INTERNAL MEMORANDUM

PROJECT NAME Hopeland Industry Licence Support **PROJECT NUMBER** EP14-057(01)

DATE 24/11/2014 **PURPOSE** Baseline survey of flora, vegetation and wetland values present within Lot 371 Hopelands Road, Hopelands

CIRCULATION Jason Hick and Kirsten Knox

DETAILS OF MEMORANDUM

Introduction

Lot 371 Hopeland Road in Hopeland ('the site') is owned by Goodfeel Enterprises Pty Ltd and portions of the site are proposed for sand extraction purposes. This memorandum was prepared to document the results of a baseline, Level 1 flora and vegetation assessment (in accordance with EPA Guidance Statement Number 51 - *Terrestrial flora and vegetation surveys for environmental impact assessment in Western Australia* (EPA 2004)) and an assessment of the wetland values present.

Background

Regional Soils and Landform

The site occurs on the Swan Coastal Plain which is a geomorphic entity approximately 20-30 km wide. The site forms part of the Southern River geomorphological unit, which comprise sandplains with low dunes and many intervening swamps; iron and humus podzols, peats and clays (Churchward and McArthur 1980). The Southern River unit occurs at the junction of the Bassendean and Guildford major geological systems (Playford *et al.* 1976).

Regional vegetation

The site lies within the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) region (Thackway and Cresswell 1995). The Swan Coastal Plain IBRA region is broadly compatible with the Swan Coastal Plain (Drummond Botanical Subdistrict) Phytogeographical Subregion as described by Beard (1990). This region is characterised by *Banksia* low woodlands on leached sands, woodlands of tuart (*Eucalyptus gomphocephala*), jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) on less leached soils and *Melaleuca* swamps.

At a local level, vegetation complex mapping for the Swan Coastal Plain undertaken by Heddle *et al.* (1980) indicates that the site is mapped within the Southern River vegetation complex. Vegetation complex mapping is based on soil, geomorphology and water availability patterns. The Southern River complex is described as containing 'open woodland of *Corymbia calophylla - Eucalyptus marginata - Banksia* spp. with fringing woodland of *Eucalyptus rudis - Melaleuca rhaphiophylla* along creek beds' (Heddle *et al.* 1980).

Remnant vegetation extent according to vegetation complexes statistics have been published by the Local Biodiversity Program through the Western Australian Local Government Association (WALGA). These statistics indicate that the pre-European extent of the Southern River complex on the Swan Coastal Plain was 57,171 ha. As of 2013, 11,255 ha (19.7%) of this remains and 6.6% is under some form of protection. Review of aerial photography indicates that there is virtually no intact plant communities remaining within the site thus there is no remaining representation of this vegetation complex.

Significant Flora Species

At a state level, plant species acquire 'Threatened' or 'Priority' conservation status where populations are restricted geographically or threatened by local processes. DPaW recognise these threats and subsequently considers population protection and species conservation. DPaW enforces the *Wildlife Conservation Act 1950* (WC Act) to conserve Threatened flora and protect all populations. Threatened flora are gazetted under subsection 2 of section 23F of the WC Act and it is an offence to "take" or damage rare flora without Ministerial approval. Section 23F of the Act defines "to take" as "... to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora to cause or permit the same to be done by any means".

Priority flora species are potentially rare or threatened and are classified in order of threat, however are not afforded direct statutory protection. The definition and categories of Threatened and Priority Flora are listed in **Table 1**.

Table 1: Definition of Threatened and Priority Flora Species (Smith 2010)

CONSERVATION CODE	CATEGORY
T	Threatened Flora – Extant Taxa Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.
X	Threatened Flora – Presumed Extinct Taxa Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such.
P1	Priority One – Poorly Known Taxa Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat e.g. road verges, urban areas, farmland, active mineral leases etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	Priority Two – Poorly Known Taxa Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but urgently need further survey.
P3	Priority Three – Poorly Known Taxa Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but needs further survey.
P4	Priority Four – Rare Taxa Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

A search was conducted of DPaW's databases for Threatened and Priority Flora and the EPBC Act list of Matters of National Environmental Significance (MNES) that occur within the wider local area and the results are listed in **Table 2**.

Table 2: Significant flora species known to occur within the general area (DPaW 2014; DoE 2014).

Note: T=Threatened, V=Vulnerable, CE=Critically Endangered, E=Endangered, P=Perennial, Pg=Perennial Geophyte, A=Annual, AA=Aquatic Annual.

SPECIES	LEVEL OF SIGNIFICANCE		LIFE STRATEGY	HABITAT	FLOWERING PERIOD
	STATE	EPBC ACT			
Andersonia gracilis	T	E	P	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	Sep-Nov
Caladenia huegelii	T	-	Pg	Grey or brown sand, clay loam.	Sep-Oct
Centrolepis caespitosa	P4	E	A	White sand, clay. Salt flats, wet areas.	Oct-Dec
Darwinia foetida	T	CE	P	Sandy flats. Most to dry.	Sep-Nov
Diuris micrantha	T	V	Pg	Brown loamy clay. Winter-wet swamps, in shallow water.	Sep-Oct
Diuris purdiei	T	E	Pg	Grey-black sand, moist. Winter-wet swamps.	Sep-Oct
Drakaea elastica	T	E	Pg	White or grey sand. Low-lying situations adjoining winter-wet swamps.	Oct-Nov
Eucalyptus balanites	T	E	P	Sandy soils with lateritic gravel.	Oct-Dec or Jan-Feb
Lasiopetalum pterocarpum	T	E	P	Dark red-brown loam or clayey sand over granite. On sloping banks near creeklines.	Aug-Dec
Lepidosperma rostratum	T	E		Peaty sand, clay.	Jun-Jul or Sep-Nov
Stylidium longitubum	P3	-	A	Sandy clay, clay. Seasonal wetlands.	Oct-Dec
Synaphea stenoloba	T	E	P	Sandy or sandy clay soils. Winter-wet flats, granite.	Aug-Oct
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	T	CE	P	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland.	Oct
Synaphea sp. Pinjarra Plain (A.S. George 17182)	T	-	P	Grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains.	Sep-Nov
Synaphea sp. Serpentine (G.R. Brand 103)	T	-	P	Flat areas in or adjacent to winter wetlands. Yellow/brown sand/clay soils.	Sep-Oct
Tetraria australiensis	T	V	P	Sandy flats or plains. Moist or winter wet to well drained.	Nov-Dec
Thelymitra stellata	T	E	Pg	Sand, gravel, lateritic loam.	Oct-Nov
Verticordia lindleyi subsp. *lindleyi*	P4	-	P	Sand, sandy clay. Winter-wet depressions.	May or Nov-Dec or Jan

Threatened Ecological Communities (TEC's) and Priority Ecological Communities (PEC's)

In Western Australia, Threatened Ecological Communities (TECs) are determined by the Western Australian Threatened Ecological Communities Scientific Advisory Committee (WATECSAC) and endorsed by the Minister for the Environment. The WATECSAC is an independent group comprised of representatives from organisations including tertiary institutions, WA Museum and DPaW. Communities can be assigned to one of the categories

outlined in **Table 3** relating to their status of threat. While they are not afforded direct statutory protection at a state level (unlike Threatened Flora under the WC Act) their significance is acknowledged through other state environmental policies and approval processes such as Environmental Impact Assessment pursuant to Part IV of the *Environmental Protection Act 1986* (EP Act) and the Part V EP Act Clearing Regulations.

In addition to listing as a TEC, a community may be listed as a Priority Ecological Community (PEC). This is an ecological community that is under consideration for listing as a TEC, but does not yet meet survey criteria or has not been adequately defined, and can be placed on the list of PECs in either Category 1, 2 or 3 (these are described in **Table 4**). Ecological communities that are adequately known and are rare but not threatened, or meet criteria for "Near Threatened", or that have been recently removed from the Threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation dependent ecological communities are placed in Priority 5 (DEC 2009).

Threatened Communities are afforded statutory protection at a Federal level pursuant to the EPBC Act. The EPBC Act provides for the protection of ecological communities, which are listed under section 181 of the Act. They are categorised as 'Critically Endangered', 'Endangered' or 'Vulnerable'.

Table 3: Categories of Threatened Ecological Communities (English and Blyth 1997)

CONSERVATION CATEGORY	DESCRIPTION
PD	Presumably Totally Destroyed An ecological community that has been adequately searched for but for which no representative occurrences have been located.
CE	Critically Endangered An ecological community that has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
E	Endangered An ecological community that has been adequately surveyed and is not critically endangered but is facing a very high risk of total destruction in the near future.
V	Vulnerable An ecological community that has been adequately surveyed and is not critically endangered or endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future.

Table 4: Categories of Priority Ecological Communities (DEC 2009)

PRIORITY CATEGORIES	DESCRIPTION
Priority 1	Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2	Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority 3	Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (i) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; (ii) communities made up of large, and/or widespread occurrences, that may or not be represented in

PRIORITY CATEGORIES	DESCRIPTION
	the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
Priority 4	Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened or that have been recently removed from the threatened list. These communities require regular monitoring.
Priority 5	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Selected TECs are also afforded statutory protection at a Federal level pursuant to the EPBC Act. The EPBC Act provides for the protection of TECs, which are listed under section 181 of the EPBC Act, and are defined as "Critically Endangered", "Endangered" or "Vulnerable" under Section 182.

A search was conducted of the EPBC Act list of MNES which indicated the presence of three federally listed TECs within 5 km of the site. These are listed in **Table 5**. Comparisons with state listed TECs and PECs have been undertaken based on the vegetation present within the site.

Table 5: Federally listed TEC's within the wider local area

COMMUNITY CODE	COMMUNITY NAME	TEC/PEC	LEVEL OF SIGNIFICANCE	
			STATE	FEDERAL
SCP 3a	*Corymbia calophylla - Kingia australis* woodlands on heavy soils of the Swan Coastal Plain	TEC	T	E
SCP 3c	*Corymbia calophylla - Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain	TEC	T	E
SCP 07	SCP 07 - Herb rich saline shrublands in clay pans (included within Claypans of the Swan Coastal Plain under the EPBC Act)	TEC	T	CE
SCP 08	Herb rich shrublands in clay pans (included within Claypans of the Swan Coastal Plain under the EPBC Act)	TEC	T	CE
SCP 09	Dense shrublands on clay flats (included within Claypans of the Swan Coastal Plain under the EPBC Act)	TEC	T	CE
SCP10a	Shrublands on dry clay flats (included within Claypans of the Swan Coastal Plain under the EPBC Act)	TEC	T	CE

Wetlands

Wetlands in Western Australia are defined as "*areas of seasonally, intermittently or permanently waterlogged soils or inundated land, whether natural or otherwise, fresh and saline, e.g. waterlogged soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and the tributaries*" (Wetlands Advisory Committee 1977). This definition has been adopted by Semeniuk (1987) and by V & C Semeniuk Group for the purposes of wetland mapping and classification on the Swan Coastal Plain (Hill *et al.* 1996).

DPaW (formally known as Department of Environment and Conservation) digitised the original Hill *et al.* (1996) mapping to form the Geomorphic Wetland Swan Coastal Plain Dataset, which categorises the individual wetlands into specific management categories as described in **Table 6**.

Table 6: Wetland management categories and management objectives (WAPC 2005)

MANAGEMENT CATEGORY	DESCRIPTION OF WETLAND	MANAGEMENT OBJECTIVES
Conservation (CCW)	Supports high levels of attributes and functions	Preserve wetland attributes and functions through reservation in national parks, crown reserves and state owned land. Protection provided under environmental protection policies.
Resource Enhancement (REW)	Partially modified but still supporting substantial functions and attributes	Restore wetland through maintenance and enhancement of wetland functions and attributes. Protection via crown reserves, state or local government owned land, environmental protection policies and sustainable management on private properties.
Multiple Use (MUW)	Few wetland attributes but still provide important hydrological functions	Use, development and management considered in the context of water, town and environmental planning through land care.

A review of the area indicates the presence of part of two mapped Geomorphic Wetlands within the Geomorphic Wetlands of the Swan Coastal Plain dataset; there were Resource Enhancement Wetland (REW) Unique Feature Identifier (UFI) No. 15364 (a dampland) and Multiple Use Wetland (MUW) UFI 15785 (a palusplain) (DPaW 2014). The wetlands within the site are shown on **Figure 1** and **2**.

REW UFI No. 15364 is an extensive wetland occupying 2635 ha extending out to the east of the site. Review of aerial photography indicates that much of the area covered by this REW retains limited native vegetation.

The wetlands within the site form part of the Bennett Brook consanguineous suite, of which 7.7% is classified as Conservation Category Wetlands (CCWs) (DPaW 2013).

Fauna Habitat

In addition, three small areas on the periphery of the site to the north and south are mapped as potentially containing Carnaby's black cockatoo foraging habitat (DEC 2011). These identified patches of potential Carnaby's black cockatoo foraging habitat extend and cover larger areas of intact vegetation that occur to the north and south of the site, as shown on **Figure 1** and **2**.

Methodology

A botanist and environmental consultant and from Emerge Associates visited the site on 22 October 2014 to undertake an assessment of the flora, vegetation and wetland values present within the site. The site was traversed by vehicle and on foot and vegetation present within the site was recorded and mapped. Relevant site features were photographed.

The condition of the vegetation was assessed to assist in determining the conservation values of the site. The vegetation condition was rated according to Keighery (1994), a vegetation condition scale commonly used in the Perth Metropolitan Region, but which is also appropriate for other urban and peri-urban areas. The categories are listed and defined in **Table 7** (Keighery 1994).

Table 7: Vegetation Condition Scale (Keighery 1994).

VEGETATION CONDITION	DEFINITION
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing

VEGETATION CONDITION	DEFINITION
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Survey Results

Flora

The native species listed in **Table 8** were recorded within the site. No Threatened or Priority Flora species were found to occur within the site, nor are any considered likely to occur due to the high level of historical disturbance and widespread weed invasion which has resulted in the removal of almost all native understorey species.

Table 8: Native flora species recorded within the site.

Note: [1] denotes species that are likely to have been planted.

FAMILY	SPECIES	CONSERVATION SIGNIFICANCE
Dasypogonaceae	*Kingia australis*	Not threatened
Myrtaceae	*Corymbia calophylla*	Not threatened
	Eucalyptus gomphocephala[1]	Not threatened
	Eucalyptus marginata	Not threatened
	Eucalyptus rudis	Not threatened
	Melaleuca preissiana	Not threatened
Juncaceae	*Juncus pallidus*	Not threatened
Proteaceae	*Banksia attenuata*	Not threatened
	Xylomelum occidentale	Not threatened

Vegetation

The site visit indicated the presence of numerous areas containing native flora species across the site. The vast majority of these areas however consisted of 'Parkland Cleared' native trees over a pasture weed dominated understorey and were thus not considered to constitute 'intact' plant communities. The areas of vegetation within the site are described below and shown on **Figure 1**.

- **CcMpJp** - Open woodland of *Corymbia calophylla* and *Melaleuca preissiana* over sedgeland of *Juncus pallidus* and forbland of pasture weeds (**Plate 1**).
- **MpJp** - Remnant *Melaleuca preissiana* over scattered patches of *Juncus pallidus* over pasture weeds (**Plate 2**).

- **CcMp** - Remnant *Corymbia calophylla* and *Melaleuca preissiana* over pasture weeds (**Plate 3**).
- **EgCc** - Remnant/Planted *Eucalyptus gomphocephala* and *Corymbia calophylla* over pasture weeds (**Plate 4**).
- **Er** - Remnant *Eucalyptus rudis* over pasture weeds (**Plate 5**).
- **Cc** - Remnant *Corymbia calophylla* over pasture weeds (**Plate 6**).
- **Em** - Remnant *Eucalyptus marginata* over pasture weeds (**Plate 7**).
- **EmAf** - Remnant *Eucalyptus marginata* with occasional *Allocasuarina fraseriana* and *Xylomelum occidentale* over pasture weeds (**Plate 8**).
- **P** - Planted non-endemic trees over pasture weeds (**Plate 9**).

An additional vegetation type was noted just outside of the eastern site boundary adjacent to Hopelands Road and was described as **CcMpKa** - Remnant *Corymbia calophylla* and *Melaleuca preissiana* with occasional *Kingia australis* over pasture weeds (**Plate 10**). This vegetation type is likely to have once represented FCT 3a – *Corymbia calophylla – Kingia australis woodlands on heavy soils* which is a state and federally listed TEC, however was in 'Degraded' condition and thus is unlikely to currently represent this TEC.

Owing to the significantly compromised condition, no vegetation types within the site can be determined or considered likely to represent any other TECs or PECs.

Plate 1: Vegetation type **CcMpJp** n 'Degraded' condition.

Plate 2: Vegetation type **MpJp** in 'Degraded' to 'Completely Degraded' condition.

Plate 3: Vegetation type **CcMp** in 'Degraded' condition.

Plate 4: Vegetation type **EgCc** in 'Completely Degraded' condition.

Plate 5: Vegetation type **Er** in 'Completely Degraded' condition.

Plate 6: Vegetation type **Cc** in 'Completely Degraded' condition.

Plate 7: Vegetation Type **Em** in 'Completely Degraded' condition.

Plate 8: Vegetation type **EmAf.** in 'Completely Degraded' condition.

Plate 9: Vegetation type **P** in 'Completely Degraded' condition.

Plate 10: Vegetation Type **CcMpKa in 'Degraded' condition**.

Vegetation Condition

The majority of the site was considered to be in 'Completely Degraded' condition owing to historical clearing and extensive grazing that has resulted in the removal of most native flora species. The 'Completely Degraded' areas of the site include some areas containing scattered or isolated native trees such as *Corymbia calophylla, Melaleuca preissiana* and *Eucalyptus marginata*. Some small scattered patches were considered to be in 'Degraded' condition, as they contained several native species comprising both the overstorey and understorey layers and in which native flora species were not isolated occurrences. The areas of 'Degraded' vegetation comprise remnant *Melaleuca preissiana* over scattered patches of *Juncus pallidus* over pasture weeds, open

woodland of *Eucalyptus rudis* and *Melaleuca preissiana* over sedgeland of *Juncus pallidus* and remnant *Corymbia calophylla* and *Melaleuca preissiana* over pasture weeds. No vegetation was considered to be in 'Good' or better condition. Vegetation condition across the site is shown on **Figure 2**.

Wetlands

The portion of REW UFI No. 15364 within the site was largely in 'Completely Degraded' condition, excepting some small patches of vegetation type **CcMpJp** and **MpJp**. The vegetation type **CcMpKa** occurred just to the west of the site and was within the mapped extent of REW UFI No. 15364.

Based on the evaluation of the wetland values of the portion of REW UFI No. 15364 within the site using DPaW's evaluation methodology (DPaW 2013), the wetland did not meet any of the preliminary evaluation criteria (which would lead to an automatic assignment of CCW) thus the secondary evaluation was used. Given the large size of the REW, it was deemed acceptable to evaluate the section of the wetland just within the site. The secondary evaluation led to a score of:

- Three high level attributes
- Four intermediate level attributes
- Eight low level attributes.

The three high level attributes are all at the regional scale and related to:

- <20% of wetlands in the same consanguineous suite (Bennett Brook) are assigned Conservation by area
- <20% of wetlands of the same type (dampland) in the same consanguineous suite (Bennett Brook) are assigned Conservation by area
- The wetland is identified in a vegetation complex (Southern River Complex) which is represented by <30% of the pre-European extent.

Due to the condition of the wetland area and the historic loss of virtually all native wetland vegetation, the portion of REW UFI No. 15364 does not reflect any of these high level values. The most appropriate management category for the portion of REW UFI No. 15364 within the site was considered to be MUW based on the results of the evaluation.

Fauna Habitat

The small patches of the site mapped as containing potential Carnaby's black cockatoo foraging habitat occurring on the periphery of the site (shown on **Figure 1** and **2**) were in 'Degraded' or 'Completely Degraded' condition. The southern area contained largely planted non-native trees (vegetation type **P**), with a small area containing vegetation type **EgCc** in 'Degraded' condition (containing five native trees). The north-eastern patch includes a small area of vegetation type **CcMp** in 'Degraded' condition, whilst the north western patch includes one *Eucalyptus marginata* tree on the periphery of the site, this area was in 'Completely Degraded' condition. Much more significant potential foraging habitat occurs to the north and south of the site which is more likely to be used by species of black cockatoo.

Outside of the mapped potential foraging habitat, the site contained a number of tree species that are commonly foraged by species of black cockatoo (c. 26 *Eucalyptus marginata*, three *Eucalyptus gomphocephala* and c. 15 *Corymbia calophylla*); however these were contained within Parkland Cleared, 'Completely Degraded' vegetation, with the remnant trees all that remained of the original plant assemblages. A number of these trees had a Diameter at Breast Height (DBH) greater than 500 mm, and thus could potentially be used for breeding by

species of black cockatoo; however again these were located within areas of 'Completely Degraded' vegetation and were not associated with intact foraging habitat likely to support a population of black cockatoos.

Foraging evidence on *Corymbia calophylla* fruit within the site was predominantly from the common Red-capped parrot, with some old foraging evidence noted from the forest red-tailed black cockatoo within vegetation type **EgCc** in the south eastern corner of the site, this area contained three *Eucalyptus gomphocephala* and two *Corymbia calophylla* trees). Vegetation type **CcMpKa** located outside of the site along Hopelands Road was found to contain foraging evidence on *Corymbia calophylla* fruit from all three species of black cockatoo (Carnaby's, Baudin's and Forest red-tailed black cockatoo).

Discussion

No Threatened or Priority Flora species, TECs or PECs are considered likely to occur within the site due to the high level of historic disturbance and the loss of the vast majority of flora species and intact vegetation structure. The most intact vegetation within the site was in 'Degraded' condition.

Eucalyptus gomphocephala (Tuart) was recorded in the south eastern corner of the site, represented by three large individuals. This species is largely restricted to the two coastal Aeolian dune systems, the Quindalup Dunes and the Spearwood Dunes, however outlying population shave been recorded near the Murray, Serpentine, Swan and Canning Rivers. Given this distribution, the Tuart trees within the site are unlikely to be remnant. They are however, very large trees that would have been planted between 50-100 years ago.

Whilst REW UFI No. 15364 contains its original soils and topography and is thus is likely to retain some hydrological function (such as flood attenuation, recharge/discharge and hydrological storage), the wetland vegetation has been almost completely removed, with occasional remnant trees and some small patches in 'Degraded' condition all that remains. As such, MUW is considered to the most representative wetland classification. The portion of this REW extending outside of the site to the east is similarly highly disturbed and is largely used for agricultural purposes.

Whilst species of black cockatoo have the potential to utilise the remnant trees within the site for foraging and potentially also for roosting and breeding, these trees are unlikely to constitute a large proportion of habitat, and the adjacent patches of vegetation, to the north and south of the site, are far more likely to be utilised.

Conclusions

Based on this baseline assessment, the site was not considered to contain any significant values related to flora, vegetation and wetlands. Similarly, whilst a targeted fauna assessment has not been undertaken over the site, it is not considered likely that the site is used by any fauna species to any high degree owing to the loss of virtually all intact vegetation.

Figures

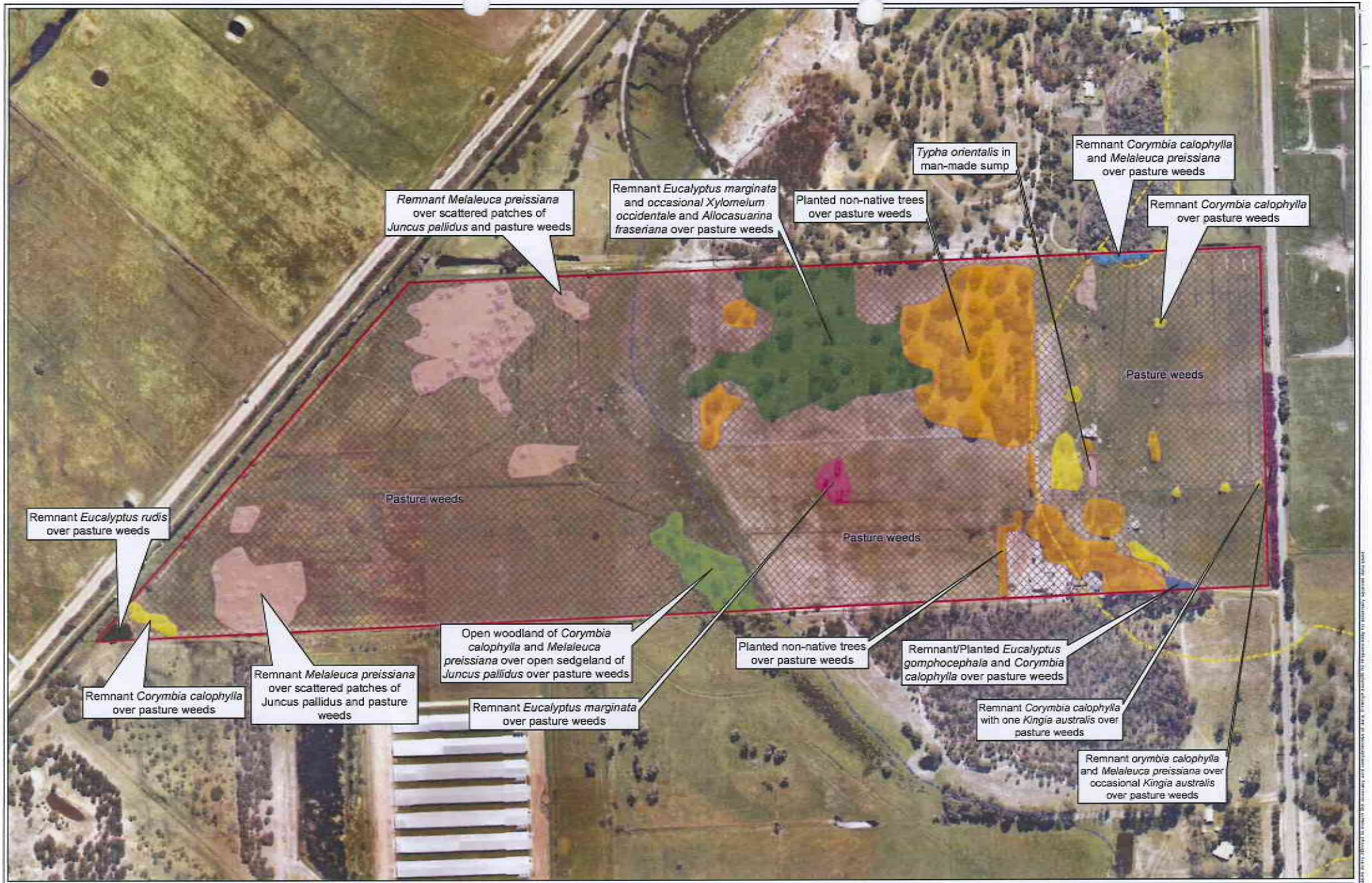

Figure 1:	Vegetation
Project:	Lot 311 Hopelands Road Extractive Industry Licence Support
Client:	Goodfeel Enterprises Pty Ltd

Legend

- Site boundary
- CBC potential foraging habitat requiring investigation

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use

Plan Number: EP14-057[01]–WD02		
Drawn:	GRO	Date: 21/10/14
Approved:	JDH	Date: 26/11/14
Checked:	SKP	Scale: 1:4,000@A3

emerge ASSOCIATES

Figure 2:	Vegetation Condition	Plan Number: EP14-057(01)--WD03	
Project:	Lot 311 Hopelands Road Extractive Industry Licence Support	Drawn: GRD	Date: 21/10/14
		Approved: JDH	Date: 26/11/14
Client:	Goodfeel Enterprises Pty Ltd	Checked: SKP	Scale: 1:4,000@A3

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