

Ref: 2504/01/RPP03

3 June 2021



Leanne Harris
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Planning Panels Secretariat
320 Pitt Street Sydney NSW 2000

By email: Leanne.harris@dpie.nsw.gov.au

RE: Kings Hill concept development for residential subdivision | PPS-2018HCC047

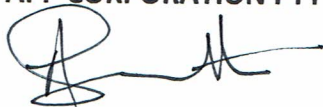
Dear Leanne,

On behalf of the Applicant, Kings Hill Development Pty Ltd (No.1 and No.2), attached is an initial response to the Umwelt review carried out by RPS (SIS Author) responding to the ecological matters raised.

For the consideration of Council and the Panel.

Yours sincerely

APP CORPORATION PTY LIMITED



ADAM SMITH
Project Director

Attachment:

1. RPS Memo dated 3rd June 2021 (11 pages) responding to ecological matters of Umwelt Review (V3) dated 24th May 2021

MEMO

Date: 3 June 2021
To: Adam Smith - APP
From: Mark Aitkens
Pages: 11 inc. this page
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Response to the Umwelt Review of the RPS Species Impact Statement prepared for Kings Hill

Key response items to the Umwelt Report in review of the RPS Species Impact Statement (SIS) are listed below:

1. Umwelt refer to information being 'hidden' and the document structuring being 'somewhat challenging', however the SIS is presented in a way to comply with the Chief Executive Requirements (CERs) and is therefore not meant to hide or mislead the reader.
2. Umwelt refer to a 'Biodiversity Offsets Package' or 'Offsets'. The SIS makes mention of Compensatory Measures (i.e. Section 7.1.3 of the CERs) but does not infer the use of offsets as indicated by Umwelt. It appears that Umwelt do not hold a proper understanding of the Concept Development Application (Concept DA) or approach outlined in the SIS hence misunderstands the basis for the assessment conclusions.
3. Umwelt provide advice on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The assessment of these matters relates to a 'proposed action' under the EPBC Act. This is separate and outside the jurisdiction of the NSW Planning framework and is not a matter for the Regional Planning Panel (RPP) or Council to consider.
4. In reviewing impacts on the Koala, Umwelt have provided an incomplete assessment of the information contained in the SIS.
5. Umwelt state that the nutrient enrichment mitigation is heavily relied on in the koala assessment and also take out of context the nutrient enrichment approach stating it is 'novel'. This is not the case. The SIS properly weights the inclusion of measures relating to the nutrient enrichment program.
6. Extensive genetic studies performed by OWAD Environmental for the koala show there is not considerable uncertainty about the connection between the koalas in the Kings Hill hub and other areas on the lower north coast.
7. Umwelt critique the Vegetation Mapping and Floristic Survey provided in the SIS. This critique is not correct.
8. Umwelt critique the classification of Lower Hunter Spotted Gum Ironbark Forest EEC. This critique is not correct.
9. Umwelt critique the survey timing and effort for *Pterostylis chaetophora* and *Corybas dowlingii*, the reliability of the results and, as a consequence, the seven part test conclusions. This critique is not correct.
10. Umwelt critique the SIS by stating it has not defined the locality and identified the extent of the local population for many affected species (e.g. brush-tailed phascogale) and, as a consequence, incorrectly

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state that the seven part test for these species has not been properly performed and the conclusions are therefore not supported. This critique is not correct.

11. Umwelt critique the assessment prepared for the Brush-tailed Phascogale on the basis of habitat classification and assessment of importance of habitat. This critique is not correct.

A more detailed discussion of RPSs response to the Umwelt review is provided as follows.

1. Information 'hidden' in the SIS

Umwelt highlighted the following on page 23 of the review where it is stated that the SIS is:

“structured in a manner that makes to the locating of data somewhat challenging” and “This is particularly evident in relation to the flora survey and vegetation community mapping, whereby the detail regarding floristic plot analysis is ‘hidden’ within paragraphs of information contained within Section 4.3.2 “General Species Survey Results””.

RPS disagrees with this statement. Section 1.1.1 of the SIS clearly states the following regarding the structure of the SIS:

*“This document has been structured to comply with the CERs. Throughout the SIS at the start of each major section the relevant parts of the CERs are reproduced in italics in order to demonstrate how each SIS section complies with statutory requirements. A compliance table is also included in **Appendix B**.”*

The SIS has been prepared in accordance with the CERs. The SIS makes no attempt to hide information or mislead a reader in such as way.

A more thorough review of the SIS would not conclude that the information is 'hidden', rather, would conclude the SIS is comprehensive with information presented in the correct form as required by regulation.

2. Umwelt refer to a 'Biodiversity Offsets Package' or 'Offsets'.

The Concept DA and SIS do not describe a 'Biodiversity Offsets Package' or 'Offsets'. Such references misrepresent the nature of the proposal description and the SIS recommendations. The dedication of land to the Council under the DA is not proposed as an 'offset', but rather is part of a proposal that retains viable local populations for affected threatened species and ecological communities. After considering the proposal as a whole the SIS accurately concludes that there are no significant residual impacts and offsets for such residual impacts are therefore not required.

RPS makes clear in the SIS that the purpose of the Conservation Area is to retain and manage habitat for the ongoing protection of biodiversity values in the locality (p49 of the SIS). It serves the purpose of protecting habitat for viable local populations of affected threatened species and ecological communities in the long term. Therefore, commentary regarding the adequacy of 'offsets' is unnecessary and irrelevant.

The Concept DA addresses, in the positive, objectives 3(a-b), 3(d) and 3(f) of the *Threatened Species Conservation Act 1995* being:

- (a) *to conserve biological diversity and promote ecologically sustainable development, and*
- (b) *to prevent the extinction and promote the recovery of threatened species, populations and ecological communities, and*
- (d) *to eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities, and*

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- (f) *to encourage the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.*

To reiterate, the purpose of the 'in-perpetuity conservation area' is not to demonstrate an effect that negates the risk of a residual significant impact, as outlined in the Umwelt Report, rather to demonstrate an in-perpetuity protection of local habitat required to:

1. Maintain local populations of affected threatened species in the long term (i.e. addresses criterion (a) of the seven part test).
2. Prevent ongoing loss of local diversity and ecological integrity such as cumulative impacts (i.e. addresses criterion (d) of the seven-part test)
3. Manage key threatening processes, addressing criterion (g) of the seven-part test.

The Concept DA describes all actions associated with the management of threatened species and ecological communities. These works are clearly described in the Biodiversity Management Plan for the Conservation Area and Vegetation Management Plan for the future subdivision area. In this regard, the Umwelt Report correctly refer to the Conservation Area as a "beneficial measure". The SIS correctly considers the benefit of this measure made in the Concept DA (i.e. conserves biological diversity in the local area) and consequently forms an appropriate conclusion that the project is not likely to have a significant impact on affected threatened species and ecological communities.

3. Umwelt provide advice on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

The CERs make abundantly clear that the assessment of threatened species and ecological communities is restricted to matters listed under the NSW *Threatened Species Conservation Act 1995 (TSC Act)* (i.e. Section 109 and 110 of the TSC Act and CERs). The SIS properly refers to the EPBC Act (Section 9.2 of the SIS "Other Approvals") noting that a Referral will be prepared to assess the Proposal under the EPBC Act "due to potential impacts to threatened species listed under the EPBC Act". The SIS is correct in not providing assessment or conclusion relating to impacts on matters of national environmental significance (MNES) listed under the EPBC Act, as the SIS's purpose relates to the NSW statutory framework.

4. Umwelt comments that RPS provide an incomplete review of impacts on the koala

The SIS provides a detailed analysis on the koala involving numerous contributions from recognized experts. In reading Umwelt's review it is unclear why important information obtained from recognised experts is not considered or referred to (e.g. studies performed by OWAD Environmental). A properly prepared seven part test provided in the SIS has incorporated this expert information and supports the conclusion of a 'no significant impact' outcome.

Umwelt states that the impact on the koala amounts to an 11% habitat loss for the Kings Hill koala hub (i.e. 152 ha loss from 1,377 ha) noting the subject site (impact area and Conservation Area) is estimated to have 27 koala individuals with an estimated direct impact on the habitat of eight individuals (16%), as referenced in BioLink (2019a,b). This is the limit of Umwelt's consideration of relevant information provided in the SIS.

Two detailed and important reports included in the SIS prepared by OWAD Environmental were not referred to or taken into account in the Umwelt Report. They quantify koala activity, estimate the number of koala individuals within the subject site and analyse population structuring in the Port Stephens local government area (i.e. genetics). These reports are highly relevant and provide important information that properly frame context for the impact assessment.

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Umwelt have not taken into account important information provided in the SIS. The following factors, which are relevant to conclusions presented in the SIS for the koala, support the view that concurrence is not required:

- (a) OWAD Environmental identify:
 - (i) approximately 10 koala individuals occur across the subject site, rather than 27, and these koalas are genetically linked to those that occur outside the Kings Hill koala hub.
 - (ii) Some parts of the subject site are more important for the koala than others, and that these higher activity areas are included within the Conservation Area.
- (b) Higher koala activity is likely to be correlated with elevated foliage nutrient levels (Youngentob et al 2015; Marsh and Youngentob 2019). By area, the Conservation Area has proportionally higher foliage nutrient levels.
- (c) The BioLink (2019a) assessment states that koalas belonging to the Kings Hill hub are likely to occur within an area of habitat that exceed the minimum requirements for an active hub (i.e. population size of 50 Koalas and available habitat of > 900 ha). This is important and was not referenced in the Umwelt Report.
- (d) The 1,225 ha of secondary habitat available to the Kings Hill Koala hub area after development is 36% greater than the minimum 900 ha requirement for an active hub. It is realistic to expect that this residual habitat will continue to sustain the Kings Hill Koala hub into the future noting that the Concept DA will make a significant and important contribution to the in-perpetuity security of this habitat in the locality (i.e. 95% of the Conservation Area (233.37 ha) is koala habitat securing 26% of the minimum requirement for an active hub – 900 ha).

The in-perpetuity protection and management of habitat within the Conservation Area, in contrast to the impact area, is consistent with mapped areas of high and very high habitat presented in the Lower Hunter Koala Study (Eco Logical Australia 2013), which maps the impact area as being of moderate habitat value.

5. Umwelt state that the nutrient enrichment program is heavily relied on in the koala assessment

The seven part test prepared for the koala relies on the application of the 'mitigation hierarchy' comprising several initiatives to avoid, minimise and mitigate impacts. The proposal clearly describes the extent of impact avoidance (Section 2.2.1.1), impact minimization (Section 2.2.1.3, Section 2.2.1.4) and impact mitigation (Section 2.2.1.5 and Vegetation Management Plan, Section 2.2.1.7).

There are strong foundations for the contribution of the nutrient enrichment program to the overall management of impacts. For the Umwelt report to describe it as 'novel' with reference to comments of Dr Lemckert, incorrectly distorts the full quote. Dr Lemckert accepts that nutrient enrichment has been proven to work in cleared areas, but observes that no study has been done in areas where trees have been retained. He does not suggest that it will not encourage koalas observing instead that it is:

"... relatively novel and very interesting and is simply an extension of the principles of the Biodiversity Assessment Method (BAM) (emphasis added) ... a very logical use of the offset principles followed under BAM" (emphasis added).

Notably, Umwelt accepts the benefit and effect of revegetation/ plantings works proposed as part of the DA, as provided in Section 5.1.3 of the SIS and meets the requirements of the Port Stephens Comprehensive Koala Plan of Management (i.e. local outcome). In any event, nutrient enrichment is only one appropriately weighted factor in the ameliorative strategy.

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6. Connections for the koala with lower North Coast bioregion and genetic studies performed by OWAD Environmental

The Umwelt Report concludes that there was considerable uncertainty about the connection between the koalas in the Kings Hill hub and other areas on the lower north coast. This conclusion is not incorrect.

As previously stated, the Umwelt Report did not take into account the following relevant information:

- (a) Genetic studies performed by OWAD identify the individuals within the Kings Hill hub to be genetically diverse, reasonably inferring that Kings Hill koalas form part of a larger population that well exceeds the number of individuals present in the Kings Hill hub area.
- (b) Geographically, genetic linkages have been established between koala individuals found at Kings Hill with those occurring outside the Kings Hill hub at Clarence Town, Booral, Karuah, Barrington Tops and Port Macquarie.
- (c) The true boundaries of the 'local population' are not known and are highly likely to well exceed the conservative 'Kings Hill hub' area as defined by BioLink.
- (d) As stated in the seven part test of the SIS, these genetic linkages support the assigning of habitat occupied by Koalas at Kings Hill with occupied habitat within the Wang Wauk Area of Regional Koala Significance (ARKS) (Rennison 2017b). This habitat area is estimated to comprise 174,864 ha north from Raymond Terrace.

Genetic flow inferred from the genetic study demonstrates a connection between koala individuals located at Kings Hill with koala individuals located throughout the lower North Coast bioregion. The Concept DA does not change or interrupt vegetated connections with the lower North Coast bioregion. Conversely, it protects such vegetated connections through the provision of an in-perpetuity Conservation Area. The Concept DA will not interrupt, sever or fragment this connection.

7. Umwelt critique the Vegetation Mapping and Floristic Survey provided in the SIS

The Vegetation Mapping and Floristic Survey presented in the SIS is considerable, comprehensive, spatially representative and well exceeds the CERs requirements. The survey work performed has been guided by appropriate and publicly available datasets, which are properly referenced in the SIS where required.

Adequate vegetation mapping and floristic survey has been performed and documented in the SIS, as summarised below:

- Floristic plots (76 plots by Cumberland Ecology and 28 plots by RPS). Combined, the floristic plot survey performed by Cumberland Ecology (2014 and 2016) and RPS (2018) exceeded the minimum plot requirement by 588% (i.e. 106 plots performed and 18 required). Surveys were properly stratified and spatially representative. Note: Umwelt incorrectly refer to Cumberland Ecology plot surveys being performed in 2009, despite reference to that year being clearly a typographical error (see Section 4.2.1.2.1 of the SIS).
- Rapid data points (888 RDPs by RPS in 2018). The minimum number of RDPs required is not specified by guidelines, however, the quantum performed is equivalent to 1.7 RDPs per hectare. Surveys were properly stratified and spatially representative.
- Parallel transects (see Table 4.3 of the SIS). Surveys were consistent with relevant applicable guidelines (quantum of transects, seasonal timing and spatial representativeness). Maps provided clearly demonstrate the comprehensive nature of the surveys (i.e. systematic and stratified) to minimise 'false-negatives'. A total of 560 person hours were deployed by RPS and an additional 64 person hours by Cumberland Ecology. According to Table 3 of the *Guide to surveying threatened plants*, equates to a total estimated survey extent of 483 – 1,288 ha across three seasons (winter and spring 2018 and spring 2019). This comprehensive survey

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effort adequately addressed concerns relating to 'false absences and imperfect detection' identified in the CERs (see Section 4.1.1 of the SIS).

- Tree canopy nearest neighbour survey: 187 survey points were examined to measure tree species presence and abundance across the entire subject site (1 per 2.8 ha).
- Preferred Koala feed tree survey: Complete survey of the impact area to map all preferred koala feed trees within DBH > 300mm DBH, with an estimated 152 ha survey area.

Umwelt indicate that the use of regional vegetation mapping used in the SIS (i.e. NPWS 2003) was inappropriate and should have used the Greater Hunter Vegetation Map. It is important to note that the latter is not regarded as a superior mapping product as it has been demonstrated to be "highly inaccurate with only 17% of validation points attributed as 'correct' and a further 13% 'essentially correct'. Therefore, a majority of PCTs were mapped with an accuracy of less than 30%"¹.

Umwelt state that the SIS does not provide a soils map. The SIS does provide a soil map with soil descriptions (Figure 2.2 and Section 2.1.2.4). Further, in respect to the utility and importance of soil in the analysis of vegetation and threatened ecological communities (TECs), Umwelt make the following two conflicting statements in their review:

"One important aspect of determining the PCTs and TECs present is to assess the geology and soil types present, or likely to be present" (p 11); and

"The other factors that are relied upon to discriminate against the presence of LHSGIF EEC for PCT 1590, being edaphic (soil) and mean annual rainfall matters, are not supported by this review" (p 15).

Umwelt's first statement is correct and is supported by relevant case law², notably paragraphs 31, 33, 39 and 40 for that judgment. The latter statement is therefore inconsistent and should therefore not carry weight in Umwelt's review.

8. Umwelt critique the classification of Lower Hunter Spotted Gum Ironbark Forest EEC.

Umwelt support the process described in the SIS for determining TEC presence. Among various agreements, Umwelt's Report states *"One important aspect of determining the PCTs and TECs present is to assess the geology and soil types present, or likely to be present"*. In conflict with this, Umwelt latter state that the SIS conclusion of PCT 1590 not aligning with Lower Hunter Spotted Gum Ironbark Forest EEC is not supported, citing an over reliance on 'edaphic' (soil) factors. RPS disagrees. The SIS provides a supported rationale for rejecting PCT 1590 as forming part of the Lower Hunter Spotted Gum Ironbark Forest EEC (Section 6.1.1.2 of the SIS) consistent with case law².

Umwelt states the SIS placed significant reliance on factors other than those regarded as fundamental (i.e. high percentage of the 'assemblage species', edaphic (soil) conditions and the particular area). This position is inconsistent with the case law² as outlined below:

- Paragraph 23: *latitudinal, altitudinal and physiographical variations*

¹ Hunter (2016). Validation of the Greater Hunter Native Vegetation Mapping as it pertains to the Upper Hunter region of New South Wales. *Ecological Management and Restoration* <https://doi.org/10.1111/emr.12195>

² Motorplex (Australia) Pty Limited v Port Stephens Council [2007] NSWLEC 74

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- Paragraph 24: *significant differences in the geographical and climatic distribution of the communities have consequences for the floristic composition and distribution of the communities*
- Paragraph 31: *The descriptions note that as physiographic and edaphic factors change, one community may intergrade with and be replaced by another community*
- Paragraph 33: *species composition of sites will vary according to various physiographic, edaphic and anthropogenic influences*
- Paragraph 39: *the Scientific Committee identifies the locations on which each of the communities occurs by reference to edaphic and physiographic factors*

The SIS provides a phytosociological analysis, as directed to do so by the CERs and is an analysis supported by paragraph 101 of the relevant case law². Conversely, Umwelt rely solely on a simple comparison of the species, which was found to be a flawed approach in paragraph 102 of the relevant case law² and is reproduced below:

"112 The quantitative analysis of Mr Travers, whilst providing some useful information, is not as reliable as the phytosociological analysis by Dr Smith. As Dr Smith noted, Mr Travers' method was merely a simple count of the number of so-called indicator species in different mapped communities. It did not take account of the abundance of the indicator species. It is a less reliable method of assemblage identification than the agglomerative, hierarchical classification used in Dr Smith's study which considered the relative abundance of plant species and not just their presence and absence."

Fundamental to the consideration of a TEC are boundaries with intergrading communities that are not included in the listing as outlined in paragraph 105 below from the relevant case law²:

"105 A conclusion that the vegetation on the site corresponds with a vegetation community described elsewhere is uninformative unless that vegetation community has been incorporated expressly by reference by the Scientific Committee in its Final Determinations of the endangered ecological communities."

The SIS correctly considers the entire listing for Lower Hunter Spotted Gum Ironbark Forest EEC including matters additional to floristic composition represented in Part 1.1.

Contrary to suggestion made in the Umwelt Report, the SIS makes no statement indicating that Lower Hunter Spotted Gum Ironbark Forest EEC is dismissed solely by floristic comparison in Part 1.1 of the analysis. Final determination listings for EECs do take into consideration their transitions with adjoining communities as alluded to in Part 1.2 of the Lower Hunter Spotted Gum Ironbark Forest EEC listing, thus acknowledging Paragraph 32 and 105 of the relevant case law². As earlier mentioned, factors such as location, climate, edaphic and physiographic factors as also important and are particularly relevant in circumstances where intergrades exist with other (adjoining) communities that do not form part of the EEC listing, where specifically mentioned in the final determination. Adjoining intergrading communities are noted in the final determination for Lower Hunter Spotted Gum Ironbark Forest EEC and are discussed in Part 4 of that listing and include MU65 (or PCT 1590).

Kings Hill is located outside and 2-5 km east of the specified geographical distribution of Lower Hunter Spotted Gum Ironbark Forest EEC (i.e. line between Clarence Town and Beresfield), with the geographic distribution prescribed in Part 4.1 of the final determination, reproduced below and in bold for emphasis:

*"Lower Hunter Spotted Gum Ironbark Forest is currently known to occur in the Lower Hunter Valley centred on the Cessnock-Beresfield area **and approximately bounded by the towns of Paxton, Branxton, Clarence Town, Beresfield, Mt Vincent** and the northern boundary of Watagans National Park. The northern and southern parts of its distribution are separated by the floodplain of the Hunter River."*

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Kings Hill has an annual average rainfall exceeds the range specified for Lower Hunter Spotted Gum Ironbark Forest EEC in the final determination (i.e. 1044 mm at Kinross versus an upper limit of 1,000 mm per annum in the Final Determination). The climatic variation noted is not inconsequential as noted in paragraph 23 of the relevant case law.

The joint consideration of relative abundance and characteristic species in Part 1.1 and Part 4.6 of the analysis presented in the SIS is consistent with the relevant case law². This enriched comparison by way of objective analysis of floristic data using methods stated in the CERs (i.e. ANOSIM) is appropriate and in difference to Umwelt's analysis (i.e. counts of characteristic species), which is viewed as simplistic in Paragraph 112 of the relevant case law². The SIS properly considers the added importance of relative abundance in determining the relevance of adjoining vegetation communities described elsewhere that differ to Lower Hunter Spotted Gum Ironbark Forest EEC (i.e. Part 4 of the Final Determination).

MU 65 (or PCT 1590), which is a '*vegetation community described elsewhere*' as it differs to Lower Hunter Spotted Gum Ironbark Forest EEC, is expressly referenced by the Scientific Committee in its final determination for Lower Hunter Spotted Gum Ironbark Forest EEC (i.e. Part 4.6). Therefore, it is proper to regard this vegetation as adjoining and excluded from the listed EEC. The final determination for Lower Hunter Spotted Gum Ironbark Forest EEC identifies location and climate as key identifiers for the consideration of grading communities such as MU 65 (or PCT 1590). This is important context for the subject site.

In application, and with reference to Part 4.6 of the final determination, the Scientific Committee correctly notes MU 65 (i.e. PCT 1590) grades with and *differs from* Lower Hunter Spotted Gum Ironbark Forest thus excludes MU 65 (PCT 1590) from the listing. It is reasonable to construe that MU 65 does not form part of the EEC at and beyond geographic and climatic limits specified in the Final Determination. Part 4.6 is reproduced below with bold to emphasise the key floristic features that differentiate the intergrading community (i.e. MU 65 or PCT 1590 as found within the subject site) from Lower Hunter Spotted Gum Ironbark Forest:

"Lower Hunter Spotted Gum Ironbark Forest grades into Spotted Gum/Broad-leaved Mahogany/Red Ironbark moist shrubby open forest (MU 65 of Somerville 2009b) in areas with similar edaphic properties but receiving a higher average annual rainfall. This community includes vegetation described as Coastal Foothills Spotted Gum Ironbark Forest, Seaham Spotted Gum Ironbark Forest (MU 15 and MU 16 of NPWS 2000) and Hinterland Spotted Gum Ironbark Forest (Bell 2013). Spotted Gum/Broad-leaved Mahogany/Red Ironbark moist shrubby open forest differs from Lower Hunter Spotted Gum Ironbark Forest in the composition of the tree stratum, where Corymbia maculata dominates in association with Eucalyptus umbra, E. fibrosa, E. siderophloia and Allocasuarina torulosa. Spotted Gum/Broad-leaved Mahogany/Red Ironbark moist shrubby open forest also differs in the composition of the shrub stratum, with species such as Grevillea montana, G. parviflora subsp. parviflora, Melaleuca decora, M. nodosa and Pultenaea spinosa occurring less frequently than in Lower Hunter Spotted Gum Ironbark Forest, while others (Acacia ulicifolia, Breynia oblongifolia, Leucopogon juniperinus, Notelaea longifolia) have been recorded more frequently (Somerville 2009b). Subshrubs and herbaceous species recorded less frequently in MU 65 than in Lower Hunter Spotted Gum Ironbark Forest include Dianella revoluta, Dichelachne micrantha, Goodenia rotundifolia, Rytidosperma pallidum, Macrozamia flexuosa, Opercularia diphylla, Phyllanthus hirtellus, Platysace ericoides, Podolobium ilicifolium, and Pomax umbellata. Species recorded more frequently in MU 65 include Cymbopogon refractus, Desmodium rhytidophyllum, Desmodium varians, Dianella caerulea, Dichondra repens, Echinopogon ovatus, Eustrephus latifolius, Geitonoplesium cymosum, Gonocarpus tetragynus, Goodenia heterophylla, Imperata cylindrica, Pandorea pandorana and Pseuderanthemum variabile (Somerville 2009b)."

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The SIS properly considers all aspects of the Final Determination for Lower Hunter Spotted Gum Ironbark Forest EEC and does not restrict the analysis to Part 1.1 of the listing, as incorrectly stated by Umwelt. An analysis limited to one part of the Final Determination is contrary to relevant case law². This information is provided in Section 6.1 of the SIS.

In assessing for the presence of EECs, notably PCT 1590, the SIS has properly considered relevant case law in determining such matters². The SIS has used a correct approach to the delineation of Lower Hunter Spotted Gum Ironbark Forest EEC with the subject site (and excluded PCT 1590 from the listing). A properly prepared seven part test provided in the SIS has incorporated this information and supports the conclusion of a 'no significant impact' outcome for Lower Hunter Spotted Gum Ironbark Forest EEC.

9. Umwelt critique survey timing and effort for *Pterostylis chaetophora* and *Corybas dowlingii*

The SIS complied with the CERs, which expressly stated a requirement to perform certain surveys in accordance with specified guidelines and guides. The SIS documents an appropriate application of the **Guide to survey threatened plants** (OEH 2016) (emphasis added) to meet the main objective of this guide, which is:

"The survey aims to minimise 'false-negatives' (i.e. when a species is report as absent from a site when it is actually present)"

Maps provided in the SIS (i.e. Figures 4.4, 4.5 and 4.7) clearly demonstrate the comprehensive (systematic) nature of the surveys performed for *Pterostylis chaetophora* and *Corybas dowlingii* to minimise 'false-negatives'. However, on review, it is conceded that an error in the compilation of the survey effort for *Corybas dowlingii* is evident in Figure 4.4. The linework indicated actually under-represents the survey performed, with each line only indicating one or two persons traverse. Traverses or parallel transects were completed in teams of two with only one GPS used to log the path of the traverse.

The survey effort performed for both species has been systematic, comprehensive and has appropriately addressed objective of minimising false-negatives as stated in the CERs and the relevant guide. A total of 624 person hours, as notated in Table 4.3 for parallel transects, documents the amount of survey performed and demonstrates the adequacy of survey for these species.

According to Table 3 of the *Guide to surveying threatened plants* (OEH 2016), the person hours expended in performing parallel transects equates to an estimated survey area coverage of:

- 168 – 448 ha in August 2018 for *Corybas dowlingii* (i.e. 224 person hours inclusive of 64 person hours expended by Cumberland Ecology)
- 120 – 320 ha in early September 2018 for *Corybas dowlingii* (i.e. 160 person hours)
- 147 – 392 ha in September, October and early November 2018 for *Pterostylis chaetophora* (196 person hours)
- 48 – 128 ha in October 2019 for *Pterostylis chaetophora* (64 person hours)

Survey timing was seasonally appropriate:

- *Corybas dowlingii* June to August³
- *Pterostylis chaetophora* September to November⁴

³ NSW Scientific Committee 2008 *Corybas dowlingii* (an orchid) - endangered species listing

⁴ NSW PlantNet (<https://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Pterostylis%7Echaetophora>)

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This comprehensive survey effort adequately addressed the need to perform surveys that minimized the potential for 'false absences and imperfect detection' as identified in the CERs (see Section 4.1.1 of the SIS). The provision of a managed in-perpetuity Conservation Area comprising these species, which has the purpose of retaining viable local populations in the long term, was regarded by Umwelt as a beneficial measure (p9) with the BMP considered "broadly adequate in their approach and objectives" (p23). A properly prepared seven part test is provided in the SIS and has incorporated this information and supports the conclusion of a 'no significant impact' outcome for both these species of orchid.

10. Umwelt critique the SIS regarding description of locality and local population

Umwelt suggest that the SIS has not defined the locality or the extent of the local population of affected threatened species (e.g. the brush-tailed phascogale).

The locality is defined in the Glossary of Terms at start of the SIS (i.e. locality is described as a 5 km radius of the study area) and again in the CERs (Appendix A). Local and regional abundance is discussed in Section 5.3.1 to Section 5.3.35 and Section 6.2.1 to Section 6.2.4 of the SIS as are the location and importance of corridors.

On review of the SIS it is recognised that descriptions provided for local populations could be enhanced to supplement the seven part tests provided in Section 8 of the SIS.

11. Umwelt critique the assessment prepared for the Brush-tailed Phascogale on the basis of habitat classification and assessment of importance of habitat

The method for habitat characterisation is well described (Arboreal Roughness). This model includes a composite of 'rough barked trees' with a DBH of 30 cm or more. Trees included are listed in Section 4.4.25 of the SIS. Tree species used in the composite model were independently modelled using the method outlined in Section 4.2.1.2.4 of the SIS. Individual tree modelling is provided in the SIS in Section 4. In relation to the process of aggregating informative layers the SIS states the following in Section 4.4.25.

A combined consideration is an additive process. Classifications provided in Figure 4.81 reflect this process.

Put simply, breeding habitat can only occur where there are hollow-bearing trees with Figure 4.27 providing a dichotomy for defining this kind of habitat as represented in the first two classifications. Accordingly, lands without hollow-bearing trees are regarded as foraging only. Distinctions made between 'high value foraging and breeding' and 'foraging and low value breeding' simply reflect the classifications provided for hollow-bearing trees (Figure 4.27), fallen logs (Figure 4.28) and arboreal roughness (Figure 4.80).

In relation to the importance of the habitat for the brush-tailed phascogale in the local area, the SIS has rightly relied on detailed information obtained from accessible lands (i.e. subject site) and local/regional datasets for inaccessible lands (i.e. lands outside the subject site but within the locality, which is defined as 5 km radius of the study area). The limitations placed on the latter dataset is an unavoidable circumstance that is a commonly encountered challenge and universally accepted in all impact assessments of this kind. Limitations are placed on this aspect of the assessment are noted in Section 4.1.2.3 of the SIS.

Notwithstanding, the SIS demonstrates the retention of a very large proportion of important habitat within the Conservation Area. A viable population of the brush-tailed phascogale is expected to utilise this area are part of habitat occurring within the locality. The assessment of cumulative impacts clearly demonstrates a low likelihood for an ongoing erosion of biodiversity values within that part of the locality (i.e. cumulative impact area).

MEMO

Date: 3 June 2021
Regarding: Kings Hill concept development for residential subdivision | PPS-2018HCC047

On review, it is considered that the SIS could be improved by clarifying the method used to map important habitat and the associated implications for the impact assessment.

Next Steps

In light of the information provided in this response and without prejudicing the content and conclusions of the SIS, it is considered that additional clarity could be provided in the SIS. The following clarifications could be provided in the SIS to properly address matters raised in the Umwelt review:

- Review and update content provided in regards to descriptions of local populations
- Provide additional supporting information for the conclusion of PCT 1590 not being part of Lower Hunter Spotted Gum Ironbark Forest EEC
- Better outline the process involved in producing habitat mapped for the Brush-tailed Phascogale; and
- Remedy some typographical errors noted in the document (e.g. timing of Cumberland Ecology surveys – not in 2009 rather, in 2014)



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