# Western Sydney Airport

## Biodiversity
## Construction Environmental Management Plan

December 2018

Western Sydney Airport

# Document Control

| File Name | Document Name | Revision |
|---|---|---|
| WSA00-BECHTEL-00400-EN-PLN-000003 | Biodiversity CEMP | 1 |

## Revision History

| Revision | Date | Description | Author | Reviewer |
|---|---|---|---|---|
| 0 | 24/09/2018 | Approved | | |
| 0.1 | 09/11/2018 | Draft updated with additional scope | WSA Co | S Reynolds |
| 0.2 | 23/11/2018 | Draft updated to address comments on inclusion of new scope (Visitor centre, Site Accommodation and Material Importation) | WSA Co | S Reynolds |
| 0.3 | 07/11/2018 | For approval | WSA Co | S Reynolds |
| 1 | 14/12/2018 | Revision update to include Visitor Centre Site and Site Accommodation phase and Material Importation phase | WSA Co | S Reynolds |

## Plan Authorisation

| Position | Name | Signature | Date |
|---|---|---|---|
| Environment Manager | S Reynolds | | 07/12/2018 |

## Glossary and Definitions

| Item | Definition |
|---|---|
| **The Act** | *Airports Act 1996* (Cth) (Airports Act) |
| **AEPR** | *Airports (Environment Protection) Regulations 1997* |
| **Airport** | The airport located at the Airport Site. Note: the Airport is referred to in the Act as Sydney West Airport and also commonly known as Western Sydney Airport |
| **Airport Lease** | An airport lease for the Airport granted under section 13 of the Act |
| **Airport Lessee Company** | The company that is granted a lease over the Airport Site |
| **Airport Plan** | Means the airport plan for the Airport Site as determined by the Infrastructure Minister under section 96B of the Airports Act in December 2016 as varied from time to time in accordance with the Airports Act. |
| **Airport Site** | The site for Sydney West Airport as defined by the Airports Act. |
| **Ancillary Developments** | An 'ancillary development' as set out in section 96L of the Act |
| **BoM** | Bureau of Meteorology |
| **CEMP** | Construction Environmental Management Plan |
| **Conditions** | A condition set out in Part 3 of the Airport Plan in accordance with section 96C of the Act |
| **Construction Impact Zone** | The part or parts of the Airport Site or an Associated Site on which Main Construction Works are planned to occur, as detailed in the Construction Plan approved in accordance with Condition 1. |
| **CSEP** | Community and Stakeholder Engagement Plan |
| **DoEE** | Australian Government Department of the Environment and Energy |
| **DPI** | Department of Primary Industries (including Agriculture NSW, Fisheries NSW and NSW Office of Water) |
| **Ecological sustainable development** | Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life now and in the future, can be increased (Council of Australian Governments, 1992). |
| **EEW** | The Phase of the Stage 1 Development that involves early earthworks as described in section 6 of the Construction Plan |
| **Environment Minister** | The Minister responsible for the EPBC Act |
| **Environmental Impact Statement** | The environmental impact statement prepared in relation to the Airport under the EPBC Act |
| **EPA** | NSW Environment Protection Authority |
| **EPBC Act** | *Environment Protection and Biodiversity Conservation Act 1999* (Cth) |
| **EP&A Act** | *Environmental Planning and Assessment Act 1979* (NSW) |
| **EPBC Act** | *Environment Protection and Biodiversity Conservation Act 1999* (Cth) |
| **ESA** | Environmentally Sensitive Area |
| **EWMS** | Environmental Work Method Statement |

| Item | Definition |
|---|---|
| **Infrastructure Department** | The department responsible for administering the Airports Act, currently the Australian Government Department of Infrastructure, Regional Development and Cities. |
| **ISO 14001** | AS/NZS ISO 14001:2015 |
| **LDP** | Land Disturbance Permit |
| **Main Construction Works** | Substantial physical works on a particular part of the Airport Site (including large scale vegetation clearance, bulk earthworks and the carrying out of other physical works, and the erection of buildings and structures) described in Part 3 of the Airport Plan, other than TransGrid Relocation Works or Preparatory Activities. |
| **Non-conformance** | Failure to conform to the requirements of the SEMF or supporting documentation. |
| **OEH** | Office of Environment and Heritage (NSW) |
| **Preparatory Activities** | Preparatory Activities mean the following:<br>a. day to day site and property management activities;<br>b. site investigations, surveys (including dilapidation surveys), monitoring, and related works (e.g. geotechnical or other investigative drilling, excavation, or salvage);<br>c. establishing construction work sites, site offices, plant and equipment, and related site mobilisation activities (including access points, access tracks and other minor access works, and safety and security measures such as fencing but excluding bulk earthworks);<br>d. enabling preparatory activities such as:<br>i. demolition or relocation of existing structures (including buildings, services, utilities and roads);<br>ii. the disinterment of human remains located in grave sites identified in the European and other heritage technical report in volume 4 of the EIS; and<br>e. any other activities which an Approver determines are Preparatory Activities for this definition |
| **Project, the** | Western Sydney Airport – Stage 1 development |
| **Stage 1 Development** | The Developments described in Part 3 of the Airport Plan |
| **SEMF** | Site Environmental Management Framework |
| **SES Officer** | An SES employee under the *Public Service Act 1999* (Cth) |
| **Sydney West Airport** | The Airport. Note: this is the name used in the Act. The Airport is also commonly known as Western Sydney Airport |
| **Western Sydney Airport (WSA)** | The Airport. Note: Under the Act the Airport is referred to as Sydney West Airport |

## Acronyms and abbreviations

| Item | Definition |
|---|---|
| **The Act** | *Airports Act 1996* (Cth) (Airports Act) |
| **AEPR** | Airports (Environment Protection) Regulations 1997 |
| **ALC** | Airport Lessee Company |
| **ALER** | Airfield lighting equipment room |
| **ARFFS** | Aviation Rescue and Firefighting Services |
| **ATC** | Air traffic control |
| **ATCT** | Air traffic control tower |
| **CASA** | Civil Aviation Safety Authority |
| **CASR** | Civil Aviation Safety Regulations 1998 |
| **CO** | Carbon monoxide |
| **CEMP** | Construction Environmental Management Plan |
| **DIPNR** | NSW Department of Infrastructure, Planning and Natural Resources (now Department of Planning and Environment) |
| **ECZ** | Environmental Conservation Zone |
| **EIS** | Environmental Impact Statement |
| **EPA** | NSW Environmental Protection Authority |
| **GSE** | Ground support equipment |
| **ha** | Hectares |
| **HIAL** | High intensity approach lighting |
| **ISO 14001** | AS/NZS ISO 14001:2015 – Environmental Management Systems |
| **km** | Kilometres |
| **m, $m^2$ and $m^3$** | Metres, square metres and cubic metres |
| **ML and ML/d** | Megalitres and megalitres per day |
| **OEH** | NSW Office of Environment and Heritage |
| **POEO Act** | *Protection of the Environment Operations Act 1997* (NSW) |
| **RMS** | NSW Roads and Maritime Services |
| **SES** | Senior Executive Service |
| **SEMF** | Site Environmental Management Framework |

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# 1 Introduction

## 1.1 Background

In April 2014 the Australian Government announced that the Commonwealth-owned land at Badgerys Creek will be the site for a second Sydney Airport. The Badgerys Creek Airport Site was selected following extensive studies completed over a number of decades.

In December 2016 pursuant to the Airports Act, the Minister for Urban Infrastructure determined the Airport Plan which sets the environmental and planning authorisation for the development of Stage 1 of the Western Sydney Airport.

Part 3 of the Airport Plan outlines the conditions for the design, construction and operation of the Stage 1 development of the airport that must be complied with, regardless of who is delivering the works. These include strict environmental standards and implementation of mitigation measures identified in the Environmental Impact Statement (EIS).

The EIS was prepared in accordance with the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and t was finalised under the EPBC Act in September 2016, following a public exhibition period during which almost 5,000 submissions were received. The EIS considered potential impacts during construction and operation of the Stage 1 and long-term development of the proposed airport. In determining the Airport Plan, the Minister for Urban Infrastructure accepted environmental conditions proposed by the Environment Minister, taking into account the EIS.

In May 2017, the Government announced that it would establish WSA Co to develop and operate the airport. WSA Co is responsible for constructing and operating Western Sydney Airport in accordance with the Airport Plan.

The Western Sydney Airport is expected to be developed in stages to match demand and include planning for services and amenities that are easily expandable over time, providing scalable capacity for aircraft, passengers, cargo and vehicle movements.

Stage 1 will include major site preparation, removing or relocating infrastructure from the site and earthworks to prepare the Airport Site, establishing the Airport with a single 3,700 metre runway located in the north-western portion of the Airport Site, a terminal and other support facilities to provide an operational anticipated capacity of approximately 10 million regional, domestic and international passengers per year, as well as freight traffic (the Stage 1 development).

The scope of works for the Stage 1 Development is defined in the Airport Plan and will generally include the investigation, design, construction and commissioning of:

- Bulk earthworks to move and redistribute approximately 24 million cubic metres of material on the Airport Site;
- A single 3.7-kilometre runway;
- Aprons, taxiways and other airside pavements;
- A multi-user terminal;
- Appropriate airport and aviation support facilities;
- Drainage and utilities infrastructure; and
- Car parking, on-site roads and other appropriate landside facilities.

Further details with regards to site activities specific to this Biodiversity CEMP are provided in Section 2.4.

## 1.2 Document context and scope

This WSA Co Biodiversity Construction Environmental Management Plan (Biodiversity CEMP) (this Plan) has been prepared to satisfy the requirements of the Biodiversity CEMP set out in the Conditions for the Stage 1 development of the Western Sydney Airport detailed in Section 3.10.2 of the Airport Plan. Specifically, Section 3.10.2 Condition 7(1) of the Airport Plan requires that a Biodiversity CEMP be approved under the Airport Plan prior to the commencement of Main Construction Works.

This Biodiversity CEMP provides the overarching management approach and requirements (including environmental mitigation measures, controls, monitoring and reporting) for management of flora and fauna during construction of the Stage 1 development. This Plan forms one of nine CEMPs which are collectively covered by the WSA Co Site Environmental Management Framework (SEMF). To ensure the environmental resources, responsibilities and management measures are implemented during the construction activities, the SEMF is contained within the Construction Plan (included as Appendix 2). The implementation of the Construction Plan, including the SEMF, sits adjacent to other Project level management plans including the Community and Stakeholder Engagement Plan and the Sustainability Plan as illustrated in Figure 1.The Construction Plan, including the SEMF, and nine CEMPs provide the overall environmental management approach and requirements and therefore should not be read in isolation to each other due to interconnecting management outcomes and objectives. Specifically, for the Biodiversity CEMP, it is considered that the following management plan linkages can be made:

- Noise and Vibration CEMP – Management of potential noise impacts on fauna is facilitated through this CEMP.
- Soil and Water CEMP – Management of soil and water on-site will be important in preventing indirect impacts on flora and fauna.
- Waste and Resources CEMP – Management of waste and resources will also be important in minimising indirect impacts of flora and fauna.
- Community and Stakeholder Engagement Plan – The surrounding community and stakeholders are highly engaged and involved in the management of flora and fauna impacts on-site and in adjacent areas.
- Sustainability Plan (once approved) – Management of biodiversity is relevant with regard to general health, wellbeing, and quality of life for surrounding communities.
- Aboriginal Cultural Heritage CEMP – management of the known and predicted Aboriginal Cultural Heritage sites within the environmental conservation zone shown in the Land Use Plan (EC1) will be addressed through measures to protect and manage the areas in the EC1.

Where relevant, linkages to other CEMPs and management objectives have been included in the risk assessment and the environmental control measures (Section 7).

As discussed in Section 1.4, this plan forms part of WSA Co's integrated environmental management system and will be implemented in conjunction with all other management plans including the SEMF, the Construction Plan and other CEMP documents. While these plans have been produced as separate documents their operational controls will be implemented on-site in a consolidated manner via area and activity specific Environmental Control Maps and/or Environmental Work Method Statements. All relevant mitigation measures from each separate CEMP will be combined within these documents to instruct implementation on site.

Table 1 highlights relationships and linkages of this Biodiversity CEMP with other CEMPs within the environmental management framework, including key cross-referencing to Airport Plan and EIS requirements.

**Table 1 Biodiversity CEMP relationship with other CEMP documentation**

| CEMP or plan | Airport Plan Condition (3.10.2) | EIS Chapter 28 Table: Management area | EIS Chapter 28 Table: Mitigation measures |
|---|---|---|---|
| Aboriginal Cultural Heritage | 11 | 28-12 | 28-13 |
| Air Quality | 10 | 28-10 | 28-11 |
| **Biodiversity (this plan)** | 7 | 28-04 | 28-05 |
| Community and Stakeholder Engagement Plan | 15 | 28-20 | 28-21 |
| European and other Heritage | 12 | 28-14 | 28-15 |
| Noise and Vibration | 6 | 28-02 | 28-03 |
| Soil and Water | 8 | 28-06 | 28-07 |
| Sustainability Plan | 29 | 28-37 | 28-38 |
| Traffic and Access | 9 | 28-08 | 28-09 |
| Visual and Landscape | 14 | 28-18 | 28-19 |
| Waste and Resources | 13 | 28-16 | 28-17 |

| Key |
|---|
| Moderate to high relevance to this CEMP |
| Some relevance to this CEMP |

The review and document control process for this plan are described further in Section 9 of the SEMF.

The context of this plan in relation to the WSA Co environmental management system is presented in Figure 1.

## 1.3 Document purpose

The purpose of this Plan is to provide the foundation for the management of biodiversity impacts in accordance with best practice and legal requirements (including environmental mitigation measures, controls, monitoring and reporting) during the construction phase of the Stage 1 development based on the assessment undertaken as part of the EIS.

This Plan details the biodiversity management requirements that must be satisfied in order to demonstrate compliance with the Condition 7 of Section 3.10.2 of the Airport Plan for the construction of the Stage 1 development of the Western Sydney Airport.

Legal and other requirements are identified and maintained in a register within the SEMF (refer SEMF Appendix C). Mitigation measures (specific to biodiversity required to satisfy these requirements are derived from the EIS and through risk assessment processes (refer Section 6.3) and included within this CEMP refer to Section 7).

Implementation of these measures is ensured through monitoring, training and competence, inspection, audit and reporting actions detailed in Sections 10 and 11, with the responsibilities for implementation identified in Section 9. Continual improvement processes in relation to compliance with regulatory requirements are detailed in Section 14.

In summary, this plan sets out to achieve the following:

- Provision of details for the management and mitigation measures to be implemented, including timing and responsibilities;
- Ensuring the commitments of the Conditions of Approval (as set out in the Airport Plan) and regulatory requirements are met and satisfied by both WSA Co and contractors;
- Provision of process for monitoring implementation, reporting, and auditing of traffic and access related management and compliance related issues;
- Commitment to meeting the requirements of ISO 14001 including the need for continual improvement;
- Provision of a process to be implemented for the management of complaints, for stakeholder engagement, and for the management of emerging environmental issues as they arise; and
- Provision of a system including procedures, plans and documentation for implementation by WSA Co personnel and contractors to enable Project completion in accordance with the environmental requirements.

Effective implementation of this plan will assist WSA Co and relevant contractors to achieve compliance with necessary environmental regulatory and policy requirements in a systematic manner with an outcome of continual environmental management performance.

## 1.4 WSA Co environmental management system overview

WSA Co. operates in general accordance with AS/NZS ISO 14001 – Environmental management systems. A copy of the WSA Co environmental policy is provided in Appendix E of the SEMF.

The Stage 1 development will be undertaken in accordance with the Construction Plan including the SEMF and the associated CEMPs (including this Plan).

The SEMF forms an appendix to the Construction Plan and is the overarching environmental plan for the implementation of the nine CEMPs. It provides a structured and systematic approach to environmental management and provides an expectation and guidance with regards to environmental management for the overall construction of the Stage 1 Development.

The structure of the environmental management system for the Project is shown in Figure 1.

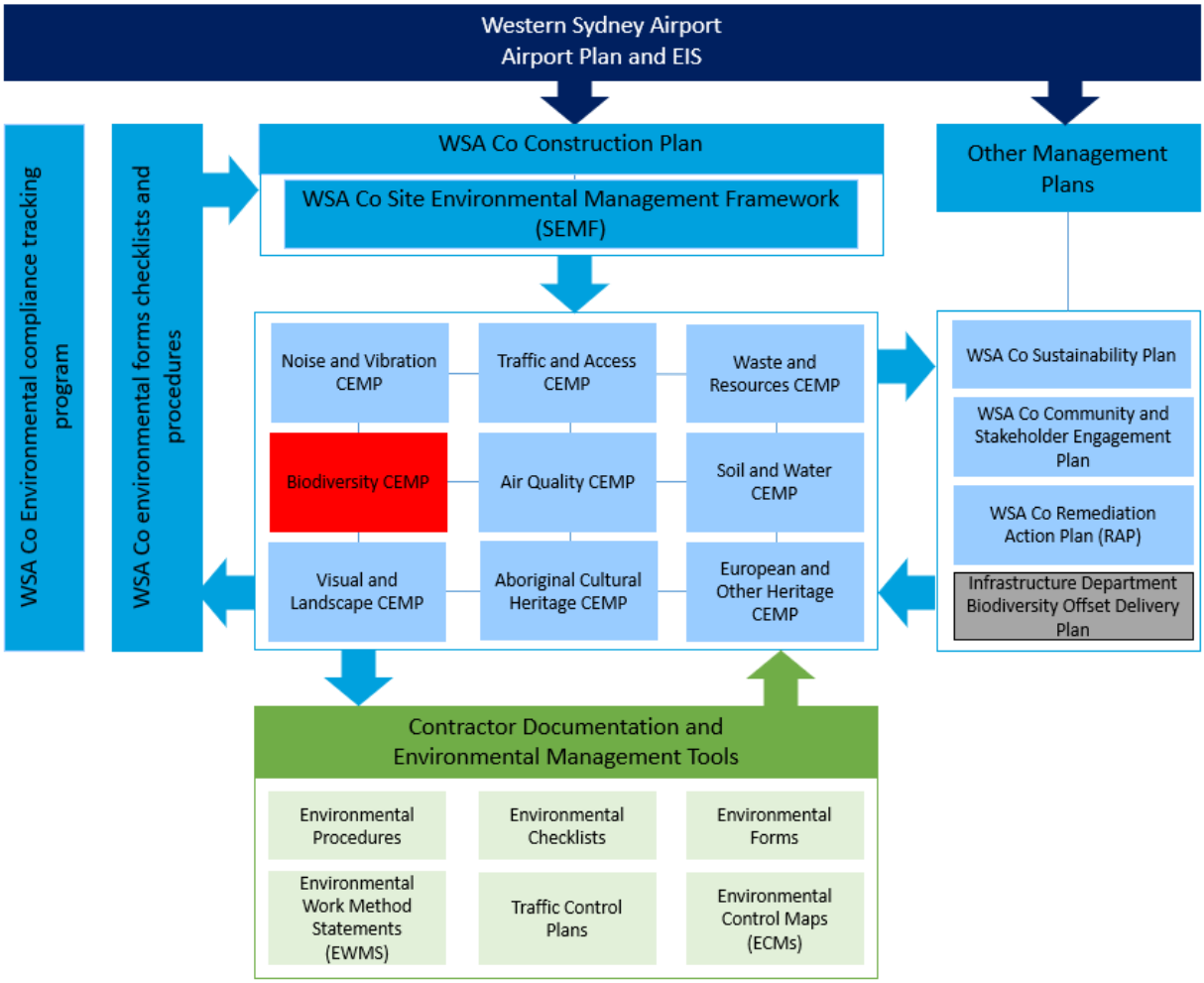



**Figure 1 WSA Co Environmental Management System and CEMP context**

## 1.5 Consultation requirements of this plan

Airport Plan Condition 35 outlines the consultation requirements during the preparation of this CEMP and requires consultation with any NSW Government agencies as specified by the NSW Department of Premier and Cabinet and consultation with the Environment Department and OEH for specific CEMPs. NSW Government agencies specified by Department of Premier and Cabinet for consultation for this Biodiversity CEMP, including the OEH. Further, Airport Plan Condition 7(3) requires that this Biodiversity CEMP take into account Table 28-4 of the EIS which states the CEMP should also be prepared in consultation with the DoEE and the OEH.

A summary of the consultation completed to date which has informed the preparation of the Biodiversity CEMP is provided in Table 2. Details of consultation is included in Appendix A.

Consultation will continue with agencies, councils, and other relevant stakeholders throughout the Project where there is a change to a CEMP. The outcomes of this consultation will be documented in subsequent revisions of the relevant CEMPs, with details of such consultation included in the applicable document.

To satisfy the above requirement this CEMP (Revision 0) has been provided to the relevant stakeholders for feedback. Details of the Visitor Centre and Site Accommodation phase and Material Importation phase was described in the correspondence to provide context to the stakeholders on the level of impact that would result from the change. In addition, stakeholders were invited to attend a workshop on 13 November 2018 where an overview of the Visitor Centre and Site Accommodation phase and Material Importation phase was presented

and feedback requested. A summary of the consultation is provided in Table 2 and details included in Appendix A.

**Table 2 Biodiversity CEMP consultation summary**

| Government authority / stakeholder | Date | Summary |
|---|---|---|
| **Consultation prior to Rev 0 approval** | | |
| Commonwealth Department of Environment and Energy (DoEE) | 27 July 2018 | A summary of the consultation completed to date which has informed the preparation of the Biodiversity CEMP is provided in Table 2. Details of consultation is included in Appendix A.<br>We appreciate the opportunity to provide input into the development of the CEMPs. We are broadly comfortable with what is proposed and reiterate the need to ensure consistency with requirements of relevant conditions of the Airport Plan, particularly those related to protection and management of matters protected under the EPBC Act and the management of PFOS and PFAS. |
| NSW Office of Environment and Heritage (OEH) | 27 July 2018 | A summary of response received is provided below, with further detail, including a copy of the correspondence and WSA Co response to comments, is provided in Appendix A.<br>*Table 1 – Biodiversity CEMP - Decommissioning Dams - dewatering of farm dams needs to be staged and the dormancy of fauna such as turtles considered.*<br>*Table 2 – Biodiversity CEMP - Include Recovering Bushland on the Cumberland Plain (DEC 2005) as a guideline.*<br>*Table 2 - Aboriginal Cultural Heritage CEMP – Remove reference to the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW NSW). This Code relates to a legal defence under the National Parks and Wildlife Act and has no relevance to this Project.*<br>*Remove reference to A proposed new legal framework: Aboriginal cultural heritage in NSW OEH. This document was for consultation purposes for ACH reforms. It is relevant to this project.*<br>*Remove reference to Aboriginal Cultural Heritage Bill 2018 (NSW). As a Bill it has no legislative status unlike the National Parks and Wildlife Act.*<br>*Table 3 CEMP Targets – Question: If these are targets, how it is proposed to measure success in achieving the targets? What actions are proposed if the targets are not being met?*<br>*Biodiversity CEMP*<br>*Avoiding and minimise disturbance to terrestrial and aquatic flora and fauna in the Environmental Conservation Zone during construction;*<br>*Avoiding and minimising adverse effects on terrestrial fauna by construction activities*<br>*Question: What is the difference between "disturbance" and "adverse effects"?* |
| NSW Rural Fire Service | Ongoing | Consultation with the NSW Rural Fire Service will be undertaken throughout the life of the project |
| | Ongoing | The Infrastructure Department consulted with the Australian Botanic Gardens at Mt Annan regarding the translocation of threatened flora species. |
| **Consultation prior to Rev 1 approval** | | |
| Commonwealth Department of | Nov 2018 | No response received regarding the revision of the CEMP for the Visitor Centre and Site Accommodation phase and Material Importation phase. |

| Government authority / stakeholder | Date | Summary |
|---|---|---|
| Environment and Energy (DoEE) | | |
| NSW Office of Environment and Heritage (OEH) | Nov 2018 | Summary of the OEH response comments included the following key issues (addressed in further detail in Appendix A):<br>• Reference to the Cumberland Plains Recovery Plan (OEH 2011)<br>• Ongoing management of Threatened Ecological Communities<br>• On site pre-clearing and clearing protocols<br>• Erosion and sedimentation management<br>• Vegetation restoration / rehabilitation management<br>• Stockpile management<br>• Soil hygiene protocols |
| NSW Rural Fire Service | Nov 2018 | Comments received primarily with regards to the provision of up to date data regarding access and egress locations. In addition, the RFS requested that clear signage displaying alphanumeric identifications be established at each of the gates, access / egress points.<br>Refer to Appendix A for further details. |
| Stakeholder information workshop | 13 November 2018 | Workshop held on 13 Nov 2018. Attendees presented with a summary of the proposed works. Topics included:<br>• Airport plan condition requirement for consultation<br>• Land-use plan<br>• Site location of works<br>• Visitor Centre and Site Accommodation scope, including images of the concept design<br>• Material importation, including location, distance to closest receiver and site access<br>No comments received at workshop.<br>**Invitees:**<br>Liverpool City Council<br>Western Area Health<br>Penrith City Council<br>NSW Department of Premier and Cabinet<br>Roads and Maritime Services<br>NSW Health<br>NSW Department of Education<br>NSW Aboriginal Affairs<br>NSW Department of Planning and Environment<br>Transport for NSW<br>**Attendees:**<br>NSW Aboriginal Affairs<br>Liverpool City Council<br>Western Area Health |

## 1.6 Certification and approval

This Biodiversity CEMP has been reviewed and approved for issue by the WSA Co Environment Manager prior to submission to Western Sydney Unit, Australian Government Department Infrastructure, Regional Development and Cities (Infrastructure Department.).

## 1.7 Distribution

All WSA Co personnel and contractors will have access to this Biodiversity CEMP via the Project document control management system. The Approved Plan must be published on WSA Co's website within one month of being approved and be available until the end of the Construction Period. An electronic copy can be found on the Project website - http://wsaco.com.au/Project/index.aspx

This document is uncontrolled when printed. One controlled hard copy will be maintained by the quality manager at the Project office.

# 2 Project details and scope of works

## 2.1 Project general features

The Project will be delivered through a packaging strategy with a wide variety of package sizes, risk profiles and contracting entities. Each package will have different levels of environmental risk and environmental obligations, depending on the scope of works, location of works and sensitivity of the receiving environment and relevant statutory requirements and obligations.

The Project is described in the Construction Plan. Stage 1 development of the Project comprises the following key features:

- Site preparation
- Airside precinct
- Terminal
- Utilities
- Ground transport
- Aviation support facilities
- Ancillary developments
- Other building activities

Further details of the overall Project construction activities, programming and methodologies are included in the Construction Plan. Further detail of the specific works as covered by this CEMP, is included in Section 2.4.

## 2.2 Project site location and layout

The Western Sydney Airport will be developed on around 1,800 hectares of Commonwealth-owned land at Badgerys Creek in Western Sydney (Airport Site). The Airport Site is approximately 50 kilometres from Sydney's central business district.

The Airport Site is bounded by Elizabeth Drive to the north, Willowdene Avenue to the south, Luddenham and Adams Road to the west and Badgerys Creek to the east. The existing terrain is made up of undulating topography, and substantial earthworks are required to create a level surface to allow construction of the runway, taxiways and support services. The Airport Site location is provided in Figure 2 and the Construction Impact Zone (CIZ) is provided in Figure 3.

An Environmental Conservation Zone (ECZ), referred to as EC1 in Figure 3 is located within the Airport Site, mostly to the south and south east along with a smaller portion to the west. This is a protected land use due to the occurrence of natural habitats and water flows, including Badgerys Creek. The ECZ also provides for an environmental preservation corridor which has a number of specific objectives and permissible uses in this land use zone as identified in the Airport Plan. Any construction work within the ECZ must be managed appropriately and is to be carried out only with prior approval from the WSA Co Environmental Manager.


**Figure 2 Western Sydney Airport Site location**

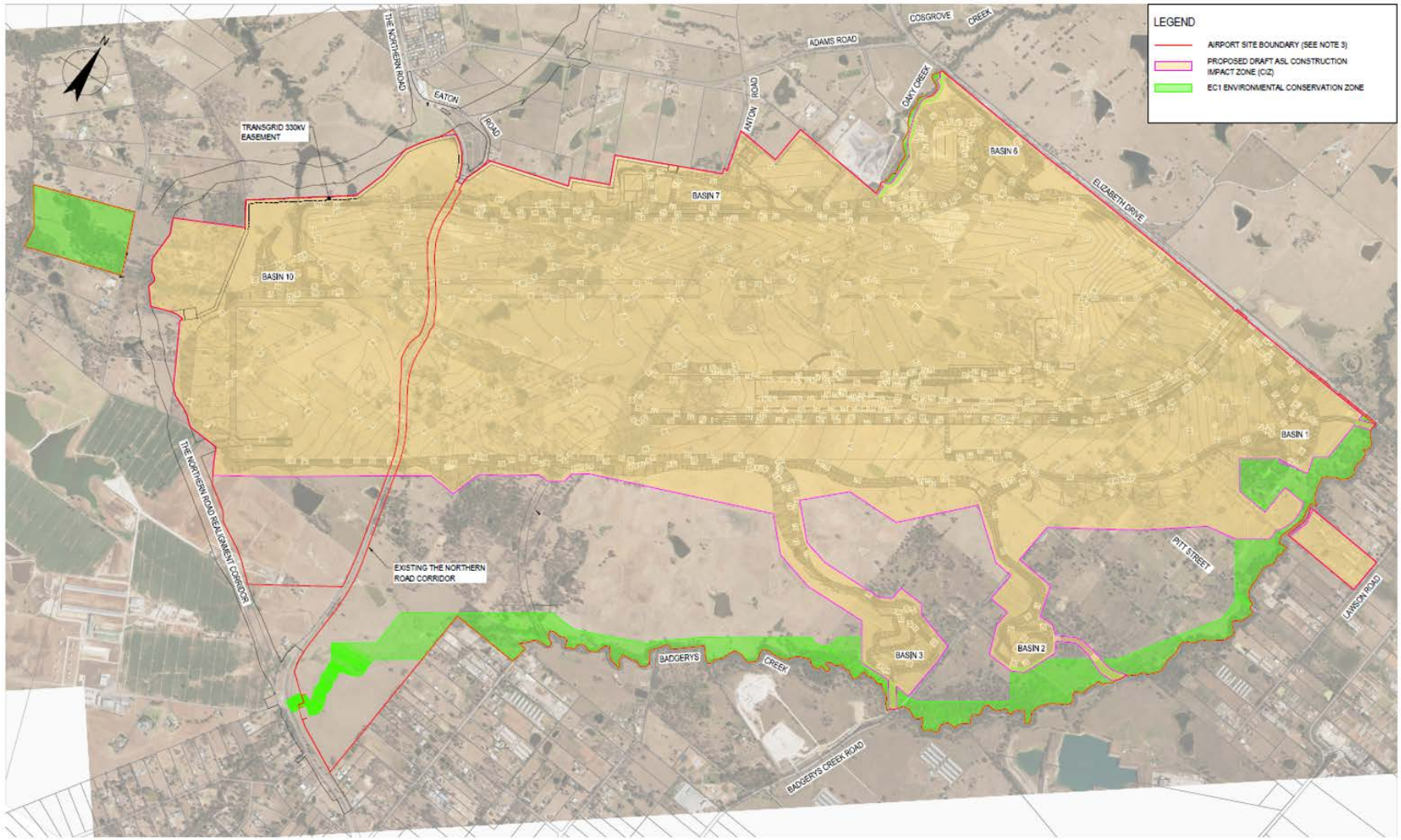



**Figure 3 Stage 1 Development Construction Impact Zone**

## 2.3 Project staging and environmental management approach

Section 2 of the Construction Plan provides an overview of the total Project activities to be undertaken. As permitted by Condition 1(5), the Construction Plan identifies that the Stage 1 Development will be undertaken in the following phases:

- Preparatory Activities
- Early Earthworks (EEW)
- Visitors Centre and Site Accommodation
- Material Importation
- Bulk Earthworks and Drainage (P1-A)
- Bulk Earthworks and Drainage (P1-B)
- Runway Pavement / Airside Civil (P1-C)
- Passenger Terminal Complex (P2)
- Landside Civil and Buildings (P3)

At the time of preparing this Biodiversity CEMP, the current work phases, and therefore the phases covered by this Biodiversity CEMP are included below in Table 3.

A variation to this CEMP will be submitted before work other than Preparatory Activities is undertaken on any other phases of the Project.

**Table 3 Works covered by this Biodiversity CEMP**

| Works covered | Reference |
|---|---|
| Preparatory Activities | Refer to section 2.4.1 |
| Early Earthworks | Refer to Section 2.4.2 |
| Visitor Centre and Site Accommodation | Refer to Section 2.4.3 |
| Material Importation | Refer to Section 2.4.4 |

As the Project develops, this table will be updated accordingly with further detail to be provided as required in the subsequent sections. Any preparatory activities will not be undertaken inconsistently with this CEMP.

Section 2 of the SEMF provides a general overview of the total Project activities to be undertaken, with further specific detail targeting the current works (as indicated in Table 3) provided below in Section 2.4.

## 2.4 Scope of works

### 2.4.1 Preparatory activities (general)

Preparatory activities will be ongoing across the Airport Site throughout the Stage 1 Development. The works will be managed in accordance with the Overarching Preparatory Activities Plan which is prepared by the relevant Contractor and approved by WSA Co Environment Manager. The activities must be consistent with the Airport Plan definition for Preparatory Activities, refer to SEMF Section 3.9. Refer to Table 4 for details of proposed activities and indicative timing.

If an Approver determines an activity is a Preparatory Activity for paragraph (e) of the definition of 'Preparatory Activities' as per the Airport Plan and requires that a plan be prepared and submitted, WSA Co will prepare the necessary plan for consideration and approval in accordance with Condition 5 (2) of the Airport Plan. Any Preparatory Activities must not be carried out inconsistently with the approved CEMPs.

**Table 4 Construction Staging – Preparatory Activities**

| Construction staging | Indicative Timing |
|---|---|
| Preparatory Activities | |
| • Spatial Survey<br>• Service Investigations<br>• Pre-condition Surveys<br>• Traffic Counting<br>• Biological Pre-Clearance Surveys<br>• Contamination Pre-Clearance Surveys<br>• Aboriginal and European Cultural Heritage Survey and Salvage Works including Topsoil Protocol implementation<br>• Site Security, including fencing<br>• Removal of redundant infrastructure including farm fences, power poles, footings/slabs and rubbish<br>• Site compound establishment and roundabout construction<br>• Remediation works including establishment of stockpiles<br>• Construction of temporary sediment basins and installation of erosion and sediment controls<br>• Other activities which an Approver determines are Preparatory Activities. | Aug 2018 – 2026 |

### 2.4.2 Early Earthworks package

A breakdown of EEW construction activities are outlined below and are consistent with the activities described in the Airport Plan. The WSA EEW site comprises of 120 ha of the overall site and is bounded by Elizabeth Drive to the north and Badgerys Creek to the east.

The EEW will involve:

- Topsoil Protocol implementation
- Management of contamination in the Early Earthworks area
- Earthworks in Early Earthworks area
- Construction of a section of the new realigned Badgerys Creek Road within the Site
- Construction of a new intersection at Elizabeth Drive; and
- Utility relocations.

In accordance with the Construction Plan Section 6, the early earthworks construction activities will be delivered in several stages. Table 5 outlines each stage and indicative timing for the proposed works and illustrated in Figure 4. This CEMP identifies the aspects and impacts for each key activity and required appropriate mitigation measures based on a risk assessment.

**Table 5 Construction Staging – Early Earthworks**

| Construction staging | Indicative Timing |
|---|---|
| Stage 1 | |

| Construction staging | Indicative Timing |
|---|---|
| Involves construction of permanent open drainage, swales and diversions into existing creeks and tributaries. This prevents clean water from outside the site, entering the construction site. Activities include:<br>• Excavate northern end of the bypass channel from the existing Badgerys Creek Road culvert to the existing creek outfall on the north east of the Bio Retention Pond 1;<br>• Construct a temporary channel crossing/culvert to suit the temporary side-track;<br>• Divert overland flows to the partially constructed bypass channel;<br>• Undertake cut to fill operation to develop import stockpile area west of Badgerys Creek road in parallel with stages 1-6;<br>• Demolition of existing house; and<br>• Implementation of the RAP | Sept 2018 – Jan 2019 |
| Stage 2 | |
| • Excavate Bio Retention Pond 1 for use as temporary erosion and sediment control. | Jan 2019 |
| Stage 3 | |
| Commencement of the cut to fill operation with a focus on getting the earthworks underlying Badgerys Creek Road completed. This enables the construction of new utilities routes, bridge construction and storm water drainage underneath Badgerys Creek road. Activities include:<br>• Earthworks cut and fill to construct Badgerys Creek Road from the south tie-in to the new bridge location as well as fill required for the temporary side-track;<br>• Construct a culvert beneath the temporary side-track to manage runoff from the main fill area;<br>• Earthworks will include the water bypass channel between Badgerys Creek Road and the new bridge;<br>• Drainage and roadworks to permanent and temporary alignments;<br>• Construct bridge over stormwater channel; and<br>• Endeavour Energy utility removal | Oct 2018 – April 2019 |
| Stage 4 | |
| Completion of drainage diversions and connections to the existing creek network will be undertaken after stabilisation of the new water channels and surrounding surface area to maintain water quality standards. | Nov 2018 – Dec 2018 |
| Stage 5 | |
| Completing the final portion of earthworks on the western side of Badgerys Creek Road and taking it across the road into the main fill. It is expected that Badgerys Creek Road re-alignment has reached the finishing works at this stage. Activities include:<br>• Complete Main earthworks;<br>• Complete south west leg of the bypass channel;<br>• Complete Badgerys Creek Road north of the bridge;<br>• Sydney water utility relocation and removal; and<br>• Telstra relocation and removal. | Nov 2018 – Sept 2019 |
| Stage 6 | |
| Following RMS approval of the Works Authorisation Deed (WAD), works inside the Elizabeth Drive road corridor can commence to construct the new intersection of Elizabeth Drive and Badgerys Creek Road. Activities include:<br>• Undertake Elizabeth Drive intersection works.<br>• Divert traffic onto the full Badgerys Creek Road alignment; | April 2019 – Dec 2019 |

| Construction staging | Indicative Timing |
|---|---|
| • Endeavour Energy Elizabeth drive works; and<br>• Elizabeth Drive Upgrade works | |

### 2.4.3 Visitor Centre and Site Accommodation

WSA Co will engage a Contractor to complete the enabling works prior to the construction of the visitor centre and office accommodation (refer to Table 6). The site for the visitor centre is located in the north west section of the site at the intersection of The Northern Road and Eaton Road Luddenham. Refer to Figure 4.

The scope of the activities proposed to be undertaken in accordance with this CEMP are outlined in Table 6 and are consistent with the activities described in the Airport Plan.

**Table 6 Construction staging – Visitor Centre and Site Accommodation**

| Construction staging | Indicative Timing |
|---|---|
| **Stage 1** | |
| **Site access and preparation works**<br>• Removal of redundant infrastructure including farm fences, power poles, footings/slabs and rubbish;<br>• Site compound establishment;<br>• Site Security;<br>• Construction of temporary sediment basins and installation of erosion and sediment controls; and<br>• Implementation of the RAP. | Nov 2018 – Dec 2018 |
| **Earthworks to level the site**<br>• Earthworks – Cut and Fill (carting and disposal off-site); and<br>• Site Grading and Benching. | Dec 2018 – Jan 2019 |
| **External roadworks*** (Eaton Road – North and South from VC Entrance)<br>• Earthworks – Cut and Fill (carting and disposal off-site);<br>• Road pavement installation;<br>• Permanent open drainage (swales formed as part of cut);<br>• Line marking;<br>• Utilities Diversion – relocation of existing light poles (4 each); and Signage – “No Right Turn” signs (2 each). | Dec 2018 – May 2019 |
| **Utilities* (Power, Water and Telecommunications)**<br>• Substation and connection to HV along The Northern Road;<br>• Connection of water to Sydney Water Main; and<br>• Conduit and pits for telecommunications lead-in cable. | Dec 2018 – May 2019 |
| **Stage 2** | |
| **Foundation Works and In-Ground Services**<br>• Slab on ground for the Visitor Centre; and<br>• Screw Piles for the Site Accommodation. | Jan 2019 – Feb 2019 |
| **Structure**<br>• VC structure shall be a combination of Laminated Veneer Lumber (LVL) columns and roof beams and Cross-Laminated Timber (CLT) ceiling panels solution; and<br>• SA - modular timber framed panels lined with plasterboard internally and cladding externally. | Feb 2019 – Mar 2019 |

| Construction staging | Indicative Timing |
|---|---|
| **Finished and Internal Services**<br>• Utilities – provision and coordination of connections to external utilities such as potable water, electrical and telecommunications;<br>• Services:<br>- Fire-water and wastewater treatment systems; and<br>- Heating, Ventilation, and Air-Conditioning (HVAC)<br>• ITS (Information Technology Services)<br>• Technical exhibition display and exhibition content<br>• Furniture, Fit-out and Equipment for both VC and SA buildings. | Feb 2019 – May 2019 |
| **Testing and Commissioning**<br>• Comprehensive and systematic testing and commissioning of all utilities (below and above ground), internal services and systems:<br>- Dry / Dead Testing<br>- Wet / Live Testing<br>• Integrated Testing & Commissioning | Mar 2019 to May 2019 |
| **Internal road, car parks and Landscaping**<br>• Landscaping;<br>• Security Swipes / Cameras<br>• Fencing / Gates to perimeter boundary and site interior;<br>• Roadworks and carparking, including line marking, road furniture, and site lighting; | Jan 2019 – Mar 2019 |

*Note: may require approval from NSW government agencies and utility providers.

### 2.4.4 Material importation

Material will be imported to the site from other Sydney infrastructure sites as contemplated by the EIS starting in April 2019, this will ensure that valuable Sydney sandstone will be re-used in pavement construction potentially saving millions of tonnes of quarry won materials while diverting material from landfill sites in the Sydney area. The approximate stockpile location is shown in Figure 2. Initially 1.0 Million tonnes of sandstone material will be imported with the bulk being imported from April 2019 through to December 2020. It is expected that the stockpiled material will be used during pavement construction starting in mid-2022 and completing by December 2023.

To make the most of opportunities to obtain suitable material generated from other major infrastructure projects in Sydney, import will need to occur both during standard hours and also outside standard construction hours. As such, the processes outlined in the Noise and Vibration CEMP and the Traffic and Access CEMP for the ongoing assessment and environmental management of these works will be applied prior to commencement.

**Table 7 Construction staging – Material importation**

| Construction staging | Indicative Timing |
|---|---|
| Material importation | |
| • Haulage of sub-base and capping material to site | April 2019 – December 2020 |

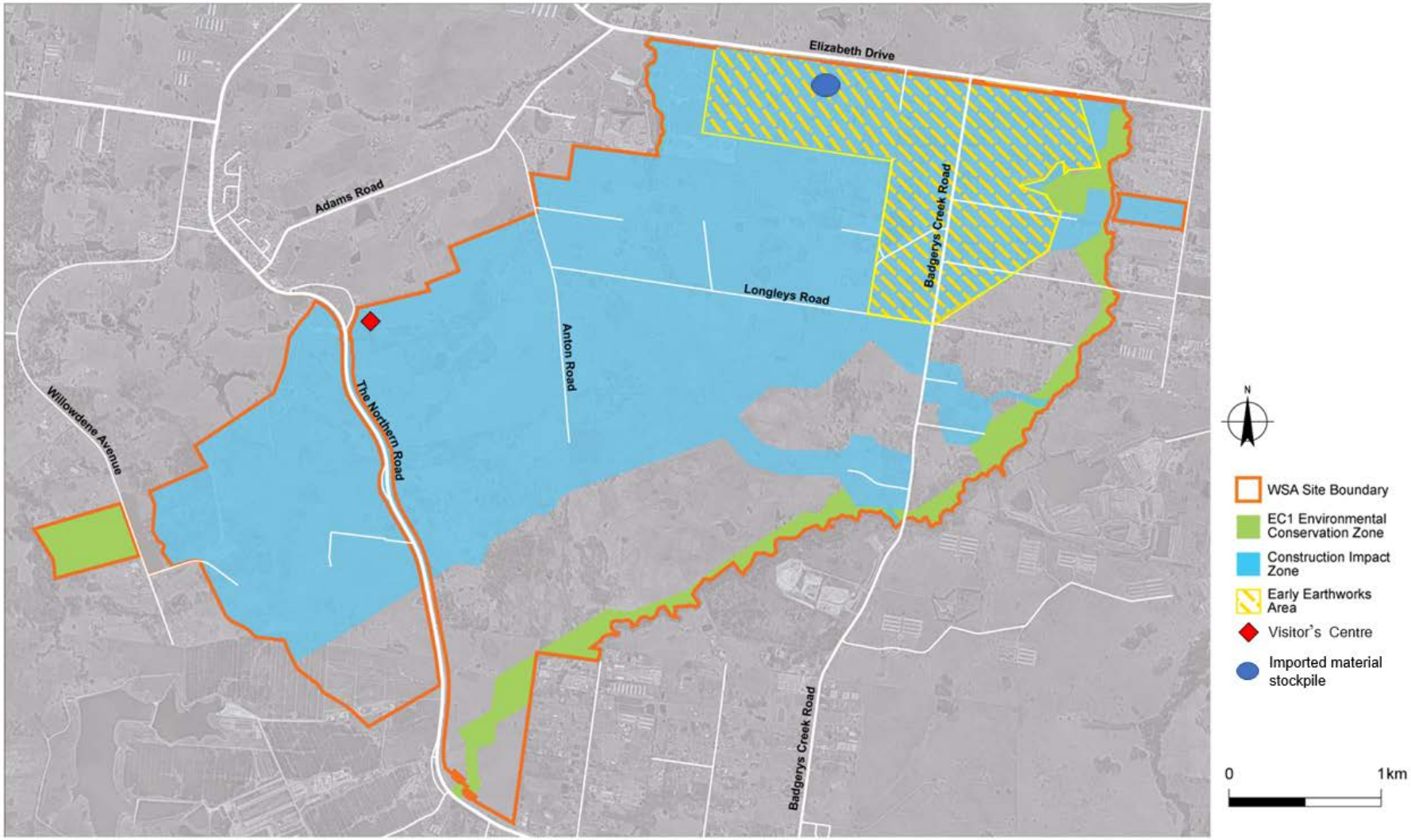



**Figure 4 Site layout location plan**

# 3 Objectives and targets

## 3.1 Objectives

The key objective of this plan is to ensure that native flora and fauna, including threatened species and endangered ecological communities are protected during construction of the Project and that any potential biodiversity impacts will be minimised and managed. To achieve this objective, the following will be undertaken:

- Ensure adverse effects on biodiversity by construction activities is limited to those predicted within Section 5 of the EIS biodiversity assessment;
- Ensure appropriate measures are implemented to address the mitigation measures detailed in Table 28-4 and Table 28-5 in Chapter 28 of the EIS; and
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 4 of this Plan.

## 3.2 Targets and performance criteria

Targets and performance criteria have been established for the management of biodiversity impacts during the construction phase of the works which have been, in part, derived from the performance criteria identified in the EIS, Table 28-4, as presented in Table 8.

**Table 8 Biodiversity targets and performance criteria**

| Objective | Target | Document Reference |
|---|---|---|
| Minimising disturbance to terrestrial and aquatic flora and fauna in the ECZ during construction | Negligible disturbance to native terrestrial and aquatic flora and fauna in the Environmental Conservation Zone. | Environmental inspection checklist<br>Site Diary |
| Minimising adverse effects on terrestrial fauna by construction activities | Minimise adverse effects on terrestrial fauna by construction activities. | Environmental inspection checklist<br>Site Diary |
| Protecting areas outside the CIZ that contain a listed Threatened Ecological Community or provide an important habitat for a listed threatened species during clearing activities | Ensure all areas outside the CIZ that contain a listed threatened ecological community or provide important habitat for a listed threatened species are protected. | Environmental inspection checklist<br>Site Diary |
| Managing weed and pest species that may be introduced as a result of the construction programme | No introduction of weed and pest species. | Environmental inspection checklist<br>Site Diary |

The above targets in Table 6 have been set to provide a benchmark performance objective to which WSA Co will endeavour to achieve. Failure to achieve the targets will not be considered a non-conformance, however, will prompt internal review of environmental management (as detailed further in environmental control measures in Table 23) and assessment of potential improvement opportunities.

# 4 Legal and other requirements

Relevant environmental legislation and other requirements are identified below.

## 4.1 Relevant legislation and guidelines

As the Western Sydney Airport is to be developed under the Airport Plan determined under the Airports Act, some state laws will not be applicable to the Project (s112 of this Act). Where state law is applicable, this plan will set out the relevant applicable state legislation and requirements and demonstrate how compliance with those laws, including obtaining relevant permits, will be achieved. Where state laws are not applicable, there may nonetheless be a requirement to have regard to those laws, for example, through mitigation measures to be incorporated in CEMPs to satisfy conditions under the Airport Plan.

### 4.1.1 Legislation

Legislation and regulations and their relevance to biodiversity and this Plan are summarised in Table 9.

**Table 9 Principal legislation and relevance**

| Legislation or regulation | Relevance | CEMP compliance provisions |
|---|---|---|
| ***Commonwealth*** | | |
| *Airports Act 1996* (Airports Act) | The Airports Act and Airports Regulations set out the framework for the regulation and management of activities at airports that could have potential to cause environmental harm. This includes offences related to environmental harm, environmental management standards, monitoring and incident response requirements.<br>The Airport Plan prepared under the Airports Act covers a number of environmental matters and, in particular, details specific measures to be carried out for the purposes of preventing, controlling or reducing the environmental impact associated with the airport. Criminal offences are applicable if these measures are not complied with. | This CEMP forms part of the overall WSA Co environmental management system which has as a target, full compliance with the Airport Plan.<br>Relevant mechanisms within this CEMP that will contribute to this include but are not limited to:<br>• Section 3.1 – Objectives<br>• Section 4.4 – Airport Plan Conditions<br>• Section 4.4.1 – Environmental Impact Statement Requirements<br>• Section 6.2 – Ecological impact risks<br>• Section 7 – Environmental Control Measures<br>• Section 8 – Biodiversity Management<br>• Section 9 – Roles and Responsibilities<br>• Section 10 – Environmental Inspection, Monitoring and Auditing<br>• Section 13 – Environmental Incidents, Non-conformance and improvement opportunities<br>• Section 14 – Review and improvement |
| *Airports (Environment Protection) Regulations 1997* (AEPR) | Imposes a general duty to prevent or minimise environmental pollution and preserve habitat. Promotes improved environmental management practices at airports. | Refer to commentary on Airport Plan above. |
| *Environment Protection and Biodiversity* | National environment law that provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |

| Legislation or regulation | Relevance | CEMP compliance provisions |
|---|---|---|
| *Conservation Act 1999* (EPBC Act) | defined in the Act as matters of national environmental significance. | Section 10 – Environmental Inspection, Monitoring and Auditing |
| ***NSW*** *As the Airport is to be developed under the Airport Plan determined under the Airports Act, 1996 (Cth), some state laws will not be applicable to the Project (see for example S 112 of that Act). Where state laws are not applicable, it is still intended to have regards to relevant laws for example through inclusion of mitigations measures incorporated into this CEMP. These laws are identified below.* | | |
| *Environmental Planning and Assessment Act 1979* (EPA Act) | The objectives of the EPA Act include the encouragement of proper management and conservation of natural and artificial resources and the promotion of the orderly and economic use and development of land in NSW. The Act also provides for the making of environmental planning instruments. | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |
| *State Environmental Planning Policy No 19 – Bushland in Urban Areas* (SEPP 19) | The purpose of SEPP 19 is to protect and preserve bushland within urban areas due to its inherent aesthetic, community and natural heritage values. | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |
| *State Environmental Planning Policy 44 – Koala Habitat Protection* | SEPP 44 aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline. | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |
| *Protection of the Environment Operations Act 1997* (PEO Act) | The objectives of the Protection of the Environment Operations Act are to protect, restore and enhance the quality of the environment, in recognition of the need to maintain ecological sustainable development. | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |
| *Biodiversity Conservation Act 2016* (BC Act) | The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |
| *Fisheries Management Act 1994* (FM Act) | The FM Act aims to conserve, develop and share the fishery resources of NSW for the benefit of present and future generations, including conserving fish stocks and fish habitat and promoting ecologically sustainable development. | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |
| *Biosecurity Act 2015* | The Biosecurity Act outlines biosecurity risks and impacts including impacts associated with weeds. The Act introduces the concept of Priority Weeds that should be prevented, managed, controlled or eradicated within particular regions. | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |

| Legislation or regulation | Relevance | CEMP compliance provisions |
|---|---|---|
| *Liverpool Local Environmental Plan 2008* (Liverpool LEP) | The Liverpool LEP provides local environmental planning controls and standards for land in the Liverpool LGA in accordance with the relevant standard environmental planning instrument under section 33A of the EPA Act. | Section 7 – Environmental Control Measures<br>Section 8 – Biodiversity Management |
| *Penrith Local Environmental Plan 2010 (Penrith LEP)* | The Penrith LEP provides local environmental planning controls and standards for land in the Penrith LGA in accordance with the relevant standard environmental planning instrument under section 33A of the EPA Act. | Section 7 – Environmental Control Measures |

### 4.1.2 Guidelines and standards

Guidelines and standards that are relevant to biodiversity management and this plan are summarised in Table 10.

**Table 10 Relevant guidelines and standards**

| Guidelines and standards |
|---|
| • *National Standards for the Practice of Ecological Restoration in Australia (Society for Ecological Restoration Australasia, 2016)* |
| • *Guidelines for the Translocation of Threatened Plants (Vallee et al, 2004)* |
| • *Cumberland Plain Recovery Plan (DECCW, 2011)* |
| • *NSW Department of Primary Industries, Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings, Fairfull and Witheridge, 2003* |
| • *Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings – November 2003* |
| • *NSW National Parks & Wildlife Service. 2001. Policy for the Translocation of Threatened Fauna in NSW: Policy and Procedure Statement No. 9 Threatened Species Unit, Hurstville NSW* |
| • *Australian Network for Plant Conservation. 2004. Guidelines for the Translocation of Threatened Plants in Australia, 2nd Edition* |
| • *Hygiene protocol for the control of disease in frogs (DECCW, 2008)* |
| • *Cumberland Plains Recovery Plan (OEH 2011)* |
| • *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act (SEWPaC 2011),* |
| • *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (DEWHA 2010)* |
| • *Survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the EPBC Act (DEWHA 2010)* |
| • *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act 1999 (SEWPaC 2011)* |

## 4.2 Approvals and other specifications

- Functional Specifications;
- EPBC Act Part 13 Permit E2017-0138 (included as Appendix D of this Biodiversity CEMP);
- Western Sydney Airport Plan (2016);
- Western Sydney Airport Environmental Impact Statement;
- Sustainability Plan when approved;
- Community and Stakeholder Engagement Plan; and
- Construction Plan.

## 4.3 Part 13 Permit Conditions

The Part 13 Permit is a requirement under the EPBC Act for activities that may kill, injure, take, trade, keep or move a member of a listed threatened species or ecological community, a member of a listed migratory species, or a member of a listed marine in or on a Commonwealth area.

Conditions of Approval attached to Part 13 Permit E2017-0138 are provided in Table 11.

**Table 11 Conditions of approval attached to Part 13 Permit E2017-0138**

| Condition No | Condition |
|---|---|
| 1. | In accordance with the Airport Plan, the permit holder is authorised to:<br>a. Clear up to 160 hectares of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest;<br>b. Clear habitat of, or kill, injure, take, trade, keep or move members of, the listed threatened, migratory and / or marine species specified in Part 13 Permit Table 1 (Attachment A), up to the specified maximum quantity. |
| 2. | The permit holder may give to another person written authority to take, for or on behalf of the holder, any activity authorised by the permit. When an authority is given to another person, the condition requirements also apply. The giving of an authority to another person does not prevent the permit holder from undertaking the authorised activity. The permit holder who gives an authority to another person must inform the Department of Environment and Energy in writing within fourteen (14) days after giving the authority. The permit holder may only give an authority to another person who has sufficient experience and competence in the activities of this permit. |
| **Administrative conditions** | |
| 3. | Within seven (7) days after the commencement of the action, the permit holder must advise the Minister in writing of the actual date of commencement of the action. |
| 4. | The permit holder must maintain accurate records substantiating all activities associated with or relevant to these permit conditions and make them available to the Department of Environment and Energy upon request. Such records may be subject to audit by the Department of Environment and Energy, or an independent auditor in accordance with section 458 of the EPBC Act or used to assess or verify compliance with the permit conditions. Summaries of audits may be published on the Department's website. The results of audit may also be publicised through the general media. |
| 5. | Unless otherwise agreed to in writing by the Minister, within three (3) months of every 12-month anniversary of the commencement of the action, the permit holder must publish a report on their website addressing compliance with these permit conditions over the previous 12 months. Non-compliance with any of the permit conditions must be reported to the Department at the same time |

| Condition No | Condition |
|---|---|
| | as the compliance report is published. Reports must remain published for the life of the permit. Reports must continue to be published until such time as advised by the Minister in writing. |
| 6. | The permit holder will be taken to comply with the requirement to publish compliance reports under permit condition 5, in relation to a 12 month or other period referred to in condition 39 of the Airport Plan, if information about compliance or non-compliance with these permit conditions, over that period, is included or is to be included in a report published by the permit holder under condition 39 of the Airport Plan.<br>If a report published by the permit holder under condition 39 of the Airport Plan includes or is to include information about compliance with these permit conditions over a 12 month or other period, a compliance report published by the permit holder under permit condition 5 does not need to address compliance with these permit conditions over any part of the same period. |
| 7. | If, after 10 years from the date of this permit, the permit holder has not commenced the action, then the permit holder must not commence the action or continue taking the action without the written agreement of the Minister. |

## 4.4 Airport Plan Conditions

Conditions of Approval relevant to biodiversity management during construction are provided in Table 12.

**Table 12 Conditions relevant to biodiversity management**

| Condition No. | Condition | Timing | Responsibility | Ref in this CEMP |
|---|---|---|---|---|
| 1.4 | The Site Occupier must ensure that no CEMP is inconsistent with the approved Construction Plan | Ongoing | WSA Co | This document (Biodiversity CEMP) |
| 1.5 | The approved Construction Plan may provide for Main Construction Works to be carried out in phases that commence at different times for different parts of the Airport Site or an Associated Site. If it does, the Site Occupier may prepare a CEMP in relation to one or more phases, and the criteria for approval of such a CEMP are taken to exclude any matter irrelevant to the phases for which approval is sought. A variation of the CEMP must be submitted for approval in accordance with condition 41 (Variation of Approved Plans) prior to commencement of any new phase. | Ongoing | WSA Co | This document (Biodiversity CEMP) |
| 5.3 | In carrying out a Preparatory Activity, the Site Occupier must:<br>a) implement any plan approved in accordance with sub condition (1) or (2), except to the extent that the plan is inconsistent with any subsequently approved CEMP or the approved Construction Plan; and<br>b) not act inconsistently with any approved CEMP or the approved Construction Plan. | Ongoing | WSA Co | This document (Biodiversity CEMP) |

| Condition No. | Condition | Timing | Responsibility | Ref in this CEMP |
|---|---|---|---|---|
| 7.1 | The Site Occupier must not:<br>• commence Main Construction Works until a Biodiversity CEMP has been prepared and approved in accordance with this condition; or<br>• carry out any development described in Part 3 of the Airport Plan inconsistently with the approved Biodiversity CEMP. | Prior to Main Construction Works | WSA Co | This document (Biodiversity CEMP) |
| 7.2 | The Site Occupier must:<br>a. Prepare, and<br>b. Submit to an Approver for approval;<br>A Biodiversity CEMP in relation to the carrying out of the developments described in Part 3 of the Airport Plan. | Prior to Main Construction Works | WSA Co | This document (Biodiversity CEMP) |
| 7.3 | The criteria for approval of the Biodiversity CEMP are that an Approver is satisfied that:<br>a. in preparing the Biodiversity CEMP, the Site Occupier has taken into account Table 28-4 in Chapter 28 of the EIS; and<br>b. the Biodiversity CEMP complies with Table 28-5 in Chapter 28 of the EIS and is otherwise appropriate. | Prior to Main Construction Works | Approver | CEMP Sections 6, 7, 8, 9 and 10 |
| 7.4 | The Biodiversity CEMP must be based on and informed by a Biodiversity Assessment Report that:<br>a. includes the results of an updated ecological survey that has applied the field survey methodology of the FBA for areas outside the Construction Impact Zone (but within the Airport Site);<br>b. has had regard to the key diagnostic characteristics and condition thresholds specified in the Commonwealth Listing Advice on Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (Threatened Species Scientific Committee 2008), particularly regarding patch size and contiguous native vegetation; and<br>c. has been independently verified by a person accredited in accordance with section 142B(1)(c) of the BC Act (NSW), appointed following consultation with OEH. | Prior to Main Construction Works | WSA Co | This document (Biodiversity CEMP, Section 5) |

| Condition No. | Condition | Timing | Responsibility | Ref in this CEMP |
|---|---|---|---|---|
| 7.5 | The Biodiversity CEMP must contain measures to protect and manage the areas in the environmental conservation zone shown in the Land Use Plan (EC1) along the Badgerys Creek riparian corridor including to:<br>a. replace exotic grasslands with suitable native vegetation;<br>b. rehabilitate existing remnant and native vegetation; and<br>c. provide ongoing protection of the biodiversity and environmental values. | Prior to Main Construction Works | WSA Co | CEMP Sections 6, 7, 8, 9 and 10 |
| 35 | An Approver must not approve a plan referred to in Chapter 28 of the EIS unless he or she is satisfied that the Plan Owner:<br>(a) in preparing the plan, has (i) consulted with any NSW Government agencies specified by the NSW Department of Premier and Cabinet; and (ii) in the case of the Biodiversity CEMP…also consulted the Environment Department (DoEE) and OEH; and<br>(b) has provided:<br>I the Approver; and<br>II each consulted agency, with an explanation of how any responses have been addressed. | Ongoing | The Approver | This document (Biodiversity CEMP) |
| 37 to 42 | Set out requirements in relation to informing other parties of conditions, keeping records, publishing reports, independent audits, variation to approved plans and publication of approved plans | Ongoing | WSA Co and Approver | This document (Biodiversity CEMP) |

### 4.4.1 Environmental Impact Statement requirements

The requirements of biodiversity management to be considered and addressed during the construction phase of the Stage 1 development are included in the EIS, specifically Table 28-4. A summary of these requirements and how they have been addressed in this Biodiversity CEMP is presented in Table 13.

**Table 13 Summary of biodiversity management requirements**

| EIS Reference | Topic | Summary | Biodiversity CEMP Reference |
|---|---|---|---|
| Table 28-4 | Performance Criteria | Compliance with the approved Biodiversity CEMP | Section 3 – Objectives and Targets |
| | | Compliance with the general duty to preserve habitat under the AEPR | Section 3 – Objectives and Targets |
| | | Compliance with the environmental values as outlined in the Land Use Plan in the Airport Plan | Section 3 – Objectives and Targets |
| | | Clearing of the construction impact zone is undertaken in an environmentally sensitive manner | Section 3 – Objectives and Targets |
| | | Disturbance of fauna outside of the construction impact zone is minimised | Section 3 – Objectives and Targets |
| | | Subject to the requirements for safe airport operations, no clearance of significant vegetation occurs outside the designated Stage 1 construction impact zone prior to further approvals under the Airports Act where the vegetation:<br>• Is in the Environmental Conservation Zone; or<br>• Comprise a threatened ecological community under the EPBC Act; or<br>• Provides important to critical habitat for a listed threatened species under the EPBC Act | Section 3 – Objectives and Targets |
| | | All reasonable and practicable measures are taken to ensure no weed or pest species are introduced to or from the airport site. | Section 3 – Objectives and Targets |
| Table 28-4 | Implementation framework | A Biodiversity CEMP will be approved prior to Main Construction Works for the proposed airport. The CEMP will collate measures to mitigate and manage potential impacts to the local and regional road network, including cross-reference to other environmental management plans where they are relevant. | This Biodiversity CEMP |
| | | The Biodiversity CEMP will as a minimum: | |
| | | Detail the management and mitigation measures to be implemented, including the measures and sub-plans, protocols and surveys in Table 28-5 | Section 8 – Biodiversity Management |
| | | Describe the process for managing complaints, stakeholder engagement and emerging environmental management issues as they arise | Section 12 – Communications and Complaints Management |

| EIS Reference | Topic | Summary | Biodiversity CEMP Reference |
|---|---|---|---|
| | | Specify the process for monitoring implementation, reporting and auditing | Section 10 – Environmental Inspection, Monitoring and Auditing |
| | | Identify the party responsible for implementing the CEMP | Section 9 - Environmental Roles and responsibilities |
| Table 28-4 | Monitoring | Monitoring requirements include that: | |
| | | Monitoring must take place under the direction of an appropriately qualified person. | Section 10.2 - Biodiversity Monitoring |
| | | The results of the monitoring must be kept in a written record. | Section 10.2 - Biodiversity Monitoring |
| | | Additional monitoring requirements for specific mitigation measures [outlined in EIS Table 28-5] | Section 10.2 - Biodiversity Monitoring |
| Table 28-4 | Auditing and reporting | An annual report will be prepared and submitted to the Secretary of the Infrastructure Department in relation to compliance with the Biodiversity CEMP for the period until the airport commences operations. | Section 10.4 - Environmental reporting |
| | | The Community and Stakeholder Engagement plan provides for the development of a complaints log and includes specific measures for how complaints will be managed. | Community and Stakeholder Engagement Plan |
| Table 28-4 | Responsibility | The Biodiversity CEMP will be prepared in consultation with DoEE and OEH | Section 1.5 Consultation requirements of this plan |
| | | The Biodiversity CEMP will be submitted for approval for the Infrastructure Minister or a SES Officer in the Department of Infrastructure and Regional Development | Section 9 - Environmental Roles and responsibilities |
| | | The D&C contractor will be responsible for implementing site specific environmental management arrangements and work method statements applicable to the proposed works in accordance with the requirements of the Biodiversity CEMP | Section 7 – Environmental Control Measures |
| | | The airport environment officer will be responsible for day to day regulatory oversight of AEPR compliance at the airport after an airport lease is granted. | Section 9 - Environmental Roles and responsibilities |

# 5 Existing environment

The following section summarises the results of ecological assessments undertaken at the Airport Site. The majority of the ecological assessment undertaken at the Airport Site was reported in the EIS. However, additional ecological assessments have been undertaken at the Airport Site post-EIS. The existing environment information outlined below is a summary of the ecological assessment undertaken at the Airport Site both for the EIS and post-EIS.

## 5.1 Ecological assessments undertaken for the EIS

A range of desktop and field based ecological assessments were undertaken as part of the EIS. For more details of the ecological assessment undertaken for the EIS, refer to Volume 4, Appendix K of the EIS.

## 5.2 Post-EIS ecological assessment

Post-EIS, the Commonwealth prepared a Biodiversity Assessment Report and Biodiversity Assessment Report Addendum for areas directly impacted by Stage 1 works (*Stage 1 Biodiversity Assessment Report* (GHD 2017) and the *Stage 1 Biodiversity Assessment Report Addendum* (GHD 2018)). This work was undertaken as a Preparatory Activity for the following purposes:

- To refine the impact area from the indicative Construction Impact Zone (CIZ) to the approved CIZ; and
- To update the ecological information from the EIS to calculate the biodiversity offsets required for impacts on plants, animals and their habitats.

The Commonwealth has also undertaken ecological assessments using methodologies in accordance with the Framework for Biodiversity Assessment (FBA) on the land outside the CIZ but within the Airport Site during Preparatory Activities (*Biodiversity Assessment Report for Land Outside Stage 1 Development* (GHD, 2018)). This work was undertaken to comply with the requirements of the Airport Plan, which specified that management actions for areas outside of the CIZ but within the Airport Site must be informed by a Biodiversity Assessment Report that has been independently verified by an accredited person (following consultation with OEH). These reports have been used to inform the below sections.

## 5.3 Endangered ecological communities

All of the native woodland and forest vegetation at the Airport Site, including derived native grasslands, comprise local occurrences of endangered ecological communities listed under the BC Act. These endangered ecological communities are summarised in Table 14.

The critically endangered ecological communities (CEEC) listed under the EPBC Act must comply with key diagnostic characteristics and condition thresholds (such as projected foliage cover, patch size, perennial understory vegetation cover and contiguous native vegetation) as outlined in the Commonwealth Listing Advice and in EPBC Act Policy Statement 3.31 (DEWHA 2010). As such, only CEECs in good condition comply with the EPBC Act listings for the Cumberland Plain Woodland in the Western Sydney Basin Bioregion and the Shale/ Gravel Transition Forest in the Sydney Basin Bioregion. Refer to the Biodiversity Risk Assessment in Table 22 for more information on the management of endangered ecological communities within the Airport Site.

**Table 14 Endangered Ecological Communities within the Stage 1 Construction Impact Zone**

| Patch | Endangered ecological community | BC Act | EPBC Act | Good condition (ha) | Medium condition (ha) | Poor condition (ha) |
|---|---|---|---|---|---|---|
| Grey Box – Forest Red Gum grassy woodland on flats | Cumberland Plain Woodland in the Sydney Basin Bioregion | CEEC | CEEC[1] | 104.8 | 6.1 | 113.2 |
| Grey Box – Forest Red Gum grassy woodland on hills | Cumberland Plain Woodland in the Sydney Basin Bioregion | CEEC | CEEC[1] | 35.5 | - | 13.2 |
| Forest Red Gum – Rough-barked Apple grassy woodland | River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South-East Corner bioregions | EEC | | 35.9 | - | 11.7 |
| Broad-leaved Ironbark – Grey Box – Melaleuca decora grassy open forest | Shale/Gravel Transition Forest in the Sydney Basin Bioregion | EEC | CEEC[1] | 5.5 | - | 0.4 |

[1]Only vegetation classed as in good condition. Also subject to patch size and condition criteria as documented in the listing advice for the community (TSSC 2008). Around 141.0 hectares of these vegetation zones comprises the EPBC Act-listed form of the community.

## 5.4 Threatened or other significant flora species

Nine species of threatened flora listed under the EPBC Act and/or BC Act have been recorded or are predicted to occur within the general locality of the Airport Site. These are detailed in Table 15.

Four species that are either threatened or part of an endangered population were recorded at the Airport Site during EIS or post-EIS field surveys, while it is anticipated an additional five species may occur. The remaining species predicted to occur in the general locality of the airport side are considered unlikely to occur at the Airport Site due to a lack of suitable habitat, and therefore will not be affected by the proposed airport.

**Table 15 Threatened flora recorded or have potential to occur at the Airport Site**

| Scientific name | Common name | Conservation status | | Likelihood of occurrence |
|---|---|---|---|---|
| | | EPBC Act | BC Act | |
| *Pultenaea parviflora* | | Vulnerable | Endangered | Present |
| *Marsdenia viridiflora subsp. viridiflora* | | | Endangered population | Present |
| *Pimelea spicata* | Spiked Rice-flower | Endangered | Endangered | Present |
| *Dillwynia tenuifolia* | | | Vulnerable | Present |
| *Cynanchum elegans* | White-flowered Wax Plant | Endangered | Endangered | Possible |
| *Acacia pubescens* | Downy Wattle | Endangered | Vulnerable | Possible |
| *Grevillea parviflora subsp. parviflora* | Small-flower Grevillea | Vulnerable | Vulnerable | Possible |
| *Grevillea juniperina subsp.juniperina* | Juniper-leaved Grevillea | | Vulnerable | Possible |

| Scientific name | Common name | Conservation status | | Likelihood of occurrence |
|---|---|---|---|---|
| | | EPBC Act | BC Act | |
| *Thesium austral* | Austral Toadflax | Vulnerable | Vulnerable | Possible |

## 5.5 Vegetation corridors

A significant vegetation corridor occurs within the ECZ along the eastern boundary of the Airport Site in association with Badgerys's Creek riparian zone. The ECZ is predominately comprised of native grassy woodland and exotic grassland. The ECZ will be retained during the Project. The ECZ will be demarcated in the field during construction works and access will be restricted. Habitat augmentation and enhancement works will be undertaken in the ECZ during the life of the Project including nest box installations, replacing exotic vegetation with suitable native vegetation and rehabilitation of native remnant vegetation.

## 5.6 Threatened fauna

One threatened fauna species listed under the EPBC Act was recorded at the Airport Site. The Grey-headed Flying-fox (*Pteropus poliocephalus*) was recorded during surveys for preparation of the EIS as well as surveys for the 1999 EIS. This species is listed as a vulnerable species under the EPBC Act and under the BC Act. There are no Grey-headed Flying-fox camps located at the Airport Site, although there are at least seven known camps within 20 kilometres. Three other threatened fauna species listed under the EPBC Act may occur at the Airport Site, as identified in Table 16, although they were not detected during the field surveys.

**Table 16 Threatened species not detected during the field surveys but may be present**

| Threatened species | EPBC Act listing | BC Act listing | Habitat attractiveness |
|---|---|---|---|
| Swift Parrot (*Lathamus discolour*) | Critically endangered | Endangered | Shelter or supplementary foraging resources for migrating individuals |
| Australasian Bittern (*Botaurus poiciloptilus*) | Endangered | Endangered | Potential foraging and breeding habitat |
| Australian Painted Snipe (*Rostratula australis*) | Endangered | Endangered | Potential foraging and breeding habitat |

A further ten threatened fauna species listed under the BC Act (but not the EPBC Act) have been recorded at the Airport Site during current and previous surveys. These are listed in Table 17.

**Table 17 Threatened fauna species listed under the BC Act likely to occur within the Airport Site**

| Threatened fauna species | BC Act listing | Occurrence likelihood |
|---|---|---|
| Cumberland Plain Land Snail *(Meridolum corneovirens)* | Endangered | Present |
| Little Eagle *(Hieraaetus morphnoides)* | Vulnerable | Present |
| Little Lorikeet *(Glossopsitta pusilla)* | Vulnerable | Present |
| Scarlet Robin *(Petroica boodang)* | Vulnerable | Present |
| Varied Sittella *(Daphoenositta crysoptera)* | Vulnerable | Present |
| Black Bittern *(Ixobrychus flavicollis)* | Vulnerable | Present |
| Blue-billed Duck *(Oxyura australis)* | Vulnerable | Present |

| Threatened fauna species | BC Act listing | Occurrence likelihood |
|---|---|---|
| Eastern Freetail-bat *(Mormopterus norfolkensis)* | Vulnerable | Present |
| Eastern False Pipistrelle *(Falsistrellus tasmaniensis)* | Vulnerable | Present |
| Eastern Bentwing Bat *(Minopterus schreibersii oceanensis)* | Vulnerable | Present |
| Large-footed Myotis *(Myotis macropus)* | Vulnerable | Probably recorded (anabat) |
| Greater Broad-nosed Bat *(Scoteanax rueppellii)* | Vulnerable | Probably recorded (anabat) |
| Eastern Cave Bat *(Vespadelus troughtoni)* | Vulnerable | Probably recorded (anabat) |

## 5.7 Migratory species

A total of three migratory species listed under the EPBC Act were recorded at the Airport Site during ecological assessments for the EIS. These species are listed in Table 18.

**Table 18 Migratory species listed under the EPBC Act known to occur within the Airport Site**

| Migratory species | EPBC Act listing | Occurrence likelihood |
|---|---|---|
| Latham's snipe (*Gallinago hardwickii*) | Marine; Migratory (Bonn, JAMBA, ROKAMBA) | Present |
| White-throated needletail (*Hirundapus caudacutus*) | Marine; Migratory (CAMBA, JAMBA, ROKAMBA)) | Present |
| Rufous fantail (*Rhipidura rufifrons*) | Marine; Migratory (Bonn) | Present |

## 5.8 Aquatic fauna

No threatened fish species listed under the EPBC Act and/or the FM Act that were identified in the database searches as potentially occurring in the locality were collected during the EIS surveys. No suitable habitat for these species was observed during the EIS site visits.

## 5.9 Aquatic flora

Thirteen aquatic plant species were recorded within the waterbodies (wetlands and creeks) sampled at the Airport Site and in the locality. The majority of aquatic flora were all native while two declared noxious weeds were recorded during surveys, namely Salvinia (*Salvinia molesta*) and Water Hyacinth (*Eichhornia crassipes*). Where exotic or priority weed species were found, they tended to dominate the waterbody.

# 6 Biodiversity aspects and impacts

The potential for biodiversity impacts was considered in Chapter 16 of the EIS, with further ecological assessment undertaken at the Airport Site post-EIS. The findings are summarised in the following sections.

## 6.1 Construction activities

Construction activities with the potential to impact terrestrial and aquatic biodiversity include:

- Clearing of native vegetation (including habitat);
- Works around watercourses;
- Noise;
- Disturbance of soils, consequential erosion and the mobilisation of sediment; and
- Use of chemicals / fuels (potential for spills).

The risk assessment and management process for the Project are detailed in Section 6.2 of this CEMP. The following information has been used in the initial risk assessment. Risks will be reviewed, and the risk register updated periodically.

## 6.2 Ecological impact risks

### 6.2.1 Direct impacts

Construction of the Stage 1 development will result in the removal of approximately 1,199 hectares of vegetation; 794 hectares of exotic grassland and cleared land or cropland, dominated by exotic species and priority and environmental weeds, and 359 hectares of native vegetation.

Potential direct impacts associated with construction of the Project include:

- Removal of native vegetation;
- Loss of terrestrial and wetland fauna habitat; and
- Loss of aquatic fauna habitat.

Vegetation clearing will directly impact:

- 224.1 hectares of Grey Box – Forest Red Gum grassy woodland on flats critically endangered ecological community (CEEC) (104.8 hectares good condition);
- 48.7 hectares of good condition Grey Box – Forest Red Gum grassy woodland on hills CEEC (35.5 hectares good condition);
- 47.6 hectares of Forest Red Gum – Rough-barked Apple grassy woodland endangered ecological community (EEC) (35.9 hectares good condition);
- 5.9 hectares of Broad-leaved Ironbark – Grey Box – Melaleuca decora grassy open forest (5.5 hectares good condition CEEC); and
- 32.7 hectares of good artificial freshwater wetland on floodplain.

### 6.2.2 Indirect impacts

Potential indirect impacts associated with construction of the Project include:

- Habitat fragmentation;
- Potential fauna displacement, injury or mortality;
- Edge effects*;

- Altered surface water hydrology*;
- Altered groundwater*;
- Erosion, sedimentation and contamination*;
- Dust;
- Light, noise and vibration;
- Mobilisation of legacy contaminated soils;
- Spread of pests and pathogens; and
- Fire.

*Note: These impacts will be discussed in the Soil and Water CEMP

## 6.3 Risk Assessment

A Preliminary Risk Assessment has been undertaken as part of the CEMP. The parts of the overall risk assessment relevant to biodiversity have been extracted and summarised in Table 22.

The identification of construction activities and associated impacts that could eventuate during construction of the Project is central to the selection of appropriate environmental safeguards.

The risk management process involved an assessment of all specific Project activities/aspects in or near environmentally sensitive areas and resulted in the development of a list of environmental risks (effects and impacts) and a corresponding risk mitigation strategy and risk ranking. Each environmental risk was categorised, based on the following:

- The environmental aspect;
- Relative scale of the potential impact;
- Type of potential impact; and
- Likelihood of occurrence.

The identification of risks included a review of the works, and review of the environmental risks identified by the EIS. The mitigations in the risk assessment are in line with the EIS mitigation measures in Section 7.

The following risk assessment process has been implemented, together with a review of proposed activities and known risks based on past Project experience.

### 6.3.1 Risk Assessment Process

The following tables outline the risk assessment process using 3 steps to identify the appropriate management measures required.

Table 19 is used to determine the likelihood that the aspect will have an impact on the environment.

Table 20 is used to determine the potential consequence rating of the risk identified.

From these two tables, a risk rating can then be assigned using Figure 5 to determine the potential severity of the risk and the appropriate management response as per Table 21.

**Table 19 Likelihood descriptor**

| | Likelihood | Description |
|---|---|---|
| A | Rare / improbable | The event may only occur in exceptional circumstances. |
| B | Unlikely / remote | The event may occur at some time (about once every five years). |
| C | Possible | The event is likely to occur at some time (about once every year). |

| | Likelihood | Description |
|---|---|---|
| D | Likely | The event will probably occur in most circumstances (at least once every six months). |
| E | Almost certain | The event is expected to occur in most circumstances (at least once every month). |

**Table 20 Consequence descriptor**

| | Consequence (impact) | Description |
|---|---|---|
| 1 | Insignificant/negligible | • Short-term disturbance with minor environmental release or damage that is non-reportable.<br>• No impact outside site boundary.<br>• No community complaints or media reports. |
| 2 | Minor/low | • Minor violation of regulation or guideline with minimal damage to the environment and small clean-up.<br>• Immediately contained on site.<br>• Local government action, minor community complaints.<br>• Potential or actual breach of legislation. |
| 3 | Moderate | • Violation of regulation or guideline with moderate temporary damage to the environment and significant clean-up costs.<br>• Release of pollution off site.<br>• Detrimental media reports, community concerns and complaints. |
| 4 | Major | • Major environmental damage with potentially permanent consequences.<br>• Release of pollution off site. Significant loss of environmental resources.<br>• Detrimental media reports in the national or state media, organised community concern.<br>• High likelihood of fine or court action. |
| 5 | Catastrophic | • Long-term environmental harm.<br>• Permanent irreparable damage to the environment.<br>• Sustained detrimental state and national media reports. Sustained community outrage.<br>• Penalty Infringement Notice/court action. |

**Figure 5 Risk severity ranking**

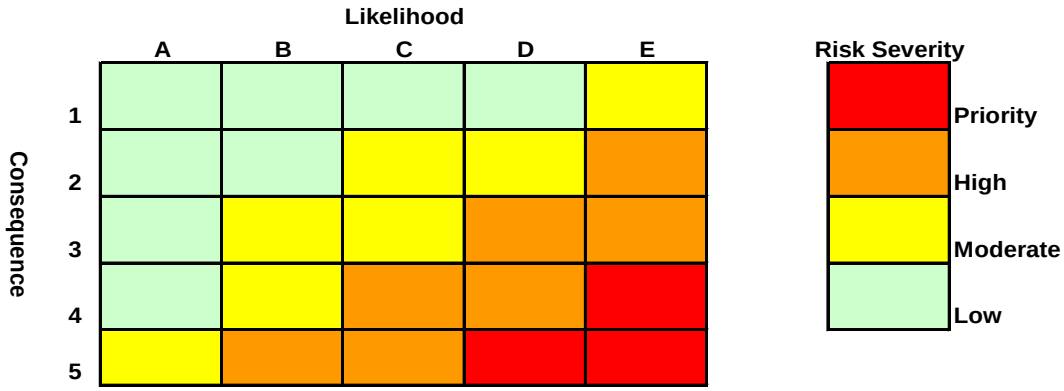



**Table 21 Risk severity and management response**

| Risk severity | Management response |
|---|---|
| Priority | Immediate and detailed management action required. (e.g. stop or change activity) |
| High | Priority management action warranted |
| Moderate | Management action warranted |
| Low | Management action should be considered, particularly for low-level impacts that nevertheless occur on a continual basis |

**Table 22 Biodiversity Risk Assessment**

| Ref | Activity | Construction Aspect | Environmental Aspect | Potential Impact | Risk level [2] pre-mitigation | Mitigation measure [1] | Risk level [2] post-mitigation | Management tools |
|---|---|---|---|---|---|---|---|---|
| 1 | Site Compound establishment | Spraying weeds | Damage to flora | Use or accidental release of chemicals resulting in substantially stunted growth of native vegetation | B2 (low) | B04<br>B11 | B2 (Low) | • Biodiversity CEMP (including sub-plans)<br>• Air Quality CEMP<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• Erosion and Sedimentation Control Plans (ESCPs)<br>• Environmental Control Map (ECM) |
| | | Clearing for footprint of compound | Damage to flora | Over clearing | C2 (Mod) | B02<br>B07<br>B10<br>B11 | B2 (Low) | • Biodiversity CEMP (including sub-plans)<br>• Air Quality CEMP<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| | | Importation of base layer materials | Damage to flora and fauna | Incorrect stockpiling location | C2 (Mod) | B02<br>B07<br>B10<br>B11 | B2 (Low) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure |

| Ref | Activity | Construction Aspect | Environmental Aspect | Potential Impact | Risk level [2] pre-mitigation | Mitigation measure [1] | Risk level [2] post-mitigation | Management tools |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | • Induction<br>• ESCPs<br>• ECM |
| 2 | Construction of haul roads and work areas | Minor clearing and grading | Damage to flora and fauna | Improper material management damaging vegetation | C2 (Mod) | B02<br>B07<br>B10<br>B11 | B2 (Low | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| | | | Damage to flora and fauna | Over clearing | C4 (High) | B02<br>B07<br>B10<br>B11 | C2 (Mod) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| | | | Damage to environmental conservation zone | Over clearing / incorrect stockpiling locations | C3 (High) | B03<br>B11 | C2 (Mod) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS |

| Ref | Activity | Construction Aspect | Environmental Aspect | Potential Impact | Risk level [2] pre-mitigation | Mitigation measure [1] | Risk level [2] post-mitigation | Management tools |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | • Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| 4 | Clearing and grubbing | Habitat removal | Damage to flora and fauna | Damage to retained vegetation and improper use of habitat resources | C4 (High) | B02<br>B03<br>B07<br>B10<br>B11 | C2 (Mod) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| | | Stockpiling mulch | Damage to flora and fauna | Damage to retained vegetation and improper use of resources | B2 (Low) | B02<br>B03<br>B07<br>B10<br>B11 | B2 (Low) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| | | Stockpiling trees | Damage to flora and fauna | Damage to retained vegetation and | B2 | B02 | B2 | • Air Quality CEMP |

| Ref | Activity | Construction Aspect | Environmental Aspect | Potential Impact | Risk level [2] pre-mitigation | Mitigation measure [1] | Risk level [2] post-mitigation | Management tools |
|---|---|---|---|---|---|---|---|---|
| | | | | improper use of resources | (Low) | B03<br>B07<br>B10<br>B11 | (Low) | • Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| | | Stockpiling topsoil | Damage to flora and fauna | Damage to retained vegetation and improper stockpiling location | B2<br>(Low) | B02<br>B03<br>B07<br>B10<br>B11 | B2<br>(Low) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| 5 | Construction of environmental controls | Sediment basin construction | Endangerment to fauna from dam decommissioning | Aquatic wildlife fatality | C2<br>(High) | B05 | C2<br>(Mod) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |

| Ref | Activity | Construction Aspect | Environmental Aspect | Potential Impact | Risk level [2] pre-mitigation | Mitigation measure [1] | Risk level [2] post-mitigation | Management tools |
|---|---|---|---|---|---|---|---|---|
| | | Installation of sediment fences | Damage to flora | Damage to retained vegetation on periphery of site | B2 (Low) | B02<br>B03<br>B07<br>B10<br>B11 | B2 (Low) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| 6 | Utility works | Potholing and trenching | Damage to flora | Damage to sensitive areas | B2 (Low) | B02<br>B03<br>B07<br>B10<br>B11 | B2 (Low) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| 7 | Earthworks | Excavation | Damage to flora | Dust drift into the environmental conservation zone | C2 (Mod) | B02<br>B03<br>B07<br>B10<br>B11 | B2 (Low) | • Air Quality CEMP (including sub-plans)<br>• Biodiversity CEMP<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs |

| Ref | Activity | Construction Aspect | Environmental Aspect | Potential Impact | Risk level [2] pre-mitigation | Mitigation measure [1] | Risk level [2] post-mitigation | Management tools |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | • ECM |
| | | Earthworks near waterways | Water degradation | Contamination to waterways from silt, materials due to improper controls | C3 (High) | B01 | C2 (Mod) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| | | Embankment creation and stabilisation | Damage to fauna | Potential for fauna to relocate to excavations / other areas on site | B2 (Low) | B01<br>B09<br>B11 | B2 (Low) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |
| 8 | Infrastructure works (culverts, bridges) | Culvert construction | Damage to flora and fauna | Potential for over clearing | B2 (Low) | B07<br>B10<br>B11 | B2 (Low) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure |

| Ref | Activity | Construction Aspect | Environmental Aspect | Potential Impact | Risk level [2] pre-mitigation | Mitigation measure [1] | Risk level [2] post-mitigation | Management tools |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | • Induction<br>• ESCPs<br>• ECM |
| 9 | Roadworks | Excavation, compaction, asphalt works on Elizabeth Drive | Damage to flora | Damage to flora and fauna and spread of weeds | B2 (Low) | B04<br>B07<br>B10<br>B11 | B2 (Low) | • Air Quality CEMP<br>• Biodiversity CEMP (including sub-plans)<br>• EWMS<br>• Soil and Water CEMP<br>• Complaints Procedure<br>• Induction<br>• ESCPs<br>• ECM |

[1]Refer to Table 22 for mitigation measures and controls

[2]Derived from risk assessment process detailed in Section 6.1.1

# 7 Environmental control measures

Mitigation and management measures that will be implemented during construction are detailed in Table 23 and are consistent with those provided in Tables 28-4 and 28-5 in Chapter 28 of the EIS, as per condition 7.3 in the Airport Plan. The relevant control measures will be included in the site-specific Environmental Work Method Statement (EWMS) and Environmental Control Map (ECM) – refer to Section 4.3 of the SEMF for further detail.

**Table 23 Environmental control measures**

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | **Waterway Crossings** | | | | |
| B01 | New waterways crossings or upgrades of existing crossings, if required on the Airport Site, will be designed and constructed to minimise potential impacts on watercourse functionality, in particular impacts on riparian and aquatic habitats and fish passage. | WSA Co and Contractor | Pre-construction<br>Construction | All works are constructed as per the approved design and in accordance with best practice management for fish passage. | EIS Table 28-5 |
| | **Pre-clearance surveys for threatened species** | | | | |
| B02 | Pre-clearance surveys for threatened species will be undertaken by a qualified ecologist. Pre-clearance surveys will take into account suitable survey conditions for the threatened species present and / or potential within the Airport Site. Specific management plans will be prepared to manage impacts on each threatened flora and fauna species. These plans will include:<br>• Additional targeted searches of the construction impact zone for the Green and Golden Bell Frog (in suitable conditions) to confirm that they are not present at the site. Should this species be located during targeted surveys, this species would be managed in accordance with the Green and Golden Bell Frog Management Plan. Frog collection and relocation would need to be | WSA Co and Contractor | Pre-construction<br>Construction | Pre-clearance surveys will be undertaken as Preparatory Activities before any works commence on the Project. Additional specific management plans will be developed in line with the survey findings by an ecologist.<br>Appendix B – Cumberland Plains Land Snail Management Plan<br>Consideration will be given to the local rainfall conditions and likelihood of finding some species, for example roosting bats. | EIS Table 28-5 |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | conducted by appropriately experienced ecologists. If weather conditions are not suitable for completing pre-clearance surveys (surveys should be undertaken during warm and windless conditions following rainfall as outlined in EPBC Act Policy Statement 3.19 (DEWHA, 2009)) vegetation removal works should be supervised by a suitably qualified ecologist in suitable habitat for the Green and Gold Bell Frog, such as during dam dewatering and vegetation removal around farm dams (as appropriate);<br>• Targeted searches of the construction impact zone for the Cumberland Plain Land Snail (in suitable conditions) and salvage and relocation of any snails and/or suitable shelter sites that are detected. A management plan would be prepared to provide more detail on Cumberland Plain Land Snail relocation and habitat management if snails are identified. Snails and/or suitable shelter sites would be relocated to appropriate land on or near the Airport Site. Snail collection and relocation would need to be conducted by appropriately experienced ecologists;<br>• Searches for roosting bats at any bridges or culverts that need removal;<br>• Pre-clearing surveys for larger birds' nests, particularly the White-bellied Sea-Eagle and Little Eagle; and<br>• Targeted searches for threatened flora species in areas of appropriate habitat with particular attention to the vicinity of known populations of *Marsdenia virdiflora subsp. viriidflora* and *Pultenaea parviflora*.<br>• Any unexpected finds would be communicated to the Infrastructure Department and addressed in | | | | |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | the translocation plan and/or Offset Delivery Plan as appropriate. | | | | |
| | **Habitat clearing and fauna removal plan** | | | | |
| B03 | A Habitat Management Subplan will be developed by a suitably qualified ecologist or environmental officer for the management of impacts on fauna species during clearing activities. The plan will include the following measures:<br>• Preparation of a nest box strategy, including provisions for the:<br>  • Installation of nest-boxes within the Environmental Conservation Zone prior to clearing areas of native vegetation on the Airport Site. This would provide a safe location for hollow-dwelling fauna to be transferred to during clearing operations;<br>  • Reuse of hollows and fallen debris within conservation areas; and<br>  • Salvage of native fauna from existing nest boxes in the construction impact zone prior to their removal and translocation.<br>• Providing for pre-clearing surveys to be undertaken by a suitably qualified ecologist to mark and map hollow-bearing trees, logs and existing nest boxes that would require fauna management during removal;<br>• Establishing protocols for the staged clearing of vegetation and safe tree felling and log removal to reduce the risk of fauna mortality;<br>• Measures outlined in the threatened species translocation plan;<br>• Establishing protocols for the capture and relocation of less mobile fauna (such as nesting | WSA Co and Contractor | Pre-construction<br>Construction | The Habitat Clearing and Fauna Management Protocol outlined in the Habitat Management Subplan is to be followed during all habitat clearing and outlines the required measures to minimise impact to fauna. See Appendix B for further details.<br>The Habitat Clearing and Fauna Management Protocol outlined in the Habitat Management Subplan is to be followed if wildlife is discovered within the Project footprint during site construction activities, including clearing that may harm, or has resulted in harm, to the animal or poses a risk to site personnel.<br>The Habitat Clearing and Fauna Management Protocol outlined in the Habitat Management Subplan the required measures for the safe handling of native fauna to minimise stress and/or remove the risk of further injury. | EIS Table 28-5 |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | birds and nocturnal fauna) by a trained fauna handler; and<br>• Establishing protocols for the appropriate management of injured or deceased individuals. | | | | |
| | **Weed management plan** | | | | |
| B04 | A weed management plan will be developed by a suitably qualified ecologist or environmental officer and will include the following measures:<br>• Implementing soil erosion and sediment control measures;<br>• Mapping of weed infestations;<br>• Removing and controlling priority weed species;<br>• Appropriate disposal of weed and weed-infested soils;<br>• Stabilising disturbed areas following clearing to prevent weed spread;<br>• Monitoring and adaptive management of weeds; and<br>• Reporting on the extent, composition and severity of weed infestations and adaptive management measures. | WSA Co and Contractor | Pre-construction<br>Construction | Section 5.2 of the Weed and Disease management plan (Appendix C) outlines the biosecurity hygiene protocol steps required to minimise the spread of weeds and pathogens.<br>Section 6.3 of the Weed and Pathogen management plan details the weed management actions to be undertaken prior to clearing, during construction and post construction within the Project area. It also includes recommended treatment methods for Priority weeds and environmental weeds known to occur within the Airport Site.<br>Appendix E includes information on the ongoing management of weeds in the study area | EIS Table 28-5 |
| | **Dam decommissioning and repurposing protocol** | | | | |
| B05 | • A protocol for the decommissioning of dams, or repurposing of dams for storage and use of water during construction, will be developed by a suitably qualified ecologist or environmental officer, in consultation with relevant agencies. The measures to be implemented though the protocol include: | WSA Co and Contractor | Pre-construction<br>Construction | A protocol for the decommissioning of dams has been developed and is included in the Aquatic Flora and Fauna Management Plan, see Appendix B. | EIS Table 28-5 |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | • Any requirements of a Green and Golden Bell Frog management plan;<br>• Eradication of the Alligator Weed infestation on the dammed section of Oaky Creek near Elizabeth Drive prior to any works in the vicinity;<br>• Progressively emptying dams over a number of days to allow fauna to relocate;<br>• Avoiding the nesting season of waterbirds, where possible. A pre-removal survey would be conducted to identify bird breeding locations;<br>• Salvaging and relocating aquatic vertebrate fauna, including frogs, turtles and eels, to areas of suitable habitat retained at the Airport Site or nearby habitats, with regard to numbers and identification of suitable release sites;<br>• Preventing the release of Eastern Gambusia (*Gambusia holbrooki*) and other noxious fish into local waterways as a result of draining of farm dams. Eastern Gambusia will be eradicated from dams using humane methods; and<br>• Establishing protocols for the humane euthanasia of aquatic fauna, including fish. | | | | |
| | **Bushfire management** | | | | |
| B06 | As part of ongoing site management activities, the Infrastructure Department has prepared and implemented a bushfire management plan for the Commonwealth owned land at Badgerys Creek. This plan addresses current bushfire risk and identifies response actions. The existing bushfire management plan has been reviewed and updated in consultation with NSW Rural Fire Service to minimise the risk of bushfire and associated impacts on adjoining areas of native vegetation during construction and | WSA Co and Contractor | Pre-construction<br>Construction | The Bushfire Management Plan has been reviewed and updated with regards to the scope of work of this CEMP (latest revision to include the addition of the area and works associated with the Visitor Centre and Site Accommodation) , see Appendix F – Western Sydney Airport Site at Badgerys Creek Bushfire Management Plan 2018. | EIS Table 28-5 |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | operation of the proposed airport, including the proposed environmental conservation area. This would include:<br>• Identifying activities likely to generate sparks and putting in place appropriate restrictions based on the forecast fire danger;<br>• Preparing pre-planned fire response actions plans. The action plans would be issued as part of the site induction for all site personnel;<br>• Developing limitations on relevant construction procedures which would be applied during the fire season based on specific fire danger ratings. An example of such restrictions would include the halting of all construction works during extreme or catastrophic fire danger days;<br>• Managing the Airport Site to maintain a low overall fuel hazard. Measures to achieve this would include a combination of herbicide application, slashing, low intensity burning and hand removal; and<br>• Ensuring that fuel-reduction measures are appropriate to biodiversity values in each area, e.g. low intensity burns rather than slashing would be used in native woodland and forest. | | | Refer to Table 2 of this CEMP for further detailed with regards to consultation with the NSW Rural Fire Service and other relevant government stakeholders. | |
| | **Clearance minimisation** | | | | |
| B07 | The detailed design and construction planning will demonstrate that it has sought to minimise the extent of vegetation clearing within the Project boundary. | WSA Co and Contractor | Pre-construction<br>Construction | n/a | Good Practice |
| | **Threatened flora translocation plan** | | | | |
| B08 | A threatened flora salvage and translocation plan will be developed by a suitably qualified ecologist or environmental officer, in consultation with relevant | Infrastructure Department | Prior to the commencement of works with potential to | Threatened species management plans have been developed, works to be overseen by an ecologist, see Appendix B. | EIS Table 28-5 |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | agencies and the Australia Botanic Garden at Mount Annan and with consideration of the Guidelines for the Translocation of Threatened Plans (Vallee et al 2004).<br>The threatened flora translocation plan will specify measures for the salvage and translocation of threatened flora species in accordance with condition 33 of the Airport Plan. In particular, it will include:<br>• The salvage and propagation or transplanting of the known local populations of *Pultenaea parviflora* and *Marsdenia viridiflora* and any other threatened flora detected at the Airport Site; and<br>• Consideration of the suitability of sites within the Environmental Conservation Zone in order to maintain populations of these species as close to their original location as possible. | | impact threatened species | | |
| | **Threatened species management plans** | | | | |
| B09 | Threatened species management plans will be prepared by a suitably qualified ecologist or environmental officer to reduce the potential for impacts on threatened species known to occur on the Airport Site, both inside and outside of the Construction Impact Zone. These plans will include:<br>• Maps identifying locations of threatened species;<br>• The scope and requirements for targeted surveys and pre-clearing surveys; including an unexpected finds protocol;<br>• Vegetation and habitat clearing protocols;<br>• Reporting and adaptive management measures; and<br>• Unexpected finds protocol, detailing measures to be undertaken if threatened flora and fauna not previously recorded on site are detected during | WSA Co and Contractor | Prior to the commencement of works with potential to impact threatened species | Threatened species management plans have been developed, works to be overseen by an ecologist, see Appendix B. | EIS Table 28-5 |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | clearing or construction, and if additional occurrences of threatened species previously recorded in the broader area, but not previously recorded at a specific location, are recorded during clearing or construction activities. | | | | |
| | **Vegetation clearance and habitat loss** | | | | |
| B10 | The following measures will be taken to reduce the potential for adverse impacts on ecologically sensitive areas due to vegetation clearance and habitat loss:<br>• Deferring vegetation removal until necessary;<br>• Locating site offices and stockpiles in already cleared and disturbed areas where possible, to avoid further unnecessary removal or disturbance of native vegetation and hollow-bearing trees;<br>• Providing maps to construction staff engaged in Main Construction Works clearly showing vegetation clearing boundaries and exclusion/no-go zones;<br>• Engaging a suitably qualified ecologist or environmental officer prior to any clearing works that form part of Main Construction Works to clearly demarcate vegetation protection areas; and<br>• Establishing an unexpected finds protocol to detail measures to be undertaken if threatened flora and fauna not previously recorded at the Airport Site are detected during Main Construction Works. | WSA Co and Contractor | Construction | Vegetation removal will be undertaken when construction works are to be undertaken.<br>Vegetation removal will be staged and deferred until necessary.<br>Offices and stockpiles are planned for cleared areas.<br>Environmental control maps to be given to all workers on Project.<br>An ecologist is to be present during all clearing works with unexpected finds protocols in place. | EIS Table 28-5 |
| | **Exclusion zones** | | | | |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| B11 | Sensitive areas must be delineated on environmental constraints plans and EWMSs. These areas will be temporarily fenced. No materials storage or machinery entry or operation will be permitted within these areas, to ensure they are not subject to disturbance during construction.<br>The ECZ will be demarcated in the field and access will be restricted. | Contractor | Construction | Environmental Control Maps to be prepared and tool boxed with site personnel. | Good Practice |
| | **Disease management protocol** | | | | |
| B12 | A disease management protocol will be developed by a suitably qualified ecologist or environmental officer to minimise the potential for the spread of disease. The protocol will include procedures for the management of plant diseases (such as Phytophthora. Myrtle Rest and Chytrid fungus), as well as any other likely diseases. | WSA Co and Contractor | Pre-construction<br>Construction | A disease management protocol has been developed, works to be overseen by an ecologist, see Appendix C. | EIS Table 28-5 |
| | **Management of vegetation areas outside the construction impact zone** | | | | |
| B13 | A vegetation management plan will be developed by a suitably qualified ecologist or environmental officer to guide the activities for managing areas of endemic vegetation outside the Stage 1 construction impact zone. The plan will identify how environment protection objectives for the Environmental Conservation Zone shown in the Land Use Plan in the Airport Plan will be met.<br>The plan will detail specific measures to:<br>• Avoid unnecessary disturbance in nearby areas of retained vegetation outside of the construction impact zone such as avoiding unnecessary light spill; | WSA Co and Contractor | Pre-construction<br>Construction | A vegetation management plan has been developed, works to be overseen by an ecologist, see Appendix E. | EIS Table 28-5 |

| Ref. | Measure / Requirement | Responsibility | When to implement | How to implement | Reference |
|---|---|---|---|---|---|
| | • Replace exotic grasslands with suitable native vegetation in the Environmental Conservation Zones;<br>• Rehabilitate existing remnant and native vegetation within the Environmental Conservation Zones; and<br>• Provide ongoing protection of the biodiversity and environmental values within the Environmental Conservation Zone.<br>As required by condition 7 (5) of the Airport Plan. | | | | |
| | **Landscaping** | | | | |
| B14 | Landscaping on the Airport Site will utilise predominantly native vegetation endemic to the region, sourced from the local area where possible. This will include:<br>• Planting of native grasses in open areas around airport infrastructure; and<br>• The use of native vegetation in decorative gardens and plant screenings used to minimise visual impacts. | WSA Co and Contractor | Post-Construction | To be included into detailed design as per condition B14. | EIS Table 28-5 |
| | **Worker inductions** | | | | |
| B15 | All workers are to be provided with an environmental induction prior to starting construction activities on site. This would include information on the ecological values of the Airport Site and protection measures to be implemented to protect biodiversity during construction. | WSA Co and Contractor | Pre-construction<br>Construction | To be included as part of site inductions. | EIS Table 28-4 |

# 8 Biodiversity Management

## 8.1 Biodiversity Controls - Sub plans

### 8.1.1 Vegetation Management

Impacts within the Airport Site (including areas outside the CIZ) will be managed in accordance with the Vegetation Management Plan (Appendix D). The following is addressed in the VMP Subplan:

- Location of soil stockpiles to avoid further unnecessary removal or disturbance of native vegetation and hollow-bearing trees;
- Areas not proposed to be impacted by works (e.g. conservation areas) are to be fully fenced and access is to be restricted to approved personnel, to avoid disturbance of native vegetation and fauna habitat;
- Measures to enhance vegetation outside the Stage 1 CIZ, including the ECZ and areas within the riparian corridor along Badgerys Creek. Management actions will include replacing exotic grasslands with suitable native vegetation, rehabilitation of existing remnant and native vegetation and ongoing protection of the biodiversity and environmental values;
- Maps for contractors engaged in Stage 1 Earthworks clearly showing vegetation clearing boundaries and exclusion/no-go zones;
- Unexpected Finds Protocol;
- Threatened flora translocation (see Threatened Flora Propagation Program);
- Weed management (see Weed and Disease Management Plan) including locations of weed barrier fencing; and
- Provide schedules for inspection, monitoring, management and corrective actions.

### 8.1.2 Weed and Disease Management

Impacts within the Airport Site (including areas outside the CIZ) will be managed in accordance with the Weed and Disease Management Plan (WDMP) (Appendix C). The following is addressed in the WDMP subplan:

- Soil erosion and sediment control measures;
- Existing weed infestations;
- Measures to reduce the potential spread of plant diseases (i.e. Phytophthora, Myrtle Rush and Chytrid Fungus);
- Removing and controlling of priority weed species prior to earthworks, as necessary;
- Appropriate disposal of weeds and weed-infested soils;
- Stabilising disturbed areas following clearing to prevent weed spread; and
- Reporting on the extent, composition and severity of weed infestations and adaptive management measures.

### 8.1.3 Bushfire Management

Impacts within the Airport Site (including areas outside the CIZ) will be managed in accordance with the Bushfire Management Plan (BMP) (Appendix E). The following is addressed in the Stage 1 BMP subplan:

- Identify ‘hot works’ areas and enforce restrictions to mitigate the risk of ignition;
- Prepare planned fire response action plans;

- Construction procedures for fire season;
- Slashing of grassland to manage fuel loads and bushfire risk; and
- Schedules for inspection, monitoring, management and corrective actions.

### 8.1.4 Habitat Management

Impact within the Airport Site (including areas outside the CIZ) will be managed in accordance with the Habitat Management Plan (HMP) (Appendix B). The following is addressed in the HMP subplan:

- Strategies to achieve connectivity throughout the landscape and minimise the effects of habitat fragmentation and associated edge effects;
- Nest box Management Plan, detailing:
  - Designated installation points within environmental conservation zones, prior to scheduled clearing of native vegetation;
  - Reuse of hollows and fallen debris within conservation areas; and
  - Salvage of native fauna from existing nest boxes in stage 1 impact zone prior to their removal and translocation.
- Pre-clearance surveys to be conducted by a suitably qualified ecologist to map hollow-bearing trees, logs and existing nest boxes that would require fauna management during removal;
- Necessary rehabilitation activities to mitigate the risk of reduced reproductive success of biota etc;
- Designated offset sites, with additional or alternative offset sites outlined for compensatory measures; and
- Schedules for inspection, monitoring, management and corrective actions.

### 8.1.5 Aquatic Flora and Fauna Management

Impacts within the Stage 1 Construction Impact Zone will be managed in accordance with the recommendations in the Aquatic Flora and Fauna Management Plan (AFFMP) (Appendix B). The following is addressed in the Stage 1 AFFMP subplan:

- Protocol for dam decommissioning/dewatering;
- Dewatering of dams (at the right time of year, i.e. avoid nesting season of waterbirds) to allow the relocation of fauna species;
- Salvaging and relocation of aquatic vertebrate fauna, including frogs, turtles and eels, to areas of suitable habitat retained at the Airport Site or nearby habitats, with regard to numbers and identification of suitable release sites;
- Establishing protocols for humane euthanasia of aquatic fauna, including fish;
- Identification of potential risks and mitigation measures for watercourse functionality, riparian and aquatic habitat and fish passage as a result of the design and construction of waterway crossings;
- Describe weed management activities (i.e. the eradication of Alligator Weed on the dammed section of Oaky Creek near Elizabeth Drive prior to any works in the vicinity) (also see WPMP); and
- Provide schedules for inspection, monitoring, management and corrective actions.

Construction in Stage 1 development would comprise of the infilling of stream outlets, including the upper reaches of Oaky Creek and smaller drainage lines that feed into Badgerys, Cosgroves and Duncans Creeks, which are currently situated within the Stage 1 Construction Impact Zone.

The existing tributaries are highly modified (high levels of eutrophication as a result of runoff from nearby urbanisation and domination by environmental and priority weeds) and in poor condition as a result of

historical and current land uses. The current aquatic fauna assemblage within these creeks is indicative of its poor quality. Water quality parameters and background levels are documented in the Soil and Water CEMP.

Badgerys Creek will be retained within an environmental conservation zone, as outlined in the revised draft Airport Plan.

### 8.1.6 Microbat Management

Threatened microbat species have been identified as potentially occurring on the site. Targeted surveys of culverts and bridges that are subject to decommissioning for microbat species will be conducted (in suitable conditions) to confirm the presence of microbat species roosting within construction areas and if present; will be managed as per the Microbat Management Plan (MMP) Appendix B. The following is addressed in the MMP subplan:

- Map of identified areas of occurrence;
- Unexpected Find Protocol;
- Legislative requirements;
- Protocols for potential relocation, habitat management and ecological supervision; and
- Schedules for inspection, monitoring, management and corrective actions.

### 8.1.7 Cumberland Plain Land Snail Management

Cumberland Plain Land Snail, *Meridolum corneovirens*, has been identified as potentially occurring on the site. Targeted surveys for the species will be conducted (in suitable conditions) to confirm the presence of Cumberland Plain Land Snail individuals within the construction area and if present; will be managed as per the Cumberland Plain Land Snail Management Plan (CPLSMP) Appendix B. The following is addressed in the CPLSMP subplan:

- Map of identified areas of occurrence;
- Unexpected Find Protocol;
- Legislative requirements;
- Protocols for potential relocation, habitat management and ecological supervision; and
- Schedules for inspection, monitoring, management and corrective actions.

### 8.1.8 Green and Golden Bell Frog Management

Green and Golden Bell Frog *Litoria aurea* has been identified as potentially occurring on the site. Targeted surveys for the species will be conducted (in suitable conditions) to confirm the presence of Green and Golden Bell Frog individuals within the construction area and if present; will be managed as per the Green and Golden Bell Frog Management Plan (GGBFMP) (Appendix B). The following is addressed in the Stage 1 GGBFMP subplan:

- Map of identified areas of occurrence;
- Unexpected Find Protocol;
- Legislative requirements;
- Protocols for potential relocation, habitat management and ecological supervision; and
- Schedules for inspection, monitoring, management and corrective actions.

### 8.1.9 Threatened flora propagation program

A Threatened Flora Propagation Program (TFPP) developed in consultation with the Department of Environment and Energy, OEH, and the Australian Botanic Gardens, Mount Annan (ABGMA) is required under Condition 33 of the Airport Plan. This activity was presented as a mitigation measure (through the development of a threatened flora translocation plan) in the EIS. The offset package in the EIS also recommended that the Infrastructure Department's Biodiversity Offset Delivery Plan (BODP) include consideration of the salvage and propagation of the known local populations of *Pultenaea parviflora* and *Marsdenia viridiflora* subsp. *viridiflora* and any other threatened plants detected at the Airport Site.

As part of the work required to meet the biodiversity conditions in the Airport Plan, ABGMA has been engaged to deliver a TFPP on behalf of the Infrastructure Department. Located in Western Sydney, ABGMA is the native plant garden of the Royal Botanic Garden, Sydney, and specialises in the conservation and seed storage of New South Wales's threatened species. Operating out of PlantBank, a state-of-the art $20 million purpose-built seed storage and research centre, staff have extensive experience in collecting and conserving Western Sydney flora.

The TFPP will directly contribute to translocation and ecosystem restoration activities by providing source populations of these threatened plants. Outcomes of the propagation program and the end use of the plants have been reported on in the Infrastructure Department's BODP.

### 8.1.10 Biodiversity offsets

Biodiversity offsets are proposed as required by Conditions of Approval 30. These are documented separately in the BODP prepared by the Infrastructure Department.

Biodiversity offsets to compensate for significant residual impacts on threatened species and communities listed under the EPBC Act were calculated using the offset assessment guide under the EPBC Act Environmental Offset Policy (DSEWPaC 2012). Biodiversity offsets to compensate for significant residual impacts on other features of the natural environment on Commonwealth land, plants, animals and their habitat, including threatened species, populations and communities listed under the BC Act (refer to Section 16.2.9 Offsetting Impacts in Western Sydney Airport Environmental Impact Statement, Volume 2A).

# 9 Environmental roles and responsibilities

The key environmental management roles and responsibilities for the construction phase of the work are detailed in Section 4.5 of the SEMF.

WSA Co will ensure sufficient resources are allocated on an ongoing basis to ensure effective implementation by both WSA Co and the responsible contractors.

Specific responsibilities for the implementation of this Biodiversity CEMP are detailed in the sections below.

## 9.1 External roles and responsibilities

***Environment Minister (or an SES employee in the Environment Department)***

- The Approver for the Biodiversity Offset Delivery Plan.
- On 24 August 2018 the Approver approved the Biodiversity Offset Delivery Plan in accordance with Condition 30 of the Airport Plan.
- Required to be included in the consultation process for the Biodiversity CEMP and the Soil and Water CEMP (in accordance with Condition 35 of the Airport Plan).
- The Environment Department receives notification regarding publication of annual reports under condition 39 of the Airport Plan and copies of independent audits under condition 40 of the Airport Plan.

***Infrastructure Minister (or an SES employee in the Infrastructure Department)***

- The Approver for the Construction Plan, CEMPs, the Community and Stakeholder Engagement Plan and the Sustainability Plan;
- Approval for variation of an Approved Plan; and
- Review and approve other matters (excluding Biodiversity Offset Delivery Plan).
- The Infrastructure Department is also responsible for administration and enforcement of the Airports Act, including the conditions under the Airport Plan.

***Airport Environment Officer***

The responsibilities of the Airport Environment Officer (AEO) include the following:

- Monitoring compliance with the AEPRs;
- Facilitate an understanding of the obligations of the AEPRs;
- Ensure the best possible outcomes are achieved;
- Complete site inspections to review monitoring requirements and completion of works;
- Review and comment on CEMPs, incidents, and remedial activities;
- Issue an environmental protection order in accordance with Part 7 of the AEPR; and
- Issue an infringement notice in response to an offence against the AEPR.

## 9.2 WSA Co roles and responsibilities

***WSA Co Executive General Manager***

Environmental responsibilities of the WSA Co Executive General Manager include (but are not limited to):

- Provide resources to ensure compliance with this CEMP is achieved;
- Mandate and ensure that environmental protection remains an integral element of all Project activities;
- Authorise resourcing with regards to biodiversity management.

***WSA Co Environment Manager***

The WSA Co Environment Manager is responsible for leading the planning, approvals and environmental function and is responsible for the ongoing requirements associated with the management of biodiversity as follows:

- Coordinate and manage the preparation of the Biodiversity CEMP (this plan) and associated documents / plans / procedures;
- Liaise regularly with the stakeholders and contractors on environmental matters routinely and as required;
- Coordinate ongoing training in environmental awareness for all levels of WSA Co staff as required to implement this Biodiversity CEMP;
- Ensure that an appropriate environmental induction and training program is developed such that personnel are aware of their environmental responsibilities under relevant legislation and the contract, including the requirements associated with biodiversity management;
- Ensure compliance of Stage 1 development activities with this Biodiversity CEMP;
- Implement, maintain, monitor, report and advise the Executive General Manager on all environmental matters including those associated with biodiversity management;
- Liaise with the Infrastructure Department.  Environment Manager on environmental issues, including the written notification of non-conformances;
- Monitor the implementation of all environmental management requirements as detailed in this plan;
- Provide direction and guidance on implementation of this Biodiversity CEMP to all levels of the Project, including to the contractors as required;
- Ensure Project contractors comply with all relevant statutes, regulations, rules, procedures, standards and policies as detailed in this Biodiversity CEMP;
- Ensure the timely review and assessment of environmental monitoring, auditing and inspection outcomes to ensure identification and implementation of continual improvement with regards to environmental management; and
- Overall reporting of the environmental performance of the Project.

***WSA Co Site Environment Officer***

The environmental responsibilities of the WSA Site Environmental Officer include (but are not limited to):

- Daily interaction and coordination with Project contractor representatives to ensure their environmental management requirements are discharged; and
- Work collaboratively with the WSA Co Environment Manager to ensure desired environmental outcomes are achieved.

## 9.3 Western Sydney Airport Delivery Partner roles and responsibilities

The Western Sydney Airport Delivery Partner is responsible for the coordination and management of contractors ensuring all necessary planning approvals and environmental management activities and documentation are undertaken in accordance with WSA Co requirements.

In summary, the environmental requirements of the Western Sydney Airport Delivery Partner in relation to biodiversity management are as follows:

- Ensure that this Biodiversity CEMP is effectively implemented by the contractor as required;
- Ensure that the required monitoring and reporting, including environmental auditing, is undertaken and reported to WSA Co as required;

- Ensure that all necessary planning approvals, licenses and permits are obtained, as required by this Biodiversity CEMP, prior to commencement of applicable works;
- Liaise with the WSA Co Environment Manager on landscape and access related issues, including the written notification of non-conformances;
- Participate in regular workplace inspections to ensure compliance;
- Provide direction and guidance on implementation of the Biodiversity CEMP; and
- Liaise between contractors and relevant government stakeholders as required and provide notification / information where environmental incidents / events have occurred.

## 9.4 WSA Co contractor roles and responsibilities

***Contractor responsibilities***

The responsibilities of the relevant contractor with regards to the management of impacts associated with biodiversity are:

- Identify resources required for implementation of the Biodiversity CEMP;
- Report to the WSA Co Environment Manager as required to inform community and stakeholder notifications and to provide information where environmental incidents / events have occurred;
- Report to WSA Co Environment Manager (or delegate) on environmental performance monthly or at other times as necessary;
- Ensure that all personnel receive appropriate induction training, including details of the environmental obligations associated with biodiversity management;
- Ensure suppliers and subcontractors comply with requirements regarding biodiversity management;
- Undertake weekly inspections, ensuring all works comply with relevant regulatory and Project requirements, including biodiversity management objectives;
- Provide other information as required from time to time, in order to demonstrate to WSA Co that environmental management requirements are being met by the contractor;
- Program toolbox talks and daily pre-start meetings to include any relevant biodiversity management requirements;
- Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to WSA Co Environment Manager;
- Stop activities where there is an actual or immediate risk of harm to the environment and advise WSA Co Environment Manager;
- Ensure steps are taken to rectify and prevent future incidents from occurring;
- Ensure that biodiversity management controls are properly maintained and effective; and
- Carefully select suppliers and subcontractors based upon their ability to meet stated requirements.

# 10 Environmental inspection, monitoring and auditing

Monitoring, inspection and auditing will be undertaken to measure effectiveness and facilitate continuous improvement of biodiversity management.

General environmental monitoring, inspection and auditing requirements are summarised in Table 16 of the SEMF.

A summary of the environmental inspection, monitoring and auditing requirements is provided below, with details of how they apply to biodiversity management where applicable.

## 10.1 Environmental inspections

### *WSA Co environmental inspections*

Environmental site inspections will be undertaken by the WSA Co Environment Manager (or delegate) on a monthly basis to evaluate the effectiveness of environmental controls implemented by the contractor.

The monthly site inspection is to include a visual check of all biodiversity management control measures including but not limited to the following:

- Adherence to the designated traffic access and transport routes (this may include observation from strategic locations); and
- Ensuring that all vehicle movements (including contractors and sub-contractors) are compliant with the approved routes.

The findings of the WSA Co site environmental inspection will be recorded on a WSA Co Site Environmental Inspection Checklist with an accompanying photographic style inspection report.

Refer to Appendix B of the SEMF for further details with regards to completing the Site Environmental Inspection Checklist.

### *Contractor environmental inspections*

Regular site inspections will be undertaken to monitor compliance with this plan. Inspection results will be recorded, and the inspection log made available upon request. Any improvement opportunities or non-conformances will be reported in the monthly report and discussed at the Environmental Coordination meeting.

More frequent site inspections by the site environmental coordinator will be conducted onsite when activities with a large number of vehicle movements are underway.

### *Pre-start inspection*

Prior to the commencement of works on each shift, an inspection will be carried out by the relevant contractor and will include a check of relevant environmental controls, and allocate resources required to ensure effective operation and maintenance. This is to include an inspection of relevant biodiversity management mitigation measures and controls, where applicable. Works are not to commence unless inspections are found to be satisfactory.

## 10.2 Biodiversity monitoring

General environmental monitoring requirements are set out in the AEPR which will include the following:

- Monitoring must take place under the direction of an appropriately qualified person; and
- The results of the monitoring must be kept in a written record.

Specific biodiversity monitoring requirements, including timing and responsibilities, are included in Table 24.

**Table 24 Biodiversity monitoring requirements**

| Reference | Requirement | Timing | Responsibility |
|---|---|---|---|
| B_M_01 | Vegetation retention and restoration monitoring (refer to VMP for detail) | Prior to vegetation removal and establishment of no-go zones<br>AND<br>Ongoing post vegetation removal through to site operation. | Contractor |
| B_M_02 | Monitoring of Weeds (refer to Weed Management Plan for detail) | Prior to implementation of control measures<br>AND<br>Ongoing post weed control through to site operation. | Contractor |
| B_M_03 | Monitoring of vegetation clearing (refer to VMP for detail) | Prior to vegetation removal and establishment of no-go zones<br>AND<br>Ongoing post vegetation removal through to the cessation of construction activities. | Contractor |

Where a non-conformance or an improvement opportunity is identified, the non-conformance and improvement opportunity process described in Section 13 will be implemented.

## 10.3 Environmental auditing

Refer to Section 8.2 of the SEMF for environmental auditing requirements, including internal audits, independent audits and audits to be undertaken by contractors.

Auditing and subsequent reporting will be undertaken annually to ensure compliance with this BCEMP, Airport Plan Conditions of Approval and Part 13 Permit Conditions of Approval, as identified in Section 4 of this CEMP.

## 10.4 Environmental reporting

General environmental reporting requirements are detailed in Section 8.3 of the SEMF. In addition, a summary of reporting requirements required under this Biodiversity CEMP (including environmental reporting requirements required under the Airport Plan specific to the Biodiversity CEMP) is provided in Table 25.

**Table 25 Biodiversity management reporting**

| Action | Scope | Timing / Frequency | Responsibility |
|---|---|---|---|
| Annual reporting | Unless otherwise agreed in writing by an Approver, an annual report will be prepared t in relation to compliance with this Biodiversity CEMP (Condition 39). | Annual | WSA Co Environment Manager. |

| Action | Scope | Timing / Frequency | Responsibility |
|---|---|---|---|
| | In accordance with Condition 39 (2) WSA Co will publish each of the annual reports on its website within three months of the end of the period in respect of which the report was prepared, with evidence providing proof of the date of publication to the Infrastructure Department with a copy to the Environment Department. The report must remain on the website for a period of at least 12 months.<br>An annual report is also to be prepared and managed in accordance with section 6.03 of the AEPR. | | |
| Reporting pollution incidents (required under the Airport Act) | Report pollution incidents resulting in offsite impacts to the NSW Environment Protection Authority – refer to WSA Co *Environmental Non-conformance Classification and Reporting Procedure.* | As required | All |
| Complaints reporting | Recording of complaints and stakeholder interactions | As required | WSA Co Environment Manager and Contractor Environment Manager in consultation with the community and Stakeholder Engagement Manager |
| Environmental Site Register (required under the 6.02(3) of the AEPR) | Environmental Site Register to be kept and maintained to include written record of environmental conditions of the Airport and its environmental management generally. | As required | All |
| General environmental inspection | Inspection of environmental management controls on site and sighting of site documentation as required by the contractor's CEMP. | Minimum monthly | WSA Co |
| General environmental inspection | Inspection of environmental management controls and site documentation for contractor works (as required by the contractor's CEMP). | As per Contractor environmental management system (minimum weekly) | Contractor |

## 10.5 Environmental compliance tracking

In accordance with Condition 38 of the Airport Plan, a Compliance Tracking Program has been developed for the Project and is included in Appendix G of the SEMF. The Compliance Tracking Program will allow WSA Co to track compliance status with the conditions of the Airport Plan (and any other approval requirements) and will allow WSA Co to demonstrate measures taken to implement the Approved Plan. The Compliance Tracking Program will be used as a tool to inform the annual report (as detailed above in Table 25) and will be made available to the Infrastructure Department upon request as required. Refer to Section 8.3.2 of the SEMF for further details regarding the maintenance and implementation of the Compliance Tracking Program.

# 11 Competence, training and awareness

To ensure this Biodiversity CEMP is effectively implemented, each level of management is responsible for ensuring that all personnel reporting to them are aware of the requirements within. The WSA Co Environment Manager will coordinate the necessary and relevant environmental training in conjunction with other training and development activities.

All competence, training and awareness requirements will be implemented as detailed in the SEMF. A summary of these requirements is provided in the following sections.

## 11.1 Environmental Project induction

All Project personnel working on the Stage 1 development (including sub-contractors) are required to attend a compulsory Project induction that includes an environmental component prior to commencement of works on site, which will include:

- Summary of the significance of surrounding vegetation and fauna habitat in a regional context;
- Location of mapping of environmentally sensitive areas marked as no-go zones;
- Threatened species that may be encountered on site (where applicable);
- Points of contact for personnel if threatened species are encountered;
- Descriptions or works where ecologists may be required to supervise or support personnel (where applicable);
- Overview of dam dewatering protocols (where applicable);
- Site weed and pathogen protocols; and
- Bushfire management procedures.

Short-term visitors to site for purposes such as deliveries will be required to be accompanied by inducted personnel at all times. A visitors' induction will also be undertaken for visitors onsite for short periods as agreed with the WSA Co Safety Manager.

The WSA Co Environment Manager (or delegate) will be responsible for providing the environmental component of the Project inductions, ensuring that the environmental management requirements of this plan are incorporated.

A WSA *Co Induction and Training Register* will be maintained at all times including the details of all personnel who have completed the WSA Co Project induction and any other pertinent environmental training and or awareness forums (workshops, presentations etc.).

## 11.2 Contractor specific site inductions

In addition to the WSA Co Project induction, contractors will develop and implement their own environmental training and induction program relevant to their scope of works. A record of all environment inductions is to be maintained by the contractor and provided weekly to WSA Co.

## 11.3 Toolbox talks, training and awareness

Environmental issues associated with biodiversity management to be considered for toolbox talks may include (but are not limited to):

- Ensuring the location of sensitive areas are conveyed and understood by all site personnel, contractors and sub-contractors;
- Compliance with designated no-go zones; and

- Observation of requirements regarding unexpected or anticipated threatened species finds and the action taken to resolve the situation.

For activities with high environmental risk (as identified through the risk assessment process undertaken as part of the CEMP), targeted environmental awareness training is to be provided.

The WSA Co Environment Manager will establish a schedule of environmental training.

## 11.4 Daily pre-start meetings

The pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work.

Specifically with regards to this Biodiversity CEMP, the daily pre-start forum can be used as an opportunity to discuss the following:

- Distribution of map of environmentally sensitive areas marked as no-go zones in immediate vicinity of works;
- Threatened species that may be encountered on site;
- Points of contact for personnel if threatened species are encountered;
- Introduction of ecologists that may be present to supervise or support personnel; and
- Overview of dam dewatering protocols.

# 12 Communications and complaints management

All communications and complaints management will be implemented and managed in accordance with Sections 6 and 7 of the SEMF.

## 12.1 Complaints management

A Complaints and Enquiries Procedure, consistent with AS 4269: Complaints Handling, has been developed for the work, in accordance with the requirements of Condition No. 15 (Airport Plan, Section 3.10.2).

All community inquiries and complaints related to the construction activities will be referred to the 24-hour community information line (1800 972 972). A postal address (PO Box 397, Liverpool NSW 1871) and email address (info@wsaco.com.au) has been provided for receipt of complaints and enquiries. The telephone number, the postal address and the email address will be published in newspapers circulating in the local area prior to the commencement of construction and is provided on the Project website.

The community and stakeholder engagement team will take the lead in responding to complainants. Attempts will be made to resolve all complaints in accordance with the Community and Stakeholder Engagement Plan. Timeframes for initial responses to complaints are outlined below.

- Telephone complaints received during work hours will be provided a response within two hours. Complaints received outside of works hours will be provided a response within two hours of the next working day; and
- Email and postal complaints will be responded to within two (2) business days of receipt.

The aim is to resolve the complaint at the first point of contact, by providing a solution or negotiating an agreed course of action. The complainant will be provided updates on the progress of their complaint and a written response will be provided within 10 working days if the complaint cannot be resolved by the initial or follow up verbal response.

The community contacts database will be used as a complaints register. The database will be used to record, track and respond to complaints efficiently. Information on all complaints received, the means by which they were addressed, and whether resolution was reached with or without mediation shall be included in the construction compliance reports.

The WSA Co Environment Manager in consultation with the relevant contractor where required, will apply an adaptive approach to ensure that corrective actions are applied in consultation with the appropriate construction staff to allow modifications and improvements in the management of any environmental issues resulting in community complaints.

## 12.2 Community and stakeholder communication

Construction of the Stage 1 Development will involve a number of interactions with local residents, local councils and NSW Government agencies, among others. To ensure a consistent approach with regards to community and stakeholder management, WSA Co have developed a Community and Stakeholder Engagement Plan to address broader stakeholder engagement objectives during construction and to coordinate engagement activities for all environmental management issues during construction. For further detail with regards to community and stakeholder engagement, refer to Section 7.3 of the SEMF.

# 13 Environmental incidents, non-conformance and improvement opportunities

The management and reporting requirements of environmental non-conformances and improvement opportunities will be in accordance with Section 8.1 of the SEMF. The management and reporting of environmental incidents shall be undertaken by the appropriate person as detailed in Section 6 of the SEMF.

It should be noted that the management and reporting requirements associated with major accidents and emergency situations (for example a major chemical or hydrocarbon spill, fuel storage tank failure, surface fires, sediment basin failure) should be undertaken in accordance with the *WSA Co Emergency Preparedness and Response Procedure.*

# 14 Review and improvement

## 14.1 Continuous improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. This process is detailed in Section 9 of the SEMF.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance;
- Determine the cause or causes of non-conformances and deficiencies;
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies;
- Verify the effectiveness of the corrective and preventative actions;
- Document any changes in procedures resulting from process improvement; and
- Make comparisons with objectives and targets.

## 14.2 Change management

Further refinements to the Stage 1 Development may result from detailed design refinement or changes identified during the construction phase of the works. Any design changes or changes in scope of works will be communicated to the WSA Co Environmental Manager.

WSA Co would be responsible for assessing any potential inconsistencies with the Airport Plan and formally seeking approval from the Infrastructure Minister for any project modifications as required, prior to commencement of the scope of works in question.

## 14.3 Variation of approved plans

WSA Co will seek approval for variation of an Approved Plan from the Infrastructure Minister or an SES Officer (SES employee under the *Public Service Act 1999*) in the Infrastructure Department by submitting a version of the plan with the proposed variation clearly marked. All variations to an Approved Plan must be approved in accordance with Condition 41 of the Airport Plan. As each package of work is developed the SEMF and associated CEMPs documents will be reviewed and where applicable updated to ensure the environmental aspects of the work package are managed. Where necessary the document will be updated and submitted for approval in accordance with the Airport Plan prior to the work commencing. A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure, including update of the publicly available copy of the document on the Project website.

The Infrastructure Minister or an SES Officer in the Infrastructure Department may vary an Approved Plan or request WSA Co prepare and seek approval for a specified variation if the Infrastructure Minister or an SES Officer in the Infrastructure Department believes on reasonable grounds that:

- A Condition of Approval has been contravened and the nature of the contravention is relevant to the subject matter of the Approved Plan;
- The variation will address the contravention; and
- WSA Co will comply with any such request within three months.

## 14.4 Review of approved plans

WSA Co will review each approved plan at least every five years (from the date of approval) as required by the Airport Plan. A review will also be completed annually to ensure that it continues to meet the approval criteria. Details of the review will be included in the annual report (refer to Section 8.3 of the SEMF). If the review identifies areas where the plan does not continue to meet the approval criteria for that plan, a variation to the approved plan will be prepared and submitted for approval.

WSA Co may initiate reviews of Approved Plans at other times in response to improvement opportunities, non-conformances changes to scope of work or construction methodology; or alterations to legal or contractual requirements.

Any changes identified and implemented through the variation and review process identified above will be communicated to Relevant Contractors through re-issue of the revised WSA Co Approved Plan and subsequent training and awareness (refer to Section 5 of the SEMF).

# 15 References

Commonwealth Department of Infrastructure and Regional Development, 2016. *Airport Plan (December 2016)*

Commonwealth Department of Infrastructure and Regional Development, 2016. *Western Sydney Airport Environmental Impact Statement, 2016* Standards Australia 2001. *Australian and New Zealand environmental management international standard* (AS/NZS ISO 14001)

Department of the Environment, Water, Heritage and the Arts, 2010. Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest EPBC Act Policy Statement 3.31. http://www.environment.gov.au/system/files/resources/3c01d3d1-c135-4d91-a605-f5730975d78c/files/cumberland-plain-shale-woodlands.pdf.

Department of the Environment, Water, Heritage and the Arts, 2009. Significant impact guidelines for the vulnerable green and golden bell frog (*Litoria aurea*) EPBC Act policy station 3.19. < http://www.environment.gov.au/system/files/resources/e882f6c7-a511-4fba-9116-2f2f7ef941aa/files/litoria-aurea-policy.pdf>.

# Appendix A

# Biodiversity CEMP Consultation

# A1 Stakeholder consultation – Commonwealth Department of Environment and Energy

**Table A1 DoEE CEMP consultation summary**

| Input | Response / where addressed |
|---|---|
| ***Consultation prior to Rev 0 approval*** | |
| A response to an invite for comment on the Biodiversity CEMP was received from the Commonwealth Department of Environment and Energy (DoEE) on 26 July 2018. The relevant comments were addressed and considered in the preparation of the CEMP. Details with regards to how the DoEE comments were addressed are provided below.<br>A letter acknowledging receipt of the review comments from DoEE and how the comments were addressed was prepared and issued from WSA Co to DoEE in September 2018. | |
| We appreciate the opportunity to provide input into the development of the CEMPs. We are broadly comfortable with what is proposed and reiterate the need to ensure consistency with requirements of relevant conditions of the Airport Plan, particularly those related to protection and management of matters protected under the EPBC Act and the management of PFOS and PFAS. | Noted.<br>Refer to Section 4 of the CEMP for reference and details with regards to applicable legislation and guidelines.<br>Refer to the Soil and Water CEMP for further details with regards to the management / monitoring requirements for PFOS and PFAS. |
| ***Consultation prior to Rev 1 approval*** | |
| A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. | |
| No comments received from DoEE regarding the update of this Biodiversity CEMP. | Ongoing consultation to be undertaken in accordance with Section 1.5 of the Biodiversity CEMP and the Community and Stakeholder Engagement Plan. |

# A2 Stakeholder consultation – NSW Office of Environment and Heritage

**Table A2 NSW OEH CEMP consultation summary**

| Input | Response / where addressed |
|---|---|
| ***Consultation prior to Rev 0 approval*** | |
| A response to an invite for comment on the Biodiversity CEMP was received from NSW Office of Environment and Heritage (NSW OEH) on 26 July 2018. The relevant comments were addressed and considered in the preparation of the CEMP. Details with regards to how the NSW OEH comments were addressed are provided below.<br>A letter acknowledging receipt of the review comments from NSW OEH and how the comments were addressed was prepared and issued from WSA Co to NSW OEH in September 2018. | |
| *Table 1 – Biodiversity CEMP - Decommissioning Dams - dewatering of farm dams needs to be staged and the dormancy of fauna such as turtles considered.* | Covered in Aquatic Flora and Fauna Management Plan (Biodiversity CEMP, Appendix B) |
| *Table 2 – Biodiversity CEMP - Include Recovering Bushland on the Cumberland Plain (DEC 2005) as a guideline.* | CEMP has been updated to include the referenced guideline. |
| *Table 3 CEMP Targets – Question: If these are targets, how it is proposed to measure success in achieving the targets? What actions are proposed if the targets are not being met?* | Achievement of targets will be measures through inspection, monitoring and auditing provisions details in Section 10 of the CEMP.<br>Actions to be taken should the targets not be achieved will be facilitated through the processes described in Sections 10, 13 and 14 of the CEMP. |
| *Avoiding and minimise disturbance to terrestrial and aquatic flora and fauna in the Environmental Conservation Zone during construction;* | Environmental Control Measures (Table 22 of the Biodiversity CEMP) includes control measures to minimise disturbance to the ECZ during works. Additional management measures are included in the Biodiversity Management Protocols (Biodiversity CEMP, Appendix B). |
| *Avoiding and minimising adverse effects on terrestrial fauna by construction activities* | Environmental Control Measures (Table 22 of the Biodiversity CEMP) includes control measures for avoiding and minimising effects on terrestrial fauna during works. Additional management measures are included in the Biodiversity Management Protocols (Biodiversity CEMP, Appendix B). |
| ***Consultation prior to Rev 1 approval*** | |
| A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. A response to the invitation for comment on the Biodiversity CEMP was received from OEH and is summarised below. The relevant comments were addressed and considered in the preparation of this revision of the CEMP.<br>A letter acknowledging receipt of the review comments from OEH and how the comments were addressed was prepared and issued from WSA Co to OEH in December 2018. | |

| Input | Response / where addressed |
|---|---|
| *The Biodiversity CEMP, Table 2 references the Recovering Bushland on the Cumberland Plain (DEC 2005), this plan is out of date. The most up to date available is the Cumberland Plains Recovery Plan (OEH 2011). If a reference is required this should be utilised. Please note however, neither plan is recognised under the new legislation Biodiversity Conservation Act 2016 (BC Act). The 2011 plan was due for renewal and as such, is now out of date.* | Noted. The reference to the stated plan was requested by OEH during consultation received 27 July 2018 (refer to Table 2).<br>Based on this more recent consultation, reference to the Recovering Bushland on the Cumberland Plain (DEC 2005) has been replaced with the Cumberland Plains Recovery Plan (OEH 2011), and it is noted that this plan is not recognised under the new legislation Biodiversity Conservation Act 2016 (BC Act). |
| *A number of threatened ecological communities (TECs) and species have been recorded near the proposed Western Sydney Airport. If these threatened entities are currently present and are positioned outside of the impact/construction zone, protective fencing must be installed to protect the vegetation- referred to as sensitive environmental zone areas. No machinery/ plant equipment can enter these areas. Protection zones must be established prior to any clearing events. During the pre and post construction stages a buffer zone of 25m should be established around the vegetation. These areas should be identified as no-go zones for all construction works and a sign identifying the environmental sensitive area should be erected throughout the construction period.* | Noted. Sensitive areas will be identified in pre-clearance surveys and as known from existing data and site information. These areas will be managed in accordance with the Biodiversity CEMP and will specifically be addressed in the contractor Environmental Work Method Statements (EWMS) and Environmental Control Maps (ECMs).<br>Appropriate buffer zones will be implemented and identified as non-go zones. |
| *TEC's recorded in the footprint include Cumberland Plains Woodland (under both the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 and the BC Act NSW), River Flat Eucalyptus Forest (BC Act), Shale Gravel Transition Forest (BC Act), Moist Shale Woodland (BC Act), and threatened species: Pultenaea parviflora, Marsdenia viridiflora subsp. viridiflora.* | Noted. |
| *If any trees are currently present in the impact zones and due for clearing, a two-stage clearing principle should be applied (i.e. non habitat trees are removed first, and habitat trees (trees with hollows, nests etc) should be knocked over and left for 24 hours, then removed the following day.* | All pre-clearance surveys and habitat / vegetation clearing will be undertaken in accordance with the mitigation measures and controls outlined in Section 7 of this CEMP, including a two-stage clearing process as required. |
| *All areas of remnant natural vegetation including the TECs and threatened species must be identified by a qualified ecologist as part of pre-clearance surveys. Any threatened entities should be GPS monitored and marked with flagging tape or similar.* | As noted in Section 7 of this CEMP, pre-clearance surveys for threatened species will be undertaken by a qualified ecologist. Pre-clearance surveys will take into account suitable survey conditions for the threatened species present and / or potential within the Airport Site. Specific management plans will be prepared to manage impacts on each threatened flora and fauna species. |
| *Sedimentation and erosion controls should be established around the remnant vegetation (including the TEC and T/S) to protect it from runoff, sedimentation build up, erosion and weed invasion impacts.* | All erosion and sedimentation management will be implemented as per the WSA Co Soil and Water CEMP, including down-gradient protection measures and sediment capture prior to departure form site. |
| *If planting or bush regeneration management actions are proposed in the remaining remnant vegetation (including the TEC and T/S) than a Biodiversity Conservation Licence (Threatened Species licence- previously referred to as a Section 91 Licence to harm under the Threatened Species Conservation Act 1995) under the Biodiversity Conservation Act 2016 must be* | Noted. |

| Input | Response / where addressed |
|---|---|
| *applied for with the NSW Office of Environment and Heritage and best practice guidelines and all recovery strategy guidelines for the TEC and T/S must be followed.* | |
| *No foreign soil materials should be stock piled in close vicinity or within the remnant vegetation areas (including the TEC and T/S).* | Noted.<br>All vegetation to be retained will be identified / delineated with exclusion fencing with appropriate no-go signage. |
| *Hygiene protocols must be established for all soil introduction to the site, as well as for the movement of plant vehicles on site to prevent the spread of disease to the threatened biota and the spread of weeds to the remnant vegetation.* | Section 5.2 of the Weed and Disease management plan (Biodiversity CEMP Appendix C) outlines the biosecurity hygiene protocol steps required to minimise the spread of weeds and pathogens.<br>Section 6.3 of the Weed and Pathogen management plan details the weed management actions to be undertaken prior to clearing, during construction and post construction within the Project area. It also includes recommended treatment methods for Priority weeds and environmental weeds known to occur within the Airport Site. |
| *A plan of management for the remaining threatened biota should be established and a monitoring program to identify the current and future condition of each entity.* | Management of retained vegetation and restoration, including monitoring is included in the Vegetation Management Plan (Biodiversity CEMP Appendix D).<br>Ongoing monitoring and management of remaining threatened biota, beyond the scope of the construction phase of works, will be addressed in the Operational Environmental Management Plan and associated documents. |

# A3 Stakeholder consultation – NSW Rural Fire Service

**Table A3 RFS CEMP consultation summary**

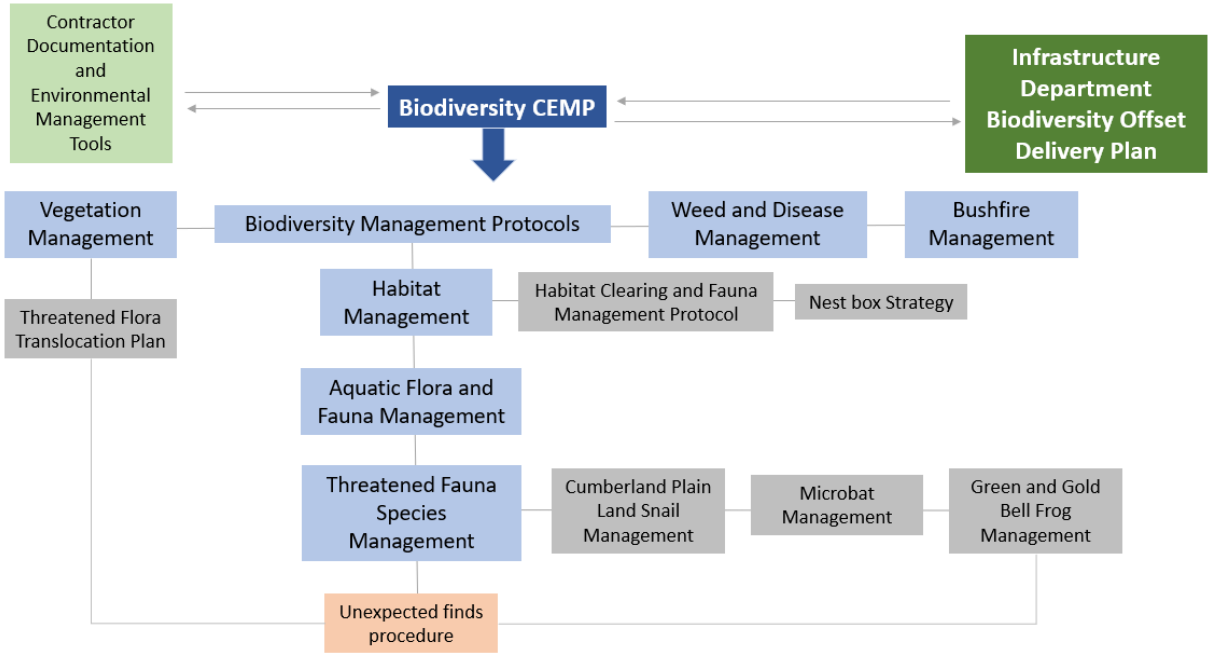
| Input | Response / where addressed |
|---|---|
| ***Consultation prior to Rev 0 approval*** | |
| A response to an invite for comment on the Biodiversity CEMP was received from NSW Rural Fire Service (RFS) on 26 July 2018. The relevant comments were addressed and considered in the preparation of the CEMP. Details with regards to how the RFS comments were addressed are provided below.<br>A letter acknowledging receipt of the review comments from RFS and how the comments were addressed was prepared and issued from WSA Co to RFS in September 2018. | |
| *NSW Rural Fire Service are please to advise that the NSW RFS Macarthur District Office has maintained ongoing dialogue with various representatives of the WSA Project since early 2014 and most recently attended a meeting on 29 June 2018 with WSA Co.* | Acknowledged. |
| *In regards to the 'Bushfire Management Plan' referred to within Table 1, NSW RFS would like to clarify that it should actually State 'Bushfire Risk Management Plan'.* | Noted. The name of the management plan has been changed as requested. |

| Input | Response / where addressed |
|---|---|
| *Superintendent Paul Norton from the NSW RFS Macarthur District Office will continue to be the primary contact with WSA Co.* | Acknowledged. WSA Co. will continue to consult with Superintendent Paul Norton. |
| ***Consultation prior to Rev 1 approval*** | |
| A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. A response to the invitation for comment on the Biodiversity CEMP was received from RFS and is summarised below. The relevant comments were addressed and considered in the preparation of this revision of the CEMP.<br>A letter acknowledging receipt of the review comments from RFS and how the comments were addressed was prepared and issued from WSA Co to RFS in December 2018. | |
| *As the NSW RFS [the Service] has raised at the monthly site stakeholder meetings, could we please ensure that regular spatial updates are made to site access and egress points as the works and fencing commence and that these are passed to NSW RFS as they are done. Could the maps also include the location of site emergency assembly points and any dangerous goods / fuel stores etc.* | Noted this information will be provide as requested<br>Details of site emergency assembly points and any dangerous goods / fuel stores etc are detailed on site in the emergency site procedures |
| *The Service has also requested that clear signage displaying alphanumeric identifications be established at each of the gates, access / egress points around complete operating footprint of the site and that these are labelled on any spatial information for the benefit of Emergency Services.* | Noted, this detail included in the Traffic and Access CEMP. |

# Appendix B

## Biodiversity Management Protocols:

- **Habitat Management Sub-plan**
- **Aquatic Flora and Fauna Management Sub-plan**
- **Threatened Species Management Sub-plan**



# Western Sydney Airport

## Biodiversity Management Protocols

XX December 2018

Western Sydney Airport

## Revision History

| Revision | Date | Description | Author | Reviewer |
|---|---|---|---|---|
| A | 11/09/2018 | Incorporation of Biosis information and draft review for comment | WSA Co | S Reynolds |
| B | 17/09/2018 | Draft for review | WSA Co | S Reynolds |
| C | 21/09/2018 | For approval | WSA Co | S Reynolds |
| 0 | 24/09/2018 | Approved | WSA Co | S Reynolds |
| 0.1 | 09/11/2018 | Draft updated to address comments on inclusion of new scope (Visitor centre, Site Accommodation and Material Importation) updated to address WSU comments on Biodiversity CEMP | WSA Co | S Reynolds |
| 0.2 | 07/12/2018 | For approval | WSA Co | S Reynolds |
| 1 | TBC | Revision update to include the Visitor Centre Site Accommodation and Material Importation | WSA Co | S Reynolds |

## Plan Authorisation

| Position | Name | Signature | Date |
|---|---|---|---|
| Environment Manager | S Reynolds | | 07/12/2018 |

# Contents

# Appendices

# 1 Introduction

In April 2014 the Australian Government announced that the Commonwealth-owned land at Badgerys Creek will be the site for a second Sydney Airport. The Badgerys Creek airport site was selected following extensive studies completed over a number of decades.

In December 2016, the Minister for Urban Infrastructure determined the Airport Plan which sets the environmental and planning authorisation for the development of Stage 1 of the Western Sydney Airport (WSA Stage 1). In May 2017, the Government announced that it would establish WSA Co, to develop and operate the airport. WSA Co is responsible for constructing and operating Western Sydney Airport in accordance with the Airport Plan.

An EIS has been prepared in accordance with the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Airports Act 1996. The EIS considered potential impacts during construction activities for the site and operation of the Stage 1 and long term development of the proposed airport.

The Western Sydney Airport is expected to be developed in stages to match demand and include planning for services and amenities that are easily expandable over time, providing scalable capacity for aircraft, passengers, cargo and vehicle movements.

Stage 1 will include major site preparation, removing or relocating infrastructure from the site and earthworks to prepare the airport site, establishing the Airport with a single 3,700 metre runway located in the north-western portion of the Airport Site, a terminal and other support facilities to provide an operational anticipated capacity of approximately 10 million regional, domestic and international passengers per year, as well as freight traffic (the Stage 1 development).

The scope of works for the Stage 1 Development is defined in the Airport Plan and will generally include the investigation, design, construction and commissioning of:

- Bulk earthworks to move and redistribute approximately 24 million cubic metres of material on the Airport Site
- A single 3.7-kilometre runway;
- Aprons, taxiways and other airside pavements;
- A multi-user terminal;
- Appropriate airport and aviation support facilities;
- Drainage and utilities infrastructure;
- Car parking, on-site roads and other appropriate landside facilities.

## 1.1 Project background

A series of sub-plans are required as appendices of the Biodiversity Construction Environment Management Plan for the Western Sydney Airport site at Badgerys Creek, NSW. These sub-plans are required to be developed to ensure compliance with project approvals.

This Biodiversity Management Protocols provides controls and actions required to manage the retained ecological features within the Airport Site (Figure 1).

## 1.2 Description of Airport Site

The Western Sydney Airport will be developed on around 1,700 hectares of Commonwealth-owned land at Badgerys Creek in Western Sydney (Airport Site). The Airport Site is approximately 50 kilometres from Sydney's central business district.

The Airport Site is bounded by Elizabeth Drive to the north, Willowdene Avenue to the south, Luddenham and Adams Road to the west and Badgerys Creek to the east. The existing terrain is made up of undulating topography, and substantial earthworks are required to create a level surface to allow construction of the runway, taxiways and support services.

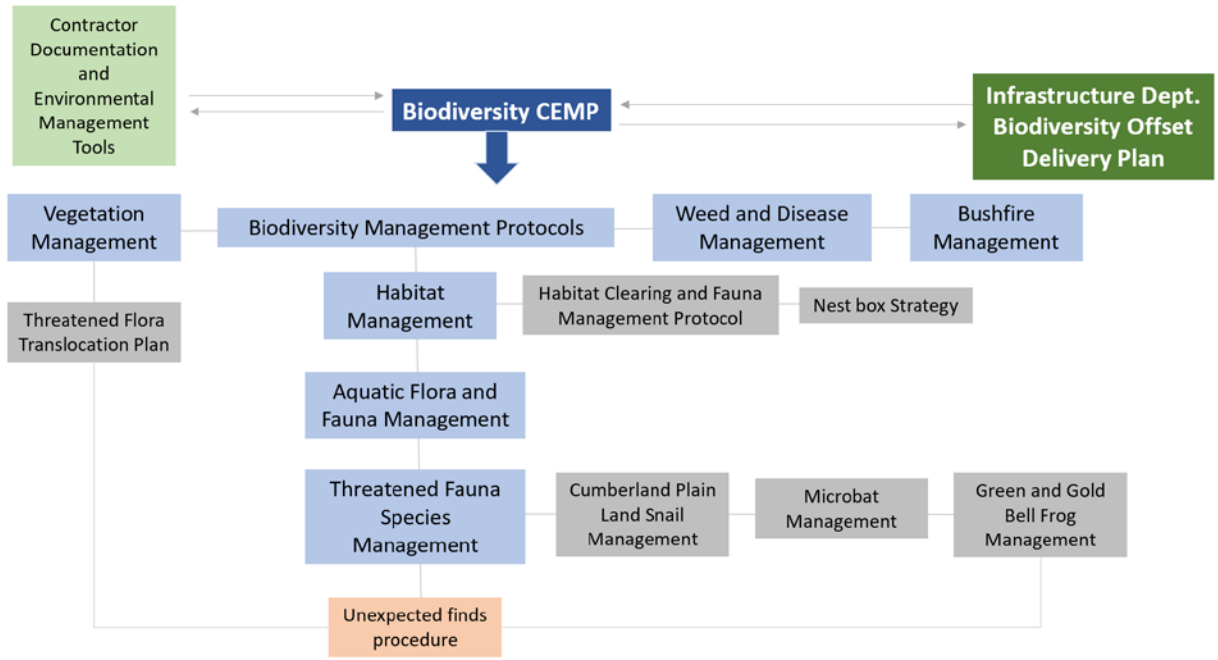
## 1.3 Management Protocols

The requirements of the following biodiversity management sub-plans will be addressed within this Biodiversity Management Protocols document. This is illustrated in Figure 1.

- Habitat Management Sub-plan including the Habitat Clearing and Fauna Management Protocol and Nestbox Strategy;
- Aquatic Flora and Fauna Management Sub-plan
- Threatened Fauna Species Management Sub-plans, including Microbat Management Sub-plan, Cumberland Plain Land Snail Management Sub-plan, and Green and Golden Bell Frog Sub-plan.

Ongoing review of these management plans will be undertaken, and plans will be adjusted in line with the Adaptive Management Strategy detailed in Section 8.

**Figure 1 Biodiversity documents**




The preclearance survey report and annual reporting will also be used to indicate where potential improvements can be made and where improvements are possible, measures will be implemented as part of an ongoing adaptive management strategy for the Project (as appropriate).

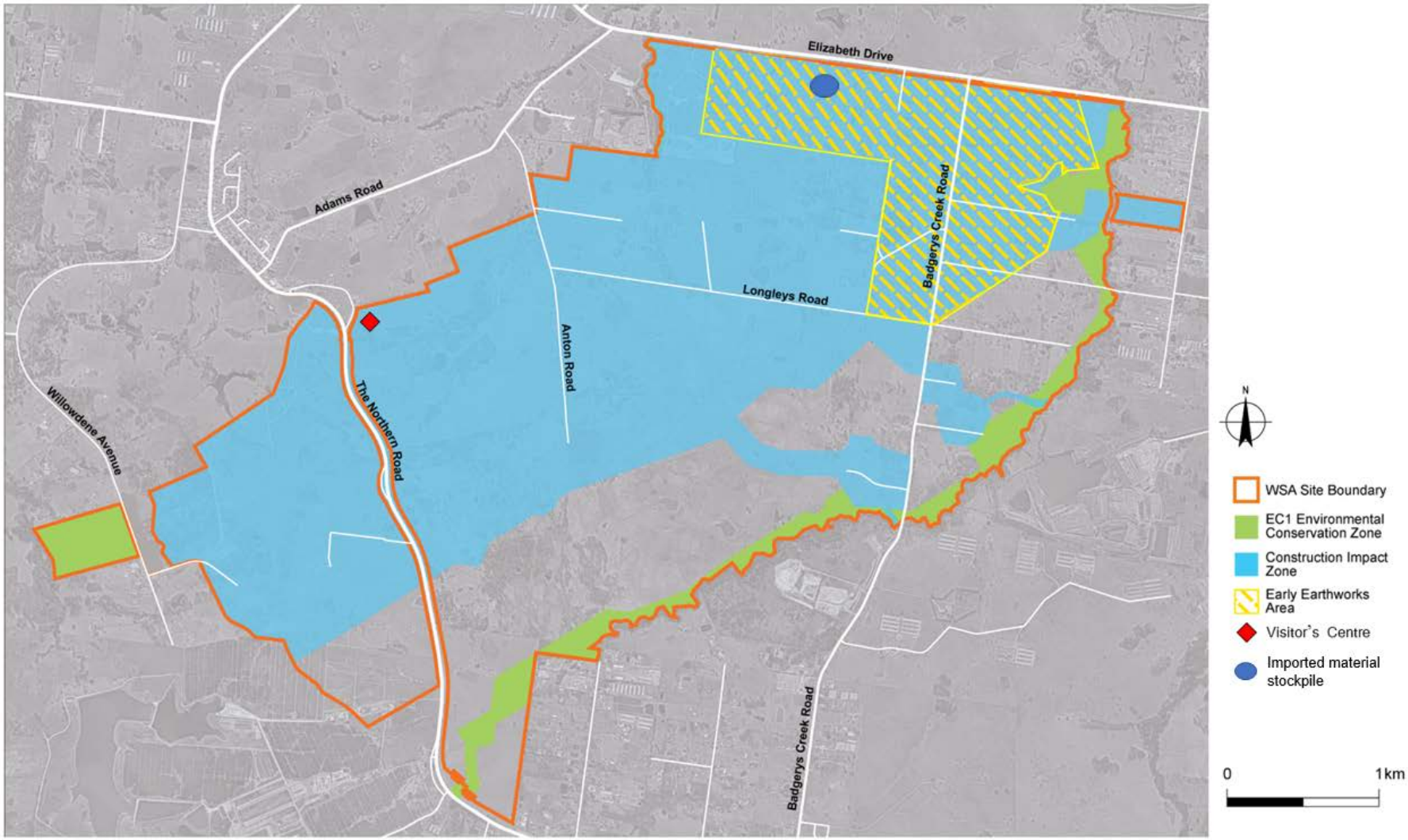



**Figure 2 Stage 1 Development location plan**

# 2 Scope and objectives

## 2.1 Objectives of the Habitat Management Sub-plan

The Habitat Management Sub-plan aims to address the requirements of the Habitat Clearing and Fauna Management Protocols and Nestbox Strategy through addressing the following:

- Strategies to achieve connectivity throughout the landscape and minimise the effects of habitat fragmentation and associated edge effects
- Pre-clearance surveys to be conducted by a suitably qualified ecologist to map hollow-bearing trees, logs and existing nest boxes that would require supervision during removal
- Necessary rehabilitation activities to mitigate the risk of reduced reproductive success of biota
- A Nest box Management Strategy, including:
  - Maps and data to show hollow-bearing trees proposed to be removed and the number of hollows associated with each tree

  Provisions for the installation of nest boxes within the Environmental Conservation Zones prior to clearing areas of native vegetation on the airport site

  Reuse of hollows and fallen debris within conservation areas

  The number of nest boxes to be installed, commensurate with the number of hollows proposed to be removed

  Provisions for salvage of native fauna from existing nest boxes in the construction impact zone prior to their removal and translocation

  A guide on the installation of nest boxes and the appropriate design specifications

  A monitoring program for the monitoring of the nest boxes.
- Designated offset sites, with additional or alternative offset sites outlined for compensatory measures e.g. nest box installation
- Schedules for inspection, monitoring, management and corrective actions.

## 2.2 Objectives of the Aquatic Flora and Fauna Management Sub-plan

The Aquatic Flora and Fauna Management Sub-plan aims to address the following:

- Protocol for dam decommissioning/dewatering
- Dewatering of dams (at the right time of year, i.e. avoid nesting season of waterbirds) to allow the relocation of fauna species
- Salvaging and relocation of aquatic vertebrate fauna, including frogs, turtles and eels, to areas of suitable habitat retained at the airport site or nearby habitats, with regard to numbers and identification of suitable release sites
- Establishing protocols for humane euthanasia of aquatic fauna, including fish
- Identification of potential risks and mitigation measures for watercourse functionality, riparian and aquatic habitat and fish passage as a result of the design and construction of waterway crossings
- Describe weed management activities (i.e. the eradication of Alligator Weed on the dammed section of Oaky Creek near Elizabeth Drive prior to any works in the vicinity) (also see Weed and Disease Management Plan)
- Provide schedules for inspection, monitoring, management and corrective actions.

## 2.3 Objectives of the Threatened Species Management Sub-plan

The threatened species management sub-plan details the requirements for Microbat; Cumberland Plain Land Snail (CPLS); and Green and Golden Bell Frog (GGBF).

Targeted surveys will be undertaken by a suitably qualified ecologist as part of the preclearance surveys to determine the presence of threatened microbats, CPLS and GGBF within the Airport Site. If present or likely to be present, the following will be addressed in the respective Management Plans:

- Map of identified areas of occurrence
- Unexpected Finds Protocol
- Legislative requirements
- Protocols for potential relocation, habitat management and ecological supervision
- Schedules for inspection, monitoring, management and corrective actions.

## 2.4 Management measures

The biodiversity management measures that are directly relevant to this Biodiversity Management Protocols are outlined in Table 1.

**Table 1 Biodiversity management measures relevant to this plan**

| ID | Measure/ requirement | Reference | When to implement | Responsibility | Where to address |
|---|---|---|---|---|---|
| **Biodiversity Management** | | | | | |
| Environmental Management | A Biodiversity Construction Environmental Management Plan (BCEMP) will be prepared, including the specific mitigation/management measures and sub-plans listed below along with work methods, contingencies, roles and responsibilities.<br>The mitigation/management measures included in the CEMP and sub-plans would be implemented during pre-construction and construction stages. | EIS (GHD 2016) | Pre-construction<br>Construction | Environmental Coordinator | BCEMP |
| **Threatened Fauna Species Management** | | | | | |
| Threatened fauna management sub-plan (e.g. GGBF, CPLS and Microbats) | Threatened fauna species management plans should be prepared to reduce the potential for impacts on relevant species. These should include:<br>• Maps identifying locations of threatened species<br>• Scope and requirements for targeted surveys, pre-clearing surveys<br>• Unexpected Finds Protocol, including for occurrences of threatened species previously recorded in the broader area, but not previously recorded at a specific location | EIS (GHD 2016) | Pre-construction | Environmental Coordinator<br>Contractor/s | Project Inductions<br>BCEMP |

| ID | Measure/ requirement | Reference | When to implement | Responsibility | Where to address |
|---|---|---|---|---|---|
| | • Salvage and translocation of threatened species as per the measures recommended below<br>• Clearing protocols.<br>o reporting and adaptive management measures | | | | |
| **Habitat Management** | | | | | |
| Habitat clearing and fauna management protocol | Pre-clearance surveys will be undertaken by a qualified ecologist. Target threatened species surveys would be undertaken as part of preclearance works (as discussed above). In addition to targeted surveys for the GGBF, CPLS and microbats, preclearance surveys would also target:<br>• Hollow bearing trees and other habitat features<br>• Larger birds' nests, particularly the White-bellied Sea-Eagle and Little Eagle<br>• Threatened flora species in areas of appropriate habitat with particular attention to the vicinity of known populations of *Marsdenia viridiflora* subsp. *viridiflora* and *Pultenaea parviflora.*<br>• Any unexpected finds would be communicated to the Department and addressed in the translocation plan | EIS (GHD 2016) | Pre-construction | WSA Co<br>Environmental Coordinator<br>Project Ecologist | This document |

| ID | Measure/ requirement | Reference | When to implement | Responsibility | Where to address |
|---|---|---|---|---|---|
| | and/or offset delivery plan as appropriate.<br><br>Additionally, measures for the management of impacts on fauna species during clearing activities will be implemented, including:<br>• Establishing protocols for the staged clearing of vegetation, safe tree felling and log removal to reduce the risk of fauna mortality<br>• Protocols for the capture and relocation of less mobile fauna (such as nesting birds and nocturnal fauna) by a trained fauna handler<br>• Salvage of native fauna form existing habitat on the Airport Site and translocation of fauna to suitable habitat<br>• Protocols for the appropriate management of injured or deceased individuals. | | | | |
| Nestbox Strategy | • Design of nestboxes<br>• Installation of nest-boxes within conservation areas prior to clearing areas of native vegetation on the airport site to provide a safe location for hollow-dwelling fauna to be transferred to during clearing operations | | | | |

| ID | Measure/ requirement | Reference | When to implement | Responsibility | Where to address |
|---|---|---|---|---|---|
| | • Reuse of hollows and fallen debris within environmental conservation zone (where appropriate). | | | | |
| **Aquatic Flora and Fauna** | | | | | |
| Dam decommissioning (pre-construction) | A protocol for the decommissioning of dams should be developed in consultation with relevant agencies, and should include, but not be restricted to, the actions described below:<br>• Dam removal should follow any requirements of a Green and Golden Bell Frog management plan if one has been prepared<br>• The Alligator Weed infestation on the dam at the quarry should be eradicated prior to any works in the vicinity<br>• Existing dams within the footprint should be progressively emptied to allow fauna to relocate as the water is removed. Smaller dams should be emptied by water carts directly pumping the water into their tanks, larger dams will have a standpipe installed<br>• A pre-removal survey should be conducted to ensure no birds are breeding<br>• Salvage and relocation of aquatic vertebrate fauna, including frogs, | EIS (GHD 2016) | Pre-construction | Environmental Coordinator<br>Project Ecologist | This document<br>Inductions |

| ID | Measure/ requirement | Reference | When to implement | Responsibility | Where to address |
|---|---|---|---|---|---|
| | turtles and eels, to areas of suitable habitat retained on the Airport Site or adjoining habitats should be undertaken with regard to numbers and identification of suitable release sites<br>• Eastern Gambusia (*Gambusia holbrooki*) and other noxious fish should not be released into local waterways as a result of draining of farm dams. Eastern Gambusia should be eradicated from dams using humane methods<br>• Protocols for the humane euthanasia of aquatic fauna, including fish, should be specified and implemented. | | | | |

# 3 Habitat management plan

## 3.1 Habitat connectivity

The impacts of the construction of the Western Sydney Airport have been specified in the project EIS, Appendix K1 Biodiversity - Table 67. It has been acknowledged that construction, lighting, aircraft movement and traffic within the 4 kilometre by 2 kilometre project area would represent a significant barrier to fauna species. The operation of an international airport is not conducive to improvement of fauna habitat connectivity and, as such, is not considered further in the preparation of this habitat management plan.

## 3.2 Preclearance surveys

A key aim of the pre-clearance surveys will be to identify and map the presence/absence of threatened biota. Additionally, a suitably qualified ecologist will undertake pre-clearing surveys to:

- Identify all locations of trees, habitat features (hollow bearing trees, logs and existing nest boxes) and any other plants which have been marked or otherwise identified for preservation
- Inspect bridges and/or culverts prior to demolition for the presence of native fauna (particularly roosting bats)
- Inspect farm dams and surrounding habitat prior to dewatering for presence of aquatic fauna – including frogs, turtles and eels
- Identify the presence or evidence of the presence (including fresh scats, scratches and remains of prey) of fauna, including threatened species
- Identify the presence of raptor nests, particularly White-bellied Sea-Eagle *Haliaeetus leucogaster* and Little Eagle *Hieraaetus morphnoides*
- Identify Threatened Ecological Communities (TECs), delineating areas within and outside of the study area
- Mark all hollow bearing trees, potential hollow bearing trees, logs, nest boxes, and all other fauna-containing habitat trees, including trees with nests, dreys and termitaria likely to be occupied by fauna, at least seven days prior to the commencement of clearing in a manner which clearly identifies and demarcates the trees.

Following the completion of the pre-clearing surveys, a report or brief letter will be submitted to WSA Co. within five working days detailing works undertaken. The report will include:

- Description of the presence of threatened flora species
- Description of the presence or evidence of fauna (including fresh scats, scratches and remains of prey), including threatened species
- Recommended actions to avoid the potential for harm to any fauna during clearing, including protocols for staged clearing of vegetation, safe tree felling, and a two-stage tree and log removal process
- Measures to avoid disturbance to surrounding vegetation during clearance works
- Measures to avoid the spread of weeds and pathogens in accordance with the weed and disease management plans
- Locations of habitat features marked during preclearance surveys

## 3.3 Nest Box strategy

### 3.3.1 Background

It is widely recognised that tree hollows are an important habitat source for a range of fauna. In NSW, terrestrial vertebrate species that are known to be reliant on tree hollows for shelter and/or nesting include at

least 46 mammals, 81 birds, 31 reptiles and 16 frogs (Gibbons & Lindenmayer 1997, Gibbons & Lindenmayer 2002). However, tree hollows are often depleted in modified landscapes, particularly in eastern Australia, the rate of tree hollow loss is accelerating as a result of increasing urban development (Goldingay 2011).

Many hollow-dependant fauna will readily take to artificial hollows, most commonly as nest boxes attached to trees (Beyer & Goldingay 2006). The use of these hollows by fauna may depend on a number of factors, including hollow characteristics (diameter, height, depth), landscape position, tree health, location and the thermoregulatory capabilities of the hollows themselves (Gibbons & Lindermayer 2002).

The Airport Site mainly consists of exotic grassland, with areas of Grey Box – Forest Red Gum grassy woodland, Forest Red Gum – Rough-barked Apple grassy woodland, Broad-leaved Ironbark – Grey Box – Melaleuca decora grassy open forest, artificial freshwater wetlands and cleared land. Within these vegetation zones there is suitable habitat (hollow-bearing trees) for a range of hollow-dependent fauna. In addition to natural tree hollows, a number of nest boxes have already been installed within the airport site. A portion of these nest boxes now fall within the boundaries of the current airport footprint and will be offset as part of this Nestbox Strategy.

## 3.3.2 Methodology

Initial hollow-bearing tree (HBT) surveys were conducted as part of a larger fauna habitat assessment by GHD over 18 days between February to May 2015. The results of these surveys were incorporated into the EIS for the Project (GHD 2016). The methodology (below) used for recording HBTs will also be used by a suitably qualified ecologist to undertake additional HBT surveys encompassing the Airport Site in its entirety.

### *Hollow-bearing tree inventory*

Tree hollows were only recorded if:

- The entrance could be seen from the ground
- The hollow appeared to have depth
- The hollow was at least 1 metre above the ground (basal hollows were only recorded if they continued up into the tree above 1 metre).

The location of each hollow-bearing tree was recorded with a hand-held GPS unit.

### *Hollow characteristics*

For each individual HBT, the following data was collected:

- Whether the tree was dead or alive
- The species of tree (if alive)
- Height of the tree
- Diameter at breast height (DBH) of the tree
- Approximate number of hollows
- Estimated size of hollows based upon diameter entrance.

## 3.3.3 Results

### *Project Landscape*

The majority of the Airport Site contains grassland with fenced grazing land (GHD 2016). These areas would have previously supported native woodland vegetation but have been extensively modified by previous clearing and agriculture. However, there is a relatively extensive network of drainage lines and waterbodies across the airport site, and large, hollow-bearing trees occur in high densities along these riparian corridors.

These hollow-bearing trees may be removed as part of the project, and will require offsetting with artificial nest boxes.

Apart from riparian corridors the airport site contains only moderate quantities of pre-European occupation age trees and associated habitat resources such as tree hollows and stags. The hollow-bearing trees recorded contain hollows with a range of sizes, orientations and landscape positions, in both living and dead trees (GHD 2016).

#### *Hollow-bearing tree inventory*

GHD recorded approximately 50 hollow-bearing trees during the habitat assessment conducted in 2015 (GHD 2016). A suitably qualified ecologist will conduct a further comprehensive hollow-bearing tree survey across the Airport Site. A catalogue of the hollow-bearing trees located within the site during this survey will be provided in a preclearance report. Each tree will be identified to species.

#### *Hollow characteristics*

GHD reported that hollow-bearing trees recorded during the habitat assessment contained hollows of a range of sizes, orientations and landscape positions. A suitably qualified ecologist will record the number of hollows present in each hollow-bearing tree, as well their size and location. This information will be provided in a preclearance report.

#### *Existing nest boxes*

A suitably qualified ecologist will record the number, location and characteristics of nest boxes already present within the Airport Site. It is recommended that all nest boxes that will be impacted by the project should be relocated to areas immediately adjacent the project footprint, as close to the original location as possible. It should be noted that some of these boxes may lie on the boundary of the project footprint and may not be impacted by the project. An assessment should be made during pre-clearing surveys prior to construction to determine which nest boxes require re-location.

### 3.3.4 Nest box placement strategy

The installation of nest-boxes in suitable habitat within the Environmental Conservation Zone is proposed as a compensatory mechanism for the loss of habitat trees which are to be removed for the project. The number, type and location of nest boxes required will be determined as a result of the completion of the HBT survey by a suitably qualified ecologist, and will be based on the number, quality and size of the hollows to be removed, taking into consideration the hollow-dependent fauna species identified as inhabiting the area, or likely to inhabit it.

#### *Hollow-dependent fauna*

The hollows within the Airport Site may provide nesting/roosting habitat for a range of fauna species. For example, large hollows may provide nesting resources for owls and cockatoos, whilst smaller hollows may provide habitat for gliders or microbats.

A suitably qualified ecologist will use the HBT catalogue to determine the hollow-dependent fauna that might be using the current hollows within the Airport Site. This may include both threatened and common species. The Nestbox Strategy will target both common and threatened species, as providing some boxes for common species in addition to threatened species ensures that nesting/roosting habitat for the range of species which may be displaced by the works will be provided. Additionally, targeting common as well as threatened species is considered to be beneficial due to the complex relationships between common and threatened species. For example, increasing nesting habitat for common arboreal mammals, such as Common Ringtail Possums (*Pseudocheirus peregrinus)* and Common Brushtail Possums (*Trichosurus vulpecula)*, has the flow-on effect of improving the foraging value of the area for Powerful Owl (*Ninox strenua*), a threatened species.

Nevertheless, as common species tend to be less particular about nest box dimensions and locations, the hollow strategy will be targeted more towards threatened species, with the expectation that a proportion of

the boxes designed for threatened species will be occupied by common species. This approach is designed to facilitate an improved overall conservation outcome.

#### *Catalogue of hollow resources*

A catalogue of hollow-bearing trees and their hollow resources will be provided, as well as a description of the general locations, and conditions of these resources.

### 3.3.5 Number and type of nest boxes required

#### *Proposed number of nest boxes required*

Information gathered by GHD and a suitably qualified ecologist will be reviewed and the number of nest boxes required will be provided here. Based on the Biodiversity Guidelines - Guide 8 Nest Boxes (RTA 2011) it is recommended that a 1:1 ratio of nest boxes for each hollow removed will be adequate to offset impacts on hollow-bearing trees within the airport site.

Following vegetation clearing, the final number of nest boxes required (as determined by the actual number of tree hollows being removed) will be refined up or down. The final number of nest boxes required will be reported once all vegetation clearing has been completed.

#### *Types of nest boxes required*

The number of each type of nest box required will be calculated on a proportional basis (i.e. reflecting the proportion of hollows likely to be used by each species known to occur in the area), with the final ratio determined based upon knowledge of hollow use in the locality. This stage of the assessment will also involve an appraisal once the clearing works have been completed and a final tally of the actual numbers of hollow-bearing trees and tree hollows to be removed based on the detailed design.

Following pre-clearing inspections, the final number of nest boxes required will be reported. The ratio of nest box types installed will reflect the types of hollows present as well as the home ranges of species being targeted. The distribution of nest boxes for each fauna group will be determined by the Project Ecologist based on the presence/absence of suitable habitats and the likelihood of occupancy by target species in any given area.

### 3.3.6 Nest box specifications

#### *Background*

This section of the Nestbox Strategy will provide recommendations and guidance on the provision of nest boxes as a compensatory mechanism for the loss of habitat trees within the airport site, inclusive of den, roosting and nesting resources. It will also specify nest box dimensions, installation requirements, locations of nest boxes and ongoing monitoring and maintenance.

The number and type of nest boxes required will be determined as a result of the completion of pre-clearance surveys, and will be based on the number, quality and size of the hollows to be removed, taking into consideration the threatened hollow-dependent fauna species potentially inhabiting the Airport Site (detailed above).

Nest boxes will then be installed to compensate for the loss of hollow-bearing trees within the Airport Site. Installation and maintenance will be undertaken in accordance with the Guide 8: Nest Boxes of the Biodiversity Guidelines (RTA 2011). This plan will consider placement of nest boxes in adjacent habitats and Conservation areas, focusing effort on areas of naturally low abundance of hollows

#### *Nest box construction and design*

The design of nest boxes will be recommended according to each target species. A table will be provided showing a summary of specifications for nest boxes targeting specific species of threatened fauna groups that are known to, or considered likely to, occur in the airport site.

While recognising the different nest box dimensions, the constructed nest boxes should also include number of additional species-specific design considerations into account. For example, the thermoregulatory capabilities of the nest boxes should be considered, particularly for bats as this is considered to significantly influence roost use (Gibbons & Lindenmayer, 2002).

Furthermore, the design of the positioning and fastening mechanism should be sturdy and stable, preferably with a slight forward lean to assist with drainage whilst allowing for growth in the host tree. The preferred option for bracketing is the Habisure system (Franks & Franks 2006). This has the advantage of allowing at least one metre growth in the diameter of the host tree before adjustment is required, is non-invasive to the tree and provides the required security. However, other suitable bracketing options will also be explored and may be used for nest box installation.

### *Reducing competitive interactions*

A number of pest species, both native and exotic, may be relevant to this plan and are known to utilise both natural hollows and nest boxes. These have been outlined in Table 2 along with measures to reduce nest occupation by these species. During monitoring of nest boxes, the ecologist will select the most appropriate measure/s for removal or deterrence of pest fauna. This may require the use of professional pest control personnel e.g. for bee hive removal, and/or the installation of a replacement box.

**Table 2 Possible measures to reduce invasion by introduced/ pest species**

| Potential invading species | Measures to prevent or discourage use* |
|---|---|
| Ants | Talcum powder applied to the entrance and edges of the nest box to deter ants. |
| | Talcum powder sprinkled inside of the box incites ants to leave, and lanolin grease around the edges of the box prevents them from returning. |
| | Ring of grease around trunk of smooth-skinned eucalypt encourages colony to leave the box. |
| | Open bottom prevents ant infestations in bat boxes. |
| Wasps | 2 cm roost spacing discourages wasp infestations in bat boxes. |
| European Honeybee *Apis mellifera* | Insecticide strip placed inside box kills bee colonies; however, this practice is hazardous. |
| | Lining the ceiling of nest box with carpet prior to installation may thwart attachment of wax comb to ceiling. |
| | A small box volume reduces incidents of hive building. |
| | Greasing the underside of the lid and top of the walls with marine grease or lanolin prevents bees from attaching honeycomb. |
| | 2 cm roost spacing discourages bee infestations in bat boxes. |
| Common Myna *Acridotheres trisis* | A board of ply attached to overhanging box lid and positioned approximately 10 cm parallel to the front face (i.e. side including entrance hole) of the box successfully excludes the common myna, but not native species. Rosella boxes can be purchased with an anti-myna baffle attached. |
| | Nest removal deters nesting, but may need to be repeated several times. |
| Common Starling | Starlings actively avoid nest boxes with painted white interiors. |

| Potential invading species | Measures to prevent or discourage use* |
|---|---|
| *Sturnus vulgaris* | |

*Adopted from Gleeson & Gleeson 2012

#### *Installation of nest boxes*

Nominated nest boxes should be installed prior to the proposed clearing works (preferably within two weeks of clearance of vegetation) with the objective of providing temporal refuge habitat for those hollow dependent fauna displaced during clearing operations. The remaining nest boxes should be installed following clearing. Occupancy rates of tree hollows during the clearing supervision may also facilitate the final number and types of nest boxes being installed. The Project Ecologist will be responsible for determining whether adjustment to nest box numbers or types is required, based upon the hollows recorded during pre-clearing assessment.

#### *Location of nest boxes*

The selected location and positioning of nest boxes is considered to be a fundamental component of this plan, given that it will ultimately determine the effectiveness of nest boxes as a mitigation tool.

As a general rule, nest boxes should be installed on large mature trees (DBH > 400 mm) close to or on the main trunk. Within each of the nest box installation areas, the behavioural ecology of the target species should be considered, together with aspect, height, installation techniques and the spatial arrangement or density of nest boxes, to determine the fine-scale installation locations and specifications.

The following should be taken into account by the Project Ecologist when considering the fine scale locations of nest boxes.

- Studies have suggested that there is a spatial trend in the occupancy pattern of nest box use where nest boxes used for arboreal marsupials (specifically gliders) placed in a clump of four had greater occupancy rates over time (Lindenmayer et al. 2003). For this reason, it is recommended that nest boxes for glider species be installed in clumps of four boxes in some locations.
- The fine-scale position of the nest box on the host tree has also been considered, specifically in the context of predominant weather patterns and light and noise disturbances arising from the Project. It is proposed that nest boxes be installed with their entrances facing away from the lights of the traffic and from a north-west to south-easterly position on the tree trunk to provide additional shelter from the rain and wind (i.e. dominant rain is from the south-east). Where this is not possible, an alternative for some fauna groups (e.g. gliders) is to have the entrance facing the tree. This requires a gap of around 100 mm to be maintained between the nest box entrance and the tree.
- It is recommended that nest boxes be placed high off the ground (i.e. at least 2 m) to protect the occupants from predation and low enough to allow for safe monitoring and maintenance. Nest boxes should be installed by a specialist nest box contractor with appropriate tree climbing certification (i.e. Arborist Tree Climbing Certificate and Work Safely at Heights certification). Monitoring and maintenance would preferably be undertaken from the ground by ecologists using pole-mounted cameras.

### 3.3.7 Nest Box Monitoring and Maintenance

Monitoring and maintenance has been included to evaluate the effectiveness of the nest boxes. As such, it will be important to assign each nest box a number and ensure its location is recorded using a GPS. This section details the timing, frequency and methods for monitoring. Nest box maintenance is discussed further below.

#### *Timing and frequency*

Bi-annual spring and autumn monitoring is recommended to be carried out from installation during Stage 1 Development. A brief monitoring report will be produced after the completion of each monitoring survey. This report will outline the results of the monitoring and recommendations for maintenance or replacement. It is

assumed that nest boxes will be effectively utilised within the allocated monitoring period; however, a review should be undertaken to determine whether further monitoring is required.

The timing of monitoring and maintenance activities is outlined in Table 3. Further detail is provided below.

**Table 3 Timing of nest box management actions**

| Management Action | Year 1 | Year 2 | Year 3 | Each year until 4 years post construction | Responsibility | Documentation Requirements |
|---|---|---|---|---|---|---|
| Prepare Nest Box Plan | X | | | | Contractor Ecologist | This document |
| Construction of Nest Boxes | X | | | | Contractor | N/A |
| Install Nest Boxes | X | | | | Contractor | This document |
| Post-installation Inspection | X | | | | Ecologist | Nest box post-installation report |
| Spring and Autumn Monitoring | | X | X | X | Ecologist | Annual reporting provided to Contractor and WSA Co. |
| Maintenance of Nest Boxes | | X | X | X | Contractor | N/A |

### *Nest box monitoring*

The number and type of nest boxes required for the Project will be provided following HBT surveys conducted by an ecologist. Once installed, twice-yearly monitoring will be required to determine the usage of nest boxes by the target species and inform any maintenance requirements.

During each monitoring event, a visual inspection of each nest box will be conducted from the ground (using cameras mounted on extension poles) to collect the following data using a field proforma:

- Inspection dates, weather conditions (i.e. rain, wind, cloud cover, ambient temperature) and time each box was inspected
- Nest box number
- Is the nest box currently occupied by native fauna?

  If yes, which species?

  If no, are there signs of use and can the species be identified or assigned to a group (i.e. bats, birds)?
- Has the nest box been used by a pest species (i.e. European Bees, Common Myna, Termites)?
- Is there any deterioration of the nest box?
- Is there any maintenance required?
- Has the surrounding landscape changed (e.g. clearing or partial clearing)?

Visual inspection would enable the observer to perform a close inspection for signs of feathers, droppings/scats, hair, nesting material or individuals themselves. At this time some maintenance considerations/actions could be undertaken. For example, aspect of nest boxes could be changed to address thermoregulatory considerations.

### *Nest box maintenance*

It is recommended that nest box maintenance should occur following the monitoring schedule provided in Table 3. This allows for the monitoring activities to inform the level of maintenance that is required. Factors to be considered as part of the maintenance schedule include the following.

- The need to remove exotic pest species such as Common Mynas, Common Starlings and European Bees
- Replacement of fallen, damaged or degraded nest boxes. The location of damaged boxes would need to be reported
- Repositioning, re-installation or relocation of nest boxes
- Checking that each box is not holding water or leaking
- Removing excess nesting material, which may impede access over time.

### *Performance indicators and corrective actions*

Determination of appropriate performance indicators will be refined following completion of clearing operations. The results of observations made of felled trees during clearing will enable final calculation of the actual number of hollows present (as opposed to the number estimated from ground-based assessments) and the number of hollows showing signs of fauna utilisation. The performance of the nest box program will be assessed against the following parameters.

- Use of nest boxes by a wide range of native fauna
- Use of nest boxes by the species they were designed for
- Low rates of exotic fauna using nest boxes
- Low maintenance requirements.

Performance Indicators and appropriate corrective actions are outlined below in Table 4.

**Table 4 Nest box performance monitoring and corrective action plan**

| Performance indicator | Corrective actions | Responsibility |
|---|---|---|
| Nest boxes are being used by a wide range of native fauna, including target species. | Review the location, type and number of nest boxes used. Install additional boxes or relocate boxes if deemed necessary. | The lead contractor is responsible for engaging suitably qualified ecologists to undertake the monitoring and suitably qualified contractors to undertake the maintenance |
| A low rate (< 20%) of occupation by exotic or invasive fauna. | Review/ change nest box design and/or placement on tree to exclude undesirable species, treat if applicable or relocate those nest boxes to another location. | |
| A total of <5% of nest boxes requiring maintenance over a 4 year span | Identify causes of nest box failure, modify design and construct accordingly. | |

# 4 Aquatic Flora and Fauna Management Plan

Construction in Stage 1 Development would comprise of the infilling of stream outlets, including the upper reaches of Oaky Creek and smaller drainage lines that feed into Badgerys, Cosgroves and Duncans Creeks, which are currently situated within the Stage 1 Construction Impact Zone.

The existing tributaries are highly modified (high levels of eutrophication as a result of runoff from nearby urbanisation and domination by environmental and priority weeds) and in poor condition as a result of historical and current land uses. The current aquatic fauna assemblage within these creeks is indicative of their poor quality.

Badgerys Creek will be retained within an environmental conservation zone, as outlined in the Airport Plan.

## 4.1 Protocol for dam decommissioning and dewatering

The protocols for undertaking dam dewatering and salvage of aquatic fauna have been developed with the aim of minimising harm to resident aquatic fauna, ensuring maintenance of ambient water quality and prevention of the spread of aquatic weeds.

The staging for dam decommissioning and aquatic fauna salvage will adhere to the following steps:

- Suitable recipient sites for salvaged aquatic fauna are to be determined within the locality of the project area prior to commencement of decommissioning
- The water quality of the recipient site is to be assessed prior to release to ensure adequacy of conditions for individuals to be released
- Site inspection of each dam, one week prior to commencement of decommissioning, to record water quality measurements, identify priority aquatic weeds, presence of breeding/nesting waterbird, determine salvage equipment requirements and site safety considerations
- Discuss and implement and weed control measures, with particular focus on the prevention of the spread of Alligator Weed *Alternanthera philoxeroides* propagative material
- Site manager is to coordinate the setup of pumps and commence dewatering of the dams until the maximum depth of the dam is no greater than 1.2 metres. The project ecologist is to be notified that dewatering has commenced and DPI Fisheries is to be notified in accordance with a current DPI Fisheries Research Permit
- The project ecologist is to undertake activities to salvage aquatic fauna using a range of equipment to be determined by the prevailing site conditions including seine nets, fyke nets, dip nets, electrofishing and hand collection
- Pumping operations are to continue until the project ecologist is satisfied that fauna salvage operations are no longer required or ineffective
- The dam wall is to be broken to drain the remaining water, with any remaining aquatic fauna to be collected in fyke nets staked at the break in the dam wall
- Aquatic fauna salvaged during dewatering is then to be relocated to the identified recipient site(s)
- Removal of silt and capping of dam bed can then commence.

### 4.1.1 Salvaging and relocation of fauna

The collection, handling and storing of aquatic fauna will be undertaken by experienced aquatic ecologists and operate under an approved DPI Fisheries scientific collection permit.

All aquatic vertebrate fauna collected will be identified to species level and any notes taken on their general condition including lesions, presence of Lernaea, ulcerations and fin deformities. Any species identified as Noxious under the *Fisheries Management Act 1994* (FM Act) and any moribund native species are to be euthanised, in accordance with animal ethics approvals. Animal ethics approvals (Animal Research

Authority) is to have been issued by, and in accordance with, the Animal Care and Ethics Committee of the Secretary NSW Department of Primary Industry.

All aquatic fauna are to be held in appropriately sized containers, tubs and buckets, fitted with aerators and shading to prevent overheating or asphyxiation of animals.

## 4.2 Euthanasia of fauna

Euthanasia of fish and larvae in the field is achieved by overdose of AQUI-S (175 mg/L – 20 mins). Euthanasia of crustaceans in the field is achieved by overdose of AQUI-S (250 mg/L – 20 mins). Where euthanasia using overdose of AQUI-S is infeasible, such as for larger species (e.g. Carp), then euthanasia will be achieved via blunt trauma with a fish bat. Blunt force trauma involves delivery of sufficient force to the brain case of the fish to cause mortality with minimal distress of the animal.

Rationale for euthanasia follows an assessment by suitably qualified aquatic ecologists on a case by case basis and includes a determination of the survival of the individual based on physical condition, level of parasitism, injury or damage to critical functions (e.g. compromised iso-osmotic barrier, gill trauma, blood loss). These assessments are continually conducted during processing identifying potentially affected individuals. These individuals are then placed in separate containers with adequate aeration to assist recovery. Affected individuals are constantly monitored and if recovery is not observed then the individual is immediately euthanised by the most appropriate method for the species.

Certain species are to be euthanised under permit restrictions (i.e. listed noxious species). Listed noxious species in New South Wales include Common Carp, Eastern Gambusia and Oriental Weatherloach. These individuals are separated from species to be returned to the water and are euthanised as soon as practicable to minimise distress associated with restraint and handling. Post-processing of euthanised fish may include length and weight measurements, gut analysis and taking of genetic samples and otoliths.

## 4.3 Weed management

A severe infestation of Alligator Weed was identified within the dammed section of Oaky Creek during EIS investigations undertaken by GHD (2016). Alligator Weed is identified as a Weed of National Significance (WoNS) and is a Priority Weed under the *Biosecurity Act 2015* (NSW) (Biosecurity Act), and spreads via vegetative reproduction. The biosecurity duty as specified under the Biosecurity Act requires land managers to ensure that the risk associated with the species is prevented, eliminated or minimised as far as reasonably practical. Therefore the management procedures prescribed herein, when implemented, will ensure compliance with this duty.

The following steps are to be undertaken to ensure that Alligator Weed does not pose a biosecurity risk to the project area and surrounding lands.

**Step 1**

Dewater dam on Oaky Creek by pump fitted with an inline filter to minimse uptake of Alligator Weed vegetative material, with the water to be distributed overland (preferably a section proposed to be capped) with a silt fence installed downslope to catch any unfiltered propagules.

**Step 2**

Monitor site to identify growth of propagules, with particular attention to the land that the water was discharged over. If any plants are identified, the soil is to be scraped back into the dam on Oaky Creek.

**Step 3**

The entire bed, bank and wall of the dam (along with residual sediment laden water) is to be excavated until biological matter is no longer present within the soil strata.

**Step 4**

Excavated material is to be buried at depth of approximately two metres and clay capped.

**Step 5**

All machinery, nets, holding tanks and footwear is to be washed down within the silt fenced area prior to leaving site.

**Step 6**

Site is to be monitored monthly with any re-emergent plants to be treated using Metsulfuron-methyl 600 g/kg based product at a dilution rate of 10 g per 100 L water until such a time as no new plants have been recorded

### 4.3.1 Performance indicators and corrective actions

**Table 5 Aquatic flora and fauna management performance measures**

| Performance indicator | Corrective actions | Responsibility |
|---|---|---|
| Mortalities of native aquatic fauna identified during dewatering activities. | Monitor levels of dissolved oxygen during draining of the dams and undertake aeration of the waterbodies as necessary. | The lead contractor is responsible for engaging suitably qualified aquatic ecologists to undertake the monitoring and suitably qualified contractors to undertake the operation of the draining of the dams. |
| Dam bed deemed unsafe to undertake fauna salvage. | Excavate sumps/pits in the dam bed and drain water to the base level of the dam bed. Project ecologist (Aquatic) is to instruct excavator operators on the correct procedures to undertake the aquatic fauna salvage using the sumps/pits. | |
| Aquatic fauna are identified by construction personnel following dam dewatering and salvage. | Contact the project ecologist (Aquatic) to provide advice or attend the site to relocate | |

# 5 Microbat management plan

## 5.1 Targeted surveys

A suitably qualified ecologist will undertake targeted surveys for microbats and potential microbat habitat (e.g. hollow-bearing trees, rock outcrops, culverts etc.) within the airport site prior to the implementation of the management plan.

Microbats identified in the Western Sydney Airport EIS (GHD 2016) as being either present, probably recorded (via Anabat) or possibly likely to occur within the study area include:

- East Coast Freetail Bat *Mormopterus norfolkensis*
- Eastern False Pipistrelle *Falsistrellus tasmaniensis*
- Eastern Bentwing Bat Miniopterus schreibersii oceanensis
- Large-footed Myotis *Myotis macropus*
- Greater Broad-nosed Bat *Scoteanax rueppellii*
- Eastern Cave Bat Vespadelus troughtoni
- Yellow-bellied Sheath-tail Bat *Saccolaimus flaviventris*.

The microbat targeted surveys will also involve visual ground-based inspections using spotlights and binoculars to detect existing roost habitat. Once identified, the location, species, number of individuals (or estimate if many) and any evidence of breeding (e.g. presence of juveniles) will be recorded at each roost site. An ecologist may also deploy ultrasonic call detector Anabats over two nights at known or suspected roosting sites. Collected call data will be analysed to determine species present and activity levels.

Following the completion of the targeted Microbat surveys, a report or brief letter will be submitted which includes mapping of relevant ecological values and habitat features within five working days, detailing the results of the survey.

## 5.2 Preclearance and exclusion

Pre-clearance surveys are to be undertaken during the day of all suitable areas with the potential to support microbat habitat prior to the commencement of works. All potential habitat is to be inspected to confirm if microbats are present.

All potential habitat found not to support microbats during pre-clearance surveys AND considered likely to be impacted by proposed works is to have temporary exclusion measures installed to prevent microbats from moving in.

Exclusion measures are to include:

- Thick tape (such as bitumen tape) or plywood installed over the habitat with the use of an emulsion fluid painted directly onto the culvert
- Expanding foam is not to be used due to difficulties in removal post-construction
- Exclusion measures are to be installed immediately following pre-clearing surveys by an ecologist to ensure microbats do not move into the habitat overnight
- Exclusion measures are to be confirmed sufficient and effective by a qualified ecologist prior to moving on to the next phase of works.

Habitat not considered likely to be impacted by the works are to remain available to any displaced microbats. Where exclusion measures are not practical and/or cannot be achieved a suitably qualified ecologist is required to supervise the works and relocate microbats to nearby suitable habitat if found.

If microbats are found to be present during pre-clearance inspections, temporary exclusion measures are to be installed overnight once the bats have left the roost to forage. Planned roost exclusion can be conducted

from November to March under the supervision of a qualified ecologist to ensure all microbats have vacated the roost.

The following safeguards must be considered to minimise potential impacts to displaced bats:

- Ensure that this procedure is not conducted during an extensive dry period (drought) as this could be detrimental and lead to mortality, if there is no nearby suitable habitat
- Avoid conducting this procedure during windy, full-moon, cold or rainy nights, as there is a lower likelihood of roost exodus

If works and exclusion of roosting bats are required during the colder months (April to September), when many culvert roosting bats enter torpor (hibernation state), the following additional safeguards must be adhered to:

- Nocturnal monitoring of roost activity is to be undertaken by a qualified ecologist and bats must be confirmed as leaving the roost to forage on at least two separate occasions prior to installation of exclusion measures
- If bats are not confirmed as leaving the roost to forage (i.e. in winter torpor) additional monitoring is to be undertaken until regular foraging has resumed
- Works are not to impact upon culverts with bats present in winter torpor.

Additional safeguards that must be considered when exclusion devises are installed include:

- Avoid the breeding season between April and May, as this could disrupt the reproductive success of a population
- All roost exclusion should be done after dusk, once individuals have emerged to feed and an ecologist is satisfied no microbat individuals remain within the roost
- Roosting habitat that has been sealed must be regularly monitored to ensure the sealing mechanism remains intact and no microbats are able to utilise the habitat. If it is suspected that the exclusion mechanism has failed then an ecologist must re-inspect the habitat before the seal is reapplied
- Alternative roosting habitat should be made/left available wherever possible when undertaking passive roost exclusion
- All exclusion devices must be temporary and be easily removed following completion of the works. Removal of exclusion devices is to be confirmed by an ecologist
- Potential impacts to bats in winter torpor or during breeding season must be avoided.

Reports are to be provided outlining the findings of pre-clearance assessments and detailing the exclusion measures installed (if required).

Vegetation removal surrounding any culverts should be undertaken during the day and wherever possible. Maintaining appropriate exclusion zones and managing night works by ensuring noise and light pollution is kept to a minimum through the breeding and lactation period (April and May) in the vicinity of identified microbat habitat.

Should habitat be excluded at one end of a culvert due to the need to undertake works, the opposite end of the culvert where habitat may remain un-impacted (and not excluded) should have any vegetation blocking the fly-way removed to mirror the end of the culvert known to allow entry/exit for bats i.e. ensure both ends of the culvert allow access to any habitat that remains inside. If bats are present in torpor within a structure, fortnightly winter monitoring should be conducted during upgrades or maintenance works to ensure that over-wintering roosting colonies are not being adversely impacted by ongoing maintenance works.

Monitoring reports are to be provided outlining the findings of each inspection. A conclusion must be made as to the successful removal of any installed exclusion measures.

## 5.3 Additional microbat management actions

**Table 6 Microbat impact management strategies**

| Environmental management measures | Description | Timing |
|---|---|---|
| Nest-box offsets and management | All tree hollows recorded as suitable microbat habitat during surveys will be included in the nest-box management plan and monitored accordingly (Section 5.3). | Pre-works |
| Unexpected finds protocol | If a microbat is encountered unexpectedly during works, all activities that may affect the individual or its habitat will be ceased until an ecologist is present and can collect the individual. This would also be communicated to the Environment Coordinator Any such individuals will be recorded and translocated accordingly. | During works |

# 6 Cumberland Plain Land Snail Management Plan

## 6.1 Background

The Cumberland Plain Land Snail (CPLS) is listed as an endangered species under the *Biodiversity Conservation Act 2016* (NSW) (BC Act). The species lives in small areas on the Cumberland Plain west of Sydney, from Richmond and Windsor south to Picton and from Liverpool west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. It faces a range of threats such as clearing of Cumberland Plain Woodland, removal of shelter material, weeds, inappropriate fire regimes and predation. (OEH 2018).

The Cumberland Plain Land Snail primarily inhabits Cumberland Plain Woodland, which is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest (OEH 2018).

The snail is superficially similar to the familiar exotic Garden Snail *Helix aspera*, but differs most obviously in its 25 - 30 millimetre diameter shell. While this shell may be almost any shade of brown, it is always uniform in colour, while that of the Garden Snail consists of dark patches on a pale background. A green or yellow tinge may be present. The Cumberland Plain Land Snail also has a more flattened shell that is very thin and fragile, compared with the thick shell of the Garden Snail. The underside of the shell tends to have a glossy appearance and is semitransparent, enabling the observer to see the animal colour and some internal organs. The upper side of the shell has a coarse wrinkly appearance. The Cumberland Plain Land Snail lives under litter of bark, leaves, logs or rubbish, or shelters in loose soil around grass clumps. It can dig several centimetres into the soil to escape drought (OEH 2018).

## 6.2 Targeted surveys

Targeted surveys will be completed by a suitably qualified ecologist (in suitable conditions) to determine the occurrence of Cumberland Plain Land Snail habitat and individuals within the airport site. Surveys will need to be completed in accordance with the Environmental Impact Assessment Guidelines: Cumberland Plain Land Snail (NPWS 2000). Field surveys will be undertaken following a period of rain. Moist conditions are considered favourable for Cumberland Plain Land Snail searches, as the species is easily detectable. Searches will be undertaken by lightly raking at the leaf litter and soil in areas of potential habitat. Where the soil is friable, it will be raked to a few centimetres below the surface. This is because in dry conditions, the snail is known to burrow into the ground in search of moisture.

If individuals or shells are found during targeted surveys they will be relocated as per the protocol detailed below. The occurrence of both Cumberland Plain Land Snail individuals and habitat within the airport site will be mapped, to guide further pre-clearance surveys, salvage and translocation.

Cumberland Plain Land Snail habitat will be considered ‘good’ if the following components are present:

- Abundant logs and building refuse
- Abundant leaf litter
- Remnant vegetation
- A large patch size or connectedness to adjoining habitat
- More than 10 % open ground cover with low abundance of dense exotic grasses.

Cumberland Plain Land Snail habitat will be considered ‘moderate’ of the following components are present:

- A low abundance of logs or building refuse
- Moderate leaf litter
- Regrowth vegetation
- A small patch or fragmentation
- Less than 10 % open ground with a patchy mix of plant cover.

If habitat has no logs, leaf litter, natural vegetation or open ground cover it will be considered ‘poor’.

## 6.3 Pre-clearance

Following mapping of Cumberland Plain Land Snail individuals and habitat, any area of habitat which will be removed or impacted during works will require the following pre-clearance protocol to be undertaken:

- Searches will involve a sweeping of the area by a qualified ecologist, focusing on areas of higher quality habitats and where snails have previously been located
- Searches will target the base of native trees, accumulated leaf litter, moist areas such as drains and depressions, under fallen logs, rubbish and rubble and around clumps of grass
- Searches will involve gently scraping back the leaf litter to expose the soil profile. In dry environments, loose soil may be disturbed to a maximum depth of 10 centimetres at the base of trees using a hand trowel
- All salvaged individuals will be identified, measured (diameter), photographed, and their location recorded in a hand-held GPS. A brief description of habitat context including the location, tree species and condition the individual was captured
- The snails will be temporarily stored in moist leaf litter within a 20 litre bucket while collections are being completed
- A total number of live snails and shells will also be recorded for each pre-clearance survey.

If due to unforeseen circumstances there is a delay of more than two weeks between surveys and the clearing of vegetation, additional surveys may be required.

## 6.4 Translocation

Salvaged Cumberland Plain Land Snail and suitable shelter sites will be relocated into appropriate habitat nearby the airport site on the same day as being salvaged from the area to be cleared of vegetation. Appropriate recipient sites will be discussed with OEH prior to translocations. Individuals are to be transported with some moist leaf litter from the salvage site to the recipient site. Leaf litter should be taken from areas where weed densities are low. Similarly, large fallen wood debris or trees to be removed will be relocated to the recipient site prior to clearing of vegetation within the project area.

Relocated Cumberland Plain Land Snails should be placed under leaf litter, beneath Forest Red Gum or similar microhabitat to where the snail was located within the salvage site. Relocation of Cumberland Plain Land Snails into the recipient site is to occur within 100 metres of the captured location, where possible.

Only invertebrates listed as threatened under the BC Act (i.e. Cumberland Plain Land Snail) will be relocated into the adjacent recipient site during pre-clearance surveys. Introduced species such as the Garden Snail will be destroyed if found during the pre-clearance surveys. If identification of individuals is difficult, especially for juvenile specimens, then individuals will be recorded as Cumberland Plain Land Snail and relocated, however, a confidence assessment will be used to determine the level of accuracy (Certain, Probable or Possible).

Relocated Cumberland Plain Land Snails will be released into the recipient site at similar densities to those found during the salvage surveys. Where possible, recipient sites should include a large extent of moderate-high quality habitats to prevent overcrowding of new/existing populations. To mitigate the risk of competition between Cumberland Plain Land Snail individuals, no more two individuals may be released at the base of a native tree with a diameter at breast height (DBH) of 20 centimetres. This can be increased proportional to DBH, to up to five individuals around larger trees (e.g. 100 centimetres DBH). Where possible, individuals found at under the same tree, or structure, will be relocated together.

## 6.5 Unexpected Finds Protocol

If a CPLS individual is encountered unexpectedly during works, all activities that may affect the individual or its habitat will be ceased until an ecologist is present and can collect the individual. This would also be communicated to the Department. Any such individuals will be recorded and translocated accordingly. This is detailed further in Appendix C of the Biodiversity CEMP.

# 7 Green and Golden Bell Frog Management Plan

## 7.1 Background

The Green and Golden Bell Frog is listed as Vulnerable under the Commonwealth EPBC Act, and as Endangered under the NSW BC Act. It is a relatively large frog, ranging from approximately 45 millimetres to 100 millimetres snout to vent length. Its distinguishable features include a gold or creamish white stripe running along its side, extending from the upper eyelids almost to the groin, with a narrow dark brown stripe beneath it, from nostril to eye. It also has blue or bluish-green colour on the inside of its thighs. The colour of the body varies, and is usually vivid pea-green splotched with a metallic brassy brown or gold (OEH 2017).

The species were formerly distributed from the NSW north coast near Brunswick Heads, southward along the NSW coast to Victoria and into East Gippsland. Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, isolated, coastal or near-coastal populations (OEH 2017).

Green and Golden Bell Frog inhabit marshes, dams and stream-sides, favouring unshaded water bodies containing bullrushes or spike rushes. Some populations occur in highly disturbed areas (OEH 2017). The species will be subject to targeted surveys between the end of November and January in accordance with the *Survey Guidelines for Australia's Threatened Frogs* (CoA 2010).

## 7.2 Site Hygiene Management

A water-borne fungal pathogen *Batrachochytrium dendrobatidis*, commonly known as frog chytrid fungus, is responsible for the disease Chytridiomycosis (NPWS 2001). The accidental introduction or spread of this pathogen has the potential to adversely affect frog populations, and must be managed accordingly.

When travelling between potentially infected sites it is recommended in the Threatened Species Management Information Circular No. 6 – Hygiene Protocol for the Control of Disease in Frogs (NPWS 2001) that the following hygiene precautions be taken if the GGBF is determined to be present at the Airport Site:

- Hands, arms, knees etc. should be cleaned to remove debris and washed or wiped with a suitable disinfectant before entering the vehicle or moving to another site
- Footwear should be thoroughly cleaned and disinfected at the commencement of fieldwork and between each site. This can be achieved by initially scraping boots clear of mud and standing the soles in a disinfecting solution. The remainder of the boot should be rinsed or sprayed with a disinfecting solution. Clothing that has significant contact with frogs and the environment should also be subjected to changing or cleaning
- Disinfecting solutions should be prevented from entering any water bodies
- Any equipment used on site should be cleaned and disinfected before use at another site
- If a vehicle is to transverse a known frog site the wheels and tyres should be cleaned and disinfected prior to travelling to another site.

Recommended disinfection strategies and products are detailed in Phillott et al. 2010.

## 7.3 Targeted surveys

Targeted surveys for Green and Golden Bell Frog are required to confirm the species is not present within the construction impact zone. As Green and Golden Bell Frog is listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) and BC Act, surveys will need to be completed in accordance with:

- Threatened species survey and assessment guidelines: field survey methods for fauna. Amphibians (DECC 2009)
- Survey Guidelines for Australia's Threatened Frogs (CoA 2010)

The key outcome of the targeted surveys is to determine if there are any habitat features within the study area being utilised by Green and Golden Bell Frog for breeding, refuge, dispersal or overwintering.

Targeted surveys must be undertaken when conditions are suitable (from October to January) after a minimum 50 millimetres of rainfall in seven days, and following confirmation of calling from known reference populations within the local area. The proposed methodology for targeted surveys for the Green and Golden Bell Frog in accordance with Commonwealth and NSW survey guidelines is outlined in Table 7.

**Table 7 Proposed methodology for Green and Golden Bell Frog targeted surveys**

| Species | Threat status | Timing | Monitoring type | Methodology |
|---|---|---|---|---|
| Green and Golden Bell Frog | Endangered (BC Act) Vulnerable (EPBC Act) | Oct-Jan after a minimum 50 millimetres of rainfall in seven days | Call survey, including call playback | Call playback over four consecutive nights. The methodology will follow the static call survey method with individual points predetermined and 5 minutes of the call will be broadcast followed by 5 minutes of listening.<br>A suitably qualified ecologist will also liaise with relevant landholders to confirm the species is calling at a known reference site prior to targeted surveys. |
| | | | Nocturnal spotlighting surveys | Nocturnal spotlighting searches over four consecutive nights using a visual encounter survey with a randomise walk design. This will be conducted immediately after the call surveys detailed above. |

Following the completion of the targeted Green and Golden Bell Frog surveys, a report or brief letter will be submitted five working days detailing the results of the survey.

## 7.4 Pre-clearance

Prior to undertaking activities that may impact on identified habitat for Green and Golden Bell Frogs, such as broad-scale application of herbicide, and mechanical removal of vegetation, the project ecologist is to undertake a pre-clearance inspection. This will involve targeted active diurnal searches of potential Green and Golden Bell Frogs habitat located within the proposed disturbance. Following the diurnal habitat searches, a nocturnal habitat search may need to be conducted to assess nocturnal usage in the habitat area. These searches may include searching of habitat features that were searched during the day, spotlighting and/or call play-back.

## 7.5 Translocation

If a GGBF is located during preclearance surveys of a proposed impact area, the following relocation procedure will be carried out:

- The qualified ecologist undertaking the preclearance assessment will capture the frog using a gloved hand or inverted plastic bag
- If the frog appears healthy, the frog will be transported and released into a pre-determined nearby relocation area. If captured during the day the individual will be held in a cool, dark and moist place until nightfall. The individual will be released nearby suitable shelter and a water source
- If the frog appears to be sick or injured and would most likely not survive transportation, it will be humanely euthanised
- If the frog appears to be sick or injured and appears likely to survive transportation, it will be placed inside a moist bag with damp leaf litter and transported to an appropriate wildlife carer or vet

- All details of translocations including the location the individual was found, the sex and life stage of the individual and the release point are to be recorded.

# 8 Adaptive Management and Contingency Measures

An adaptive management approach is to be employed in respect to the works forming part of the Biodiversity Management Protocols. An adaptive management approach involves an integrated process of monitoring, reviewing and then responding to the health and condition of the species or habitat features addressed in this Management Plan. This will identify any alterations to the design and maintenance of works that may be required to ensure the objectives of the Management Plan are achieved.

For example, the results of targeted surveys for threatened species should be considered and incorporated into the Management Plan once completed. Annual reporting shall also be provided to indicate where known or potential problems occur, and contingency measures will be implemented as part of an ongoing adaptive management strategy for the Project.

It is important to note that any changes should comply with the aims of this Management Plan, and any licensing or approval conditions issued before implementation. An Adaptive Management Statement (or similar) will be prepared and signed by both parties prior to implementation of any adaptive management actions.

Table 8 provides a summary of potential problems that may be detected during the implementation of the management plans detailed in this document and suggested contingency measures to facilitate adaptive management of these problems.

**Table 8 Summary of recommended contingency measures**

| Action | Potential Problem | Contingency Measure |
|---|---|---|
| Baseline surveys | • Detection of a threatened species not previously recorded or accounted for in management plans | • Implement unexpected finds procedures. |
| Nest box monitoring | • Performance parameters outlined in Section 4 not met | • Review nest boxes utilised and reassess nest box recipient sites.<br>• Relocate nest boxes or source suitable additional sites outside of the conservation area and recommence nest box management plan. |
| Threatened species targeted surveys | • Failure to detect threatened species or threatened species habitat during targeted surveys | • Follow unexpected finds procedures when working in areas identified as containing suitable habitat |
| Translocation of CPLS | • Failure to detect CPLS during follow up monitoring of translocated individuals. | • Compare findings of monitoring with results collected at reference sites, to identify correlation with regional trends.<br>• If no regional trend is identified that correlates with failed detection, implement EPBC Act offset requirements. |
| Translocation of GGBF | • Failure to detect GGBF during follow up monitoring of translocated individuals. | • Compare findings of monitoring with results collected at reference sites, to identify correlation with regional trends. |

| Action | Potential Problem | Contingency Measure |
|---|---|---|
| | | • If no regional trend is identified that correlates with failed detection, implement EPBC Act offset requirements. |

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# Appendix A

# WSA Co Fauna Handling and Rescue Procedure

# Fauna Handling and Rescue Procedure

## Purpose and scope

This procedure explains the actions to be undertaken in the event fauna (including injured, shocked, juvenile or other animal) that require handling or rescue are discovered on the project site during vegetation and soil clearance and ongoing construction activities.

This procedure is applicable to all native and introduced species that are found on the project site.

### *Frogs*

Green and Golden Bell Frog has been recorded within the vicinity of the Stage 1 Construction Impact Zone and are likely to be encountered in the vicinity of riparian habitats and drainage lines. The proposed works will potentially interfere with breeding habitat for Green and Golden Bell Frog.

### *Birds*

Twenty-three threatened bird species have been identified as likely to occur within or adjacent to the Stage 1 Construction Impact Zone. Of the species recorded within the vicinity eight are considered likely to be encountered by construction personnel during clearing of vegetation, including the removal of hollow-bearing trees, as these species utilise these nesting resources. Clearance of vegetation during late winter to spring is considered likely to substantially increase the likelihood of these species being encountered and impacted upon.

### *Mammals - Chiroptera (Bats)*

Eight Chiroptera species have been recorded within the vicinity of the Stage 1 Construction Impact Zone, with eight of these species regarded as microchiropteran (microbats) and one megachiroptera (megabats – Grey-headed Flying Fox) species. Some of these microbat species are considered likely to be encountered during the clearance of vegetation (roost habitat).

Encounters with native mammals will be predominantly restricted to clearing of native vegetation, and further restricted to tree dependant fauna including; Common Ringtail Possum, Common Brushtail Possum and Antechinus species. Most mammals recorded are mobile species and will evade personnel and equipment undertaking works within the Project footprint. Special considerations for identified microbat roost habitats should be considered prior to works and recommendations referred to in Microbat Management Plan.

### *Molluscs*

Records of Cumberland Plain Land Snail *Meridolum corneovirens* have been located within the vicinity of the Project footprint, with this species utilising terrestrial habitat resources; woody debris, peeling bark and leaf litter. The proposed works will interfere with idealistic foraging habitat; therefore Cumberland Plain land Snail has the potential to be encountered during vegetation clearing works and associated earthworks within the Project footprint.

## Procedure Resources

This Fauna handling and Rescue Procedure was drafted in accordance with the following documents:

- *Western Sydney Airport Early Earthworks RF; Volume 4* (WSA Co 2018)
- *Western Sydney Airport Draft Biodiversity CEMP* (WSA Co 2018)
- *Western Sydney Airport Environmental Impact Statement Volume 2a: Stage 1 Development, Chapter 16 – Biodiversity* (DIRD 2016).

## Clearing procedure

Refer also to Pre-Clearing /Pre-Construction Checklist.

The Project Ecologist will undertake the following steps:

1. Prior to undertaking clearing at any location or time, a pre-clearing assessment must be undertaken by the Project Ecologist to identify the presence or evidence of the presence of fauna (including fresh scats, scratches and remains of prey), including threatened species. The pre-clearing assessment must also include the identification and assessment of habitat trees affected by the clearing activities, including details on the checks by the project ecologist on trees for fauna, nests and the like. The assessment must include processes and actions to protect or rescue the identified fauna including koalas, bat colonies and roosts, glider dens and frogs and address all elements of the implementation, outcomes and effectiveness of the proposed fauna rescue procedure (Section 7).
2. All hollow bearing trees, potential hollow bearing trees and all other fauna containing habitat trees, including trees with nests, dreys and termitaria likely to be occupied by fauna, must be marked at least 7 days prior to the commencement of clearing in a manner which clearly identifies and demarcates the trees.
3. Under-scrubbing and non-habitat tree removal. Non-habitat trees must be removed at least 48 hours before habitat trees are removed, unless otherwise agreed with the OEH.
4. Habitat trees should be inspected by Project Ecologist prior to removal to ensure animal exodus. Excavator operator to knock or disturb the habitat tree prior to felling, with the intent to encourage the passive removal of fauna from hollows and nests.
5. Habitat tree removal. Habitat trees must be carefully felled at least 48 hours after Stage 1 unless otherwise agreed with the OEH, to allow fauna an opportunity to move from habitat trees and allow time to concentrate rescue efforts on the trees that are most likely to be inhabited. Habitat trees must be felled using equipment that allows the trees to be lowered to the ground with minimal impact (e.g. claw extension). All habitat trees must be felled under the supervision of a suitably qualified ecologist. Felled trees must be left for a short period of time, determined by the project ecologist, on the ground to give any fauna trapped in the trees an opportunity to escape.
6. Injured fauna are to be taken to a local vet or a WIRES representative is to be contacted as soon as possible.

All fauna captured will be relocated into areas of suitable habitat adjacent to the Project site in accordance with the Rescue Procedure detailed in Section 7. The species, number, sex, age, class and general health of each individual is to be recorded for later reporting in accordance with the Rescue Procedure detailed in Section 7 below.

## Rescue procedure

If wildlife is discovered within the Project footprint during site construction activities, including clearing (refer Section 6) that may harm, or has resulted in harm, to the animal or pose a risk to site personnel, the following steps will be taken:

1. Stop all work in the vicinity of the fauna and immediately notify project Superintendent who will notify the Environmental Manager and suitably qualified ecologist.
2. Preferably allow fauna to leave the area without intervention.
3. Use a licensed fauna ecologist or wildlife carer with specific animal handling experience to carry out any fauna handling.
4. Where necessary, to minimise stress to native fauna and/or remove the risk of further injury before a licensed fauna handler arrives onsite, the Environmental Officer will implement the Handling Procedure detailed in Section 6.
5. If the animal cannot be handled (i.e. venomous reptiles):
6. exclude all personnel from the vicinity with fencing and/or signage; and
7. record the exact location of the animal and provide to the suitably qualified ecoloigst or appropriate rescue agency.

8. Call the appropriate rescue agency immediately and follow any advice provided by the agency. Once the rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the rescue agency. The contact details for the relevant fauna rescue services and local veterinary services contact details are provided in Table 9.

**Table 9 Fauna rescue contact details**

| Agency / business | Contact Number |
|---|---|
| Project Ecologist | 0428 585 182 |
| WIRES (to be called if Project Ecologist not available) | 1300 094 737 |
| Sydney Wildlife | 02 9413 4300 |
| Animal Welfare League NSW | 02 8899 3333 |
| Rossmore Veterinary Hospital | 02 9606 6984 |

The contact details for the Project Ecologist will be kept at a convenient location on the project site and be available to the Contractor's personnel at all locations where clearing is being undertaken, to enable quick contact and access to the Project Ecologist.

In the event the rescue service and/or local veterinary service cannot be contacted, the injured animal will be delivered to the relevant agency as soon as practically possible.

In the event the rescue service and/or local veterinary service cannot be contacted, if required, the most appropriate euthanasia will be administered by the Project Ecologist (i.e. cervical dislocation for small vertebrates, ice slurry for introduced fish). This is to occur in accordance animal ethics approval and legislative requirements.

1. If the fauna species is identified as a threatened species that is not a species identified in the TSMP, the Environmental Manager must:

   immediately cease all work likely to affect the threatened species;

   – inform the WSA co Representative;

2. Contact the following stakeholders, in the order provided, to determine the appropriate corrective actions and additional safeguards to be undertaken:

   – Project Ecologist
   – OEH
   – Environmental Representative
   – others as instructed by the WSA co Representative or OEH

3. Relocation of fauna captured during construction works, including clearing and associated works, will be undertaken by the Project Ecologist or wildlife rescuer. If the animal is not injured or stressed, it should be released to an area that is not to be disturbed by the project construction works, in accordance with the following:

   – sites identified as suitable release points by the Project Ecologist or wildlife rescuer;
   – release site will contain similar habitat and occur as close to the original capture location as possible;
   – if the species is nocturnal, release will be carried out at dusk;
   – release would generally not be undertaken during periods of heavy rainfall;
   – non-native fauna will not be translocated and will be euthanised.

4. If the animal has been placed into care due to injury, age (i.e. young) or stress, upon its rehabilitation it will be released in an area that is not to be disturbed by the project construction works, at the discretion of the Project Ecologist or wildlife rescuer.

5. Following consultation with all relevant stakeholders, the Project Ecologist/Environmental Manager will implement any corrective actions and additional safeguards.
6. Following confirmation by the Project Ecologist/Environmental Manager that all appropriate safeguards have been implemented, construction works can recommence.
7. Project Ecologist/Environmental Manager to record find/translocation in the WSA co Environmental Incident Report or Weekly Environmental Inspection Checklist. All relevant characteristics of the fauna find should be recorded to the extent practicable (i.e. visual signs of behaviour; habitat; health signs; sex, time date, weather etc.), and capture and relocation data.

## Handling procedure

The Handling Procedure will be implemented to minimise stress to native fauna and/or remove the risk of further injury. The Project Ecologist will:

1. Cover larger animals with a towel or blanket and place in a cardboard box and/or hessian bag;
2. Place smaller animals in a cotton bag, tied at the top;
3. Keep terrestrial fauna quiet, warm, ventilated and in a dark location away from noisy construction activities;
4. Place aquatic fauna in plastic aquaria or plastic bag with sufficient amount of water. Ensure sufficient water and adequate aeration;
5. Transport frogs without water or debris in recognition of the risk of transporting disease and the minimal transport time.
6. Animals such as venomous reptiles and raptors require particular handling and will only be handled by appropriately qualified personnel, i.e. Project Ecologist or wildlife rescuer.
7. If handling bats, the handler must be vaccinated against the Australian Bat Lyssavirus (ABL), which is a form of rabies.
8. Any frog handling will be undertaken in accordance with the Hygiene Protocol for the Control of Disease in Frogs (DECC 2008). This protocol recommends onsite hygiene precautions be undertaken to minimise the transfer of disease between and within wild frog populations. Measures recommended include:
   - thorough cleaning/disinfecting of footwear and equipment when moving from one site to another;
   - spraying/flushing vehicle tyres with a disinfecting solution where necessary in high risk areas;
   - Cleaning/disinfecting hands between collecting samples/frogs (gloves, not bare hands, will be used to handle frogs); and limiting one frog or tadpole to a bag. Bags will not be reused.

# Appendix B

# WSA Co Anticipated Threatened Species / EEC Management Procedure

# Anticipated Threatened Species / EEC Management Procedure

## Purpose and scope

This procedure describes the management of threatened species/ecological communities anticipated to be present within the project site. Management actions will be undertaken prior to and during vegetation clearance and earthworks and ongoing construction activities to avoid or minimise impacts on these threatened fauna species.

This procedure is applicable to all threatened species/ecological communities that are anticipated to occur on the project site. The Western Sydney Airport EIS identified the following threatened and endangered fauna species within the Project (DIRD, 2016):

- Green and Golden Bell Frog *Litoria aurea* (BC Act – Endangered and EPBC Act - Vulnerable)
- Cumberland Plain Land Snail *Meridolum corneovirens* (BC Act – Endangered)
- Threatened Microbat Species (BC Act – Vulnerable) - Eastern Freetail-bat *Mormopterus norfolkensis*, Eastern False Pipistrelle *Falsistrellus tasmaniensis*, Eastern Bentwing-bat *Miniopterus schreibersii oceanensis*, Large-footed Myotis *Myotis macropus*, Greater Broad-nosed Bat *Scoteanax rueppellii* Eastern Cave Bat *Vespadelus troughtoni* and Yellow-bellied Sheath-tail Bat *Saccolaimus flaviventris.*
- Scarlet Robin *Petroica boodang* (BC Act – Vulnerable)
- Little Lorikeet *Glossopsitta pusilla* (BC Act – Vulnerable)
- Little Eagle *Hieraaetus morphnoides* (BC Act – Vulnerable)
- Varied Sittella *Daphoenositta chrysoptera* (BC Act – Vulnerable)
- Black Bittern *Ixobrychus flavicollis* (BC Act – Vulnerable)
- Blue-billed Duck *Oxyura australis* (BC Act – Vulnerable)
- Grey-headed Flying-fox *Pteropus poliocephalus* (BC Act and EPBC Act – Vulnerable)

The Western Sydney Airport EIS identified that the Project will impact a range of threatened fauna. Management procedures for these anticipated threatened fauna species are therefore provided below to ensure that impacts on these fauna will be avoided or minimised during vegetation clearing and construction works.

The Project also has some potential to impact on bird species with smaller home ranges and specialised niches; management procedures are therefore provided for this species. Little Eagle has a relatively large home range and occupies territories.

No other anticipated threatened fauna management procedures have been prepared, given the remaining species known to occur are highly mobile/nomadic, and there is no roosting/breeding habitat present for these species within the Project. Little Eagle occupies open woodlands for foraging and have a large home range, no large canopy nests were found during surveys for the EIS; therefore, roosting habitat hasn't been previously identified within the footprint.

## Green and Golden Bell Frog

The Green and Golden Bell Frog was recorded within the vicinity of the project during surveys for the EIS. Given the ecology of this species it is unlikely that individuals would disperse beyond several metres of these known locations. The locations of all Green and Golden Bell Frog habitat within the Project are shown in Sensitive Area Mapping provided in the Threatened Species Management Plan for the Project. Targeted surveys for Green and Golden Bell Frog will be required to confirm that the species is not present within the Stage 1 construction footprint.

Potential impacts on the Green and Golden Bell Frog likely to result from the Project include:

1. Direct impacts on individuals/populations/species habitat resulting from vegetation clearing and construction works on known habitat for the Green and Golden Bell Frog within the Project.
2. Indirect/direct impacts on individuals/populations/species if the Project results in the isolation of sub-populations.
3. Indirect impacts on individuals/populations/species habitat adjacent to/downstream of the Project such as changes to hydrology, run-off, water/soil chemistry (particularly pH), pollutants and nutrients.

The following management procedures should be followed to avoid or minimise impacts on the Green and Golden Bell Frog:

1. Where possible the Project footprint should be refined to avoid direct or indirect (upstream) impacts on known populations of the Green and Golden Bell Frog.
2. Exclusion fencing and signage should be in place prior to all vegetation clearing and construction works to ensure Green and Golden Bell Frog populations adjacent to the Project, or to be retained within the Project will not be impacted by the Project.
3. Targeted surveys to locate all Green and Golden Bell Frog present within the Stage 1 construction footprint should be conducted to identify areas of sensitivity and provide recommendations to translocate individuals to suitable areas in accordance with the Green and Golden Bell Frog Management Plan.
4. Appropriate hygiene protocol should be observed during all works within and adjacent to/upstream of all known populations of/habitat for the Green and Golden Bell Frog to avoid introducing/spreading frog Chytrid fungus in accordance with the Pathogen and Weed Management Strategy.
5. All personnel working on the Project should be informed of the presence of the Green and Golden Bell frog and habitat within and adjacent to the Project, and how to avoid or minimise impacts. This information should be provided during site inductions, and re-iterated during pre-start meetings in areas where known records of the Green and Golden Bell Frog occur.
6. No parking, digging, laydown of equipment and materials or any other activities that may impact on Green and Golden Bell Frog/habitat within exclusion fencing.
7. Appropriate run-off and sediment controls to be in place prior to any vegetation clearing/translocation and construction works for the Project.
8. Spill kits should be provided on site to avoid impacts of chemical spills on downstream populations of Green and Golden Bell Frog.
9. Inform Environmental Officer if impacts on Green and Golden bell Frogs/habitat are observed.
10. Refer to the Information Sheet provide below for the Green and Golden Bell Frog.

## Cumberland Plain Land Snail

Cumberland Plain Land Snail was recorded within the Project during surveys undertaken for the Western Sydney Airport EIS (2016). Individuals were record was within the Stage 1 Construction Impact Zone and in the adjacent woodlands. This species lives in small areas on the Cumberland Plain (primarily in Cumberland Plain Woodland). The species lives under litter of bark, leaves and logs, and particularly at the base of Grey Box *Eucalyptus moluccana* and Forest Red Gum *Eucalyptus tereticornis*. During vegetation clearing and construction for the Project, individuals are only likely to be encountered.

The locations of Cumberland Plain Land Snail records within the Project should be shown in the Sensitive Area Mapping provided in the Cumberland Plain Land Snail Management Plan for the Project.

Given the ecology of this species, direct impacts on Cumberland Plain Land Snail resulting from the Project are likely to occur during vegetation clearing and earthworks.

The following management procedures should be followed to avoid or minimise impacts on the Cumberland Plain Land Snail:

1. Pre-clearing surveys should be conducted by the Project Ecologist to locate all individuals present within the Project prior to each stage of vegetation clearing or construction works.
2. If individuals are located, works should be postponed within the area (including and appropriate buffer area surrounding individual/s).
3. Recommendations for the translocation of Cumberland Plain Land Snail to suitable areas in accordance with the Cumberland Plain Land Snail Management Plan.
4. All personnel working on the Project should be informed of the potential for Cumberland Plain Land Snail within the Project, and how to avoid or minimise impacts. This information should be provided during site inductions, and re-iterated during pre-start meetings.
5. Inform Environmental Officer if Cumberland Plain Land Snail are observed on site.

A description of Cumberland Plain Land Snail is provided in the Information Sheet below.

## Threatened Microbats

Microbat species were recorded within the project footprint during surveys for the Western Sydney Airport works EIS. The threatened microbat species (Vulnerable, BC Act) include Eastern Freetail-bat *Mormopterus norfolkensis*, Eastern False Pipistrelle *Falsistrellus tasmaniensis*, Eastern Bentwing-bat *Miniopterus schreibersii oceanensis*, Large-footed Myotis *Myotis macropus*, Greater Broad-nosed Bat *Scoteanax rueppellii*, Eastern Cave Bat *Vespadelus troughtoni* and Yellow-bellied Sheath-tail Bat *Saccolaimus flaviventris*.

Common species were also recorded such as Chocolate Wattled-bat *Chalinolobus morio* and Eastern Little Freetail-bat *Mormopterus ridei*. Given the ecology of these species, they are likely to utilise the Badgerys Creek Corridor and the large adjacent woodland patches for foraging and breeding. Consideration for their ecology and home ranges should be shown in the Sensitive Area Mapping provided in the Threatened Species Management Plan for the project.

Potential impacts on microbat species likely to result from the Project include:

1. Direct impacts on individuals/populations/species habitat resulting from vegetation clearing and construction works on known habitat for microbats within the Project.
2. Indirect impacts on riparian foraging species (i.e. Large-footed Myotis) if run-off is a by-product of the works resulting in reduced water quality, affecting food resources.
3. Indirect impacts resultant of construction, remediation and clearing works such as light, noise and vibration causing roost disturbance, leading to potential roost exodus.

The following management procedures should be followed to avoid or minimise impacts on microbat Species:

1. Where possible the Project footprint should be refined to avoid direct or indirect (hollow-bearing trees).
2. Identify impacts on known microbat populations found within the project footprint.
3. A Microbat Management Plan should be prepared to provide appropriate management for the species prior to and during vegetation clearing and construction for the Project.
4. Targeted surveys by the Project Ecologist to locate all threatened microbat species present within the project area and provide recommendations to relocate individuals (if necessary) to suitable areas in accordance with the Microbat Management Plan.
5. Microbats should be intentionally handled by a vaccinated wildlife handler and/or Project Ecologist to ensure appropriately handling and mitigate the risk of contracting Australian Bat Lyssavirus (ABL – a rabies-like disease).
6. All personnel working on the Project should be informed of the presence of threatened microbat species and habitat within and adjacent to the Project, and how to avoid or minimise impacts. This information

should be provided during site inductions, and re-iterated during pre-start meetings in areas where known records of microbats occur.

7. Appropriate run-off and sediment controls to be in place prior to any vegetation clearing/translocation and construction works for the Project.
8. Minimise construction associated disturbance near known roost sites (i.e. light pollution, noise, vibration and dust generation) and ensure the roost site is delineated from the works with the installation of signage and No-Go-Zones.
9. Inform Environmental Officer if impacts on microbats/habitat are observed or predicted.
10. Refer to the Information Sheet provide below for Threatened Microbats.

## Threatened Birds

Various birds were recorded within the project footprint during surveys for the Western Sydney Airport works EIS. Threatened bird species (Vulnerable, BC Act) include Varied Sitella *Daphoenositta chrysoptera*, Little Lorikeet *Glossopsitta pusilla* and Scarlet Robin *Petroica boodang*. The locations of threatened bird records within the Project should be shown in the Sensitive Area Mapping provided in the Threatened Species Management Plan for the Project.

Given the ecology and sedentary nature of these species, direct impacts on Varied Sitella *Daphoenositta chrysoptera*, Little Lorikeet *Glossopsitta pusilla* and Scarlet Robin *Petroica boodang* resulting from the Project are likely to occur during vegetation clearing and earthworks (barrier for movement and loss of hollow-bearing trees).

The following management procedures should be followed to avoid or minimise impacts on threatened birds:

1. Pre-clearing surveys should be conducted by the Project Ecologist to locate all individuals present within the Project prior to each stage of vegetation clearing or construction works.
2. If individuals or cup-shaped nests are located, works should be postponed within the area (including and appropriate buffer area surrounding the roosting individual/s) until further inspections confirm that birds are no longer present.
3. All personnel working on the Project should be informed of the potential roosting or foraging of threatened birds within the Project, and how to avoid or minimise impacts. This information should be provided during site inductions, and re-iterated during pre-start meetings.
4. Inform Environmental Officer if threatened birds are observed on site.
5. Ensure nest boxes are installed in accordance with the Nest Box Strategy to ensure adequate prey shelter habitat remains present during vegetation clearing and construction works.
6. Refer to the Information Sheet provide below for Varied Sitella, Little Lorikeet and Scarlett Robin.

A description of each species are provided in the Information Sheets below.

# Appendix C

# WSA Co Unexpected Threatened Fauna Finds Procedure

Purpose of the Unexpected Finds Protocol – a procedure for dealing with unexpected threatened fauna species identified during construction including:

- stop work and notify the Contractor Environment Manager (EM), Project Ecologist, WSA Co Environment Manager;
- The WSA Co Environment Manager will notify external stakeholders, e.g. Infrastructure Department, AEO, OEH, DPI
- The WSA Co Environment Manager will consult with the Project Ecologist and any necessary specialist and determine appropriate management measures in consultation with relevant stakeholders (including relevant re-location measures), and
- update of ecological monitoring and/ or biodiversity offset requirements.
- The WSA Co Environment Manager will advise when work can commence in the local area where the find was identified.

## Purpose and scope

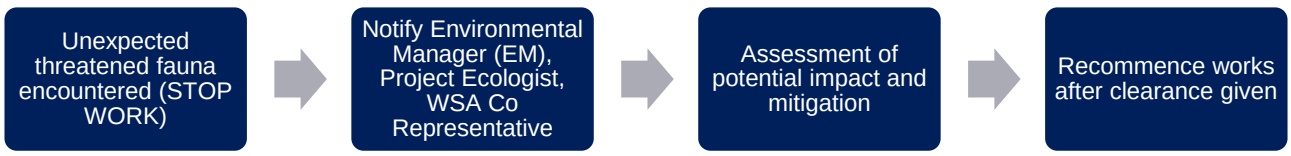
This procedure details the actions to be taken when a threatened fauna species is unexpectedly encountered during excavation / construction activities.

## Induction / Training

Where required, personnel will be inducted on the identification of potential threatened fauna species occurring on site and the relevant actions for them with regards to this procedure during the Project Induction, Site Inductions and regular Toolbox Talks.

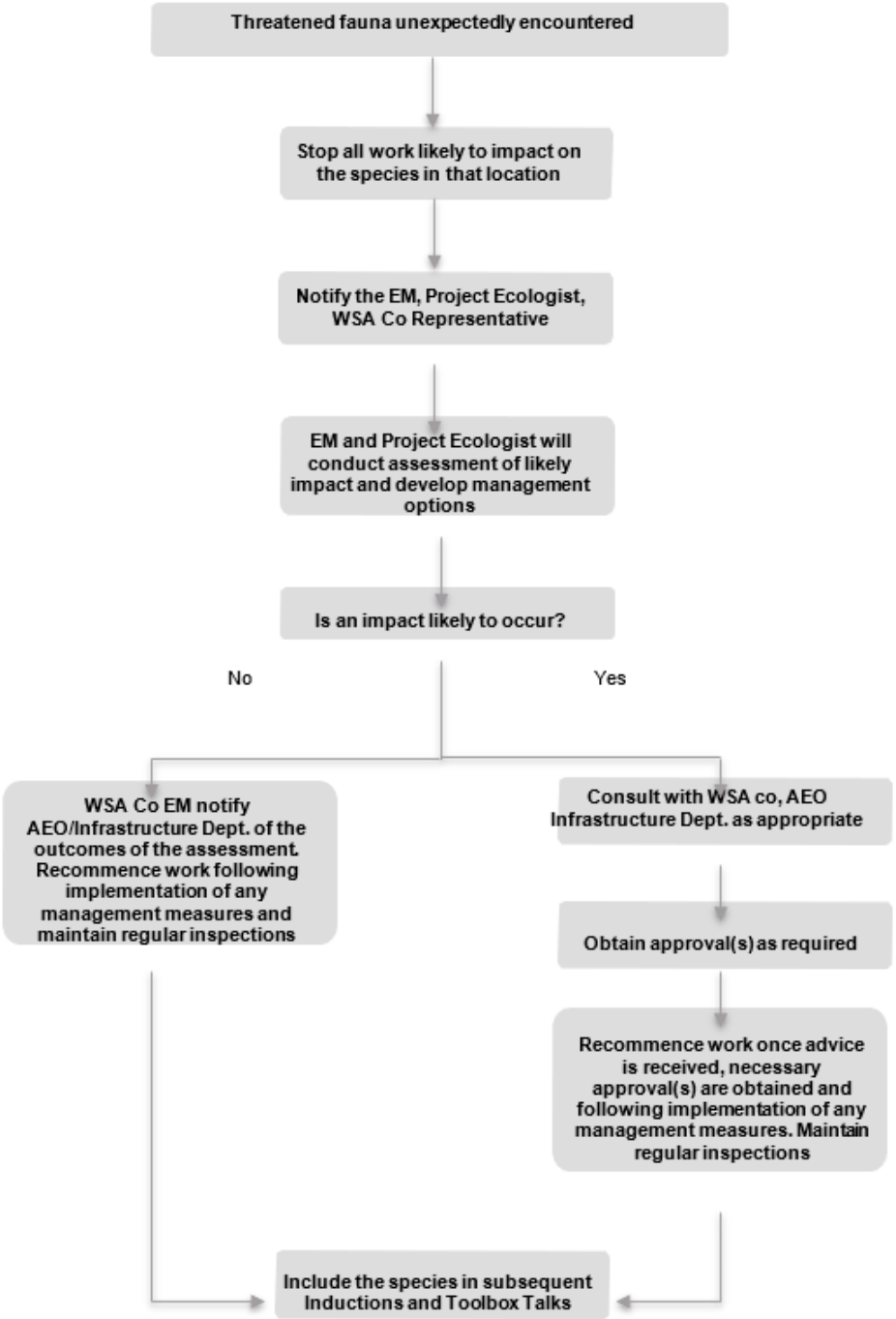
## Scope

This procedure is applicable to all activities conducted by personnel that have the potential to come into contact with threatened fauna species. Where threatened fauna is unexpectedly encountered, refer to the **Fauna Handling and Rescue Procedure.** Refer to Figure C1 for Unexpected Threatened Fauna Find Procedure flow chart.



## Procedure

**Figure 3 Unexpected Threatened Fauna Species Find Procedure Flow Chart**



# Appendix C

# Weed and Disease Management Plan

# Western Sydney Airport

## Weed and Disease Management Plan

December 2018

Western Sydney Airport

# Document Control

## Project Revision History

| Revision | Date | Description | Author | Reviewer |
|---|---|---|---|---|
| 0 | 24/09/2018 | Early Earthworks scope and visitor centre preparation | WSA Co | S Reynolds |
| 0.1 | 09/11/2018 | Draft updated with the Visitor Centre and Site Accommodation phase and Material Importation phase | WSA Co | S Reynolds |
| 0.2 | 07/12/2018 | For Approval | WSA Co | S Reynolds |
| 1 | TBC | Revision update to include the Visitor Centre Site Accommodation and Material Importation | WSA Co | S Reynolds |

## Plan Authorisation

| Position | Name | Signature | Date |
|---|---|---|---|
| Environment Manager | Sally Reynolds | | 07/12/2018 |

# Contents

# Tables



# Figures

# 1 Introduction

In April 2014 the Australian Government announced that the Commonwealth-owned land at Badgerys Creek will be the site for a second Sydney Airport. The Badgerys Creek airport site was selected following extensive studies completed over a number of decades.

In December 2016, the Minister for Urban Infrastructure determined the Airport Plan which sets the environmental and planning authorisation for the development of Stage 1 of the Western Sydney Airport (WSA Stage 1). In May 2017, the Government announced that it would establish WSA Co, to develop and operate the airport. WSA Co is responsible for constructing and operating Western Sydney Airport in accordance with the Airport Plan

An EIS has been prepared in accordance with the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Airports Act 1996*. The EIS considered potential impacts during construction activities for the site and operation of the Stage 1 and long term development of the proposed airport.

The Western Sydney Airport is expected to be developed in stages to match demand and include planning for services and amenities that are easily expandable over time, providing scalable capacity for aircraft, passengers, cargo and vehicle movements.

Stage 1 will include major site preparation, removing or relocating infrastructure from the site and earthworks to prepare the airport site, establishing the Airport with a single 3,700 metre runway located in the north-western portion of the Airport Site, a terminal and other support facilities to provide an operational anticipated capacity of approximately 10 million regional, domestic and international passengers per year, as well as freight traffic (the Stage 1 development).

The scope of works for the Stage 1 Development is defined in the Airport Plan and will generally include the investigation, design, construction and commissioning of:

- Bulk earthworks to move and redistribute more than 24 million cubic metres of material on the Airport Site;
- A single 3.7-kilometre runway;
- Aprons, taxiways and other airside pavements;
- A multi-user terminal;
- Appropriate airport and aviation support facilities;
- Drainage and utilities infrastructure; and
- Car parking, on-site roads and other appropriate landside facilities.

## 1.1 Project background

A series of sub-plans are required as appendices of the Biodiversity Construction Environment Management Plan (CEMP) for the Western Sydney Airport site at Badgerys Creek, NSW (the study area). These sub-plans are required to be developed to ensure compliance with project approvals.

This Weed and Disease Management Plan (WDMP) forms a subplan to the Biodiversity CEMP and provides controls and actions required to manage the retained ecological features within the Airport Site (Figure 1).

## 1.2 Description of area

The Western Sydney Airport will be developed on around 1,700 hectares of Commonwealth-owned land at Badgerys Creek in Western Sydney (Airport Site). The Airport Site is approximately 50 kilometres from Sydney's central business district.

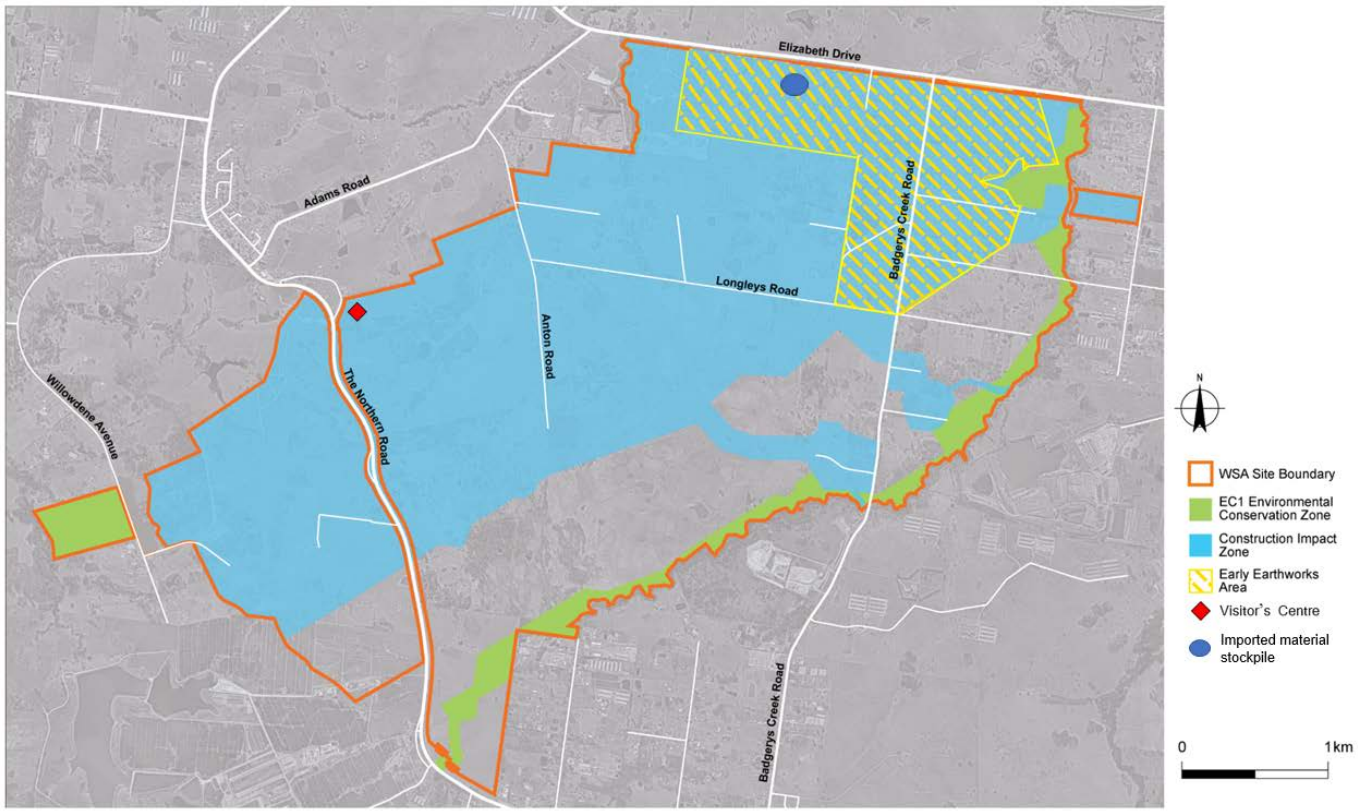
The Airport Site is bounded by Elizabeth Drive to the north, Willowdene Avenue to the south, Luddenham and Adams Road to the west and Badgerys Creek to the east. The existing terrain is made up of undulating topography, and substantial earthworks are required to create a level surface to allow construction of the runway, taxiways and support services. The current Weed and Disease Management Plan outlines weed and disease management measures for the construction activities covered by the WSA Co Biodiversity Construction Environmental Management Plan.

## 1.3 Potential ecological impacts

Key aspects of the proposed works that could result in potential ecological impacts include:

- Clearing of native vegetation and habitat;
- Invasion of exotic species, weeds, pests and pathogens;
- Impacts on threatened species and their habitats;
- Habitat fragmentation and loss of connectivity;
- Stockpile/compound road construction;
- Works around and within watercourses;
- Noise, vibration, light and vehicular movement impacts;
- General earth vegetation resulting in disturbance of soils, erosion, and the mobilisation of sediment; and
- Open excavation works (e.g. visitors centre and site office).

**Figure 1 Stage 1 Development location plan**



# 2 Scope

The impact within the early works footprint and retained vegetation within the site are to be managed in accordance with the WDMP.

This Plan focuses on:

- Identification and mapping of the known extent of NSW Department of Primary Industry (DPI) listed Priority Weeds and pathogens within the construction area (to be undertaken during the preparation for the contractor site environmental management documentation, including within the Environmental Controls Maps (ECM) and or Environmental Work Method Statement (EWMS) (refer to Section 4.3 of the Site Environmental Framework (SEMF)).
- Prevention of the introduction of the Priority Weeds and pathogens within the impact area, not limited to the 12 listed priority weeds and three potential pathogens identified in the EIS.
- Prescription of suitable control measures and means of preventing spread beyond the construction impact area during construction.
- The minimisation of impacts arising from Key Threatening Processes (KTP) listed under the *Environment Protection and Conservation Act 1999* (Cth) (EPBC Act) and *Biodiversity Conservation Act 2016* (NSW) (BC Act) as a result of the occurrence and/or spread of pathogens and weeds (GHD 2017) is also a priority to ensure the Stage 1 Development does not increase the operation of or increase impact of KTPs.

# 3 Existing environment

For information on the existing environment, refer to Section 5 of the Biodiversity Construction Environment Management Plan.

## 3.1 Key Threatening Processes

Key threatening processes listed under the EPBC Act and BC Act relevant to managing weeds and disease during construction activities associate with the construction works covered by the Biodiversity CEMP, are outlined in Table 1.

**Table 1 Key threatening processes relevant managing weeds and disease during construction of the Stage 1 Development**

| Key Threatening Process | EPBC Act | BC Act |
|---|---|---|
| Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*) | X | |
| Infection of amphibians with chytrid fungus resulting in chytridiomycosis | X | |
| Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants | X | |
| Novel biota and their impact on biodiversity | X | |
| Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners | | X |
| Infection of frogs by amphibian chytrid causing the disease chytridiomycosis | | X |
| Infection of native plants by *Phytophthora cinnamomic* | | X |
| Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae | | X |
| Invasion and establishment of exotic vines and scramblers | | X |
| Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata* (Wall. ex G. Don) Cif. | | X |
| Invasion of native plant communities by *Chrysanthemoides monilifera* | | X |
| Invasion of native plant communities by exotic perennial grasses | | X |
| Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants | | X |

## 3.2 Priority and environmental weeds

Table 2 below, outlines the weeds listed under the *Noxious Weed Act 1993* (NSW) (NW Act) at the time of assessment by (GHD 2016) and an updated Biosecurity Duty under the *Biosecurity Act 2015* (NSW) (Biosecurity Act). All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable. Species that are listed as Weeds of National Significance (WoNS) are also outlined below.

**Table 2 Priority and environmental weeds recorded within the study area**

| Scientific Name | Common Name | Biosecurity Act Biosecurity Duty | WoNS |
|---|---|---|---|
| *Alternanthera philoxeroides* | Alligator Weed | Biosecurity Zone<br>The Alligator Weed Biosecurity Zone is established for all land within the state except land in the following regions: Greater Sydney; Hunter (but only in the local government areas of City of Lake Macquarie, City of Maitland, City of Newcastle or Port Stephens).<br>Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. | |
| *Anredera cordifolia* | Madeira vine | General biosecurity duty | |
| *Asparagus asparagoides* | Bridal Creeper | General biosecurity duty | |
| *Bryophyllum sp.* | Mother-of-millions | General biosecurity duty | |
| *Cestrum parqui* | Green Cestrum | Regional Recommended Measure<br>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. | |
| *Cortaderia selloana* | Pampas grass | General biosecurity duty | |
| *Lantana camara* | Lantana | General biosecurity duty | |
| *Ligustrum lucidum* | Broad-leaved Privet | General biosecurity duty | |
| *Ligustrum sinense* | Small-leaved Privet | General biosecurity duty | |

| Scientific Name | Common Name | Biosecurity Act Biosecurity Duty | WoNS |
|---|---|---|---|
| *Lycium ferocissimum* | African Boxthorn | General biosecurity duty | |
| *Olea europa* subsp. *cuspidata* | African Olive | Regional Recommended Measure<br>An exclusion zone is established for all lands in Blue Mountains City Council and Central Coast local government areas. The remainder of the region is classified as the core infestation area.<br>Whole region: The plant or parts of the plant are not traded, carried, grown or released into the environment.<br>Core infestation area: Land managers prevent spread from their land where feasible. | |
| *Opuntia stricta* | Common Prickly pear | General biosecurity duty | |
| *Ricinus communis* | Castor Oil Plant | General biosecurity duty | |
| *Rubus fruticosus* species aggregate | Blackberry | General biosecurity duty | Yes |
| *Salvinia molesta* | Salvinia | Regional Recommended Measure<br>Exclusion zone: whole region except for the core infestation area of the Georges and Hawkesbury-Nepean Rivers and their tributaries.<br>Whole region: Land managers mitigate the risk of the plant being introduced to their land.<br>Core infestation area: Land managers should prevent spread from their land where feasible. | Yes |
| *Senecio madagascariensis* | Fireweed | General biosecurity duty | Yes |

# 4 Biosecurity protocol

## 4.1 Site inductions and toolbox talks

The presence of biosecurity items (weed and pathogens) within the project area are to be addressed at a project level during project inductions, and the biosecurity protocol below is to be presented to all contractors and its requirements made clear. Toolbox talks are to discuss specific biosecurity issues and requirements relating to work areas as determined through pre-clearing surveys undertaken as specified within the Biodiversity Construction Environmental Management Plan (BCEMP).

## 4.2 Biosecurity hygiene protocol

All contractors are to follow the biosecurity hygiene protocol detailed below in Table 3 prior to clearing, during construction and post-construction.

**Table 3 Biosecurity hygiene protocol**

| Timing | Hygiene protocol | Risk reduction |
|---|---|---|
| Prior to clearing | Presence of biosecurity matters within the project area are to be discussed during toolbox talks.<br>Tools to be cleaned free of soil and plant material prior to bring tools to site or moving between works areas.<br>Vehicle/machine hygiene inspections are to be undertaken prior to works starting using the checklist in Appendix 1 to determine if vehicles are free from soil and plant material.<br>Vehicles/machines must pass the hygiene inspection prior to works commencing, Additional cleaning may be required to achieve this.<br>Vehicles to be parked in designated roadsides and parking spaces only.<br>Completed hygiene inspection forms are to be kept within the relevant vehicle/machine during the works and provided to the relevant land access officers at completion of the works.<br>Toolbox talks are to include information on potential presence of weed and methods to reduce spread | Prevent import of new biosecurity items to the project area. |
| During construction | Presence of biosecurity matters to be discussed during toolbox talks.<br>Hygiene procedures above to be maintained.<br>Avoidance or limiting vehicle / foot traffic through areas identified as having biosecurity matters present, if feasible.<br>Limit access between and across vegetated areas to formed roads wherever practicable.<br>Minimise entry and exit points from sites determined as supporting biosecurity matters.<br>If vehicles/machines have left formed roads, or have become soiled due to wet conditions, since the last vehicle hygiene inspection, a vehicle hygiene inspection must be conducted and passed prior to accessing any additional properties.<br>Vehicle/machine wash down and completion of hygiene inspection must be undertaken prior to accessing a new vegetation clearing site. | Prevent import of new biosecurity items to the project area. |

| Timing | Hygiene protocol | Risk reduction |
|---|---|---|
| | Regular visual checks of PPE and vehicle tyres for plant parts and seed.<br>All plant material and soil removed is to be bagged and disposed of in landfill or at a registered green-waste facility.<br>Tools to be cleaned free of soil and plant material upon completion of works at each property | |
| Post-construction | PPE and clothing/waders to be brushed down, plant fragments and seeds removed, soils scrubbed from footwear, inside of vehicles cleaned. Bag detritus and seal bag before depositing at a local waste cell or waste cell collection point. | Prevent import of new biosecurity items to the project area. |

## 4.3 Monitoring

Monitoring of biosecurity matters is to be undertaken and evaluated against performance targets, to ensure the management measures in this plan are implemented and performance criteria are satisfied. The monitoring program will commence at pre-clearing surveys and continue for the operation period i.e. pre, during and post construction. Details of the monitoring program are included in Section 10.

# 5 Weed Management

## 5.1 Occurrence within the Stage 1 development

Weeds have been recorded throughout the biodiversity assessment undertaken for the Stage 1 Development (GHD 2016). Specific locations of weeds have not been mapped to date, however mapping of occurrences is to be undertaken prior to construction and detailed on inspection form and provided to the Construction Environment Manager.

## 5.2 General approach

Priority weeds (as listed under the Biosecurity Act) will be treated to satisfy the requirements of the general biosecurity duty whereby the potential spread of exotic species present within the project area will be prevented, and the presence of weeds in the construction footprint and adjoining areas will be reduced. Weed occurrence and extent will be mapped during pre-clearance surveys and regular inspections, with infestations to be treated on an ongoing basis.

General weed management measures to be undertaken include:

- Use a range of weed management methods such as clearing, slashing or mowing (physical and mechanical control) as well as a range of herbicides (to avoid herbicide resistance).
- Mow/slash areas infested with weeds before they seed (avoiding native vegetation).
- Employ biosecurity hygiene protocols.
- Securely cover loads of weed-contaminated material.
- Dispose of weed contaminated soil at an appropriate waste management facility.
- Remove weeds immediately and dispose of without stockpiling.
- Separate weeds from native vegetation to be mulched, do not use weed material for mulch.
- Minimise soil disturbance in weed infested areas.

Application of herbicide during weed control works will depend on species targeted and the growing situation. For example the selection of a herbicide and the application method for a particular species or class of plant will be determined by factors such as the degree of infestation of target species, limiting damage to off target native flora and preventing herbicides entering waterways. The *Noxious and Environmental Weed Control Handbook. A Guide to Weed Control in Non-crop, Aquatic and Bushland Situations, 5th Edition* (DPI 2011) should be referred to as guide for specific herbicides, record keeping and herbicide application techniques.

Use of herbicides must be according to the NSW *Pesticides Act 1999*, Material Safety Data Sheets and labelling instructions for specific trade name herbicides and off label use permits registered with the Australian Pesticides and Veterinary Medicines Association. Any contractors using herbicides on the site must be trained and appropriately qualified to do so (ChemCert Level 2 or equivalent for subordinates and ChemCert Level 3 or equivalent for supervisors). Due to the highly sensitive native of the retained native vegetation (i.e. TECs and threatened species habitats) all weed control works are to be carried out by a qualified and experienced bush regeneration contractor.

All herbicide use must also be undertaken in accordance with the on-label requirements and site procedures for the application and storage of chemicals.

Pre-clearance weed control is required for weeds that pose a biosecurity risk to local land use and biodiversity values.

Prior to vegetation removal a pre-clearance inspection report is required to outline the recommended treatment methods for weeds present within the project site. Weed species and the required pre-clearance actions are outlined in section 6.3.

## 5.3 Aquatic habitats

A severe infestation of Alligator Weed was identified within the dammed section of Oaky Creek during EIS investigations undertaken by GHD. Alligator Weed is identified as a WoNS and is a Priority Weed under the Biosecurity Act. The biosecurity duty as specified under the Biosecurity Act requires land managers to ensure that the risk associated with the species is prevented, eliminated or minimised as far as reasonably practical. Therefore, the management procedures prescribed herein, when implemented, will ensure compliance with this duty.

Table The following steps are to be undertaken to ensure that Alligator Weed does not pose a biosecurity risk to the Stage 1 Development and surrounding lands.

**Table 4 Alligator Weed management**

| Step | Management measure |
|---|---|
| **Step 1** | Dewater dam on Oaky Creek by pump fitted with an inline filter, with the water to be distributed overland (preferably a section proposed to be capped) with a silt fence installed downslope to catch any unfiltered propagules. |
| **Step 2** | Monitor site to identify growth/germination of propagules, with particular attention to the land that the water was discharged over. If any plants are identified, the soil is to be scraped back into the dam on Oaky Creek. |
| **Step 3** | The entire bed, bank and wall of the dam on Oaky Creek is to be excavated until biological matter is no longer present within the soil strata. |
| **Step 4** | Excavated material is to be buried at depth of approximately two metres and clay capped. |
| **Step 5** | All machinery, nets, holding tanks and footwear is to be washed down within the silt fenced area prior to leaving site. |
| **Step 6** | Site is to be monitored monthly with any emergent plants to be treated using Metsulfuron-methyl 600 g/kg based product at a dilution rate of 10 g per 100 L water. |

## 5.4 Weed management action

Table 5 below details weed management actions to be implemented prior to vegetation clearing and during the construction phase of the works. Table 6 outlines the recommended treatment methods for the Biosecurity Act priority weeds known to occur on site. Treatment priorities and performance criteria provided are based on WSA Co general biosecurity duty to prevent, eliminate or minimise the occurrence of priority weeds within the construction footprint. Table 4 provides treatment recommendations for each of the weed types known to occur within the construction footprint.

**Table 5 Weed management and performance criteria**

| Management Action | Task / Performance criteria | Responsibility | Timing |
|---|---|---|---|
| **Prior to vegetation clearing** | | | |
| **Pre-clearing inspections** | Pre-clearing inspection prior to planned vegetation removal to highlight the presence of priority weeds and recommend treatment methods to be undertaken prior to, and post-clearing. | Project ecologist | At least two weeks prior to planned clearing. |
| **Project area weed treatments** | Where vegetation removal is likely to result in the spread of weed propagules into adjacent retained vegetation weed treatments outlined in Table 6 and Table 7 are to be undertaken prior to clearing. The requirement for "pre-treatment" of weeds will be determined during pre-clearance inspections.<br>Treat Priority weeds across the project area as recommended by the "Project area weed inspections".<br>Weed treatment should be undertaken in adjoining Council and/or Roads and Maritime owned lands following consultation and agreement between all parties.<br>Priority weed reproductive material (for those weeds treated prior to clearing) is to be removed from site, where practicable, and disposed of at a licensed green waste disposal facility or landfill. | Weed control contractor | Prior to vegetation removal. |
| **During construction** | | | |
| **Vegetation removal** | Vegetation clearing / removal, including the removal of any weeds not subject to "pre-treatments", is to be undertaken following approval from the Environment Manager.<br>Any weeds not considered likely to spread into adjacent retained areas (and therefore not subject to "pre-treatments'), can be undertaken removed (treated) as part of full vegetation clearing without further weed specific treatments.<br>However, if vegetation is to be stockpiled, weeds material must be separated from native vegetation waste, and stockpiled away from any retained vegetation. Weed infested vegetation waste must not be reused on site. | Environmental manager | During / following vegetation clearing |

| Management Action | Task / Performance criteria | Responsibility | Timing |
|---|---|---|---|
| **Treatment of weed infested soil** | Weed infested soil must not be stockpiled adjacent to native vegetation.<br>Soil exhausted of viable weed propagules and other reproductive material can be reused onsite.<br>Any re-used soil should be monitored and treated for any future weed re-growth. Stockpile weed infested soil in bunded area, and regularly treat germinating weeds with herbicide to exhaust reproductive material. | Environmental manager | Following vegetation clearing |
| **Project weed inspections and treatments** | 6 monthly site inspections to map the occurrence of priority weeds within the construction footprint.<br>Areas left open / un-vegetated following clearing are to be prioritised for inspections and treatments to prevent establishment of weeds in these areas.<br>Treat priority weeds within the construction footprint and adjacent areas (where appropriate).<br>Any areas revegetated and/or landscaped following completion of construction activities are to be included in regular inspections and treatments. | Project ecologist and weed control contractor | As outlined above. |

**Table 6 Priority weed requirements under the Biosecurity Act**

| Scientific name | Common name | Biosecurity Act requirement |
|---|---|---|
| *Alternanthera philoxeroides* | Alligator Weed | Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. |
| *Anredera cordifolia* | Madeira vine | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Asparagus asparagoides* | Bridal Creeper | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Bryophyllum sp.* | Mother-of-millions | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Cestrum parqui* | Green Cestrum | Regional Recommended Measure<br>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. |
| *Cortaderia selloana* | Pampas grass | Prevent spread of species – Treat occurrences where they occur within the project area. |

| Scientific name | Common name | Biosecurity Act requirement |
|---|---|---|
| *Lantana camara* | Lantana | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Ligustrum lucidum* | Broad-leaved Privet | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Ligustrum sinense* | Small-leaved Privet | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Lycium ferocissimum* | African Boxthorn | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Olea europa* subsp. *cuspidata* | African Olive | Regional Recommended Measure<br>An exclusion zone is established for all lands in Blue Mountains City Council and Central Coast local government areas. The remainder of the region is classified as the core infestation area.<br>Whole region: The plant or parts of the plant are not traded, carried, grown or released into the environment. Exclusion zone: The plant is eradicated from the land and the land kept free of the plant. Core infestation area: Land managers prevent spread from their land where feasible. |
| *Opuntia stricta* | Common Prickly pear | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Ricinus communis* | Castor Oil Plant | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Rubus fruticosus* species aggregate | Blackberry | Prevent spread of species – Treat occurrences where they occur within the project area. |
| *Salvinia molesta* | Salvinia | Regional Recommended Measure<br>Exclusion zone: whole region except for the core infestation area of the Georges and Hawkesbury-Nepean Rivers and their tributaries.<br>Whole region: Land managers mitigate the risk of the plant being introduced to their land. Exclusion zone: The plant is eradicated and the land kept free of the plant. The Local Control Authority should be notified if the plant is found. Core infestation area: Land managers should prevent spread from their land where feasible. |
| *Senecio madagascariensis* | Fireweed | Prevent spread of species – Treat occurrences where they occur within the project area. |

Where “pre-treatments’ have been recommended following pre-clearance inspections, or weed treatments are required following ongoing monitoring inspections, weed types listed below are to be treated as detailed in Table 6. Pre-clearance inspection reports will also outline recommended treatment methods for weeds recorded on site, not listed in this Plan.

**Table 7 Weed treatment recommendations**

| Scientific name | Common name |
|---|---|
| Woody weeds | Spot spray application of Glyphosate 360 g/L Roundup® at a rate of 1 part glyphosate to 50 parts water. Completely wet all leaves and stems. Best done during times of active growth i.e. Spring/summer.<br>Stem injection for basal diameter up to 25 cm of Glyphosate 360 g/L Roundup® at a rate of 1 part glyphosate to 1 part water, 2 mL per cut or for basal diameter 25 cm to 60 cm undiluted, 2 mL per cut. Best done during times of active growth i.e. Spring/summer. |
| Perennials/ Scrambling weeds | Spot spray application of Glyphosate 360 g/L Roundup® at a rate of 1 part glyphosate to 50 parts water. Completely wet all leaves and stems. Best done during times of active growth i.e. Spring/summer. |
| Annual and grass weeds | Slashing for large areas of infestation. |
| Vines | Spot spray application Glyphosate 360 g/L Roundup® at a rate of 1 part glyphosate to 50 parts water. Best done during times of active growth i.e. Spring/summer. |

# 6 Pathogen management

## 6.1 Occurrence within the Stage 1 Development

General information on known pathogens to occur in the vicinity of the construction footprint were identified within the EIS biodiversity investigations (GHD 2016), however no testing for the occurrence of pathogens was undertaken or the identification of high pathogen risk areas. The aim of developing pathogen management protocols is to create a dynamic process that identifies the extent of pathogens within the subject site and prevents their spread outside of known infestation areas.

## 6.2 General approach

The approach to managing pathogens within the construction footprint to assume occurrence within suitable environments to support these pathogens. Pre-clearance assessments will then assess each of these areas following a set of criteria (7.3) to determine the likely presence of pathogens within these environments. Testing will then be undertaken of these areas to resolve the occurrence of pathogens within the construction footprint and facilitate the development of mapping and establishment of exclusion zones.

## 6.3 Pathogen Risk Zones and Priority Weeds

Pathogen risk zones were developed as means of identifying areas within the potential impact are that have a high, medium or low risk of spreading or disturbing pathogens. Through the development of these risk zones, management measures can be implemented which would be commensurate with the level of risk identified within an area.

Determination of risk zones for each of the pathogens identified in the EIS was undertaken by assessing vegetation for signs of infection or, in the case of Chytrid, identifying areas that within the potential impact area where a precautionary approach can be practically applied. The following criteria were applied when determining the Pathogen risk zones:

**High** – Myrtle rust identified on host plants OR, extensive evidence of tree dieback potentially attributed to Phytophthora.

**Medium** – Small instances of tree dieback (more than 3 trees in close proximity) potentially affected by Phytophthora OR, small drainage lines within potential impact area containing suitable frog (vector) habitat.

**Low** – No tree dieback evident, AND no evidence of myrtle rust on host plants AND low potential for surface water to persist and maintain frog (vector) habitat.

It is important to note that there are in excess of 50 native species of Phytophthora in Australia, and while the occurrence of these species may be identified during the testing phase, no management measures will be proposed other than for *Phytophthora cinnamomi*.

# 7 Management measures

## 7.1 Pathogens

Management measures for pathogens can be split into three broad categories as follows:

- Planning or awareness measures
- Exclusion measures; and
- Containment measures

Pathogen management measures have been developed in accordance with the Roads and Maritime Services *Biodiversity Guidelines – Guide* 7 (RTA, 2011), and incorporate best practice measures for reducing the transport of potentially harmful pathogens throughout the construction footprint and associated surrounding landscape.

## 7.2 Priority weeds

Use of herbicides must be according to the *Pesticides Act 1999* (NSW), Material Safety Data Sheets and labelling instructions for specific trade name herbicides and off label use permits registered with the Australian Pesticides and Veterinary Medicines Authority (APVMA). The use of herbicide as part of this plan will be limited to direct application to cut stumps and spot spraying. High pressure spraying may be permissible in areas located 50 metres away from waterways during favourable weather conditions (i.e. low/no wind/rain). Any contractors using herbicides on the site must be trained and appropriately qualified to do so (NSW ChemCert Level 2 or equivalent for subordinates and ChemCert Level 3 or equivalent for supervisors).

Manual and chemical options for weed control have been taken from the noxious and environmental weed control handbook *A guide to weed control in non-crop, aquatic and bushland situations, 6th edition* (DPI 2014).

The primary means of weed control during construction works (covered in the Biodiversity CEMP) will be to mechanically remove weeds with appropriate plant and machinery at the initial stages of construction, due to ease and speed of removal. The preference for the use of mechanical control measures will also reduce the development of herbicide resistances in the identified weed species. Control methods include hand removal, herbicide application, and mechanical removal. Weeds requiring hand or mechanical removal, including contaminated topsoil, would require disposal by encapsulation (deep burying) or to an approved waste management facility.

**Table 8 Pathogen management measures**

| Activity | Management: Myrtle Rust | Management: *Phytophthora cinnamomi* | Management: Frog Chytrid | Responsibility | Quality control mechanism |
|---|---|---|---|---|---|
| Construction scheduling and works programs | Plan works to commence in low risk areas and move to **medium risk** areas and last in **high risk** areas. | | | Environmental Manager | Staging documentation<br>Inductions/start up meetings |
| Inductions | Construction personnel should be made aware of this plan or its core components and include an identification/fact sheet on myrtle rust. | Construction personnel should be made aware of this plan and its core components. | Construction personnel should be made aware of this plan or its core components, with particular focus for personnel undertaking dust suppression and works in riparian areas. | Environmental Manager | Inductions 3 |
| Vehicles and machinery hygiene | Vehicles and machinery should arrive on site free of sources of potential contaminants including vegetative material and mud. | Vehicles and machinery should arrive on site free of sources of potential contaminants including mud. Plant is to be washed down Appropriate wash down facilities should be provided for plant in **medium to high risk** areas. | Vehicles and machinery should arrive on site free of sources of potential contaminants including mud. Dust suppression operations to consider the sourcing of suitable water resources where introduction of Chytrid is unlikely. | Foreman<br>Environmental coordinator | Inductions/audits |
| Access restrictions | Access to **medium and high risk** zones where pathogens listed above are identified should be restricted with the specific control measures implemented for the disposal of material or hygiene in these zones. **Medium and high risk** pathogen zones, are to be marked on relevant plans, with wash down facilities provided to prevent potential pathogens spreading beyond the area. | | | Environmental Manager | Inductions/audits |

| Activity | Management: Myrtle Rust | Management: *Phytophthora cinnamomi* | Management: Frog Chytrid | Responsibility | Quality control mechanism |
|---|---|---|---|---|---|
| Transport of new material | Use a certified supply of plants that is disease-free (the Australian Nursery Industry Myrtle Rust Management Plan (McDonald 2011) provides best practice Myrtle rust management that is to be expected from suppliers). | Soil and fill is to be sourced from suppliers that can provide certification that the material is free of disease. | Where works are undertaken in the vicinity (within 100 m) of waterways, the use of water externally sourced should be minimised or be potable water. | Environmental Manager | Inductions/start up meetings/audits |
| Identification and Testing | Instances of myrtle rust on host plants identified during construction are to be verified by an ecologist or the environment manager. | If **medium or high risk** areas are identified in the pathogen risk zones AND cannot be avoided during construction, testing of soils or plant material is to be undertaken to confirm the presence or absence of Phytophthora.<br>The Plant Disease Diagnostic Service provides a range of services to assist in the identification and management of Phytophthora. | If a medium to high risk zone is identified for Chytrid AND the management measures identified herein cannot be practically achieved, then samples of water and/or testing of common frog is to be undertaken by ecologists with samples sent to a NATA accredited laboratory.<br>The CSIRO Livestock Industries Australian Animal Health Laboratories can undertake appropriate laboratory testing. | Environmental Representative / Ecologist | Inductions/start up meetings/audits |
| Disposal of material | **Medium to high risk areas only:**<br>Plant material should be | **Medium to high risk areas only:**<br>Retain all affected | Do not dispose of water, collected on-site, outside of the creek catchment from which it was | Environmental Representative/ Ecologist | Inductions/start up meetings/audits |

| Activity | Management: Myrtle Rust | Management: *Phytophthora cinnamomi* | Management: Frog Chytrid | Responsibility | Quality control mechanism |
|---|---|---|---|---|---|
| | buried on site (and mapped) if possible, with care taken to ensure material does not enter adjacent areas of native vegetation.<br><br>Seek advice from DPI or a licenced waste facility if material cannot be disposed on site.<br><br>Local licenced waste facility | materials within the contaminated area.<br><br>Separate stockpiles from affected areas to avoid potential spread into unaffected adjacent areas. | obtained. | | |

# 8 Monitoring

Monitoring of the noxious weed and pathogen management measures are to be evaluated against performance targets, required to ensure the measures outlined in this plan are implemented and that performance criteria are satisfied as far as possible. The monitoring program will commence prior to weed control works and continue for the operation period i.e. pre, during and post construction. The monitoring program can draw upon the information contained in this plan and will involve reporting to assess and document outcomes, including:

- The implementation of weed and pathogen management measures.
- General condition of the study area including identification of additional priority weeds or reduction in the occurrence of priority weeds.
- Recommendations to undertake additional measures should these be identified as required during site inspections.
- Recommendations for corrective measures and/or revised vegetation management techniques as a result of site response to the works specified herein or other factors such as climatic conditions.

An adaptive management approach is to be employed in respect of the works forming part of this noxious weed and pathogen management plan. An adaptive management approach involves an integrated process of monitoring, reviewing and then responding to the health and condition of the measures as well as the status of the noxious weed species to identify any alterations to the design and maintenance of works that may be required to ensure the objectives of the noxious weed and pathogen plan are achieved.

Table 8 identifies the monitoring requirements for the weed and pathogen management plan, and includes a description of the action, timing, reporting requirements, responsibilities, performance parameters and assessment criteria.

**Table 9 Weed and pathogen monitoring schedule and performance indicators**

| Action | Description | Timing of action | Reporting | Responsibility | Performance Parameters / Assessment Criteria |
|---|---|---|---|---|---|
| Mapping of Priority Weeds and Pathogens | Priority weed mapping will occur prior to clearing works. | Priority weed mapping to be undertaken:<br>1. Prior to construction. | Any additional instances of weeds or pathogens that are identified are to be provided, with co-ordinates and species identification to ensure weed and pathogen mapping remains current. | Environment Manager | Indicators of success of the Weed Management Procedure include:<br>No new noxious weed and pathogen infestations within the Project footprint and in adjacent bushland as a result of the Project.<br>Assessment criteria:<br>No new priority weed species (in addition species list within this plan) to establish in the Project footprint. |
| Implementation of weed and pathogen management measures | Weed and pathogen management measures will occur throughout the extent and duration of the project in accordance with this plan. | Noxious weed management to be undertaken:<br>1. Prior to construction.<br>2. During construction. | The project area would be monitored for weed invasion during weekly site inspections, and any other inspections or audits undertaken as part of CEMP requirements. The presence of weed infestations would be reported as part of the inspection process, and include actions to be undertaken to manage these infestations | Environment manager | Indicators of success of the Weed Management Procedure include:<br>A reduction in the area of priority weed and pathogen infestations within the project footprint.<br>Assessment criteria:<br>A 50% reduction in identified weed infestations to be achieved in year 1 within the project footprint, with gradual improvement for the following two years. |
| Weed and pathogen management during rehabilitation | Rehabilitated sites | Stabilisation of catchments | Rehabilitated sites would be monitored during inspections, with weed management to be undertaken if required to manage any new infestations. | Environmental Manager | Indicators of success of the Weed Management Procedure include:<br>Control of weed infestation during rehabilitation of sites.<br>Assessment criteria:<br>No uncontrolled weed infestations. |

# 9 References


DPI 2014. *Noxious and environmental weed control handbook. A guide to weed control in non-crop, aquatic and bushland situations, 6th edition*, NSW Department of Primary Industries. Accessed via- http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0017/123317/noxious-and-environ-weed-control-handbook.pdf.

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NSW Scientific Committee 2006a. *Exotic vines and scramblers - key threatening process listing* Final determination.

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Roads & Traffic Authority 2011. *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects.* Guide 6: Weed management and Guide 7: Pathogen Management. New South Wales Roads and Traffic Authority.

# Appendix D

# Vegetation Management Plan

# Western Sydney Airport

## Vegetation Management Plan

December 2018

Western Sydney Airport

# Document Control

## Project Revision History

| Revision | Date | Description | Author | Reviewer |
|---|---|---|---|---|
| 0 | 24/09/2018 | Early Earthworks scope and visitor centre preparation | WSA Co | S Reynolds |
| 0.1 | 21/11/2018 | Draft updated to address comments on inclusion of new scope (Visitor centre, Site Accommodation and Material Importation) updated to address WSU comments on Biodiversity CEMP | WSA Co | S Reynolds |
| 0.2 | 07/12/2018 | For Approval | WSA Co | S Reynolds |
| 1 | TBC | Revision update to include the Visitor Centre Site Accommodation and Material Importation | WSA Co | S Reynolds |

## Plan Authorisation

| Position | Name | Signature | Date |
|---|---|---|---|
| Environment Manager | S Reynolds | | 07/12/2018 |

# Contents

# Tables



# Figures

# 1 Introduction

In April 2014 the Australian Government announced that the Commonwealth-owned land at Badgerys Creek will be the site for a second Sydney Airport. The Badgerys Creek airport site was selected following extensive studies completed over a number of decades.

In December 2016, the Minister for Urban Infrastructure determined the Airport Plan which sets the environmental and planning authorisation for the development of Stage 1 of the Western Sydney Airport (WSA Stage 1). In May 2017, the Government announced that it would establish WSA Co, to develop and operate the airport. WSA Co is responsible for constructing and operating Western Sydney Airport in accordance with the Airport Plan

An EIS has been prepared in accordance with the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Airports Act 1996. The EIS considered potential impacts during construction activities for the site and operation of the Stage 1 and long-term development of the proposed airport.

The Western Sydney Airport is expected to be developed in stages to match demand and include planning for services and amenities that are easily expandable over time, providing scalable capacity for aircraft, passengers, cargo and vehicle movements.

Stage 1 will include major site preparation, removing or relocating infrastructure from the site and earthworks to prepare the airport site, establishing the Airport with a single 3,700 metre runway located in the north-western portion of the Airport Site, a terminal and other support facilities to provide an operational anticipated capacity of approximately 10 million regional, domestic and international passengers per year, as well as freight traffic (the Stage 1 development).

The scope of works for the Stage 1 Development is defined in the Airport Plan and will generally include the investigation, design, construction and commissioning of:

- Bulk earthworks to move and redistribute approximately 24 million cubic metres of material on the Airport Site
- A single 3.7-kilometre runway
- Aprons, taxiways and other airside pavements
- A multi-user terminal
- Appropriate airport and aviation support facilities
- Drainage and utilities infrastructure
- Car parking, on-site roads and other appropriate landside facilities.

## 1.1 Project background

A series of sub-plans are required as appendices of the Biodiversity Construction Environment Management Plan (CEMP) for the Western Sydney Airport site at Badgerys Creek, NSW (the study area). These sub-plans are required to be developed to ensure compliance with project approvals.

This Vegetation Management Plan (VMP) forms a subplan to the Biodiversity CEMP and provides controls and actions required to manage the retained ecological features within the study area (Figure 1).

## 1.2 Description of VMP area

The Western Sydney Airport will be developed on around 1,700 hectares of Commonwealth-owned land at Badgerys Creek in Western Sydney (Airport Site). The Airport Site is approximately 50 kilometres from Sydney's central business district.

The Airport Site is bounded by Elizabeth Drive to the north, Willowdene Avenue to the south, Luddenham and Adams Road to the west and Badgerys Creek to the east. The existing terrain is made up of undulating

topography, and substantial earthworks are required to create a level surface to allow construction of the runway, taxiways and support services.

## 1.3 Potential ecological impacts

Key aspects of the proposed works that could result in potential ecological impacts include:

- Clearing of native vegetation and habitat
- Invasion of exotic species, weeds, pests and pathogens.
- Impacts on threatened species and their habitats.
- Habitat fragmentation and loss of connectivity.
- Stockpile/compound road construction.
- Works around and within watercourses.
- Noise, vibration, light and vehicular movement impacts.
- General earth vegetation resulting in disturbance of soils, erosion, and the mobilisation of sediment.
- Open excavation works.

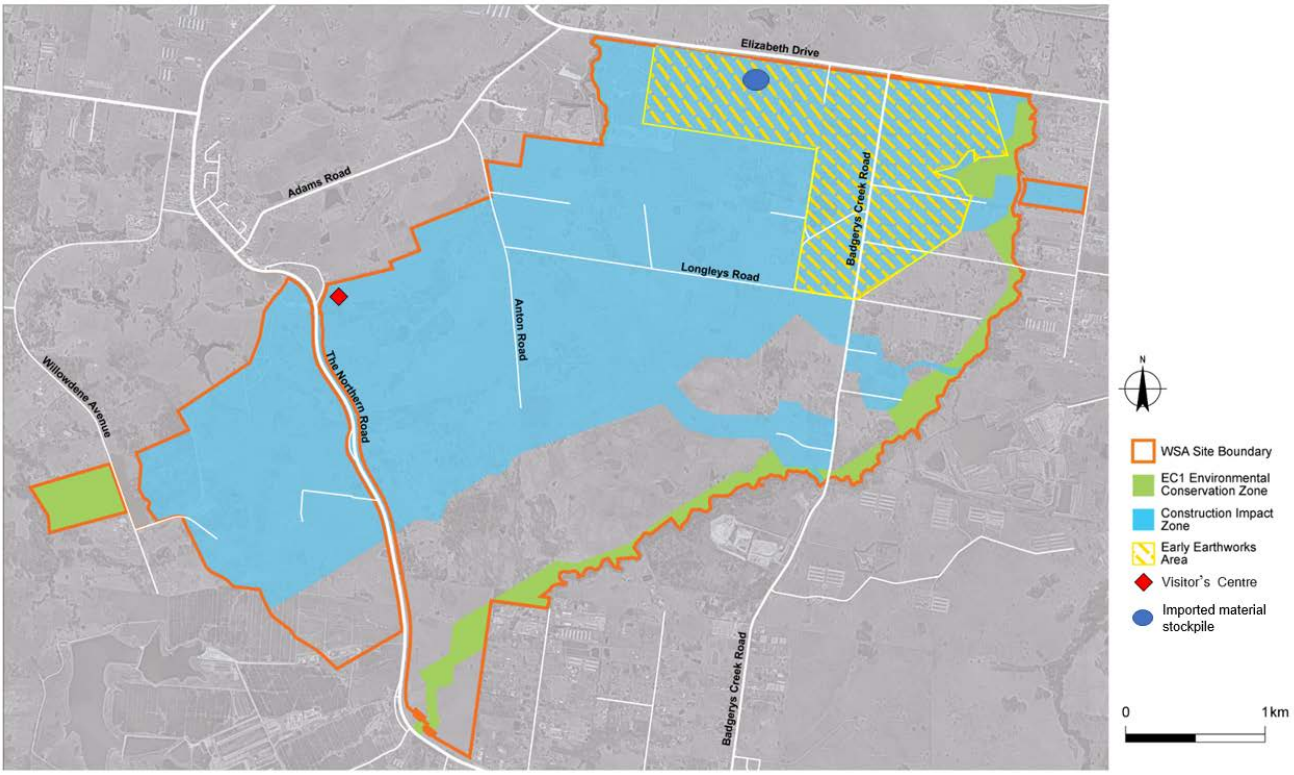



**Figure 1 Location of the study area and VMP area**

# 2 VMP Scope and Objectives

## 2.1 Scope

The scope of this VMP is to develop a framework for the management of vegetation to be retained, vegetation to be removed, and the ongoing management of weeds within the study area. The VMP also outlines ongoing management actions required for successful establishment of native plants (where applicable) within the VMP area, and actions to protect the surrounding vegetation from future negative pressures.

## 2.2 Objectives

The specific objectives for the implementation of this VMP are to:

- Outline strategies to avoid or minimise impacts on vegetation where possible.
- Outline the management requirements for any vegetation to be retained, including details on tree and vegetation protection measures e.g. establishment of no go fencing
- Provide schedules for inspection, monitoring, management and corrective actions.
- Describe weed management activities.

# 3 Methods

This section is to be updated upon completion of field surveys/pre-clearance assessments.

## 3.1 Desktop Research

A review of all available design plans and reports relating to the site and adjacent areas was conducted, as well as relevant legislation, recent vegetation mapping and other documentation relevant to the current project, including;

- Western Sydney Airport Environmental Impact Assessment (GHD 2016)
- Proposed Site Plans
- The Native Vegetation of the Sydney Metropolitan Area (OEH 2013)
- NSW Scientific Committee final determinations for threatened biodiversity.
- Department of the Environment and Energy (DEE) Protected Matters Search Tool for matters protected by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Office of Environment and Heritage (OEH) NSW BioNet, the database for the Atlas of NSW Wildlife, for matters protected under the *Biodiversity Conservation Act 2016* (BC Act).

## 3.2 Site Assessment

A general flora and fauna site survey of the construction footprint covered by the Biodiversity CEMP will be conducted prior to the commencement of construction works by a qualified and experienced restoration ecologist. Investigation of the study area will involve:

- The identification of native and exotic plant species, according to Field Guide to the Native Plants of Sydney (Robinson 2003) and the Flora of NSW (Harden 1992, 1993, 2000, 2002), with reference to recent taxonomic changes.
- The identification and mapping of plant communities according to the structural definitions of Native Vegetation of the Sydney Metropolitan Area (OEH 2013).
- Targeted searches for plant species of conservation significance according to the “random meander” method (Cropper 1993).
- Identifying fauna habitats, assessing their condition and assessing their value to threatened fauna species.
- Observations of animal activity and searches for indirect evidence of fauna (such as scats, nests, burrows, hollows, tracks, scratches and diggings).
- An assessment of the natural resilience of the vegetation of the site.
- Identification of previous and current factors threatening the ecological function and survival of native vegetation within and adjacent to the study area.
- Determination of appropriate rehabilitation and bush regeneration techniques for the native vegetation of the site.

The conservation significance of plant species and plant communities will be determined according to:

- *Biodiversity Conservation Act 2016* (NSW) (BC Act) for significance within NSW
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for significance within Australia.

## 3.3 Limitations

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as species dormancy, seasonal conditions, and ephemeral status of waterbodies and migration and breeding behaviours of some fauna. In many cases these factors do not present a significant limitation to assessing the overall ecological values of a site.

# 4 Site description

This section will be revised upon site assessment to ensure details are specific to the construction footprint covered by the Biodiversity CEMP.

## 4.1 Vegetation communities

The VMP area contains seven vegetation communities that were identified during EIS investigations (GHD 2016):

- Grey Box – Forest Red Gum grassy woodland on flats (HN528)
- Grey Box – Forest Red Gum grassy woodland on hills (HN529)
- Forest Red Gum – Rough-barked Apple grassy woodland (HN526)
- Broad-leaved Ironbark – Grey Box – *Melaleuca decora* grassy open forest (HN512)
- Artificial freshwater wetland
- Exotic Grassland
- Cleared land or cropland

### 4.1.1 Grey Box - Forest Red Gum grassy woodland on flats

The Forest Red Gum grassy woodland within the VMP area was found to be in moderate condition occurring describe the location of the vegetation community within the VMP area.

The canopy consisted of Grey Box *Eucalyptus moluccana,* Forest Red Gum *Eucalyptus tereticornis* and the occasional Thin-leaved stringybark *Eucalyptus eugenioides.* The canopy provided approximately 20% cover and varied from 15–25m tall.

The midstory consisted of a generally sparse cover 1- 26.5% of shrubs such as *Dilwynia* sieberi or gorse Bitter-pea *Daviesia ulicifolia.* On occasion dense patches of Native Blackthorn, Black Wattle *Acaica decurrens* or Parramatta wattle *Acacia parramattensis* growing to 5m tall providing 50-80% cover.

The ground cover consisted of Kangaroo Grass *Themeda* australis, Weeping Grass *Microlena stipoides* var. stipoides, Treeawn Speargrass *Aristida* vagans, Paddock Love Grass *Eragrostis* l*eptostachya* and *Lomandra filiformis* subsp. *Filiformis,* occasional understorey species such as peach heath *Lissanthe strigose*, herbs such as *Caesia parviflora* var. *vittata,* Kidney Weed *Dichondra* repens, Native Wandering Jew *Commelina cyanea* and Blue Trumpet *Brunoniella australis.*

Locally high cover of chenopods such as climbing Saltbush *Einada nutans* subsp. *Nutans* and berry saltbush *Einadia hastata* moderate cover and species richness of scramblers such as Amulla *Eremophila debilis* and Glycine species.

Exotic plants such as African Boxthorn *Lycium ferocissimum* and African olive *Olea europaea* subsp. *europaea* Cuspidate pasture grasses such as *Setaria parviflora*, Kikuyu *Pennisetum clandestium* and Paspalum *Paspalum dilatatum*, African Lovegrass *Eragrostis curvula* and Panic Veldtgrass *Ehrharta erecta*, Fireweed *Senecio madagascariensis*, Dandelion *Taraxaxum offcinale,* Greater Beggar's Ticks *Bidens subalternans* Black-berry Nightshade *Solanum nigrum* and *Solanum sisymbriifolium* and climbers such as Moth Vine *Araujia sericifera* and Bridal Creeper *Asparagus asparagoides*.

This species assemblage is consistent with the CEEC Cumberland Plain Woodland, listed under the BC Act and EPBC Act.

### 4.1.2 Grey Box – Forest Red Gum grassy woodland on hills

The Forest Red Gum grassy woodland within the VMP area was found to be in moderate condition occurring describe the location of the vegetation community within the VMP area.

The canopy consisted of Grey Box *Eucalyptus moluccana,* Forest Red Gum *Eucalyptus tereticornis* and the occasional Thin-leaved stringybark *Eucalyptus eugenioides*.The midstorey consisted of sparse cover with patches of dense Native Blackthorn *Acaica decurrens* or Hickory Wattle *Acacia implexa*.

The ground cover consisted of Weeping Grass *Microlena stipoides var. stipoides*, Two-colour panic *Panicum simile*, Red Grass *Bothriochloa macra*, Treeawn Speargrass *Aristida vagans*, Mat-rush *Lomandra multiflora subsp. Multiflora* and *Lomandra filiformis subsp. Filiformis*, Wedge Guinea Flower *Hibbertia diffusa*.

Herbs such as Indian Weed *Sigesbeckia orientalis subsp. Orentalis, Plectranthus parviflora,* Native Wandering Jew *Commelina cyanea*, Forest Nightshade *Solanum prinophyllum* and Blue Trumpet *Brunoniella australis* high cover of Climbing Saltbush *Einada nutans subsp*. *Nutans* and *Einadia trigonos subsp. Trigonos*, scramblers such as *Amulla Eremophila debilis* and glycine species.

Exotic plants included African Boxthorn *Lycium ferocissimum*, Lantana *Lantana camara* and African olive *Olea europaea subsp. Europaea*, *Setaria parviflora, Kikuyu Pennisetum clandestium* and Paspalum *Paspalum dilatatum*, African Lovegrass *Eragrostis curvula* and Panic *Veldtgrass Ehrharta erecta*, Fireweed *Senecio madagascariensis*, Dandelion *Taraxaxum offcinale*, Greater Beggar's Ticks *Bidens subalternans*, *Solanum sisymbriifolium* and climbers such as Moth Vine *Araujia sericiferm*, Paddy's Lucerne *Sida rhombifolia*.

This species assemblage is consistent with the CEEC Cumberland Plain Woodland listed under the BC Act.

### 4.1.3 Forest Red Gum – Rough-barked Apple grassy woodland

The canopy consisted of Forest Red Gum *Eucalyptus tereticornis*, Cabbage Gum *Eucalyptus amplifolia subsp. amplifolia* with the occasional Thin-leaved stringybark *Eucalyptus eugenioides* and Grey Box *Eucalyptus moluccana*.

The midstorey consisted of occasional dense patches of Native Blackthorn *Acaica decurrens,* Prickly-leaved Tea Tree *Melaleuca styphelioides*, Flax-leaved Paperbark *Melaleuca linariifolia,* Swamp Oak *Casurarina glauca* or Acacia species up to ten metres.Ground cover species included moderate cover of grasses such as; Weeping Grass *Microlena stipoides* var. *stipoides,* Treeawn Speargrass *Aristida vagans*, Early Spring Grass *Eriochloa pseudoacrotricha*, *Oplismenus aemulus* and Slender Rat's Tail Grass *Sporobolus creber* locally dense patches of sedges such as Slender Flat-sedge *Cyperus gracilis, Cyperus polystachyos* and the occasional dense patches of Native Blackthorn, Black Wattle *Acaica decurrens.*

Herbs such as Indian Weed *Sigesbeckia orientalis* subsp. *Orentalis, Plectranthus parviflorus,* Native Wandering Jew *Commelina cyanea,* Forest Nightshade *Solanum prinophyllum*, Indian Pennywort *Centella asiatica* and Blue Trumpet *Brunoniella australis.*

High cover of Climbing Saltbush *Einada nutans* subsp. *Nutans* and Einadia trigonos *subsp.* Trigonos, other scramblers such as Amulla *Eremophila debilis*, Slender Tick-trefoil *Desmodium varians* and *Glycine* species. Native vincesuch as Headache Vine *Clematis glycinoides* are locally abundant.

Drainage lines through the vegetation featured high species such as richness and cover/abundance of native aquatic herbs and ferns such as *Marsilea mutica, Alternanthera denticulate, Eleocharis cylindrostachys, Triglochin microtuberosa* and *Myriophyllum variifolium.*

Exotic species such as African Boxthorn *Lycium ferocissimum*, Lantana *Lantana camara*, Green Cestrum *Cestrum parqui*, Blackberry *Solanum nigrum* and African olive *Olea europaea* subsp. *europaea*, pasture grasses such as Setaria parviflora, Kikuyu *Pennisetum clandestium* and Paspalum *Paspalum dilatatum*. Weedy grasses such a Panic Veldtgrass *Ehrharta erecta*, Fireweed *Senecio madagascariensis*, Maderia Winter Cherry *Solanum pseudocapsicum* and Dandelion *Taraxaxum offcinale*, Greater Beggar's Ticks *Bidens subalternans*, *Solanum sisymbriifolium* and Paddy's Lucerne *Sida rhombifolia*, also scramblers such as Wandering Jew *Tradescantia fluminensis*, and climbers include Moth Vine *Araujia sericiferm*, Maderia Vine *Anredera cordiflora* and Bridal creeper *Asparagus asparagoides*.

This species assemblage is consistent with the EEC River-flat Eucalypt Forest, listed under the BC Act.

### 4.1.4 Broad-leaved Ironbark – Grey Box – Melaleuca decora grassy open forest

The canopy consisted of Forest Red Gum *Eucalyptus tereticornis* and Broad-leaved Ironbark *Eucalyptus fibrosa* with the occasional Thin-leaved stringybark *Eucalyptus eugenioides.*

The midstorey included mature *Melaleuca decora* with the occasional dense patches of Native Blackthorn *Acaica decurrens*, or Parramatta Wattle *Acacia parramattensis*, cover from small trees such as Dwarf Cherry *Exocarpus strictus*, and Wedge-leaf hop bush *Dodonaea viscosa* subsp. *cuneata.*

Ground cover consisted of plants such as Treeawn Speargrass *Aristida vagans*, Purple Wiregrass *Aristida ramose*, Wiry Panic *Entolasia stricta*, Kangaroo Grass *Themeda* australis, Wallaby Grass *Austrodanthonia racemose*, Slender Chloris *Chloris divaricate* var. *divaricata, Lomandra filiformis* subsp. *Filiformis*, localised dense patches of *Melaleuca nodosa* and other occasional shrubs such as Rough Guniea Flower *Hibbertia aspera,* Prickly Currant Bush *Coprosma quadrifida* and sticky Cassinia *Cassinia uncata,* herbs such as Pomax *Pomax umbellate,* Variable stickweed *Opercularia varia*, Slender Wire Lily *Laxmannia gracilius* and *Caesia parviflora* var. *vittata. Scramblers such as Glycine* species.

Exotic plant species recorded include African Love Grass *Eragrostis curvula*, and windborne environmental weeds such as Dandelion *Taraxaxum offcinale*. This species assemblage is consistent with the CEEC Cumberland Plain Woodland, listed under the BC Act and EPBC Act.

### 4.1.5 Artificial freshwater wetland

The canopy was generally absent. Occasional isolated Cabbage Gum *Melaleuca decora,* Flax-leaved Paperbark *Melaleuca linariifolia*, or Swamp Oak *Casurarina glauca.*

The mid storey was generally absent, with occasional patches of *Melaleuca* species or Tantoon *Leptospermum polygalifolium.*

The groundcover was dense, structurally complex. Common species included Common Reed *Phragmites australis*, Cumbungi *Typha orientalis*, Spike Rush *Eleocharis palustris*, and *Schoenoplectus validus*. Other wetland species include; Water Couch *Zoysia macrantha*; floating aquatic ferns such as Nardoo *Marsilea mutica* and *Azolla* species. Emergent aquatic herbs such as Wooly Frogmouth *Phylidrum lanuginosum, Perscaria* species and *Ludwigia peploides* subsp. *Montevidensis,* submerged aquatic herbs such as *Triglochin microtuberosum* and *Myriophyllum* species, *Centella asiatica* and Swamp Goodenia *Goodenia paniculata.*

There is generally low to moderate exotic plant cover. Herbs such as *Ludwigia peruviana* and localised dense patches of exotic sedge Sharp Rush *Juncus acutus*, also included is African Love Grass *Eragrostis curvula*. There is localised infestation of Alligator Weed *Alternanthera philoxeroides.*

### 4.1.6 Exotic Grassland

Canopy was absent.

Midstorey was generally absent apart from the occasional Native Blackthorn *Acaica decurrens*, Swamp Oak *Casurarina glauca*, Acacia species or *Dilwinia sieberi.*

Groundcover was dominated by exotice grasses. Occasionally native species such as Peach Heath *Lissanthe strigose*, Kangaroo grass *Themeda australis*, Spear grass *Aristida* species and Common Couch *Elymus repens* were present. Sedges such as Common Fringe-sedge *Carex crinita* and scramblers included *Gylcine* species.

Exotic species dominated, pasture grasses such as Kikuyu *Seteria parviflora* and Carpet Grass *Axonopus fissifolius*. There were extensive areas dominated by weeds such as African Love Grass *Eragrostis curvula*, Khaki Weed *Alternanthera pungenes*, Blackberry *Rubus fruitcosus* or Noogoora Burr *Xanthium occidentale*,

Dandelion *Taraxaxum offcinale*, Rhodes Grass *Chloris gayana, Solanum sysimbrifolium,* Stinkgrass *Eragrostis cilianensis* and Lamb;s Tongue *Plantago lanceolate.*

### 4.1.7 Cleared land or cropland

The Canopy was absent.

Midstorey was generally absent apart from the occasional Native Blackthorn *Acaica decurrens*, Swamp Oak *Casurarina glauca*, Acacia species or *Dilwinia sieberi.*

The Ground cover was dominated by exotic crops. Patchy and variable cover of species such as Peach Heath *Lissanthe strigose*, grasses such as Kangaroo Grass *Themeda australis*, Speargrass *Aristida* species and Common Couch *Elymus*. Sedges such as *Juncus usitasis* and scramblers such as *Glycine* species.

The exotic groundcover was also patchy and variable. Extensive areas dominated by noxious weeds such as African Olive *Olea europaea* subsp. *Europaea,* Blackberry *Solanum nigrum*, Inkweed *Phytolacca octandra.* African Love Grass *Eragrostis curvula*, *Bidens* species. *Rhodes* grass, *Solanum sysimbrifolium* and Lamb's Tongues X throughout.

## 4.2 Fauna habitats

A range of fauna habitat features were present throughout the study area. Habitat within the VMP area provides potential foraging, breeding and nesting resources for a range of fauna. Fifty hollow-bearing trees were recorded within the study area during field surveys. The habitat features relevant to each fauna group are identified in Table 1 below.

**Table 1 Key fauna habitat features present across the study area**

| Habitat feature | Fauna species |
|---|---|
| Vegetated areas of tall open forest | Arboreal mammals, microchiropteran bats and owls. |
| Hollow bearing trees | Arboreal mammals, microchiropteran bats and birds. |
| Watercourse | Habitat for amphibians and fish; foraging for birds, microbats, reptiles and marsupials. |
| Leaf litter/woody debris | Foraging resources for birds, mammals, frogs and reptiles. |
| Pasture | Birds, microchiropteran bats and reptiles |

## 4.3 Threatened species habitats

A key aim of the pre-clearance surveys will be to identify and map the presence/absence of threatened biota. Additionally, the ecologist will undertake pre-clearing surveys to:

- Identify all locations of trees, habitat features (hollow bearing trees, logs and existing nest boxes) and any other plants which have been marked or otherwise identified for preservation.
- Inspect bridges and/or culverts prior to demolition for the presence of native fauna (particularly roosting bats).
- Inspect farm dams and surrounding habitat prior to dewatering for presence of aquatic fauna – including frogs, turtles and eels.
- Identify the presence or evidence of the presence (including fresh scats, scratches and remains of prey) of fauna, including threatened species.
- Identify the presence of raptor nests, particularly White-bellied Sea-Eagle *Haliaeetus leucogaster* and Little Eagle *Hieraaetus morphnoides*.

- Identify Threatened Ecological Communities (TECs), delineating areas within and outside of the study area.
- Mark all hollow bearing trees, potential hollow bearing trees, logs, nest boxes, and all other fauna-containing habitat trees, including trees with nests, dreys and termitaria likely to be occupied by fauna, at least seven days prior to the commencement of clearing in a manner which clearly identifies and demarcates the trees.

Following the completion of the pre-clearing surveys, the ecologist will submit a letter report the WSA Co Environment Manager within five working days detailing works undertaken. The report will be provided to the Contractor for information. The report will include:

- Description of the presence of threatened flora species.
- Description of the presence or evidence of fauna (including fresh scats, scratches and remains of prey), including threatened species.
- Recommended actions to avoid the potential for harm to any fauna during clearing, including protocols for staged clearing of vegetation, safe tree felling, and a two-stage tree and log removal process.
- Measures to avoid disturbance to surrounding vegetation during clearance works.

## 4.4 Priority and environmental weeds

Table 2 below, outlines the weeds listed under the *Noxious Weed Act 1993* (NSW) (NW Act) at the time of assessment by (GHD 2016) and an updated Biosecurity Duty under the *Biosecurity Act 2015* (NSW). All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Weeds of National Significance (WoNS) were also recorded within the subject site and are presented in Table 2.

**Table 2 Priority weeds and WoNS records within the study area**

| Scientific name | Common name | Biosecurity Act 2015 Biosecurity Duty | WoNS |
|---|---|---|---|
| *Alternanthera philoxeroides* | Alligator Weed | Biosecurity Zone<br>The Alligator Weed Biosecurity Zone is established for all land within the state except land in the following regions: Greater Sydney; Hunter (but only in the local government areas of City of Lake Macquarie, City of Maitland, City of Newcastle or Port Stephens).<br>Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. | Yes |
| *Anredera cordifolia* | Madeira vine | General biosecurity duty | Yes |
| *Asparagus asparagoides* | Bridal Creeper | General biosecurity duty | Yes |
| *Bryophyllum sp.* | Mother-of-millions | General biosecurity duty | No |
| *Cestrum parqui* | Green Cestrum | Regional Recommended Measure<br>Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread | No |

| Scientific name | Common name | Biosecurity Act 2015 Biosecurity Duty | WoNS |
|---|---|---|---|
| | | from their land. The plant should not be bought, sold, grown, carried or released into the environment. | |
| *Cortaderia selloana* | Pampas grass | General biosecurity duty | No |
| *Lantana camara* | Lantana | General biosecurity duty | Yes |
| *Ligustrum lucidum* | Broad-leaved Privet | General biosecurity duty | No |
| *Ligustrum sinense* | Small-leaved Privet | General biosecurity duty | No |
| *Lycium ferocissimum* | African Boxthorn | General biosecurity duty | Yes |
| *Olea europa* subsp. *cuspidata* | African Olive | Regional Recommended Measure<br>An exclusion zone is established for all lands in Blue Mountains City Council and Central Coast local government areas. The remainder of the region is classified as the core infestation area.<br>Whole region: The plant or parts of the plant are not traded, carried, grown or released into the environment. Core infestation area: Land managers prevent spread from their land where feasible. | No |
| *Opuntia stricta* | Common Prickly pear | General biosecurity duty | Yes |
| *Ricinus communis* | Castor Oil Plant | General biosecurity duty | No |
| *Rubus fruticosus* species aggregate | Blackberry | General biosecurity duty | Yes |
| *Salvinia molesta* | Salvinia | Regional Recommended Measure<br>Exclusion zone: whole region except for the core infestation area of the Georges and Hawkesbury-Nepean Rivers and their tributaries.<br>Whole region: Land managers mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers should prevent spread from their land where feasible. | Yes |
| *Senecio madagascariensis* | Fireweed | General biosecurity duty | Yes |

# 5 Vegetation Management

## 5.1 General approach

This VMP provides a framework for the successive restoration activities that will be undertaken at the Airport Site. WSA Co has demonstrated a long-term commitment to biodiversity through the establishment of the Environmental Conservation Zone (ECZ) and will progressively undertake activities to enhance and protect the environmental values of this area. The ECZ will be the priority area for restoration activities, with works in this area established by applying the principles of 'retain, regenerate and revegetate'. Inherent in this approach is the need to work from areas of more resilient bushland to areas of more degraded bushland within the ECZ (Buchanan 1989; DEC 2005).

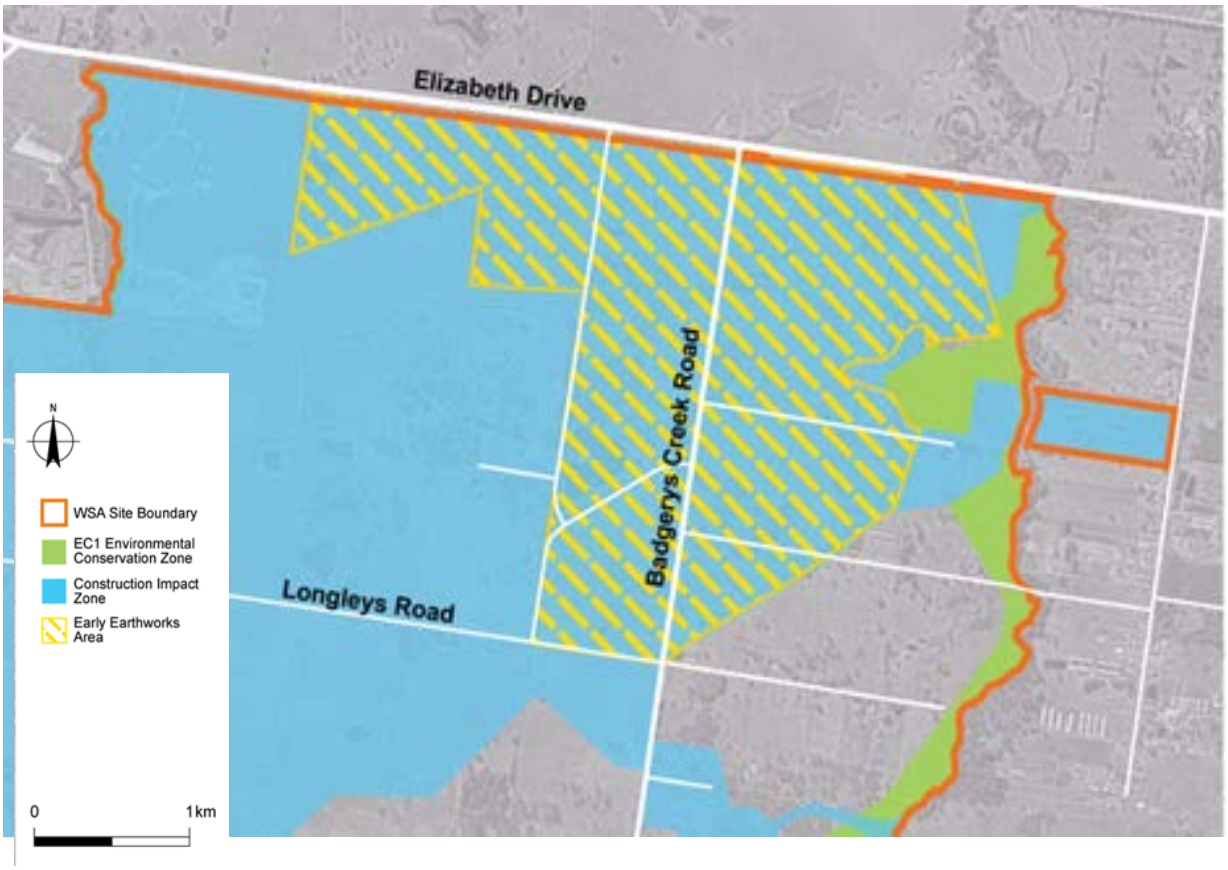
## 5.2 Environmental conservation zone

Ecological restoration activities to be undertaken in the ECZ will align with the objectives of Condition 7 (5) of the Airport Plan, which requires that measures to protect and manage the areas in the ECZ, particularly along the Badgerys's Creek riparian corridor are undertaken, including:

- Replacing exotic grasslands with suitable native vegetation;
- Rehabilitating existing remnant and native vegetation; and
- Providing ongoing protection of the biodiversity and environmental values.

Refer to Figure 1 for the location of the ECZ within the Airport Site and Table 2 for the location of areas of the ECZ that occur within close proximity to the Early Earthworks Site footprint, noting that there are no ECZs within close proximity or that are likely to be impacted by the activities associated with other component of the works covered by under the Biodiversity CEMP (refer to Table 1).

**Figure 2 Area of the Environmental Conservation Zone in close proximity to the Early Earthworks Footprint**



# 6 Specific management actions

## 6.1 Construction Activities

### 6.1.1 Site inductions

Supervisors are required to identify all potential environmental impacts and implement and maintain control measures, procedures and constraints in accordance with the Biodiversity CEMP. Site specifics include the presence of threatened species habitat and locally significant vegetation communities. Th general Project induction include hygiene protocols to reduce the potential for introduction of invasive flora and fauna species or disease into the protected vegetation at the site.

### 6.1.2 Exclusion fencing

The ECZ located adjacent to the Early earthworks area will be shown on relevant Environmental Control Map (ECM) and physically delineated on site using fencing and signage. Prior to the commencement of earthworks, exclusion fencing is to be installed along the boundaries of vegetated areas to be retained. The alignment of this fencing is to be in accordance with the Australian Standard *Protection of Trees on Development Sites (AS4970-2009)* and incorporate the relevant tree protection zones for trees and vegetation to be retained.

The fencing should be constructed of, as a minimum, capped star pickets and high visibility para webbing and have appropriate signage stating that it is an environmentally sensitive area to inform and educate construction personnel. Exclusion zones are to be clearly marked and labelled on design drawings issued for construction and will be displayed in prominent places and provided in site inductions.

No storage of materials or machinery is to be undertaken within exclusion zones or retained vegetation, no preparation of chemicals or concrete to be mixed in these areas, or adjacent, and care to avoid the compaction of soils to be observed.

### 6.1.3 Erosion and sediment controls

Earthworks will not commence until sediment and erosion controls have been installed as per an Erosion and Sediment Control Plan. Erosion and sediment control will be observed and monitored in accordance with the Soil and Water CEMP.

## 6.2 Rehabilitation works

### 6.2.1 Weed management

This proposed work has the potential to introduce and promote weeds and pathogens in the site footprint as well as in the surrounding area. Environmental weeds are exotic species considered either a high risk of dispersing and becoming established in adjacent native vegetation or have the potential to cause significant ecological harm. Recommended methods for control of environmental weeds recorded on site, along with priority species, are outlined in the Biodiversity CEMP Appendix C Weed and Disease Management Plan.

### 6.2.2 Pest control

Predation by native macropods, introduced herbivores (rabbits and hares), insect pests and infection caused by plant diseases/pathogens can have an adverse effect on the establishment of plantings by defoliating, damaging, removing or killing young plants. To minimise the loss of plants through predation and/or disease, all new plantings will be protected by:

- Use of black plastic rigid mesh tree guards, which would be reused on new plantings once the initial planted specimens mature.
- Temporary exclusion fencing of larger areas or where initial trials indicate that the efficacy of using individual tree guards is low.

# 7 Vegetation management actions

**Table 3 Vegetation management actions**

| Management Action | Location | Responsibility | Task | Timing |
|---|---|---|---|---|
| Establish Biodiversity Offsets | Offsite, reported in the BODP | Infrastructure Department | Secure suitable Biodiversity Offsets for the Airport Site and gain approval for the Biodiversity Offset Delivery Plan (BODP) prior to commencing main construction works (in accordance with Condition 30 of the Airport Plan). | Pre-construction |
| Native seed collection | Across site in suitable native vegetation, reported in the BODP | Infrastructure Department | Facilitate Greening Australia to undertake native seed collection at the Airport Site to support the organisations Native Seed Production Area (SPA) program (in accordance with Condition 32 of the Airport Plan) | Pre-construction |
| Threatened flora propagation | Across site in habitat suitable for threatened flora species, reported in the BODP | Infrastructure Department | Undertake seed or propagule collection (as biologically appropriate), propagation trials and field planting trials (where possible) for the threatened species *Marsdenia viridflora* subsp. *viridflora* and *Plutenaea parviflora* in collaboration with the Department of the Environment, the Office of Environment and Heritage and Mount Annan Botanic Garden (in accordance with Condition 33 of the Airport Plan) | Pre-construction |
| Fence Environment Conservation Zone | ECZ | Contractor | Fence the perimeter of the ECZ to delineate the construction impact zone from area of vegetation to be retained.<br>Place locks on gates to restrict access<br>Place signage on fence identifying the location as an Environmental Conservation Zone | Pre-construction |
| Stockpile hollow-bearing logs for use in rehabilitation projects | Airport Site | Contractor | Stockpile hollow-bearing logs for future use in rehabilitation projects (in accordance with Condition 7 (3) of the Airport Plan) | Construction |
| Install nest boxes | ECZ | Contractor | Install nest boxes for biodiversity in the ECZ (in accordance with Condition 7 (3) of the Airport Plan) | Construction |

| Management Action | Location | Responsibility | Task | Timing |
|---|---|---|---|---|
| Monitor nest boxes | ECZ | WSA Co. | Undertake nest box monitoring program | Post-construction |
| Use hollow-bearing logs in rehabilitation projects | To be determined | WSA Co. | Use hollow bearing logs in rehabilitation projects | Post-construction |
| Replace exotic grasslands with suitable native vegetation within the ECZ along Badgerys Creek | ECZ | WSA Co. | Undertaken activities that reinstate native grasslands where exotic grasslands currently occur within the ECZ (in accordance with Condition 7 (5) of the Airport Plan) | Post-construction |
| Rehabilitate existing remnant and native vegetation within the ECZ long Badgerys Creek | ECZ | WSA Co. | Undertake rehabilitation activities within the ECZ along Badgerys Creek (in accordance with Condition 7 (5) of the Airport Plan) | Post-construction |

# 8 Adaptive Management

An adaptive management approach is to be employed in respect of the works forming part of this VMP. An adaptive management approach involves an integrated process of monitoring, reviewing and then responding to the health and condition of the plantings as well as the status of the weed species to identify any alterations to the design and maintenance of works that may be required to ensure the objectives of the VMP are achieved.

It is important to note that any changes should comply with the aims of this VMP and any licensing or approval conditions issued before implementation. An Adaptive Management Statement (or similar) will be prepared by the ecologist and approved by the WSA Environment Manager prior to implementation of any adaptive management actions.

# 9 References

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Ralph, M. 1993. Seed Collection of Australian Native Plants – For Revegetation, Tree Planting and Direct Seeding. Bushland Horticulture, Fitzroy.

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# Appendix E

# Bushfire Management Plan

# Western Sydney Airport

## Bushfire Risk Management Plan

December 2018

Western Sydney Airport

# Document status

| Version and Title | Purpose | Prepared by | Approved by | Date |
|---|---|---|---|---|
| 1.0 Badgerys Creek Bushfire Risk Management Plan 2015-16 and 2016-17 Financial Year | Update Badgerys Creek Bushfire Risk Management Plan from 2002 following transfer of site management responsibilities from Aviation and Airports Division to the Western Sydney Unit in 2015 | Environment and Land Use Planning Section; Communications, Environment and Legal Branch; Western Sydney Unit | General Manager, Communications, Environment and Legal Branch<br>Western Sydney Unit | 10 November 2015 |
| 2.0 Western Sydney Airport Site at Badgerys Creek Bushfire Risk Management Plan 2017 | Update Badgerys Creek Bushfire Risk Management Plan 2015-2016 and 2016-17 Financial Year to reflect advice received from Rural Fire Service on 15 December 2016 and take account of the commencement of implementation phase of the Western Sydney Airport project | Director, Site Integration and Transition Section | General Manager, Communications, Environment and Legal Branch<br>Western Sydney Unit | Updated 20 December 2016<br>Approved 20 January 2017 |
| 3.0 Western Sydney Airport – Bushfire Risk Management Plan 2018 - 2020 | Update the 2017 Plan to reflect the impact on bushfire management and RFS access to site as a result of:<br>1. the move to WSA Co management of the site<br>2. the proposed construction activities<br>3. the proposed Fire Trail standards to be implemented by 2020 | Principal Construction Surveillance Manager | Construction Manager | |
| 4.0 Western Sydney Airport – Bushfire Risk Management Plan 2018 - 2020 | Update the plan to reflect the activities associated with the Early Earthworks | WSA Co | General Manager, Communications, Environment and Legal Branch<br>Western Sydney Unit | 24 September 2018 |
| 5.0 Western Sydney Airport – Bushfire Risk Management Plan 2018 - 2020 | Update the plan to reflect the activities associated with the construction of the Visitors Centre and Site Accommodation and Material Importation | WSA Co | General Manager, Communications, Environment and Legal Branch<br>Western Sydney Unit | TBC |

# Information sources

| Source |
| --- |
| Macarthur Bush Fire Management Committee (2012) Bush Fire Risk Management Plan (still current)<br>Available at: http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0017/2393/Macarthur-BFRMP.pdf |
| WSA Co Documents including:<br>• Environmental Management Plan<br>• Construction Environmental Management Plan(s)<br>• Construction Plans and Scheduling |
| NSW Rural Fire Service |
| Strategic Fire Trail Network paper & Fire Trail Standards - August 2017 |

# Contents

# 1. Introduction

## 1.1 Background

Originally, the Badgerys Creek Bush Fire Risk Management Plan (the Plan) was prepared by the Western Sydney Unit (WSU) of the Department of Infrastructure and Regional Development for the Western Sydney Airport (WSA) site. The Plan was an interim strategy to address bushfire risks associated with the management of the site only, which require mitigation and response actions. The Plan was intended to sit within the broader context of the *Macarthur Bushfire Risk Management Plan*, prepared by the Macarthur Bush Fire Management Committee.

Subsequent iterations of the Plan have taken into account greater understanding of the site and its inherent conditions as well as consultations with all relevant stakeholders and local authorities.

The Bushfire Risk Management Plan in all its iterations did not address bushfire risks associated with the development of the site or construction and future operations of an airport. In July 2015, as part of the Western Sydney Airport Environmental Impact Statement (EIS), a Bushfire Risk Assessment was conducted for airport operations. The responsible authority would prepare any required plans for the airport in future following the grant of a lease to an Airport Lessee Company.

In late 2017 WSA Co was established with the objective of the design, construction and operation of Western Sydney Airport. Subsequently in May 2018 WSA Co assumed responsibility of the site in the lead up to the commencement of construction activities. In assuming control of the site WSA Co will take responsibility for bushfire management and relationships with the Rural Fire Service (RFS) and ensure the bushfire management and mitigation plan is up to date and reflects the changing site conditions generated by the construction activities.

This latest iteration prepared by WSA Co in consultation with specialist consultants addresses:

a. The known fire conditions
b. Future-proofing the Plan to consider the changing construction activities
c. The requirements of the RFS proposed fire trail standards

## 1.2 Aims and objectives

The aim of this Plan is to identify and define the levels of bushfire risk within the site boundary and from adjoining properties. This Plan also aims to minimise the adverse impacts of bushfires on the local community and environment through implementation of the bushfire risk management activities identified in Section 3. The objectives of the Plan are to:

- Meet the **obligations** of a large landowner under the *Rural Fires Act 1997*, and under the Liverpool Range and Macarthur Bush Fire Risk Management Plans;
- **Reduce the risk** of bushfire damage to life, property and the environment on the site (see discussion in Section 2) through the use of appropriate bushfire risk management strategies (Section 3);

- **Manage fuel** to reduce the rate of spread and intensity of bushfires, while minimising environmental impacts (Section 3);
- Ensure relevant people **understand** their bushfire management responsibility, including the local community through the Western Sydney Airport quarterly updates; and
- Provide for effective **monitoring** bushfire risk management strategies to ensure protection and conservation of the natural, cultural, scenic and recreational features of the site.

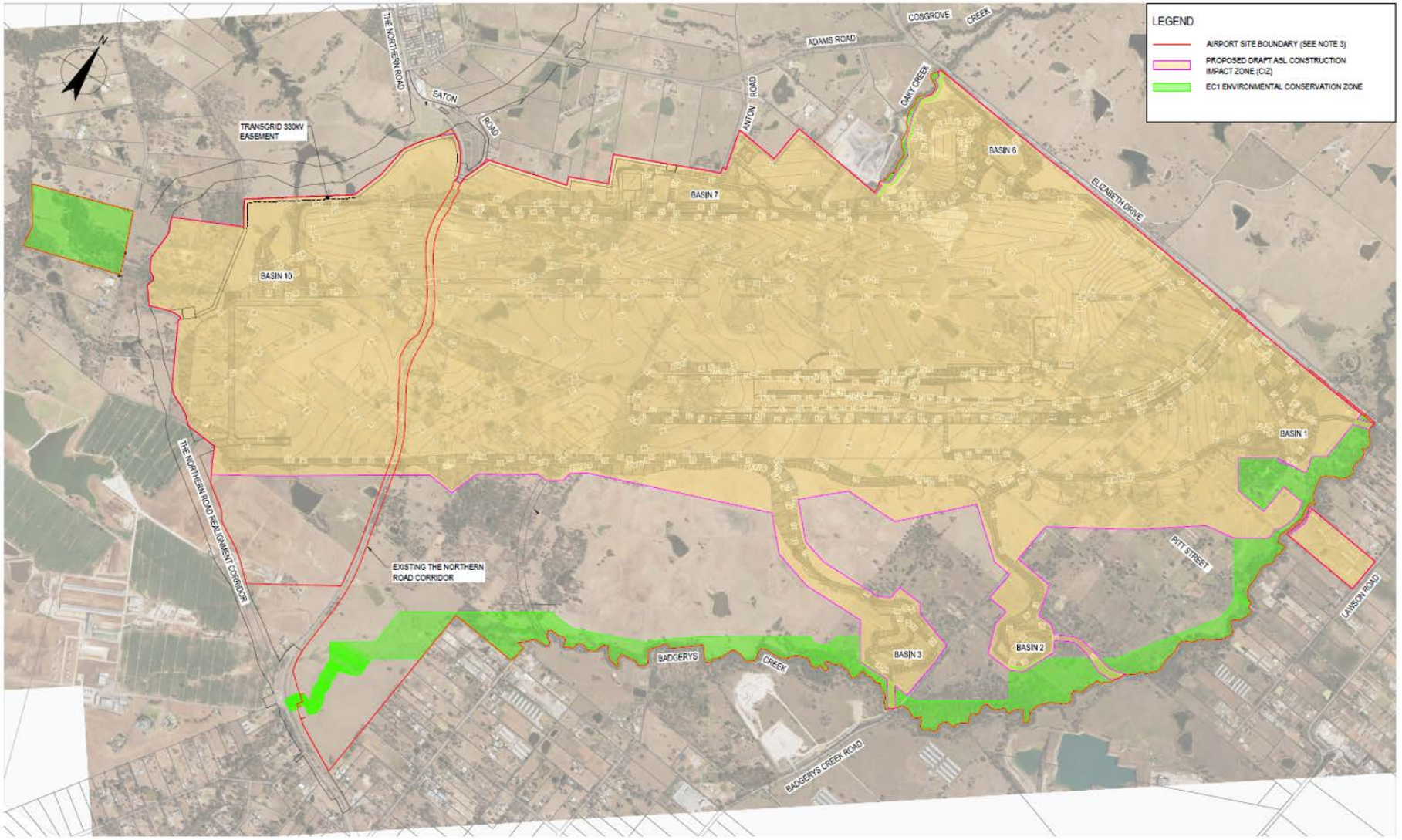
## 1.3 Scope of the Plan

### 1.3.1 Description of the Badgerys Creek site

The scope of this plan is the Commonwealth owned land at Badgerys Creek in New South Wales, which was proclaimed as the Western Sydney Airport site in August 2015 and covers approximately 1700 hectares. Refer to Figure 1~~Figure 1~~ for site location and Figure 2~~Figure 2~~ for site layout plan.

**Figure 1 Western Sydney Airport site location plan**

**Figure 2 Western Sydney Airport site layout plan**



The site is located approximately 50 kilometres west of the Sydney central business district and is within the Liverpool local government area and the Macarthur Bush Fire Management Committee (BFMC) area. The Nepean River and the Greater Blue Mountain area lie to the west of the site. The landscape consists mostly of large areas of grassland related to the past agricultural uses of the site, with patches of forest and shrub vegetation.

Until 2014 there were around 200 short-term residential rural and commercial leases within the site. Land uses of the site in the past have included grazing, horse agistment, a winery, a shop, a piggery, duck farming, quarrying, irrigation, landfilling and market gardens. The majority of the individual properties were approximately two hectares or greater in size.

Following the Australian Government's announcement in April 2014 that the site for a Western Sydney airport would be Badgerys Creek, all leases have been gradually terminated such that there are no longer any tenants on site.

### 1.3.2 Climate and bushfire season

The Badgerys Creek site typically experiences warm to hot conditions and the bushfire season usually runs from October to the end of March. During this period, the area experiences strong south-westerly to north-westerly winds and high daytime temperatures.

The main sources of ignition have been through thunderstorm activity (dry electrical storms), accidental ignition, escaped private burns and intentionally lit fires (arson). Since the end of 2014 properties within the site have been subject to increasing vandalism and arson attacks, coinciding with the decreased number of tenants occupying and using the site, and increasing the risk of bushfire on the site. Accordingly, regular security patrols of the site have been in place to manage this risk, and specific patrols are varied as required to respond to changes (e.g. increased patrols to take account of a possible increase in risk during seasonal events such as school holidays and adverse weather conditions).

# 2. Bushfire Risk

## 2.1 What is bushfire risk?

Bushfire risk is the chance of a bushfire igniting, spreading and causing damage to assets valuable to the community, including land, residential development and items of heritage and natural significance (Macarthur BFMC, 2012). Bushfire is an established natural hazard within this landscape and can occur across parts of south-western Sydney frequently during the summer months. The Macarthur BFMC area, in which the WSA site is located, experiences an average of 417 bushfires annually, of which around five develop into major fires (Macarthur BFMC, 2012). The last major fires to burn near the WSA site occurred in 2001 and 2002, where fires under adverse westerly winds resulted in significant property and stock losses.

Prolonged dry conditions, hot temperatures, and low humidity during spring, summer and early autumn are experienced regularly at the WSA site. Along with wind, these climate features contribute significantly to the behaviour of a fire (such as increasing the chance ignitions will hold, quicker build-up time and rate of spread, quicker curing of grass fuels, increased combustibility of fuels, and higher intensity and spotting potential). The correlation between very dangerous fire weather conditions, major wildfire events, and long hot dry periods is strong.

The *Bush Fire Risk Management Planning Guidelines* and Australian/New Zealand Standard AS/NZS 4360: 2004 *Risk Management* were used as a basis for the risk assessment process. A bushfire hazard exists where there is fuel in the form of vegetation, including grass, scrub, bushes and trees. The risk arising from the hazard depends on factors including:

- **Fuel**: The initial development of a bushfire depends largely on the availability of fuel. The type and arrangement of vegetation are factors in determining how a fire will behave. Fuel reduced areas, mown areas, bare or wet ground will reduce the intensity of a bushfire.
- **Ignition sources**: Includes both natural sources and those that are caused by deliberate activity.
- **Topography**: The slope of land will affect the speed and intensity of fire. Some aspects will also receive increased exposure to the drying effects of sun.
- **Climate**: Including humidity, temperature, wind and rainfall. High temperatures can make fuel more susceptible to ignition. Wind can increase the intensity and rate of spread of fire.

## 2.2 Bushfire Risk Assessment: identifying the site assets and risks

Past and present day assets within the site that have been and continue to be at risk from bushfire include:

- The remaining **residential dwellings** and associated infrastructure (past risk);
- The Badgerys Creek Public School and other sites of local **heritage** significance (past risk);
- **Agricultural and commercial enterprises** located on site (past risk);
- **Livestock (present risk)**;
- Areas within and around the boundary of the airport site that face on to internal and external roads (present risk)

- Identified areas of threatened or significant **flora and fauna (present risk)**; and
- Aboriginal Cultural Heritage sites (present risk)

### 2.2.1 Environmental significance

An environmental assessment of the WSA site was conducted and an EIS publicly released on 15 September 2016 and provided to the Minister for the Environment and Energy for consideration alongside the draft Airport Plan. On 11 November 2016 the Minister for the Environment and Energy provided environmental protection advice to the Minister for Urban Infrastructure, who announced on 12 December 2016 that he had determined the Airport Plan, incorporating all the environment conditions advised by the Environment Minister. The finalised EIS and Airport Plan can be found at http://westernsydneyairport.gov.au/environment/index.aspx and should be referred to for a full assessment of environmental significance.

The EIS recognises that the WSA site is composed of gently undulating, low hills on shale and broad flats on alluvium on the Cumberland Plain. The site features remnant patches of grassy woodland and narrow corridors of riparian forest within extensive areas of derived grassland, cropland and cleared, developed land. Across the site, the condition of native vegetation is generally poor, and there is moderate to severe weed infestation throughout.

The EIS identified that notwithstanding the generally poor condition of the airport site, it has high conservation significance due to the presence of threatened species and ecological communities and the generally limited extent and quality of similar environments in the Western Sydney region. The activities that could be undertaken to manage the Site were extremely limited whilst the EIS was being developed. With the finalisation of this assessment process including environmental protections in mid-December 2016, further management actions can now be progressed to more actively manage the site in particular the bushfire risk potential.

### 2.2.2 Aboriginal and European Heritage

No heritage values consistent with World Heritage or National Heritage listing were identified within the WSA site. However, the EIS has identified items of indigenous heritage significance and of European heritage significance within the WSA site.

The EIS identifies 74 artefact occurrences of indigenous heritage significance within the WSA site. Included in these items is one possible Aboriginal scarred tree, situated on the creek line (and north east boundary of the site).

A total of 20 European and other heritage items of local significance were identified within the boundary of the site. The nature of these items varies and included cemeteries, the local primary school, and several homesteads that date to the turn of the century. The EIS also identifies 22 items of local heritage significance located nearby the proposed WSA site.

Mitigation measures for the management of these items, including preparatory activities undertaken by the Department, are detailed in the Aboriginal and European and Other Cultural Heritage CEMPs.

### 2.2.3 Outside the site – Greater Blue Mountains Heritage Area

The Greater Blue Mountains Area is listed as a declared World Heritage Area and a National Heritage Place. The Greater Blue Mountains Area is located approximately six kilometres to the west of the

site and is separated by extensive areas of residential and agricultural land, fragmented patches of native vegetation, roads and the Nepean River.

The Greater Blue Mountains World Heritage Area consists of approximately 1.03 million hectares of sandstone plateaus, escarpments and gorges dominated by temperate eucalypt forests. The area is noted for its diversity of eucalypts, which are associated with its wide range of habitats as well as significant numbers of rare or threatened species, including endemic and evolutionary relict species.

## 2.3 Bushfire Risk Assessment: analysing/assessing/evaluating the site risks

Once the assets were identified, the potential impact of a bushfire on these assets was considered. For all assets, this involved considering the:

- Assessing likelihood and consequences of a bushfire occurring and impacting these assets;
- Fire history of the region;
- Ignition cause and patterns;
- Known fire paths;
- Access routes;
- Containment potential; and
- Potential fire run.

Consequence and likelihood ratings were used to identify the level of risk. The risk assessment for the past and present day assets can be found at **Appendix 1: Asset Register**.

Once the risk ratings were identified, these were evaluated to identify appropriate risk level assessment, where treatment was required and treatment priorities. The bushfire risk ratings were used to prioritise the risk treatments.

In addition to considering the key assets on the site the overall likelihood factors were considered. The identified likelihood factors are contained in **Appendix 2: Risk Assessment**.

## 2.4 Activities likely to generate sparks

The Early Earthworks contractor and the contractor responsible for the construction of the Visitor Centre and Site Accommodation (adjacent to Eaton Road) is expected to commence construction works in a portion of the site which may generate sparks and a source of fire. These activities are summarised in Table 1.

**Table 1 Activities likely to generate sparks**

| Activity | Mitigation Measures |
|---|---|
| Smoking | **Ignition management** – no smoking on site except at designated areas. Dedicated but disposals at each location.<br>**Hazard reduction** – the site will be cleared at the early stages of the project, reducing ignition sources. |

| Activity | Mitigation Measures |
|---|---|
| | **Preparedness** – Fire extinguishers available on all plant and equipment. Regular communication with Fire Services on changes to fire trails and water sources. Site Monitoring Protocol as detailed in Appendix G. |
| Plant maintenance | **Ignition management** – Hot works permit to be completed on a case by case basis, assessing the risk of fire and setting appropriate mitigation measures<br><br>**Hazard reduction** – the site will be cleared at the early stages of the project, reducing ignition sources. The Contractor will not undertake cutting, welding and grinding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br><br>**Preparedness** – Fire extinguishers available on all plant and equipment. Regular communication with Fire Services on changes to fire trails and water sources. Site Monitoring Protocol as detailed in Appendix G. |
| Driving on site | **Ignition management** – Hot works permit to be completed on a case by case basis, assessing the risk of fire and setting appropriate mitigation measures<br><br>**Hazard reduction** – the site will be cleared at the early stages of the project, reducing ignition sources. All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br><br>**Preparedness** – Fire extinguishers available on all plant and equipment. Regular communication with Fire Services on changes to fire trails and water sources. Site Monitoring Protocol as detailed in Appendix G. |
| Other Hot works | **Ignition management** – Hot works permit to be completed on a case by case basis, assessing the risk of fire and setting appropriate mitigation measures<br><br>**Hazard reduction** – the site will be cleared at the early stages of the project, reducing ignition sources. The Contractor will not undertake cutting, welding and grinding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br><br>**Preparedness** – Fire extinguishers available on all plant and equipment. Regular communication with Fire Services on changes to fire trails and water sources. Site Monitoring Protocol as detailed in Appendix G. |

# 3. Bushfire Treatments (mitigation and management strategies)

## 3.1 Bushfire Procedures

In the event of a Bushfire occurring on or threatening the site, any personnel on site should respond by raising the alarm to emergency services and any other onsite personnel immediately where it is safe to do so.

In the event of known high-risk conditions such as severe weather and bushfire risk/total fire ban warnings, and/or management and mitigation activities being scheduled on the site such as back-burning, the commissioning of private emergency response services to attend for the duration of such activities will be considered.

## 3.2 Bushfire management zones

Bush Fire Management Zones were identified and mapped within the site, identifying the fire management intent for each specific area, refer Table 2. The four categories of Bush Fire Management Zones are:

- Asset Protection Zone;
- Strategic Fire Advantage Zone;
- Land Management Zone; and
- Fire Exclusion Zone

Maps in Appendix 3: *Bushfire Management Zones* sets out the Asset Protection Zones within the site (these areas identify the European and Aboriginal heritage items on the site) and the Strategic Fire Advantage Zones within the site (these areas identify where low intensity hazard reduction activities can occur).

All areas that are not mapped or described as an Asset Protection Zone or a Strategic Fire Advantage Zone are considered to be a Land Management Zone. Table 2 describes these zones and their purposes.

A series of bushfire trails have been created on the site. These provide quick, unobstructed access within the site. The map at Appendix 4: *Badgerys Creek Bush Fire Trails* sets out the bushfire trails on site which should be used to allow rapid emergency access and egress in event of a bushfire. NSW RFS holds the GPS tracking coordinates for the bushfire trails.

Other bushfire risk management and mitigation activities implemented include the extension of fire breaks; hay baling and stock grazing to reduce fuel load, removal of contaminated waste and other rubbish that is regularly illegally dumped on the site, and further bushfire risk assessment and emergency response activities. The maps at Appendix 5*: Hay Baling* identifies areas of the site where hay baling has occurred.

**Table 2 Bush Fire Management Zones: Purpose, objectives and characteristics**

| Zone | Purpose | Suppression Objective(s) | Zone characteristics |
|---|---|---|---|
| Asset Protection (APZ) | Protect human life, property and highly valued public assets and values. | Enable safe use of Direct Attack suppression strategies1 within zone and minimise impact on undefended assets. | Refer to NSW RFS's 'Standards for Asset Protection Zones' for further information. |
| Strategic Fire Advantage (SFAZ) | • Provide strategic fire protection advantage areas to reduce speed and intensity of bush fires and reduce potential for spot fires to develop.<br>• Aid containment of wildfires to existing management boundaries. | Improve likelihood and safe use of:<br>• Parallel Attack suppression strategies2 within the zone, and/or<br>•Indirect Attack3 (back burning) in high to very high fire weather conditions within the zone.<br>Reduce likelihood of:<br>• Crown fire4 development within the zone and/or<br>• Spot fire ignition potential from the zone. | Factors such as:<br>• Topography<br>• Aspect<br>• Spotting propensity<br>• Location of adjacent firebreaks<br>• Mosaic pattern of treatment<br>• Assess overall fuel hazard once vegetation communities reach minimum fire thresholds within this plan.<br>Management practices should aim for mosaic fuel reduction patterns so majority of the zone has an acceptable overall hazard. |
| Land Management (LMZ) | Meet relevant land management objectives in areas where Asset Protection or Strategic Fire Advantage Zones are not appropriate. | • As per land management and fire protection objectives of the responsible land management agency.<br>• Reduce likelihood of spread of fires. | Undertake mosaic burning5 as appropriate to achieve land management objectives such as heritage and/or fire protection objectives. |
| Fire Exclusion (FEZ) | To exclude bush fires. | N/A | Zone characteristics vary depending on the size of the fire sensitive area requiring protection. |

[1] Direct Attack - any treatment applied directly to burning fuel such as wetting, smothering, or chemically quenching the fire or by physically separating the burning from not burned fuel. This includes the work of fire engines, fire personnel and aircraft applying water or fire retardant directly to the burning fuel.
[2] Parallel Attack - where crews construct a fireline at some distance from the edge of the fire and then *burn out* the fuel in the buffer as the fireline is completed.
[3] Indirect Attack – is a preparatory suppression tactic carried out a distance away from the oncoming fire. These include fuel reduction activities, establishment of firelines, backburning activities and wetting unburnt fuels.
[4] Crown Fire - a fire that advances from the top-to-top of trees or shrubs more or less independently of a surface fire.
[5] Landscape Mosaic Burning may be defined as applying planned fire at varying intensities, scales and times within a broader landscape to create patches (a mosaic) of burnt and unburnt areas that change over time.

## 3.3 Bush Fire Management Treatments

Bush fire management treatments are activities to reduce the overall bushfire risk within the area near the site, undertaken on an ongoing basis as part of normal business to manage the site. Relevant Bush fire management treatments that can be applied include:

- Bushfire hazard complaints;
- Normal fire suppression activities;
- Investigation of bushfire cause; or
- Prosecution of offenders.

Five broad strategies are available to treat the bushfire risk as identified in this Plan. The types of asset specific treatments that could be applied are set out in Table 3:

**Table 3 Bush Fire Management Strategies: Purpose, objectives and characteristics**

| Strategy | Targeted treatments |
|---|---|
| **1.** Ignition Management | • ***Road Side Vegetation Management:*** aim to prevent ignition prevalence on roadsides and inhibit the spread of any occurring fire. This can occur through mowing, slashing, hay baling, cattle grazing or prescribed burning as appropriate.<br>• ***Roadside firebreaks:*** aim to maintain firebreaks along the roadside to provide access for fire services. Implement containment lines where necessary to provide access for emergency services and to reduce the spread of fire.<br>• ***Vegetation Inspections and Management:*** aim to prevent the occurrence of Bushfires associated with power infrastructure.<br>• ***Restrict Vehicle Access:*** aim to prevent unauthorised access to bushland areas (interface) with gates, locks and barrier fencing (primary treatment for fires started by dumping of stolen motor vehicles) and associated liaison with NSW Police Force. |
| **2.** Hazard Reduction | • ***Strategic Fire Advantage Zone Management****:* aim to maintain identified SFAZ by mowing, mechanical slashing, hay baling, cattle grazing or prescribed burning as appropriate.<br>• ***Asset Protection Zone Management:*** aim to maintain identified APZ by mowing, mechanical slashing/hand clearing or prescribed burning.<br>• ***Land Management Zone Management:*** aim to maintain identified LMZ in accordance with relevant Fire Management Plans prescribed.<br>• ***Rubbish accumulation:*** aim to continually monitor and remove accumulated or dumped rubbish on vacant properties. |
| **3.** Community Education | • ***Community Engagement:*** aim to communicate bushfire hazards to occupants and users of the Badgerys Creek site. The quarterly Western Sydney Airport community updates will be the primary delivery mechanism for this strategy. |
| **4.** Property Planning | • ***Pre-Incident Planning:*** aim to undertake pre-incident planning regimes as identified. Regular liaison with relevant authorities. |

| Strategy | Targeted treatments |
|---|---|
| **5.** Preparedness | • ***Fire & Rescue NSW Operational Pre-Incident Planning:*** aim to ensure adequate response and recorded information for assets identified at risk. Regular liaison with relevant authorities. |

## 3.4 Implementation of Treatments

The bushfire mitigation and management strategies discussed above have been and will be implemented according to Appendix 6 – *Treatment Register*. Environmental and heritage assets of the site will be considered as the treatments identified in this Plan are implemented.

## 3.5 Site Access Protocols

Site Access Protocols govern all access to the site and must be followed by any person entering the site for any purpose at any time. They are at Appendix 7 – *Site Access Protocols*.

## 3.6 Road Closures

As areas within the site have become vacant over time, minor roads have been closed to restrict access to deter trespass, vandalism and illegal dumping, as well as to facilitate management of the site and its transition for the airport development. The road closures are shown in the map provided in Appendix 8 – *Minor Road Closures.*

## 3.7 Monitoring and review of Bushfire Risk

The management of the site, in particular its risk of bushfire (and therefore this Bushfire Risk Management Plan), is monitored on an ongoing basis by WSA Co. WSA Co's proactive management of the site aims to ensure that:

- all parties are aware of their bushfire management responsibility;
- the plan is effective in reducing the risk of bushfires; and
- the plan remains current over the period which it is in place.

# Appendix 1: Asset Register of past and present day assets

| Asset / Location | Map Reference | Type | Threat | Vulnerability | **Likelihood** (Likely, Almost certain, Possible or Unlikely) | **Consequence** (Minor, Moderate, Major or Catastrophic) | **Risk** (Low, Medium, High, Very High or Extreme) | **Treatment Number** |
|---|---|---|---|---|---|---|---|---|
| Badgerys Creek Public School, Badgerys Creek Road | T1 | Heritage/Cultural | Medium | High | Low | Moderate | Medium | 1 |
| Uniting Church and cemetery, Pitt Street | T2 | Heritage/Cultural – nonindigenous significance | Medium | High | Low | Moderate | Medium | 2 |
| Anglican Church and cemetery, Pitt Street | T3 | Heritage/Cultural – nonindigenous significance | Medium | High | Low | Moderate | Medium | 3 |
| Aboriginal site, various locations | Various locations | Heritage/Cultural - Aboriginal significance | Medium | High | Low | Moderate | Medium | 5 |
| Threatened Flora and Fauna, various locations | Various locations | Environment / Endangered | Medium | High | Low | Moderate | Medium | 6 |
| Blue Sky Mining (Australia) Pty Ltd, 2420 Elizabeth Drive, Badgerys Creek | T7 | Commercial Agricultural | Medium | High | Low | Moderate | Medium | 7 |
| Vicary's Winery, 1935 The Northern Road | T8 | Heritage/Cultural – nonindigenous significance | Medium | High | Low | Moderate | Medium | 8 |
| Leppington Pastoral Company, 1695 The Northern Road | T9 | Commercial Agricultural | Medium | High | Low | Moderate | Medium | 9 |
| Elizabeth Drive | T10 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 10 |
| The Northern Road | T11 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 11 |
| Eaton Road | T12 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 12 |

| Asset / Location | Map Reference | Type | Threat | Vulnerability | Likelihood (Likely, Almost certain, Possible or Unlikely) | Consequence (Minor, Moderate, Major or Catastrophic) | Risk (Low, Medium, High, Very High or Extreme) | Treatment Number |
|---|---|---|---|---|---|---|---|---|
| Greendale Road | T13 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 13 |
| Willowdene Avenue | T14 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 14 |
| Vicar Park Lane | T15 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 15 |
| Anton Road | T16 | Human Settlement - Residential | Medium | High | Low | Moderate | Medium | 16 |
| Jackson Road | T17 | Human Settlement - Residential | Medium | High | Low | Moderate | Medium | 17 |
| Ferndale Road | T18 | Human Settlement - Residential | Medium | High | Low | Moderate | Medium | 18 |
| Winston Close | T19 | Human Settlement - Residential | Medium | High | Low | Moderate | Medium | 19 |
| Taylors Road | T20 | Human Settlement - Residential | Medium | High | Low | Moderate | Medium | 20 |
| Jagelman Road | T21 | Human Settlement - Residential | Medium | High | Low | Moderate | Medium | 21 |
| Badgerys Creek Road | T22 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 22 |
| Gardiner Road | T23 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 23 |
| Pitt Street | T24 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 24 |
| Longleys Road | T25 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 25 |
| Leggo Street | T26 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 26 |
| Fuller Street | T27 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 27 |
| Lawson Road and Martin Road | T28 | Human Settlement - Residential | Medium | High | Low | Major | Medium | 28 |

# Appendix 2: Identified likelihood factors and their risk

| Likelihood factors | Risk Rating | Risk Description | Mitigation measures |
|---|---|---|---|
| Vegetation cover in the surrounding landscape | Moderate | The site adjoins areas of rural-residential subdivision and agricultural enterprises which contain grass and woodland vegetation.<br>The Blue Mountains National Park to the west contains large areas of forest vegetation in which a fire can develop and spread from. | This risk could be reduced through community consultation (including consultation with and conducted by the Liverpool and Macarthur regional councils) on the importance of being bushfire aware and the required mitigations to reduce the potential of a bushfire. |
| Vegetation cover within the site | Moderate | The site contains grass and woodland vegetation capable of supporting a bush or grassfire which may burn across Badgerys Creek.<br>Unmanaged grass and woodland fuel can enable grassfires to spread and then potentially move off-site and impact peri-urban areas of Bringelly, Badgerys Creek and Kemps Creek to the east. These areas contain fire sensitive agricultural assets including poultry farms and stables. | The measure currently adopted is strategic reduction of grass fuel and fine-fuels (slashing and mowing) within the site including along the site boundaries and adjacent to areas where people work or the public may congregate.<br>To this end, contracts are in place to allow for hay baling and cattle grazing as appropriate for further fuel load reduction measures.<br><br>In September 2018 construction at the Western Sydney Airport site commenced with the occupation of the early earthworks area, thus greatly reducing vegetation cover within this area of the site. The site area associated with Visitor Centre and Site Accommodation (adjacent to Eaton Road) will be cleared in November 2018 reducing vegetation cover. In uncleared areas of these sites vehicle and personnel access will be restricted to reduce the risk of ignition sources. |
| Proximity of woody / forested vegetation on surrounding lands | Moderate | The site is adjacent to woody vegetation in some areas and on some occasions is only separated by narrow breaks.<br>The proximity of adjoining grass and woodland fuel can enable direct fire spread into the site along a number of boundaries. | The measure currently adopted is strategic reduction of grass fuel and fine-fuels (slashing and mowing) along those boundaries which adjoin vegetation hazard.<br><br>In September 2018 construction at the Western Sydney Airport site commenced with the occupation of the early earthworks area, thus greatly reducing vegetation cover within this area of the site. The site area |

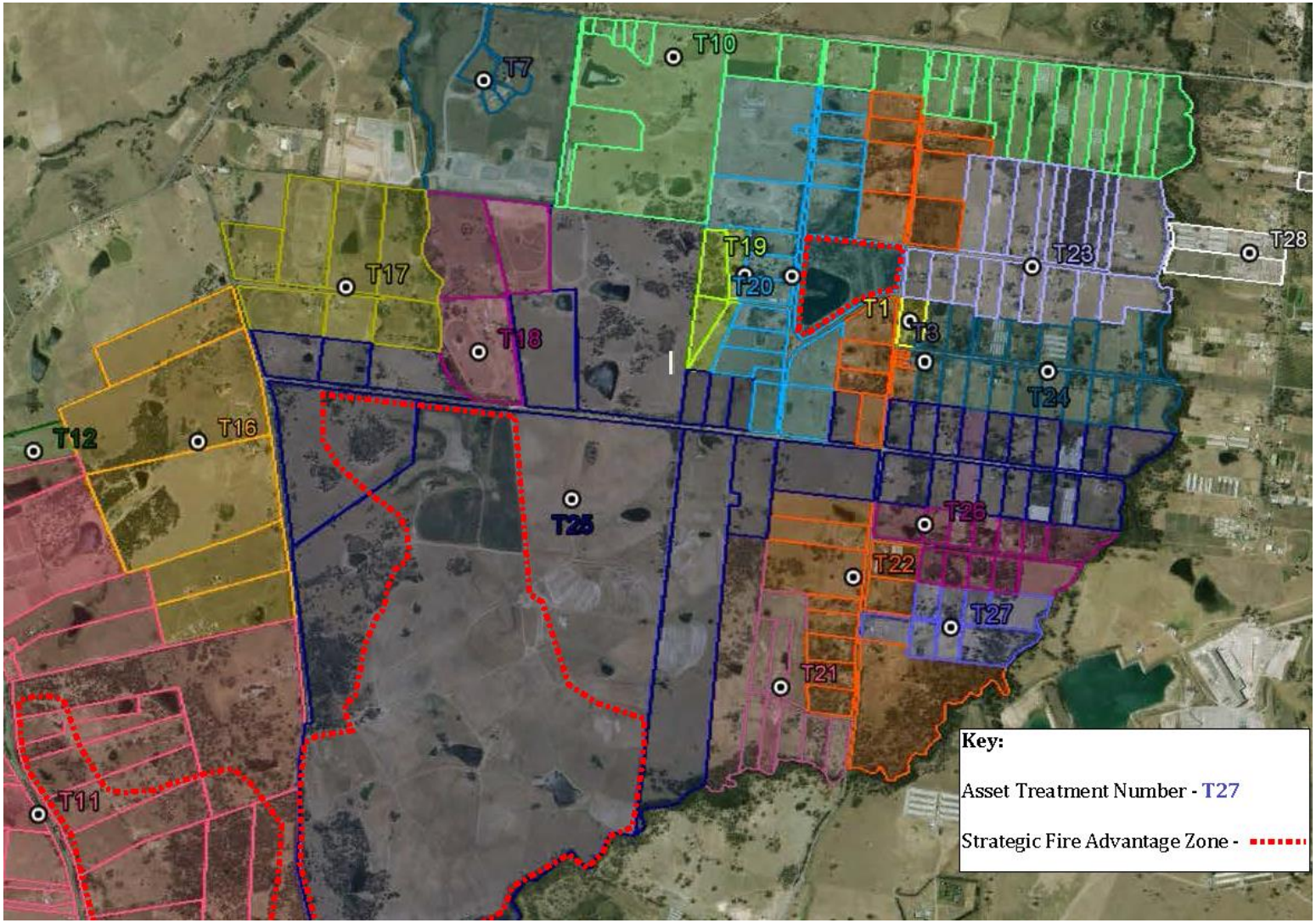
| Likelihood factors | Risk Rating | Risk Description | Mitigation measures |
|---|---|---|---|
| | | Adjoining vegetation also provides a means by which a fire may be able to move off-site. | associated with Visitor Centre and Site Accommodation (adjacent to Eaton Road) will be cleared in November 2018 reducing vegetation cover. In uncleared areas of these sites vehicle and personnel access will be restricted to reduce the risk of ignition sources. |
| Spotting and ember attack potential of vegetation | Moderate | The vegetation surrounding parts of the site may facilitate spotting and ember attack.<br>Adjoining grasslands and woodland fuel can facilitate ember attack and spotting into parts of the site.<br>Long distance spotting, as has occurred previously, may also result from fires burning under adverse conditions in the Blue Mountains National Park to the west.<br>Vegetation retained within the site may be susceptible to spotting and ember attack, igniting spot fires within the site. | The measure currently adopted is strategic reduction of grass fuel and fine-fuels (slashing and mowing) within the site and adjacent to assets.<br><br>Risks to assets which adjoin vegetation hazards may be reduced through the creation and maintenance of asset protection zones and appropriate operational preparedness actions.<br><br>In September 2018 construction at the Western Sydney Airport site commenced with the occupation of the early earthworks area, thus greatly reducing vegetation cover within this area of the site. The site area associated with Visitor Centre and Site Accommodation (adjacent to Eaton Road) will be cleared in November 2018 reducing vegetation cover. In uncleared areas of these sites vehicle and personnel access will be restricted to reduce the risk of ignition sources. |
| Land management practices on adjoining land | Moderate | The site is predominantly surrounded by rural residential areas and agricultural enterprises which include patches of woody vegetation which may not be frequently hazard-reduced.<br>The removal of grazing and agricultural enterprises may result in an increase in fuel load across the site, significantly elevating bush and grass fire risk above historic levels. | The measure currently adopted is strategic reduction of grass fuel and fine-fuels (slashing and mowing) within the site and adjacent to assets.<br><br>In September 2018 construction at the Western Sydney Airport site commenced with the occupation of the early earthworks area, thus greatly reducing vegetation cover within this area of the site. The site area associated with Visitor Centre and Site Accommodation (adjacent to Eaton Road) will be cleared in November 2018 reducing vegetation cover. In uncleared areas of these sites vehicle and personnel access will be restricted to reduce the risk of ignition sources. |
| Topography and access within and surrounding the site | Low | Topography surrounding the site is relatively flat and access is not restricted. On the site this risk may move into the MEDIUM class where access trails and | The site will be managed to ensure that open access is preserved across the site, through maintaining a clearance area around the fire trails (marked on Appendix 4). This will enable the responding fire crews to access all parts of the site in the event of a fire ignition. |

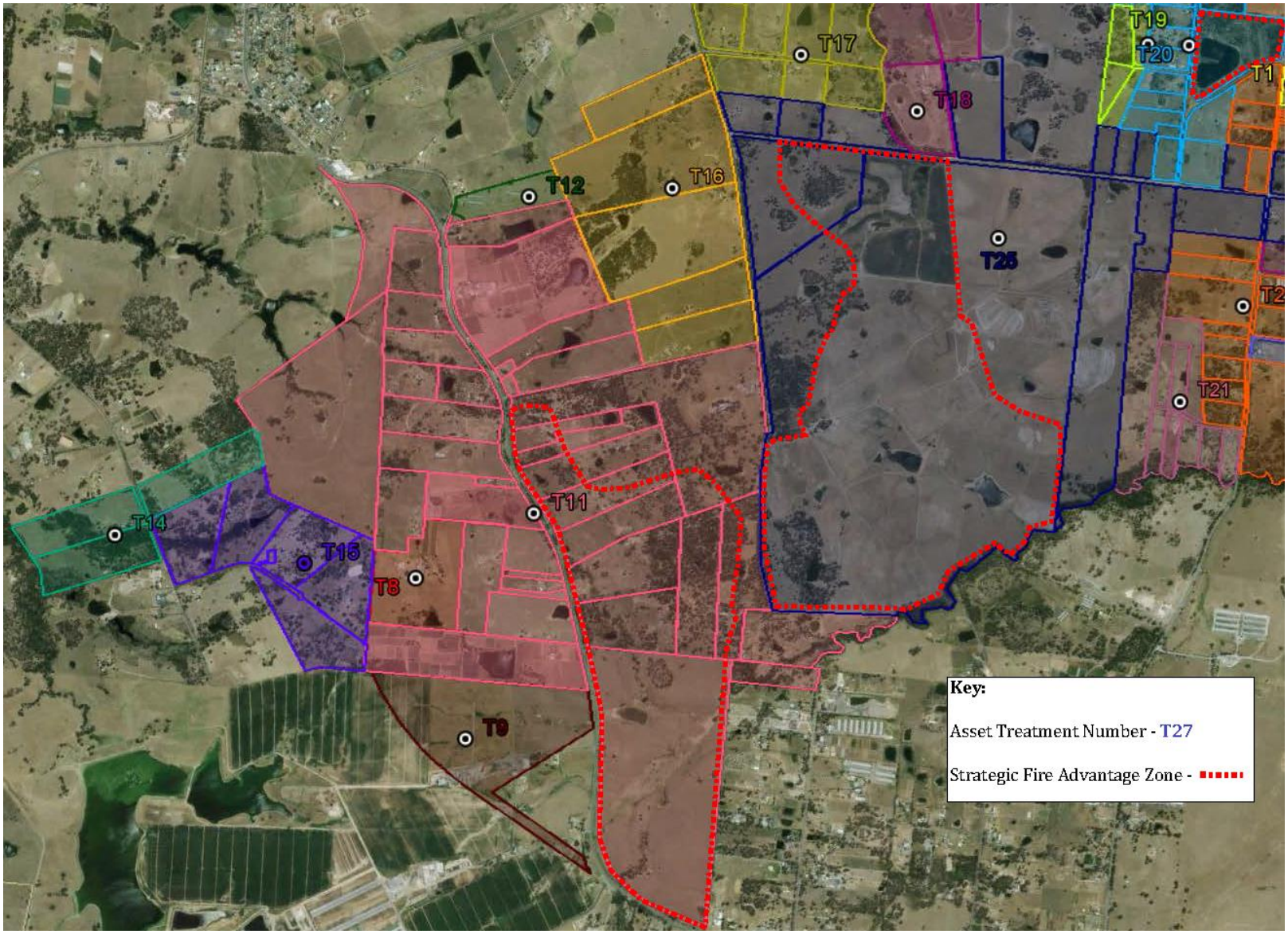
| Likelihood factors | Risk Rating | Risk Description | Mitigation measures |
|---|---|---|---|
| | | roads across former agricultural properties fall into disrepair (through erosion, revegetation or tree fall) and access is restricted from current levels. Where access is restricted for responding fire crews, initial bushfire attack may be delayed, potentially enabling a fire to develop into an uncontrollable size before control actions can be applied. | The bushfire trails will of suitable dimensions, and load capacity for access by a fire tanker. Bushfire trail maps (including names) and gate numbers will be provided to local fire authorities. There is ongoing liaison between the site and emergency services authorities in particular the NSW Police and NSW Rural Fire Service. |
| Potential ignition sources within and surrounding the site | High | The site has a history of frequent ignitions on or adjoining the site (from an annual to a decadal occurrence).<br>The departure of residents and agricultural enterprises may result in an increase in unauthorised and illegal ignitions at the site, with less people present to report this behaviour and act as a deterrent. | This risk will be reduced through active management strategies (temporary fencing, the closure of particular roads and fuel reduction through slashing, spraying and mowing) to reduce the opportunities for illegal incendiarism (arson) and unauthorised use of the site.<br><br>Further, a Site Security Services contract is now in place to ensure randomised security patrols of the site on at least a twice-weekly basis. Security patrols are increased in times of higher likely risk, for example in school holidays. |
| Detection of new ignitions | Low | New ignitions will be quickly detected in western Sydney due to the sites' proximity to residential areas and main roads.<br>This risk is highest during the pre-construction phase, due to the departure of residents and agricultural enterprises formerly living and working on the site, that are no longer present to report new fire ignitions quickly.<br>This risk will reduce during the site preparation and construction phases, | This risk will be reduced through the site security patrols described above.<br><br>New contractual arrangements have been finalised with local Rural Fire Service crews for the provision of appropriate emergency fire response. |

| Likelihood factors | Risk Rating | Risk Description | Mitigation measures |
|---|---|---|---|
| | | with the lowest risk likely during the operational phase. | |
| Local fire response capacity | Low | The site is located in an urban/rural residential area and fire suppression resources are located nearby.<br>Site access trails and roads across former agricultural properties which fall into disrepair (through erosion, revegetation or tree fall) and restricted access may restrict access for responding fire crews. | This risk factor will be reduced through the maintenance of clear access trails across the site, to enable responding fire crews to access all parts of the site in the event of a fire ignition.<br><br>Fire trails retained should be clearly signposted and be of suitable dimensions and load capacity for access by a fire tanker.<br><br>Trail maps (including names) and gate numbers will be provided to local fire authorities. |

Reference: *Western Sydney Airport Environmental Impact Statement (EIS): Bushfire Risk Assessment*, September 2015, GHD.

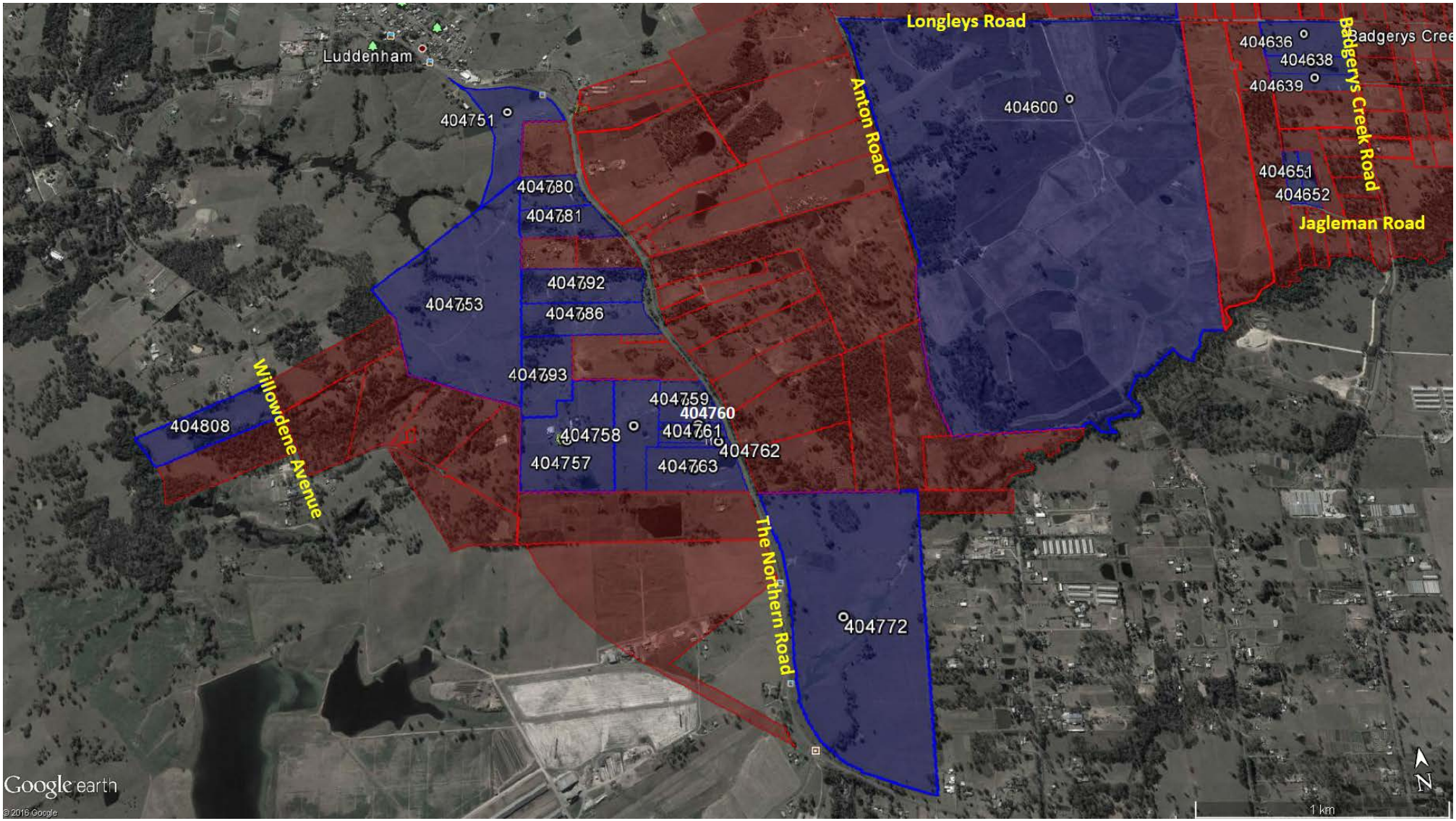
# Appendix 3: Bush Fire Management Zones

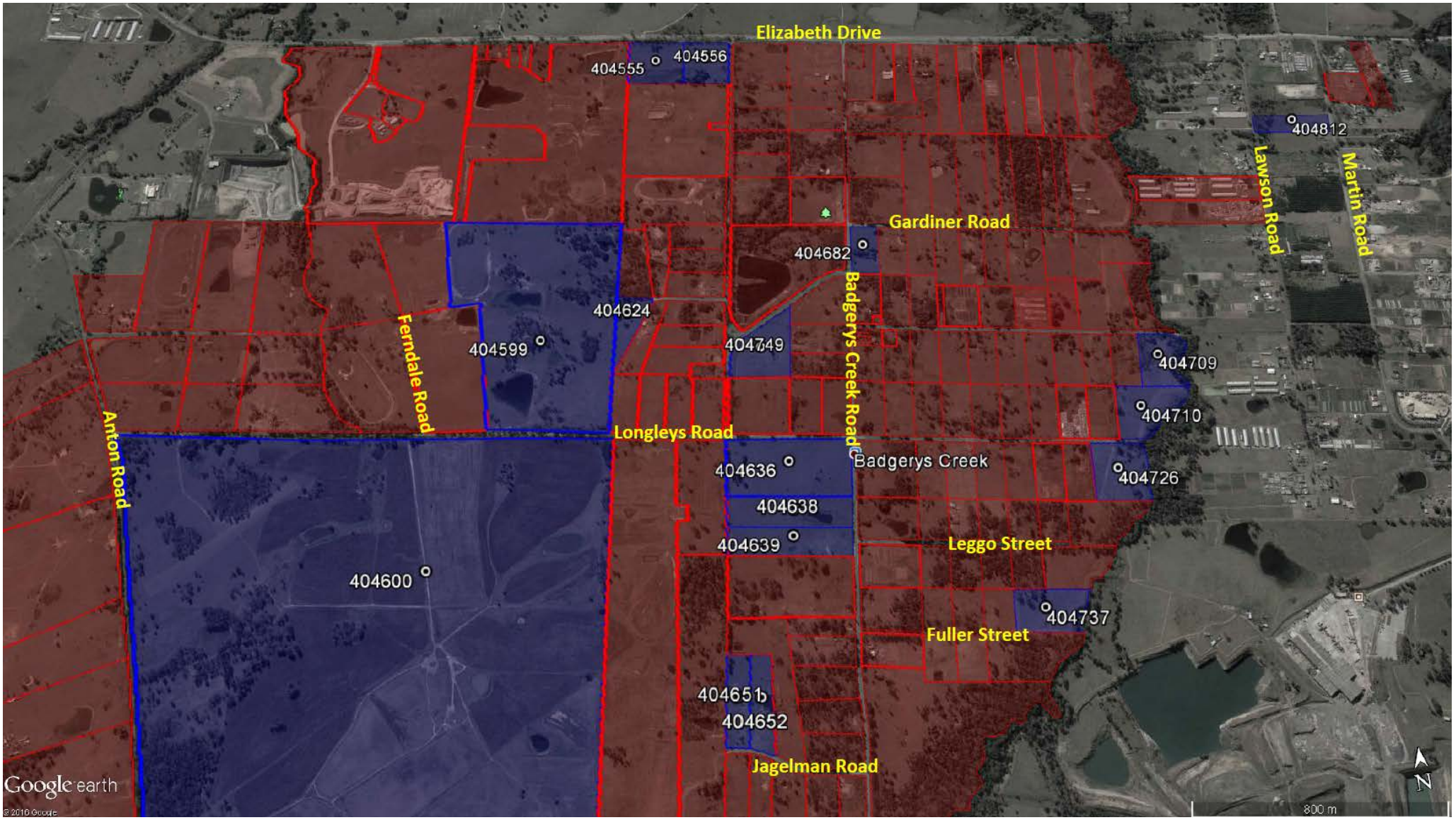



T19
T20
T1
T17
T18
T12
T16
T25
T2
T21
T11
T14
T15
T8
T9
Key:
Asset Treatment Number - T27
Strategic Fire Advantage Zone -

# Appendix 4: Fire Trails Map

# Appendix 5: Hay Baling maps




Elizabeth Drive
404555
404556
404812
Lawson Road
Martin Road
Gardiner Road
404682
Badgerys Creek Road
404624
Ferndale Road
404599
404749
404709
404710
Anton Road
Longleys Road
Badgerys Creek
404636
404726
404638
404639
Leggo Street
404600
404737
Fuller Street
404651b
404652
Jagelman Road
Google earth
© 2016 Google
800 m
N

# Appendix 6: Treatment Register for past and present day assets

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| **1** | Badgerys Creek Public School, Badgerys Creek Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **2** | Uniting Church and cemetery, Pitt Street | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place. |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| | | | | - All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Department of Infrastructure - Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where require<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **3** | Anglican Church and cemetery, Pitt Street | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| **5** | Aboriginal site, various locations | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Department of Infrastructure - Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **6** | Threatened Flora and Fauna, various locations | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place. |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| | | | | - All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **7** | Blue Sky Mining (Australia) Pty Ltd,<br>2420 Elizabeth Drive, Badgerys Creek | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| **8** | Vicary's Winery,<br>1935 The Northern Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>RFS - Back burning of properties where required<br>Liverpool City Council - Hazard reduction and ignition management of roadside and public areas |
| **9** | Leppington Pastoral Company,<br>1695 The Northern Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **10** | Elizabeth Drive | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| | | | | **Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **11** | The Northern Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **12** | Eaton Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| **13** | Greendale Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **14** | Willowdene Avenue | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **15** | Vicar Park Lane | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **16** | Anton Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| **17** | Jackson Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **18** | Ferndale Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **19** | Winston Close | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| | | | | **Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **20** | Taylors Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **21** | Jagelman Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | - Department of Infrastructure - Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| **22** | Badgerys Creek Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **23** | Gardiner Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching. |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| | | | | - Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **24** | Pitt Street | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| **25** | Longleys Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching.<br>- Site Monitoring Protocol as detailed in Appendix G.<br>**WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **26** | Leggo Street | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **Construction Contractor:**<br>- No smoking on-site except at designated areas.<br>- All works involving a fire source to have a hot works permit in place with specific controls to prevent risk of a fire.<br>- Supply of water to be available at all times for firefighting purposes. Supply points will be communicated with local firefighting authorities.<br>- Emergency response procedure to be implemented.<br>- The Contractor will not undertake cutting, welding and girding on total fire ban days, unless the works takes place in an area at least 50m away from an ignition source and appropriate firefighting controls are in place.<br>- All entry points into the site are to be shut to prevent unauthorised vehicle access and torching. |

| Treatment Number | Asset / Location | Strategy (Community Education, Hazard Reduction, Ignition Management, Preparedness or Property Planning | Action (Slashing, mowing, back burning) | Responsibility |
|---|---|---|---|---|
| | | | | - Site Monitoring Protocol as detailed in Appendix G. |
| **27** | Fuller Street | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |
| **28** | Lawson Road | Community education, hazard reduction, ignition management, preparedness | Slashing and mowing, back burning as required | **WSA Co:**<br>- Hazard reduction and ignition management of vacant properties, community education and preparedness for residents<br>**Rural Fire Service:**<br>- Back burning of properties where required<br>**Liverpool City Council:**<br>- Hazard reduction and ignition management of roadside and public areas |

# Appendix 7: Site Access Protocols

**SITE ACCESS PROTOCOLS – STAGE 1 SITE**

The following site access protocols have been developed to provide guidance to WSA Co staff and all other people including consultants accessing the Commonwealth-owned land at Badgerys Creek. These protocols must be followed to ensure that the Commonwealth's property management and environmental obligations continue to be met.

As the airport lessee company, WSA Co has compliance obligations in accordance with airports legislation and regulations and health and safety requirements. In fulfilling these obligations, WSA Co is responsible for managing the airport site in an appropriate manner and therefore has wide discretion in determining who can access the site, when that access can be granted and for what purpose.

**Summary of process**

Any access to the Badgerys Creek site must follow the process described below.

1. Personnel requiring site access submit a request for access to WSA Co (see section 1 below).
2. WSA Co provides initial advice on site sensitivities and assists the requesting team to refine site access requirements.
3. WSA Co provides final advice on on-site protocols (see section 2 below).

**1 Requesting site access**

An email must be sent to tony.cummings@wsaco.com.au with the information set out below. This will assist the team to identify any sensitivities and facilitate site access arrangements where appropriate.

- Describe the nature of work proposed, addressing the following matters:
  - proposed activities while on site;
  - the name and organisation of those who will be accessing the properties (consultants, WSU staff, etc.);
  - number of personnel on site;
  - machinery/vehicles that will be used; and
  - any information on likely work health and safety issues.
- Identify the proposed timing of access, including the date(s) on which access is required and the duration of access (i.e. hours/days/weeks). Be as specific as possible to allow facilitation of site access with minimal delays.
- Identify the sites to be accessed, including whether the proposal is to only access public roads.

- Provide specific title details and/or street addresses and schedule (if known). Plans to access different parts of the site on different dates should be avoided wherever possible.
- Speak with a WSA Co team member prior to submitting the access request as they can assist you in identifying properties.

**2 On-site protocols**

While on site, WSU staff and consultants will need to:

- avoid damaging any environmental or heritage features on the land;
- avoid any actions that may pose a fire risk and be vigilant for any source of ignition (and please also check behind you when you leave);
- inform the property manager at the site office on the first day that they commence access and also upon completion of access, unless access involves after-hours access; and
- inform the property manager immediately if any issues are encountered on site.

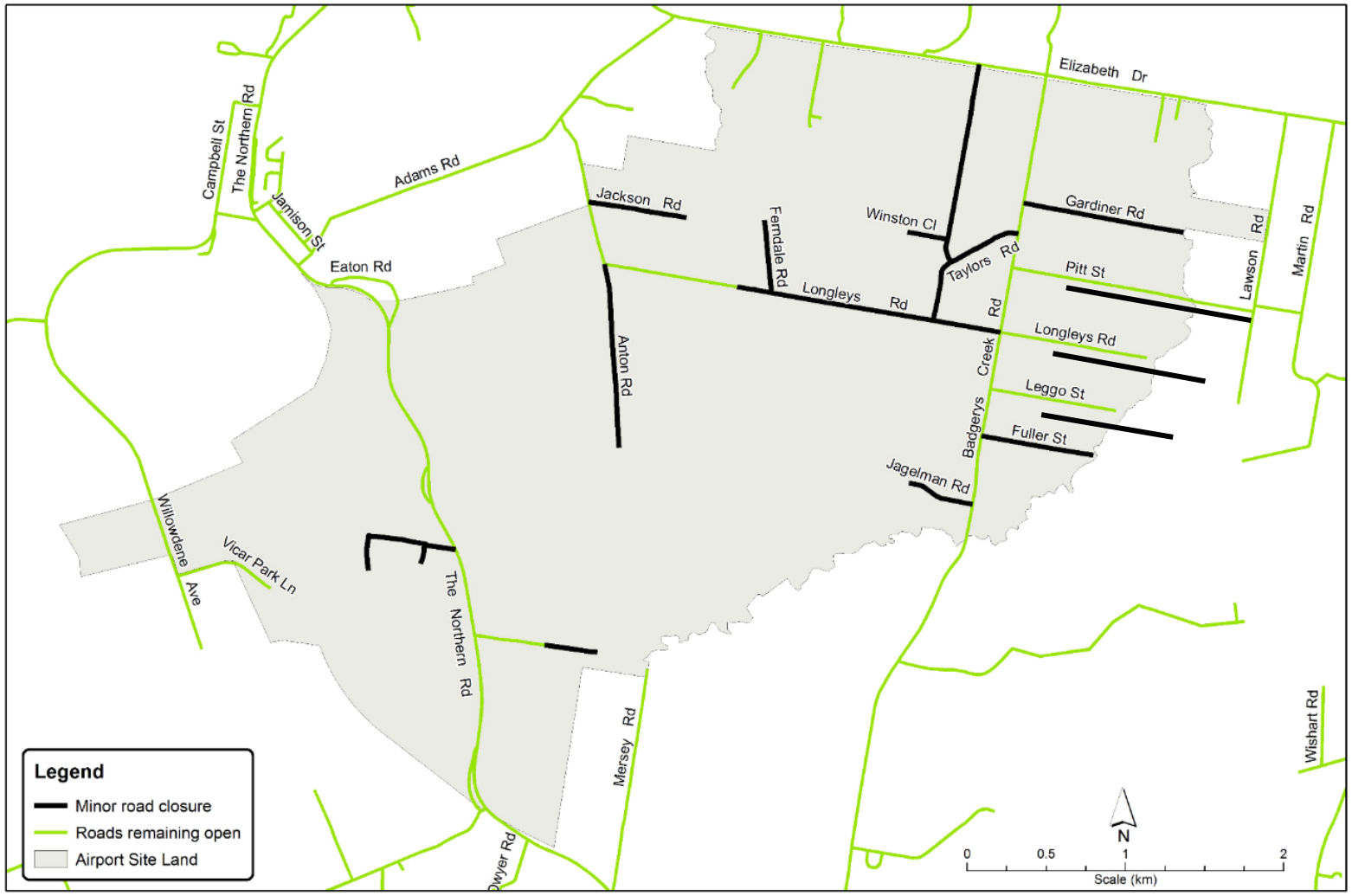
In order to ensure on-site activities do not breach any obligations the under the *Environment Protection and Biodiversity Conservation Act 1999* the following matters must be addressed when considering any construction, building works or site investigations involving machinery undertaken on site:

- protocols and permits, including Conditions of Approval attached to Part 13 Permit E2017-1038, as referenced in the Biodiversity CEMP), that address impacts on listed threatened species or ecological communities, a member of a listed migratory species, or a member of a listed marine species in or on a Commonwealth area;
- protocols to protect and manage known sites of environmental sensitivity, including Aboriginal cultural heritage sites; and
- unexpected finds protocols to be followed in the event that new heritage items are encountered, including stopping work immediately.

WSA Co will ensure the above protocols and permits have been addressed prior to any activities taking place on the site.

# Appendix 8: Minor Road Closures

## WESTERN SYDNEY AIRPORT SITE: MINOR ROAD CLOSURES



# Appendix 9: Site Condition Monitoring Protocol

| | Normal | Trigger Level 1 (T1) | Trigger Level 2 (T2) | Trigger Level 3 (T3) |
|---|---|---|---|---|
| **Trigger Description** | Wind – Light to gentle breeze (20 km/h). Not impacting working @ heights or lifting activities<br>Rain – No rain forecasted. No recent flooding impacting works.<br>Lightning – No lightning or signs of lightning within area<br>Bushfire – No bushfire<br>Fire Danger Ratings – Low to High | Wind – Strong wind with wind gusts up to4 5 km/h/ 12.5m/s creating a risk that is not controlled with existing measures<br>Rain – Light rain fall (50-90% chance 50-100mm) in immediate catchment area with continuing rain forecast<br>Lightning – Lightning activity greater than 30 kilometers away.<br>Other - Weather warning from BOM<br>Bushfire – 30kms-200kms away<br>Fire Danger Ratings – Very High | Level 1 triggers plus<br>Wind – Strong wind to strong gale force winds of 45 km/h to 87 km/h, 13-24 m/s<br>Rain – Forecast significant rain fall (50-90% chance of 100-200mm) in immediate catchment area. Rain / storms forecast in catchment areas.<br>Lightning – Lightning activity 10-30 kilometers away<br>Other - Severe weather warning from BOM<br>Bushfire – Bushfire 5-30kms away<br>Fire Danger Ratings – Severe | Level 2 triggers plus<br>Wind – Storm force winds in excessive of 88 km/hr., 25 m/s causing immediate risk<br>Rain – Current/immediate risk of heavy downpour resulting (Greater than 200MM) in localised flooding. Current/immediate risk of waterways flooding. Long term > 4-day loss of site access<br>Lightning – Lightning <5 Kilometers away.<br>Other- Flood warning BOM website<br>Bushfire – Bushfire <5km away<br>Fire Danger Ratings – Catastrophic |

| Position | Normal | Trigger Level 1 (T1) | Trigger Level 2 (T2) | Trigger Level 3 (T3) |
|---|---|---|---|---|
| Site works | Operate as normal | Check crane operation limits and cease works if required<br>Ensure ERSED measures are in place to manage dirty water<br>Operate as normal ensure measures are in place to control fire if it occurs | Check crane operation limits and cease works if required<br>Ensure ERSED measures are in place to manage dirty water<br>Allow Hot Works if strictly necessary | Cease crane operation<br>Ensure ERSED measures are in place to manage dirty water<br>Cease all Hot Works |
| Project Manager | No variation from standard project managerial activities | Communicate status to all Section Managers. | Communicate status to with relevant staff (function support managers).<br>Consider mobilisation of ECO<br>Communicate status to EPC | Communicate status to senior Managers<br>Conduct Planning session with relevant staff (function support managers) |
| Superintendent/Emergency Controller | No variation from standard supervision activities | Communicate status to subcontractors<br>Ensure new environmental conditions are assessed by contractors and Identify temporary works at risk in event of escalation<br>Communicate status to Project Manager | Communicate status to Project leader<br>Communicate with subcontractors and develop action plan.<br>Ensure sub-contractors and emergency management plans are ready to be activated.<br>Monitor progress.<br>Communicate status to Project Manager | Communicate status to Project Manager<br>Ensure Project emergency management plans are activated<br>Monitor progress of action plan<br>Communicate status to Project Manager |
| Environmental Staff | No variation from standard management activities | Monitor and communicate information relating to inclement weather to Project Manager | Monitor and communicate information relating to inclement weather to Project Manager<br>Provide advice on environmental preparation<br>Conduct inspections as required | Monitor and communicate information relating to inclement weather to Project Manager Provide advice on environmental preparation<br>Conduct inspections as required |