



NEOEN Solar Farm Project

Flora and Fauna Management Plan

Doc ID: PL-EV-02
Rev No.: 0
Rev Date: 23/11/2016



Prepared By:
David Glossop
Senior Environment and
Sustainability Coordinator



Reviewed by:
Philippe NGUYEN
Senior project Manager



Approved By:
Marie Chuet
Project Director

TABLE OF CONTENTS

1	INTRODUCTION	3
1.1	<i>Purpose</i>	3
1.2	<i>Document Responsibilities</i>	3
1.3	<i>Document Amendment and Distribution.....</i>	3
1.3.1	Revision Status	3
2	DEFINITIONS.....	4
3	ORGANISATION	4
3.1	<i>Responsibilities and Authorities.....</i>	4
3.1.1	Project Manager	4
3.1.2	HSE coordinator.....	4
3.1.3	General Superintendent.....	4
3.1.4	All Workers on Site	4
3.2	<i>Legal Requirements</i>	4
3.3	<i>Contractual Requirements.....</i>	5
4	COMPETENCE, TRAINING AND AWARENESS	6
5	FLORA AND FAUNA MANAGEMENT	7
5.1	<i>Objectives.....</i>	7
5.1.1	Terrestrial Flora and Fauna	7
5.2	<i>Potential Environmental Impacts.....</i>	7
5.2.1	Terrestrial Flora and Fauna	7
5.3	<i>Management and Contingency Mitigation Measures.....</i>	8
6	IDENTIFY AND ASSESS.....	9
6.1	<i>Notable Flora and Fauna Species</i>	9
7	IMPLEMENT CONTROLS	9
7.1	<i>Flora and Fauna Management Control Measures.....</i>	9
8	INSPECT AND TEST.....	11
8.1	<i>Monitoring, Inspection and Reporting</i>	11
9	RECORDS.....	11
<i>Appendix 1</i>	<i>PARKES</i>	12
<i>Appendix 2</i>	<i>GRIFFITH</i>	13
<i>Appendix 3</i>	<i>South Keswick</i>	14
<i>Appendix 4</i>	<i>Narromine.....</i>	15

LIST OF TABLES

Table 1 - Flora and Fauna Mitigation Measures	9
Table 2 - Clearing and Grubbing Mitigation.....	104

1 INTRODUCTION

1.1 Purpose

The purpose of this Flora and Fauna Management Plan (FFMP) is to provide a strategy to control flora and fauna impacts during construction in the Solar Farm project.

This Flora and Fauna Management Plan shall be read in conjunction with the *PL-EV-01 Environmental Management Plan*.

1.2 Document Responsibilities

Responsibility	Role
Development	HSE coordinator
Review	Project Manager
Approval	Project Director

Any person may request updating of this Plan.

1.3 Document Amendment and Distribution

This document shall be reviewed as follows:

- As requested by Management Review
- When there is a change of method and/or technology that may affect the accuracy of this document; or
- When there has been a significant event to which this document was relevant; or
- As a result of a non-conformance resulting from an audit

Document amendments and distribution will be conducted as per detailed in the *PL-CO-01 Project Management Plan and the PL-QA-02 Records Management Plan*.

New and amended documentation issued after the initial approval and distribution of this plan to controlled copy holders shall be identified in the *FS-QA-RG-06 Document Control Register*. Revision details shall be recorded in the *Revision Status Section* of this plan.

All changes to documents shall be reviewed and approved by the same function that performed the original review and approval and as per the cover of this plan, unless specifically designated otherwise.

1.3.1 Revision Status

Revision	Revision Date	Issued Date	Nature of modification
0	2016/11/23	YYYY/MM/DD	Issued to Tender
1	YYYY/MM/DD	YYYY/MM/DD	Contract Award revision
2			
3			
4			
5			
6			
7			
8			

9			
10			

2 DEFINITIONS

BYCA	Bouygues Construction Australia Pty Ltd
EPBC	Environment Protection and Biodiversity Conservation Act 1999
EMP	Environmental Management Plan (PL-EV-01)
FFMP	Flora and Fauna Management Plan (PL-EV-02)

3 ORGANISATION

3.1 Responsibilities and Authorities

The Project Organisational chart and overall roles and responsibilities are outlined in the EMP. The key responsibilities for Flora and Fauna Management are as follows:

3.1.1 Project Manager

- Ensuring appropriate resources are available for the implementation of the FFMP

3.1.2 HSE coordinator

- Responsible for providing assistance and advice to the Project Engineers and Environmental Coordinators to fulfil the requirements of this Plan, assessing data from inspections, monitoring and reporting, and providing project-wide advice to ensure consistent approach and outcomes are achieved
- Responsible for providing necessary training for project personnel to cover protection of fauna and flora
- The HSE coordinator is also responsible for the review and update of this Plan

3.1.3 General Superintendent

- Responsible for developing/revising the construction schedule in consultation with the HSE coordinator to ensure the protection of the flora and fauna in the area and/or minimize the impact of the construction activities
- Identifying, analysing and treating the risks before commencing works each day and ensuring that the appropriate controls are implemented and effective; thus controls may be increased or decreased as required
- Ensuring all flora and fauna controls are implemented and effective in controlling impacts

3.1.4 All Workers on Site

In relation to Flora and Fauna management, all workers on site are required to:

- Implement and maintain all applicable control measures
- Report any potential and/or actual incidence of flora or fauna

3.2 Legal Requirements

The following Acts, Regulations and Standards are applicable to this Project:

NSW

- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Regulation 2000
- Parkes Local Environmental Plan 2012
- Parkes Shire Council Development Control Plan 2013
- Griffith Local Environmental Plan 2014
- Narromine Local Environmental Plan 2011
- Narromine Development Control Plan 2012
- Orana Regional Environmental Plan No. 1 - Siding Springs (Deemed State Environmental Planning Policy)
- Dubbo Local Environmental Plan 2011
- Dubbo Development Control Plan 2013
- State Environmental Planning Policy (Infrastructure) 2007
- State Environmental Planning Policy (State and Regional Development) 2011
- State Environmental Planning Policy No. 55 - Remediation of Land
- State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
- State Environmental Planning Policy No. 44 – Koala Habitat Protection
- Protection of the Environment Operations Act 1997
- Roads Act 1993
- Native Vegetation Act 2003
- Water Management Act 2000
- Threatened Species Conservation Act 1995
- National Parks and Wildlife Act 1974
- Heritage Act 1977

Commonwealth

- Environment Protection and Biodiversity Conservation Act 1999
- Native Title Act 1993
- Renewable Energy (Electricity) Act 2000

3.3 Contractual Requirements

BYCA have identified the most critical Environmental Contractual requirements for the project, these are:

PARKES - Development Consent

- The Inland Grey Box Woodland EEC located within the project site, as shown in Appendix 1, shall be maintained and enhanced.
- A mature vegetation buffer shall be established and maintained around the site at the locations outlined in Appendix 1. This buffer must:
 - be comprised of species that make up the Inland Grey Box Woodland EEC;
 - be at least 5 metres deep, comprising at least two rows of staggered trees;

- be effective at screening views of the solar panels and ancillary infrastructure on site from surrounding residences, and minimising the glare from the solar panels on road users; and
- be kept free of weeds.

GRIFFITH - Development Consent

- Minimise the clearing of any Weeping Myall Woodland EEC in the road reserve during the construction of the new site entry points and the ancillary infrastructure connecting the site to the nearby substation.
- The Applicant shall establish and maintain a mature vegetation buffer around the site at the locations outlined in the figure in Appendix 2. This buffer must:
 - be comprised of species that make up the Weeping Myall Woodland EEC, with *Acacia pendula* as the main species;
 - be at least 5 metres deep, comprising at least two rows of staggered trees;
 - be effective at screening views of the solar panels and ancillary infrastructure on site from surrounding residences, and minimising the glare from the solar panels on road users; and
 - be kept free of weeds.

DUBBO SOUTH KESWICK - Western Plains Regional Council Approval

While acknowledging some vegetation will be required to be removed, the Application identifies mitigation measures to minimise potential adverse impacts to the environment (including flora and fauna) which includes:

- Dealing with any noxious weeds under the Noxious Weeds Act 1993 No. 11;
- Ensuring materials, plant, equipment and stockpiles are not placed in a manner that results in damage to trees; and
- Construction staff to be briefed on the requirement to avoid damage or removal of vegetation adjacent to the construction area

DUBBO NARROMINE - Western Plains Regional Council Approval

Although the proposed area is identified as containing a sensitive area for Terrestrial Biodiversity, this area is confined to the banks of the Macquarie River some 400 metres from the development site. The development is therefore not proposed to affect the riparian zone which houses sensitive terrestrial biodiversity

4 COMPETENCE, TRAINING AND AWARENESS

As stated in the EMP all project personnel, subcontractors and consultants will receive training in the group and personal environmental obligations during the *Site Inductions* and *Toolbox Talks*. From time-to-time staff may also attend specific training sessions, when necessary, by the HSE coordinator.

Examples of topics that will be covered during project induction and toolboxes include:

- protected flora and fauna species and their habitats

5 FLORA AND FAUNA MANAGEMENT

5.1 Objectives

5.1.1 Terrestrial Flora and Fauna

The terrestrial flora and fauna management objectives are as follows:

- Minimisation and management of impacts on flora and vegetation not required to be cleared for construction works
- Minimisation and management of impacts to indigenous or otherwise protected fauna that are located on-site, including the protection of remaining fauna habitats
- Minimisation of ground disturbance
- Promotion of the growth of local species and a stable vegetation community through reducing access and maintenance of preserved areas

5.2 Potential Environmental Impacts

5.2.1 Terrestrial Flora and Fauna

Potential environmental impacts to terrestrial flora and fauna include:

IMPACT	FREQUENCY	INTENSITY	DURATION	CONSEQUENCE
Direct				
Habitat clearance for permanent and temporary construction facilities (e.g. solar infrastructure, compound sites, stockpile sites, access tracks)	Regular	High	Construction Phase	<ul style="list-style-type: none"> • Direct loss of native flora and fauna habitat including threatened species and EECs • Potential over clearing of habitat outside of the development footprint. • Injury and mortality to fauna during clearing of fauna habitat and habitat trees. • Disturbance to fallen timber, dead wood and bush rock
Indirect				
Accidental spills and contamination from construction activities (including compound sites)	Rare	Moderate	Construction Phase	<ul style="list-style-type: none"> • Pollution of waterways
Earthworks	Regular	Moderate	Construction Phase	<ul style="list-style-type: none"> • Erosion and sedimentation of waterways
Noise	Regular	Low	Construction Phase	<ul style="list-style-type: none"> • Construction machinery and activities may disturb local fauna
Dust generation	Regular	Low	Construction Phase	<ul style="list-style-type: none"> • Inhibit the function of plant species and communities, waterways
Light spills during night works	Rare	Low	Construction Phase	<ul style="list-style-type: none"> • Night works may alter fauna activities/movements
General construction activities	Regular	Moderate	Construction Phase	<ul style="list-style-type: none"> • Feral pest, weed and/or pathogen encroachment

5.3 **Management and Contingency Mitigation Measures**

Refer to site specific information:

- Appendix 1 – Parkes
- Appendix 2 – Griffith
- Appendix 3 – South Keswick
- Appendix 4 – Narromine

The following Flora and Fauna Management measures will be implemented:

All Sites

- Report immediately to relevant authorities any incident that impacted or could impact the flora or fauna of the project and areas around it, as per the PR-CO-04 Incident Management Procedure
- Regular inspection of the works to ensure procedures and precautions are in place to minimise risk to human health and the environment
- The development of a contingency response if monitoring indicates a risk to sensitive receptors or human health
- Retain all trees and shrubs within the Project area not impacted by works
- No removal of any trees with trunks larger than 100mm in diameter if this can be avoided
- Prevent or mitigate dust emission impacts to flora and fauna
- Prevent or mitigate noise and vibration emission impacts to flora and fauna
- Stage flora and vegetation clearing to the minimum necessary, where practicable
- Excavation pits will be shaped and contoured to ensure that the likelihood of water ponding is minimised
- Manage contamination to land, groundwater and surface water by implementing the Project Waste and Energy Management Plan
- Limit dewatering activities to the minimum areas necessary
- Manage contamination to land, groundwater and surface water and spills and contamination risks, potentially impacting vegetation and aquatic fauna, by implementing the Waste and Energy Management Plan
- Undertake surface water and groundwater management measures and monitoring procedures as outlined in Soil and Water Management Plan
- All personnel will be informed of protected flora and fauna species (terrestrial and their habitats on and around the Project area and the related management measures as part of the induction. The induction will also cover potential risks arising from construction activities and relevant mitigation measures.
- Implement any specific conditions applied to the project by regulatory authorities

The success of management strategies will be reviewed on a regular basis to confirm its continued suitability for the site. Should the risk to the environment or to human health change during the construction period, management options will be reviewed.

6 IDENTIFY AND ASSESS

6.1 *Notable Flora and Fauna Species*

Refer to site specific information:

- Appendix 1 – Parkes
- Appendix 2 – Griffith
- Appendix 3 – South Keswick
- Appendix 4 - Narromine

7 IMPLEMENT CONTROLS

7.1 *Flora and Fauna Management Control Measures*

Project mitigation and management measures for flora and fauna impacts during construction are outlined in the table below:

Table 1 - Flora and Fauna Mitigation Measures

Source/Reference			
Mitigation Measure	Responsibility	Timing	Records
Pre-Clearing			
Ecologist report identifying flora and fauna within the site including areas to be cleared and areas to be protected. Details to be recorded for any threatened flora/fauna, hollow bearing/habitat trees (HBTs) on the site.	HSE Coordinator	Before commencement of earthworks	Consultant report
Incorporate discussion on flora and fauna impacts and mitigation measures into Site Induction.	General Superintendent	Pre-Construction	Project Site Induction
Ensure areas to be cleared are identified, defined and inspected prior to construction commencing	General Superintendent	Pre-Construction	FS-EV-AT-01 Environmental Inspection
Clearing			
The method used to clear vegetation should be specific to the location and type of vegetation.	General Superintendent	N/a	FS-EV-AT-01 Environmental Inspection
Clearing will be a two-step process where non-habitat trees are removed first allowing fauna time to move to other areas and then following a minimum duration period of one (1) night, habitat trees are removed.	General Superintendent	N/a	FS-EV-AT-01 Environmental Inspection
Trees to be removed will be felled in such a way as to avoid falling into and damaging adjacent vegetation outside the construction footprint.	General Superintendent	N/a	FS-EV-AT-01 Environmental Inspection
Prior to felling, trees will be ‘tapped’ by the excavator bucket (or other clearing equipment apparatus) to provide an opportunity for animals to escape.	General Superintendent	Immediately prior to clearing	FS-EV-AT-01 Environmental Inspection
The HSE coordinator is to be present during clearing process. If fauna is observed in trees whilst felling, then clearing work is to cease and personnel fall back to allow fauna a chance to vacate the area.	HSE Coordinator	During clearing	FS-EV-AT-01 Environmental Inspection

Felled habitat trees will remain on the ground for a short period to allow time for any trapped fauna to escape. All hollows will be checked immediately after felling and prior to further processing of the tree.	General Superintendent	During Clearing	FS-EV-AT-01 Environmental Inspection
If fauna are found to be utilising the site, or a nest, den or roost is found, the animals will be relocated by a qualified ecologist or other authorised person to outside the construction footprint.	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection
General Flora and Fauna			
Any unintended disturbance of environmentally sensitive areas is to be reported to HSE coordinator and General Superintendent	All	Ongoing	FS-EV-AT-01 Environmental Inspection FS-EV-IM-01 Environmental Incident Report & Investigation

Table 2 - Clearing and Grubbing Mitigation

Source/Reference			
Mitigation Measure	Responsibility	Timing	Records
Pre-Clearing and Grubbing			
Ensure all areas to be cleared and grubbed are clearly defined. Ensure all areas to be protected are clearly defined (Refer to Flora and Fauna EP).	General Superintendent	Pre-construction	FS-EV-AT-01 Environmental Inspection
Establish sediment erosion controls (as per Sediment and Erosion EP).	General Superintendent	Pre-construction	FS-EV-AT-01 Environmental Inspection
Incorporate discussion on clearing and grubbing impacts and mitigation measures into Site Induction. Include details on sensitive flora and fauna that may be locate onsite.	General Superintendent	Pre-Construction	Project Site Induction
General Clearing and Grubbing			
No clearing is approved within the road reserve on Pat Meredith Dr (Parkes) except for the access point into the laydown/office area on site. This will be communicated to all personnel working on the road upgrade.	General Superintendent	Ongoing	Project Site Induction
Minimise the clearing of any Weeping Myall Woodland EEC in the road reserve (Griffith) during the construction of the new site entry points and the ancillary infrastructure connecting the site to the nearby substation	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection
Ensure all sediment and erosion controls are implemented as appropriate for the site (Sediment and Erosion EP).	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection
The method used to clear vegetation should be specific to the location and type of vegetation.	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection

Take all precautions outlined in the Flora and Fauna MP to ensure no damage/harm occurs to flora/fauna to be retained/protected.	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection
The locations to be cleared will be visually inspected for potential fauna species within the area. If fauna species are identified clearing is not to proceed until such time as the animal has vacated the area, or is relocated by authorised personnel (General Superintendent)	HSE coordinator/General Superintendent	Prior to clearing	FS-EV-AT-01 Environmental Inspection
Clearing will be a two-step process where non-habitat trees are removed first allowing fauna time to move to other areas and then following a minimum duration period of one (1) night, habitat trees are removed.	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection
Trees to be removed will be felled in such a way as to avoid falling into and damaging adjacent vegetation outside the construction footprint.	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection
Prior to felling, trees will be 'tapped' by the excavator bucket (or other clearing equipment apparatus). A short period of time will be allowed to provide an opportunity for animals to escape.	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection
Felled habitat trees will remain on the ground for a short period to allow time for any trapped fauna to escape. All hollows will be checked immediately after felling and prior to further processing of the tree.	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection
If fauna are found to be utilising the site, or a nest, den or roost is found, the animals will be relocated by the Project Ecologist or other authorised person to outside the construction footprint.	General Superintendent	Ongoing	FS-EV-AT-01 Environmental Inspection

8 INSPECT AND TEST

8.1 *Monitoring, Inspection and Reporting*

Daily visual inspections of the construction site will be undertaken by the HSE coordinator and construction personnel to identify any potential flora and fauna management issues. Any actions to be undertaken as a result of site inspections will be recorded in the *FS-QA-RG-02 Corrective & Preventative Actions Register*.

All inspections will be conducted as per the *PL-EV-01 Environmental Management Plan*.

9 RECORDS

A record shall be maintained as per *PR-QA-06 Project Document Control and Record Management Procedure*.



Shaping a **Better Life**

Solar PV Projects
Flora and Fauna Management Plan

Id no.:PL-EV-02

Appendix 1

PARKES

Appendix 2 **GRIFFITH**



Shaping a **Better Life**

Solar PV Projects
Flora and Fauna Management Plan

Id no.:PL-EV-02

Appendix 3

South Keswick



Shaping a **Better Life**

Solar PV Projects
Flora and Fauna Management Plan

Id no.:PL-EV-02

Appendix 4

Narromine