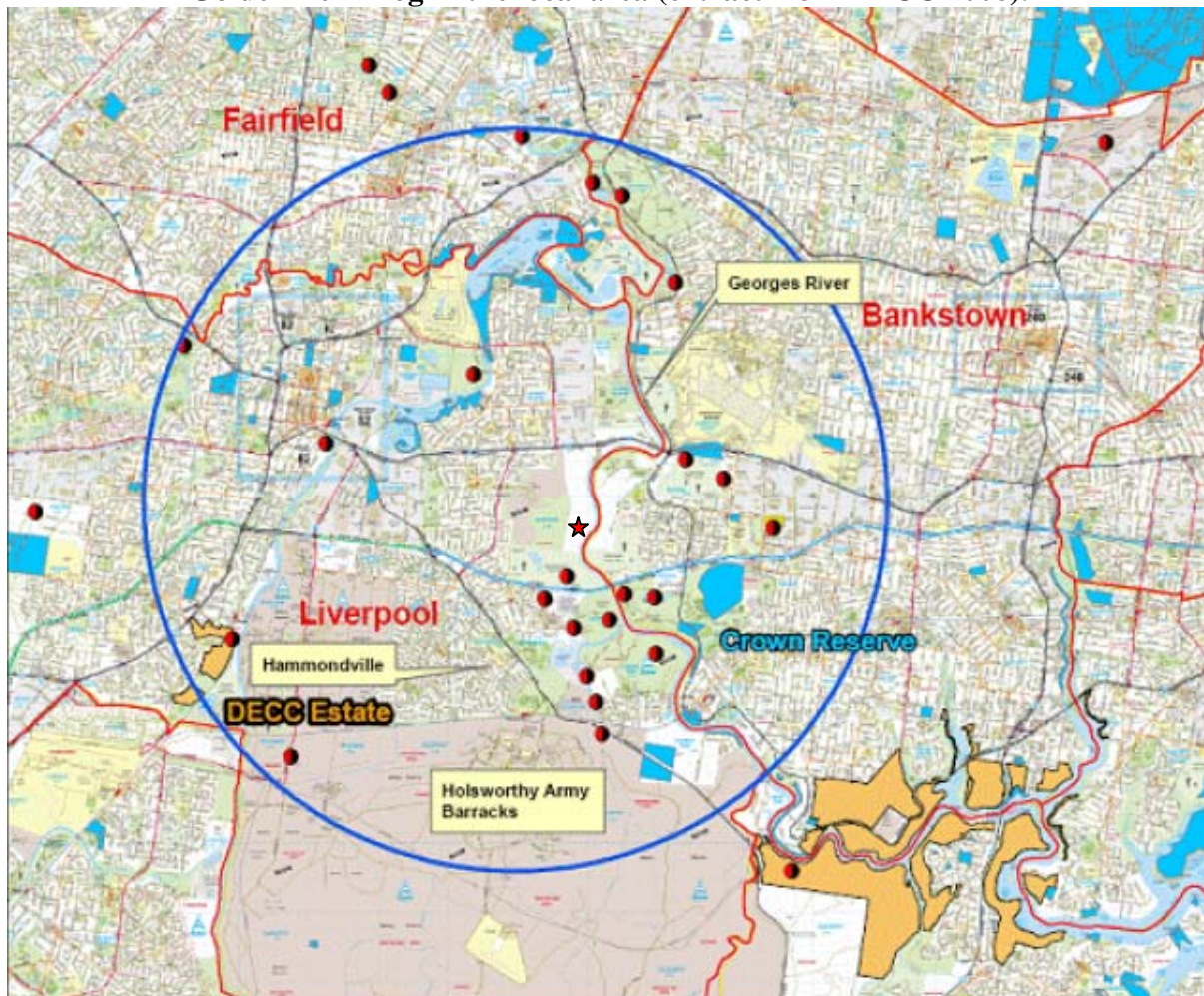
5. Environmental Assessments

5.1 Environmental Planning & Assessment Act 1979

(a) *in the case of a 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,*

The local population of the Green and Golden Bell Frog (GGBF) is considered to be the population covered by the management plan for the Georges River Green and Golden Bell Frog Key Population (DECC 2008). The known GGBF population on the lower Georges River occurs in several locations, including in the vicinity of the wetlands at Hammondville, at Holsworthy and East Hills, and along Prospect Creek and Orphan School Creek. The subject site is located between records of the species in New Brighton Golf Course (1993) and Bankstown Golf Course (1964 and 1980).

Figure 1. Subject Site (red star) in relation to known occurrences of the Green and Golden Bell Frog in the local area (extract from DECC 2008).



It is considered unlikely that the local population permanently inhabits the subject site.

Therefore, it is considered that the local population would not be placed at risk of extinction should the proposed action proceed.

(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,

As the Green and Golden Bell Frog is listed as an endangered species, no populations of the species are eligible for listing as endangered.

(c) in the case of a critically endangered or 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,

The Green and Golden Bell Frog is a threatened species, not an endangered ecological community.

(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,

The proposed action would not affect any known or potential habitat of the species.

(ii) and whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action,

Possible corridors for movement for the species occurs either side of the site. To the east is Cabbage Gum Open forest adjacent to the Georges River that includes ponding areas. To the west is the former Boral property which is well vegetated providing protective cover. The proposed action would be undertaken on already cleared land and would not affect the functioning of these corridors either directly or indirectly.

(iii) and 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,

Very little habitat would be removed by the proposed action. It is considered that the habitat to be removed is not important to the long-term survival of the species in the locality.

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

The subject site does not contain, nor is it in proximity to, any area of critical habitat.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

As mentioned previously, a recovery plan has been prepared for the Georges River Key population of the species, the duration of which was mid-2008 to mid-2011 (DECC 2008). The three objectives of the Georges River Green and Golden Bell Frog Management Plan were

- 1 To maintain the GGBF population and its outliers;
2. Where possible enhance existing GGBF habitat and thus measures of population viability; and
3. To increase connectivity within and between sub-populations.

It is considered that the proposed development is consistent with the objectives of the plan. Opportunities arise from landscaping of the site to improve habitat for the species.

(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.*

The Georges River Green and Golden Bell Frog Management Plan (DECC (2008) mentions a number Listed Key Threatening Processes that affect the local population of this species. They are ‘Predation by the Plague Minnow (*Gambusia holbrooki*),’ ‘High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition,’ ‘Predation by the European Red Fox *Vulpes vulpes* (Linnaeus 1758),’ ‘Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands’ and ‘Anthropogenic Climate Change’ and (inter alia) ‘Clearing of native vegetation¹.’ Apart from Anthropogenic Climate Change, which almost every development contributes to, it is considered unlikely that the proposed action would result in the operation of, or increase the impact of, these key threatening processes.

Furthermore, the management plan lists specific developments that are a threat to the Georges River population of the species. The subject development is not amongst those mentioned even though the original application predates the management plan.

7-part test Conclusion

On the basis of the above discussion, it is considered unlikely that the proposed action would have a significant effect on the Green and Golden Bell Frog, or its habitat. Therefore, a Species Impact Statement need not accompany the development application.

Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Green and Golden Bell Frog

The Green and Golden Bell Frog is listed as vulnerable on the *EPBC Act*. As such it is a Matter of National Environment Significance and there is a requirement to assess impacts on the species with regard to the Significant Impact Guidelines that accompany the Act (Australian Government 2009a).

Under these guidelines an action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population² of a species;*

¹ The management plan discusses habitat loss, which may or may not involve Clearing of native vegetation.

² An important population is a population that is necessary for a species’ long-term survival and recovery. This may include populations identified as such in recovery plans and/or that are:

- Key source populations either for breeding or dispersal;
- Populations that are necessary for maintain genetic diversity; and/or
- Populations that are near the limit of the species range.

A precautionary approach has been taken that considers the local population an important population.

It is considered unlikely that the local population inhabits the area proposed for development. Some potential habitat occurs within the Cabbage Gum Open Forest to the east which has some ponding areas. The proposed action would not diminish the potential for this area to provide habitat for the species. Therefore, the proposed action is unlikely to lead to a long-term decrease in the size of the population.

- *reduce the area of occupancy of an important population;*

The area proposed for the action is not a confirmed area of occupancy of the species nor is it likely to be habitat for the species. Therefore, the area of occupancy of the population would not be reduced

- *fragment an existing important population into two or more populations;*

A possible corridor of movement for the species occurs through forested land adjacent to the Georges River and in former Boral property to the west. The proposed action would not interfere with the functionality of either of these corridors that maintain possible links between individuals that occur to the south and north of the site.

- *adversely affect habitat critical to the survival of a species;*

It is considered unlikely that the subject site is critical to the survival of the species.

- *disrupt the breeding cycle of an important population;*

It is considered unlikely that the proposed action would disrupt the population's breeding cycle. There is very limited pond habitat on site and, apart from regularly slashed grass, little or no protective cover.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;*

It is considered unlikely that the proposed action would modify, destroy, remove or isolate or decrease the availability or quality of any habitat. The species is unlikely to decline as a result of the proposal.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;*

The invasive Plague Minnow is a threat to the Green and Golden Bell Frog. The species is already present in potential habitat in the Cabbage Gum Open Forest area of the site that would remain unaffected by the proposal.

- *introduce disease that may cause the species to decline;*

The Green and Golden Bell Frog is susceptible to the *Chytrid* fungus. It is unlikely that the proposed action would result in introduction of this disease into the population.

- *or interfere substantially with the recovery of the species.*

Given its location within already heavily modified land, and the scope and extent of the proposed action, it is considered that it would not interfere with the recovery of this species.

EPBC Act Conclusion

The significant impact guidelines for this particular species (Australian Government 2009b) state that “there is a possibility of a significant impact on the green and golden bell frog, and a referral under the *EPBC Act* should be considered, if the action results in:

1. the removal or degradation of aquatic or ephemeral habitat either where the green and golden bell frog has been recorded since 1995 or habitat that has been assessed as being suitable according to these guidelines. This can include impacts from chytrid, (and) *Gambusia* originating off-site;
2. the removal or degradation of terrestrial habitat within 200 metres of habitat identified in threshold 1; and
3. breaking the continuity of vegetation fringing ephemeral or permanent waterways or other vegetated corridors linking habitats meeting the criteria in threshold 1.

The guidelines also state that these thresholds are not considered prescriptive and significant impact judgements must be made on a case-by-case basis and with consideration for the context of the action.

It is considered that there would be no removal of potential habitat nor disruption to any potential corridors for movement adjacent to the area proposed for the action. Therefore, referral to the Federal Minister for the Environment to determine whether the proposal is a controlled action is considered unnecessary.

White-bellied Sea-eagle

The White-bellied Sea-eagle was detected in habitat adjacent to the area proposed for the action. The species is listed as migratory on the *EPBC Act*. As such it is a Matter of National Environment Significance and there is a requirement to assess impacts on the species with regard to the Significant Impact Guidelines that accompany the Act (Australian Government 2009a).

Under these guidelines an action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- *substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles; or altering hydrological cycles), destroy or isolate an area of important habitat³ for a migratory species;*

The White-bellied Sea-eagle was detected during the site survey in the Cabbage Gum Open Forest adjacent to the area proposed for the action. As the area proposed for the action is largely cleared, it is unlikely to be inhabited by the species. It is unclear whether habitat

³ An area of ‘important habitat’ for a migratory species is:

- a. habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or
- b. habitat that is of critical importance to the species at particular life-cycle stages, and/or
- c. habitat utilised by a migratory species which is at the limit of the species range, and/or
- d. habitat within an area where the species is declining.

adjacent to the site along the Georges River is “important habitat” for the White-bellied Sea-eagle.

In the short-term repulsion species may avoid this habitat area due to noise associated with site activity. However, as the species is already apparently accustomed to human activity, as evidenced by its habitation of the busy Georges River, it is considered likely that it would return to previously occupied habitat adjacent to the site. Therefore, it is unlikely that substantial modification, destruction or isolation of habitat would occur.

- *result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or*

The proposed action is unlikely to result in further introduction of invasive species into the White-bellied Sea-eagle’s habitat.

- *seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.*

No evidence of breeding (e.g. large stick nests) was observed in the Cabbage Gum Open Forest during the site survey. Whilst there may be some short-term disruption to resting (roosting) and possibly feeding behaviour as a result of the proposed action (due to , it is considered unlikely that this would seriously disrupt the lifecycle of the White-bellied Sea-eagle.

It is considered unlikely that the proposed action would have a significant impact on the White-bellied Sea-eagle. Therefore, referral to the Federal Minister for the Environment to determine whether the proposal is a controlled action is considered unnecessary.

References

Australian Government (2009a) *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*. <http://www.environment.gov.au/epbc/publications/neg-guidelines.html>

Australian Government (2009b) *Significant impact guidelines for the vulnerable green and golden bell frog (Litoria aurea). Nationally threatened species and ecological communities EPBC Act policy statement 3.19*. <http://www.environment.gov.au/epbc/publications/pubs/litoria-aurea-policy.pdf>

Department of Environment and Climate Change [DECC] (2008). *Management Plan for the Green and Golden Bell Frog Key Population of the Georges River*. Department of Environment and Climate Change (NSW), Sydney.

Evans and Peck (2010) *Materials Recycling Facility Newbridge Road, Moorebank Water Management and Pollution Control Assessment*. Report prepared for Nexus Environmental Planning Pty Ltd.