

25 June 2019

Ethos Urban
c/o CBRE Project Management
Lvl 21, 363 George Street
Sydney NSW 2000
Attention: Hamish Rolls, Project Manager, CBRE (Hamish.Rolls@cbre.com.au)

Re: BDAR for NMH Stage 2 SSI Application 9775 - FINAL

Dear Hamish

Background

Health Infrastructure (HI) have received Stage 1 concept approval under the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the New Maitland Hospital (NMH) State Significant Infrastructure (SSI) application. HI have subsequently received the SEARs for the NMH Stage 2 works (detailed design, construction and operation) from the NSW Department of Planning and Environment (DPE). The Stage 2 SEARs notes that biodiversity impacts related to the proposed development are to be assessed in accordance with the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR).

HI have subsequently commissioned Sclerophyll Flora Surveys and Research Pty Ltd (Sclerophyll) to prepare a BDAR to support the Stage 2 SSI application. This letter report thus serves as the Stage 2 NMH BDAR.

Environmental Setting

The Stage 2 NMH development site boundary comprises Lot 7314 and Part Lot 401 DP 755237 contained within a portion of the former PGH/CSR brickworks site known as the Metford Triangle. The development site is 19.73 hectares in area and consists of a construction site with extensive earthworks associated with the Stage 1 NMH early works, a narrow strip of roadside open forest along Metford Road (south of the main hospital entrance) and adjoining open forest along the site's south-western and southern boundaries.

The development site is situated within the North Coast botanical subdivision (Anderson 1961), the Sydney Basin Bioregion (Thackway and Cresswell 1995), Newcastle Coastal Ramp Mitchell Landscape and Maitland City Council LGA.

The study area is mapped as being underlain with the Beresfield soil landscape group, comprising Permian-aged siltstone, mudstone and sandstone-derived silts, clays and sands. This regional mapping is generally consistent with site observations of clay topsoils and siltstone-mudstone rock outcropping.

The western portion of the development site drains to the west to Two-Mile Creek whilst the central and eastern portion drains to the east to an unnamed tributary of Three Mile Gully, which, in turn, all flow

northward to the Morpeth and Tenambit wetlands on the northern side of the main northern railway line, ultimately discharging into the Hunter River.

Land use surrounding the study area comprises the remaining portion of the former quarry and brickworks site (Metford Triangle) to the east and immediate north; transmission line easement and Metford residential suburb to the south; Metford light industrial area and Fieldsend Oval to the west; main northern railway line and Tenambit and Morpeth wetlands to the distant north.

Site context and development site plans are shown in **Figure 1** and **Figure 2**, respectively.

Description of the Proposal

A summary description of the Stage 2 NMH SSI proposal is provided below:

- Construction and operation of a new 7 storey Acute Services Building, including;
 - Emergency services;
 - Medical, surgical, paediatric and maternity services;
 - Critical care services for adults and babies, including a special care nursery;
 - Operating theatres, delivery suites and assessment rooms;
 - Palliative care and rehabilitation services;
 - Mental health services;
 - Satellite renal dialysis;
 - A new chemotherapy service;
 - Oral health service;
 - A range of ambulatory care and outpatient clinics.
- Internal roadways and car parking for staff, patients and visitors;
- Signage;
- Site landscaping and open space improvements;
- Tree removal; and
- Utility and services connection and amplifications works.

Streamlined Assessment Module (Small area development)

Appendix 2 of the BAM allows proposals to use the ‘streamlined assessment module-small area development’ if it meets the following 2 criteria:

- The development site is not mapped on the State-wide biodiversity values map (BV map); and

- Native vegetation clearing associated with the proposal falls below the maximum clearing thresholds prescribed for minimum lot sizes as listed in Table 13 Appendix 2 of the BAM.

Results from a desktop review revealed that the proposed Stage 2 clearing extent (0.76 ha) falls well below the maximum clearing threshold of 5 ha for the 40ha minimum lot size mapped for the 2 development site lots, as ascertained from Maitland Council LEP 2011 lot size maps. The vegetation proposed for removal as part of the Stage 2 SSI is shown in **Figure 3**.

The Biodiversity Values Map and Threshold Tool (BMAT)

(<https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap>) was also reviewed to confirm that the development site is not mapped on the biodiversity values map.

Based on the results of the desktop review outlined above, the streamlined assessment module-small area development would apply to the Stage 2 NMH proposal.

BAM Field Survey Methods

Two BAM field plots (0.1 ha in area) were undertaken within the stands of native vegetation remaining in the Stage 2 development site by Sclerophyll botanist Isaac Mamott on the 6th and 14 June 2019 in fine conditions. Plot data recorded during the field survey comprised species composition, foliage cover values as well as structural/functional attributes such as tree stem size classes, litter cover, hollows, length of fallen logs and tree regeneration. Survey effort was in accordance with the minimum plot requirements listed in Table 4 of the BAM.

Sclerophyll has relied on previous ecological investigations undertaken across the development site (and greater Metford triangle site) by General Flora and Fauna in the spring and summer of 2014 (General Flora and Fauna 2014) to satisfy the BAM Threatened species survey requirements for the Stage 2 NMH proposal. The BAM allows the use of previous investigations for current assessments as long as the previous studies were undertaken within 5 years from the current proposal. It is considered that the General Flora and Fauna 2014 investigations fall within the 5 year prescribed timeframe for the current Stage 2 proposal.

The suite of baseline and targeted terrestrial flora and fauna surveys undertaken by General Flora and Fauna (2014) on the Metford triangle site comprised:

- 9 full floristic botanical plots;
- 8 straight line botanical transects;
- Small mammal trapping (4 trap lines with each trap line comprising Elliott A/Bs, cage traps and hair tubes);
- Anabat microbat detection;
- Spotlighting;
- Diurnal bird surveys;
- Call playbacks; and
- Active searching for reptiles.

A number of fauna survey sites employed by General Flora and Fauna (2014) were situated within the Stage 2 development site and project influence area. The reader is referred to the Stage 1 NMH BAR for a complete description of targeted Threatened survey methodologies employed (a full reproduction of the General Flora and Fauna 2014 report is provided as an Appendix in the Stage 1 BAR).

BAM Field Survey Results

One (1) Plant Community Type (PCT) was recorded in the development site, this being PCT ID 1592 Lower Hunter Spotted Gum-Red Ironbark-Grey Gum grass/shrub open forest of the lower Hunter. PCT 1592 is considered to be analogous to the Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions EEC, listed under Schedule 2 of the *Biodiversity Conservation Act* 2016 (BC Act). The PCT recorded within the development site generally comprised relatively young regrowth cohorts and was subject to high to very high levels of weed cover likely due to edge effects typically associated with an urban remnant. A PCT map is provided as **Figure 3**.

It is noted that a narrow ephemeral drainage line was recorded bisecting a small patch of PCT 1592 on Lot 401 within the Stage 2 development site. Portions of the drainage line held standing water and supported a dense narrow band of native aquatic emergents, *Phragmites australis* and *Typha orientalis*. This assemblage of native aquatics along the drainage line would typically be mapped as PCT 1071 Coastal freshwater wetlands. However, the section of drainage line within the Stage 2 project influence area was considered too small an area to be mapped at the scale employed for the BDAR (3 metres wide x 15 metres in length) and was thus incorporated into PCT 1592 with which it adjoins.

No Threatened flora species were recorded on the development site by General Flora and Fauna (2014) nor by Sclerophyll during both the conduct of BBAM/FBA plots associated with the Stage 1 BAR and Stage 2 BAM plots.

A total of 7 Threatened fauna species listed under the BC Act were recorded by General Flora and Fauna (2014) on the greater Metford triangle site, these being:

- Little Lorikeet;
- Squirrel Glider;
- Little Bentwing Bat;
- Large Bentwing Bat;
- Greater Broad Nosed Bat;
- Large footed Myotis (also known as Southern Myotis); and
- Grey headed Flying Fox.

A total of 2 of these 7 species (Little Lorikeet, Squirrel Glider) were recorded by General Flora and Fauna (2014) within Spotted Gum - Ironbark Forest habitat on Lot 7314 within the Stage 2 NMH development site. General Flora and Fauna (2014) noted that the habitats recorded on the greater Metford triangle site may provide potential foraging and denning habitat for the species. A map showing the locations of the Threatened species recorded by General Flora and Fauna (2014) on the development site is provided as **Figure 4**.

Data Entered Into the BAM-C

The following data was entered into the BAM Calculator (BAM-C) for the Stage 2 NMH proposal:

- Assessment Type – Part 5 (small area development);
- IBRA Region – Sydney Basin;
- IBRA Sub-Region – Hunter;
- % Native Vegetation within 1500m buffer – 23 (refer **Figure 5**);
- Vegetation zone 1 – PCT 1592 Medium (full clearing of 0.43 ha);
- Vegetation zone 2 – PCT 1592 Poor (Management Zone 1 partial clearing of 0.21 ha to reflect proposed underscrubbing and canopy retention; Management Zone 2 full clearing of 0.12 ha). Future vegetation integrity scores for Management Zone 1 were manually increased from '0' to match the current vegetation integrity score values for tree composition and structure in order to reflect canopy retention proposed for MZ 1. Plot data for the 2 vegetation zones was entered into the BAM-C and is shown on the completed field data sheets provided as **Attachment B**;
- Confirmed Predicted Threatened Species (Ecosystem credit species) – 26 Threatened fauna species were confirmed in the BAM-C as predicted ecosystem credit species based on the presence of suitable site habitats (dry sclerophyll open forest). Only 1 of the 27 predicted ecosystem credit species was discounted and not confirmed in the BAM-C for the Stage 2 NMH proposal, this being the Koala, as there are no known Koala populations in the lower Hunter in the vicinity of the proposed development site;
- Confirmed Candidate Threatened Species (Species credit species) – A total of 4 Threatened flora species were confirmed in the BAM-C as candidate Threatened flora species credit species for the proposal, these being *Callistemon linearifolius*, *Grevillea parviflora subsp. parviflora*, *Persoonia pauciflora* and *Rutidosis heterogama*. These 4 species are most closely associated with Lower Hunter Spotted Gum Ironbark Forest (LHSGIF) habitats. A total of 3 Threatened fauna species credit species were confirmed as candidate species credit species in the BAM-C based on the presence of dry sclerophyll open forest habitats present on the Stage 2 development site, these being the Bush Stone Curlew, Green and Golden Bell Frog and Squirrel Glider. It is noted that both the Little and Eastern (Large) Bent-wing Bats as well as the Southern Myotis (microbat) were not confirmed as candidate Threatened fauna species in the BAM-C for the Stage 2 proposal even though General Flora and Fauna (2014) recorded these 3 species within the greater Metford triangle (albeit outside the Stage 2 proposed development site). Both the bent wing bats are dual ecosystem credit/species credit species under the BAM and are only considered as a species credit species if breeding habitat (ie. maternity roost) is present. General Flora and Fauna (2014) did not identify any maternity roosts within the greater Metford triangle site and thus both bat species were considered as ecosystem credit species for the purposes of the Stage 2 NMH proposal. The Southern Myotis typically requires the presence of large water bodies (large creeks, rivers, ponds) for foraging habitat and was likely exploiting the large man made (stormwater) ponds that were previously present on the Stage 2 development site.
- Habitat Survey – Based on the results of General Flora and Fauna (2014), none of the confirmed candidate Threatened flora species was entered into the BAM-C as being present on the development site as ascertained from targeted surveys. Based on the results of General Flora and Fauna (2014), only 1 of the 4 confirmed candidate Threatened fauna species was entered into the BAM-C as being present on the Stage 2 development site as ascertained from targeted surveys, this being the Squirrel Glider. A species polygon habitat map was prepared for the Squirrel Glider

(refer **Figure 6**), denoting vegetation zones 1 and 2 as suitable habitat for the species within the Stage 2 development site. An area of species impact totalling 0.55 ha was entered into the BAM-C for the Squirrel Glider, reflecting the proposed removal of vegetation zone 1 (0.43 ha of full clearing) and vegetation zone 2 (Management Zone 2- 0.12 ha of full clearing). The proposed partial removal of vegetation zone 2 (Management Zone 1 – 0.21 ha) was excluded from the Squirrel Glider impact habitat area value entered into the BAM-C due to the proposed canopy retention.

BAM-C Credit Results

A series of biodiversity credit and credit payment reports was generated by the BAM-C for the Stage 2 NMH proposal. A summary of the key report results is provided below:

- Ecosystem Credit requirement – 23 credits = \$68,900.44 payment into the BCF; and
- Species Credit requirement (Squirrel Glider) – 17 credits = \$10,122.70 payment into the BCF.

The biodiversity credit reports generated by the BAM-C for the Stage 2 proposal are provided as **Attachment C**.

A Biodiversity Offset Strategy (BOS) for the Stage 2 NMH proposal would be prepared following project approval to identify the preferred mechanism by which HI will meet its offset obligations.

Impact Assessment

The Stage 2 NMH proposal will result in the removal of 0.76 hectares of PCT 1592 (LHSGIF) situated within the Stage 2 Project Influence Area. This is considered to be an over-estimate of the actual clearing proposed as 0.21 ha of this 0.76 ha total clearing area is proposed only for understorey clearing (canopy would be retained) and much of the understorey in this area is heavily degraded with very high weed cover. The 0.21 ha of understorey clearing is proposed for the narrow strip of roadside woodland/open forest fringing Metford Road south of the main hospital entrance.

The Stage 2 proposal footprint redesign (relative to the Stage 1 approved concept design) has enabled the retention of 1.9 ha of LHSGIF (PCT 1592) habitat on Lot 7314 that was approved for removal in Stage 1. Hence, the Stage 2 proposal has met the BAM principle of ‘avoid and minimise’ in relation to biodiversity impacts.

The LHSGIF EEC proposed for Stage 2 removal forms part of and is contiguous (albeit tenuously) with a larger LHSGIF remnant that extends to the east following the Ausgrid transmission line easement until its intersection with the main northern railway line (commonly referred to as the ‘Metford triangle remnant’). The Metford triangle LHSGIF remnant has an areal extent of approximately 13 hectares and would be subject to further minor fragmentation impacts as a result of Stage 2 clearing proposed, although such negligible clearing would not be expected to significantly impact the wider remnant’s overall integrity and viability to the point where it would be at risk of localised extinction.

Given the extent of available forested habitat in the wider locality for the more mobile subject species that have relatively large foraging ranges (eg. bats, woodland birds), the direct loss of 0.76 ha of disturbed

LHSGIF dry sclerophyll forest habitat is not expected to result in significant fauna impact. These highly mobile subject species would not be expected to be exclusively reliant on site habitats for their life cycle requirements and would be expected to utilise extensive forested tracts south of the site at Four Mile Creek (south-west of the New England Highway) as well as additional extensive tracts of bushland further south to Mt Sugarloaf Reserve and Awaba State Forest and west to Kurri Kurri. It is thought that the New England Highway and main northern railway line form a local movement barrier for the Squirrel Glider in the immediate locality of the development site and that the species population is isolated both from smaller woodland stands surrounding the Tenambit and Morpeth wetlands to the north and from the larger tracts of forested lands to the south of the New England Highway. The Squirrel Glider was recorded in LHSGIF habitat on Lot 7314 (within the Stage 2 Project Influence Area) and as such is likely reliant on habitats within the greater Metford triangle for its life cycle requirements (i.e. foraging, denning, movement) given the likely isolation of its meta-population in the lower Hunter valley. The relatively minor vegetation clearing works proposed for Stage 2 NMH (along the far western boundary of the Metford triangle remnant) would not be expected to contribute to further habitat isolation nor movement barrier impacts for less mobile subject species such as the Squirrel Glider.

Potential indirect impacts on retained fauna (dry sclerophyll) habitats on Lot 7314 during construction activity include daytime noise and vibration and night time light spill. Noise, vibration and light spill can have an impact on a suite of protected and Threatened fauna such as roosting microbats, owls and denning arboreals such as the Squirrel Glider (recorded on Lot 7314). The subject site lies within an urban area of the lower Hunter valley and it is considered that the assemblage of resident and transient fauna utilising site habitats would be habituated to typical urban daytime ambient noise and vibration levels from Metford Road, the industrial area on the western side of Metford Rd (south of fieldsend oval) and the long-term mining activity and more recent remediation activity that has been undertaken on part of the Stage 2 development site.

The Stage 2 NMH proposal will not impact upon any habitats supporting karst, cliffs or other significant geological features nor would it impact upon habitats containing significant rock outcropping or man-made artificial Threatened fauna habitats. Hence, there are no 'prescribed' impacts expected as a result of the Stage 2 NMH proposal.

An assessment under SEPP 44 - Koala Habitat Protection and Draft SEPP (Environment) is provided as **Attachment D**. The SEPP 44 assessment concluded that the Stage 2 development site is not considered core Koala habitat and that the preparation of a site specific Koala Management Plan is not required.

Mitigation Measures

A Biodiversity Management Plan (BMP) is to be incorporated in the project Construction Environmental Management Plan (CEMP) to include detail of the mitigation measures outlined below. The BMP would aim to reduce the potential impacts of the proposal on biodiversity through minimising the extent of clearing, maintaining key habitat and also reducing the potential injury to fauna during and after the clearing works. The BMP will also include a map showing specific areas where particular measures are to be implemented.

The following protocol would be undertaken as part of the clearing activities:

1. Clearing boundaries shall be pegged out by a registered surveyor and suitably demarcated (eg metal stake and high vis plastic mesh fencing) prior to vegetation clearing activity.
2. All contractors conducting clearing, earth works or construction activities within Lot 7314 must be informed of the ecological value of the retained forested remnants and particularly the restrictions to the clearing of vegetation outside the 'exclusion fencing'. No storage of materials, vehicle parking or other disturbance would be undertaken outside the exclusion fencing into retained bushland habitats.
3. A site induction must be undertaken so as to clearly inform personnel undertaking clearing operations the relevance of any marked items (e.g. hollow bearing trees requiring ecological supervision, clearing boundaries) and identify their responsibilities. A site induction will need to be signed by all relevant personnel involved with the clearing operations, noting they have understood ecological conduct requirements.
4. Trees would be felled away from the retained forested remnants back into the proposed development footprint.

The removal of any tagged and mapped hollow bearing trees (HBTs) must be undertaken with the presence of a suitably qualified and experienced fauna ecologist and the cavities of any hollow bearing trees will need to be checked for inhabiting fauna upon felling. Any injured fauna should be captured where possible and taken to the local wildlife carer. Once rehabilitation has been achieved (if possible), the individual should be released into retained habitats adjoining the capture site, and if required, into shelter sites appropriate for that species (*i.e.* nest boxes). The relevance of the marked HBTs and requirements for ecological clearing supervision must be communicated to the supervisor responsible for the clearing contractors.

It is recommended that night lighting be installed as far from the retained bushland habitats on Lot 7314 as possible and that such lighting be directed away from such habitats to minimise nocturnal light spill.

Yours faithfully

Isaac Mamott

Isaac Mamott

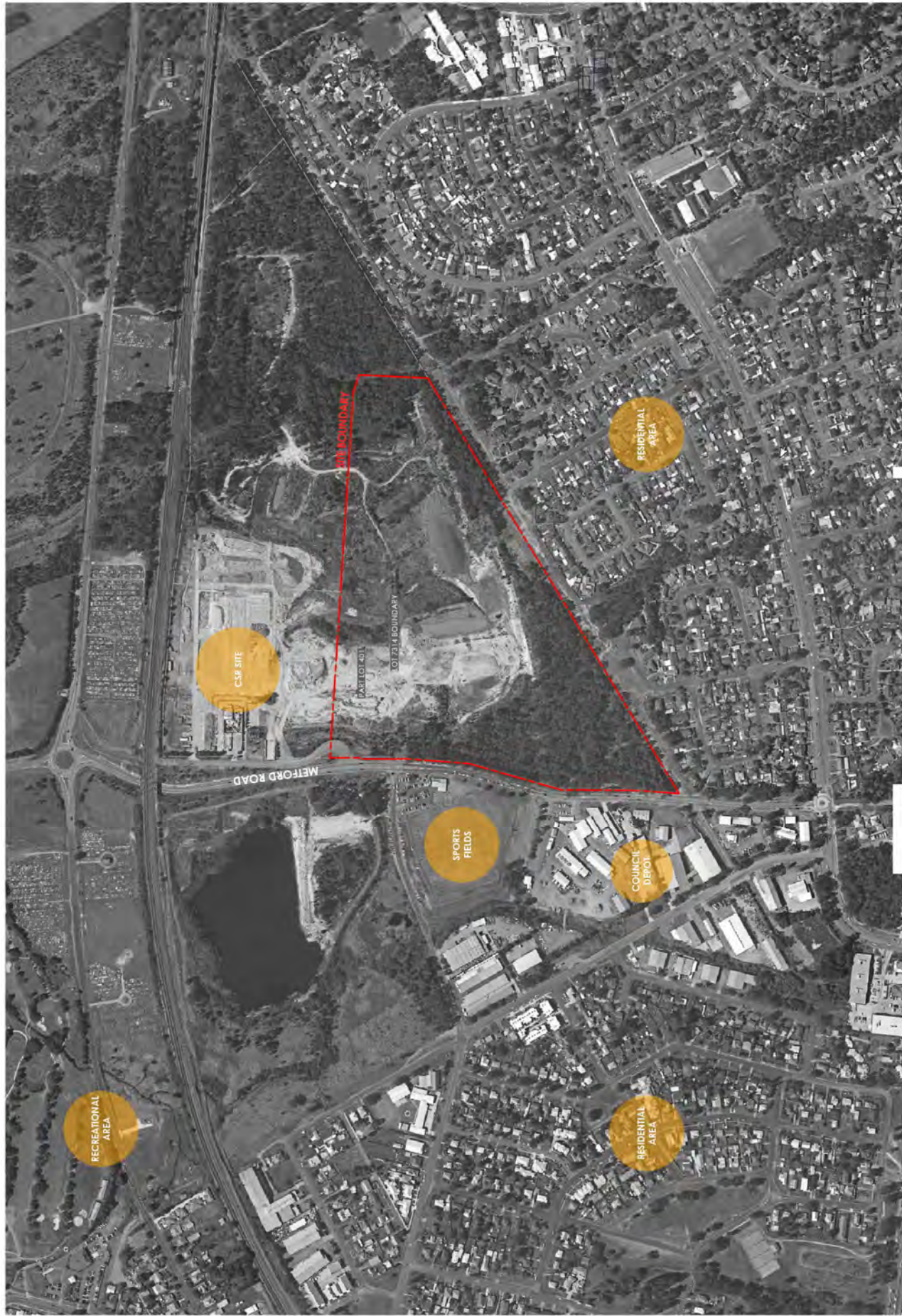
Director, Principal Botanist

BAM Assessor (BAAS18008)

BBAM Assessor (0081)

Attachment A	BDAR Figures
Attachment B	Completed BAM field data sheets
Attachment C	BAM-C Biodiversity Credit Reports
Attachment D	SEPP Assessments

Attachment A
BDAR Figures

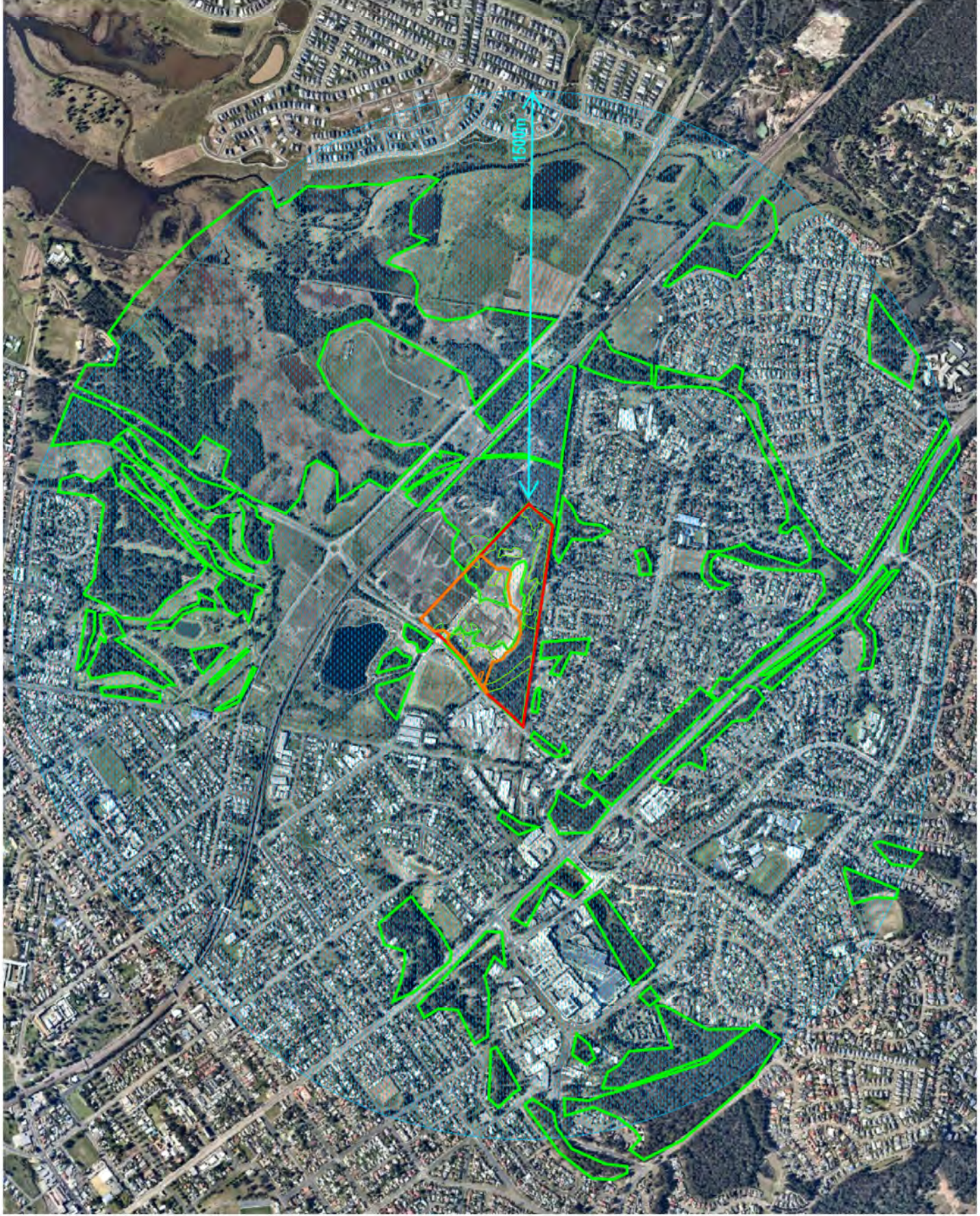




- LEGEND**
- SSR BOUNDARY LINE
 - PROPOSED STAGE 2 PROJECT INFLUENCE LINE
- VEGETATION PROPOSED TO BE CLEARED IN STAGE 2**
- ZONE 1 - PCT ID 1562 (MEDIUM) - 0.45ha
 - ZONE 2 - PCT ID 1569 (POOR) - 0.33ha
- TREES RETAINED - UNDERSTORY CLEARING ONLY
- SAMPLE LOCATION
 - SAMPLE LOCATION



FIGURE 5 -
 NATIVE VEGETATION
 1500M BUFFER





MULTIPLEX
 PROJECT MANAGEMENT
CBRE
 ARCHITECTURE
BVA
ITW
 HYDRAULIC & PIPE
 MECHANICAL
 ELECTRICAL

Health NSW
 Infrastructure
 NEW MATLAND HOSPITAL
 Metford Road, Metford

FIGURE 6 -
 SQUIRREL GLIDER
 SPECIES POLYGON MAP



- LEGEND**
- SSI BOUNDARY LINE
 - PROPOSED STAGE 2 PROJECT (REFURBISH) LINE
 - VEGETATION PROPOSED TO BE CLEARED IN STAGE 2
 - SQUIRREL GLIDER HABITAT AREAS TO BE CLEARED IN STAGE 2 - 0.75 ha
 - TREES RETAINED - UNDERSTORY CLEANING ONLY

Attachment B
Completed BAM Field Data Sheets

BAM Site – Field Survey Form

Site Sheet no:

Date		Survey Name	Plot Identifier	Recorders	
		NH Stage 2	BAM PLOT 1	IM	
Zone	Datum	IBRA region	Photo #	Zone ID	
NGA 56	GDA 94		1-6	1	
Easting	Northing	Dimensions	Orientation of midline from the 0 m point.		
369167	6374496	20 x 20 m nested 20 x 50 (0.1 ha)	S / SW		
Vegetation Class					Confidence:
hunter-macro dry sclerophyll forests					(H) M L
Plant Community Type					Confidence:
1592-spotted gum-red ironbark-grey gum forest lower hunter					(H) M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

lower hunter spotted gum ironbark forest

BAM Attribute (400 m ² plot)	Sum values
Trees	3
Shrubs	12
Grasses etc.	12
Forbs	10
Ferns	1
Other	7
Count of Native Richness	
Trees	53
Shrubs	10.3
Grasses etc.	5.3
Forbs	14.4
Ferns	1.0
Other	3.9
Sum of Cover of native vascular plants by growth form group	
High Threat Weed cover	31.2

BAM Attribute (20 x 50 m plot)	# Tree Stems Count	Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately
dbh	Euc*	Non Euc
large trees for Euc* & Non Euc	80 + cm	—
50 – 79 cm	—	—
30 – 49 cm	✓	—
20 – 29 cm	✓	—
10 – 19 cm	✓	—
5 – 9 cm	✓	n/a
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	6	total

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30, ..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	40 30 5 50 50	2 - 1 2 3	- 15 - - -	- 10 - - -
Average of the 5 subplots	35	1.6	3	2

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type
siltstone/mudstone	clay-heavy	dark brown	low
0-1°; flat	190°	moderate-good	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			Lantana infestation; Privet infestation, urban remnant...
Other			adjoins construction site (NH) + metford rd.

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m ² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 6. 6 2019	NMH Stage 2	BANBLOT ①	IM (Sclerophyll Flora)

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
f	<i>Corymbia maculata</i>	N	30	12	U	
f	<i>Eucalyptus punctata</i>	N	20	14	U	
s	<i>Acacia elongata</i>	N	2	20	M	
s	<i>Leucopogon juniperinus</i>	N	2	15	M	
s	<i>Lantana camara</i>	HTE	30	500+	M	
s	<i>Ozothamnus diosmifolius</i>	N	1	10	M	
e	<i>Cheilanthes sieberi</i>	N	1	200+	G	
f	<i>Dianella revoluta</i> - nrm. (mostly juvs).	N	5	200+	G	
g	<i>Entolasia stricta</i>	N	5	500+	G	
g	<i>Microlaena stipoides</i>	N	4	200+	G	
g	<i>Aristida ramosa</i>	N	4	50+	G	
g	<i>Sporobolus indicus</i>	E	0.1	2	G	
g	<i>Cymbopogon refractus</i>	N	4	30+	G	
s	<i>Bursaria spinosa</i>	N	2	50+	M	
r	<i>Lomandra longifolia</i>	N	1	30+	G	
f	<i>Pratia purpurascens</i>	N	2	150+	G	
g	<i>Aristida vagans</i>	N	5	20	G	
l	<i>Parsonia straminea</i>	N	0.2	20	all	
f	<i>Brunoniella pumilio</i>	N	1	2	G	
l	<i>Pandorea pandorana</i> (juv; int; adult leaves)	N	2	360+	G, M	
f	<i>Goodenia hederacea</i>	N	2	200	G	
f	<i>Oxperularia diphylla</i>	N	0.3	1	G	
l	<i>Hardenbergia violacea</i>	N	0.1	3	G, M	
s	<i>Acacia parvipinnula</i> - seedling (2).	N	0.1	2	M	
g	<i>Echinopogon caespitosus</i> ✓ (v. long awn).	N	4	20	G	1
v	<i>Lepidosperma laterale</i>	N	0.3	30+	G	
f	<i>Pomax umbellata</i>	N	2	4	G	
s	<i>Ligustrum sinense</i>	HTE	1	10	M	
s	<i>Pittosporum undulatum</i>	N	0.5	8	M	
g	<i>Themeda triandra</i>	N	4	5	G	
s	<i>Glochidion ferdinandi</i> - seedling, saplings.	N	0.1	4	M, G	
g	<i>Imperata cylindrica</i> var. <i>major</i>	N	5	100+	G	
g	<i>Eragrostis brownii</i>	N	4		G	
l	<i>Smilax</i> sp. (juv. leaves) - prob. <i>aristata</i> .	N	0.1	2	G	
g	<i>Panicum simile</i> ✓ (finely striolate palea, fertile lemma)	N	5	10	G	3
s	<i>Breynia oblongifolia</i> - sapling.	N	0.1	1	M, G	
f	<i>Goodenia bellidifolia</i> - ch.	N	0.1	4	G	
s	<i>Acacia falcata</i> - sapling.	N	0.2	3	G	
f	<i>Euchiton</i> sp.	N	1	10	G	2
f	<i>Senecio madagascariensis</i>	HTE	0.2	20	G	

GF Code: see Growth Form definitions in Appendix 1

N: native, E: exotic, HTE: high threat exotic

GF - circle code if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ... 100% (foliage cover); **Note:** 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

400 m ² plot: Sheet <u>2</u> of <u>2</u>	Survey Name	Plot Identifier	Recorders
Date <u>6.6.19</u>	<u>NHT Stage 2</u>	<u>SAMPLET ①</u>	<u>IM (Sclerophyll flora)</u>

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
f	<i>Wahlenbergia communis</i>	N	0.5	5	G	
f	<i>Oxalis</i> sp.	N	0.5	10	G	
t	<i>Eucalyptus fibrosa</i>	N	3	1	U	
s	<i>Callistemon linearis</i>	N	2	2	M	
s	<i>Pultenaea refusa</i>	N	0.2	1	M	
r	<i>Lomandra multiflora</i>	N	0.2	6	G	
s	<i>Daviesia obovatifolia</i> (seedling)	N	0.1	1	M	
g	<i>Digitaria breviglumis</i> ✓	N	5	5	G	5
g	<i>Dischelosia micrantha</i> ✓ (glumes long acuminate; hyaline margins).	N	4	3	G	4
PCT = 1592 Lower Hunter Spotted Gum						
— Lambark Forest						
BEC — Bc Act.						
occurrence — on siltstone/mudstone-derived clays.						
— extensive outcropping.						
— high % weed cover (lantana, privet, African olive outside plot). high lantana cover in plot.						

GF Code: see Growth Form definitions in Appendix 1

N: native, E: exotic, HTE: high threat exotic

GF — circle code if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

		Survey Name	Plot Identifier	Recorders	
Date					
Zone	Datum	IBRA region	Photo #	Zone ID	
Easting	Northing	Dimensions		Orientation of midline from the 0 m point.	
Vegetation Class					Confidence: H M L
Plant Community Type		EEC:			Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
 Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m ² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)		# Tree Stems Count	
dbh	Euc*	Non Euc	Hollows†
large trees for Euc* & Non Euc	80 + cm		
	50 – 79 cm		
	30 – 49 cm		
	20 – 29 cm		
	10 – 19 cm		
	5 – 9 cm		n/a
	< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

BAM Site – Field Survey Form

Site Sheet no:

Date		Survey Name	Plot Identifier	Recorders	
14 6 19		NH Stage 2 B&A	BAM PLOT 2	IH	
Zone	Datum	IBRA region	Photo #	Zone ID	
56	GDA 94	Sydney Basin		2	
Easting	Northing	Dimensions	Orientation of midline from the 0 m point.		
369225	6374581	10 x 40 nested in. 10 x 10	S/SW		
Vegetation Class		hunter-maclessy dry sclerophyll forests.			Confidence: H M L
Plant Community Type		(1592) spotted gum-red ironbark-grey gum forest lower hunter			Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient pike so that perforated rib points along direction of midline. Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m ² plot)	Sum values
Trees	5
Shrubs	7
Grasses etc.	4
Forbs	4
Ferns	1
Other	5
Count of Native Richness	
Trees	42.1
Shrubs	30.6
Grasses etc.	7.3
Forbs	2.6
Ferns	0.1
Other	5.7
Sum of Cover of native vascular plants by growth form group	
High Threat Weed cover	78.1

BAM Attribute (20 x 50 m plot)	# Tree Stems Count	Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately
dbh	Euc*	Non Euc
large trees for Euc* & Non Euc	80 + cm	—
50 – 79 cm	—	—
30 – 49 cm	✓	—
20 – 29 cm	✓	—
10 – 19 cm	✓	—
5 – 9 cm	✓	n/a
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	42	total

Counts must apply to each size class when the number of living tree stems within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30, ..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	80 85 85 60 75	2 3 2 15 -	- - - - -	- - 3 - -
Average of the 5 subplots	77	4.4	0	0.6

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type
siltstone / mudstone	clay	brown	low
0-2° - flat		moderate	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
* Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness	3	0	Lantana, olive, Privet infestation (>50% exotic cover) in plot.
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Metford Rd urban remnant would receive urban runoff. Very poor condition roadside remnant strip.

400 m ² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 14.6.19	NMH Stage 2 B&A	BAMPLOT (2)	IM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
+	<i>Corymbia maculata</i>		20	22	U	
+	<i>Eucalyptus punctata</i>		10	6	U	
+	<i>Eucalyptus fibrosa</i>		7	3	U	
+	<i>Eucalyptus tereticornis</i>		5	4	U	
* g	<i>Erharta erecta</i>	HTE	5	300+	G	
* s	<i>Ligustrum sinense</i>	HTE	30	1000+	M	
* s	<i>Lantana camara</i>	HTE	30	1000+	M	
* s	<i>Olea europaea</i>	HTE	5	100+	M	
* s	<i>Pavonia hastata</i>	E	30	1000+	M	
* f	<i>Bidens pilosa</i>	HTE	5	300+	M	
s	<i>Acacia parvifolia</i>		3	10	M	
s	<i>Acacia elongata</i>		2	5	M	
* f	<i>Verbena bonariensis</i>	E	2	20+	M	
g	<i>Imperata cylindrica</i> var <i>major</i>		5	200+	G	
f	<i>Protea purpurascens</i>		2	100+	G	
g	<i>Cynodon dactylon</i>		2	100+	G	
s	<i>Pittosporum undulatum</i>		20	300+	M	
f	<i>Centella asiatica</i>		0.2	10	G	
f	<i>Oxalis</i> sp. - nrm. (<i>perennans</i>)		0.2	30	G	
* f	<i>Plantago (lanceolata?)</i> - nrm. ^{intact}	E ⁺	0.2	20	G	
* g	<i>Panicum</i> sp. (poss. <i>maximus</i> - no spikelets left on inflor.)	E ⁺	5	300+	G	1
* s	<i>Ligustrum lucidum</i>	HTE	2	20	M	
s	<i>Breynia oblongifolia</i>		2	6	M	
l	<i>Pandorea pandorena</i>		3	50+	G, M	
l	<i>Geitonoplectrum cymosum</i>		2	20+	G, M	
* s	<i>Glochidion ferdinandi</i>		3	6	M	
* f	<i>Conyza</i> sp. (basal tuft)	E	1	6	M	
* f	<i>Senecio madagascariensis</i>	HTE	1	6	G	
+	<i>Synum glandulosum</i> - seedling.		0.1	1	G	
s	<i>Rursaria spinosa</i>		0.5	3	M	
f	<i>Dianella revoluta</i>		0.2	2	G	
e	<i>Selaginella uliginosa</i>		0.1	1	G	
l	<i>Clematis aristata</i>		0.5	6	G	
r	<i>Lomandra multiflora</i>		0.1	1	G	
* s	<i>Asparagus aethiopicus</i>	HTE	0.1	2	G	
s	<i>Notelaea venosa</i>		0.1	1	M	
g	<i>Entolasia stricta</i>		0.2	4	G	
g	<i>Microlaena stipoides</i>		0.1	2	G	
r	<i>Lomandra filiformis filiformis</i>		0.1	1	G	

GF Code: see Growth Form definitions in Appendix 1

N: native, E: exotic, HTE: high threat exotic

GF - circle code if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); **Note:** 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Attachment C
BAM Biodiversity Credit Reports

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00016427/BAAS18008/19/00016428	New Maitland Hospital Stage 2 SSI	12/06/2019
Assessor Name	Report Created	BAM Data version *
	23/06/2019	11
Assessor Number	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
Revision No		
0		

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter								
1	1592_medium	66.9	0.4	0.25	High Sensitivity to Potential Gain	2.00		14

BAM Credit Summary Report

2	1592_poor	54.8	0.3	0.25	High Sensitivity to Potential Gain	2.00		9
							Subtotal	23
							Total	23

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAIL	Species credits
<i>Petaurus norfolcensis</i> / <i>Squirrel Glider</i> (Fauna)						
1592_medium	66.9	0.43	0.25	2	False	14
1592_poor	54.8	0.12	0.25	2	False	3
					Subtotal	17



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00016427/BAAS18008/19/00016428	New Maitland Hospital Stage 2 SSI	12/06/2019
Assessor Name	Assessor Number	BAM Data version *
		11
Proponent Names	Report Created	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.
	23/06/2019	
Revision No		
0		

Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks
No Changes

BAM Biodiversity Credit Report (Like for like)

Predicted Threatened Species Not On Site

Name
Phascolarctos cinereus / Koala

Ecosystem Credit Summary

PCT	TEC	Area	Credits
1592-Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter	Lower Hunter Spotted Gum—Ironbark Forest in the Sydney Basin Bioregion	0.8	23.00

Credit classes for 1592	Like-for-like options		
	TEC	HBT	IBRA region
	Lower Hunter Spotted Gum—Ironbark Forest in the Sydney Basin Bioregion (including PCT's 1590, 1592, 1593, 1600, 1602)	No	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

Species	Area	Credits
Petaurus norfolcensis / Squirrel Glider	0.6	17.00

Petaurus norfolcensis / Squirrel Glider	1592_medium	Like-for-like options	
		Spp	IBRA region
		Petaurus norfolcensis /Squirrel Glider	Any in NSW
	1592_poor	Like-for-like options	
		Spp	IBRA region
		Petaurus norfolcensis /Squirrel Glider	Any in NSW



BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id
00016427/BAAS18008/19/00016428

Assessor Name

Proponent Name(s)

Revision No
0

Proposal Name
New Maitland Hospital Stage 2 SSI

Assessor Number

Report Created
23/06/2019

BAM data last updated *
12/06/2019
BAM Data version *
11

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks
No Changes

BAM Biodiversity Credit Report (Variations)

Predicted Threatened Species Not On Site

Name
Phascolarctos cinereus / Koala

Ecosystem Credit Summary

PCT	TEC	Area	Credits
1592-Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter	Lower Hunter Spotted Gum—Ironbark Forest in the Sydney Basin Bioregion	0.8	23.00

Credit classes for 1592	Like-for-like options			
	TEC	HBT	IBRA region	
	Lower Hunter Spotted Gum—Ironbark Forest in the Sydney Basin Bioregion (including PCT's 1590, 1592, 1593, 1600, 1602)	No	Hunter, Ellerton, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	
	Variation options			
	Formation	Trading group	HBT	IBRA region



BAM Biodiversity Credit Report (Variations)

	Dry Sclerophyll Forests (Shrub/grass sub-formation)	Tier 3 or higher	No	IBRA Region: Sydney Basin, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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Species Credit Summary

Species	Area	Credits
Petaurus norfolcensis / Squirrel Glider	0.6	17.00

Petaurus norfolcensis/ Squirrel Glider	1592_medium	Like-for-like options		
		Spp		IBRA region
		Petaurus norfolcensis/Squirrel Glider		Any in NSW
		Variation options		
		Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region

BAM Biodiversity Credit Report (Variations)

		Fauna	Vulnerable	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
1592_poor	Like-for-like options			
	Spp		IBRA region	
	Petaurus norfolcensis/Squirrel Glider		Any in NSW	
	Variation options			
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below		IBRA region
	Fauna	Vulnerable	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	

Biodiversity payment summary report

Assessment Id	Payment data version	Revision number	Report created
00016427/BAAS18008/19/000164 28	57	0	23/06/2019
Assessor Name	Assessor Number	Proposal Name	
		New Maitland Hospital Stage 2 SSI	

PCT list

Include	PCT common name	Credits
Yes	1592 - Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter	23

Species list

Include	Species	Credits
Yes	<i>Petaurus norfolcensis</i> (Squirrel Glider)	17

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Biodiversity payment summary report

IBRA sub region	PCT common name	Baseline price	Dynamic coefficient	Market coefficient	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Hunter	1592 - Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter Note: This PCT has trades recorded	\$2,252.97	0.71782200	2.17841491	19.99%	\$20.00	1.0000	\$2,723.34	23	\$62,636.76
Subtotal (excl. GST)										\$62,636.76
GST										\$6,263.68
Total ecosystem credits (incl. GST)										\$68,900.44

Species credits for threatened species

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price
10604	Petaurus norfolcensis (Squirrel Glider)		\$434.47	19.9900%	\$20.00	17	\$9,202.45
Subtotal (excl. GST)							\$9,202.45
GST							\$920.24
Total species credits (incl. GST)							\$10,122.70



Biodiversity payment summary report

Grand total	\$79,023.14
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Attachment D
SEPP Assessments

**SEPP 44 Assessment – Koala Habitat Protection
Stage 2 New Maitland Hospital SSI – Attachment D**

Land to which the policy applies

The policy applies to all lands in Maitland LGA as per Schedule 1 of SEPP 44 and thus applies to the Stage 2 NMH proposal.

Land to which Part 2 (development controls) of the SEPP 44 applies

Part 2 of SEPP 44 applies to the Stage 2 NMH proposal given that the Stage 2 NMH proposal:

- is situated on lands with which the SEPP 44 policy applies;
- relates to a development application; and
- occurs on lands with an area greater than 1 hectare.

Is the land potential Koala habitat?

SEPP 44 defines *potential Koala habitat* as areas of native vegetation where the trees of the types listed in Schedule 2 (of the SEPP) constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. The Stage 2 NMH development site presently supports 0.76 ha of Lower Hunter Spotted Gum-Ironbark Forest (LHSGIF). The LHSGIF on the development site contains 2 tree species listed in Schedule 2 of the SEPP, these being *Eucalyptus punctata* (Grey Gum) and *Eucalyptus tereticornis* (Forest Red Gum). Based on data from 2 BAM plots recently conducted in June 2019 within extant vegetation on the development site, a portion of the site (southern section) showed 20% cover for Grey Gum whilst the central and northern portions of the site showed 10% and 5% cover for Grey Gum and Forest Red Gum, respectively. Consequently, at least a portion of the development site would be considered potential Koala habitat.

Is the land core Koala habitat

SEPP 44 defines *core Koala habitat* as 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. The greater Metford triangle remnant (with which the development site forms a part of) was subject to detailed ecological investigations (surveys and assessment) in spring and summer 2014 (General Flora and Fauna 2014). General Flora and Fauna (2014) did not record any Koalas or evidence of them on the site as part of their investigations. A search of the Bionet atlas records (10km radius search centered on the Stage 2 development site) revealed a single Koala record in March 2017 in Morpeth near the Hunter River. The single Bionet Koala record is from the Wildlife Rehabilitation database and notes that the individual Koala was 'stranded in an unsuitable environment'. The Lower Hunter Koala Study (EcoLogical Australia, 2013) furthermore does not identify any high or very high Koala priority habitat areas in the Maitland LGA and considers Maitland and Newcastle LGAs to be

significant ecological barriers to movement for the Koala between known populations at Cessnock/Lake Macquarie and Port Stephens. As such, the land subject to the Stage 2 NMH proposal is not considered to be core Koala habitat and thus no site or project-specific Koala Plan of Management would be required.

Draft SEPP (Environment)

The NSW government has been working towards developing a new SEPP for the protection and management of the natural environment. Changes proposed include consolidating the following seven existing SEPPs:

- State Environmental Planning Policy No. 19 – Bushland in Urban Areas;
- State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011;
- State Environmental Planning Policy No. 50 – Canal Estate Development;
- Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment;
- Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No.2-1997);
- Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005; and
- Willandra Lakes Regional Environmental Plan No. 1 – World Heritage Property.

Based on our review of the Draft SEPP (Environment), the Draft policy does not apply to lands subject to the Stage 2 NMH proposal. HI may wish to seek confirmation from DPE in relation to the application of the Draft policy to the NMH proposal.

