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**Date:** 27/02/2018  
**Our Ref:** 136556  
**Via:** Letter

Attn: Mitchell Sovechles  
Sovechles Nominees Pty Ltd  
PO Box 3131  
Merewether NSW 2291

Dear Mr Sovechles

**NEW LPG STORAGE FACILITY, 130 CORMORANT ROAD, KOORAGANG (PART LOT 1 DP 1195449):  
Biodiversity Impact Assessment**

This Biodiversity Impact Assessment has been prepared to address the submission made by the Office of Environment and Heritage (OEH) in respect of State Significant Development (SSD) 8448; as detailed in their letter dated 16 October 2017. This submission recommends that biodiversity impacts related to the proposed development should be assessed and documented in accordance with the Framework for Biodiversity Assessment (FBA) by a person accredited in accordance with s142B(1)(c) of the NSW *Threatened Species Conservation Act* 1995 (TSC Act). This report has been prepared by Mr Mark Aitkens (accreditation number 0101) of RPS to address the assessment recommendations made by OEH.

## 1 Method

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### 1.1 Overview

Preliminary vegetation mapping was generated from available desktop resources prior to site inspection (i.e. regional vegetation mapping and recent aerial imagery). A preliminary 'likelihood of occurrence' analysis was generated for threatened biodiversity listed under the TSC Act using available databases, spatial datasets and preliminary vegetation mapping. Preliminary vegetation typing/ boundary definition and likelihood of occurrence analysis was field validated following a site investigation performed on 14 December 2017 by Mr Mark Aitkens B.Sc. (Accredited BioBanking Assessor). Key constraints were identified and mapped. Impact avoidance, minimisation and mitigation principles were considered and applied, as and where required by the Framework for Biodiversity Assessment (OEH 2014a), to determine residual impacts for assessment. If required, a biodiversity offset liability was calculated and reported.







## 1.2 Preliminary Investigations

### 1.2.1 Vegetation Mapping

The following spatial datasets were interrogated to evaluate landscape context, preliminary native vegetation typing and estimate adjacent patch size and condition for vegetation cover occurring within the site:

- Regional vegetation mapping (NPWS 2000);
- Mitchell Landscapes (NPWS 2003); and
- IBRA Region and subregion mapping (IBRA7).
- The latest aerial photography.

The mapping of preliminary vegetation zones involved the assignment of notional Plant Community Type (PCT) and condition state in preparation for field validation.

### 1.2.2 Desktop Database Search

A review of relevant information was performed to gain an appreciation of the biodiversity values that may occur within the site. Information sources reviewed included:

- Fauna and flora records contained in the Office of Environment and Heritage (OEH) BioNet atlas (OEH 2017a) (accessed December 2017); and
- Online OEH BioBanking Credit Calculator (accessed December 2017) after having regard for matters specified in **Section 1.2.1**.

A preliminary 'likelihood of occurrence' assessment was produced from this information to provide a framework for determining investigation methods necessary for performing an adequate site investigation. The planning of site surveys had regard for various guidelines such as *NSW Guide to Surveying Threatened Plants* (OEH 2016).

### 1.2.3 Likelihood of Occurrence Analysis

The list of threatened species, populations and ecological communities (threatened biodiversity) identified as potentially occurring was determined through a likelihood of occurrence analysis. Five 'likelihood of occurrence' categories were attributed to threatened biodiversity. Habitat descriptions were generally taken from the online Threatened Species Profile Database (TSPD) (OEH 2017b). The categories are outlined in **Table 1**.

**Table 1 Likelihood of Occurrence Criteria**

Likelihood Rating	Threatened Fauna	Threatened Flora
None	Suitable habitat is absent from the study area.	
Low	It is unlikely that the species would occur or inhabit the study area due to the absence of broad and specific habitat values. While the species may be an occasional visitor (i.e. random incidence), the species is not likely to be dependent on apparent habitat values (i.e. for breeding or important life cycle periods). If present, the species is likely to be very infrequent and inconsequential.	Species specific habitat is not present in the study area and/ or species not detected.

Likelihood Rating	Threatened Fauna	Threatened Flora
Moderate	Potential habitat is present in the study area. Species unlikely to maintain sedentary populations; however may seasonally use resources on an opportunistic basis. The species is unlikely to be dependent on habitat within the study area (i.e. for breeding or important life cycle periods), or habitat is in a modified or degraded state.	Potential habitat is present in the study area. The species is unlikely to be dependent on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were seasonally targeted by surveys and were not recorded.
High	It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (i.e. for breeding or important life cycle periods) and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration.	It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (i.e. for reproduction) and is known or likely to maintain resident populations in the study area.
Known	The species was observed in the study area during the current survey.	

## 1.3 Field surveys

### 1.3.1 BioBanking Plots

BioBanking plots were performed in accordance with the BioBanking Assessment Methodology (OEH 2014b), as varied by the FBA (OEH 2014a), for the purpose of:

- Classifying and describing PCTs; and
- Delineating condition against published benchmark states (i.e. vegetation zones).

Each survey location was selected randomly within each vegetation zone. A 50 m transect was measured from the chosen location. A 20 x 20 m plot was then measured using the central line of the transect. Transects were used to assess the site attributes. The following attributes were measured along the transect and 50 x 20 m plot:

- Native over-storey cover (NOS);
- Native mid-storey cover (NMS);
- Native ground cover (grasses) (NGCG);
- Native ground cover (shrubs) (NGCS);
- Native ground cover (other) (NGCO);
- Exotic plant cover (ES);
- Over-storey regeneration (OR);
- Fallen logs (FL); and
- Number of tree hollows (NTH).

Full floristics (DEC 2004) were measured within each 20 x 20 m plot:

- Native plant species richness (NPSR);
- Exotic plant species richness;

- Native species percent cover; and
- Native species abundance.

One BioBanking plot was completed on 14 December 2017 at the location shown in **Figure 2**.

### 1.3.2 Targeted Flora Search

A Random Meander (Cropper 1993) was performed to supplement flora survey results obtained from the BioBanking plot and to perform targeted surveys for threatened flora species. The path of the random meander performed on 14 December 2017 is shown in **Figure 2**.

### 1.3.3 Opportunistic observations

Opportunistic sightings and secondary indications (scratches, scats, diggings, tracks etc.) of resident fauna were noted. Such indicators included:

- Distinctive scats left by mammals;
- Scratch marks made by various types of arboreal animals;
- Nests made by various guilds of birds;
- Feeding scars on Eucalyptus trees made by Gliders;
- Whitewash, regurgitation pellets and prey remains from Owls;
- Aural recognition of bird and frog calls;
- Skeletal material of vertebrate fauna; and
- Searches for indirect evidence of fauna (such as scats, nests, burrows, hollows, tracks, and diggings).

Any scats or pellets collected on-site were sent to Barbara Triggs at “Dead Finish” for analysis.

### 1.3.4 Habitat Survey

Habitat surveys included an assessment of condition and value of habitat present across the study area. Significant fauna habitat features including hollow-bearing trees, hollow logs and termite nests were identified and noted. This was undertaken to evaluate areas of the proposal that may include resident fauna. The assessment also considered the potential value of the study area (and surrounds) for all major guilds of native flora and fauna.

Habitat assessment for threatened species known to occur or with the potential to occur in the area was based on the specific habitat requirements of each threatened fauna species in regards to home range, feeding, roosting, breeding, movement patterns and corridor requirements. Consideration was given to contributing factors including topography, soil, light and hydrology for threatened flora and assemblages.

## 1.4 Analysis

### 1.4.1 Revision of Preliminary Investigations

The site inspection results were used to revise/ update preliminary findings produced from **Section 1.2** to produce revisions of:

- Native vegetation mapping (i.e. extent and cover) including the vegetation zones; and
- Likelihood of occurrence analysis.





TITLE : **FIGURE 2: BIOBANKING PLOT AND FLORA SURVEY**

LOCATION : **KOORAGANG**

DATUM:GDA 1994

DATE : **27/02/2018**

VERSION (PLAN BY): AA3 (mark.aitkens)

PROJECTION: GDA 1994 MGA Zone 56

PURPOSE: **PLANNING**

PATH: J:\OBS\136k\136556 Kooragang\10 - Drafting\Arcgis Map Documents\Ecol\136556 Fig 2 Flora Plot A A3 20180208.mxd

CLIENT: **SOVECHLES NOMINEES PTY LTD**  
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## 1.4.2 Impact Intensity

Project related direct and indirect impacts on field validated biodiversity values were quantified in a manner consistent with FBA (i.e. vegetation zones and species polygons). Opportunities to deliver impact avoidance and minimisation are investigated prior to finalisation of development design. Residual impacts on biodiversity matters requiring offsets are defined in accordance with Section 9.4.1 of the FBA.

## 1.5 Impact Assessment

A report prepared in accordance with stages 1, 2 and 3 of FBA 2014 (OEH 2014a) is provided for matters deemed to require biodiversity offsets. A Stage 2 and 3 assessment is not required in circumstances where the Stage 1 assessment identifies no impact on threatened biodiversity or their habitats.

## 2 Results

### 2.1 Vegetation Cover

Aerial photography interpretation identified most of the site to comprise vegetation cover in a heterogeneous state (i.e. planted trees, shrubs and sparse to dense groundcover); this being generally consistent with the prior history of earthworks and fill emplacement (i.e. up to 3.2 m of sand emplaced on clay) (RCA Australia 2014). Based on cover characteristics (i.e. texture and colour), soils (i.e. sand) and proximity to the coast, one vegetation zone was preliminarily mapped and notionally assigned to the 'Heathland' formation and BVT HU530 "*Coast Banksia - Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion*". The results obtained from the BioBanking plot are provided in **Table 2** together with benchmark data for HU530.

**Table 2 BioMetric Plot Data**

Plot Number	NPSR	NOS (%)	NMS (%)	NGCG (%)	NGCS (%)	NGCO (%)	ES (%)	OR	FL (m)	NTH
1	3	0	0	38	0	0	58	0	0	0
Benchmark	≥7	40-86	16-56	2-20	16-80	15-30	0	1	≥0	≥0

The BioBanking plot performed clearly shows the vegetation cover to be dominated by exotic vegetation (58%) notably *Acacia saligna*<sup>1</sup>, *Eragrostis curvula*\* and *Plantago lanceolata*\*. The percent cover of native species (38%) was less than the exotic cover with observed species including *Cynodon dactylon*, *Dichondra repens* and *Eragrostis leptostachya*. The three native species observed were distinctly heterogeneous in their distribution. Further these species are not characteristic of HU530 or any other published BVT description. No area of an endangered ecological community (EEC) or critically endangered ecological community (CEEC) occurs within the site.

<sup>1</sup> Identified as exotic by the online Flora of NSW (<http://plantnet.rbgsyd.nsw.gov.au/floraonline.htm>)

As per the FBA definition for 'vegetation zone', it is considered that the vegetation cover assessed on site does not qualify for mapping as a vegetation zone that would otherwise require further assessment. As such, there are no vegetation zones comprising native vegetation present within the site.

## 2.2 Threatened Species

Targeted searches for threatened flora species and fauna habitat were performed for species identified by the BBCC as listed in **Table 3** where considered to have a likelihood of occurrence. The likelihood of occurrence is provided in **Appendix A**.

**Table 3 Site Survey Detail**

Common name	Scientific name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Charmhaven Apple	<i>Angophora inopina</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eastern Pygmy-possum	<i>Cercartetus nanus</i>												
Green and Golden Bell Frog	<i>Litoria aurea</i>	Yes	Yes	Yes							Yes	Yes	Yes
Koala	<i>Phascolarctos cinereus</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regent Honeyeater	<i>Anthochaera phrygia</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

As described in **Section 2.1**, the vegetation cover mapped within the site is not classed as native. Following close inspection, it was also determined that the vegetation cover does not comprise any habitat for the species listed in **Table 3**, as indicated in the likelihood of occurrence in **Appendix A**. No further targeted surveys were required to determine the Projects need for biodiversity offsets.

## 3 Assessment

### 3.1 Vegetation Zones

According to Section 9.4.1 of the FBA, biodiversity offsets are not required for vegetation cover that is not native or vegetation zones with a condition score below 17 and is not a listed threatened ecological community. Vegetation cover described in **Section 2.1** does not qualify for mapping as a vegetation zone, as defined in the FBA, and as such, there is no requirement to determine biodiversity offsets for the Project.

### 3.2 Threatened Species

Irrespective of the findings of **Section 3.1**, there remains potential for the need to calculate biodiversity offsets for species not predicted by BVTs (i.e. species credits). Habitat assessment determined the site to not contain any habitat for the species listed in **Table 3**. As such it is considered that the Project will not impact on a threatened species requiring offsets under the FBA.



## 4 Conclusions

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The site comprises exotic vegetation inconsistent with the definition for 'vegetation zone' as provided in FBA 2014. No area of vegetation cover identified within the site is consistent with a published description for native vegetation types naturally occurring within NSW. Further, none of the site habitat values are considered important for threatened species listed in **Table 3**. Under Section 9.4.1 of the FBA, biodiversity offsets are not required in circumstances where there are no vegetation zones or habitat for a threatened species. Further assessment in accordance with Stages 2 and 3 of the FBA are not reported as no biodiversity offsets are required for this project.

Yours sincerely

**RPS**



**Mark Aitkens**

Principal Ecologist

## 5 References

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- Cropper, S.C. (1993) Management of Endangered Plants. CSIRO Publications Victoria.
- NPWS (2000). *Vegetation Survey and Mapping - Lower Hunter and Central Coast Region*. Report prepared for the Lower Hunter and Central Coast Regional Environment Management Strategy, Version 1.1 April 2000. 178pp
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(<http://www.environment.nsw.gov.au/resources/threatenedspecies/160129-threatened-plants-survey-guide.pdf>)
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- RCA Australia (2014). Geotechnical Investigation Lot 10 and Part Lot 11 DP1195449, CNR OF EGRET STREET & CORMORANT ROAD, KOORAGANG ISLAND. Unpublished report prepared for Sovechles Development, Merewether.

## Appendix A Likelihood of Occurrence

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## Likelihood of Occurrence

Scientific Name	TSC Act	EPBC Act	Habitat	Likelihood of Occurrence
<i>Phascogale tapoatafa</i> (Brush-tailed Phascogale)	V	-	The Brush-tailed Phascogale has a patchy distribution around the coast of Australia. In NSW it is mainly found east of the Great Dividing Range although there are occasional records west of the divide. Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest.	None. Suitable habitat is absent from the study area.
<i>Angophora inopina</i>	V	V	Endemic to the Central Coast region of NSW. The known northern limit is near Karuah where a disjunct population occurs; to the south populations extend from Toronto to Charmhaven with the main population occurring between Charmhaven and Morisset. Occurs most frequently in red bloodwood – scribbly gum woodland, wet heath, red mahogany – paperbark sedge woodland and stringybark – red bloodwood forest.	None. Suitable habitat is absent from the study area.
<i>Cercartetus nanus</i> (Eastern Pygmy-possum)	V	-	Inhabits rainforest through to sclerophyll forest and tree heath. Banksias and myrtaceous shrubs and trees are a favoured food source. Will often nest in tree hollows, but can also construct its own nest. Because of its small size it is able to utilise a range of hollow sizes including very small hollows. Individuals will use a number of different hollows and an individual has been recorded using up to 9 nest sites within a 0.5 ha area over a 5 month period.	None. Suitable habitat is absent from the study area.
Green and Golden Bell Frog ( <i>Litoria aurea</i> )	E	V	Inhabits a very wide range of water bodies including marshes, dams and streams, particularly those containing emergent vegetation such as bullrushes or spikerushes. It also inhabits numerous types of man-made water bodies including quarries and sand extraction sites. Optimum habitat includes water-bodies that are un-shaded, free of predatory fish such as Plague Minnow, have a grassy area nearby and diurnal sheltering sites available.	None. Suitable habitat is absent from the study area.
<i>Anthochaera phrygia</i> (Regent Honeyeater)	CE	CE, M	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. The distribution of the species has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests.	None. Suitable habitat is absent from the study area.
<i>Phascolarctos cinereus</i> (Koala)	V	V	Inhabits eucalypt forests and woodlands. The suitability of these forests for habitation depends on the size and species of trees present, soil nutrients, climate and rainfall.	None. Suitable habitat is absent from the study area.