

**BOX HILL NORTH**

**EPBC Interim Management Plan - Biobank Site  
Monitoring Report**

For:

**Celestino Developments Pty Limited**

June 2018

**Final**



**PO Box 2474  
Carlingford Court 2118**

## Report No. 15062RP5

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or recommendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

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1	21/05/18	GK/DR	draft
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Approved by: David Robertson

Position: Director

Signed: \_\_\_\_\_



Date: 22 June, 2018

Project EPBC Number	2014/7119
Project Name	The Gables, Box Hill North
Proponent/approval holder	E.J.Cooper & Son Pty Ltd
	ACN 000 269 750
Proposed/approved action	Development of a 339 ha parcel of land to accommodate residential dwellings, community centres, a town centre, school, roads and associated infrastructure
Location of action	Box Hill North, New South Wales

**Declaration of accuracy**

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed

Full name (please print)

  
GEORGE TSEKOURAS

Organisation (please print)

E.J. Cooper & Son Pty Limited

Date

2 / 07 / 2018

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## Executive Summary

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The purpose of this report is to document the management actions implemented at the Gables development as required under the Interim Management Plan (IMP) approved by the Commonwealth Department of Environment and Energy (DoEE)

The Gables is a 339 hectare parcel of land (the 'Gables Project') at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, town centre, schools, roads and associated infrastructure. The Gables project is divided into nine separate development 'Precincts', namely Precincts A – I.

The Gables project was referred to DoEE and was determined as a controlled action (EPBC 2014/7119) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species.

Approval for the Gables development was initially granted by the Department of the Environment and Energy (DoEE) on 19 July 2016. Following discussions with DoEE, two variations to the conditions were approved on 23 June 2017 and 19 March 2018 respectively to accommodate amendments to the action in accordance with consent conditions by local and state government.

Condition 5 of the DoEE approval required the preparation of a BioBank Site Management Plan for the conservation and management of Matters of National Environmental Significance (MNES) present within the two BioBank Sites until approval of the Biobanking Agreements by DoEE and the NSW Office of Environment and Heritage (OEH). The Interim Management Plan (IMP), prepared in accordance with Condition 5 was approved by DoEE on 17 May 2017 and implementation of management actions listed in the IMP commenced on 22 May 2017.

As part of the IMP, a monitoring strategy was implemented, comprising flora monitoring inspections and the establishment of photomonitoring points around the perimeter of the two BioBank sites to detect changes in vegetation condition, weed outbreaks or breaches of the perimeter fence.

Monitoring commenced on 29 June 2017 and concluded on 26 March 2018 following approval of the Biobanking Agreements by DoEE and OEH on 19 March 2018 and 23 March 2018 respectively. In accordance with the IMP, the flora monitoring was conducted every six months while the photo-monitoring was conducted every three months. A final flora monitoring session was conducted during the final monitoring period on 26 March 2018. No significant changes in vegetation condition were detected and no weed outbreaks occurred during the monitoring period. No significant breaches of the perimeter fence occurred and minor damage to fences were repaired within 2 weeks of detection. Therefore the objective of the IMP, to protect and maintain the condition of MNES and MNES habitat in the proposed

BioBank sites until approval of the respective BioBanking agreements, is determined to have been met.

# Introduction

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## 1.1 Purpose

The purpose of this report is to document the management actions implemented at the Gables development as required under the Interim Management Plan (IMP) approved by the Commonwealth Department of Environment and Energy (DoEE).

The objectives of management plans outlined in the IMP are to maintain the condition of vegetation within the BioBank sites as they were characterized at the time of EPBC assessment and prevent any significant degradation of vegetation, including MNES and MNES habitat within the BioBank sites.

## 1.2 Background

The Gables is a 339 hectare parcel of land ('the Gables project') at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, town centre, schools, roads and associated infrastructure. The Gables project is divided into nine separate development 'Precincts', namely Precincts A – I (**Figure 1.1**).

The Gables project was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined as a controlled action (EPBC 2014/7119) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species. The affected MNES include:

- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW);
- Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and
- Grey-headed Flying Fox.

The MNES and MNES habitats are restricted to Precincts E, F, G and I (hereafter collectively referred to as 'the subject site') and the DoEE conditions of approval, as issued on 19 July 2016, are limited to these four precincts. Following discussions with DoEE, two variations to the conditions were approved on 23 June 2017 and 19 March 2018 to accommodate amendments to the action in accordance with consent conditions by local and state government.

In accordance with conditions of consent issued by the NSW Office and Environment and Heritage (OEH) and Hills Shire Council, parts of the CPW and SSTF communities present

within Precincts I and G respectively are to be conserved as two separate BioBank sites under the NSW BioBanking scheme (**Figure 1.1**).

Condition 5 of the original consent conditions issued by DoEE on 19 July 2016 required the preparation and implementation of a BioBank Site Management Plan for the conservation and management of MNES present within the two BioBank Sites. In accordance with Condition 5, an Interim Management Plan (IMP), which prescribed measures for the conservation and management of MNES in the BioBank sites as well as additional management strategies for the wider subject site (Precincts E, F, G and I) was submitted to DoEE. The IMP was approved by DoEE on 17 May 2017 and implementation of the management actions prescribed in the IMP commenced by 22 May 2017.

As per the requirements of the revised Condition 5 (dated 23 June 2017) the IMP was to be implemented until such time as the BioBanking Agreements were approved by the Minister and signed with NSW OEH. Approval for the Biobanking Agreements was received from DoEE on 19 March 2018 and the Biobanking Agreements were formally signed off by OEH on 23 March 2018.

Section 2.7 of the approved IMP required an annual performance report to be prepared following the second round of 6 monthly monitoring conducted each year or upon approval of the BioBanking agreements. Therefore, in accordance with Section 2.7 of the IMP, this report comprises the final performance report of management actions implemented under the IMP.

### 1.3 Interim Management Actions

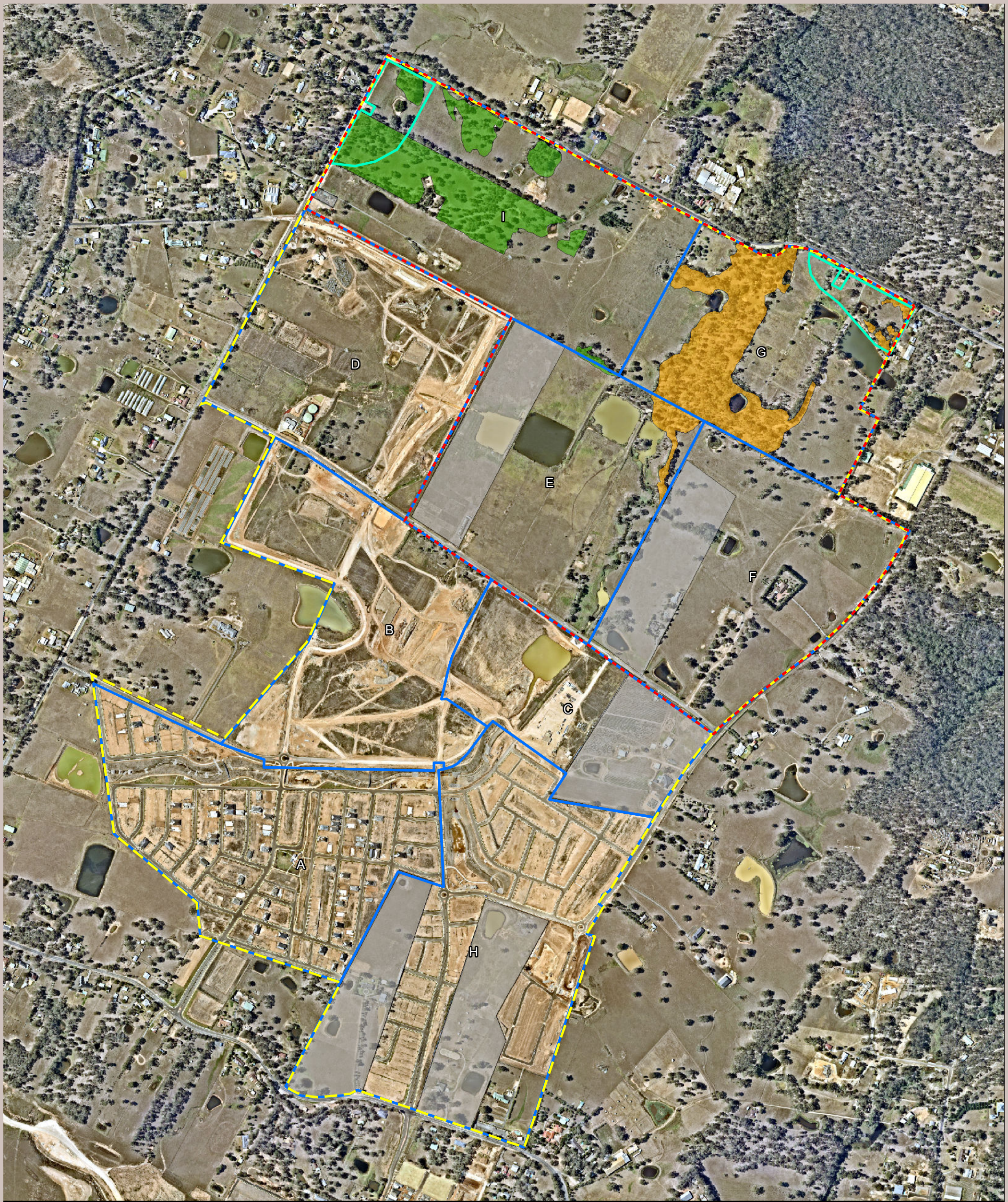
The management and monitoring actions to be implemented within the Biobank sites and wider subject site as part of the IMP include:

- Settlement of relevant properties;
- Installation of fencing and signage;
- Site remediation;
- Dam dewatering;
- Site inspections;
- Weed monitoring and management;
- *Phytophthora cinnamomi* monitoring and management; and
- CPW and SSTF threatened ecological condition monitoring.






The environmental outcome of implementing these management actions is to maintain the condition of the site as it was characterized at the time of EPBC assessment. The

performance from the implementation of the above listed actions is detailed in the following chapter of this report.





**Legend**

-  Subject Site
-  Gables Project
-  Development Precincts
-  Proposed Biobank Site
-  Properties excluded from the assessment

**Vegetation Community**

-  Cumberland Plain Woodland
-  Shale Sandstone Transition Forest

Coordinate System: MGA Zone 56 (GDA 94)

Image Source:  
Image © NearMap 2018  
Dated 18-01-2018

cumberland  
ecology

**Figure 1.1. Aerial View of Subject Site and wider Gables Development**

0 100 200 300 400 m



## Biobank Site Interim Management Actions

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### 2.1 Interim Management Actions

#### 2.1.1 *Settlement of Relevant Properties*

The properties contained within the subject site prior to implementation of the IMP were subject to a variety of land uses including grazing by livestock and mowing of grassy areas.

The objective of settlement was to transfer ownership of all the relevant properties to the approval holder to enable implementation of further management actions.

The settlement of all properties was completed at the time of approval of the IMP by DoEE in May 2017 which enabled immediate commencement of all other management actions required under the IMP. The settlement of properties also resulted in the removal of all livestock within the subject site which contributed towards the protection of MNES and MNES habitat via reduction in grazing pressure.

The objective of this management measure to allow damaging land practices to be halted has therefore been met.

#### 2.1.2 *Fencing and Signage*

Following settlement of properties fauna friendly fencing, comprising a 1.8m high chain wire fence, was erected along the Boundary Road and Maguires Road frontages of the subject site, thereby restricting any public access to the Biobank sites as well as the wider subject site. Signage designating the Biobank sites as well as adjacent subject site areas as an 'Environmentally Sensitive Area' was installed at regular intervals along the Boundary Road and Maguires Road frontages (see **Photograph 2.1**).



**Photograph 2.1 Example signage installed on fauna friendly fencing along Maguires Road**

Due to requirement of frequent access to the Biobank sites and adjacent parts of the wider subject site for remediation, archaeological works and demolition works, internal fences separating the Biobank Sites from the adjacent parts of the subject site were set up following completion of any demolition and remediation works in the immediate vicinity of the Biobank Site boundary. Prior to the set up of the internal fences, access to the subject site was limited to contractors commissioned by the approval holder and contractors provided with access to the biobank site areas were notified of the limitations and requirement to consult with ecologists prior to any works being implemented within these areas.

The objective of the IMP to install fencing and signage to prevent inadvertent damage and degradation to the MNES values that the BioBank sites contain has therefore been met.

### **2.1.3 Site Remediation**

Environmental assessments conducted for the Gables development identified pockets of contaminants, including asbestos containing materials, within the BioBank sites and the wider subject site. These contaminants not only constituted a potential health hazard to

humans but also had the potential to degrade the quality of the soils within the Biobank sites in the long-term, thus potentially affecting the long-term health of MNES vegetation within the BioBank sites. Remediation of these contaminants in accordance with a Remedial Action Plan (RAP) was also a consent condition issued by local government.

The amended DoEE consent conditions, dated 23 June 2017, allowed for remediation and demolition of existing structures to be conducted as 'ancillary works' within the subject site, including the Biobank sites.

In order to protect existing MNES within the Biobank sites and wider subject site, site assessments were conducted for each individual property within the subject site to identify suitable tracks and work areas for remediation and associated demolition/material removal. Individual reports identifying the vegetation present around each structure to be demolished/removed/remediated, locations of access tracks and potential work sites, recommendations for site specific mitigation measures to reduce the risk of impacts to MNES as well as strategies for rehabilitation in the event of unavoidable impacts were prepared for each property. These reports are provided in **Appendix A**.

Follow-up inspections were conducted as required during the demolition/remediation process to ensure that works were contained within the designated work sites. No MNES were impacted during the demolition and remediation works and no revegetation works were required.

The objectives of the IMP in respect to remediation – being removal of contaminants from within the BioBank sites and the wider subject site while preventing inadvertent damage of vegetation - has been met.

#### ***2.1.4 Archaeological Salvage Works***

Archaeological salvage works were conducted across three archaeological sites within the subject site, namely BHN2, BHN5 and BHN6 as indicated in the Heritage Clearance Map provided in **Appendix D** of the IMP.

All archaeological works were conducted in accordance with the Salvage Excavation Methodology provided in the Box Hill North Cultural Heritage Assessment Report. All archaeological works occurred within demarcated work sites located outside of the Biobank sites and did not require any buffer zones with respect to the Biobank sites. Furthermore, salvage works did not require clearing of any MNES vegetation within the wider subject site.

Therefore the objectives of the IMP to prevent damage of MNES vegetation while allowing for archaeological salvage works to be conducted have been met.

#### ***2.1.5 Dam Dewatering Protocol***

A total of 24 farm dams are located within the subject site (4 in Precinct E, 6 each in Precincts F and G, and 8 in Precinct I), with one dam being located within each of the proposed BioBank sites.

In accordance with the requirements of the IMP, an Ecological Work Method Procedure for Dam Dewatering was prepared for dams located within the subject site, in particular for the dams within and immediately adjacent to the Biobank Site. As per the requirement of the IMP, the Ecological Work Method Procedure was based on the Dam Decommissioning Ecological Work Method Procedure prepared by Cumberland Ecology for Precincts A, B, C and H, as approved by the Hills Shire Council, and was tailored to specific conditions within the subject site. In particular, work zones and access tracks for dewatering of dams within the Biobank sites have been designated by ecologists in order to maximise protection of MNES within the Biobank sites. Figures showing the locations of the tracks and work zones relative to MNES vegetation within the Biobank site are provided in **Appendix B**.

Dewatering of the dams within the subject site, the Biobank sites in particular, is yet to commence as further site specific development applications are yet to be approved by Hills Shire Council. However sediment and erosion control plans for dewatering of dams within the Biobank sites have been submitted to Hills Shire Council and all dewatering works will be conducted in accordance with the Ecological Work Method Procedure for Dam Dewatering.

The approved Biobanking agreements, signed off by OEH, specify that the dams will be dewatered in accordance with the requirements of the Commonwealth IMP (specifically the Ecological Work Method Procedure for Dam Dewatering) prior to commencement of management actions for the Biobank Site. The approved Biobanking agreement also specifies that dewatered and in filled dam areas will be revegetated to a form of MNES vegetation.

Therefore appropriate steps to achieve the objectives of the IMP in relation to dewatering of dams, namely removal of long-term risk of harm from the artificial water bodies and creation of areas for additional planting of MNES vegetation, have been implemented.

### **2.1.6 Rehabilitation of Disturbed Vegetation**

All ancillary works conducted under the IMP were limited to work areas designated by ecologists. No clearing of native vegetation or inadvertent damage to MNES occurred during any ancillary works and no rehabilitation of disturbed native vegetation was required.

### **2.1.7 *Phytophthora cinnamomi* Risk Management**

All ancillary works within and immediately adjacent to the Biobank sites were limited to designated work areas and all protocols in relation to hygiene were met.

Ongoing monitoring of vegetation within the Biobank sites showed no indication of degradation of condition or dieback of vegetation within Biobank sites. Therefore, the potential introduction of *Phytophthora cinnamomi* into the Biobank sites is considered to be highly unlikely. Further details on the monitoring are provided in Section 2.2 below.

Therefore the objective of the IMP in relation to *Phytophthora cinnamomi* risk management, namely minimising the risk of inadvertently introducing *Phytophthora cinnamomi* into the BioBank sites, has been met.



## 2.2 Monitoring Program

The main objective of the monitoring program was to record the condition of MNES within the BioBank sites and to identify any threatening processes occurring within these areas that could degrade the integrity of MNES within the Biobank site until approval of the BioBanking agreements. As per the requirements of the IMP, monitoring of the Biobank sites included:

- Site inspections;
- Photomonitoring;
- Visual assessment of dieback as an indication of potential *Phytophthora cinnamomi* infection; and
- Transect monitoring of MNES vegetation.

These are detailed in the following sections.

### 2.2.1 Methods

#### i. Site Inspections and Photo Monitoring

An initial site inspection to establish photopoints was first conducted on 29 June 2017 following the settlement of properties and installation of fencing and signage as described in **Sections 2.1.1 and 2.1.2.**

A total of four (4) photo-monitoring locations were established within each Biobank site. The location of each photo-monitoring point was recorded during a hand-held GPS unit and marked up using a star-picket. The locations of the photo-monitoring sites are shown in **Figure 2.1.**

A minimum of four (4) photographs, one each with a north, east, south and west aspect, was taken at each photo-monitoring point. The perimeter fence was also traversed and the locations of any damaged areas were recorded using a hand-held GPS.

As photo-monitoring was required to be conducted every three months under the IMP, inspections were conducted on 26 September 2017, 14 December 2017 and 26 March 2018.

#### ii. Vegetation Community Monitoring

Concurrent with the initial site inspection to establish photo-monitoring points on 29 June, two 50m monitoring transects were established in each Biobank Site. The start of each transect coincided with an established photo-monitoring point. The location of the end of each transect was recorded using a hand-held GPS and marked up with a star-picket to enable consistency in the location of transects across monitoring periods.

Data recorded within each transect included:

- Percentage cover of each stratum (canopy, mid-storey and groundcover) every 10m;
- Percentage cover and identity of exotic species every 10 m; and
- Percentage cover and identity of Weeds of National Significance (WoNS) every 5 m.

In addition to transects, random meanders were conducted in both woodland and grassland habitats in the proposed BioBank site. The following data was recorded:

- Dominant species present in each strata in each habitat type;
- Presence of significant environmental weeds and/or WoNS in each habitat type;
- Percentage cover of dominant species and weeds in each habitat type;
- General health of the vegetation; and
- New disturbances or changes to previous conditions.

As vegetation condition monitoring was required to be conducted every six months under the IMP, inspections were conducted on 14 December 2017. As 26 March 2018 represented the final monitoring period following approval of the Biobanking agreements by DoEE and OEH, vegetation condition monitoring was also conducted during this monitoring period.

### *iii. Site Remediation, Archaeological Salvage Works and Dam Dewatering Monitoring*

All site remediation works were conducted in with the Remedial Action Plan (RAP) for the subject site. Access tracks and work areas were identified by ecologists prior to commencement of works (see **Appendix A**) and demolition/remediation works were inspected and signed off by ecologists.

Archaeological Salvage work sites were not established in the vicinity of the Biobank sites and no removal of native vegetation was required. All works were conducted and monitored in accordance with the Salvage Excavation Methodology provided in the Box Hill North Cultural Heritage Assessment Report in consultation with the ecologist prior to commencement of excavation works and no onsite monitoring of work sites was required.

A Dam Dewatering Ecological Work Method Procedure Plan has been prepared but dewatering works are yet to commence pending approval of site specific applications by local government. Sediment and erosion control plans for dewatering of dams within the Biobank sites have been reviewed and signed off by ecologists and onsite supervision of dewatering will be conducted in accordance with the Dam Dewatering Ecological Work Method Procedure once physical dewatering of the dams commences.

## 2.2.2 Results

### i. Photo-monitoring

The photo-monitoring surveys did not detect any significant changes in vegetation condition between survey periods. Although a visible change in the height of ground-cover was observed, this change is likely due to the change in weather conditions between seasons, in particular dry conditions in summer due to low rain fall.

No indications of dieback of trees were observed, indicating that there are no obvious symptoms of *Phytophthora cinnamomi* into the woody vegetation of the Biobank sites. Given the lack of susceptibility to the fungal pathogen, disease symptoms are considered highly unlikely.

A subset of photographs taken at each photopoint during the initial June 2017 surveys and final March 2018 surveys is provided in **Appendix C**.

Minor damage to the top of one panel was observed along the Maguires Road frontage of the Boundary Road Biobank site, approximately 25m west of PP8 during the 26 September 2017 photomonitoring surveys (**Photograph 2.2**). The damage was reported to the relevant contractor and panel was replaced as no damage to the fence line was observed during the 14 December 2017 surveys.



**Photograph 2.2 Damaged fence panel near PP8 during September 2017 surveys**

## ii. Vegetation Community Monitoring

No significant differences in cover of native species in the different strata were detected within the monitoring transects during the surveys. Although there was a visible difference in the height of groundcover between survey periods with a clear reduction in height in the summer (December 2017) and autumn (March 2018) survey seasons compared to the initial winter surveys (June 2017), differences in percentage cover for all strata were less than 5% across the transects.

No significant change in weed cover (<5%) was detected across the monitoring transects, with the exception of Transect 3 which had a 12% decrease in weed cover.

Common weed species recorded across both Biobank sites included *Cenchrus clandestinus* (Kikuyu), *Eragrostis curvula* (African Lovegrass), *Hypochaeris radicata* (Flatweed), *Lysimachia arvensis* (Scarlet Pimpernel), *Paspalum dilatatum* (Paspalum), *Setaria parviflora* (Pigeon grass) *Sida rhombifolia* (Paddy's Lucerne) and *Verbena officinalis* (Common Verbena).

The WoNS *Senecio madagascariensis* (Fireweed) was recorded in all transects. Although not present within the monitoring transects, a patch of *Rubus fruticosus* (Blackberry) was recorded within the Boundary Road Biobank Site. Both WoNS species had previously been identified as occurring within the Biobank site during the assessment process for the wider Gables development and controls for these species will be implemented as part of the Biobank Site management plans, as approved by DoEE and OEH. No significant change in the extent of either WoNS was detected during the surveys.

A summary of the field data from the monitoring transects is provided in **Appendix D**.





**Legend**

- Subject Site
- Gables Project
- Proposed Biobank Site
- Development Precincts
- Properties excluded from the assessment

**IMP Monitoring Locations**

- Transects
- Photopoints

Coordinate System: MGA Zone 56 (GDA 94)

Image Source:  
Image © NearMap 2018  
Dated 18-01-2018

cumberland  
ecology

**Figure 2.1. Biobank Site Monitoring locations**

0 50 100 150 200 m



## 2.3 Assessment against performance criteria

Under the IMP, a series of performance criteria were established were proposed for each proposed management action. An assessment of achieved outcomes against the requisite performance criteria was conducted and is summarised in **Table 2.1** below.

**Table 2.1 Performance Criteria**

Management/ Monitoring Measures	Performance Criteria	Responsible Person	Outcome
Settlement of Relevant Properties	All properties settled as specified	Celestino	All properties within subject site settled and livestock removed
Fencing and Signage	Fencing and signage erected as specified	Celestino and nominated contractors	Fencing and Signage installed around Subject Site and Biobank sites
Site remediation	All sites remediated in accordance with relevant Remediation Action Plan	Contamination Specialist	Site remediation and demolition conducted in accordance with RAP. All works contained within work sites nominated by ecologists
Archaeological Salvage	All works clearly demarcated and conducted in accordance with Salvage Excavation Methodology.  Buffer zones established as required.	Archaeologist  Ecologist (identification of buffer zones, if required)	All salvage works conducted in accordance with Salvage Excavation Methodology. No works conducted in vicinity of Biobank sites and no removal of native vegetation required. Buffer zones not required
Dam dewatering - works areas	Dam dewatering buffer zones appropriately demarcated	Ecologist	Dewatering buffer zones nominated by ecologist in Dam Decommissioning Ecological Work Method Statement
Dam dewatering – vehicle/machin ery access	No vehicle or material intrusion beyond the limits of the marked buffer zones at each dam to be dewatered	Ecologist	Dewatering of dams to commence upon approval of site specific development application by Hills Shire Council. Works to be supervised by ecologist in accordance with Dam Decommissioning Ecological Work Method Statement
Dam dewatering -	Dams dewatered according to the Dam	Ecologist	Dewatering of dams to commence upon approval of site specific development application by Hills

**Table 2.1 Performance Criteria**

Management/ Monitoring Measures	Performance Criteria	Responsible Person	Outcome
draining of water and fauna rescue	dewatering ecological protocols		Shire Council. Works to be supervised by ecologist in accordance with Dam Decommissioning Ecological Work Method Statement
Dam dewatering – infilling	Infilling conducted as per the dam dewatering protocols	Ecologist	Dewatering of dams to commence upon approval of site specific development application by Hills Shire Council. Works to be supervised by ecologist in accordance with Dam Decommissioning Ecological Work Method Statement
Site inspections	Site inspections conducted as specified in plan and include monitoring of fences and signage, unauthorized disturbances, <i>Phytophthora cinnamomi</i> and photopoints	Ecologist	Inspections conducted on 29 June 2017, 26 September 2017, 14 December 2017 and 26 March 2018.
CPW and SSTF threatened ecological community condition monitoring	Monitoring conducted as specified in plan	Ecologist	Inspections conducted on 29 June 2017 and 14 December 2017 in accordance with survey period specified in IMP. Final survey conducted on 26 March 2018 following approval of Biobanking agreement.
Weed and <i>Phytophthora</i> monitoring	Monitoring conducted as specified in plan	Ecologist	Inspections conducted on 29 June 2017, 26 September 2017, 14 December 2017 and 26 March 2018
Weed and <i>Phytophthora</i> <i>cinnamomi</i> management	Weed and <i>Phytophthora</i> <i>cinnamomi</i> management conducted as specified in plan	Ecologist	Hygiene protocols implemented as part of remediation, demolition and salvage works. No indication of potential <i>Phytophthora cinnamomi</i> introduction to sites – therefore no further management required.  No significant changes in weed

**Table 2.1 Performance Criteria**

Management/ Monitoring Measures	Performance Criteria	Responsible Person	Outcome
			cover detected during inspections – therefore no further management required.

## 2.4 Adaptive Strategy and Contingency Responses

No significant weed outbreaks or potential of *Phytophthora cinnamomi* damage to native vegetation occurred during the implementation of management actions. Therefore no adaptive strategies for new risks were required.

The majority of the management actions proposed in the IMP were fully implemented. Although dewatering of dams is yet to commence, management plans for the protection of MNES have been prepared and can be implemented upon approval of site specific development applications by Hills Shire Council. Significant impediments to the implementation of the proposed management plans are considered to be unlikely. Therefore no contingency plans are considered necessary for the implementation of these works.

## 2.5 Reporting Requirements

Under Section 2.7 of the approved IMP, an annual performance report is required to be prepared following the second round of six monthly monitoring (excluding establishment surveys) conducted each year or upon approval of the BioBanking agreement.

Therefore, in accordance with Section 2.7 of the IMP, this report comprises the final performance report of management actions implemented under the IMP.

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*Appendix A*

Remediation and Demolition Works:  
Ecological Assessment Reports

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31 July 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 207 - 217  
BOUNDARY ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 14 July 2017 in relation to demolition of existing structures and associated remediation works within 207 – 217 Boundary Road, Box Hill (Current Lot 1 DP11126).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact me, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 207-217 Boundary  
Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I (**Figure 1.1**).

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require assessment as potential fauna habitat to fulfill ecological requirements for Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 1 DP 11126 or 207 – 207 Boundary Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.



A survey of the subject site was conducted by an ecologist and a botanist on 14 July 2017 which involved meander surveys across the entire subject site. The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### **A.3 Results**

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- Fibro residences;
- Sheds;
- Septic tanks;
- Water tanks;
- Concrete slabs;
- Power poles; and
- Unknown debris.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all residences, sheds, slabs and tanks may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences and power poles.

The existing residences/sheds and associated structures within the subject site occur in three main areas. These are indicated in **Figure 1** of **Appendix B**. The fences to be removed consist of fences across the entire outer boundary of the subject site as well as internal fencing, mainly near the three main areas of residences/sheds. The ecological values of these areas are described in detail in the following sections.

### **A.3.1 Area 1**

Area 1 is present in the south-west corner of the subject site, adjacent to Boundary Road and consists of an existing fibro residence, a shed and a septic tank.

Vegetation to the north and east of Area 1, extending up to 10m from the fencelines, comprises exotic vegetation (**Photograph 1**). The western part of Area 1 is bounded by Boundary Road and largely lacks any vegetation. However the shed and southern fenceline of Area 1 lie within 10m of the edges of a patch of Cumberland Plain Woodland (CPW) (**Photograph 2**).

The fenceline to the south of Area 1 forms part of the southern boundary fenceline of the subject site and continues to pass through the edges of an area mapped as CPW along the majority of the southern border of the subject site (**Photograph 3**).

The roof of the existing residence may provide limited potential roosting habitat for microchiropteran bats in cavities between the roofing material and underlying insulating material. The roof of the shed may also provide some potential roosting habitat for microbats, however this is less likely if there is no insulating material under the roofing material.



**Photograph 1**      **Exotic vegetation to the north and east of Area 1 (facing south)**





**Photograph 2** CPW along southern boundary of Area 1



**Photograph 3** Area 1 southern fenceline at the edge of CPW (facing east)



### A.3.2 Area 2

Area 2 is located along the northern boundary of the subject site, adjacent to Maguires Road and consists of an existing fibro residence, sheds, a water tank and a concrete slab.

The northern part of Area 2 is bounded by Maguires Road and largely lacks any vegetation. Vegetation along the eastern and south eastern borders of Area 2, extending up to 10m from the fencelines, comprises exotic vegetation. An area of CPW lies within the 10 m spray zone buffer of a shed at the southern extent of Area 2 (**Photograph 4**). Although scattered native trees occur within 10m of the western fenceline, vegetation within the 10m spray zone for the existing concrete slab/path comprises exotic grassland and planted palm trees (**Photograph 5**).

The fenceline to the north of Area 2 forms part of the northern boundary fenceline of the subject site. This fenceline passes through the edges of patches of native vegetation mapped as CPW located to the east and west of Area 2. The fenceline along the eastern side of Area 2 and extending further south passes through exotic grassland only.

The roof of the existing residence may provide limited potential roosting habitat for microchiropteran bats in cavities between the roofing material and underlying insulating material. The sheds are not considered suitable roosting habitat for bats as the structure is more open/exposed in comparison to the residence and appears to lack any insulating material.



**Photograph 4** CPW adjacent to south-west corner of Area 2



**Photograph 5** Exotic palms adjacent to slab in western parts of Area 2

### **A.3.3 Area 3**

Area 3 is located near the south-eastern corner of the subject site and consists of 4 large sheds, concrete slabs and other debris. Vegetation to the east and west of Area 3 comprises exotic grassland only. Although patches of CPW are present to the north and south of Area 3, they are located outside the 10m spray zone required for the existing sheds (**Photograph 6**).

The fenceline to the south of Area 3 forms part of the southern boundary fenceline of the subject site and is located along the edges of an area mapped as CPW (**Photograph 7**). The fenceline located to the north-east of Area 3 largely passes through exotic grassland. However the fence is located within 10m of a patch of CPW towards its northern extent.

The roofs of the large sheds in the north of Area 3 (**Photograph 6**) may provide some limited habitat for roosting bats as these sheds are largely enclosed structures. The sheds at the southern end of Area 3 (**Photograph 7**) are less likely to provide suitable roosting habitat for bats as the structures are relatively open and exposed.





**Photograph 6**      **Exotic vegetation in 10m zone north of sheds**



**Photograph 7**      **CPW to south of sheds in Area 3**

#### **A.3.4 Other Structures**

A single concrete slab is located to the west of Area 3. The vegetation within the 10m spray zone of this slab comprises exotic grassland vegetation only.

Two existing power poles occur adjacent to the fenceline, extending northwards from Area 3. These power poles also occur completely within exotic grassland areas.

### **A.4 Impact Assessment and Recommendations**

#### **A.4.1 Access Tracks**

It is assumed that large machinery will be required for all demolition works. To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

If any additional access tracks are required, they should largely pass through exotic grassland areas. Locations for additional access tracks, if required, shown on **Figure 1**. These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section 4.2** for further details).

#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section 4.4** below.

The outer boundary fenceline for the subject site passes through patches of CPW along the majority of the southern boundary as well as through scattered patches along the northern and western boundaries. As these patches constitute open woodland, with significant spaces between trees, the machinery/vehicles utilised for fence removal should be small enough to fit between trees. As the fences occur on the edges of CPW vegetation, machinery should remain outside of areas containing native trees to the fullest extent feasible.

The outer boundary fence along the eastern boundary of the subject site occurs wholly within exotic grassland and does not have any restrictions for removal.

While the internal fencelines; one to the east and south east of Area 2, and another to the north-east of Area 3, largely pass through exotic grassland, both have patches of CPW to the west of the respective fencelines. Therefore machinery to access these two internal fencelines should approach from access paths to the east of the fencelines to maximise avoidance of CPW

vegetation. These paths also allow access to the power poles adjacent to the fenceline, north of Area 3.

#### **A.4.3 Building Demolition**

##### *i. Area 1*

Vegetation within the 10m spray zone to the north, east and west of Area 1 comprises exotic grassland and therefore is suitable for spraying and removal of groundcover.

However, vegetation within the outer edges of the spray zone to the south comprises CPW (that is to be conserved within the Boundary Road Biobank site. Therefore, the minimum possible area should be sprayed on the south. Spraying should also be done downwind of the adjacent CPW (indicated by start of the treeline) to minimise drift.

If spraying/removal of groundcover vegetation within the adjacent CPW is unavoidable, the area is to be fully revegetated using species characteristic of CPW following completion of remediation. Further details on revegetation requirements are outlined in **Section 4.4**.

Work areas for machinery utilised for the demolition of structures as well as any stockpiles for debris prior to removal from site should be located in the northern and eastern parts of Area 1 to maximise avoidance of MNES vegetation.

##### *ii. Area 2*

Vegetation within the 10m spray zone to the north, east and south-west of Area 2 comprises exotic grassland and therefore is suitable for spraying and removal of groundcover.

CPW vegetation is present within 10m of the north-western parts of the fence but is outside of the 10m spray zone for the slab. Therefore any spraying for the slab should be done downwind of the adjacent CPW to minimise drift.

As CPW is present immediately adjacent to the shed along the southern boundary of Area 2, it is assumed that spraying/removal of groundcover vegetation within the CPW is unavoidable. Therefore the sprayed areas should be revegetated, as outlined in **Section 4.4**, following completion of remediation.

Work areas for machinery utilised for the demolition of structures as well as any stockpiles for debris prior to removal from site should be located in the northern and eastern parts of Area 2 to maximise avoidance of MNES vegetation.

##### *iii. Area 3*

Vegetation within the 10m spray zone to the north, east and west of Area 3 comprises exotic grassland and therefore is suitable for spraying and removal of groundcover.



However, vegetation within the outer 9-10 edge of the spray zone to the south comprises CPW. Therefore, the minimum possible area should be sprayed on the south. Spraying should also be done downwind of the adjacent CPW (indicated by start of the treeline) to minimise drift.

If spraying/removal of groundcover vegetation within the adjacent CPW is unavoidable, the area is to be revegetated as outlined in **Section 4.4**, following completion of remediation.

No CPW is present within 10m of the isolated slab present to the west of Area 3. This area is therefore suitable for spraying and removal of groundcover.

Work areas for machinery utilised for the demolition of structures as well as any stockpiles for debris prior to removal from site should preferentially be located in the western and eastern parts of Area 3 to maximise avoidance of MNES vegetation. There are no restrictions on the location of work areas for the isolated slab to the west of Area 3.

#### **A.4.4 Revegetation Strategy**

Areas of CPW that may be impacted by the works occur to the south of Area 1 and Area 3 and to the north-west and south-west of Area 2 (see **Figure 1** of Appendix B). These areas are to be revegetated in the event of unavoidable removal of groundcover vegetation for the soil testing or or inadvertent damage from demolition of structures.

The CPW vegetation to the south of Area 1 is to be conserved within the Boundary Road Biobank site. Therefore any groundcover removal within this area of CPW is to be revegetated using CPW groundcover species outlined in the Masterplan Vegetation Management Plan. Groundcover species should be planted at a density of 4 unit/1 m<sup>2</sup>.

Areas of CPW adjacent to Area 2 and Area 3 are proposed to be fully cleared for the Gables development. The areas potentially impacted by the spraying are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval. As these areas are to be fully cleared in the future, full revegetation to CPW is not considered to be warranted. However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of CPW. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

#### **A.4.5 Bat Habitat Management**

Some of the buildings within Areas 1 – 3, primarily the residential buildings and larger storage units/sheds constitute potential roosting habitat for microbats (threatened and non-threatened species). As the buildings to be demolished have a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be in winter torpor. However as microbats can come out of torpor for short periods of time, dismantling the buildings gradually

and carefully to render them undesirable as roosting habitat for microbats, thereby encouraging them to re-locate, is considered the best option in this case. Where feasible, dismantling of buildings likely to support roosting bats, should commence in September to maximise likelihood of bats coming out of torpor and self-relocating.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

As microbats may be in torpor during August or in the final stages of torpor in early September and unable to self-relocate, an ecologist should be on-site if removal the roofing material occurs during this time and remove any bats found that may be in torpor.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

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*Appendix B*

Figure

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3 August 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill, NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 195  
BOUNDARY ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 14 July 2017 in relation to demolition of existing structures and associated remediation works within 195 Boundary Road, Box Hill (Current Lot 2 DP11126).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 195 Boundary Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I (**Figure 1.1**).

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 2 DP 11126 or 195 Boundary Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.

A survey of the subject site was conducted by an ecologist and a botanist on 14 July 2017 which involved meander surveys across the entire subject site. The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### A.3 Results

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- a residence;
- a shed;
- a septic tank;
- a tennis court;
- Concrete slabs; and
- Power poles.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all residences, sheds, slabs and tanks may require an investigation or 'spray zone' area. This assessment, therefore, allows for an initial investigation or 'spray zone' area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences and power poles.

The existing residence/shed and associated structures occur within three areas. These are indicated in **Figure 1 of Appendix B**. The fences to be removed consist of fences across the

northern, eastern and southern boundaries of the subject site as well as internal fencing, around the residential area and associated driveway. The ecological values of these areas are described in detail in the following sections.

#### **A.3.1 Area 1**

Area 1 consists of a residence with associated tennis court to the north-west of the residence.

Vegetation contained within the wooden perimeter fences of the existing residence consists of planted and exotic vegetation. Vegetation extending up to 10m from the southern to south-eastern perimeter fence (**Photograph 1**) and the northern perimeter fence of the existing residence (**Photograph 2**) also comprises exotic vegetation.

Although some native trees are present along the eastern perimeter fence of the existing residence, this vegetation has not been mapped as MNES vegetation due to a lack of understorey (**Photograph 3**). However some CPW is present within 10m of the western perimeter fence of the residence (**Photograph 4**).

Patches of CPW vegetation are present within 10 m of the northern, north-western and north-eastern fenceline of the existing tennis court (**Photograph 5**)

The roof of the existing residence is considered to be potential roosting habitat for microchiropteran bats in cavities between the roofing material and underlying insulating material. The adjacent shed is unlikely to provide roosting habitat for microbats as the structure is relatively open and exposed.



**Photograph 1 Exotic vegetation along southern perimeter of residence (facing east)**





**Photograph 2**      **Exotic vegetation along northern perimeter of residence (facing west)**



**Photograph 3**      **Eastern perimeter of existing residence**





**Photograph 4** CPW within 10m of western perimeter of residence



**Photograph 5** CPW within 10m of tennis court



### A.3.2 Area 2 and Area 3

Area 2 (**Photograph 6**) and Area 3 (**Photograph 7**) consist of isolated concrete slabs. Both slabs occur within areas mapped as CPW and native trees are present within 10m of both slabs.



**Photograph 6** CPW on fringes of slab (Area 2)



**Photograph 7** Exotic vegetation on slab with fringing CPW (Area 3)



### **A.3.3 Boundary Fences**

The fenceline along the northern boundary of the subject site comprises the same southern boundary fenceline for 207 – 217 Boundary Road (see 17135 Let2). This fenceline passes through the northern edges of the area of CPW present across the majority of the subject site. (**Photograph 6**).

The fenceline along the southern boundary of the subject site forms the boundary with the adjacent 181-191 Boundary Road and passes through the southern edges of the area of CPW present across the majority of the subject site (**Photograph 7**). An additional fenceline, located just north of the existing driveway, also passes through areas mapped as CPW.

The fenceline along the eastern boundary of the subject site passes through a patch of CPW towards the north-eastern corner of the subject site but is located within exotic grassland towards the south.



**Photograph 8**      **Fenceline within CPW at the boundary of the subject site and 207-217 Boundary Road (facing east)**



**Photograph 9** Fenceline on the edges of CPW at the boundary of the subject site and 181-191 Boundary Road (facing east)

## **A.4 Impact Assessment and Recommendations**

### **A.4.1 Access Tracks**

It is assumed that large machinery will be required for all demolition works.

To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works. If additional access tracks are required, they should largely pass through exotic grassland areas. Potential access tracks to all areas are shown on **Figure 1**.

These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section 4.2** for further details).



#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section 4.4** below.

The outer boundary fenceline for the subject site passes through patches of CPW along the majority of the northern and southern boundaries as well as through a scattered patch of CPW in the northern half of the eastern boundary.

As these patches constitute open woodland, with significant spaces between trees, the machinery/vehicles utilised for fence removal should be small enough to fit between trees. As the fences occur on the edges of CPW vegetation, machinery should remain outside of areas containing native trees to the fullest extent feasible.

Due to the relatively higher density of CPW within the subject site, the approach to the northern boundary fence should occur via access tracks through exotic grassland within 207-217 Boundary Road (see **Figure 1** of **Appendix B** and 17135 Let2) to maximise avoidance of CPW.

Similarly, the approach to the southern boundary fence should occur via access tracks through exotic grassland within 181-191 Boundary Road (see **Figure 1** of **Appendix B**). The approach to the eastern fenceline should also occur either from 181-191 Boundary Road or from 89 Maguires Road to the east of the subject site.

#### **A.4.3 Structure Demolition**

##### *i. Area 1*

Vegetation within the 10m spray zone to the north, east and south of the existing residence within Area 1 comprises exotic and/or planted vegetation and therefore is suitable for spraying and removal of groundcover.

However, vegetation within the outer edges of the spray zone to the south-south west of the residence and to the north-west and south west of the tennis court comprises CPW. The minimum possible area should be sprayed in these areas and spraying near trees should be avoided to the maximum feasible extent. Any spraying in these areas should also be done downwind of the adjacent CPW (indicated by start of the treeline) to minimise drift.

If spraying/removal of groundcover vegetation within the adjacent CPW is unavoidable, the area is to be fully revegetated using species characteristic of CPW following completion of remediation. Further details on revegetation requirements are outlined in **Section 4.4**.

Work areas for machinery utilised for the demolition of structures as well as any stockpiles for debris prior to removal from site should be located in the northern, eastern and southern parts of Area 1 to maximise avoidance of MNES vegetation.



ii. *Area 2 and Area 3*

Vegetation within the 10m spray zone of both slabs comprises vegetation mapped as CPW. Due to the proximity of CPW, it is assumed that spraying/removal of groundcover vegetation within the CPW is unavoidable. The minimum possible area should be sprayed in these areas and spraying near trees should be avoided to the maximum feasible extent.

Work sites for machinery should be located along the northern edges of Area 2 and in the south-eastern corner of Area 3 to maximise avoidance of native trees.

The sprayed areas or damaged areas should be revegetated, as outlined in **Section 4.4**, following completion of remediation and/or demolition works.

#### **A.4.4 Revegetation Strategy**

Areas of CPW that may be impacted by the remediation works occur within the western and northern parts of Area 1 and completely surround Areas 2 and Area 3. These areas are to be revegetated in the event of unavoidable or inadvertent removal of groundcover vegetation for the soil testing or work site establishment.

The CPW vegetation within Areas 1, 2 and 3 are proposed to be fully cleared for the Gables development. The areas potentially impacted by the spraying or establishment of work sites are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval. As these areas are to be fully cleared in the future, full revegetation to CPW is not considered to be warranted. However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of CPW. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

#### **A.4.5 Bat Habitat Management**

The residential building within Area 1 constitutes potential roosting habitat for microbats (threatened and non-threatened species). As the building to be demolished has a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be in winter torpor. However as microbats can come out of torpor for short periods of time, dismantling the buildings gradually and carefully to render them undesirable as roosting habitat for microbats, thereby encouraging them to re-locate, is considered the best option in this case. Where feasible, dismantling of buildings likely to support roosting bats, should commence in September to maximise likelihood of bats coming out of torpor and self-relocating.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be

removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

As microbats may be in torpor during August or in the final stages of torpor in early September and unable to self-relocate, an ecologist should be on-site if removal the roofing material occurs during this time and remove any bats found that may be in torpor.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

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*Appendix B*

Figure

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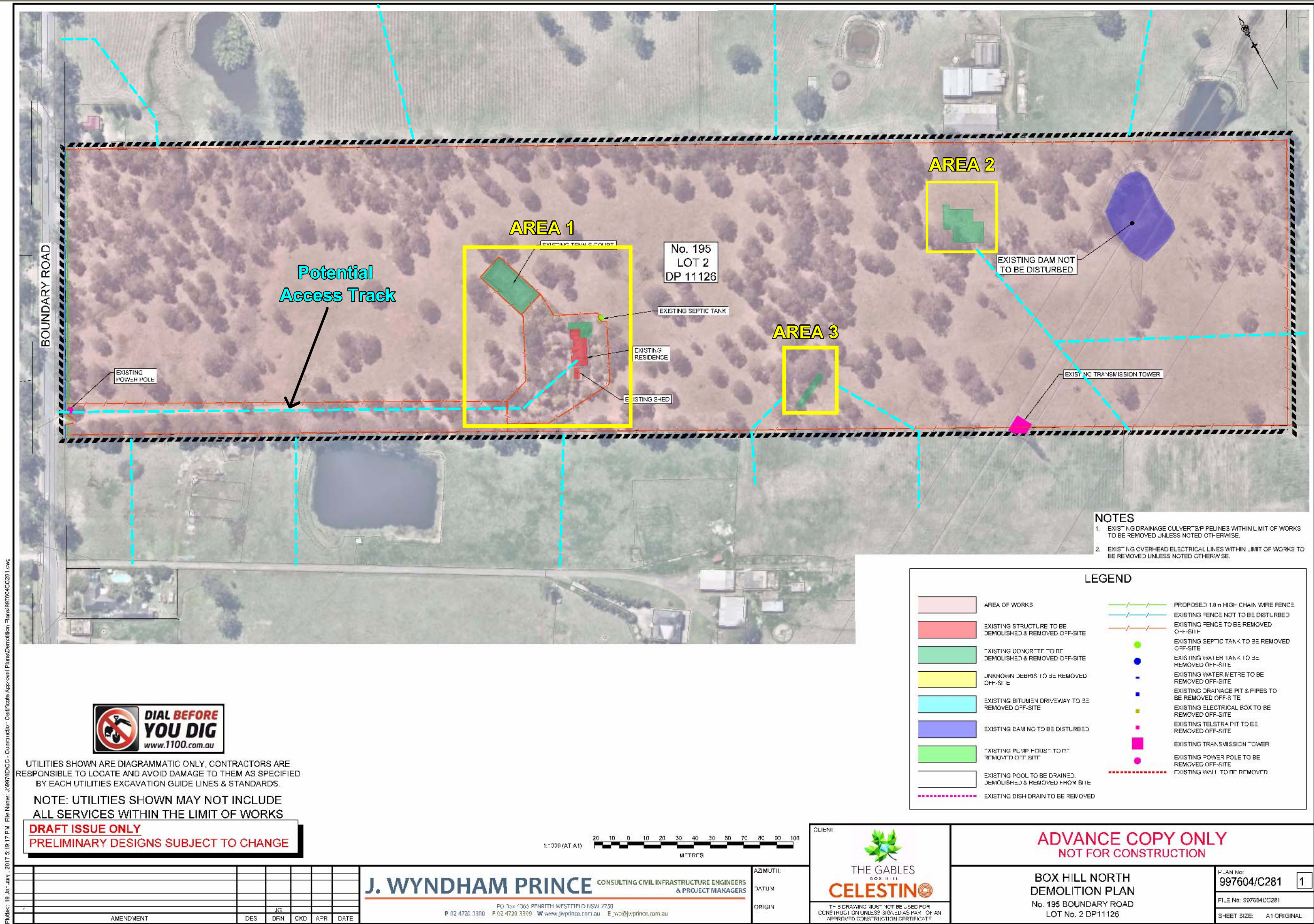


Figure 1. Demolition Sites and Potential Access tracks for 195 Boundary Road

Image Source: J. Wyndham Prince (2017). Box Hill North Demolition Plan.



3 August 2017

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Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 181-191  
BOUNDARY ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 20 July 2017 in relation to demolition of existing structures and associated remediation works within 181-191 Boundary Road, Box Hill (Current Lot 1 DP207750).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 181 - 191 Boundary  
Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I (**Figure 1.1**).

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of the Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 1 DP 207750 or 181-191 Boundary Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.

A survey of the subject site was conducted by an ecologist and a botanist on 20 July 2017 which involved meander surveys across the entire subject site. The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### **A.3 Results**

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- Residences;
- Sheds;
- Septic tanks;
- Concrete slabs/paths;
- Debris;
- Electrical boxes and
- Power poles.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all residences, sheds, slabs and tanks may require an investigation or 'spray zone' area. This assessment, therefore, allows for an initial investigation or 'spray zone' area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences, power poles and surface debris.

The locations of the existing residence/shed and associated structures are indicated in **Figure 1** of **Appendix B**. The fences to be removed consist of fences across the northern, eastern and southern boundaries of the subject site as well as internal fencing, around the residential areas and associated driveway. The ecological values of these areas are described in detail in the following sections.

### **A.3.1 Residences and Associated structures**

The residences and associated structures are located in two clusters within the subject site, one in the central portions of the subject site and another in the south-western corner of the subject site (**Figure 1** of **Appendix B**).

All existing structures lie within areas mapped as cleared or exotic grassland. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the existing structures or slabs.

The roofs of both existing residences are considered to be potential roosting habitat for microchiropteran bats in cavities between the roofing material and underlying insulating material (**Photographs 1 – 2**). The majority of sheds are unlikely to provide roosting habitat for microbats as they comprise relatively open and exposed structures (**Photographs 3 – 5**).

Although several Barn Swallows (*Hirundo rustica*) and Fairy Martins (*Petrochelidon ariel*) were observed in the vicinity of the sheds, no nests were detected within the sheds.



**Photograph 1**      **Residence in central portion of subject site**





**Photograph 2**      **Residence in south-western corner of subject site**



**Photograph 3**      **Open shed structures in central portions of subject site**



**Photograph 4**      **Shed in south-west corner of subject site**



**Photograph 5**      **Small shed near main driveway**



### **A.3.2 Boundary Fences**

The fenceline along the northern boundary of the subject site comprises the same southern boundary fenceline for 195 Boundary Road (see 17135 Let3). This fenceline passes through the edges of an area mapped as CPW along the majority of the northern border of the subject site (**Photograph 6**).

The fencelines along the southern and eastern boundaries of the subject site as well as all internal fencelines pass through exotic vegetation only



**Photograph 6** Fenceline on the edge of CPW patch along the northern boundary of the subject site

### **A.3.3 Other Structures**

A single pile of debris is located near the north-western corner of the subject site (**Photograph 7**). Although the debris pile is located within exotic grassland areas, the CPW along the northern fenceline is within the outer edges of the 10m buffer zone of the debris pile.

The existing power pole and electrical box are located adjacent to the existing driveway, completely within cleared or exotic grassland areas.





**Photograph 7**      **Surface debris near the north-western corner of the subject site**

## **A.4      Impact Assessment and Recommendations**

### **A.4.1      Access Tracks**

It is assumed that large machinery will be required for all demolition works.

To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works. If additional access tracks are required, they should largely pass through exotic grassland areas. Potential access tracks to all areas are shown on **Figure 1**.

These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section 4.2** for further details).

#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section 4.4** below.

The outer boundary fenceline for the subject site passes through a large patch of CPW along the majority of the northern.

As this patch constitutes open woodland, with significant spaces between trees, the machinery/vehicles utilised for fence removal should be small enough to fit between trees. As the fences occur on the edges of CPW vegetation, machinery should remain outside of areas containing native trees to the fullest extent feasible.

Due to the lack of CPW across the majority of the subject site, the approach to the northern boundary fence should occur from the south (see **Figure 1 of Appendix B**). There are no restrictions on the approach to the eastern, southern and internal fencelines.

#### **A.4.3 Structure Demolition**

All existing structures lie completely within previously cleared areas or exotic grassland. Therefore there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones of all existing structures.

#### **A.4.4 Debris Removal**

It is assumed that no spraying is required in the debris stockpile area. The 10m work area around the debris stockpile comprises previously cleared or exotic grassland areas. As the existing patch of CPW lies on the fringes of the 10m work area buffer for the debris pile, it is recommended that work areas are established to the west, south or east of the debris stockpile to maximise avoidance of the MNES vegetation.

#### **A.4.5 Revegetation Strategy**

Areas of CPW that may be impacted by the remediation works occur only along the northern boundary fenceline. These areas are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval.

As these areas are to be cleared in the future, full revegetation to CPW in the event of any inadvertent or unavoidable damage is not considered to be warranted. However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of CPW. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

#### **A.4.6 Fauna Habitat Management**

##### *i. Bats*

The two residential buildings constitute potential roosting habitat for microbats (threatened and non-threatened species). As the buildings to be demolished have a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be in winter torpor. However as microbats can come out of torpor for short periods of time, dismantling the buildings gradually and carefully to render them undesirable as roosting habitat for microbats, thereby encouraging them to re-locate, is considered the best option in this case. Where feasible, dismantling of buildings likely to support roosting bats, should commence in September to maximise likelihood of bats coming out of torpor and self-relocating.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

As microbats may be in torpor during August or in the final stages of torpor in early September and unable to self-relocate, an ecologist should be on-site if removal the roofing material occurs during this time and remove any bats found that may be in torpor.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

##### *ii. Birds*

Several Barn Swallows (*Hirundo rustica*) and Fairy Martins (*Petrochelidon ariel*) were observed in the vicinity of the sheds within the subject site. Although no nests were detected within the sheds, there is a potential for these species to construct nests within the sheds. Therefore it is recommended that pre-clearance surveys are conducted within one week of the proposed



demolition of the buildings to confirm the presense of any nests. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

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*Appendix B*

Figure

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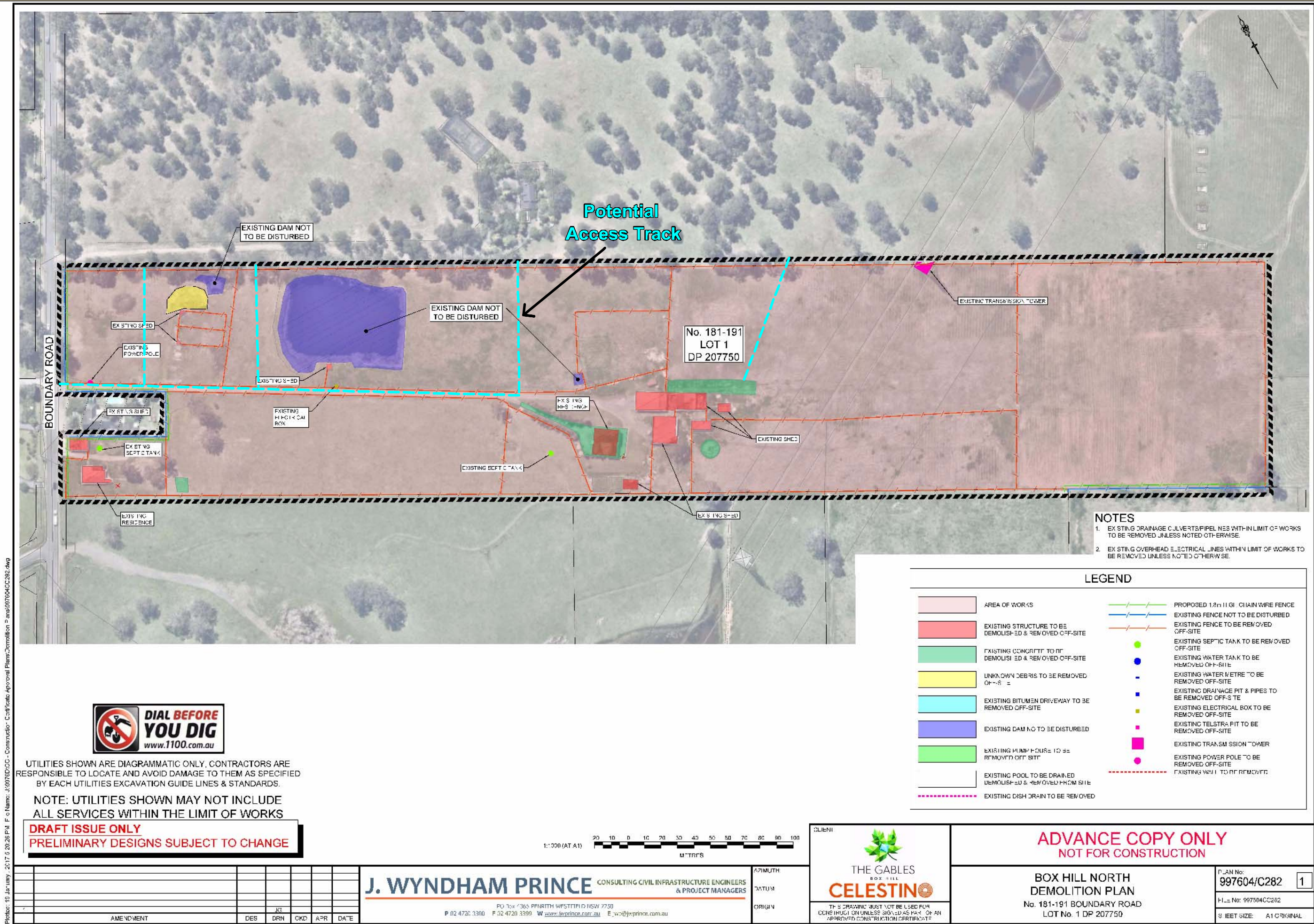


Figure 1. Demolition Sites and Potential Access tracks for 181-191 Boundary Road

Image Source: J. Wyndham Prince (2017). Box Hill North Demolition Plan.



7 August 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 89  
MAGUIRES ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 14 July 2017 in relation to demolition of existing structures and associated remediation works within 89 Maguires Road, Box Hill (Current Lot 3 DP11126).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 89 Maguires Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I (**Figure 1.1**).

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require assessment of their potential to provide fauna habitat to fulfil the ecological requirements of the Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 3 DP 11126 or 89 Maguires Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.



A survey of the subject site was conducted by an ecologist and a botanist on 20 July 2017 which involved meander surveys across the entire subject site. The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### A.3 Results

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- Residences;
- Sheds;
- a Septic tank;
- Water tanks
- Concrete slabs; and
- Power poles.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all residences, sheds, slabs and tanks may require an investigation or 'spray zone' area. This assessment, therefore, allows for an initial investigation or 'spray zone' area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences and power poles.

The existing residence/shed and associated structures occur within three areas. These are indicated in **Figure 1 of Appendix B**. The fences to be removed consist of fences across the

western, southern, eastern boundaries of the subject site as well as parts of the northern boundary and internal fencing around the residential area and associated driveway. The ecological values of these areas are described in detail in the following sections.

#### **A.3.1 Area 1**

Area 1 is located near the northern boundary of the subject site along Maguires Road. Structures within this area comprise two residences, sheds, water tanks and a septic tank.

Area 1 is located wholly within areas mapped as cleared/exotic grassland. Existing vegetation within and immediately adjacent to Area 1 comprises either exotic grassland or planted species. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the existing structures.

The roofs of the existing residences are considered to be potential roosting habitat for microchiropteran bats in cavities between the roofing material and underlying insulating material (**Photographs 1 – 2**). The adjacent sheds are unlikely to provide roosting habitat for microbats as the structures are relatively open and exposed (**Photograph 3**).

Although Barn Swallows (*Hirundo rustica*) were observed in the vicinity of the sheds, no nests were detected within the sheds at the time of the surveys.



**Photograph 1 Existing brick residence in Area 1**



**Photograph 2**      **Existing house in Area 1**



**Photograph 3**      **Exposed sheds in Area 1**



### **A.3.2 Area 2**

Area 2 is located towards the central portion of the subject site. Structures within this area comprise multiple small sheds and concrete slabs.

Area 2 is located wholly within areas mapped as cleared/exotic grassland. Existing vegetation within and immediately adjacent to Area 2 comprises either exotic grassland or planted trees. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the existing structures.

The sheds in Area 2 are unlikely to provide roosting habitat for microbats as the structures are relatively open and exposed (**Photograph 4**). No fauna were observed in the vicinity of the sheds.



**Photograph 4 Sheds within Area 2**

### **A.3.3 Area 3**

Area 3 is located in the south-western parts of the subject site. Structures within this area comprise multiple small sheds and concrete slabs.

Although the structures within Area 3 are located wholly within areas mapped as exotic grassland, some native trees are located immediately adjacent to the two northernmost sheds of Area 3. Despite the presence of the native trees, this vegetation has not been mapped as

MNES vegetation due to a lack of native understorey (**Photograph 5**). No MNES vegetation (CPW or SSTF) is mapped within a 10m radius of any of the existing structures.

The sheds in Area 3 are unlikely to provide roosting habitat for microbats or avifauna as the structures are highly exposed (**Photograph 6**). No fauna were observed in the vicinity of the sheds.



**Photograph 5** Native trees over exotic understorey near sheds in the northern parts of Area 3



**Photograph 6      Exposed sheds within Area 3**

#### ***A.3.4    Boundary Fences***

The fenceline along the northern boundary of the subject site as well as the majority of the eastern boundary and internal fencelines pass through exotic vegetation only. A very small part of the eastern fenceline lies on the outer fringes of a patch of SSTF that primarily lies within the adjacent 97 Maguires Road property.

Although the majority of the western and southern fencelines pass through exotic vegetation, two patches of CPW are present along the western and southern fencelines respectively. The southern extent of the main north-south internal fenceline also passes through the CPW patch to the south.

The section of the western fenceline that passes through a patch of CPW comprises the same eastern boundary fenceline for 195 Boundary Road (see 17135 Let3). The patch of CPW along the southern fenceline is located along the boundary with 10 Red Gables Road (Lot 25 DP 255616) and extends further south into 10 Red Gables Road (**Photograph 7**).





**Photograph 7** CPW along southern boundary with 10 Red Gables Road

## **A.4 Impact Assessment and Recommendations**

### **A.4.1 Access Tracks**

It is assumed that large machinery will be required for all demolition works.

To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works. If additional access tracks are required, they should largely pass through exotic grassland areas. Potential access tracks to all areas are shown on **Figure 1**.

These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section 4.2** for further details).

#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section 4.4** below.

The outer boundary fenceline for the subject site passes through a patches of CPW along parts of the western and southern boundaries and the outermost fringes of a patch of SSTF along the eastern boundary.

As these patches constitute open woodland, with significant spaces between trees, the machinery/vehicles utilised for fence removal should be small enough to fit between trees. As the fences occur on the edges of CPW or SSTF vegetation, machinery should remain outside of areas containing native trees to the fullest extent feasible.

Due to the lack of MNES vegetation across the majority of the subject site, the approach to the western boundary fence, which also comprises the eastern boundary fence for 195 Boundary Road, should occur from the east. Given the relative lack of MNES vegetation on both sides, the eastern boundary fence can be approached either from access tracks within the subject site for from the adjacent 97 Maguires Road property.

The patch of CPW along the southern boundary can be approached either from the north or from the south via 10 Red Gables Road. As the southern boundary fence is an extension of the southern boundary fence for 181-191 Boundary Road (see 17135 Let4), an approach from the west is also feasible, provided it is limited to access tracks within 181-191 Boundary Road.

There are no restrictions on the approach to the eastern, northern and the majority of the internal fencelines.

#### **A.4.3 Structure Demolition**

All existing structures lie completely within previously cleared areas or exotic grassland. Therefore there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones of all existing structures. However, given the presence of a patch of CPW to the west of Area 2, establishment of work sites to the north, east or south of Area 2 is recommended to maximise avoidance of MNES vegetation.

#### **A.4.4 Revegetation Strategy**

Areas of CPW that may be impacted by the remediation works occur along the western and southern boundary fencelines while the minor area of SSTF that may be affected lies along the eastern boundary fenceline. These areas are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval.

As these areas are to be cleared in the future, full revegetation to CPW or SSTF in the event of any inadvertent or unavoidable damage is not considered to be warranted. However, as the

vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of CPW. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

#### **A.4.5 Fauna Habitat Management**

##### *i. Bats*

The two residential buildings constitute potential roosting habitat for microbats (threatened and non-threatened species). As the buildings to be demolished have a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be in winter torpor. However as microbats can come out of torpor for short periods of time, dismantling the buildings gradually and carefully to render them undesirable as roosting habitat for microbats, thereby encouraging them to re-locate, is considered the best option in this case. Where feasible, dismantling of buildings likely to support roosting bats, should commence in September to maximise likelihood of bats coming out of torpor and self-relocating.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

As microbats may be in torpor during August or in the final stages of torpor in early September and unable to self-relocate, an ecologist should be on-site if removal the roofing material occurs during this time and remove any bats found that may be in torpor.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

##### *ii. Birds*



Barn Swallows (*Hirundo rustica*) were observed in the vicinity of the sheds within Area 1 of the subject site. Although no nests were detected within the sheds, there is a potential for these species to construct nests within the sheds. Therefore it is recommended that pre-clearance surveys are conducted within one week of the proposed demolition of the buildings to confirm the presense of any nests. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016). Pre-clearance surveys for birds are not required for Area 2 and Area 3 as the structures within these areas are not considered to provide suitable shelter for avifauna.

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*Appendix B*

Figure

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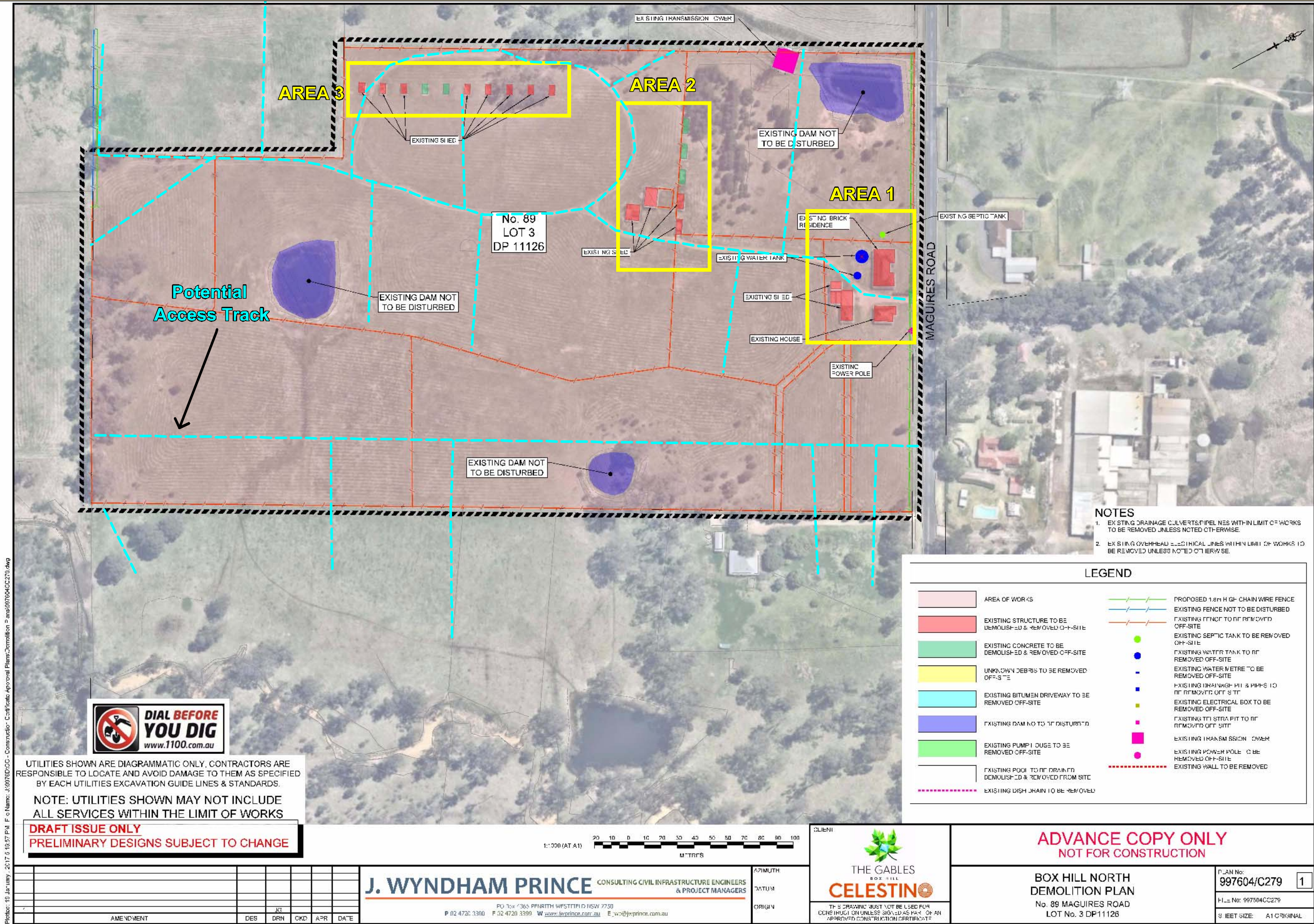


Figure 1. Demolition Sites and Potential Access tracks for 89 Maguires Road

Image Source: J. Wyndham Prince (2017. Box Hill North Demolition Plan.



7 August 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 97  
MAGUIRES ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 14 and 20 July 2017 in relation to the demolition of existing structures and associated remediation works at 97 Maguires Road, Box Hill (Current Lots 4A and 4B DP135504).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 97 Maguires Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I (**Figure 1.1**).

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lots 4A and 4B DP135504 or 97 Maguires Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.



Surveys of the subject site were conducted by an ecologist and a botanist on 14 and 20 July 2017 which involved meander surveys across the entire subject site. The 14 July surveys mainly focussed on the structures in the northern parts of the subject site while the 20 July surveys focussed on assessments of the vegetation along the southern boundary fenceline.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### **A.3 Results**

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- a Residence;
- Sheds;
- a Septic tank;
- Concrete slabs; and
- Power poles.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all residences, sheds, slabs and tanks may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences and power poles.

The existing residences/sheds and associated structures within the subject site occur in two main areas. These are indicated in **Figure 1** of **Appendix B**. The fences to be removed consist of fences across the entire western, southern and eastern boundaries and majority of the northern boundary of the subject site. Internal fencing, running in an east-west direction, is also present in the central parts of the subject site.

The ecological values of these areas are described in detail in the following sections.

### **A.3.1 Area 1**

Area 1 is present near the north-west corner of the subject site. Structures within this area comprise a residence, sheds, a concrete slab and power poles.

Vegetation to the west, north and east of Area 1, extending up to 10m from the existing structures comprises exotic or planted vegetation (**Photograph 1**). However some SSTF is present within 10m of the southern edge of the concrete slab (**Photograph 2**).

The roof of the existing residence may provide limited potential roosting habitat for microchiropteran bats in cavities between the roofing material and underlying insulating material. The roof of the southernmost shed may also provide some potential roosting habitat for microbats (**Photograph 3**). However this is less likely if there is no insulating material under the roofing material. No fauna were observed in the vicinity of the structures during surveys. However Swallows (*Hirundo* species) and Fairy Martins (*Petrochelidon ariel*) have been observed in adjacent properties and there is potential for these species to build nests under the eaves of the roofs. The remaining sheds/structures are unlikely to provide potential habitat for bats or other fauna due to their relatively exposed condition (**Photograph 4**).



**Photograph 1**      **Exotic or planted vegetation around existing residence**





**Photograph 2** SSTF near southern edges of existing concrete slab in Area 1



**Photograph 3** Potential roosting habitat in roof of shed





**Photograph 4**      **Exposed shed north of residence**

#### **A.3.2 Area 2**

Area 2 is present to the south-east of Area 1. Structures within this area comprise a shed, a concrete slab and a septic tank.

The eastern to south-eastern parts of Area 2 lie on the fringes of an area mapped as SSTF. In particular the SSTF vegetation lies within the outer south to south eastern edges of the 10m buffer for the septic tank and the slab (**Photograph 5**). Vegetation to the north and west of these two structures comprises exotic grassland.

No MNES vegetation is present within the 10m buffer of the shed (**Photograph 6**).

#### **A.3.3 Fences**

The entire eastern fenceline of the subject site passes through vegetation mapped as SSTF. Parts of the northern, southern and internal fencelines also pass through vegetation mapped as SSTF in the eastern half of the subject site (**Photograph 7**). Although the majority of the western fenceline passes through exotic grassland, a patch of SSTF is present just south of Area 1.



**Photograph 5** SSTF vegetation to the south-east of slab (facing south-east) in Area 2



**Photograph 6** Exotic Vegetation around shed in Area 2





**Photograph 7** Fenceline through SSTF along the southern boundary

## **A.4 Impact Assessment and Recommendations**

### **A.4.1 Access Tracks**

It is assumed that large machinery will be required for all demolition works. To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

If any additional access tracks are required, they should largely pass through exotic grassland areas. Locations for additional access tracks, if required, are shown on **Figure 1**. These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section 4.2** for further details).

### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section 4.4** below.



All four outer boundary fencelines pass through areas mapped as SSTF. While parts of these areas comprise open woodland, with significant spaces between trees, dense clusters of trees and/or sapling regrowth are present, particularly in the north-eastern and south-eastern parts of the subject site.

The machinery/vehicles utilised for fence removal should be small enough to fit between trees. If patches of dense vegetation, through which machines cannot fit are encountered, hand tools should be utilised for fence removal.

Given the relative lack of MNES vegetation in the western half of the site, the approach to northern, southern and internal fencelines should commence from the west. The approach to the southern fenceline can also occur from the 14 Red Gables Road property to the south.

The eastern fenceline should preferentially be approached from the 151 Maguires Road property to the east.

Due to the relative lack of MNES vegetation on both sides, the western fenceline can be approached either from the access tracks within the subject site or from the adjacent 89 Maguires Road property.

#### **A.4.3 Building Demolition**

##### *i. Area 1*

Vegetation within the 10m spray zone of the residence and sheds to the north comprises exotic grassland and therefore is suitable for spraying, removal of groundcover and establishment of work sites without any constraint.

Vegetation within the 10m spray zone to the north, east and west of the slab and the southernmost shed also comprises exotic grassland. However, vegetation within the outer edges of the spray zone to the south of these structures comprises SSTF. The minimum possible area should be sprayed in these areas and spraying near trees should be avoided to the maximum feasible extent. Any spraying in these areas should also be done downwind of the adjacent SSTF (indicated by start of the treeline) to minimise drift. Work site for these structures should also be established to the north, east or west.

If spraying/removal of groundcover vegetation within the adjacent SSTF is unavoidable, the area is to be fully revegetated using species characteristic of SSTF following completion of remediation. Further details on revegetation requirements are outlined in **Section 4.4**.

##### *ii. Area 2*

No MNES vegetation is present within the 10m spray zone of the shed within Area 2. This zone is therefore suitable for spraying, removal of groundcover and establishment of work sites.

However SSTF is present within the outer spray zone for the septic tank and slab within Area 2. The minimum possible area should be sprayed in these areas and spraying near trees should be avoided to the maximum feasible extent. Any spraying in these areas should also be done

downwind of the adjacent SSTF (indicated by start of the treeline) to minimise drift. Work sites for machinery should be located to the north-west of these two structures to maximise avoidance of MNES.

The sprayed areas or damaged areas should be revegetated, as outlined in **Section 4.4**, following completion of remediation and/or demolition works.

#### **A.4.4 Revegetation Strategy**

All impacted areas of MNES vegetation are to be revegetated in the event of unavoidable removal of groundcover vegetation for the soil testing or inadvertent damage from demolition of structures. The MNES areas potentially impacted by the spraying or establishment of work sites are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval.

Areas of SSTF that may be impacted by the works for the demolition/removal of residences, sheds, slabs and septic tank occur in the southern to south-eastern parts of Area 1 and Area 2. As these areas are proposed to be fully cleared in the future, full revegetation to SSTF is not considered to be warranted. However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of SSTF. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

Areas of SSTF that may be impacted by fence removal works occurs along the entire eastern fenceline and eastern halves of the northern and southern fencelines. As this vegetation is to be retained, any areas where unavoidable or inadvertent vegetation removal occurs should be revegetated to SSTF. Planting densities should be in accordance with the Masterplan Vegetation Management Plan (as approved by Hills Shire Council) and the Commonwealth Vegetation Management Plan (as approved by DoEE) requirements for SSTF.

#### **A.4.5 Fauna Habitat Management**

The residence and the southernmost shed within Areas 1 constitute potential roosting habitat for microbats (threatened and non-threatened species). As the buildings to be demolished have a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be in winter torpor. However as microbats can come out of torpor for short periods of time, dismantling the buildings gradually and carefully to render them undesirable as roosting habitat for microbats, thereby encouraging them to re-locate, is considered the best option in this case. Where feasible, dismantling of buildings likely to support roosting bats, should commence in September to maximise likelihood of bats coming out of torpor and self-relocating.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be

removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

As microbats may be in torpor during August or in the final stages of torpor in early September and unable to self-relocate, an ecologist should be on-site if removal the roofing material occurs during this time and remove any bats found that may be in torpor.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

Although no avifauna or nests were observed during surveys, Swallows (*Hirundo* species) and Fairy Martins (*Petrochelidon ariel*) have been observed in adjacent properties. As these species could potentially construct nests under the eaves of roofs of the residence and southernmost shed, these areas should be checked by an ecologist for nests during the roof removal stages.



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*Appendix B*

Figure

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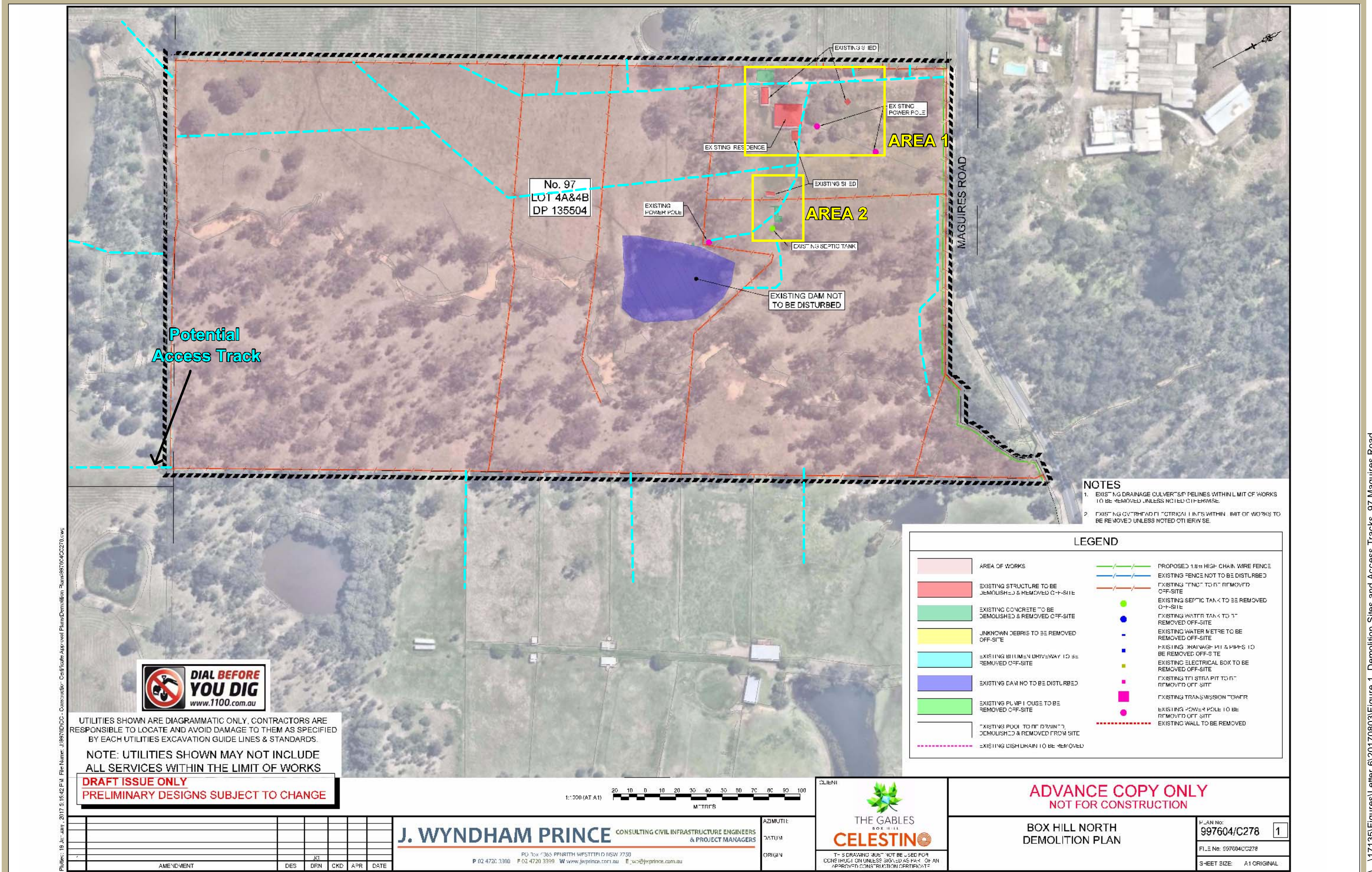


Figure 1. Demolition Sites and Potential Access tracks for 97 Maguires Road

Image Source: J. Wyndham Prince (2017. Box Hill North Demolition Plan.



7 August 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 151  
MAGUIRES ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 14 and 20 July 2017 in relation to demolition of existing structures and associated remediation works within 151 Maguires Road, Box Hill (Current Lot 5 DP 658286).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 151 Maguires Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I (**Figure 1.1**).

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 5 DP658286 or 151 Maguires Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.

Surveys of the subject site were conducted by an ecologist and a botanist on 14 and 20 July 2017 which involved meander surveys across the entire subject site. The 14 July surveys mainly focussed on the structures in the northern and central parts of the subject site while the 20 July surveys focussed on assessments of the vegetation along the southern boundary fenceline.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### **A.3 Results**

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- a Residence;
- Sheds;
- Water tanks;
- Concrete slabs; and
- Debris.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all residences, sheds, slabs and tanks may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences and power poles.



The existing residences/sheds and associated structures within the subject site occur in three main areas. These are indicated in **Figure 1** of **Appendix B**. The fences to be removed consist of fences across the entire northern, western, southern and eastern boundaries of the subject site. Internal fencing is also present in the central parts of the subject site and along a main access path thorough the centre of the site.

The ecological values of these areas are described in detail in the following sections.

### **A.3.1 Area 1**

Area 1 is present along the northern boundary of the subject site, adjacent to Maguires Road. Structures within this area comprise a residence, a small sheds and a concrete slab.

Area 1 is located wholly within areas mapped as cleared/exotic grassland. Existing vegetation within and immediately adjacent to Area 1 comprises either exotic grassland or planted species. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the existing structures.

The roof of the existing residence is considered to be potential roosting habitat for microchiropteran bats in cavities between the roofing material and underlying insulating material (**Photographs 1**). Although no fauna were observed in the vicinity of the structures during surveys, Swallows (*Hirundo* species) and Fairy Martins (*Petrochelidon ariel*) have been observed in the vicinity and there is potential for these species to build nests under the eaves of the roof. The adjacent shed is unlikely to provide roosting habitat for microbats as the structures are relatively open and exposed (**Photograph 2**).



**Photograph 1 Exotic or planted vegetation around existing residence**



**Photograph 2      Exotic Vegetation around shed in Area 1**

#### **A.3.2    Area 2**

Area 2 is located towards the central portion of the subject site. Structures within this area comprise several sheds of varying sizes, and water tanks.

Area 2 is located wholly within areas mapped as cleared/exotic grassland. Although some native trees are scattered across Area 2, this vegetation has not been mapped as MNES vegetation due to a lack of native understorey (**Photograph 3**).

The sheds within Area 2 are unlikely to provide roosting habitat for microbats as the structures are relatively open and exposed (**Photograph 4**). Swallows were observed in the vicinity and there is potential for these species to build nests under the eaves of the roofs of some of the sheds.





**Photograph 3** Exotic vegetation around sheds in Area 2



**Photograph 4** Sheds with potential nesting habitat for avifauna



### **A.3.3 Area 3**

Area 3 is located towards the central to southern half of the subject site. Structures within this area comprise several sheds of varying sizes, water tanks and debris.

Area 3 is located wholly within areas mapped as cleared/exotic grassland. Existing vegetation within and immediately adjacent to Area 2 comprises exotic grassland with scattered trees. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the existing structures.

The sheds within Area 3 are unlikely to provide roosting habitat for microbats as the structures are relatively open. Swallows were observed in the vicinity and there is potential for these species to build nests under the eaves of the roofs of some of the sheds (**Photograph 5**).

Debris within the southernmost parts of Area 3 comprises a small pile of wooden planks (**Photograph 6**).



**Photograph 5**      **SSTF vegetation to the south-east of slab (facing south-east) in Area 2**



**Photograph 6      Debris in the southernmost extent of Area 3**

#### **A.3.4    Fences**

The fenceline along the western boundary of the subject site comprises the same eastern boundary fenceline for 97 Maguires Road (see 17135 Let6). The fenceline passes through the outer edges of an area mapped as SSTF along the entire western boundary of the subject site.

The entire southern boundary fenceline and the southern parts of the eastern boundary fenceline also pass through areas mapped as SSTF. Except for areas where they connect with the western fenceline, the northern boundary fenceline and internal fencelines largely pass through exotic grassland.

Dense areas of regrowth vegetation (saplings) were observed near the southern boundary fence (**Photograph 7**)





**Photograph 7      Sapling regrowth near southern boundary fence**

## **A.4      Impact Assessment and Recommendations**

### **A.4.1      Access Tracks**

It is assumed that large machinery will be required for all demolition works. To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

If any additional access tracks are required, they should largely pass through exotic grassland areas. Locations for additional access tracks, if required, are shown on **Figure 1**. These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section 4.2** for further details).

### **A.4.2      Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section 4.4** below.



The western, southern and southern parts of the eastern boundary fencelines pass through areas mapped as SSTF. While parts of these areas comprise open woodland, with significant spaces between trees, dense clusters of trees and/or sapling regrowth are present, particularly near the southern boundary fence.

The machinery/vehicles utilised for fence removal should be small enough to fit between trees. If patches of dense vegetation, though which machines cannot fit are encountered, hand tools should be utilised for fence removal.

Given the relative lack of MNES vegetation in the northern parts of the subject site compared to the adjacent 97 Maguires Road, the western fenceline should be approached via the access tracks in the northern parts of the subject site (see **Figure 1 of Appendix B**).

Due to the high density of sapling regrowth near the southern boundary fence, this fenceline should preferentially be approached from the 3 Janpieter Road property to the south as machinery may not easily pass between spaces in the regrowth vegetation. This will also allow access to the southern portions of the eastern boundary fence that pass through SSTF. The parts of the eastern boundary fence that pass through SSTF can also be approached from the adjacent 169 Maguires Road property given the relative lack of SSTF within this property.

There are no restrictions to access for the parts of the internal fencelines, northern boundary fence and eastern boundary fence that pass through exotic grasslands.

#### **A.4.3 Structure Demolition and Debris removal**

All existing structures and debris lie completely within previously cleared areas or exotic grassland. Therefore there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones of all existing structures.

#### **A.4.4 Revegetation Strategy**

All impacted areas of MNES vegetation are to be revegetated in the event of unavoidable removal of groundcover vegetation for the soil testing or inadvertent damage from demolition of structures. The MNES areas potentially impacted by the spraying or establishment of work sites are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval.

Areas of SSTF that may be impacted by fence removal works occurs along the entire western and southern fenceline and the southern parts of the eastern fenceline.

As areas along the southern and eastern fencelines are to be cleared in the future, full revegetation to SSTF is not considered to be warranted. However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of CPW. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

As the vegetation along the western fenceline of the subject site is to be retained, any areas where unavoidable or inadvertent vegetation removal occurs should be revegetated to SSTF. Planting densities should be in accordance with the Masterplan Vegetation Management Plan (as approved by Hills Shire Council) and the Commonwealth Vegetation Management Plan (as approved by DoEE) requirements for SSTF.

#### **A.4.5 Fauna Habitat Management**

##### *i. Bats*

The residence within Area 1 constitutes potential roosting habitat for microbats (threatened and non-threatened species). As the building to be demolished has a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be in winter torpor. However as microbats can come out of torpor for short periods of time, dismantling the buildings gradually and carefully to render them undesirable as roosting habitat for microbats, thereby encouraging them to re-locate, is considered the best option in this case. Where feasible, dismantling of buildings likely to support roosting bats, should commence in September to maximise likelihood of bats coming out of torpor and self-relocating.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

As microbats may be in torpor during August or in the final stages of torpor in early September and unable to self-relocate, an ecologist should be on-site if removal the roofing material occurs during this time and remove any bats found that may be in torpor.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

ii. *Birds*

Swallows (*Hirundo* species) were observed in the vicinity of the sheds within Area 2 of the subject site. Although no nests were detected within the sheds, there is a potential for these species to construct nests within the sheds. Therefore it is recommended that pre-clearance surveys are conducted in Areas 2 and 3 within one week of the proposed demolition of the sheds to confirm the presence of any nests. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

Pre-clearance surveys for birds within Area 1 can be conducted during the roof removal stages for bats.



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*Appendix B*

Figure

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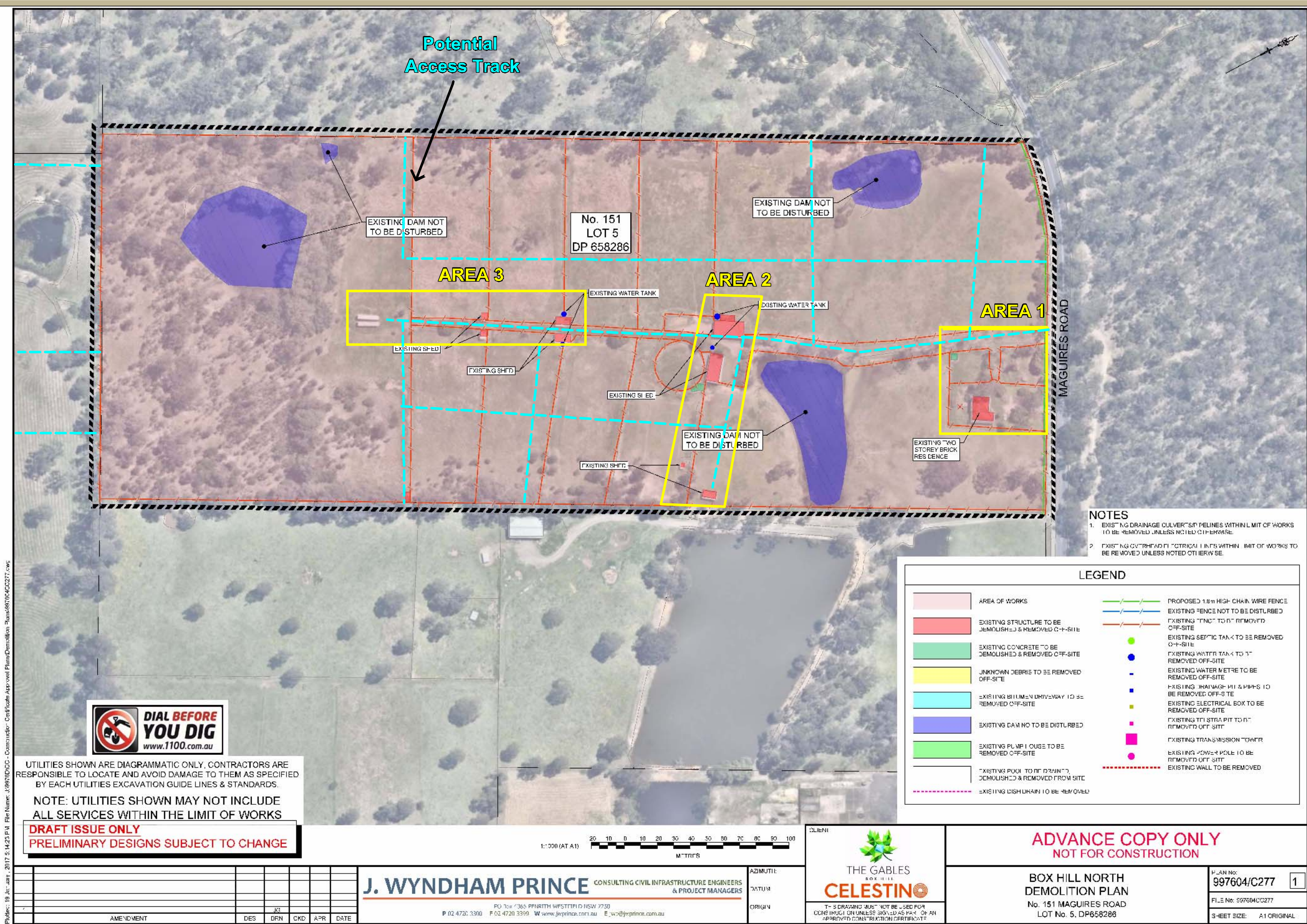


Figure 1. Demolition Sites and Potential Access tracks for 151 Maguires Road

Image Source: J. Wyndham Prince (2017). Box Hill North Demolition Plan.



7 August 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 169  
MAGUIRES ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 14 and 20 July 2017 in relation to demolition of existing structures and associated remediation works within 169 Maguires Road, Box Hill (Current Lot 1 DP 564211).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 169 Maguires Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I (**Figure 1.1**).

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEH) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 1 DP564211 or 169 Maguires Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.

Surveys of the subject site were conducted by an ecologist and a botanist on 14 July 2017 which involved meander surveys across the subject site.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### A.3 Results

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- Sheds;
- a Water tank;
- a Concrete slab; and
- Debris.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all sheds, slabs and tanks may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences and surface debris.

The locations of the existing sheds and structures are indicated in indicated in **Figure 1** of **Appendix B**. The fences to be removed consist of fences across the entire northern, western and southern boundaries of the subject site. Internal fencing is also present in the central and



southern parts of the subject site. The ecological values of these areas are described in detail in the following sections.

#### **A.3.1 Sheds and Structures**

The existing sheds/structures within the subject site occur towards the central parts of the subject site and comprise two small sheds, a concrete slab, a water tank and debris.

All the existing structures lie wholly within areas mapped as cleared/exotic grassland. No MNES vegetation (CPW or SSTF) is present within a 10m radius of the sheds, debris and water tank. However the outer fringes of a patch of SSTF is present within the edge of the 10m buffer zone to the west of the existing slab (**Photograph 1**).

The sheds are unlikely to provide roosting habitat for microbats as the structures are open and highly exposed (**Photograph 2**). They are also considered unlikely nesting habitat for any avifauna.



**Photograph 1**      **Outer fringes of SSTF patch adjacent to slab**



**Photograph 2      Existing structures in exotic grassland**

#### **A.3.2    Fences**

The fenceline along the western boundary of the subject site comprises the same eastern boundary fenceline for 151 Maguires Road (see 17135 Let 7). This fenceline passes through the outer edges of a large patch of SSTF located within 151 Maguires Road in the southern parts of the subject site.

While the northern boundary fence largely passes through exotic vegetation, a patch of SSTF is present towards the eastern extent. The southern boundary and internal fencelines pass through exotic vegetation only. The eastern boundary fenceline is not proposed to be removed.

### **A.4      Impact Assessment and Recommendations**

#### **A.4.1    Access Tracks**

It is assumed that large machinery will be required for all demolition works. To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

If any additional access tracks are required, they should largely pass through exotic grassland areas. Locations for additional access tracks, if required, are shown on **Figure 1**. These tracks are indicative only and can be further refined in consultation with operators based on on-ground

conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section 4.2** for further details).

#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section 4.4** below.

The southern parts of the western boundary fenceline pass through the outer edges of a large patch of SSTF located primarily within the adjacent 151 Maguires Road property. While parts of this patch comprise open woodland, with significant spaces between trees, dense clusters of trees and/or sapling regrowth are present near the fenceline.

The machinery/vehicles utilised for fence removal should be small enough to fit between trees. Given the relative lack of MNES vegetation in the southern parts of the subject site, the western fenceline should be approached from access tracks in the subject site to minimise the requirement to pass between trees.

There are no restrictions to access for the southern boundary and internal fenceline as they pass through exotic vegetation. The northern boundary fence should be accessed from Maguires Road, given the presence of newly installed chain wire fencing along the northern boundary.

#### **A.4.3 Structure Demolition**

The existing sheds, water tank and debris lie completely within previously cleared areas or exotic grassland. Therefore there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones for these structures.

Vegetation within the 10m spray zone to the north, east and south-east of the slab also comprises exotic grassland. However, vegetation within the outer edges of the spray zone to the west and south-west of the slab comprises SSTF. The minimum possible area should be sprayed in these areas and spraying near trees should be avoided to the maximum feasible extent. Any spraying in these areas should also be done downwind of the adjacent SSTF (indicated by start of the treeline) to minimise drift. Work site for these structures should also be established to the north or east.



#### **A.4.4 Revegetation Strategy**

All impacted areas of MNES vegetation are to be revegetated in the event of unavoidable removal of groundcover vegetation for the soil testing or inadvertent damage from demolition/removal of structures.

Areas of SSTF that may be impacted by works adjacent to the slab and parts of the western and northern fencelines are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval. As these areas are to be cleared in the future, full revegetation to SSTF is not considered to be warranted.

However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of CPW. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works. Areas near the northern fenceline in particular, will require appropriate stabilisation as SSTF vegetation to the immediate south is to be conserved within a Biobank site.

#### **A.4.5 Fauna Habitat Management**

No fauna management is required in relation to the demolition of structures within the subject site as the existing structures do not constitute potential habitat for any fauna.

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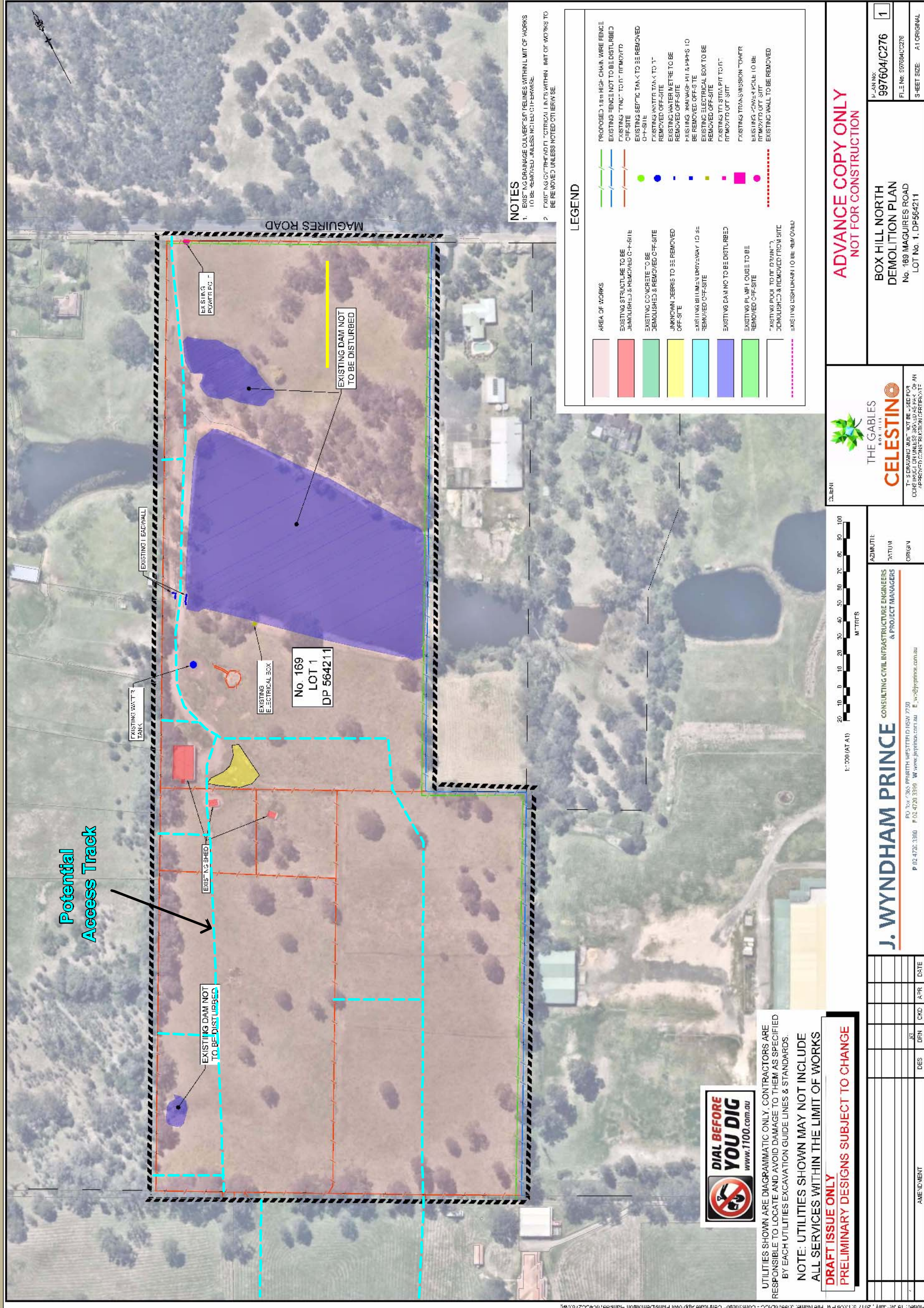
*Appendix B*

Figure

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7 September 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 10 RED  
GABLES ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 25 July 2017 in relation to demolition of existing structures and associated remediation works within 10 Red Gables Road, Box Hill (Current Lot 25 DP 255616).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 10 Red Gables Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I.

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 25 DP 255616 of Precinct E or 10 Red Gables Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.



Surveys of the subject site were conducted by an ecologist and a botanist on 25 July 2017 which involved meander surveys across the subject site.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for the Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### A.3 Results

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences; and
- Sheds.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all sheds may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences.

The locations of the existing sheds and structures are indicated in **Figure 1 of Appendix B**. The fences to be removed consist of fences across the entire northern and southern boundaries as well as parts of the western boundary of the subject site. Internal fencing is also present near the south-western corner of the subject site. The ecological values of these areas are described in detail in the following sections.

### **A.3.1 Sheds and Structures**

The existing sheds within the subject site occur in two locations within the subject site: large sheds near the south-western corner of the subject site and a small shed near the south-western corner of the dam.

All the existing structures lie wholly within areas mapped as cleared/exotic grassland. No MNES vegetation (CPW or SSTF) is present within a 10m radius of the sheds.

The roof of the large shed in the south-west corner of the subject site may provide some limited roosting habitat for bats (**Photograph 1**). However this is less likely if there is no insulating material under the roofing material. Although no fauna were observed in the vicinity of the structures during surveys, Swallows (*Hirundo* species) and Fairy Martins (*Petrochelidon ariel*) have been observed in the vicinity and there is potential for these species to build nests under the eaves of the shed roof.

The small shed near the dam is unlikely to provide roosting habitat for microbats as the structure is open and highly exposed. It is also considered unlikely nesting habitat for any avifauna.



**Photograph 1**      **Shed in south-west corner of subject site**

### A.3.2 Fences

The fenceline along the northern boundary of the subject site comprises the same southern boundary fenceline for 89 Maguires Road (see 17135 Let 5). This fenceline passes through a patch of CPW that is located largely within 89 Maguires Road but extends or overhangs into the northern boundary of the subject site (**Photograph 2**).

The southern and western boundary and internal fencelines pass through exotic vegetation only.



**Photograph 2** Overhanging CPW vegetation from 89 Maguires Road along northern boundary fenceline

## A.4 Impact Assessment and Recommendations

### A.4.1 Access Tracks

It is assumed that large machinery will be required for all demolition works. To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

If any additional access tracks are required, they should largely pass through exotic grassland areas. Locations for additional access tracks, if required, are shown on **Figure 1**. These tracks are indicative only and can be further refined in consultation with operators based on on-ground



conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section 4.2** for further details).

#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section 4.4** below.

The northern boundary fenceline passes through the outer edges of a patch of CPW located primarily within the adjacent 89 Maguires Road property.

The machinery/vehicles utilised for fence removal should be small enough to fit between trees. Given the relative lack of MNES vegetation in the subject site as well as the adjacent 89 Maguires Road property, the patch of CPW along the northern boundary of the subject site can be approached either from the south or from the north via 89 Maguires Road.

There are no restrictions to access for the southern and western boundary and internal fenceline as they pass through exotic vegetation.

#### **A.4.3 Structure Demolition**

The existing sheds lie completely within previously cleared areas or exotic grassland. Therefore there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones for these structures.

#### **A.4.4 Revegetation Strategy**

All impacted areas of MNES vegetation are to be revegetated in the event of unavoidable removal of groundcover vegetation for the soil testing or inadvertent damage from demolition/removal of structures.

Areas of CPW that may be impacted by works for removal of the northern fencelines are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval. As these areas are to be cleared in the future, full revegetation to CPW is not considered to be warranted.

However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of CPW. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

#### **A.4.5 Fauna Habitat Management**

##### *i. Bats*

The large sheds in the south-west corner of the subject site constitute potential, albeit limited, roosting habitat for microbats (threatened and non-threatened species). As the buildings to be demolished have a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be coming out of winter torpor and are likely to self-relocate if the sheds are demolished gradually and carefully to render them undesirable as roosting habitat.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used. Any roof removal using machinery should be conducted under ecological supervision in the event of any fauna encounters.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over several days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not to be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

##### *ii. Birds*

Barn Swallows (*Hirundo rustica*) were observed to be nesting in structures in nearby properties. Although no nests were detected within the sheds, there is a potential for these species to construct nests under the eaves of the sheds. Therefore it is recommended that pre-clearance surveys are conducted within one week of the proposed demolition of the buildings to confirm the presence of any nests. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016). These surveys can be conducted in conjunction with the inspections for bats.

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*Appendix B*

Figure

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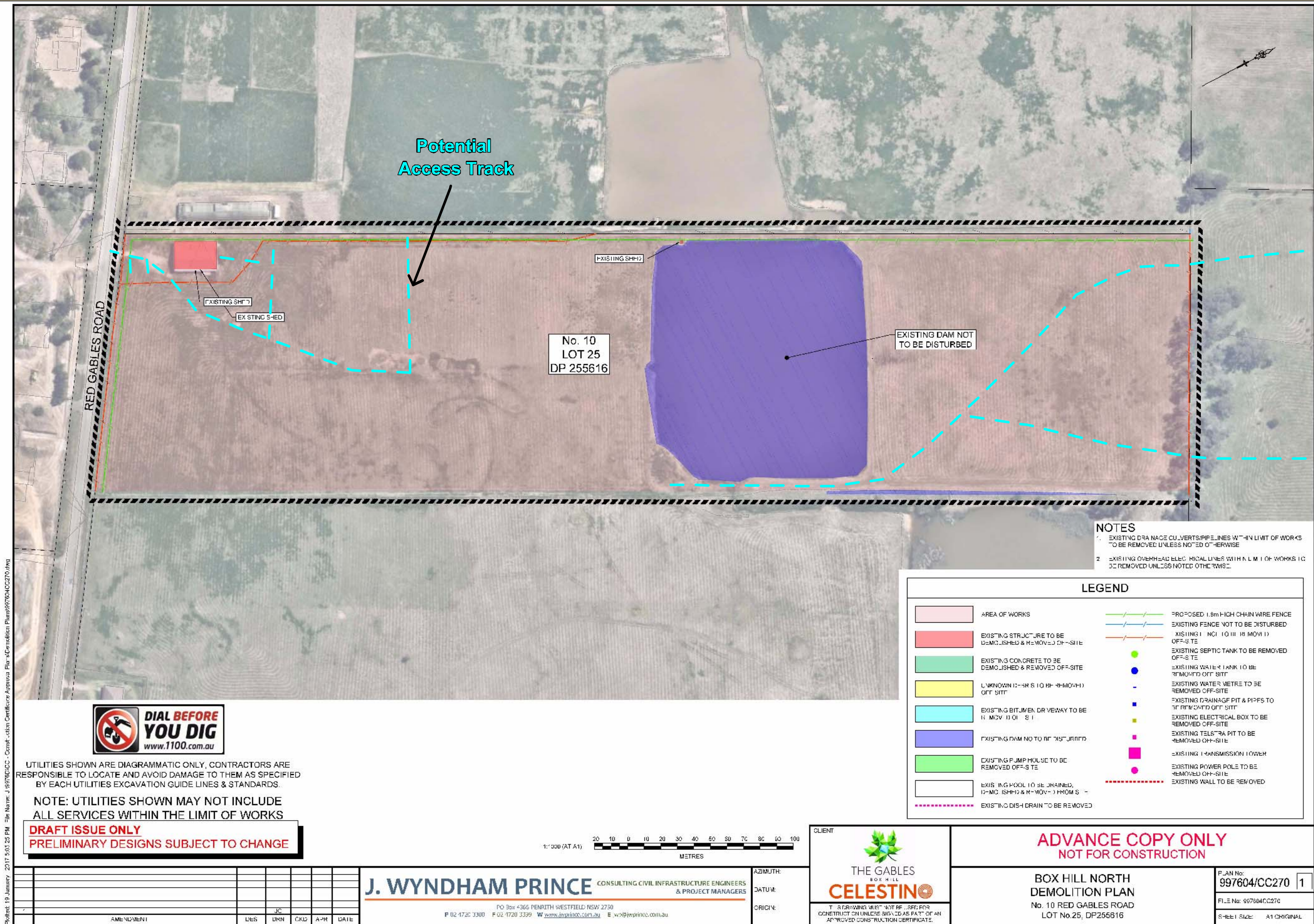


Figure 1. Demolition Sites and Potential Access tracks for 10 Red Gables Road

Image Source: J. Wyndham Prince (2017). Box Hill North Demolition Plan.



7 September 2017

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Celestino Developments  
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**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 12 RED  
GABLES ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 25 July 2017 in relation to demolition of existing structures and associated remediation works within 12 Red Gables Road, Box Hill (Current Lot 26 DP 255616).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

Ecological Inspection: 12 Red Gables Road

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I.

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEH) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 26 DP 255616 of Precinct E or 12 Red Gables Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.

Surveys of the subject site were conducted by an ecologist and a botanist on 25 July 2017 which involved meander surveys across the subject site.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### A.3 Results

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- a Residence;
- a Septic Tank; and
- a Shed.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all sheds may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences.

The locations of the existing sheds and structures are indicated in **Figure 1 of Appendix B**. The fences to be removed consist of fences across the entire northern and southern boundaries as well as parts of the western boundary of the subject site. Internal fencing is also present near the south-western corner of the subject site. The ecological values of these areas are described in detail in the following sections.

### A.3.1 Residence and Structures

The existing residence and septic tank are located in the south-eastern corner of the subject site while the shed is located on the southern boundary of the large dam within the subject site.

All the existing structures lie wholly within areas mapped as cleared/exotic grassland. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the structures.

The roof of the existing residence is considered to comprise suitable roosting habitat for microbats (**Photograph 1**). Although no fauna were observed in the vicinity of the structures during surveys, Swallows (*Hirundo* species) and Fairy Martins (*Petrochelidon ariel*) have been observed in the vicinity and there is potential for these species to build nests under the eaves of the roof of the residence.

The small shed near the dam is unlikely to provide roosting habitat for microbats as the structure is open and highly exposed. It is also considered unlikely nesting habitat for any avifauna.



**Photograph 1** Potential fauna habitat in residence within the subject site

### A.3.2 Fences

The fenceline along the northern boundary of the subject site comprises the same southern boundary fenceline for parts of 89 Maguires Road (see 17135 Let5) and 97 Maguires Road (see 17135 Let6). The vegetation in the subject site between the northern fenceline and the dam comprises a mix of *Acacia* regrowth (not an MNES) and exotic vegetation, including a large patch of Blackberry (*Rubus fruticosus*) (**Photograph 2**). However the corners of the northern



fenceline pass through the outer edges of a patch of CPW (located largely within 89 Maguires Road) at the western extent and the outer edges of a patch of SSTF (located largely within 97 Maguires Road) at the eastern extent.

Parts of the eastern fenceline near the junction between the subject site, 97 Maguires Road and 14 Red Gables Road also pass through the outer edges of a large patch of SSTF that extends from 97 Maguires Road into 14 Red Gables Road.

The remainder of the eastern fenceline as well as the southern internal fencelines pass through exotic vegetation only.



**Photograph 2      Blackberry infestation along majority of the northern fencelines (viewed from 97 Maguires Road, facing south)**

## **A.4      Impact Assessment and Recommendations**

### **A.4.1      Access Tracks**

It is assumed that large machinery will be required for all demolition works. To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

If any additional access tracks are required, they should largely pass through exotic grassland areas. Locations for additional access tracks, if required, are shown on **Figure 1**. These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section A.4.2** for further details).

#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section A.4.4** below.

The northern boundary fenceline passes through the outer edges of a patch of CPW (located primarily within the adjacent 89 Maguires Road property) and a patch of SSTF (located primarily within the adjacent 97 Maguires Road property).

The machinery/vehicles utilised for fence removal should be small enough to fit between trees. Given the relative lack of MNES vegetation in the subject site, the northern fenceline can be approached from the south (with due considerations to the limitations posed by the presence of the dam) or from the adjacent 10 Red Gables Road property. The fenceline can also be approached via access paths within 89 Maguires Road or 97 Maguires Road.

Given the large infestation of Blackberry along parts of the northern fenceline, there is potential that some Blackberry may need to be cleared as part of fence removal works. Any Blackberry cleared should be removed from site or stockpiled securely and covered in black plastic to ensure that further spread of this species does not occur.

There are no restrictions to access for the southern and western boundary and internal fenceline as they pass through exotic vegetation.

#### **A.4.3 Structure Demolition**

The existing structures lie completely within previously cleared areas or exotic grassland. Therefore there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones for these structures.

#### **A.4.4 Revegetation Strategy**

All impacted areas of MNES vegetation are to be revegetated in the event of unavoidable removal of groundcover vegetation for the soil testing or inadvertent damage from demolition/removal of structures.

Areas of CPW or SSTF that may be impacted by works for removal of the northern fencelines are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval. As the areas of CPW and SSTF within the subject site are to be cleared in the future, full revegetation to CPW or SSTF is not considered to be warranted.

However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of CPW or SSTF. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works. As areas of SSTF in the adjacent 97 Maguires Road property are to be retained, additional native species, as listed in the Masterplan Vegetation Management Plan (as approved by Hills Shire Council) and the Commonwealth Vegetation Management Plan (as approved by DoEE) for SSTF should also be utilised where feasible.

#### **A.4.5 Fauna Habitat Management**

##### *i. Bats*

The residence in the south-east corner of the subject site constitutes potential roosting habitat for microbats (threatened and non-threatened species). As the building to be demolished has a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be coming out of winter torpor and are likely to self-relocate if the building is demolished gradually and carefully to render it undesirable as roosting habitat.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over several days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not to be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

##### *ii. Birds*

Barn Swallows (*Hirundo rustica*) were observed to be nesting in structures in nearby properties. Although no nests were detected within the sheds, there is a potential for these species to



construct nests under the eaves of the sheds. Therefore it is recommended that pre-clearance surveys are conducted within one week of the proposed demolition of the buildings to confirm the presence of any nests. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016). These surveys can be conducted in conjunction with the inspections for bats.

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*Appendix B*

Figure

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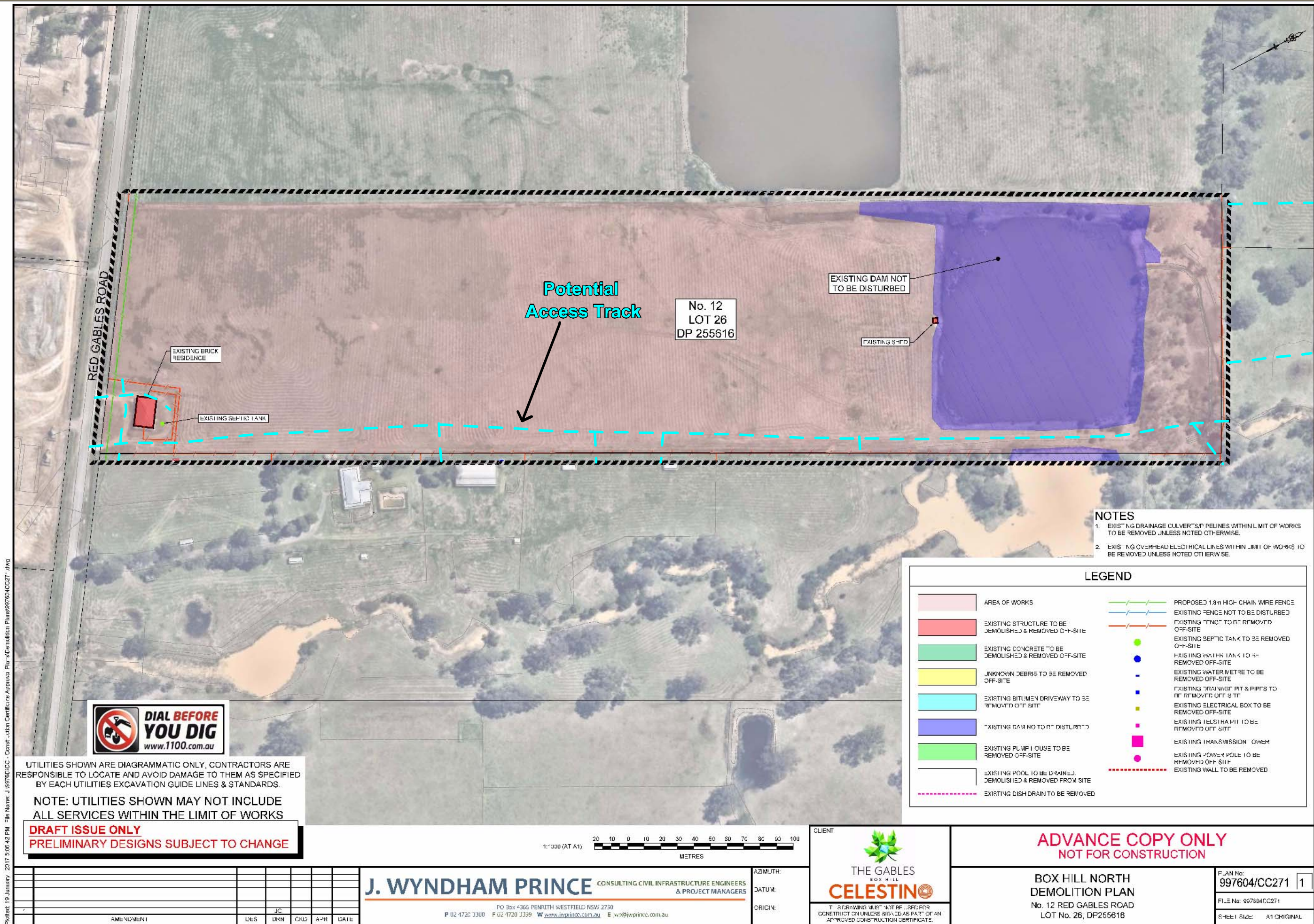


Figure 1. Demolition Sites and Potential Access tracks for 12 Red Gables Road

Image Source: J. Wyndham Prince (2017). Box Hill North Demolition Plan.



7 September 2017

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**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 14 RED  
GABLES ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 25 July 2017 in relation to demolition of existing structures and associated remediation works within 14 Red Gables Road, Box Hill (Current Lot 27 DP 255616).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

**Ecological Inspection: 14 Red Gables Road**

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I.

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 27 DP 255616 of Precinct E or 14 Red Gables Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.



Surveys of the subject site were conducted by an ecologist and a botanist on 25 July 2017 which involved meander surveys across the subject site.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### **A.3 Results**

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- a Residence with associated pool;
- Sheds and awnings;
- a Pump house;
- a Septic Tank;
- a Water Tank; and
- a Power pole.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all sheds may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences.

The locations of the existing sheds and structures are indicated in **Figure 1** of **Appendix B**. The fences to be removed consist of fences across the entire northern and western boundaries as well as parts of the eastern boundary of the subject site. Internal fencing is also present in the southern parts of the subject site. The ecological values of these areas are described in detail in the following sections.

### **A.3.1 Residence and Structures**

The existing structures are largely located in the south to south-western parts of the subject site and comprise an existing brick residence, a large corrugated iron shed, multiple awnings, tanks (water and septic) a pump house and a power pole.

All the existing structures lie wholly within areas mapped as cleared/exotic grassland. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the structures.

The roof of the existing residence is considered to comprise suitable roosting habitat for microbats (**Photograph 1**). While the large corrugated shed to the north of the residence is not considered to be suitable bat roosting habitat due to the lack of a roof cavity, several nests were observed within the shed.

The awnings are unlikely to provide habitat for microbats or avifauna as the structures are open and highly exposed (**Photograph 2**).



**Photograph 1** Potential bat roosting habitat in residence within the subject site



**Photograph 2      Exposed Structures (awnings) within the Subject Site**

### ***A.3.2    Fences***

The fenceline along the northern boundary of the subject site comprises the same southern boundary fenceline for parts of 97 Maguires Road (see 17135 Let6) (**Photograph 3**).

The entire northern fenceline of the subject site as well as northern parts of the western fence line pass through vegetation mapped as SSTF. With the exception of the north-eastern corner which is located on the outer edges of a patch of SSTF, the parts of the eastern boundary fence proposed for removal pass through exotic vegetation. All the internal fencelines pass through exotic vegetation only.





**Photograph 3** SSTF along the northern boundary fenceline of the subject site (viewed from 97 Maguires Road, facing south-east)

## **A.4 Impact Assessment and Recommendations**

### **A.4.1 Access Tracks**

It is assumed that large machinery will be required for all demolition works. To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

If any additional access tracks are required, they should largely pass through exotic grassland areas. Locations for additional access tracks, if required, are shown on **Figure 1**. These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section A.4.2** for further details).

#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section A.4.4** below.

The northern boundary fenceline passes through a large patch of SSTF that extends from the adjacent 97 Maguires Road property into the subject site. While parts of the SSTF areas comprise open woodland, with significant spaces between trees, dense clusters of trees and/or sapling regrowth are present, particularly within the 97 Maguires Road Property.

The machinery/vehicles utilised for fence removal should be small enough to fit between trees. If patches of dense vegetation or sapling regrowth, through which machines cannot fit are encountered, hand tools should be utilised for fence removal.

Due to the high density of sapling regrowth within the 97 Maguires Road property which extends slightly into the subject site, machinery may not easily pass between spaces in the regrowth vegetation. While the northern fenceline can be approached from the south if there is sufficient space between trees, there may be limitations to approach due to the presence of the creekline/drainage line that runs in a north-south direction through the subject site.

Therefore, the northern fenceline of the subject site should preferentially be approached from relatively cleared areas from the adjacent 3 Janpieter Road property to the east or the 12 Red Gables Road to the west. The approach from 3 Janpieter Road and 12 Red Gables Road also provide suitable access to the parts of the eastern and western boundary fencelines.

There are no restrictions to access for the southern parts of the western boundary and internal fencelines as they pass through exotic vegetation.

#### **A.4.3 Structure Demolition**

The existing structures lie completely within previously cleared areas or exotic grassland. Therefore there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones for these structures.

#### **A.4.4 Revegetation Strategy**

All impacted areas of MNES vegetation are to be revegetated in the event of unavoidable removal of groundcover vegetation for the soil testing or inadvertent damage from demolition/removal of structures.

Areas of CPW or SSTF that may be impacted by works for removal of the northern fencelines are included within the areas that are to be offset by retirement of appropriate Biobank credits, as per Council, State and Commonwealth conditions of approval. As the areas of CPW and SSTF within the subject site are to be cleared in the future, full revegetation to CPW or SSTF is not considered to be warranted.

However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of SSTF. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

As areas of SSTF in the adjacent 97 Maguires Road property are to be retained, additional native species, as listed in the Masterplan Vegetation Management Plan (as approved by Hills Shire Council) and the Commonwealth Vegetation Management Plan (as approved by DoEE) for SSTF should also be utilised where feasible.

#### **A.4.5 Fauna Habitat Management**

##### *i. Bats*

The residence in the south-west parts of the subject site constitutes potential roosting habitat for microbats (threatened and non-threatened species). As the building to be demolished has a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be coming out of winter torpor and are likely to self-relocate if the building is demolished gradually and carefully to render it undesirable as roosting habitat.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. However as the roof of the residence comprises large sheets rather than individual tiles, hand-removal of roofing material is unlikely to be a viable option and removal using machinery may be necessary. Any machinery utilised should allow for the materials to be removed without collapsing or crushing parts of the building and should be conducted under ecological supervision in the event of any fauna encounters.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over several days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost, if not previously signed off as being rendered unsuitable habitat during the roof removal (machine removal) stage.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not to be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).



*ii. Birds*

Several nests were observed within the large shed to the north of the existing residence. Pre-clearance surveys to determine the occupancy of the nests should be conducted within one week prior to demolition of the structures. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016). The pre-clearance surveys for birds can be conducted during the roof removal stages for bats.

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*Appendix B*

Figure

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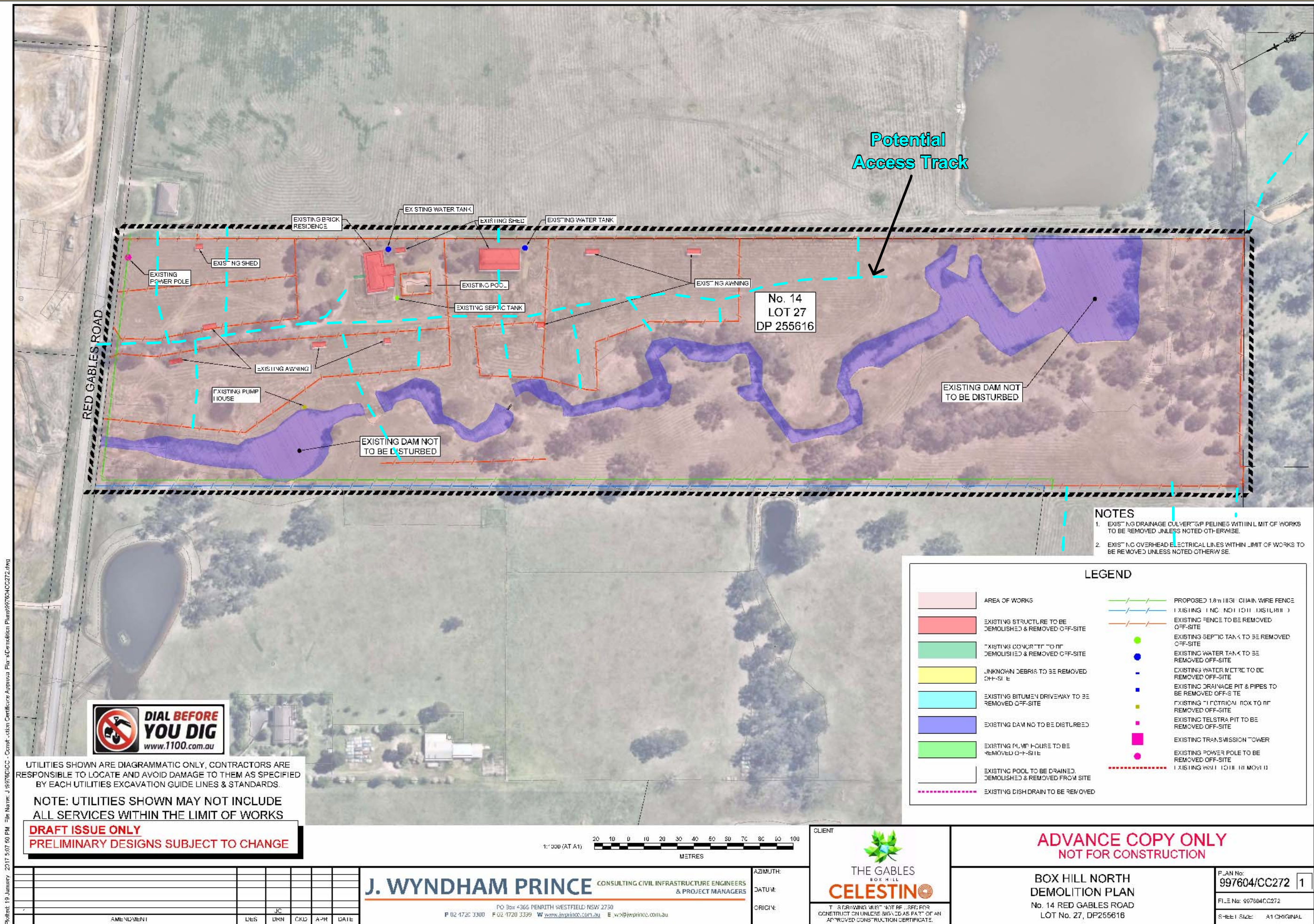


Figure 1. Demolition Sites and Potential Access tracks for 14 Red Gables Road

Image Source: J. Wyndham Prince (2017. Box Hill North Demolition Plan.



7 September 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 3  
JANPIETER ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 25 July 2017 in relation to demolition of existing structures and associated remediation works within 3 Janpieter Road, Box Hill (Current Lot 31 DP 255616).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**. A figure showing the locations of the structures inspected is provided in **Appendix B**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

**Ecological Inspection: 3 Janpieter Road**

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I.

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 31 DP 255616 of Precinct F or 3 Janpieter Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.



Surveys of the subject site were conducted by an ecologist and a botanist on 25 July 2017 which involved meander surveys across the subject site.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### A.3 Results

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- a Residence;
- Sheds;
- Septic Tanks; and
- Water Tanks.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all sheds may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences.

The locations of the existing sheds and structures are indicated in **Figure 1 of Appendix B**. The fences to be removed consist of fences across the entire eastern and western boundaries as well as parts of the northern and southern boundaries of the subject site. Internal fencing is

also present in the central parts of the subject site. The ecological values of these areas are described in detail in the following sections.

#### **A.3.1 Residence and Structures**

The existing structures are largely located in the north to north-eastern parts of the subject site and comprise an existing brick residence, a brick outhouse, corrugated iron sheds and tanks (water and septic).

All the existing structures lie wholly within areas mapped as cleared/exotic grassland or Scattered Trees. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the structures.

The roofs of the existing brick residence and brick outhouse are considered to comprise suitable roosting habitat for microbats (**Photograph 1**) given the presence of large roof cavities. Several Welcome Swallow (*Hirundo neoxena*) nests were observed within both brick structures (**Photograph 2**). The corrugated sheds are not considered to be suitable bat roosting habitat due to the lack of a roof cavity (**Photograph 3**).



**Photograph 1**      Potential bat roosting habitat in brick outhouse within the subject site



**Photograph 2**      **Swallow nests in brick residence**



**Photograph 3**      **Corrugated shed without roof cavity**



### **A.3.2 Fences**

The fenceline along the northern boundary of the subject site comprises the same southern boundary fenceline for parts of 151 Maguires Road (see 17135 Let7) and 169 Maguires Road (see 17135 Let8). This fenceline passes through areas mapped as Scattered Trees (not a MNES) along the boundary with 169 Maguires Road and through the edges of an area mapped as SSTF along the boundary with 151 Maguires Road (**Photograph 4**).

The fencelines along the western, southern and eastern boundaries of the subject site as well as all internal fencelines pass through exotic vegetation only



**Photograph 4**      **Edges of SSTF along the northern boundary fenceline of the subject site (viewed from 151 Maguires Road, facing south-east)**

## **A.4 Impact Assessment and Recommendations**

### **A.4.1 Access Tracks**

It is assumed that large machinery will be required for all demolition works. To minimise any potential impacts to existing MNES within the subject site, as a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

If any additional access tracks are required, they should largely pass through exotic grassland areas. Locations for additional access tracks, if required, are shown on **Figure 1**. These tracks are indicative only and can be further refined in consultation with operators based on on-ground conditions and machine limitations. The final access pathways should be demarcated and all ground staff notified of the requirement to remain within the access pathways.

Where access into areas of MNES is unavoidable – e.g. access for fence removal – smaller machinery that can pass between trees should be utilised to the fullest extent possible (see **Section A.4.2** for further details).

#### **A.4.2 Fence Removal**

It is assumed that spraying/soil testing for contaminants is not required for removal of the fences. In the event that spraying/groundcover removal is required around the fencelines, the sprayed areas will be subject to the revegetation strategies outlined in **Section A.4.4** below.

The northern boundary fenceline passes through the outer edges of a large patch of SSTF located within the adjacent 151 Maguires Road property. While parts of the SSTF areas comprise open woodland, with significant spaces between trees, dense clusters of trees and/or sapling regrowth are present within the 151 Maguires Road Property.

The machinery/vehicles utilised for fence removal should be small enough to fit between trees. If patches of dense vegetation or sapling regrowth, through which machines cannot fit are encountered, hand tools should be utilised for fence removal.

Due to the lack of MNES across the majority of the subject site, the approach to the northern boundary fence should occur from the south (see **Figure 1** of **Appendix B**). The western boundary fenceline, which forms the boundary with the adjacent 14 Red Gables Road property should also be approached from access tracks within the subject site due to the relative lack of MNES vegetation. There are no restrictions on the approach to the eastern, southern and internal fencelines as they pass through exotic vegetation.

#### **A.4.3 Structure Demolition**

The existing structures lie completely within or adjacent to areas mapped as Scattered Trees or cleared areas or exotic grassland. While there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones for these structures due to the lack of MNES, any native trees present within the 10m zones should be avoided to the maximum feasible extent.

#### **A.4.4 Revegetation Strategy**

All impacted areas of MNES vegetation are to be revegetated in the event of unavoidable removal of groundcover vegetation for the soil testing or inadvertent damage from demolition/removal of structures.

Areas of SSTF that may be impacted by works for removal of the northern fencelines are included within the areas that are to be offset by retirement of appropriate Biobank credits, as

per Council, State and Commonwealth conditions of approval. As the areas of CPW and SSTF within the subject site are to be cleared in the future, full revegetation to CPW or SSTF is not considered to be warranted.

However, as the vegetation will not be cleared immediately following the completion of remediation, soil stabilisation works should be implemented to prevent erosion and any potential degradation of SSTF. Only native grass, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for the soil stabilisation works.

#### **A.4.5 Fauna Habitat Management**

##### *i. Bats*

The existing brick residence and brick outhouse constitute potential roosting habitat for microbats (threatened and non-threatened species). As the buildings to be demolished have a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be coming out of winter torpor and are likely to self-relocate if the building is demolished gradually and carefully to render it undesirable as roosting habitat.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over several days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not to be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

##### *ii. Birds*

Several nests were observed within the residence and outhouse. Pre-clearance surveys to determine the occupancy of the nests should be conducted within one week prior to demolition



of the structures. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016). The pre-clearance surveys for birds can be conducted during the roof removal stages for bats.

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*Appendix B*

Figure

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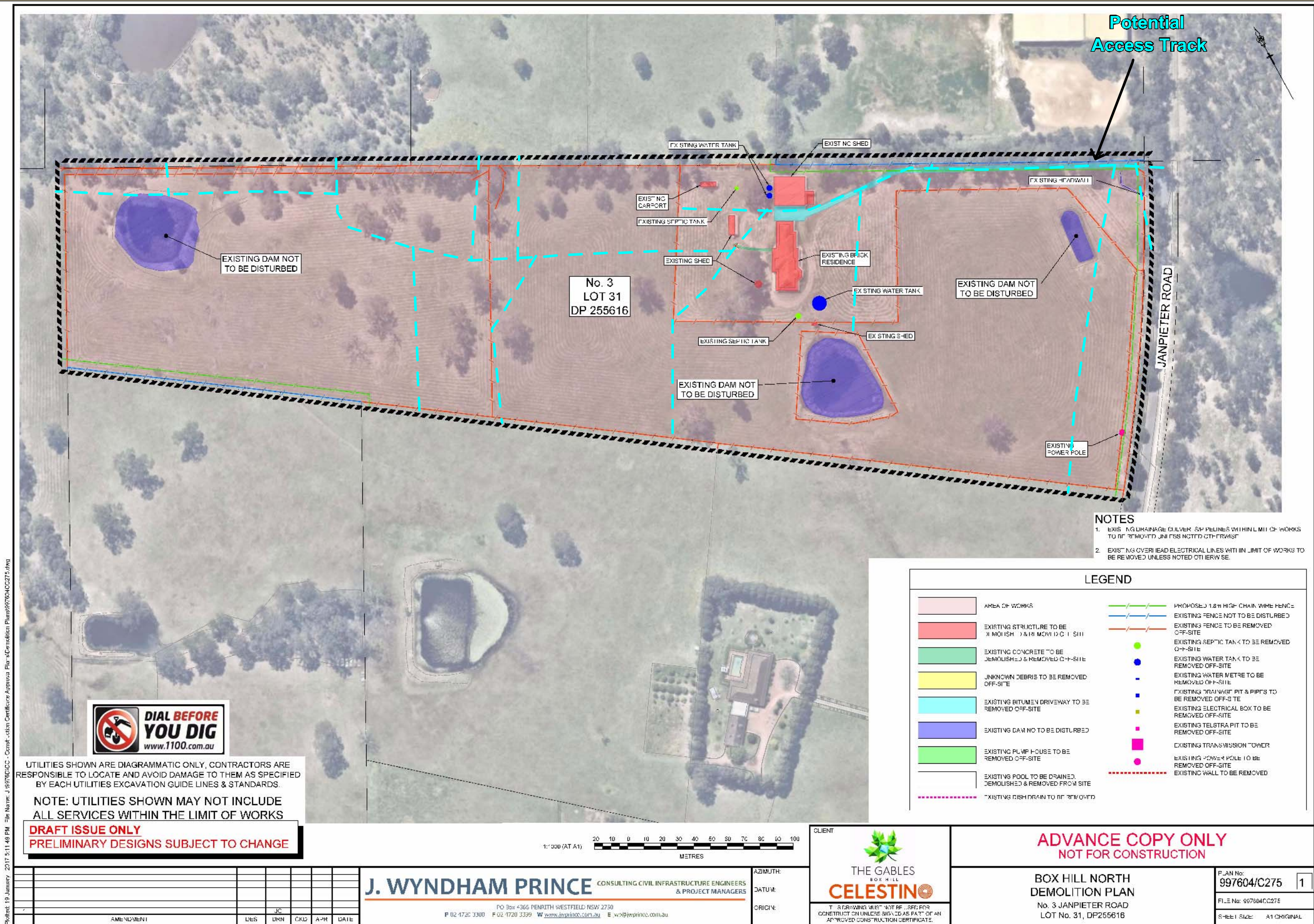


Figure 1. Demolition Sites and Potential Access tracks for 3 Janpieter Road

Image Source: J. Wyndham Prince (2017). Box Hill North Demolition Plan.



7 September 2017

Jude Adikari  
Celestino Developments  
PO Box 438  
Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 5  
JANPIETER ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 25 July 2017 in relation to demolition of existing structures and associated remediation works within 5 Janpieter Road, Box Hill (Current Lot 30 DP 255616).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

**Ecological Inspection: 5 Janpieter Road**

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I.

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 30 DP 255616 of Precinct F or 5 Janpieter Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.



Surveys of the subject site were conducted by an ecologist and a botanist on 25 July 2017 which involved meander surveys across the subject site.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### **A.3 Results**

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- a Residence with associated pool;
- Sheds;
- Septic Tanks;
- Water Tanks;
- a Power pole; and
- Debris.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all sheds may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences.

The fences to be removed consist of fences across the entire northern, eastern and southern boundaries of the subject site. Internal fencing is also present in the central parts of the subject site. The ecological values of these areas are described in detail in the following sections.

#### **A.3.1 Residence and Structures**

The existing structures are largely located in the central parts of the subject site and comprise an existing brick residence, sheds and tanks (water and septic).

All the existing structures lie wholly within areas mapped as cleared/exotic grassland or Scattered Trees. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the structures.

The roofs of the existing brick residence are considered to comprise suitable roosting habitat for microbats (**Photograph 1**) given the presence of large roof cavities. The corrugated sheds are not considered to be suitable bat roosting habitat due to the lack of a roof cavity (**Photograph 2**). No fauna were observed in the vicinity of the structures during surveys. However nests of swallows (*Hirundo* species) have been observed in adjacent properties and there is potential for these species to build nests under the eaves of the roofs.



**Photograph 1**      Potential bat roosting habitat in residence within the subject site



**Photograph 2      Corrugated shed without roof cavity**

#### **A.3.2    Fences**

All the boundary fencelines as well as all internal fencelines pass through areas that are mapped as mapped as Scattered Trees or exotic vegetation only.

### **A.4      Impact Assessment and Recommendations**

#### **A.4.1    Access Tracks**

It is assumed that large machinery will be required for all demolition works. As a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

No MNES vegetation is present within the subject site. Therefore there are no ecological restrictions for locations for additional access tracks, if required, as any additional tracks would pass through exotic grassland areas only.

#### **A.4.2    Fence Removal**

All the boundary fencelines and internal fencelines pass through areas that are mapped as mapped as Scattered Trees or cleared areas or exotic grassland. Therefore there are no ecological restrictions in relation to MNES for fence removal. However, although Scattered



Trees do not constitute MNES, native trees present near the fencelines should be avoided to the maximum feasible extent.

#### **A.4.3 Structure Demolition**

The existing structures lie completely within or adjacent to areas mapped as Scattered Trees or cleared areas or exotic grassland. While there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones for these structures due to the lack of MNES, any native trees present within the 10m zones should be avoided to the maximum feasible extent.

#### **A.4.4 Revegetation Strategy**

As surrounding vegetation will not be cleared immediately following the completion of remediation and demolition works, some soil stabilisation works in adjacent areas may be required following completion of remediation/demolition works to prevent erosion. Although these works will occur in areas of exotic grassland, native grasses, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for any soil stabilisation works.

#### **A.4.5 Fauna Habitat Management**

##### *i. Bats*

The existing brick residence constitutes potential roosting habitat for microbats (threatened and non-threatened species). As the building to be demolished has a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be coming out of winter torpor and are likely to self-relocate if the building is demolished gradually and carefully to render it undesirable as roosting habitat.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over several days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

ii. *Birds*

Nests of Swallows (*Hirundo* species) have been observed in properties adjacent to the subject site. Although no nests were detected within structures in the subject site, there is a potential for these species to construct nests within the residence or sheds. Therefore it is recommended that pre-clearance surveys are conducted in within one week of the proposed demolition of the sheds to confirm the presence of any nests. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016). The pre-clearance surveys for birds can be conducted during the roof removal stages for bats.

7 September 2017

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Pendle Hill NSW 2145

**ASSESSMENT OF DEMOLITION AND REMEDIATION SITES AT 18 RED  
GABLES ROAD, BOX HILL**

Dear Jude,

The purpose of this letter is to document the results of the ecological inspections conducted by Cumberland Ecology on 25 July 2017 in relation to demolition of existing structures and associated remediation works within 18 Red Gables Road, Box Hill (Current Lot 29 DP 255616).

The proposed demolition and remediation works constitute 'Ancillary works' as defined in the Commonwealth Variation to Conditions of approval for EPBC 2014/7119 (dated 23 June 2017) and are subject to the management actions required under the Commonwealth approved Interim Management Plan (IMP).

These inspections were conducted to fulfil the requirements of Section 2.2.3 of the IMP which requires ecologists to identify suitable tracks and work areas to minimise the risk of potential impacts to Matters of National Environmental Significance (MNES).

The details of our assessment are provided in **Appendix A**.

We would be happy to discuss any aspect of this assessment in further detail. If you have any queries or require further clarification, please do not hesitate to contact either myself, or David Robertson, on (02) 9868 1933.

Yours sincerely



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*Appendix A*

**Ecological Inspection: 18 Red Gables Road**

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## A.1 Background

The Gables is a 339 ha parcel of land at Box Hill North, NSW that is to be developed to accommodate residential dwellings, community centres, a town centre, schools, roads and associated infrastructure. The Gables development is divided into nine separate development 'Precincts', namely Precincts A – I.

The Gables development was referred to the Commonwealth Department of Environment and Energy (DoEE) and was determined to be a Controlled Action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to its likely impacts upon Matters of National Environmental Significance (MNES), namely endangered ecological communities and threatened species, in particular Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (CPW), Shale Sandstone Transition Forest of the Sydney Basin Bioregion (SSTF); and Grey-headed Flying Fox (GHFF).

Conditions of approval for the Gables development were granted by DoEE on 19 July 2016 and were restricted to Precincts E, F, G and I. In accordance with the requirements of Condition 5 of the DoEE approval (EPBC 2014/7119), an Interim Management Plan (IMP) for the management of two Biobank sites (one each within Precincts I and G) and surrounding areas (Precincts E, F, G and I) was prepared. The IMP was prepared to guide the management of these sites until the formal BioBanking agreements are approved by the NSW Office of Environment and Heritage (OEHS) and DoEE. The IMP was approved by DoEE on 17 May 2017.

A formal Variation to Approval conditions request was submitted to DoEE on 21 April 2017 and was granted on 23 June 2017. Under the Variation of Approval conditions, minor works such as fencing, demolition of existing structures and remediation constitute 'Ancillary works' and are to be conducted in accordance with the requirements of the approved IMP (also referred to as Biobank Site Management Plan).

In accordance with Section 2.2.3 of the IMP, ecologists are required to identify suitable tracks and work areas for remediation and associated demolition/material removal to minimise the risk of potential impacts to MNES. Any structures to be demolished also require an assessment of their potential to provide fauna habitat to fulfil the ecological requirements of Hills Shire Council.

The purpose of this assessment is to determine the vegetation present around each structure to be demolished/removed within Lot 29 DP 255616 of Precinct F or 18 Red Gables Road (hereafter referred to as the 'subject site') and provide recommendations for mitigation measures to reduce the risk of impacts to MNES and fauna habitats as well as strategies for rehabilitation in the event of unavoidable impacts.

## A.2 Methods

The Advanced Copy Draft demolition plan prepared by J. Wyndham Prince for the subject site was reviewed to identify the extent and type of works proposed within the subject site.

Surveys of the subject site were conducted by an ecologist and a botanist on 25 July 2017 which involved meander surveys across the subject site.

The general condition of the vegetation around each structure to be demolished/removed was noted and checked against the existing vegetation mapping for the subject site to verify if the vegetation was mapped as a MNES. Photographs were taken around each structure to record conditions during the survey.

In accordance with additional ecological requirements for Hills Shire Council, each structure was also assessed for its suitability to provide roosting habitat for fauna, in particular birds and microchiropteran bats (microbats). Targeted surveys for microbats using ultrasonic detectors were not conducted as microbats are likely to be in torpor at the time of year that the survey was conducted and therefore unlikely to be calling. Therefore a conservative approach was taken and microbats were assumed to be present if suitable roosting habitat was present within any structure.

### **A.3 Results**

The demolition plans indicate that proposed works within the subject site include removal of the following items:

- Fences;
- a Residence;
- a Shed;
- Septic Tanks;
- a Water Tank;
- a Power pole; and
- Concrete slabs.

Based on information provided by JBS&G, the areas around some of the existing structures may require further investigations to define the extent of contamination requiring remediation. The first stage of investigation includes shallow soil sampling which will require spraying and removal of groundcover to access the sediments.

A conservative approach has been taken and it is assumed that all sheds may require an investigation or 'spray zone' area. This assessment, therefore, allows for a spray zone area of 10m from the edge of residences, sheds, slabs and tanks. This 10m spray zone also serves as a work zone area for machinery and stockpiles associated with demolition of structures.

It is assumed that spray zones are not required for the existing fences.



The fences to be removed consist of fences across the entire northern, eastern and southern boundaries of the subject site. Internal fencing is also present in the central parts of the subject site. The ecological values of these areas are described in detail in the following sections.

#### **A.3.1 Residence and Structures**

The existing structures are largely located in the central to northern parts of the subject site and comprise an existing brick residence, sheds, slabs and tanks (water and septic).

All the existing structures lie wholly within areas mapped as cleared/exotic grassland or Scattered Trees. No MNES vegetation (CPW or SSTF) is present within a 10m radius of any of the structures.

The roofs of the existing brick residence are considered to comprise suitable roosting habitat for microbats (**Photograph 1**) given the presence of large roof cavities. The sheds are not considered to be suitable bat roosting habitat due to the lack of a roof cavity. No fauna were observed in the vicinity of the structures during surveys. However nests of swallows (*Hirundo* species) have been observed in nearby properties and there is potential for these species to build nests under the eaves of the roofs.



**Photograph 1**      **Potential bat roosting habitat in residence within the subject site**

### **A.3.2 Fences**

All the boundary fencelines as well as all internal fencelines pass through areas that are mapped as mapped as Scattered Trees or exotic vegetation only.

## **A.4 Impact Assessment and Recommendations**

### **A.4.1 Access Tracks**

It is assumed that large machinery will be required for all demolition works. As a priority all existing tracks and driveways should be utilised to access the structures for demolition works.

No MNES vegetation is present within the subject site. Therefore there are no ecological restrictions for locations for additional access tracks, if required as any additional tracks would pass through exotic grassland areas only.

### **A.4.2 Fence Removal**

All the boundary fencelines and internal fencelines pass through areas that are mapped as mapped as Scattered Trees or cleared areas or exotic grassland. Therefore there are no ecological restrictions in relation to MNES for fence removal. However, although Scattered Trees do not constitute MNES, native trees present near the fencelines should be avoided to the maximum feasible extent.

### **A.4.3 Structure Demolition**

The existing structures lie completely within or adjacent to areas mapped as Scattered Trees or cleared areas or exotic grassland. While there are no restrictions on the location of work areas for machinery for the demolition of structures or stockpiles for debris prior to removal from site within the 10m zones for these structures due to the lack of MNES, any native trees present within the 10m zones should be avoided to the maximum feasible extent.

### **A.4.4 Revegetation Strategy**

As surrounding vegetation will not be cleared immediately following the completion of remediation and demolition works, some soil stabilisation works in adjacent areas may be required following completion of remediation/demolition works to prevent erosion. Although these works will occur in areas of exotic grassland, native grasses, preferably *Microleana stipoides* (Weeping Meadow grass) should be used for any soil stabilisation works.

### **A.4.5 Fauna Habitat Management**

#### *i. Bats*

The existing brick residence constitutes potential roosting habitat for microbats (threatened and non-threatened species). As the building to be demolished has a large number of potential openings available to microbats, attempting to trap the microbats and relocate them prior to any demolition is not considered to be a viable option as it is not possible to detect and sufficiently

block all exit points and erect a trap at the remaining exit point to capture microbats as they exit the building.

Based on current weather conditions, microbats are likely to be coming out of winter torpor and are likely to self-relocate if the building is demolished gradually and carefully to render it undesirable as roosting habitat.

Ideally roofing material should be hand-removed to minimise potential harm to roosting microbats and where possible should be conducted close to dusk. Alternatively roofing can be removed gradually over more than one day to minimise the impact on roosting microbats. In the event that hand-removal of roofing material is not viable, machinery that allows for the materials to be removed without collapsing or crushing parts of the building is to be used.

After the initial removal of roofing material, the roost sites should be left exposed for at least one night and one day to discourage roosting microbats from returning. If roofing material is gradually removed over several days, this procedure is to be carried out after the removal is complete. All openings should be kept clear of any debris and other potential obstructions so as to allow microbats to leave freely. The roosting sites should be checked by an ecologist after being left exposed to confirm that microbats have not returned to roost.

If any microbats are sighted during demolition works, works should cease and microbats, if active, should be allowed to move freely to safety. In the event that microbats are in torpor, the ecologist should safely remove microbats from the building for relocation. Any microbats present are not to be handled or moved in the absence of the ecologist. All handling and relocation procedures for bats should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016).

## *ii. Birds*

Nests of Swallows (*Hirundo* species) have been observed in properties adjacent to the subject site. Although no nests were detected within structures in the subject site, there is a potential for these species to construct nests within the residence or sheds. Therefore it is recommended that pre-clearance surveys are conducted in within one week of the proposed demolition of the sheds to confirm the presence of any nests. Any requisite clearing supervision and fauna handling should be in accordance with the Fauna Action Plan prepared by Cumberland Ecology (16020RP1, dated 2 June 2016). The pre-clearance surveys for birds can be conducted during the roof removal stages for bats.



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*Appendix B*

## Biobank Site Dams: Designated Work Zones and Access Tracks

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**Legend**

- Biobank Site
- Remnant native vegetation to be demarcated
- Potential access tracks to dam
- Work zones for dam sediment deposition

Image Source:  
Image © 2016 Google  
(dated 16-10-2015)

cumberland  
ecology

Figure 4.1. Access tracks and work zones within the Boundary Road Biobank Site





**Legend**

- Biobank Site
- Remnant native vegetation to be demarcated
- Potential access tracks to dam
- Work zones for dam sediment deposition

Image Source:  
Image © 2016 Google  
(dated 16-10-2015)



**Figure 4.2. Access tracks and work zones within the Maguires Road Biobank Site**





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*Appendix C*

## Biobank Site Monitoring Photographs

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**Photograph C.1 PP1 – June 2017. Eastern aspect**



**Photograph C.2 PP1 – March 2018. Eastern aspect**





**Photograph C.3 PP2 – June 2017. Eastern aspect**



**Photograph C.4 PP2 – March 2018. Eastern aspect**





**Photograph C.5 PP3 – June 2017. Northern aspect**



**Photograph C.6 PP3 – March 2018. Northern aspect**





**Photograph C.7 PP4 – June 2017. Southern aspect**



**Photograph C.8 PP4 – March 2018. Southern aspect**





**Photograph C.9 PP5 – June 2017. Western aspect**



**Photograph C.10 PP5 – March 2018. Western aspect**





**Photograph C.11**      **PP6 – June 2017. Eastern aspect**



**Photograph C.12**      **PP6 – March 2018. Eastern aspect**





**Photograph C.13**      **PP7 – June 2017. Northern aspect**



**Photograph C.14**      **PP7 – March 2018. Northern aspect**





**Photograph C.15**      **PP8 – June 2017. Southern aspect**



**Photograph C.16**      **PP8 – March 2018. Southern aspect**



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*Appendix D*

## Biobank Site Monitoring Data

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**Table D.1 Biobank Site Monitoring: Native Vegetation Cover**

		June 2017							December 2017							March 2018						
	% Cover	0m	10m	20m	30m	40m	50m	Mean cover	0m	10m	20m	30m	40m	50m	Mean cover	0m	10m	20m	30m	40m	50m	Mean cover
Transect 1 (Maguires Road BB site)	Canopy	30	30	5	5	35	0	<b>17.5</b>	30	25	10	5	35	0	<b>17.5</b>	35	25	5	5	35	0	<b>17.5</b>
	Midstorey	0	0	0	0	5	0	<b>0.8</b>	0	0	0	0	5	0	<b>0.8</b>	0	0	0	0	0	0	<b>0.0</b>
	Groundcover	90	95	95	90	90	85	<b>90.8</b>	90	90	90	90	95	85	<b>90.0</b>	90	85	90	90	95	85	<b>89.2</b>
Transect 2 (Maguires Road BB site)	Canopy	40	35	20	20	40	50	<b>34.2</b>	40	30	30	20	35	50	<b>34.2</b>	35	30	35	25	35	45	<b>34.2</b>
	Midstorey	0	0	0	0	0	5	<b>0.8</b>	0	0	0	0	0	0	<b>0.0</b>	0	0	0	0	0	0	<b>0.0</b>
	Groundcover	90	90	70	85	85	95	<b>85.8</b>	90	90	75	85	90	95	<b>87.5</b>	95	90	80	85	90	95	<b>89.2</b>
Transect 3 (Boundary Road BB site)	Canopy	0	0	5	20	25	15	<b>10.8</b>	0	0	5	25	25	10	<b>10.8</b>	0	0	5	25	30	10	<b>11.7</b>
	Midstorey	0	0	0	5	0	0	<b>0.8</b>	0	5	2	0	0	0	<b>1.2</b>	0	5	5	0	0	0	<b>1.7</b>
	Groundcover	15	90	70	30	70	95	<b>61.7</b>	0	95	90	15	70	95	<b>60.8</b>	0	95	90	15	70	95	<b>60.8</b>
Transect 4 (Boundary Road BB site)	Canopy	0	0	20	40	30	60	<b>25.0</b>	0	0	20	45	30	55	<b>25.0</b>	0	0	25	45	30	50	<b>25.0</b>
	Midstorey	0	0	0	5	0	5	<b>1.7</b>	0	0	0	5	0	5	<b>1.7</b>	0	0	0	5	0	5	<b>1.7</b>
	Groundcover	80	95	90	60	70	75	<b>78.3</b>	80	90	95	50	75	70	<b>76.7</b>	85	90	95	55	70	70	<b>77.5</b>

**Table D.2 Biobank Site Monitoring: Weed Species and Cover**

		June 2017							December 2017							March 2018						
	% Cover	0m	10m	20m	30m	40m	50m	Mean cover	0m	10m	20m	30m	40m	50m	Mean cover	0m	10m	20m	30m	40m	50m	Mean cover
Transect 1 (Maguires Road BB site)	Weed cover	15	30	60	10	70	50	39.2	15	35	60	15	40	50	35.83	10	35	55	15	45	45	34.16
	Common weed species across transect	<i>Cenchrus clandestinus</i> ; <i>Cerastium glomeratum</i> ; <i>Eragrostis curvula</i> ; <i>Lysimachia arvensis</i> ; <i>Oxalis pes-caprae</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i> ; <i>Solanum nigrum</i> ; <i>Solanum pseudocapsicum</i> ; <i>Sonchus oleraceus</i>							<i>Bromus catharticus</i> ; <i>Cenchrus clandestinus</i> ; <i>Eragrostis curvula</i> ; <i>Lysimachia arvensis</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i> ; <i>Solanum nigrum</i> ; <i>Solanum sisymbriifolium</i>							<i>Bromus catharticus</i> ; <i>Cenchrus clandestinus</i> ; <i>Eragrostis curvula</i> ; <i>Lysimachia arvensis</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i> ; <i>Solanum nigrum</i> ; <i>Solanum sisymbriifolium</i>						
Transect 2 (Maguires Road BB site)	Weed cover	45	45	80	30	85	95	63.3	35	50	85	40	90	95	65.83	30	45	90	35	90	95	64.2
	Common weed species across transect	<i>Bidens pilosa</i> ; <i>Cenchrus clandestinus</i> ; <i>Hypochaeris radicata</i> ; <i>Lysimachia arvensis</i> ; <i>Oxalis pes-caprae</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i>							<i>Bidens pilosa</i> ; <i>Cenchrus clandestinus</i> ; <i>Hypochaeris radicata</i> ; <i>Lysimachia arvensis</i> ; <i>Oxalis pes-caprae</i> ; <i>Sida rhombifolia</i> ; <i>Vulpia bromoides</i>							<i>Bidens pilosa</i> ; <i>Cenchrus clandestinus</i> ; <i>Hypochaeris radicata</i> ; <i>Lysimachia arvensis</i> ; <i>Oxalis pes-caprae</i> ; <i>Sida rhombifolia</i> ; <i>Vulpia bromoides</i>						
Transect 3 (Boundary Road BB site)	Weed cover	85	85	20	2	40	75	51.2	0	50	15	10	80	80	39.16	0	40	20	10	85	80	39.2
	Common weed species across transect	<i>Cenchrus clandestinus</i> ; <i>Cerastium glomeratum</i> ; <i>Conyza bonariensis</i> ; <i>Eragrostis curvula</i> ; <i>Hypochaeris radicata</i> ; <i>Lysimachia arvensis</i> ; <i>Oxalis pes-caprae</i> ; <i>Paspalum dilatatum</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i>							<i>Cenchrus clandestinus</i> ; <i>Conyza sumatrensis</i> ; <i>Eragrostis curvula</i> ; <i>Hypochaeris radicata</i> ; <i>Plantago lanceolata</i> ; <i>Paspalum dilatatum</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i> ; <i>Verbena officinalis</i>							<i>Cenchrus clandestinus</i> ; <i>Conyza sumatrensis</i> ; <i>Eragrostis curvula</i> ; <i>Hypochaeris radicata</i> ; <i>Plantago lanceolata</i> ; <i>Paspalum dilatatum</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i> ; <i>Verbena officinalis</i>						



**Table D.2 Biobank Site Monitoring: Weed Species and Cover**

		June 2017							December 2017							March 2018						
Transect 4 (Boundary Road BB site)	Weed cover	40	10	70	20	80	10	<b>38.3</b>	35	15	70	15	85	10	<b>38.33</b>	30	15	65	20	80	15	<b>37.5</b>
	Common weed species across transect	<i>Bidens pilosa</i> ; <i>Cenchrus clandestinus</i> ; <i>Hypochaeris radicata</i> ; <i>Lysimachia arvensis</i> ; <i>Oxalis pes-caprae</i> ; <i>Paspalum dilatatum</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i>							<i>Araujia sericifera</i> ; <i>Bidens pilosa</i> ; <i>Cenchrus clandestinus</i> ; <i>Paspalum dilatatum</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i>							<i>Araujia sericifera</i> ; <i>Bidens pilosa</i> ; <i>Cenchrus clandestinus</i> ; <i>Paspalum dilatatum</i> ; <i>Setaria parviflora</i> ; <i>Sida rhombifolia</i>						

**Table D.3 Biobank Monitoring: Percentage Cover of WoNS (*Senecio madagascariensis*)**

	June 2017												December 2017												March 2018											
	0	5	10	15	20	25	30	35	40	45	50	Mean cover	0	5	10	15	20	25	30	35	40	45	50	Mean cover	0	5	10	15	20	25	30	35	40	45	50	Mean cover
Transect 1 (Maguires Road BB site)	2	2	5	15	20	20	10	0	5	0	2	7.4	0	0	5	5	20	20	5	5	5	0	5	6.4	0	0	2	5	15	20	5	3	5	2	5	5.6
Transect 2 (Maguires Road BB site)	5	5	2	0	5	0	2	0	20	5	0	4.0	5	5	5	5	5	0	5	5	10	15	0	5.5	2	5	3	5	5	0	5	5	10	10	0	4.5
Transect 3 (Boundary Road BB site)	2	5	1	0	0	0	2	0	5	1	5	1.9	0	2	1	2	0	0	0	0	5	0	0	0.9	0	3	0	2	0	1	0	0	5	0	0	1.0
Transect 4	0	1	2	1	2	5	0	1	5	2	0	1.7	0	0	5	2	0	0	0	2	1	0	0	0.9	0	0	1	0	0	0	0	2	0	0	0	0.3

**Table D.3      Biobank Monitoring: Percentage Cover of WoNS (*Senecio madagascariensis*)**

	June 2017										December 2017										March 2018									
(Boundary Road BB site)																														