

SIGNAL ENERGY[™]
AUSTRALIA PTY LTD

Biodiversity Management Plan

DARLINGTON POINT SOLAR FARM



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ACRONYMS AND ABBREVIATIONS

ANZECC	Australian and New Zealand Environment Conservation Council
APZ	Asset protection zone
ARA	Appropriate regulatory authority
ARI	Average recurrence interval
AS	Australian Standard
Contractor	Signal Energy Pty Ltd
BAR	Biodiversity Assessment Report
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BESS	Battery Energy Storage System
BMP	Biodiversity Management Plan
BS Act	<i>Biosecurity Act 2015 (NSW)</i>
CoC	Conditions of Consent
CCR	Construction Compliance Report
CEMP	Construction Environmental Management Plan
CL&W	Crown Lands and Water within Department of Industry
CTAMP	Construction Traffic and Access Management Plan
CSWMP	Construction Soil and Water Management Plan
CWD	Coarse woody debris
Construction	The construction of the development, including but not limited to the carrying out of any earthworks on site and the construction of solar panels and any ancillary infrastructure (but excludes any upgrades to the public road network required under this consent, installation of fencing, artefact survey and/or salvage, overhead line safety marking and geotechnical drilling and/or surveying)
Council	Murrumbidgee Council
DoEE	Department of the Environment and Energy (Cwth)
DPE	(NSW) Department of Planning and Environment
Decommissioning	The removal of solar panels and ancillary infrastructure and/or rehabilitation of the site
EA	Environmental Assessment, and Modification Reports
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EMS	Environmental Management Strategy
EPA	Environment Protection Authority (Previously DECCW and/or OEH)
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwth)</i>
ERSED	Erosion and sediment control
EWMS	Environmental Work Methods Statement (or Safe Work Method Statement)
ESCP	Erosion and Sediment Control Plan
Feasible	Feasible relates to engineering considerations and what is practical to build or implement

FM Act	Fisheries Management Act 1994 (NSW)
GHG	Greenhouse gas
GWh	Gigawatt hours
ha	Hectares
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species. Also referred to as high threat weeds.
HSE Manager	Health, Safety, and Environment Manager
ISEPP	<i>State Environmental Planning Policy (Infrastructure) 2007</i> (NSW)
km	Kilometres
kV	Kilovolts
Low threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade but not outcompete native plant species. Also referred to as low threat weeds.
m	Metres
m ³	Cubic metres
MW	Megawatts
NEPC	National Environment Protection Council
NML	Noise Management Level
NPW Act	<i>National Parks and Wildlife Act 1974</i> (NSW)
NSW	New South Wales
NOW	NSW Office of Water
NOx	Nitrogen oxides
NTSCORP	Native Title Services Corporation Limited
OEH	Office of Environment and Heritage
O&M	Operations and maintenance
PCT	Plant Community Type
PESCP	Progressive Erosion and Sediment Control Plan (aka ESCP)
PMP	Project Management Plan
POCR	Pre-operation Compliance Report
POEO Act	<i>Protection of the Environment Operations Act 1997</i> (NSW)
RAV	restricted access vehicles
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
RBL	Rating Background Level
RFS	NSW Regional Fire Service
RMS	Roads and Maritime Services
RTS	Response to Submissions
Sensitive vegetation	Native vegetation that is adjacent to and outside of any designed clearing area.
SoC	Statement of Commitments in Environmental Assessment

Sp./spp.	Species/species (plural)
SWMP	Soil and Water Use Management Plan
TCP	Traffic Control Plans
TMP	Traffic Management Plan
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)
The Project	Darlington Point Solar Farm
The Proponent	Edify Energy Pty Ltd
Vegetation	Any native trees, shrubs or grassland.
VEZ	Vegetation exclusion zone (different to APZ surrounding infrastructure)
VLMP	Vegetation and Land Management Plan
WMP	Waste Management Plan
WPMP	Weed and Pest Management Plan

1 INTRODUCTION

1.1 CONTEXT

This Biodiversity Management Plan (BMP) forms part of the Environmental Management Strategy (EMS) and the Construction Environmental Management Plan (CEMP) for Darlington Point Solar Farm (the Project). This includes details for operational biodiversity monitoring required by the Conditions of Consent read in consultation with the Biodiversity Assessment Report (BAR) V07 and updates.

This BMP has been prepared to address the requirements of:

- New South Wales (NSW) Department of Planning and Environment (DPE) Conditions of Consent (CoC) (7 December 2018).
- All applicable legislation, during the construction and operation of the Project.
- Mitigation and management measures and Statements of Commitments (SoC) in the Darlington Point Environmental Impact Statement (EIS) and in the Response to Submissions (RTS) on the EIS and BAR V07 and additional information provided by the proponent dated November 2018 (definition in determination).

CoC 11, to be included in the BMP, states:

In the period between 2 years and 3 years from the commencement of operations, unless the Secretary agrees otherwise, the Applicant must commission an independent review of the impacts of the development on PCT 45 and submit a subsequent report to the Secretary. This review and report must be undertaken by a suitably qualified, experienced and independent grasslands expert endorsed by the Secretary.

The expert must:

- a) consult with OEH and the Applicant.*
- b) compare the actual impacts on PCT45 against that predicted in the EIS.*
- c) if the review concludes that the impacts on PCT45 are greater than that predicted in the EIS, calculate any additional biodiversity offset credit liabilities for the development over and above that specified in Column (a) of Table 1 above, in accordance with the NSW Biodiversity Offsets Policy for Major Projects.*
- d) document the findings in its report.*

If the Secretary determines, after reviewing the expert's report, that the Applicant must retire additional biodiversity credits for PCT45, the Applicant must retire the additional credits within 12 months of the Secretary's determination, up to an aggregate maximum of that specified in Column (b) of Table 1 above.

CoC 12 states:

Prior to the commencement of construction, the Proponent must prepare a Biodiversity Management Plan for the development in consultation with OEH, and to the satisfaction of the Secretary. This plan must:

(a) include a description of the measures that would be implemented for:

- *minimising the amount of native vegetation clearing within the approved development footprint.*
- *minimising the loss of key fauna habitat.*
- *managing potential indirect impacts on threatened and migratory species, including:*

- *flora species, including Weeping Myall Woodland and Sandhill Pine Woodland.*
- *fauna species, including Grey-crowned Babbler and Superb Parrot.*
- *rehabilitating and revegetating temporary disturbance areas.*
- *protecting native vegetation and key fauna habitat outside the approved disturbance areas;*
- *maximising the salvage of vegetative and soil resources within the approved disturbance area for beneficial reuse in the enhancement or the rehabilitation of the site.*
- *controlling weeds and feral pests.*
- *protecting and promoting the growth of native plant species (including PCT45) and controlling the growth of exotic ground cover.*

(b) include a seasonally-based program to monitor and report on the effectiveness of these measures against the detailed performance and completion criteria.

(c) include details of who would be responsible for monitoring, reviewing and implementing the plan, and timeframes for completion of actions.

Following the Secretary's approval, the Proponent must implement the Biodiversity Management Plan.

Note: If the biodiversity credits are retired via a Biodiversity Stewardship Agreement, then the Biodiversity Management Plan does not need to include any of the matters that are covered under the Biodiversity Stewardship Agreement.

1.2 BACKGROUND

The EIS assessed the impacts of the Project on biodiversity. A BAR was prepared by EPS in April 2018 to support the EIS. The report was prepared under the Framework for Biodiversity Assessment as part of the Biodiversity Offsets Policy for Major Projects. The CoC issued by DP&E and mitigation measures from the EIS detail the requirements of the BMP.

1.3 ENVIRONMENTAL MANAGEMENT SYSTEMS OVERVIEW

The overall Environmental Management System for construction of the Project is described in the EMS and CEMP. This BMP is part of the environmental management framework for the Project. Mitigation and management measures identified in this BMP will be incorporated into site specific Environmental Work Method Statements (EWMS) (or Safe Work Method Statements) and Activity Procedures, with reference to relevant guidelines such as NSW Roads and Maritime Service's (2011) Biodiversity Guidelines: Protecting and managing biodiversity on RMS projects.

Used together, the EMS, CEMP, BMP, strategies, procedures and EWMS form management guides that clearly identify required environmental management actions for reference by personnel and contractors.

This BMP will be reviewed every three years.

1.4 PROJECT DESCRIPTION

The proposed project will accommodate up to 275 MW alternating current (AC) of solar generated electricity. It includes the provision of 100 MWh (AC) battery technology for energy storage (battery energy storage system – BESS) and peak demand resupply, which will be constructed at a later date, at which time

this BMP will be reviewed and revised as appropriate. A detailed infrastructure layout is provided Figure 1-1 to Figure 1-5 and includes:

- Photovoltaic (PV) solar panels.
- Steel mounting frames on piled foundations.
- A single-axis tracking system.
- Direct current (DC) / alternating current (AC) inverter stations.
- Medium voltage electrical reticulation network.
- A 33/132 kV switchyard and internal switchroom.
- A BESS facility, consisting of individual power pack cubicles or skid-mounted/containerised power packs and modular inverters and medium voltage transformers, including a connection to the above switchyard (located within substation compound areas).
- Internal access tracks for operational maintenance.
- Compound laydown areas.
- 1.8 m perimeter fencing (no barbed wire) (Figure 1-6).
- Vegetation exclusion zone (VEZ) around woodland vegetation to be retained.
- Fire breaks or asset protection zone (APZ) (with a perimeter access road overlaying this direct impact zone).
- Office and Staff car park and security fencing (within the substation compound areas).

Details of project and the methodology for construction, operation and decommissioning phases are described at length in Section 2 of the EIS.

Three impact zones for the project have been identified including:

Undisturbed: vegetation exclusion zones (VEZ), including 10 m buffer around perimeter woodland vegetation, 20 m around internal woodland vegetation and any untouched areas outside the project footprint.

Directly impacted: Anywhere that is cleared, has infrastructure built on it or subject to earthworks i.e. trenching, pilings driven into the ground.

Directly impacted native vegetation will be limited to areas identified in the BAR including:

- 8.14 ha direct impact to Black Box grassy open woodland wetland of rarely flooded depressions in south western NSW (PCT 16) moderate to good – moderate.
- 0.16 ha direct impact to Yellow Box – White Cypress Pine grassy woodland on deep sandy loam alluvial soils of the eastern Riverina and western NSW South Western Slopes Bioregions (PCT 75) moderate to good – moderate.
- 37.7 ha direct impact to Plains Grassland on Alluvial mainly clay soils in the Riverina Bioregion of NSW South Western Slopes (PCT 45) moderate to good moderate.
- 21.06 ha net impact calculated from CSU study assessment impact to Plains Grassland under the solar panels.

Indirectly impacted: grassland areas:

- Shaded by panels.
- Grazed or mowed.

Driven on during construction or operations.

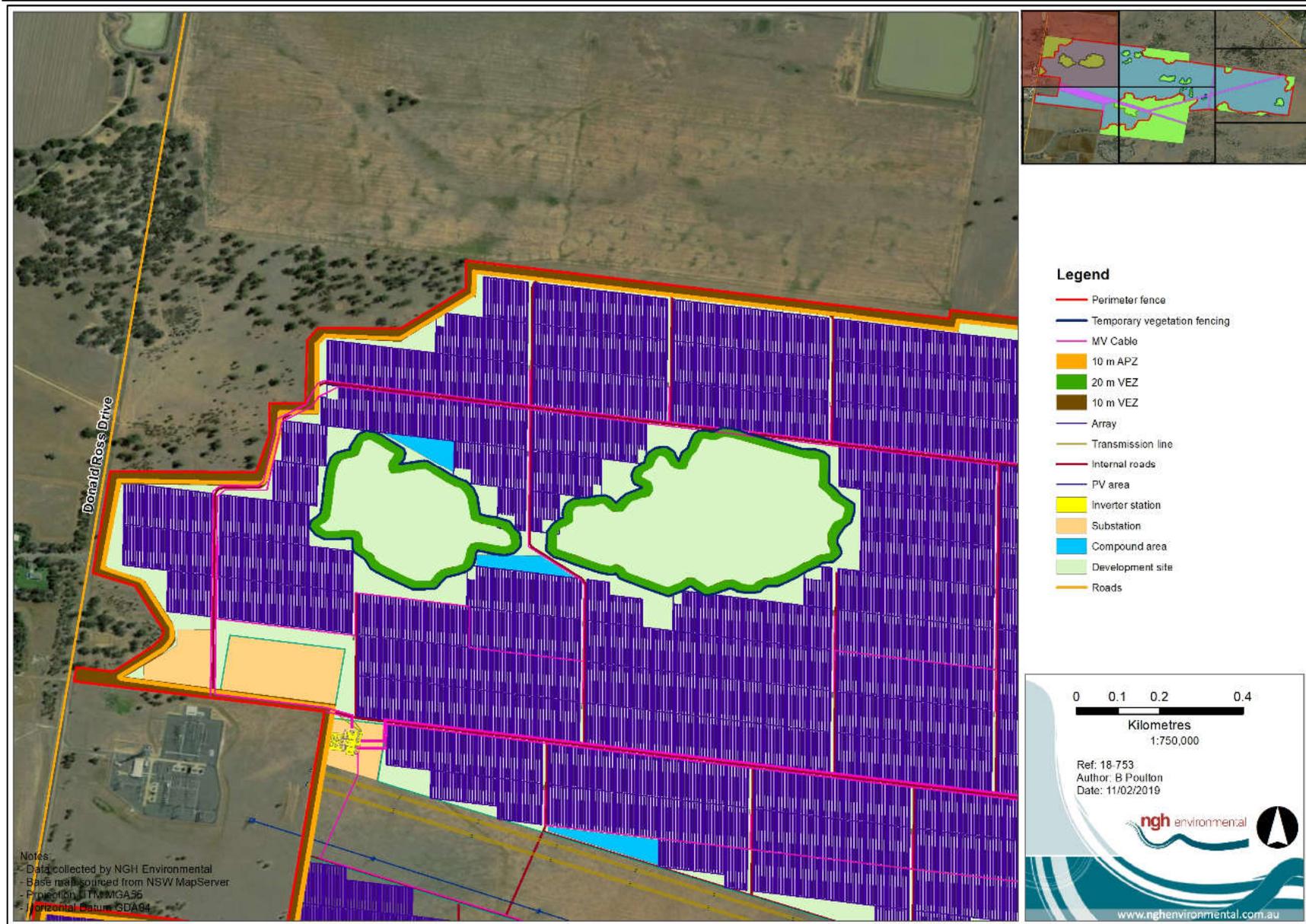


Figure 1-1 Project infrastructure and impacts (a)

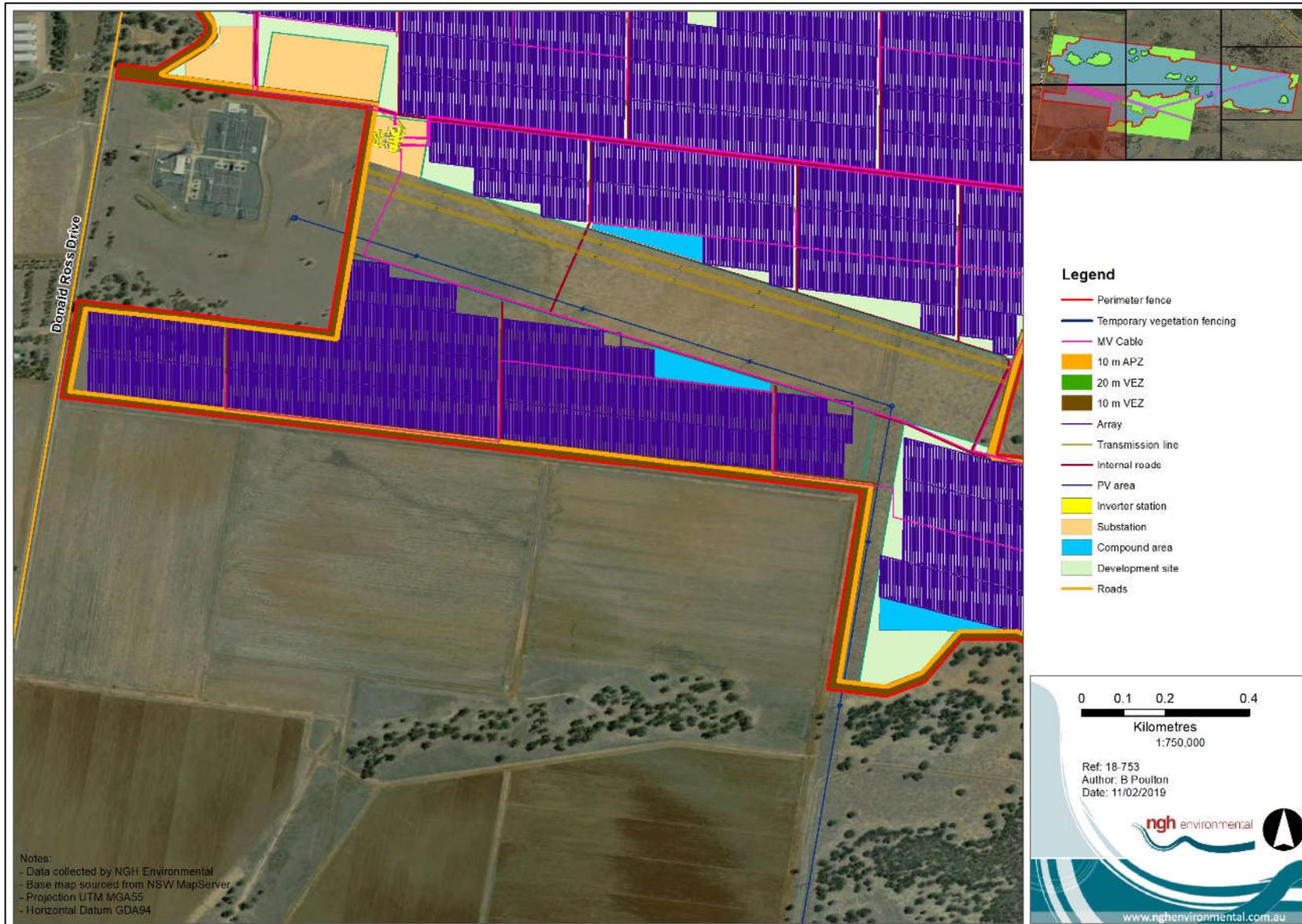


Figure 1-2 Project infrastructure and impacts (b)

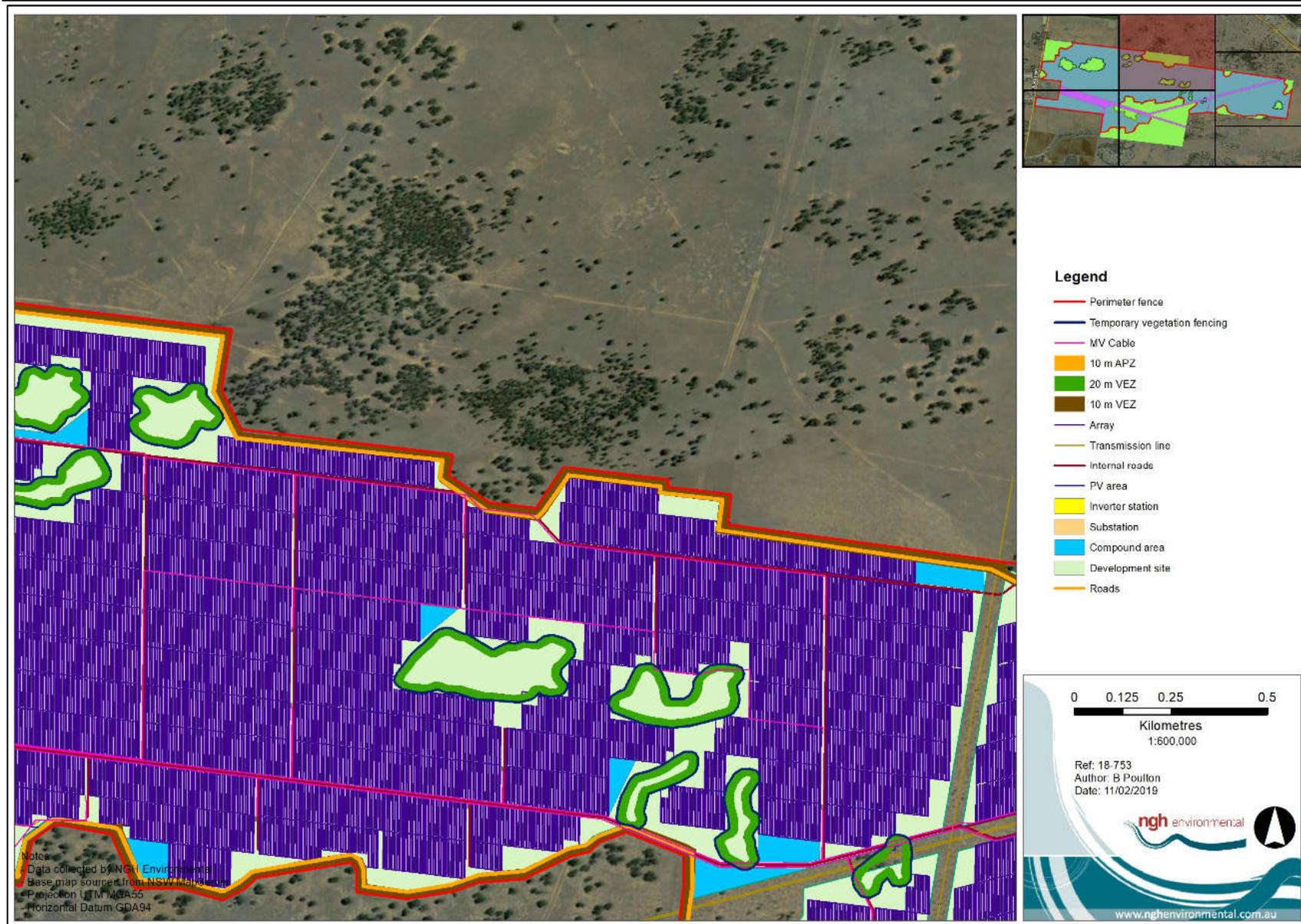


Figure 1-3 Project infrastructure and impacts (c)

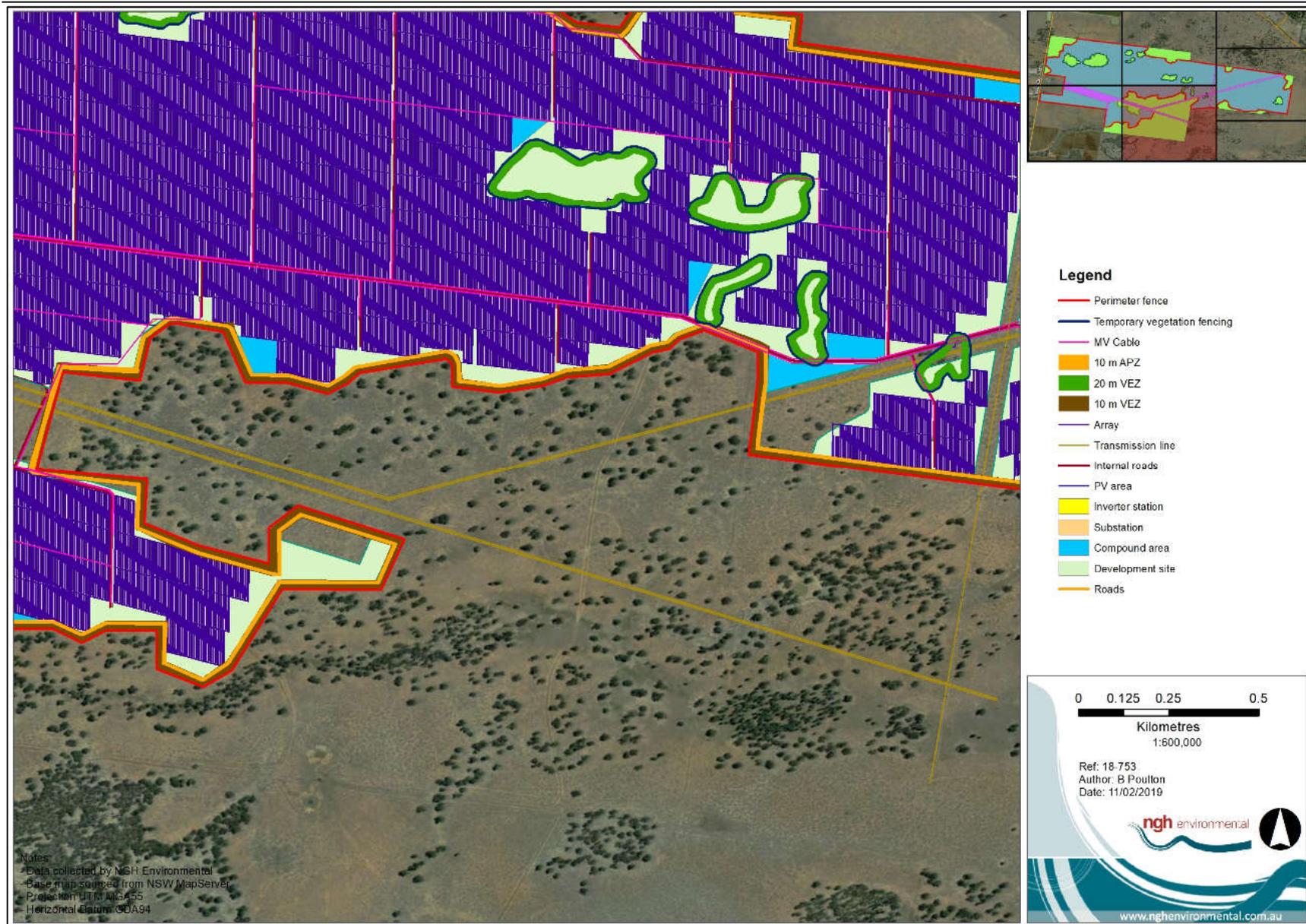


Figure 1-4 Project infrastructure and impacts (d)

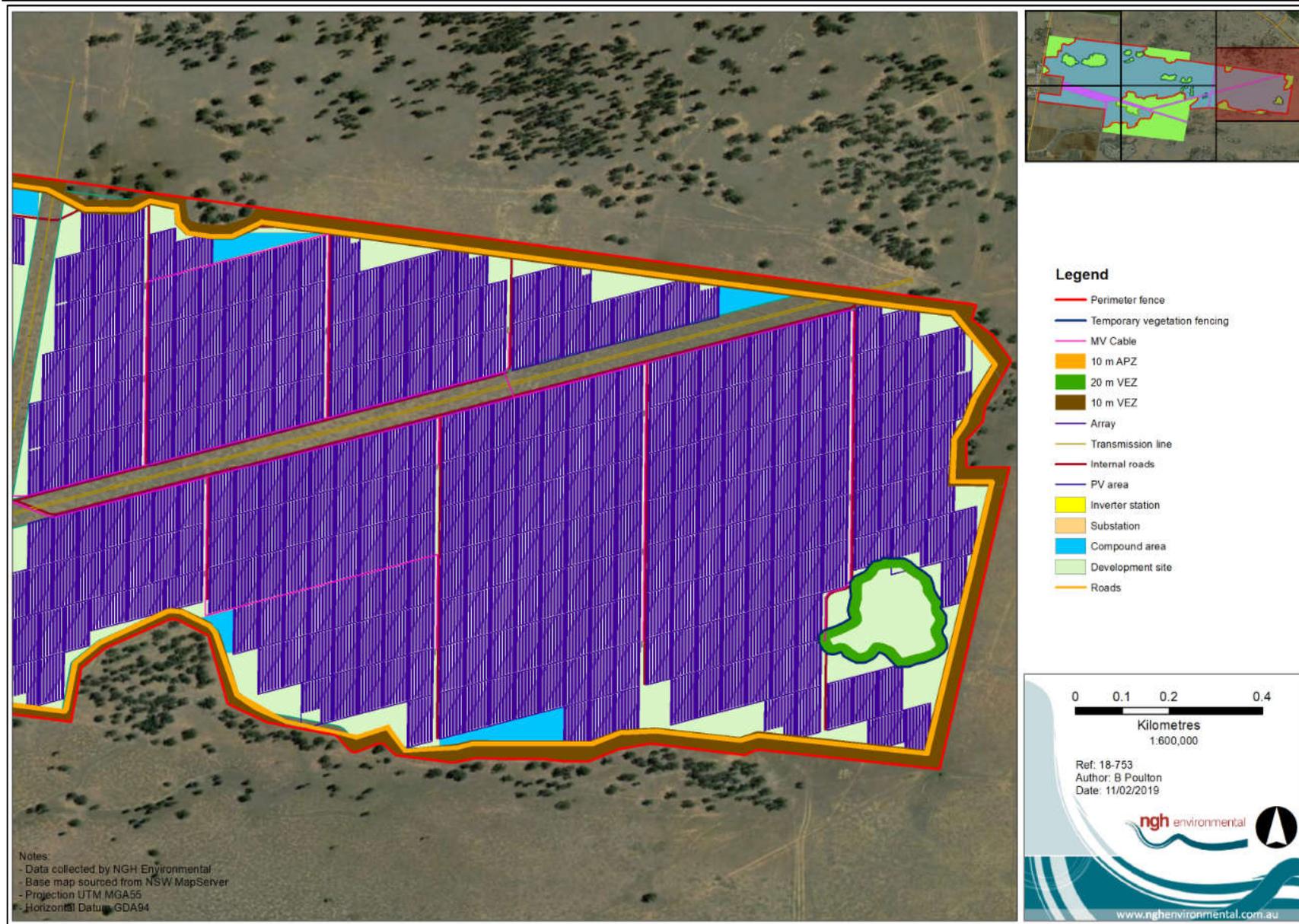


Figure 1-5 Project infrastructure and impacts (e)

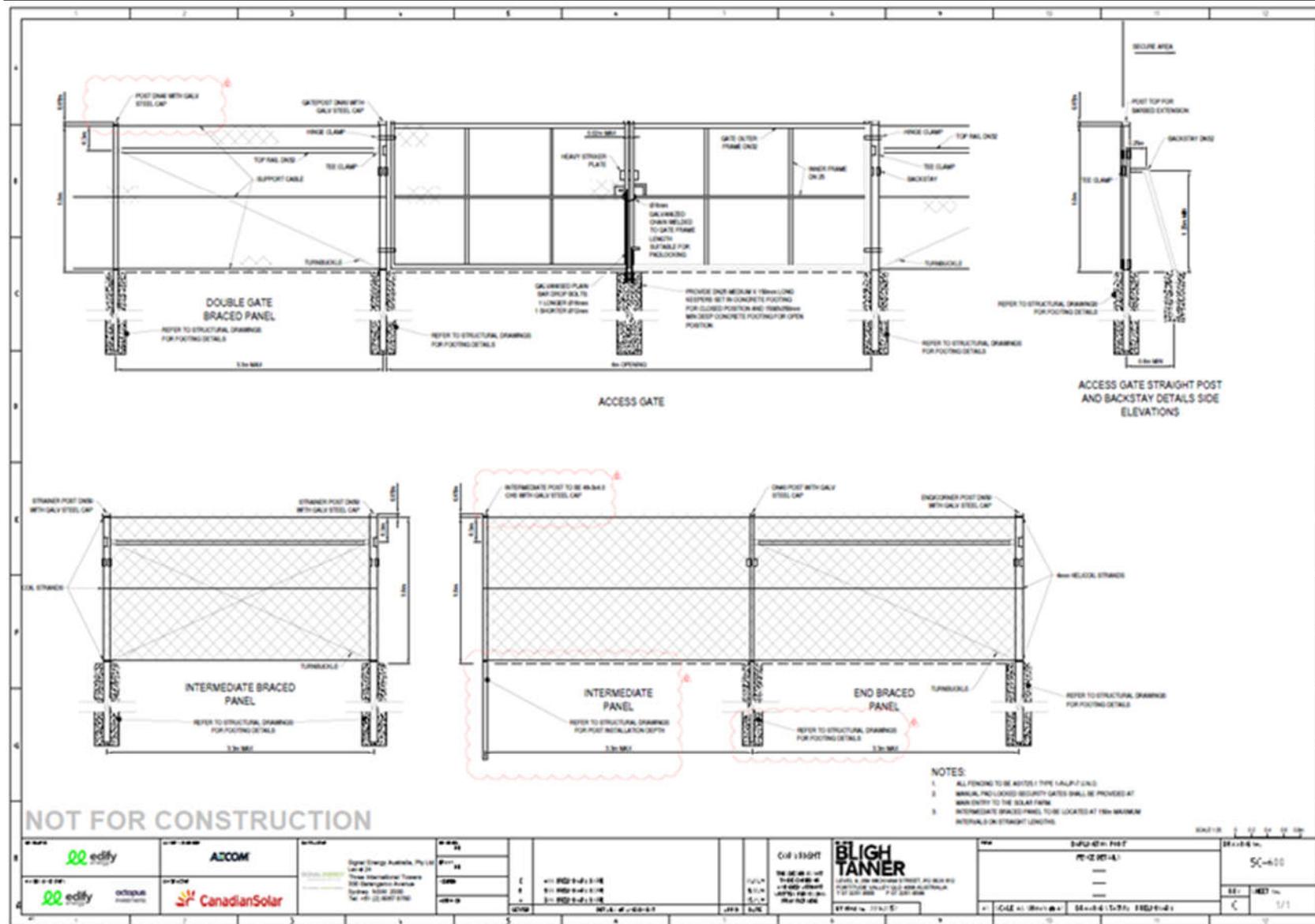


Figure 1-6 Perimeter fence design

1.5 PURPOSE OF THIS BMP

The purpose of this plan is to describe how impacts on biodiversity will be minimised and managed during construction and operation of the Project.

1.6 OBJECTIVES

The key objective of the BMP is to ensure that impacts to biodiversity are managed and are within the scope permitted by the planning approval.

To achieve this objective, Signal Energy Pty Ltd will:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid (where necessary) or minimise potential adverse impacts to biodiversity values in the project footprint.
- Ensure appropriate measures are implemented to address the mitigation measures detailed in the EIS, BAR and CoC.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in sections 4 and 4 and of this BMP.

1.7 TARGETS

The following targets have been established for the management of biodiversity impacts during construction of the Project:

- Ensure full compliance with the relevant legislative requirements.
- Ensure full compliance with relevant requirements of the EIS, BAR, SoC and CoC.
- No disturbance to biodiversity outside the construction footprint.
- Minimise disturbance to biodiversity within the project area.
- No increase in distribution of high threat exotic flora currently existing within the development site.
- No new high threat exotic flora introduced to moderate condition PCT 45 grassland.
- No fauna mortality during clearing and construction.
- No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat.
- Rehabilitate all disturbed areas not required for the operation of the solar farm.
- No revegetation or screening vegetation plantings within retained woodland or grassland areas.
- Active erosion will be managed and minimised.
- Revegetation of disturbed areas will have 70% ground cover over 90% of disturbed areas.
 - Failed vegetation patches greater than 5 m² will be revegetated.
 - High threat exotic plant cover will not exceed 2% of moderate condition PCT 45 grassland.
 - Low threat exotic plant cover will not exceed 5% of moderate condition PCT 45.
 - High threat exotic plant cover will not exceed 5% across the remaining of the development site.
 - Low threat exotic plant cover will not exceed 50% across the remainder of the development site.

- Ground cover will achieve seed set across at least 80% of area.
- Native species will be used in areas of native vegetation removal.

1.8 CONSULTATION

Following the granting of the Development Consent on 7 December 2018, a preliminary skype meeting was held with the Office of Environment and Heritage (OEH) and DPE on 18 December 2018 to discuss requirements for preparation of this BMP.

Drafts of the BMP were sent to DPE and OEH on 9 January 2019 for review and comment.

A response from NSW OEH was received on the 19 February 2019. Those comments have been addressed, the comments and the intended changes are recorded in Appendix A.

2 EXISTING ENVIRONMENT

2.1.1 Flora impacts

The site is dominated by plains grassland habitat that has historically been cleared for agricultural grazing purposes. Fragmented areas of grassy woodland and open forest also occur within the project boundary.

The project has been designed to minimise clearing of native woodland vegetation and threatened species habitats. In this regard, the development footprint comprises only circa 710 ha of the 1,042 ha project area, primarily to minimise biodiversity impacts.

The proponent has ensured the retention of:

- The majority of woodland and open forest vegetation of high importance.
- Threatened communities listed as endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/ or the *Biodiversity Conservation Act 2016* (BC Act).

Vegetation communities

The project would not disturb any Endangered Ecological Communities (EEC).

Four plant communities were identified on in the project area during surveys including:

- Black Box Grassy open woodland wetland of rarely flooded depressions in south western NSW (not listed).
- Yellow-Box – White Cypress Pine grassy woodland on deep sand-loam alluvial soils of the eastern Riverina and western NSW South Western Slopes Bioregions (not listed).
- Weeping Myall Open Woodland of the Riverina and NSW Southwestern Slopes Bioregion (listed as endangered under the BC Act and EPBC Act).
- White Cypress Pine open woodland of sand plains, prior streams and dunes mainly for the semi-arid (warm) climate zone.
- Natural Grasslands of the Murray Valley Plains (listed as critically endangered under the EPBC Act).

BLACK BOX GRASSY OPEN WOODLAND

Grassy woodland dominated by *Eucalyptus largiflorens* the upper stratum with a sparse shrub layer understorey of saltbushes and a moderately grassy understorey cover dominated by a mixture of native herbs, grasses and exotic species. This community occurred in the north western and south portions of the project area. The extent of the community is approximately 135.8 ha within the project area.

This community is not commensurate with any threatened ecological community listed either on the BC Act or the EPBC Act.

This PCT occurred in one BioBanking condition, being moderate to good - moderate. The majority of the BioBanking plots were within benchmark values. The length of fallen timber was generally below benchmark due to removal for grazing purposes. The native mid storey was absent which was likely to be a result of grazing pressures.

YELLOW BOX – WHITE CYPRESS PINE GRASSY WOODLAND

Grassy woodland dominated by *Eucalyptus melliodora* the upper stratum with a sparse shrub layer understorey of saltbushes and a moderately dense grassy understorey cover dominated by exotic grasses and exotic herbs. This community occurred in the north western and eastern portions of the project area. The extent of the community is approximately 16.1 ha within the project area.

This community is not commensurate with the similar White Box, Yellow Box, Blakely's Red Gum Woodland listed as endangered under the BC Act. This community does not meet the criteria for the federally listed White Box Yellow Box Blakely's Red Gum grassy woodland and derived grassland listed as critically endangered on the EPBC Act.

This PCT occurred in one BioBanking condition, being moderate to good - moderate. The majority of the understorey criteria was below benchmarks (Table 2 Appendix 6). The two larger patches were dominated by exotic understorey. The remaining three patches were small and were dominated by a high leaf litter content in some areas with high exotic understorey in other areas. The native mid storey was absent which was likely to be a result of grazing pressures.

WEEPING MYALL OPEN WOODLAND

Grassy open woodland, the canopy consists of pure stands of *Acacia pendula*. The understory consists of a low shrub layer of saltbushes with the ground layer consisted dominated by native grasses with interspersed with native herbs. This community occurred in the middle portion of the project area. This community occurred as six patches of *Acacia pendula*. The extent of the community is approximately 6.2 ha within the project area.

Two patches of this community are commensurate with the endangered community of Weeping Myall Woodland listed as endangered on the EPBC Act. All patches of this community are commensurate with the Myall Woodland in the Darling Riverine Plans Brigalow Belt South, Cobar Peneplain, Murray-darling Depression, Riverina and NSW Western Slopes Bioregion listed as endangered on the BC Act.

This PCT occurred in one BioBanking condition, being moderate to good - high. All the criteria meet benchmarks or above with the exception of native ground cover shrubs. The native mid storey was absent which was likely to be a result of grazing pressures.

WHITE CYPRESS PINE OPEN WOODLAND

Open forest structure dominated by pure stands of *Callitris glaucophylla* in the upper stratum with no mid stratum and a sparse understorey cover dominated by exotic plant species. this community occurred in two patches in the north western and north eastern portions of the project area. the extent of the community is approximately 5.2 ha within the project area. The patch of this community in the north eastern portion contained a large rabbit warren.

This community is commensurate with Sandhill Pine Woodland in the Riverina, Murray-darling Depression and NSW South Western Slopes Bioregions listed as endangered on the BC Act.

This PCT occurred in one BioBanking condition, being moderate to good – moderate. The majority of the criteria met were above the benchmarks. The native mid storey was absent, with low cover of native other species which was likely to be a result of grazing pressures.

NATURAL GRASSLANDS OF THE MURRAY VALLEY PLAINS

Historical aerial photos, together with additional interpretation of vegetation maps assisted in an assessment of whether the areas described as PCT 45 Plains Grass Grassland are best categorised as native grassland or derived native grassland. Initial observation of the photos suggests that there was a much greater extent of woody (trees or shrub) vegetation on the site in 1967, which could suggest that the present grassland is a derived native grassland. Nine plots undertaken for the BAM report indicated the high condition of the grassland comprising largely native perennial forbs and grasses. Both EPS, who undertook the biodiversity assessment and OEH regard the selection of PCT 45 Plains Grass Grassland as

appropriate. The extent of the community is approximately 824.8 ha within the development area. Of this area 781.64 ha was in moderate condition and 43.53 in poor condition.

Vegetation community types, threatened flora found on site during biodiversity surveys, conducted in preparation of the BAR are shown Figure 2-1.

Plant community species lists are provided in Appendix 2 of the BAR V07.

2.1.2 Fauna impacts

Two threatened fauna species were recorded during field survey including:

- Superb Parrot (listed as vulnerable under the EPBC Act and BC Act).
- Grey-crowned Babbler (listed as vulnerable under the BC Act).

GREY-CROWNED BABBLER

The Grey-crowned Babbler was recorded within the project area in 23 locations with four nest sites within Woodland habitats (Figure 5-3). The majority of Grey-crowned Babbler habitat will be retained, however 8.30 ha of forage, breeding and shading habitat for this species will be cleared. Offsetting for this habitat will be sufficiently covered under PCT 16 and PCT 75 offsets with no additional species credit offsets required under the Offsets Policy.

SUPERB PARROT

The project would impact 3.33 ha of Superb Parrot woodland habitat and the proponent is required to retire 60 species credits for the Superb Parrot. Department of Environment and Energy (DoEE) is satisfied this is not materially detrimental to Matters of National Environmental Significance.

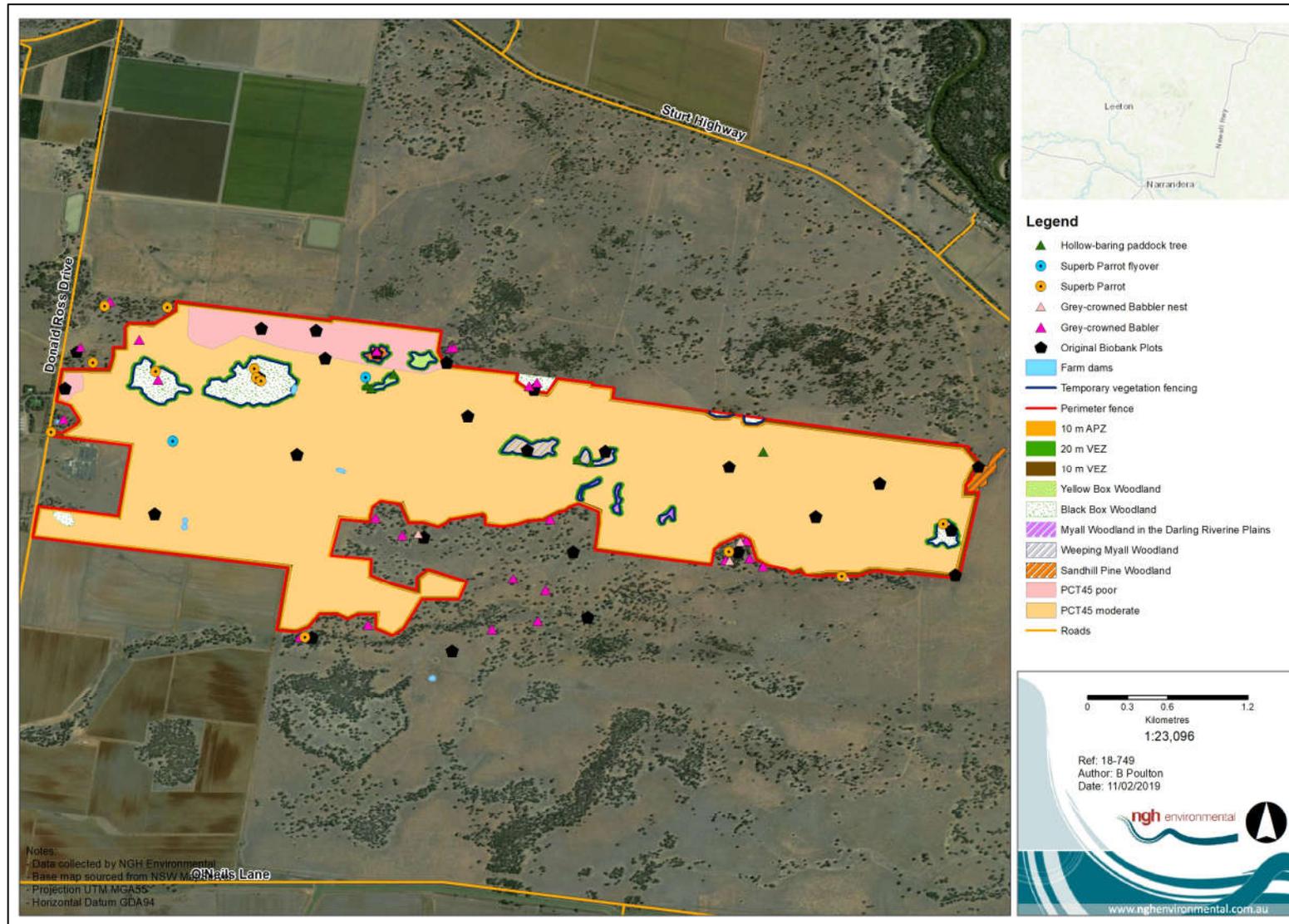


Figure 2-1 Darlington Point Solar Farm biodiversity values

3 ENVIRONMENTAL REQUIREMENTS

3.1 RELEVANT LEGISLATION AND GUIDELINES

3.1.1 Legislation

Legislation relevant to biodiversity management includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act).
- *National Parks and Wildlife Act 1974* (NPW Act).
- *Biodiversity Conservation Act 2016* (BC Act).
- *Protection of the Environment Operations Act 1997* (POEO Act).
- *Fisheries Management Act 1994* (FM Act).
- *Local Land Services Act 2013*.
- *Biosecurity Act 2015*.
- *Pesticides Act 1999*.
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in section 5 of the EMS.

3.1.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this bmp include:

- 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.
- Relevant recovery plans, priority action statements and best practice guidelines.
- DECCW. 2008. Hygiene protocol for the control of disease in frogs.
- Australian Standard AS 4373 Pruning of Amenity Trees.
- Australian Standard 4970 – 2009 Protection of Trees.

3.1.3 Conditions of consent

Condition 12 of the Development Consent requires the development of a BMP to detail how construction and operation impacts on biodiversity will be minimised and managed. Specific conditions relating to biodiversity which detail specific requirements for mitigation and management measures are detailed in Table 3-1 and Table 3-2.

Schedule 3 – Environmental Conditions – General

Table 3-1 Location of information in this BMP addressing the requirements of Conditions of Consent (Schedule 3)

Condition of Approval	Condition requirement	Location
Land Management		
Schedule 3 CoC 8	Following any construction or upgrading on the site, the Proponent must: (a) Restore the ground cover of the site as soon as practicable;	Section 7

Condition of Approval	Condition requirement	Location				
	(b) Maintain the ground cover with appropriate perennial species; and (c) Manage weeds within this groundcover,	Section 7.2				
Biodiversity						
Schedule 3 CoC 9	Within two years of commencing construction under this consent, unless the Secretary agrees otherwise, the Proponent must retire biodiversity credits of a number and class specified in Column (a) in Table 1 below, to the satisfaction of OEH.				Section 7.2	
	Biodiversity credit requirement					
	Vegetation Community	PCT ID	Column (a): minimum credits required	Column (b): maximum credits required		
	Black Box grassy open woodland wetland of rarely flooded depressions in south western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	PCT 16	294	294		
	Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	PCT 45	3,435	6,973		
	Yellow Box - White Cypress Pine grassy woodland on deep sandy-loam alluvial soils of the eastern Riverina Bioregion and western NSW South Western Slopes Bioregion	PCT 75	7	7		
Species	Species ID	Credits Required	Credits Required			
Superb Parrot (<i>Polytelis swainsonii</i>)	10645	60	60			
Schedule 3 CoC 10	The retirement of credits must be carried out in accordance with the NSW Biodiversity Offsets Policy for Major Projects and can be achieved by: (a) acquiring or retiring 'biodiversity credits' within the meaning of the <i>Biodiversity Conservation Act 2016</i> ; (b) making payments into an offset fund that has been developed by the NSW Government; or (c) providing supplementary measures.				Section 7.2	
Schedule 3 CoC 11	In the period between 2 years and 3 years from the commencement of operations, unless the Secretary agrees otherwise, the Proponent must commission an independent review of the impacts of the development on PCT45 and submit a subsequent report to the Secretary. This review and report must be undertaken by a suitably qualified, experienced and independent grasslands expert endorsed by the Secretary. The expert must: (a) consult with OEH and the Proponent; (b) compare the actual impacts on PCT45 against that predicted in the EIS;				Section 7.2	

Condition of Approval	Condition requirement	Location										
	<p>(c) if the review concludes that the impacts on PCT45 are greater than that predicted in the EIS, calculate any additional biodiversity offset credit liabilities for the development over and above that specified in Column (a) of Table 1 above, in accordance with the NSW Biodiversity Offsets Policy for Major Projects,</p> <p>(d) document the findings in its report.</p> <p>If the Secretary determines, after reviewing the expert’s report, that the Proponent must retire additional biodiversity credits for PCT45, the Proponent must retire the additional credits within 12 months of the Secretary’s determination, up to an aggregate maximum of that specified in Column (b) of Table 1 above.</p>											
Schedule 3 CoC 12	See section 4											
Hazards												
Schedule 3 CoC 23	<p>The Proponent must:</p> <p>(a) minimise the fire risks of the development;</p> <p>(b) ensure that the development:</p> <ul style="list-style-type: none"> • includes at least 10 m defendable spare around the perimeter of the solar array area that permits unobstructed vehicle access; • manages the defendable space and solar array area as an Asset Protection Zone; • complies with the relevant asset protection requirements in the RFS’s Planning for Bushfire Protection 2006 (or equivalent) and Standards for Asset Protection Zones; • is suitably equipped to respond to any fires onsite including provision of a 20,000L water supply tank fitted with a 65 mm Storz fitting located adjacent to the internal access road; <p>(c) assist the RFS and emergency services as much as practicable if there is a fire in the vicinity of the site; and</p> <p>(d) notify the relevant local emergency management committee following construction of the development, and prior to the commencement of operations.</p>	Section 7										
Decommissioning and Rehabilitation												
Schedule 3 CoC 29	<p>Within 18 months of the cessation of operations, unless the Secretary agrees otherwise, the Proponent must rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must comply with the objectives in Table 2.</p> <p>Rehabilitation objectives</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Feature</th> <th>Objective</th> </tr> </thead> <tbody> <tr> <td>Project site</td> <td> <ul style="list-style-type: none"> • Safe, stable and non-polluting. • Minimise the visual impact of any above ground ancillary infrastructure agreed to be retained for an alternative use. </td> </tr> <tr> <td>Solar farm infrastructure</td> <td> <ul style="list-style-type: none"> • To be decommissioned and removed, unless the Secretary agrees otherwise. </td> </tr> <tr> <td>Land use</td> <td> <ul style="list-style-type: none"> • Restore land capability to pre-existing use. </td> </tr> <tr> <td>Community</td> <td> <ul style="list-style-type: none"> • Ensure public safety. </td> </tr> </tbody> </table>	Feature	Objective	Project site	<ul style="list-style-type: none"> • Safe, stable and non-polluting. • Minimise the visual impact of any above ground ancillary infrastructure agreed to be retained for an alternative use. 	Solar farm infrastructure	<ul style="list-style-type: none"> • To be decommissioned and removed, unless the Secretary agrees otherwise. 	Land use	<ul style="list-style-type: none"> • Restore land capability to pre-existing use. 	Community	<ul style="list-style-type: none"> • Ensure public safety. 	Section 11
Feature	Objective											
Project site	<ul style="list-style-type: none"> • Safe, stable and non-polluting. • Minimise the visual impact of any above ground ancillary infrastructure agreed to be retained for an alternative use. 											
Solar farm infrastructure	<ul style="list-style-type: none"> • To be decommissioned and removed, unless the Secretary agrees otherwise. 											
Land use	<ul style="list-style-type: none"> • Restore land capability to pre-existing use. 											
Community	<ul style="list-style-type: none"> • Ensure public safety. 											

Schedule 4 – Environmental Management and Reporting

Table 3-2 Location of information in this BMP addressing the requirements of Conditions of Consent (Schedule 4)

Condition of Approval	Condition requirement	Location
Environmental Management		
Schedule 4 CoC 1	<p>Prior to the commencement of construction, the Proponent must prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:</p> <p>(a) provide the strategic framework for environmental management of the development;</p> <p>(b) identify the statutory approvals that apply to the development;</p> <p>(c) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;</p> <p>(d) describe the procedures that would be implemented to:</p> <ul style="list-style-type: none"> • keep the local community and relevant agencies informed about the operation and environmental performance of the development; • receive, handle, respond to, and record complaints; • resolve any disputes that may arise; • respond to any non-compliance; • respond to emergencies; and <p>(e) include:</p> <ul style="list-style-type: none"> • references to any plans approved under the conditions of this consent; and • a clear plan depicting all the monitoring to be carried out in relation to the development. <p>Following the Secretary's approval, the Proponent must implement the Environmental Management Strategy.</p>	Section 1.1
Schedule 4 CoC 2	<p>The Proponent must:</p> <p>(a) update the strategies, plans or programs required under this consent to the satisfaction of the Secretary prior to carrying out any upgrading or decommissioning activities on site; and</p> <p>(b) review and, if necessary, revise the strategies, plans or programs required under this consent to the satisfaction of the Secretary within 1 month of the:</p> <ul style="list-style-type: none"> • submission of an incident report under condition 4 of Schedule 4; • submission of an audit report under condition 6 of Schedule 4; or • any modification to the conditions of this consent. 	Section 10
Schedule 4 CoC 3	<p>With the approval of the Secretary, the Proponent may submit any strategy, plan or program required by this consent on a progressive basis.</p> <p>To ensure the strategies, plans or programs under the conditions of this consent are updated on a regular basis, the Proponent may at any time submit revised strategies, plans or programs to the Secretary for approval.</p> <p>With the agreement of the Secretary, the Proponent may prepare any revised strategy, plan or program without undertaking consultation with all parties referred to under the relevant condition of this consent.</p> <p>Notes:</p> <ul style="list-style-type: none"> • <i>While any strategy, plan or program may be submitted on a progressive basis, the Proponent must ensure that all development being carried out on site is covered by suitable strategies, plans or programs at all times.</i> • <i>If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.</i> 	Section 8, section 1

Condition of Approval	Condition requirement	Location
Compliance		
Schedule 4 CoC 4	The Department must be notified in writing to compliance@planning.nsw.gov.au immediately after the Proponent becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one) and set out the location and nature of the incident.	Section 8
Schedule 4 CoC 5	The Department must be notified in writing to compliance@planning.nsw.gov.au within 7 days after the Proponent becomes aware of any non-compliance with the conditions of the development consent. The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the noncompliance (if known) and what actions have been done, or will be, undertaken to address the noncompliance.	Section 8.5
Schedule 4 CoC 6	The Proponent must provide regular compliance reporting to the Department on the development in accordance with the relevant Compliance Reporting requirements (DPE 2018).	Section 8.5
Independent Environmental Audit		
Schedule 4 CoC 7	<p>Within 6 months of the commencement of construction, or as directed by the Secretary, the Proponent must commission and pay the full cost of an Independent Environmental Audit of the development. The audit must:</p> <ul style="list-style-type: none"> (a) be prepared in accordance with the relevant Independent Audit Post Approval requirements (DPE 2018); (b) be led and conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary; (c) be carried out in consultation with the relevant agencies; (d) assess whether the development complies with the relevant requirements in this consent, and any strategy, plan or program required under this consent; and (e) recommend appropriate measures or actions to improve the environmental performance of the development and any strategy, plan or program required under this consent. <p>Within 3 months of commencing an Independent Environmental Audit, or unless otherwise agreed by the Secretary, a copy of the audit report must be submitted to the Secretary, and any other NSW agency that requests it, together with a response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations.</p> <p>The recommendations of the Independent Environmental Audit must be implemented to the satisfaction of the Secretary.</p>	Section 8.4
Access to Information		
Schedule 4 CoC 8	<p>The Proponent must:</p> <p>(a) make the following information publicly available on its website as relevant to the stage of the development:</p> <ul style="list-style-type: none"> • the EIS; • the final layout plans for the development; • current statutory approvals for the development; • approved strategies, plans or programs required under the conditions of this consent; • the proposed staging plans for the development if the construction, operation or decommissioning of the development is to be staged; • how complaints about the development can be made; • a complaints register; • compliance reports; • any independent environmental audit, and the Proponent's response to 	Section 8.5

Condition of Approval	Condition requirement	Location
	the recommendations in any audit; and <ul style="list-style-type: none">any other matter required by the Secretary; and (b) keep this information up to date.	

4 COMMITMENTS

Commitments to protect biodiversity over the life of the project have arisen in the EIS (including the BAR) and the RTS. The commitments listed in Table 5-1 do not include and are in addition to the CoCs addressed in section 3.1.3.

Table 4-1 Commitments of the proponent and project contractors

Commitment reference	Commitment requirement	Location in the BMP
General		
Agency submissions	Targeted flora surveys are carried out to search for possible threatened species during appropriate survey periods.	BAR (COMPLETED)
Agency submissions	Firebreaks are to be within an already cleared or disturbed area, to avoid the clearing of vegetation.	Section 6
Agency submissions	A 10 m VEZ is to be around perimeter woodland to minimise edge effects from construction and operation. A 20 m VEZ will be established around internal woodland vegetation. Please Note: - The internal VEZ of 20 m throughout the project footprint except in the approximate linear length of 920m where an electrical cable, road or both transverse through the exclusion zone as per Appendix C below. In the remainder of the footprint the exclusion zone would remain at 20m	Section 67
Agency submissions	Address species diversity within panel area construction as regrowth and native species groundcover does not guarantee that diversity has been maintained.	Section 10.4, Appendix C
Agency submissions	Clearly identify the direct and indirect impacts of the proposal	Figures 1-1 to 1-5 and Figure 2-1
BAR (Appendix 9)	The primary management tools to achieve the aims of the management strategy will focus on grazing and mowing that will reduce potential fuel load but that they will occur at times that are advantageous to the native perennials while inhibiting the exotic annuals.	Section 7, Section 10.5.2
BAR (Appendix 9)	During winter graze sheep/mow. Primarily this will reduce the level of dry matter from annual growing species for summer fire hazard. The annuals will tend to have a greater palatability/digestibility than the natives at this stage and be preferentially grazed.	Section 7
BAR (Appendix 9)	Remove sheep/mow mid-August. This will allow annual grass seed heads to emerge evenly.	Section 7
BAR (Appendix 9)	Mow to 5-10 cm mid-September/October when annual grasses flowering. This will prevent seed set of exotic annual species enhancing native abundance as well as reducing combustible load.	Section 6
BAR (Appendix 9)	Destock/low stocking rate over summer. Enhance seed set of perennial native species.	Section 6
BAR (Appendix 9)	Only mow/graze during fire season if grassland growth will result in average dry matter exceeding 5000 kg/ha dry matter. This value was taken from the Murrumbidgee Irrigation Area Bush Fire Management Committee in regards to APZ fuel load in forested areas, in the absence of a defined fuel load for grassland in the RFS guidelines.	Section 6
BAR (Appendix 9)	Bathurst Burr and Silver leaf nightshade have been identified on the site and will require monitoring in the future. Integrated Weed Strategies would need to be implemented for these weeds. If broad acre spraying was	Section 10.5.2

Commitment reference	Commitment requirement	Location in the BMP
	required i.e. infestations were large, most suitable herbicides would impact native broadleaf plants in the grasslands.	
EIS Section 7	Retention of the majority of the woodland and open forest vegetation, identified as Vegetation and Heritage Protection Exclusion Zones	EIS (COMPLETED), Section 57
EIS Section 7	Retention of the threatened communities listed as endangered under the EPBC Act and/or the BC Act recorded within the project area.	EIS (COMPLETED), Section 5
EIS Section 7	Retention of the majority of structurally diverse flora and fauna habitat.	EIS (COMPLETED), Section 5
EIS Section 7	The primary management tools to achieve the aims of the management strategy will focus on grazing and mowing that will reduce potential fuel load. This will occur at times that are advantageous to the native perennials while inhibiting the exotic annuals.	Section 6
EIS Section 7	Retain grassland in the under-panel area and the between-panel areas	Section 7.1
EIS Section 7	Prepare a Pest and Weed Management Plan to manage the occurrence of invasive weeds and pest species across the site during construction and operation. The plans must be prepared in accordance with Murrumbidgee Council and NSW DPI requirements.	Section 10.4
EIS Section 7	Integrate weed and pest management with adjoining landholders.	Section 10.47.2
EIS Section 7	The Weed and Pest Management Plan shall include restricting vehicle and machinery movements to formed access tracks and implementing wash-down procedures for vehicles entering and exiting the site, as appropriate.	Section 10.6
EIS Section 7	A Bushfire Management Plan will be prepared for the project to be implemented during construction, operation and decommissioning.	Section 10.7
EIS Section 8	A vegetation and land management plan will be developed for the site and will include considerations to address soil erosion.	Section 10.8
Construction Phase		
EIS Section 2	Clearing and grading of perimeter access roads (within the 10 m firebreak areas) will occur, along with the establishment of internal access roads.	Figures 1-1 to 1-5
EIS Section 2	Construction areas impacted by site access, laydown area, firebreak and access roads are accounted for within the direct impact assessment at 100% impact for biodiversity calculations.	Figures 1-1 to 1-5
EIS Section 2	DC cable trenches run along the edge of the internal roads, within the cleared road corridor	Figures 1-1 to 1-5
EIS Section 2	The larger AC cabling from the inverter stations to the 33 kV switchroom is laid via a cable laying machine, which trenches and lays cable simultaneously. All cabling runs within the cleared road corridors.	Figures 1-1 to 1-5
EIS Section 2	Commissioning activities will be carried out by light vehicle only using the internal access tracks, with some foot traffic only, between the arrays.	Section 7.1
EIS Section 7	Complete removal of vegetation will be restricted to solar array pole locations and cable trenching.	Section 1.4
EIS Section 7	Stockpiling of construction materials to be limited to direct impact zones on-site.	Section 6
EIS Section 7	A suitably qualified ecologist is to conduct pre-clearing surveys before removal of any native vegetation to remove any fauna and mark up hollow bearing trees to be removed. All trees proposed to be removed should be re-checked for hollows prior to clearing.	Section 10.2

Commitment reference	Commitment requirement	Location in the BMP
EIS Section 7	A suitably qualified ecologist will be required to be present during hollow-bearing tree removal to relocate any displaced fauna.	Section 10.2
EIS Section 7	Where possible, dead wood, hollow trunks and tree limbs should be relocated to woodland areas not to be cleared.	Section 10.2
EIS Section 7	Engage site workers to provide an environmental induction prior to commencement of on-site works. This induction will encompass ecologically important matters on site and the procedures to protect flora and fauna.	Section 8.2
EIS Section 7	Vegetation and Heritage Protection Exclusion Zones and trees identified to be retained should be clearly marked (e.g. fencing) to ameliorate unnecessary impacts to vegetation.	Section 10.2
EIS Section 7	Re-establishment of stabilised surfaces as soon as possible following construction.	Section 10.8
Operational Phase		
EIS Section 2	Management of vegetation in accordance with the fire management and biodiversity management plans (e.g. slashing or similar).	Section 6
EIS Section 2	A maintenance program to address any bare areas that develop, by seeding or armouring (e.g. jute mesh) to avoid erosion	Section 10.8
EIS Section 2	During operations, there will be negligible traffic between the solar panels.	Section 10.6
EIS Section 2	Periodic light vehicle access along the site perimeter and along internal access roads (but not between panels) would be undertaken by maintenance workers to check for general integrity and security at the site.	Section 7.2
EIS Section 2	Should any further investigations be required, they would be done on foot, as the technicians need to multi-meter each panel and check each cable connection.	Section 7.2
EIS Section 2	Two light vehicle movements between each row per year would be undertaken for panel washing as needed.	Section 7.2
EIS Section 7	During the operational phase of the site, a management strategy will need to be implemented. The primary aims of this strategy would be: <ul style="list-style-type: none"> • To enhance native species within the pastures (diversity and abundance) • Provide sufficient structure within native grasses for habitat Reduce fuel load during the fire danger season.	Section 6
EIS Section 7	Fire breaks (maintained short grass <100 mm year-round)	Figure 1-1 to 1-5
EIS Section 7	'Lake Effect' – monitor site for bird injury or mortality, with a search for carcasses under and around areas with solar panels.	Section 8.37.2
EIS Section 7	If the mitigation measures outlined in Section 10 of (of the EIS) are implemented, then the impact of the project is unlikely to increase the spread of weeds recorded in the project area. It is in fact likely to reduce the presence of weeds within the project area.	Section 10.5.2
EIS Section 7	During the operational phase, the management of PCT 45 regime will integrate meeting biodiversity targets for the grassland and land management strategies to manage fire risk.	Section 6

5 ENVIRONMENTAL ASPECTS AND IMPACTS

The majority of the development footprint (699 ha) is covered by native grassland. The potential impacts of the project on this vegetation community would be both direct and indirect. The direct impacts (approximately 40 ha) include access roads, inverter stations and other buildings, parking and solar panel piles. The indirect impacts (approximately 660 ha) include areas under panels, between panel rows and areas not being used, which would experience difference levels of shading, rainfall and temperature.

During the project’s planning phase, it became evident that there were some complex issues associated with the potential impacts upon native grassland as a result of installation of the solar panels and operation of the solar farm. Potential indirect impacts on native grassland include but are not limited to:

- Existing use of the native grassland over many decades for stock grazing and the impacts such grazing and other existing agricultural use of the native grassland might already behaving upon grassland integrity and growth.
- What impact installation of the solar panels and associated aspects might have on the native grassland and use of the grassland habitat by fauna.
- Might there be negative, neutral or positive impacts to the native grassland as a result of the solar panel installation.
- What impacts factors such as shading from the solar panels might have on the native grassland.
- Opportunities to work with the ecology and natural seasons of the native grassland to avoid or minimise negative impacts while still being able to construct and operate the solar farm.

Key aspects of the Project that could result in impacts to biodiversity have been described in Table 5-1.

Table 5-1 Potential biodiversity impacts as a result of the project.

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	<ul style="list-style-type: none"> • Direct loss of native flora and fauna habitat including: 58 ha of grassland habitat, 8.3 ha of woodland habitat and 1.92 ha of aquatic habitat. • 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.
Fire Break (10 m) creation and maintenance	Regular	Moderate	Construction and operations	<ul style="list-style-type: none"> • Alteration to grassland habitat and clearing of some woodland. • Impact on ground dwelling fauna.
Vehicle movements	Regular	Moderate to high	Construction and operations	<ul style="list-style-type: none"> • Patches of bare ground created by repeated tyre movements.
Indirect				

Impact	Frequency	Intensity	Duration	Consequence
Edge and barrier effects	Regular	Moderate	Operations	<ul style="list-style-type: none"> Colonisation by weeds, non-native plants and pest animals.
Management of grassland biomass by mowing	Regular	High	Operations	<ul style="list-style-type: none"> Potential degradation of native grassland by increased biomass reducing native species germination.
Management of grassland biomass by grazing	Regular	High	Operations	<ul style="list-style-type: none"> Potential degradation of native grassland by producing nutrient-rich patches from sheep waste under shaded panels. Nutrient enrichment may favour exotic annuals over natives.
Shading by solar panels	Regular	Moderate	Operations	<ul style="list-style-type: none"> Changes in soil moisture. Changes in species abundance by benefitting certain species over others (likely positive).
Accidental spills and contamination from construction activities (including compound sites)	Rare	Moderate	Construction	<ul style="list-style-type: none"> Pollution of waterways.
Earthworks	Regular	Moderate	Construction	<ul style="list-style-type: none"> Erosion and sedimentation of waterways.
Noise	Regular	Low	Construction	<ul style="list-style-type: none"> Construction machinery and activities may disturb local fauna.
Dust generation	Regular	Low	Construction	<ul style="list-style-type: none"> Inhibit the function of plant species and communities, waterways.
Light spills during night works	Rare	Low	Construction	<ul style="list-style-type: none"> Night works may alter fauna activities/movements.
Increased vehicle traffic	Regular	Low	Construction	<ul style="list-style-type: none"> Increase potential for fauna mortality through vehicle strike.
General construction activities	Regular	Moderate	Construction	<ul style="list-style-type: none"> Feral pest, weed and/or pathogen encroachment.
Vehicle movements	Regular	Moderate	Construction and operations	<ul style="list-style-type: none"> Weeds spread to moderate condition PCT 45 grassland.
Fencing	Regular	Low	Construction and operations	<ul style="list-style-type: none"> Fauna fatalities.

6 BIODIVERSITY MITIGATION AND MANAGEMENT MEASURES

A range of mitigation requirements and control measures are identified in the EIS, the RTS and CoC. Specific measures and requirements to address impacts to biodiversity are outlined in Table 6-1. The measures have been listed to cover broad activities and as such there may be some repetition of mitigation measures.

Table 6-1 Biodiversity management and mitigation measures

Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
GENERAL				
Training will be provided to all personnel involved in construction and management phases of the Project, including relevant sub-contractors on landscaping impact control practices and procedures to implement recommendations relating to biodiversity through inductions, toolboxes and targeted training.	Site Induction Toolbox talks Training materials	Pre-construction Construction	HSE Manager	EIS This BMP
Develop and implement a Traffic Management Plan (TMP) for incorporation of traffic related environmental management safeguards. A traffic movement control protocol including restricting access by incoming vehicles, vehicle hygiene, recording all vehicle movements, recordkeeping and corrective actions should be included in the TMP. The process for managing vehicle hygiene is provided in section 10.6 of this BMP.	Traffic Management Procedure EIS	Pre-construction	Project Manager	EIS This BMP
Develop and implement a Weed and Pest Management Plan. Details of appropriate eradication methods, appropriate disposal of weeds and protocol for collaboration with adjoining landholders are detailed in section 10.4 of this BMP.	Pest and Weed Management Protocol Specialist advice from contracted ecologist	Pre-construction	HSE Manager	EIS This BMP
Develop and implement a Bushfire Management Plan that includes a protocol for managing the perimeter fire exclusion zone (See section 10.7 of this BMP).	This BMP Planning for Bushfire Protection 2006 (RFS 2006) Standards for Asset Protection	Pre-construction	HSE Manager	Schedule 3 CoC 23

Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
	Zones (RFS undated)			
Develop and implement a Vegetation and Land Management Plan (VLMP) that includes protocols for resolving landform and compaction issues, topsoil segregation and replacement. The VLMP should also provide completion criteria targets for temporary direct impact areas (e.g. underground cable trenches). Relevant VLMP protocols are provided in section 10.8 of this BMP.	Pre-construction soil survey including chemical testing	Pre-construction	HSE Manager	EIS This BMP
Develop and implement a Waste Management Plan (WMP) containing protocols for storage and reuse of topsoil, routine checks for litter and rubbish along access tracks and roads and responsible disposal of rubbish.	EIS Council services	Pre-construction	Logistics Manager	EIS This BMP
Prior to the commencement of construction, the Applicant must prepare a Biodiversity Management Plan for the development in consultation with OEH, and to the satisfaction of the Secretary. This BMP must: (a) include a description of the measures that would be implemented for: <ul style="list-style-type: none"> minimising the amount of native vegetation clearing within the approved development footprint; minimising the loss of key fauna habitat; managing potential indirect impacts on threatened and migratory species, including: <ul style="list-style-type: none"> - flora species, including Weeping Myall Woodland and Sandhill Pine Woodland; and - fauna species, including Grey-crowned Babbler and Superb Parrot; rehabilitating and revegetating temporary disturbance areas; protecting native vegetation and key fauna habitat outside the approved disturbance areas; maximising the salvage of vegetative and soil resources within the approved disturbance area for beneficial reuse in the enhancement or the rehabilitation of the site; and controlling weeds and feral pests; 	This BMP (COMPLETED) EIS (including BAR Appendix C) RTS CoCs Detailed infrastructure design DPSF Organisational Charts SWMP ESCP VLMP TMP Bushfire Management Plan	Pre-construction	HSE Manager	CoC 12

Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
<ul style="list-style-type: none"> protecting and promoting the growth of native plant species (including PCT45) and controlling the growth of exotic ground cover; <p>(b) include a seasonally-based program to monitor and report on the effectiveness of these measures against the detailed performance and completion criteria; and</p> <p>(c) include details of who would be responsible for monitoring, reviewing and implementing the plan, and timeframes for completion of actions.</p> <p>Following the Secretary’s approval, the Applicant must implement the Biodiversity Management Plan.</p> <p>Note: If the biodiversity credits are retired via a Biodiversity Stewardship Agreement, then the Biodiversity Management Plan does not need to include any of the matters that are covered under the Biodiversity Stewardship Agreement.</p>	<p>Coarse woody debris (CWD) reuse protocol</p> <p>Pest and Weed Control Protocol</p> <p>Ground Disturbance Protocol</p> <p>Inspection and monitoring forms.</p> <p>Grassland Monitoring program</p>			
<p>Prior to construction, surveys must be conducted for <i>Falco hypoleucos</i>, <i>Polytelis swainsonii</i>, <i>Leptorhynchos orientalis</i>, <i>Brachyscome papillosa</i> and <i>Lepidium monoplacoides</i> to determine presence or absence on the site. If a species credit is required for any of these species, then this must be incorporated into the final credit profile and offset strategy before construction commences.</p>	COMPLETED	Pre-construction	N/A	BAR
Protection of native vegetation and fauna habitat to be retained				
<p>Where trees are to be retained, an adequate VEZ will be provided around each tree for the duration of construction. Details for calculating VEZs are provided within Australian Standard 4970-2009</p>	<p>Exclusion materials (temporary fencing/tape)</p> <p>Vegetation Clearing Procedure</p>	<p>Pre-construction</p> <p>Construction</p>	HSE Manager	EIS
<p>Stockpiling and storage of materials and machinery will be avoided within the dripline (extent of foliage cover) of any native tree.</p>	<p>This BMP Mapped VEZs</p>	Construction	<p>HSE Manager</p> <p>Lead Civil Superintendent</p>	EIS

Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
	Vegetation Clearing Procedure		All plant operators	
Any fallen timber, dead wood and bush rock (if present) encountered on site will be left in situ or relocated to a suitable place nearby. Rocks will be removed with suitable machinery so as not to damage the underlying rock or result in excessive soil disturbance.	Vegetation Clearing Protocol Mapped VEZs	Construction	HSE Manager	EIS
Native vegetation areas to be retained will be delineated and construction activities will be excluded from these areas. Clearing and construction contractors will be given inductions that make clear the importance of these areas and component species.	Mapped VEZs Induction/training materials	Pre-construction Construction	HSE Manager	EIS
No plantings will occur within VEZs.	This BMP Mapped VEZs	Construction Operation	HSE Manager Lead Field Technician	OEH Consultation (Appendix A)
Native grassland will be managed through mowing and/or grazing following CSU recommendations: <ul style="list-style-type: none"> During winter graze sheep/mow. Primarily this will reduce the level of dry matter from annual growing species for summer fire hazard. The annuals will tend to have a greater palatability/digestibility than the natives at this stage and be preferentially grazed. Remove sheep/mow mid-August. This will allow annual grass seed heads to emerge evenly. Mow to 5-10 cm mid-September/October when annual grasses flowering. This will prevent seed set of exotic annual species enhancing native abundance as well as reducing combustible load. Destock/low stocking rate over summer. Enhance seed set of perennial native species. Only mow/graze during fire season if grassland growth will result in average dry matter exceeding 5000 kg/ha DM. This value was taken from the 	This BMP Biomass assessment (each October) Lease agreement with livestock owner(s) Grassland monitoring results (after first year)	Operation	HSE Manager	BAR Appendix 9 Grassland Monitoring Program (Appendix G)

Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
Murrumbidgee Irrigation Area Bush Fire Management Committee in regards to APZ fuel load in forested areas, in the absence of a defined fuel load for grassland in the RFS guidelines.				
Awareness training during site inductions regarding enforcing site speed limits.	Toolbox talks Induction materials	Pre-construction Construction	HSE Manager	EIS
Plain wire is to be used on internal fencing where practicable and where it meets safety and security requirements of the solar farm.	Infrastructure design plans This BMP	Pre- construction	Project Manager Lead Civil Superintendent	EIS
Vegetation clearing protocols				
A Vegetation Clearing Procedure will be developed as required to: <ul style="list-style-type: none"> • Include best practice methods for the removal of woody vegetation and non-woody vegetation. • Trees will be removed in such a way as not to cause damage to surrounding vegetation. The root system areas will be rehabilitated by filling these areas with spoil from close by road construction. This spoil will have similar soil and grass composition and only come from within the solar farm to promote germination of similar grass species. • A suitably qualified ecologist/expert to ensure that this process promotes the rehabilitation of these areas. • Require that where work cannot avoid encroaching into the TPZ, it does not impinge on the structural root zones (SRZ) of trees to be retained. • Details for calculating the SRZs are provided within <i>Australian Standard 4970-2009 – Protection of trees on development sites</i>. • All trees to be removed should be disposed of in accordance with the CDW procedure or WMP. • Vegetation clearing protocol includes staged habitat removal, and a 	Vegetation Clearing Procedure <i>Australian Standard 4970-2009 – Protection of trees on development sites</i>	Pre- construction	Project Manager	Agency submissions OEH consultation (Appendix A)

Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
requirement for an ecologist to be present during the felling of all hollow-bearing trees to ensure that potential impacts on fauna are minimized.				
A pre-clearing process will be implemented before clearing begins. Pre-clearing surveys will be carried out by an ecologist and will include general fauna surveys, general tree hollow inspections and dam/waterway inspections. Habitat trees will be clearly marked with flagging tape.	Qualified Ecologist Marking tape/spray Vegetation clearing procedure	Pre-construction Construction	HSE Manager	Agency submissions
Prior to the commencement of work, a physical boundary of the approved clearing limit is to be clearly delineated and implemented. The delineation of such a boundary may include the use of temporary fencing, flagging tape, parawebbing or similar.	Mapped VEZs Temporary fencing, flagging tape	Pre-construction Construction	HSE Manager	OEH consultation (Appendix A)
Trees with hollows should not be removed between 1 September and 1 January, in order to mitigate direct impacts to threatened fauna during the breeding season. Clearing of Hollow Bearing Trees will be avoided where possible. (This time period has been updated to align with the CoC).	Vegetation clearing protocol	Pre-construction Construction	Project Manager HSE Manager	Agency submissions
Clearing and construction contractors would be given inductions that make clear the importance of the VEZs and their component species.	Mapped VEZs Training materials	Pre-construction Construction	HSE Manager	EIS
The vegetation clearing protocol (section 10.2) will be followed for all vegetation clearing.	Vegetation clearing procedure	Construction	HSE Manager	Agency submissions
An Unexpected threatened species finds procedure (section 10.3) will be followed where any unexpected fauna is encountered	Qualified ecologist This BMP	Pre-construction Construction	HSE Manager	EIS
Minimise construction impact extent				

Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
Construction activities and storage of materials for boundary fencing should be wholly contained within the proposal area. Disturbance to road reserves other than access points identified in the EIS must not occur.	This BMP Mapped project footprint and approved infrastructure locations Ground disturbance permit procedure	Pre-construction Construction	HSE Manager Lead Civil Superintendent	EIS
Minimise clearing and avoid unnecessary disturbance associated with the construction and operation of the project.	This BMP Mapped project footprint and approved infrastructure locations Ground disturbance permit procedure	Construction	HSE Manager Lead Civil Superintendent	OEH consultation (Appendix A)

7 SPECIFIC WORKS AND KEY ACTIONS REQUIRED

7.1 CONSTRUCTION ACTIVITIES

This construction methodology is indicative of the staging that will be implemented at the project site. Some activities may occur in parallel, particularly given the size of the project site. The following methodology is indicative of construction sequencing and vehicle movements.

There are a lot of vehicle movements involved in the construction of the solar farm. Most of these movements terminate at the site entrance/laydown area shown in Figure 1-1 to Figure 1-5.

The majority of vehicular traffic onsite is by light vehicle (e.g. ute) and restricted to internal access tracks only. The notable exceptions are during piling, tracker install, trenching and panel installation. Tracked piling rigs and wheeled forklifts will traverse the grasslands along and across each row. However, this is limited to only a handful of movements (pile delivery, piling, tracker install and panel fitting). Repetitive vehicle movements will be avoided to reduce soil impacts and time wastage. Tracked mini-piling machines will be used.

The schedule of work in Table 7-1 guides the key actions required for management of biodiversity for the project.

Table 7-1 Schedule of construction works

Project Phase	Potential disturbance	Key actions and mitigation	Performance Target
Construction site set up, construction of access.	<ul style="list-style-type: none"> Disturbance to native groundcover from vehicle movements. Disturbance and removal of fauna habitat including woody debris. Spread of weeds, particularly high threat exotic plants. 	<ul style="list-style-type: none"> Clearly delineate the approved clearing and disturbance footprint using temporary fencing, flagging tape, parawebbing or similar. Machinery, trucks and equipment will be restricted to designated parking areas. Disturbance to road reserves other than access points identified in the EIS must not occur. Wash and inspect plant and vehicles as per Traffic Management Procedure. Implement ground disturbance permit procedure prior to any clearing activity. Pre-clearing surveys will be carried out by an ecologist and will include general fauna surveys, general tree hollow inspections and dam/waterway inspections. Habitat trees will be clearly marked with flagging tape. Trees with hollows will not be removed between 1 September and 1 January, in order to mitigate direct impacts to threatened fauna during the breeding season. Implement Vegetation Clearing Protocol for vegetation removal. Place CWD in remaining vegetated areas where practicable. Record clearing and ground disturbance via spatial mapping. Install and maintain erosion and sediment (ERSD) controls. 	<ul style="list-style-type: none"> No native vegetation other than the approved 8.14 ha of Black Box grassy open woodland, 0.16 ha Yellow Box – White Cypress Pine grassy woodland will be disturbed. Direct impacts to native grassland must not exceed 21.06 ha identified in the EIS. No mortality of native fauna during vegetation removal. No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat. Moderate condition PCT 45 grassland not to exceed 2% high threat exotic plant cover, or 5% low threat exotic plant cover. Remainder of the development site not to exceed 5% high threat exotic plant cover or 50% low threat exotic plant cover.
Internal road construction	<ul style="list-style-type: none"> Erosion and sedimentation of drainage channels from levelling and bridge construction. Disturbance to native fauna from lights and noise. Disturbance of groundcover from stockpiles. 	<ul style="list-style-type: none"> Provide awareness training during site inductions and toolbox talks-emphasise the importance of native groundcover. Machinery, trucks and equipment will be restricted to designated parking areas. No parking on roadside vegetation will occur. Plant and vehicles will be washed and inspected as per Traffic Management Procedure. 	<ul style="list-style-type: none"> No native vegetation other than the approved 8.14 ha of Black Box grassy open woodland, 0.16 ha Yellow Box – White Cypress Pine grassy woodland will be disturbed.

Project Phase	Potential disturbance	Key actions and mitigation	Performance Target
	<ul style="list-style-type: none"> • Spread of weeds, particularly high threat exotic plants. • 	<ul style="list-style-type: none"> • Stockpiling and storage of materials and machinery will occur only on designated direct disturbance areas. • Stockpiling and storage of materials will avoid the dripline (extent of foliage cover) of any native tree. • Direct any lighting away from woodland vegetation. • Install and maintain ERSER controls. • 	<ul style="list-style-type: none"> • Direct impacts to native grassland must not exceed 21.06 ha identified in the EIS. • No dirty water leaves the site • Dirt tracking is minimised on sealed public roads. • Moderate condition PCT 45 grassland not to exceed 2% high threat exotic plant cover, or 5% low threat exotic plant cover. • Remainder of the development site not to exceed 5% high threat exotic plant cover or 50% low threat exotic plant cover. •
Construction of solar farm infrastructure	<ul style="list-style-type: none"> • Erosion and sedimentation of drainage channels from levelling and bridge construction. • Disturbance to existing native fauna from lights and noise. • Disturbance of groundcover from stockpiles. • Spread of weeds, particularly high threat exotic plants. • 	<ul style="list-style-type: none"> • Provide awareness training during site inductions and toolbox talks- emphasise the importance of native groundcover. • Machinery, trucks and equipment will be restricted to designated parking areas. No parking on roadside vegetation will occur. • Stockpiles and storage of materials and machinery will avoid the dripline (extent of foliage cover) of any native tree. • Stockpiling and storage of materials will occur only on designated direct disturbance areas. • Direct any lighting away from woodland vegetation. • Plant and vehicles will be washed and inspected as per Traffic Management Procedure. • Topsoil will be stockpiled and replaced over direct disturbance areas as soon as practicable as per Rehabilitation and Revegetation Protocol. • Install and maintain ERSER controls. 	<ul style="list-style-type: none"> • No native vegetation other than the approved 8.14 ha of Black Box grassy open woodland, 0.16 ha Yellow Box – White Cypress Pine grassy woodland will be disturbed. • Direct impacts to native grassland must not exceed 21.06 ha identified in the EIS. • Moderate condition PCT 45 grassland not to exceed 2% high threat exotic plant cover, or 5% low threat exotic plant cover. • Remainder of the development site not to exceed 5% high threat exotic plant cover or 50% low threat exotic plant cover. •

Project Phase	Potential disturbance	Key actions and mitigation	Performance Target
Removal of temporary construction equipment	<ul style="list-style-type: none"> • Disturbance to existing native fauna from lights and noise. • Disturbance of groundcover from stockpiles. • Spread of weeds, particularly high threat exotic plants. • 	<ul style="list-style-type: none"> • Provide awareness training during site inductions and toolbox talks- emphasise the importance of native groundcover. • Machinery, trucks and equipment will be restricted to designated parking areas. No parking on roadside vegetation will occur. • Stockpiles and storage will be occur only on designated direct disturbance areas. • Direct any lighting away from woodland vegetation. • Plant and vehicles will be inspected and washed as per Traffic Management Procedure. • Install and maintain ERSED controls. 	<ul style="list-style-type: none"> • No native vegetation other than the approved 8.14 ha of Black Box grassy open woodland, 0.16 ha Yellow Box – White Cypress Pine grassy woodland will be disturbed. • Direct impacts to native grassland must not exceed 21.06 ha identified in the EIS. • Moderate condition PCT 45 grassland not to exceed 2% high threat exotic plant cover, or 5% low threat exotic plant cover. • Remainder of the development site not to exceed 5% high threat exotic plant cover or 50% low threat exotic plant cover. •

7.2 OPERATIONAL ACTIVITIES

7.2.1 Security and maintenance

Operational traffic within the panel area will be minimal with approximately 3-5 vehicles based permanently at the site. Periodical infrastructure upgrades may be required and will generate additional traffic movements for short periods. DPE will be contacted prior to any major upgrades or maintenance works and in the event of any incident affecting biodiversity.

Table 7-2 Schedule of operation works

Project phase	Expected disturbance	Key actions and mitigation	Performance target
Operation	<ul style="list-style-type: none"> Minor ground disturbance from panel maintenance. Disruption to the movement of native fauna. Fauna mortalities due to contact with project infrastructure such as fences and panels. Spread of high threat exotic plants. 	<ul style="list-style-type: none"> Awareness training for operational staff. Record incidents of fauna mortalities and report threatened species encounters to OEH. Wash and inspect vehicles as per the Traffic Management Procedure. Implement Weed Management Procedure. Implement Animal Pest Management Procedure as required. 	<ul style="list-style-type: none"> Moderate condition PCT 45 grassland not to exceed 2% high threat exotic plant cover, or 5% low threat exotic plant cover. Remainder of the development site not to exceed 5% high threat exotic plant cover or 50% low threat exotic plant cover. No native fauna mortalities.
Grassland management	<ul style="list-style-type: none"> Impacts on native grassland condition from managing fuel load. 	<ul style="list-style-type: none"> Manage native grassland as per the Native Grassland Management Procedure. Wash and inspect vehicles as per the Traffic Management Procedure. 	<ul style="list-style-type: none"> Moderate condition PCT 45 grassland not to exceed 2% high threat exotic plant cover, or 5% low threat exotic plant cover. Remainder of the development site not to exceed 5% high threat exotic plant cover or 50% low threat exotic plant cover.

8 COMPLIANCE MANAGEMENT

8.1 ROLES AND RESPONSIBILITIES

The Project Team’s organisational structure and overall roles and responsibilities are shown in Figure 8-1. The number of staff with functional roles during operations are shown in Figure 8-2.

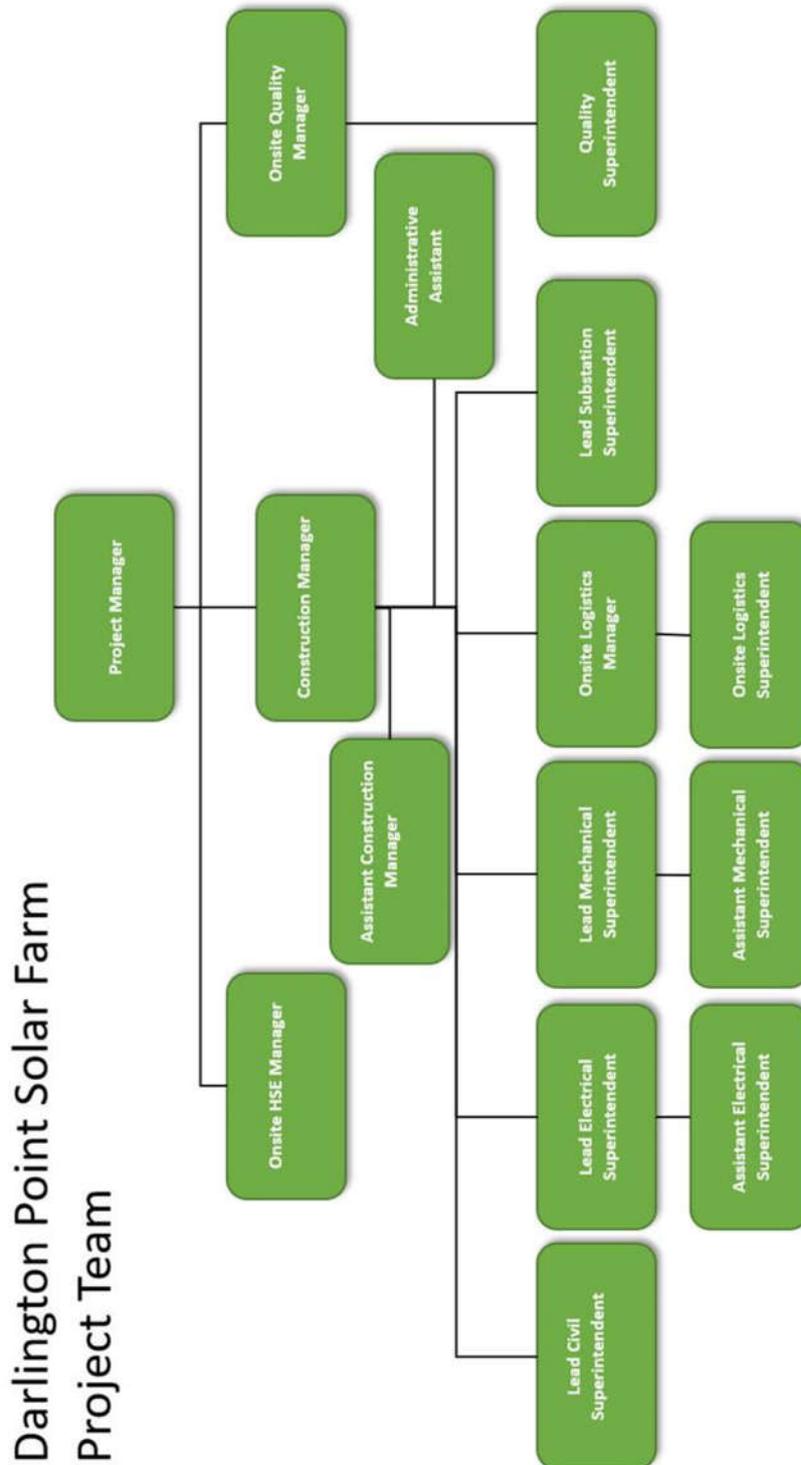


Figure 8-1 Darlington Point Solar Farm Project Team

Key responsibilities relating to managing biodiversity during construction are:

- The Signal Energy is responsible for the development and maintenance of all management plans including the overarching environmental management strategy listed in the table of commitments (Section 4).
- The Signal Energy Project Manager is responsible for ensuring groundworks occur onsite in accordance with the BMP. This includes but is not limited to disturbance in designated areas only, traffic management restricting movements off internal access tracks, topsoil storage and reuse, rehabilitation of disturbed works are carried out as soon as practicable.
- The HSE Manager who manages the ground disturbance permit process and records a running total of vegetation clearing within the development site. The HSE Manager also manages the contracts with ecologists for environmental monitoring as directed by CoCs (section 3.1.3).
- The Lead Civil Superintendent is responsible for supervising construction workers and will ensure they are sufficiently trained in the protection of biodiversity and minimising disturbance detailed below. The Lead Civil Superintendent in conjunction with the HSE Manager will oversee weedcontrol and rehabilitation of the site.
- The Onsite Logistics Manager is responsible for implementing the Traffic Management Plan, which includes controlling and recording heavy vehicle movements onsite. Workers involved in installing solar infrastructure will be trained and directed to limit vehicle movements between the rows of panels.

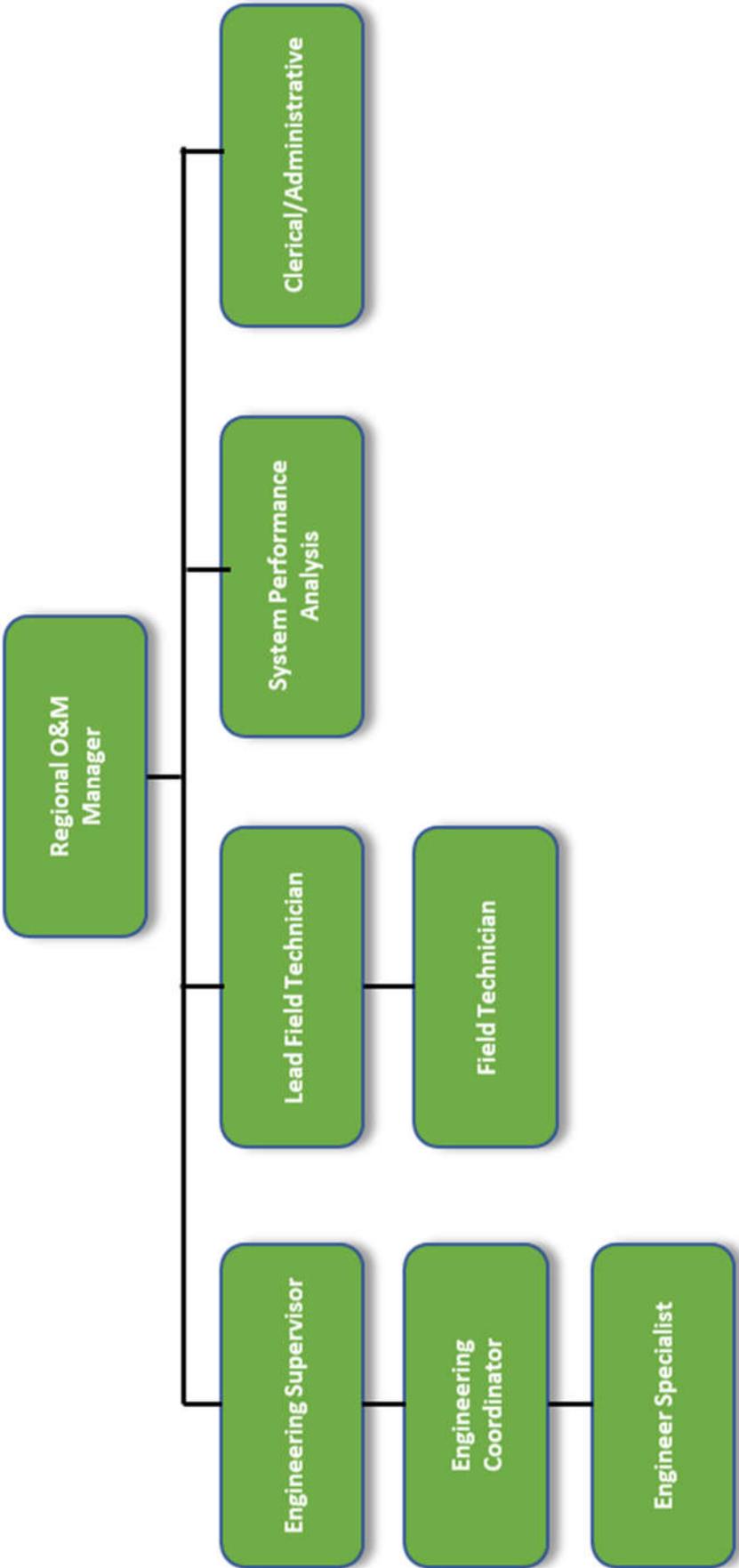


Figure 8-2 Darlington Point Solar Farm Operation Staff

Key responsibilities relating to managing biodiversity during operation are:

- The Operator is responsible for the development and maintenance of all management plans including the overarching environmental management strategy listed in the table of commitments (section 4).
- The Regional Operations and Maintenance (O&M) Manager is responsible for ensuring groundworks occur onsite in accordance with the BMP. This includes but is not limited to disturbance in designated areas only, traffic management restricting movements off internal access tracks, topsoil storage and reuse, rehabilitation of disturbed works are carried out as soon as practicable. The O&A Manager also manages the contracts with ecologists for environmental monitoring as directed by CoCs (section 4.1.3).
- The Lead Field Technician now manages the ground disturbance permit process. The Lead Field Technician will oversee bushfire management, weed control and rehabilitation of the site to achieve biodiversity outcomes.
- The Engineering Supervisor is responsible for supervising maintenance works and will ensure workers are sufficiently trained regarding protection of biodiversity and minimising disturbance.

8.2 TRAINING

All employees, contractors and staff working on site will undergo induction training covering all procedures and protocols included within this BMP. Site induction provides an introduction to the ground disturbance permit and vegetation clearing processes, traffic movement restrictions and hygiene, threatened fauna identification and handling and locations of environmentally sensitive areas. Further details regarding staff induction and training are outlined in the EMS.

Staff and contractors will attend pre-commencement meetings at the beginning of each shift, which will include the details of any urgent biodiversity matters such as any breeched of protocols or procedures. Longer toolbox meetings will occur weekly where staff and contractors will be made aware of any less urgent biodiversity matters and reinforce training on implementing protocols and procedures.

8.3 INSPECTIONS AND MONITORING

Inspections of sensitive areas and activities with the potential to impact biodiversity will occur monthly for the duration of construction and annually for the operation of the project. General biodiversity monitoring will include a quantitative and ongoing assessment of grassland and woodland condition. Monitoring and evaluation of success will include a reflection on the seasonal conditions for the previous period.

Monitoring during construction will be monthly inspections of high disturbance areas, groundcover, protected woodland areas and boundary fence lines. These monthly inspections will include:

Details of Course Woody Debris (CWD) placement, recorded as it occurs.

- A review of any fauna killed or injured. Threatened fauna mortalities will be reported to OEH and the deaths of any birds resulting from contact with fences or solar panel will be recorded.
- Fauna relocations relating to vegetation clearing will be recorded.
- Areas of high and low threat exotic plants will be recorded and controlled on a seasonal basis (section 10.4).

Biodiversity monitoring during operation will include:

- A quantitative assessment of groundcover will occur 6 months after construction. If groundcover is less than 70% cover during this time, corrective actions will be required. This will include consideration of soil conditions such as compaction, frequency of traffic movements, low seedbank storage, lack of soil moisture and nutrient imbalance. If soil chemistry the growth limiting factor, soil testing will be used to determine any need for amelioration.
- Feral animal and weed control surveys will occur on a seasonal basis.

Trigger points for corrective action include:

- Damaged exclusion fencing or signage.
- CWD stacked, not distributed.
- Any storage or infrastructure located underneath driplines of trees.
- Presence of injured or deceased fauna.
- Scours greater than 50 mm deep and 100 m long.
- Bare ground within native grassland patches greater than 20 m².
- High threat exotic plant cover greater than 2% of moderate condition PCT 45 grassland.
- Low threat exotic plant cover greater than 5% of moderate condition PCT grassland.
- High threat exotic plant cover greater than 5% for the remainder of the development site.
- Low threat exotic plant cover greater than 50% for the remainder of the development site.
- Groundcover achieves seed set across less than 70% of area.
- Observed feral animals or observations from neighbours.

A monitoring program summary is provided in Table 9-1.

Table 8-1 Monitoring program summary – minimum requirements

BMP Section	Monitoring action	Timing/Frequency	Responsibility	Decision trigger / adaptive response	Reporting
Pre-construction					
Section 10.2	Inspection of VEZ marking and fencing (no-go zones) including individual trees.	At commencement of Project.	HSE Manager and Suitably qualified ecologist.	If fencing is damaged it is rectified.	On-site reporting.
Section 10.2	Survey before removal of tree vegetation. Hollows to be re-checked prior to clearing.	Before Clearing Commences on-site.	Suitably qualified ecologist.	Implement fauna handling procedure if native fauna is found roosting in hollows.	Ecologist Report.
Section 10.2	Visual inspection of vegetation clearance activities.	Weekly.	HSE Manager.	Clearing not aligned to survey, clearing to cease immediately.	On-site reporting.
Section 10.1	Issue Ground Disturbance permit.	Weekly During Construction.	HSE Manager.	Work will cease if no aligned to Ground Disturbance Permit.	On-site reporting.
During construction					
Section 10.2	Visual inspection of vegetation clearance activities.	Regularly – at least weekly.	HSE Manager.	If lack of exclusion fencing leads to damage to retained vegetation, stop work and report incident. Reinstate exclusion fencing as required. Incident to be detailed at staff and contractor pre-commencement meetings at	HSE Manager to inform DPE of non-compliance within 7 days. HSE Manager to inform OEH immediately of incidents causing harm to threatened species, or ecological communities.

BMP Section	Monitoring action	Timing/Frequency	Responsibility	Decision trigger / adaptive response	Reporting
				the beginning of each shift (s9.2, p 47).	
Section 10.4	Maintain a log of salvaged animals and actions taken to relocate them.	As required	HSE Manager.	If threatened species are identified, then triggers a review and report.	Ecologist Report.
10.4	Inspections for fauna where footings have been left overnight.	Daily as required.	HSE Manager.	No work to proceed until fauna removed from footings.	On-site reporting.
10.8	Inspection of rehabilitation works during construction.	Monthly.	HSE Manager.	N/A	On-site reporting.
10.4	Inspection to detect high and low threat exotic plant cover throughout development site.	Quarterly.	HSE Manager and Ecologist.	High threat exotic plant cover of 2% and low threat exotic plant cover of 5% for moderate condition PCT 45. High threat exotic plant cover of 5% and low threat oxotic plant cover of 50% for the remainder of the development site.	HSE manager annual report to OEH.
	Inspection of high threat exotic plant cover control sites.	Monthly.	HSE Manager and Ecologist.	Following corrective action.	HSE manager annual report to OEH.
Post-construction					

BMP Section	Monitoring action	Timing/Frequency	Responsibility	Decision trigger / adaptive response	Reporting
	Maintain a log of mowing activities to be included with quarterly reporting on grassland management.	Quarterly.	Operations Manager.	Biomass equal to or exceeding 5000 kg/ha dry matter.	HSE manager annual report to OEH.
	Inspection of revegetated areas after all sowing is complete.	6 Monthly.	Operations Manager	Failed patches >5m ² . Seed set across less than 80% of the area.	HSE manager Annual report to OEH.
Operation					
	Inspection of high and low threat exotic plant cover control sites	Quarterly	Operations Manager	High threat exotic plant cover of 2% and low threat exotic plant cover of 5% for moderate condition PCT 45. High threat exotic plant cover of 5% and low threat oxotic plant cover of 50% for the remainder of the development site.	Lead Field Technician annual report to OEH.
Appendix B	Grassland monitoring program: Re-sampling of FBA assessment sites in PCT 45. Sampling of at least thirty permanent 1 x 10 m plots for plant species richness and cover, % bare	Six-monthly, autumn and spring. Three years, starting first autumn or spring after construction.	Expert ecologist	Increase in exotic species richness and cover	Expert ecologist to undertake monitoring and analysis. Annual reporting to Project Manager and OEH.

BMP Section	Monitoring action	Timing/Frequency	Responsibility	Decision trigger / adaptive response	Reporting
	ground, litter and non-vascular plants, and biomass.	Five-yearly for the life of the project.			

8.4 AUDITING

The HSE Manager will maintain a compliance register for the Project to ensure audits and reporting requirements are met within scope and within set timeframes. The compliance register will include a list of CoCs and biodiversity commitments identified the EIS, RTS, BAR and this BMP.

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this BMP and compliance with other relevant approvals, licenses and guidelines including:

- Independent Environmental Audit within six months from the commencement of construction. This will be prepared in accordance with the relevant Independent Audit Post Approval requirements (DPE 2018). A copy of the report will be submitted to DPE and any other NSW government agency that requests it within 3 months of commencement of the audit.

Corrective measures or actions to improve the environmental performance of the Project recommended by auditors will be reviewed by the senior management team and incorporated into strategies, plans or programs required under by the Development Consent.

The recommendations of the Independent Environmental Audit must be implemented to the satisfaction of the Secretary.

Additional audit requirements are detailed in the EMS.

8.5 REPORTING

Reporting requirements and responsibilities are documented in detailed in the EMS.

Signal Energy will document the outcomes of pre-construction surveys required by the CoCs and RTS and submit to DPE as scheduled in section 8 of this BMP.

The Proponent will progressively monitor the clearing of native vegetation and provide a Compliance Report and mapping to ensure compliance. The HSE Manager will inform DPE of any non-compliance incident within 7 days of occurrence.

Any additional mitigation or management measures relevant to biodiversity have been incorporated into section 6 of this BMP as required.

Any independent environmental audit, and the Proponent's response to the recommendations in any audit will be made publicly available on the internet. Any other biodiversity matter will also be made publicly available as required by DPE.

9 REVIEW AND IMPROVEMENT

This BMP will be reviewed every three years. Continuous improvement of this BMP will be achieved by the ongoing evaluation of performance against the BMP environmental policies, objectives and targets to identify opportunities for improvement.

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.
- Make comparisons with objectives and targets.

10 PROTOCOLS AND PROCEDURES

10.1 GROUND DISTURBANCE PERMIT PROCESS

The ground disturbance permit process is integral to communicate the distinction between vegetation projection areas and the ground disturbance footprints which contractors will be working within. This process is also vital to enable the Contractor to track and control vegetation clearing on a daily, weekly and monthly basis.

The ground disturbance permit process is managed by the HSE Manager and is summarised below;

- Contractors are informed within their contract and site induction that all ground disturbing activities require them to obtain a ground disturbance permit prior to undertaking the work.
- The ground disturbance permit form is available in hard copy at the site office or through Signal Energy's intranet and must be submitted to the HSE Manager via email at least 48 hours before the work is undertaken.
- The HSE Manager will compare the proposed ground disturbance area to the project footprint detailed in the current approved development design.
- The HSE Manager will visit the site if required and mark out vegetation projection areas and 10 m buffer zones if applicable.
- The HSE Manager will either issue the permit unamended or contact the contractor for further clarification.
- Once the permit has been issued, the contractor may undertake ground works as per their contract.
- Once the work has been completed (date specified in the permit), the HSE Manager will inspect the site, request any additional clean up or remediation activities and sign-off that the conditions of the permit have been met.
- The HSE Manager will then record the disturbed area as part of a running total disturbed area for the project.

An example of the ground disturbance permit form is provided in Figure 11-1 below.

Project: Darlington Point Solar Farm

Project No:

Requested By:

Habitat Clearing Start Date:

Expected Completion Date:

HABITAT CLEARING LOCATIONS – ATTACH DRAWINGS / SKETCHES IF NECESSARY

Location	Comments

This section to be completed by Ecologist and HSE Manager for clearing of trees, logs, rocky features, and other habitat features, with reference to constraints mapping.

Has the limit of clearing been clearly delineated? Yes No

All trees / vegetation / habitat to be retained identified and No-Go Areas fenced off? Yes No

State how identified:

Have habitat trees been identified and appropriately marked? Yes No N/A

State how identified:

Are specific targeted surveys required? Yes No

State how survey was completed, including results:

Is there a risk of weed infestation or spread? Yes No

Are any animals present? (If Yes, relocation required) Yes No

Are any active nests/burrows present? (If Yes, relocation required) Yes No

If soil disturbance is to occur, has an ERSED Plan been created and have these controls been installed? Yes No

Have relevant workers been given toolbox talks on limit of clearing, fauna handling procedures and any other SHE Controls? Yes No

Can habitat features be re-used for habitat enhancement? Yes No

Can the habitat feature be re-used immediately? Yes No

If not re-used immediately, where will it be stockpiled*?

Comments:

APPROVALS

Inspection completed by Ecologist:

Date:

Ecologist Signature Required

Approval by HSE Manager:

Date:

HSE Manager Signature Required

* Stockpiles must be placed in accordance with the CCAMP.

SIGN-OFF (ONCE WORKS COMPLETED)

Have the conditions of the permit been met?

Date:

HSE Manager Signature Required

Figure 10-1 Sample ground disturbance permit form

10.2 VEGETATION CLEARING PROTOCOL

When undertaking vegetation clearing, the following process shown in Figure 10-2 must be followed to minimise the area of disturbance and the amount of vegetation to be cleared.

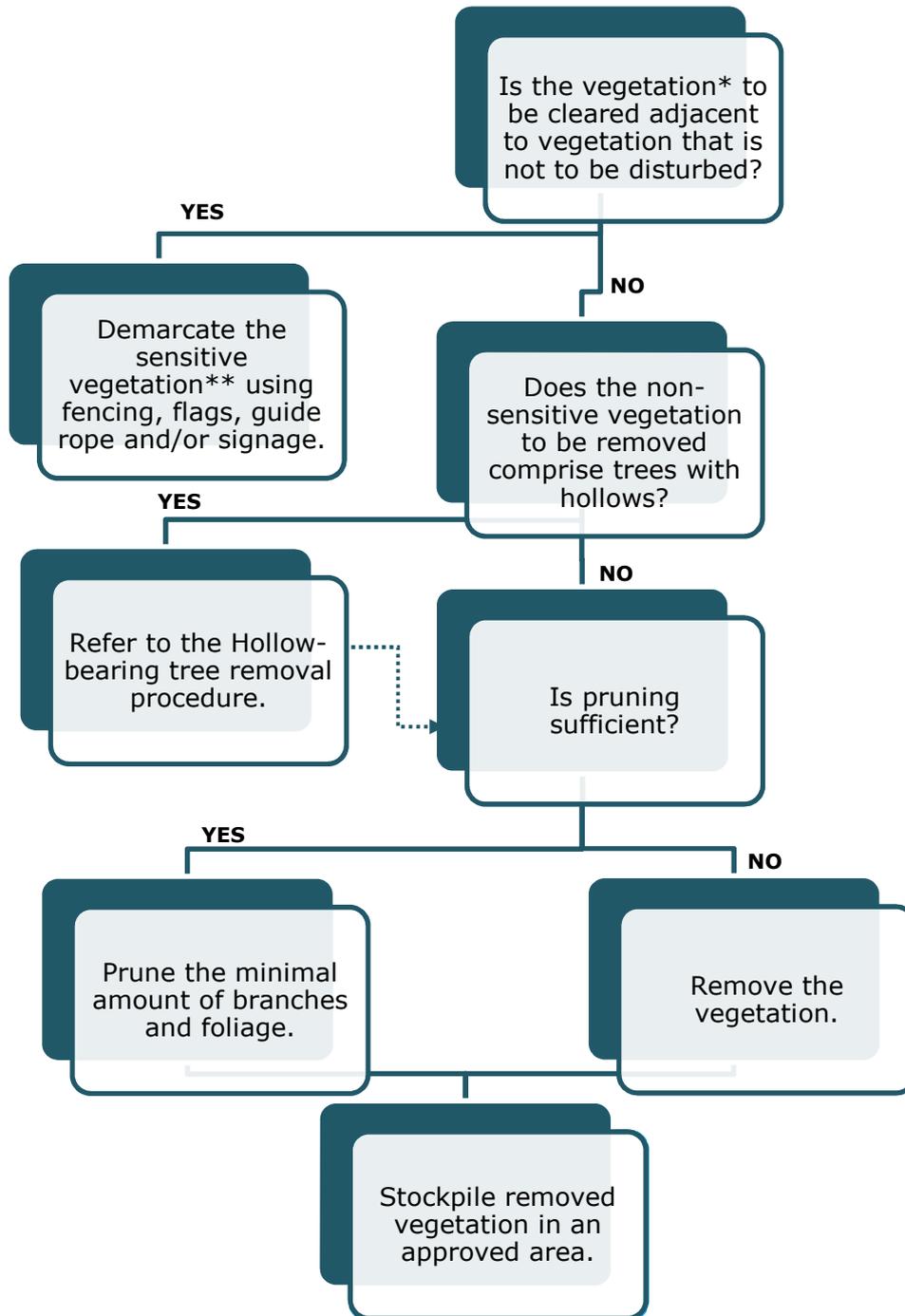


Figure 10-2 Vegetation clearance procedure

10.2.1 Vegetation Exclusion Zones

Sensitive vegetation will be protected by exclusion fencing and signage (e.g. Figure 10-3 and Figure 10-4). A 10 m VEZ will be established inside perimeter fencing. A 20 m VEZ will be established around internal woodland vegetation to ensure that sensitive vegetation is not impacted accidentally. The only exception to internal 20m zones is in the approved areas highlighted in Appendix C where it will remain a 10m Exclusion Zone. In these areas Signal Energy will ensure an ecologist inspects these areas to ensure there will be no impact to protected vegetation root systems. This inspection will be documented and kept on

record. Exclusion fencing will define vegetation to be retained and beyond that a VEZ will be established to mitigate impacts from construction activities



Figure 10-3 Example of exclusion zone signage.



Figure 10-4 Example of exclusion zone fencing.

10.2.2 Lopping, pruning and trimming procedure

Heavy machinery should not be used for pruning or trimming. Appropriate tools to use are loppers, chain saws and vehicle mounted saws.

In the first instance, hollow bearing limbs should be retained. If this is not possible the hollow bearing limb should be inspected by the Project Ecologist / suitably qualified expert and placed in adjacent un-disturbed vegetation to provide fauna habitat.

Tree limbs are to be removed using the three cut method as shown below in Figure 10-5.

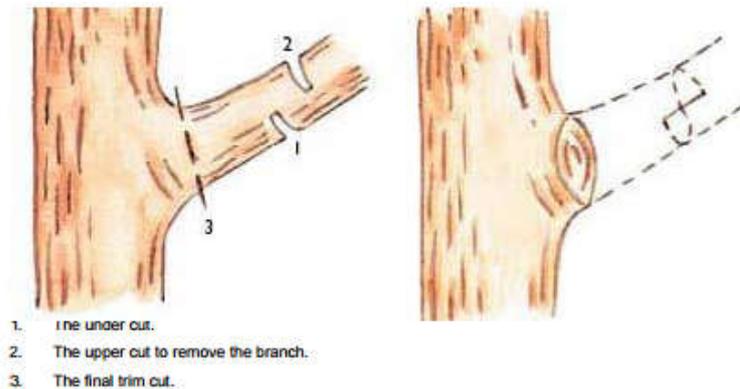


Figure 10-5 Tree cutting method

10.2.3 Hollow-bearing tree removal procedure

Hollow-bearing trees are important habitat feature for a variety of native animals such as possums, gliders, birds and bats. Before clearing any hollow-bearing trees, it is important to consider if animals are present. The following procedure (Figure 10-6) is a guide to give animals an opportunity to escape a hollow-bearing tree prior to it being removed.

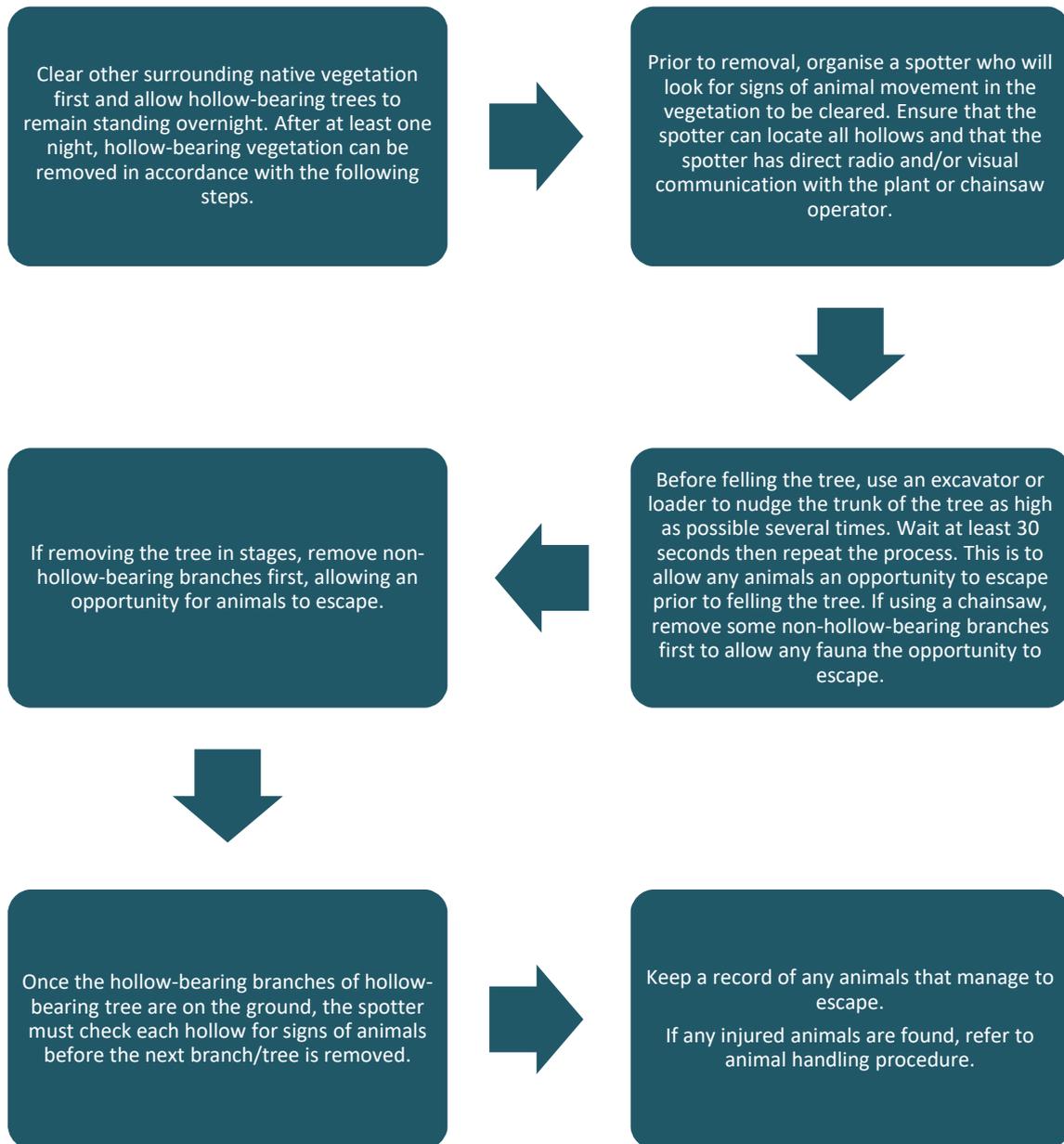


Figure 10-6 Hollow bearing tree removal procedure

10.2.4 Removal of trees outside the approved clearing limits

The approved clearing limit is the line between the vegetation to be removed and the vegetation to be retained. It will be shown on all design plans as required. This is to be avoided where at all possible.

Where additional impacts to trees are proposed, the following process should be followed:

1. The Supervisor should notify the HSE Manager of the location and need for the tree impact via the ground disturbance permit process.
2. The HSE Manager/Lead Field Technician should assess that the tree (or other vegetation type) is not heritage listed, a habitat tree, nominated for retention or protected under relevant legislation and is legally able to be removed and/or trimmed. Alternatives to removing the tree should also be investigated at this stage.

3. The HSE Manager/Lead Field Technician should notify consult a heritage specialist if heritage significance is suspected, which may require a site visit.
4. The Supervisor should await written confirmation from the HSE Manager prior to re-commencing works around the tree(s).

10.2.5 Re-use of coarse woody debris

Felled timber greater than 600 mm (primarily tree trunks) will generally be removed from site. Felled timber greater than 200 mm and less than 600 mm will be used as CWD for habitat enhancement and to maximize the salvage of resources within the disturbance area for beneficial reuse. CWD can be used to enhance habitat values in existing vegetation and rehabilitated areas including derived native grassland (either in offset areas or areas adjoining impacted areas). CWD can provide:

- Habitat for micro invertebrates.
- Habitat for macroinvertebrates.
- Habitat for vertebrates using fallen timber for shelter, e.g. skinks, geckoes, dunnarts.
- Habitat for vertebrates using fallen timber for foraging, e.g. treecreepers, robins.
- A source of nutrients for native vegetation.
- Increased habitat complexity.

CWD will be placed within protected woodland areas shown in Figure 2-1 as discrete logs rather than in piles to reduce fire risk and potential for use as shelter by feral animals such as foxes and rabbits. CWD will be placed at discrete intervals at densities to ensure that the CWD Benchmark for the receiving PCT is not exceeded. The density of CWD must take into account existing fallen timber. Removal, transportation, and placement of CWD will be carried out in a manner that minimises disturbance to native vegetation, including the canopy, trees, shrubs, standing dead timber, fallen timber, and groundcover, as well as topsoil.

CWD between 10 and 200 mm in diameter will be chipped and used for disturbed area rehabilitation.

10.3 UNPLANNED THREATENED SPECIES FINDS PROCEDURE

This procedure depicted in Figure 10-7 is derived from information provided by the NSW Wildlife Information Rescue and Education Service (WIRES).

Any nests found in habitat features to be removed should be inspected by the Ecologist to determine whether fauna is using the nest, and whether relocation of the fauna and the nest to an adjacent area is viable.

As a general principle, any native animals found with the construction area should be avoided. Fauna should only be handled by a qualified ecologist or wildlife carer with relevant skills and experience (e.g. snake handling), and only when absolutely necessary.

Any onsite protected fauna found within a habitat feature to be removed should be captured and relocated according to the following steps. Any onsite protected fauna injured during a construction activity should be captured and a registered wildlife handler or veterinarian contacted.

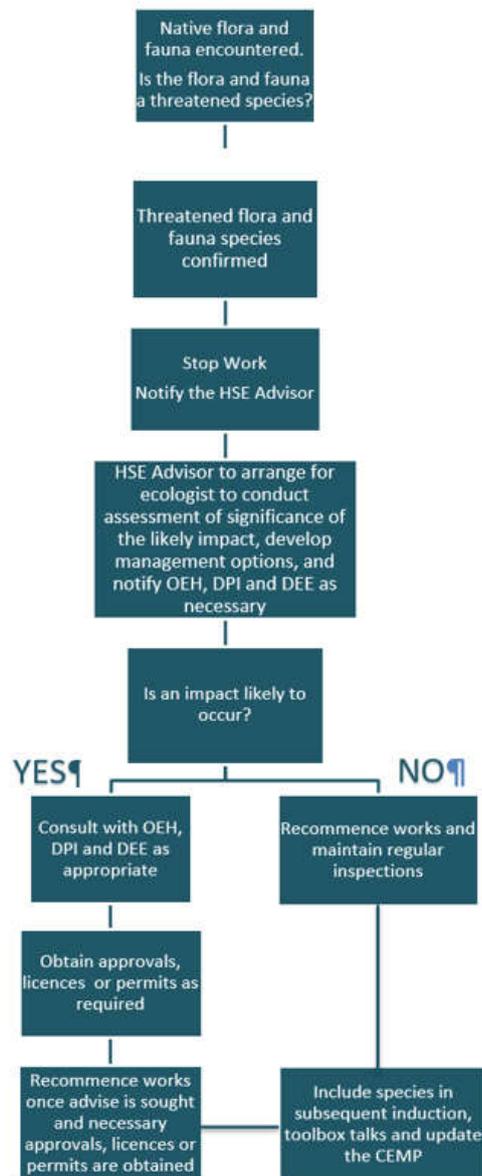


Figure 10-7 Threatened fauna encounter procedure

Step 1

Remove any threat to the animal that could cause or exacerbate an injury.

Step 2

Use appropriate equipment to capture the animal. This may include:

- Frogs: disposable gloves, disinfectant on hands and equipment between animals, disposable plastic bags (one per animal, one use only).
- Mammals: gloves, cloth bags/cotton pillow slips, up-to-date Australian Bat Lyssavirus vaccinations.

Step 3

Contain the animal to minimise stress. Gently place the animal in a holding box specifically designed for holding animals. Cotton pillowslips may be used to cover mammals, or mammals may be placed inside them. Boxes should be placed in a quiet, safe, dark location (not in a vehicle unless temperature is constantly monitored). Do not give the animal food or water.

Step 5

Call WIRES on 1300 556 686, who will provide advice on what to do until a trained WIRES rescuer can come to take the animal away. If you cannot contact WIRES, contact Leeton Veterinary Hospital on 02 6953 3111.

Step 6

Release fauna into similar habitats, as near as possible to their capture location. Diurnal (day-active) fauna should be released during the day of capture. Nocturnal (night-active) fauna should be released at or after dusk. Arboreal fauna should be slowly released from their bag onto the trunk of a tree, with bats and gliders placed on a tree with rough or peeling bark and hollows.

Step 7

Details of fauna captured and relocated should be recorded in the following register. Any injury or death of a threatened species should be reported to the HSE Manager.

10.4 NATIVE GRASSLAND MANAGEMENT PROCEDURE

Native grassland (PCT 45) will be managed through mowing and/or grazing following recommendations of grassland specialists from Charles Sturt University (CSU) provided in Appendix 9 of the BAR. The objective for the grassland management regime is to effectively balance biodiversity outcomes and reduce the risk of fire, exacerbated by high fuel loads.

Early in the construction phase, grassland will be mowed to 100 – 200 m to facilitate the installation of panel infrastructure. Following this initial mowing, the grassland will then be managed throughout the remainder of the construction phase and then during operations for the life of the project.

As per CSU recommendations, active management of the grassland will involve:

- Over winter: graze sheep or mow. This will reduce the level of dry matter from annual growing species for summer fire hazard. Exotic annuals tend to have a greater palatability/digestibility than natives at this time of year and will be preferentially grazed enhancing the abundance of native species in the medium term.
- Summer – destock or low stocking rate. This will enable native perennials to set seed and replenish the seedbank.
- Control high and low threat exotic plants by implementing the Weed Management Procedure detailed in section 10.5.2.
- Adaptive mowing and/or graze as required to select in favour of native plant species and to control exotic groundcover to meet targets listed in section 1.7.
- In the event that the diversity of native species provided in Appendix B declines, rehabilitation of affected areas may be undertaken in consultation with a grassland specialist endorsed by DPE.

The above management strategy has been designed for average rainfall years that enable strong plant growth. In the event of lower rainfall years where biomass does not exceed 5000 kg/ha dry matter (DM) grazing or mowing may not be required. This value was taken from the Murrumbidgee Irrigation Area Bush Fire Management Committee in regard to APZ fuel load in forested areas, in the absence of a defined fuel load for grassland in the RFS (2006) guidelines.

10.4.1 Native Grassland Surveys

The Riverine Plains Grassland within the development site has a long history of supporting the livestock, which has enabled native groundcover to persist.

Native grassland specialist Dr Jodi Price of Charles Sturt University has been contracted to deliver a monitoring programme for PCT 45, which is detailed in Appendix C to assess the impacts of changing land use of the development site from grazing agriculture to a solar farm. One year post-construction, monitoring will be undertaken every autumn and spring until biodiversity offset credits are relinquished for PCT 45. In compliance with Schedule 3, CoC 11, the proponent will submit a report to the Secretary between year two and three of operations.

A minimum of 20 plots for each treatment type will be monitoring over the life of the monitoring programme. Control plots will be located within the transmission line corridor and the inner edge of managed firebreaks away from solar panel infrastructure. Test plots will be located under panels so that infrastructure impacts on microclimate can be assessed and as close as practicable to the original BioBanking survey plots. Treatment types include:

- Untreated control

- Mowed control
- Mowed and raked control
- Mowed test
- Mowed and raked test

Approximate locations of the plots are shown in Figure 10-8. These may change following a site visit by Dr Price in consultation with the proponent.

The impacts, commitments and mitigation measures for operational activities are listed in Table 7-2.

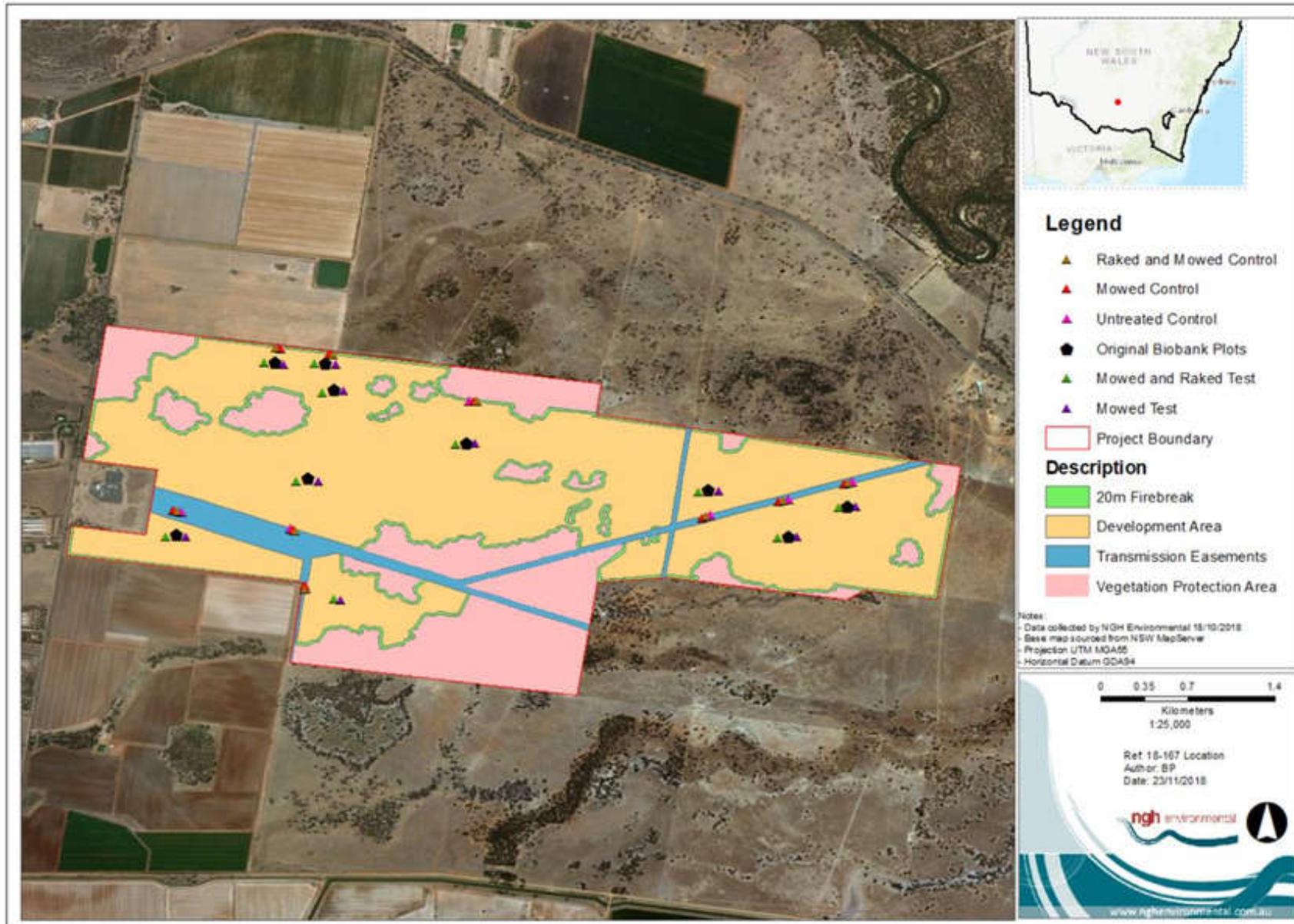


Figure 10-8 PCT 45 monitoring programme plot locations

10.5 PEST AND WEED MANAGEMENT PROTOCOL

The Project Manager or HSE Manager will initiate collaboration with adjoining landholders to control animal pests and exotic plant species that may traverse property boundaries. These initial communications will inform collaborative past and weed management measures into and during operation.

10.5.1 Animal Pest Management Procedure

Due to perimeter fencing limiting entry to the project site by large mammal pests such as feral cats, foxes and rabbits, it is anticipated that most pest control activities will be limited to the control of small mammals such as rodents and invertebrates. Larger pest animals may however be present at the site early in during the construction phase and may enter the site periodically through the main accessway.

Fox pest control (NSW Department of Primary Industries)

Reducing the impact of the red fox relies on a mixture of control techniques comprising poison baiting, shooting, trapping, fencing and guard animals. All these techniques have a short-term effect on local fox numbers. No single control method will be successful on its own and when foxes are removed from an area, reinvasion or immigration from existing untreated areas generally occurs within 2 to 6 weeks.

Control methods can be accessed from <http://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/foxes/fox-control>.

Rabbit pest control

The European rabbit is declared a noxious animal in NSW. Landholders are obliged to control rabbit populations on their land. The aim of control is to reduce the impact of rabbits on farm enterprises and the natural environment. The success of rabbit control should be determined more by how many rabbits remain than by how many rabbits have been removed. Rabbits have the ability to rapidly re-invade and recolonise areas following control, so control programs should involve as large a number of properties as possible. Set clear, attainable objectives for control work, taking account of available financial and physical resources.

Two broad rabbit control strategies are applied to rural land in NSW: the combination of poisons and harbour destruction in eastern areas with cooler climates, and extensive harbour destruction where ground conditions are suitable in western areas. There are three Stages of rabbit control:

- Stage 1- Initial reduction.
- Stage 2- Follow up control.
- Stage 3 Advanced control.

Control methods include:

- Monitoring of population density prior to deciding a control method.
- Poisons.
- Harbour destruction.
- Fumigation.
- Shooting.
- Trapping.

Further details regarding control methods can be accessed from

<http://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/rabbits/rabbit-control>.

Feral cat control

Feral cat control can be achieved by applying fox control techniques. Further information can be accessed from <http://www.environment.gov.au/biodiversity/threatened/publications/factsheet-tackling-feral-cats>.

Pesticide application record

Pesticide application will only be administered by authorised personnel with ChemCert accreditation – AQF 3 in accordance with SafeWork requirements.

Pesticides will only be applied in accordance with label instructions for that product.

A Pesticide Application Record (Figure 10-9) will be completed and public notifications made in accordance with relevant legislation, where pesticides are to be used in areas that could be accessed by members of the public.

Only pesticides registered for use near water may be used near any waterways.

Pesticide Application Record Sheet



Industry & Investment

Location, Applicator, Date of Application

Property/Holding: (residential address)				Date:										
Applicator's Full Name:			Owner (if not applicator):											
Address:			Address:											
		Phone:		Phone:										
Mobile:	Fax:	Email:	Mobile:	Fax:	Email:									
Sensitive Areas (including distances, buffers):			Comments (including risk control measures for sensitive areas):											
<table border="1"> <tr><td></td><td>N</td><td></td></tr> <tr><td>W</td><td>Treated Area</td><td>E</td></tr> <tr><td></td><td>S</td><td></td></tr> </table>				N		W	Treated Area	E		S				
	N													
W	Treated Area	E												
	S													

Host/Pest

Paddock Number/Name:	Paddock Area:	Order of Paddocks Sprayed:
Crop/Situation:	Type of Animals:	
Crop/Pasture Variety:	Age/Growth Stage:	
Growth Stage:	Mob/Paddock/Sheed:	
Pest/Disease/Weed:	Animals — Number Treated:	
	Pest Density/Incidence: Heavy <input type="checkbox"/> Medium <input type="checkbox"/> Light <input type="checkbox"/>	

Application Data

Full Label Product Name:		Rate/Dose:	Water Rate L/ha:
Permit No.:	Expiry Date:	Additives/Wetters:	
Total L or kg:	WHP:	ESI*:	Date Suitable for Sale:
Equipment Type:	Nozzle Type:	Nozzle Angle:	Pressure:
Date Last Calibrated:	Water Quality (pH or description):		

Weather

Showers <input type="checkbox"/> Overcast <input type="checkbox"/> Light Cloud <input type="checkbox"/> Clear Sky <input type="checkbox"/>					
Rainfall (24 hours before and after)					
Before:	mm	During:	mm	After:	mm
Time (show time in this column)	Temperature °C	Relative Humidity (%)	Wind Speed	Direction	Variability (e.g. gusting)
Start					
Finish					
Comments:					

* When using herbicides in mixtures with fungicides and insecticides, an ESI may apply to the non-herbicide component of the mixture.

Figure 10-9 Pesticide application record sheet

10.5.2 Weed Management Procedure

High threat exotic plant cover in this BMP are defined under the Biodiversity Assessment Method Order 2017 (NSW Government 2017) as “plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species. Also referred to as high threat weeds.” Low threat exotic plant cover is defined in this BMP as all other exotic plants cover that does not typically outcompete native plant species.

Twenty-seven species of exotic plant were recorded within the project area, those already occurring within PCT 45 are included in the plot data for this PCT in Appendix B. None of these species are listed on either the Biosecurity Act (BS Act) and/or are weeds of national significance. High threat exotic plant cover recorded include *Xanthium spinosum* (Bathurst Burr) and *Marrubium vulgare* (Horehound). During construction, the project has the potential to spread weeds through the movements of heavy machinery and light vehicles.

Weeds will be controlled through:

- An adaptive management approach whereby management actions will be adjusted to optimise the grassland growth addressing on-site observations as per the Native Grassland Management Procedure in section 10.4.
- For more intensive infestations of weeds, the use of selective herbicides may be warranted to prevent seed set and promote weed control. The advice of an ecologist and agronomist will be sought to advise on the control of weed infestations.
- Any supplementary feeding of livestock will use treated or processed feed to remove viable seeds and prevent weeds being introduced to the site.

A detailed weed management procedure is provided below.

Invasive weeds

The BMP lists the implementation of weed control measures to ensure invasive weed problems are not exacerbated. Weeds will be classified with reference to NSW WeedWise profiles. Once weeds are identified within the construction area, they should be marked up on relevant drawings.

Weed inspection

The HSE Manager/Lead Field Technician will inspect the project area for weeds as required:

- Prior to clearing and grubbing.
- When a potential weed infestation has been identified.
- Before spring (around August) to identify high and low threat exotic plants before they go to flower and seed.

Exotic plant cover will be mapped with GPS following inspections including noting the specie(s) degree of infestation and capturing an image for monitoring purposes.

Weed treatment

A general guide to weed control and management is presented above. More detailed information, including herbicide types and application rates, can be sought from the project Ecologist or from the WeedWise website (<http://weeds.dpi.nsw.gov.au/>).

Herbicide application record

Herbicide application will only be administered by authorised personnel with ChemCert accreditation – AQF 3 in accordance with SafeWork requirements.

Herbicides will only be applied in accordance with label instructions for that product.

A Herbicide Application Record (Figure 10-10) will be completed and public notifications made in accordance with relevant legislation, where herbicides are to be used in areas that could be accessed by members of the public.

Only herbicides registered for use near water may be used near any waterways.



Location, Applicator, Date of Application

Property/Holding: (residential address)				Date:										
Applicator's Full Name:			Owner (if not applicator):											
Address:			Address:											
Phone:			Phone:											
Mobile:	Fax:	Email:	Mobile:	Fax:	Email:									
Sensitive Areas (including distances, buffers):			Comments (including risk control measures for sensitive areas):											
<table border="1"> <tr><td></td><td>N</td><td></td></tr> <tr><td>W</td><td>Treated Area</td><td>E</td></tr> <tr><td></td><td>S</td><td></td></tr> </table>				N		W	Treated Area	E		S				
	N													
W	Treated Area	E												
	S													

Host/Pest

Paddock Number/Name:	Paddock Area:	Order of Paddocks Sprayed:
Crop/Situation:	Type of Animals:	
Crop/Pasture Variety:	Age/Growth Stage:	
Growth Stage:	Mob/Paddock/Shed:	
Pest/Disease/Weed:	Animals — Number Treated:	
	Pest Density/Incidence: Heavy <input type="checkbox"/> Medium <input type="checkbox"/> Light <input type="checkbox"/>	

Application Data

Full Label Product Name:		Rate/Dose:	Water Rate L/ha:
Permit No.:	Expiry Date:	Additives/Wetters:	
Total L or kg:	WHP:	ESI*:	Date Suitable for Sale:
Equipment Type:	Nozzle Type:	Nozzle Angle:	Pressure:
Date Last Calibrated:	Water Quality (pH or description):		

Weather

Showers <input type="checkbox"/> Overcast <input type="checkbox"/> Light Cloud <input type="checkbox"/> Clear Sky <input type="checkbox"/>					
Rainfall (24 hours before and after)					
Before:	mm	During:	mm	After:	mm
Time (show time in this column)	Temperature °C	Relative Humidity (%)	Wind Speed	Direction	Variability (e.g. gusting)
Start					
Finish					
Comments:					

* When using herbicides in mixtures with fungicides and insecticides, an ESI may apply to the non-herbicide component of the mixture.

Figure 10-10 Herbicide application record sheet

Follow-up inspection

The HSE Manager/Lead Field Technician will ensure that a follow-up inspection is undertaken of identified exotic plant cover to ensure treatment was successful.

Where high threat exotic plants cannot be effectively destroyed prior to topsoil stripping, weed contaminated topsoil will be isolated and disposed of at an approved offsite licensed facility as directed by the HSE Manager/Lead Field Technician.

Ongoing management & monitoring

Monitoring of exotic plant cover will occur as part of the routine monthly inspections to determine effectiveness of management controls. The presence of any exotic plant cover and the necessary management actions will be noted on the Environmental Inspection Checklist (refer to EMS).

10.6 TRAFFIC MANAGEMENT PROCEDURE

10.6.1 Vehicle, plant & equipment movement

All plant and vehicles entering the development site will be directed from the main entrance by signage and physical barriers (such as fencing and/or boom gate) to the project office where vehicle and driver details will be recorded on the vehicle movements register overseen by the Lead Civil Superintendent/Regional O&M Manager.

Heavy vehicles will be directed to the central laydown area for unloading. Plant and vehicles required to enter indirect disturbance areas will be directed to the washdown bay located within the compound shown in Figures 1-1 to Figure 1-5 where they will be washed and inspected by trained site personnel. Washing and inspection will be recorded in the Vehicle Hygiene Register prior to vehicles being given the all clear to enter indirect disturbance areas.

Any water from this washdown area will be directed to the compound wastewater pond.

Upon leaving indirect disturbance areas, plant and vehicles will be redirected to the washdown bay where they will once again be washed and inspected prior to leaving the project site. An example of the Vehicle Hygiene Register is shown in Table 10-2.

10.7 BUSHFIRE MANAGEMENT PROCEDURE

In order to minimise the risk of bushfire spreading from or within the Project, the HSE Manager/Lead Field Technician is responsible for ensuring that:

- A 10 m defendable firebreak will be established inside the perimeter of the Project (> 5 m either side of the perimeter fence line). This will enable vehicles to fight the fire from both inside the fence and externally. This perimeter firebreak or APZ is to remain unobstructed at all times.
- The APZ will be maintained on a seasonal basis including mowing prior to the commencement of fire danger season to < 50 mm and will be maintained below 100 mm throughout the year.
- A mobile 20,000 L water supply tank fitted with a 65 mm Storz fitting will be located within the central compound adjacent to the internal access road.
- In the event of a fire in the vicinity of the Project, site personnel will assist RFS and emergency services staff. Operation Staff will be required to undertake bushfire training prior to commencement of their roles.
- The Murrumbidgee Council Medical and Emergency Services Department is informed once construction is completed, prior to commissioning.
- Prior to reducing fuel loads on grassland, the Lead Field Technician will identify areas of native vegetation that could be adversely affected by mowing and mark these with stakes and tags so that they are avoided when mowing.

The readiness of firefighting equipment and condition of firebreaks will be monitored as part of monthly site inspections.

10.8 REHABILITATION AND REVEGETATION PROTOCOL

Areas temporarily disturbed for the project will need to be rehabilitated and revegetated as soon as practicable. Temporarily disturbed areas include grassland mowed for piling installation, construction and decommissioning laydown areas and cable trenches. The aim of the rehabilitation and revegetation is to stabilise the disturbed area and to return it to a condition that is similar to its pre-disturbance state, meaning that native species comprising vegetation plant communities identified in Figure 2-1 are returned to these locations.

10.8.1 Topsoiling

Topsoil will be replaced on all areas from where it has been removed. Prior to the application of topsoil, compacted areas will be tined or ripped to a depth of 150 mm to loosen the surface. Over the tined surfaces will be placed at least 30 cm of topsoil. Ensure the topsoil is free of rocks and sticks greater than 10 mm in diameter or 50 cm in length. Harrow the topsoil prior to sowing seed if the surface has set hard following rain. Apply lime and gypsum to the soil if chemical tests indicate that this would be advantageous/sodic.

Spray exotic plant growth occurring on topsoil stockpiles with a knockdown herbicide before spreading topsoil. More than one application of herbicide may be required. Apply the last application of herbicide not less than 4 weeks before spreading the topsoil or as per manufacturer's instructions.

Due to the climatic conditions (evaporation rates) native grassland establishment is best attempted over late autumn, winter or early spring. Wet summers are also able to maintain established perennial pasture growth in summer active species. Summer rainfall is less reliable than summer evaporation and as such

revegetation is also less reliable. As such rehabilitation and revegetation should commence in late summer/early autumn as temperatures decrease and evaporation rates fall.

10.8.2 Broadcast sowing

Undertake sowing using either:

- (a) a tractor drawn seed drill to place seed at a depth of 5 mm or less; or
- (b) a spreader followed immediately by a single pass with an unweighted diamond harrow.

Where safe to do so tractor passes with the seed drill or harrow will follow the finished surface contours. Distribute seed and fertiliser evenly over the areas to be sown at the rates specified below. Apply fertiliser concurrently with the seeding operation.

Calibrate the drill and monitor the seed and fertiliser application rates to ensure an even distribution over the areas sown, in accordance with the rates nominated. Maintain records of measurements and calculations to determine actual distribution rates for areas treated.

Dry sowing native species on small areas where machinery would be a hindrance can be achieved by mixing seed to sand at a ratio of 1:10 and spreading across the area by hand.

10.8.3 Hydromulching and hydroseeding

Carry out hydromulching / hydroseeding within 5-10 days of completed soil preparation or, if delayed by the weather conditions as soon as conditions permit.

Agitate continuously the slurry of seed, fertiliser, binder (60 kg/ha Guar gum) (and mulch) and water (35 kl/ha) to maintain a uniform consistency during application. Apply it the sprayed slurry uniformly over the whole surface ensuring that all surfaces are sprayed from two directions to ensure complete coverage. The sprayed hydromulch layer within 48 hours of application must have a minimum thickness at any location of 5 mm when using sugar cane mulch, or 2 mm when using wood fibre or shredded paper.

Where straw (5t/ha) is used for mulch apply the straw mulch uniformly using a purpose-made blower unit. Incorporate the emulsion (bitumen) as a spray into the air stream of the mulch blower or apply it in a separate operation within 12 hours from the application of straw mulch. The straw mulch layer within 48 hours of application must have a minimum thickness at any location of 25 mm.

Do not apply hydroseeding / hydromulching and straw mulching if winds exceed 15 km/hr, temperatures exceed 37°C, the surface is water logged; or during rain periods or when rain appears imminent.

10.8.4 Native grass sowing rate

Where required a mixture of native and introduced pasture species may be used. Care should be taken to ensure sufficient plant densities. Native component species from PCT 45 should be used for any direct seeding of bare ground triggering corrective action targets. Native species for seeding are listed in Appendix B. The recommended seeding rate is 2 kg/ha.

10.8.5 Revegetation maintenance

Maintain all revegetated areas for 6 months after all sowing is complete or until Contract Completion, whichever occurs first. Water areas where and when directed by the HSE Manager. Water by means of a fine spray which causes minimal disturbance to seeded areas.

Clear dead vegetation from areas showing poor growth or damage and replace all lost topsoil. Then recultivate and reseed the area. Control exotic plant cover where required with herbicide or hand removal.

APPENDIX A RESPONSE TO DRAFT BMP

A.1 OFFICE OF ENVIRONMENT AND HERITAGE COMMENTS ON DRAFT

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
1	Include maps of the development site at an appropriate scale that clearly show the development footprint, management zones (31 October 2018) and Vegetation and Heritage Protection Exclusion Zones	Part	How do the maps relate to assessed impact zones (management zones)? What is PV area? Previously mapped as "outside array"? Additional "compound areas" (total impact) have been added into the non-panel "minimal impact" zone? Where will ripping be undertaken? (11.6.1, p 72)	Figure 1.1 to Figure 1.5 maps should be viewed with reference to section 1.4 of V05, which clearly defines undisturbed, directly impacted and indirectly impacted areas. "Outside array" is clearly defines as within the indirect impact zone. Additional compound areas are temporary and will not be subject to groundcover removal. Ripping has been removed from section heading V06.
2	Clarify the location of security fencing, firebreaks, screening plantings, stockpiles and laydown areas in relation to the mapped native vegetation	Part	Doesn't address how to protect remnant native vegetation (including TEC) from impacts of the perimeter fence. – perimeter fence appears on figures 1-1 to 1-5 to be directly next to the mapped vegetation. – The 10 m buffer needs to be between vegetation and the fence to minimise impacts of construction. The fence diagram is unreadable (Figure 1-6, page 15) and appears to be partially solid? This could have unmitigated	The location of the perimeter fencing directly next to remnant vegetation was discussed with DPE on 27/02/19 in preparation of V05. The proponent has committed to conduct monthly checks for and report wildlife mortalities as detailed in section 9.3 A description of the perimeter fence design is clearly presented in Figure 1.6, showing that it is not "solid." Barbed wire has also been removed from the design to reduce fauna mortalities. The proponent considers that appropriate mitigation measures have been identified in V05.

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
			impacts for fauna movement.	
3	Describe the baseline ecological data for the development site based on the results of the BAR	Part	Doesn't list threatened flora likely to be found. Threatened species protocol for flora cannot be applied if the species descriptions haven't been provided and included as part of site induction. List of species is required for all vegetation types to assist with revegetation. Appendix B.2 is only relevant to PCT 45.	Threatened flora are listed in the BAR, which OEH, DPE, construction and operation staff all have access to. V06 of the BMP will be undated to reference species lists provided in the BAR.

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
4	Provide maps of the biodiversity values on the development site at an appropriate scale, including locations for threatened species and threatened ecological communities	Part	Difficult to read. Can this map realistically be used to identify no-go zones for site induction and directing site staff?	Remnant vegetation will be fenced prior to any construction works taking place (providing a physical barrier to entry) as described in section 11.2.1. Section 1.4 outlines the level of disturbance allowed in direct impact, indirect impact and undisturbed areas. Section 9.2. states: "Site induction provides an introduction to the ground disturbance permit and vegetation clearing processes, traffic movement restrictions and hygiene, threatened fauna identification and handling and locations of environmentally sensitive areas." A combination of this detail should be sufficient.
5	Update terminology in the BMP and appendices to be consistent with the BAR	No	Inconsistent terms through BMP could lead to mistakes	Though the BMP references the BAR, it is a stand alone document with terms consistent throughout and clearly defined in the "Acronyms and Abbreviations" at the beginning of the document.
6	Clearly explain the current and predicted vegetation management on the proposal site, including grazing.	Part	Partly included in Appendix	Section 3 describes that all vegetation community types have previously been subject to grazing including when recent BAR surveys were conducted. Section 7 describes impacts of changing management practices from heavy/regular grazing to a combination to mowing and/or grazing. Grassland management is described in section 11.2, which includes a combination of mowing and grazing.

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
7	Assess the potential indirect biodiversity impacts of structures and actions that were not identified by the BAR	Mostly	Still not including fence construction or all possible impacts of shading. Lack of including an increase in exotic species due to the proposal means it has not been addressed by the weed control protocol.	The fence will be constructed within the asset protection zone, aka a direct impact area where ground disturbance is permitted. Measures for identifying weeds are defined in section 11.3.2 and corrective action triggers are provided in section 2.3 including: " No increase in distribution of weeds currently existing within the project area and No new invasive weeds introduced to the project area."
8	Develop mitigation measures for residual impacts of structures and actions not identified in the BAR.	Part	Construction of fence should include habitat clearance – mitigation measure is buffer between vegetation and fence.	The fence will be constructed on the edge of the asset protection zone, aka a direct impact area where ground disturbance is permitted. The location of the fence next to remnant vegetation was discussed with DPE on 27/02/19.
9	Remove the sentence in Section D.3 (Appendix D 'Vegetation Clearing Procedure') stating that "some construction activities will require tree removal that has not been included in the design."	No		Done for V06.
10	Revise the statement of commitments in Section 5 (page 20) to include only biodiversity-related items	No		The interpretation of "biodiversity-related items" is subjective. References to waste management have been removed despite the ample literature about litter harming fauna through ingestion of getting caught in it. Fire management is also relevant to biodiversity because different spp. have varying resilience to fire, which can affect ecological communities. The location of infrastructure in relation to "impact zones" is also relevant.

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
11	Update the statement of commitments based on information generated by DPE, OEH and the proponent after the RTS was submitted. Include mitigation measures listed in the BAR (V07)	Yes	Table 7-1: OEH comments (Agency Submission) for EIS exhibition are not commitments. OEH comments on the BAR have not been removed and have been altered. They are not relevant. "Pre-construction survey" is incorrectly included – these were pre-determination. Pre-construction surveys are required for hollow-dependent fauna.	
12	Update the impacts in tables 8-3, 8-4 and 8-5 to ensure they adequately describe all the impacts relevant to implementation of the BMP	Part	8-1 mostly good. PCT45 target is wrong. Weed management needs target. Some key actions and mitigations rely on ground disturbance permit. What does the HSE manager use as constraints mapping for working out where clearing can occur?	PCT 45 target was supplied by OEH. Weed management targets supplied in section 2.3 "No increase in distribution of weeds currently existing within the project area and No new invasive weeds introduced to the project area." Also in PCT 45: exotic groundcover not to exceed 10%.

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
13	Revise tables 8-3, 8-4 and 8-5 to include activity, specific impacts to biodiversity, mitigation measures and ecologically-based completion criteria, and ensure they adhere to SMART principles. Remove activities that are not relevant to the BMP	No	<p>No plantings are to occur within any native vegetation (p 36), not just the VEZ. Remove CSU recommendations for native grassland management (p 36)</p> <p>Vegetation clearing protocols include pre-clearing inspection (p 37). Pest animal management protocol has no clear actions – it just provides details about recommended control methods. Pest control must include all retained vegetation on the whole development site, not just the disturbance footprint.</p>	<p>Section 2.3 states: "No revegetation or screening vegetation plantings within retained woodland or grassland areas." This should be sufficient. Pre-clearing inspections are appropriate. Pest animals movements would extend within the perimeter fence. Their movements would not be restricted to the development footprint anyway. Specific actions will be developed in collaboration with adjoining landholders as specified in section 11.3.1.</p>

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
14	Set out the ecological monitoring required to audit predicted impacts against the actual situation. Include monitoring actions, performance measures, triggers for remedial actions, a reporting schedule and completion criteria	Part	Monitoring actions are incomplete and not consolidated. They should be as per Attachment B. "Direct impacts to native grassland must not exceed 21.06 ha identified in EIS" - this phrase should not be used as a target. It did not come from the assessment. How will cumulative impacts to PCT 45 be tracked and monitored, and the limit determined?	There are two separate considerations here: The ground disturbance permit process is designed to track cumulative impacts and ensure that areas directly impacted are limited to approved direct impact areas. Monitoring will be carried out as per section 9.3 which also lists triggers for corrective actions. Vegetation condition targets are listed in section 2.3 including: Revegetation of disturbed areas will have 70% ground cover over 90% of disturbed areas, Failed vegetation patches greater than 5 m2 will be revegetated, Exotic plant populations greater than 10% of PCT 45 will be controlled. Ground cover will achieve seed set across at least 80% of area. Native species will be used in areas of native vegetation removal.
15	Provide details of an adaptive ecological management strategy for protecting and promoting the growth of native plant species (including PCT45), that incorporates the Biodiversity Monitoring Program in Appendix G	No	Section 9.3 is inconsistent with the rest of the document. "Feral animal and weed control surveys will occur on a seasonal basis" (p 48) - no method for feral animal surveys is provided in 11.3. No objectives, method, remedial actions or reporting have been provided for "general biodiversity monitoring". Section 9.3 mentions "General biodiversity monitoring... quantitative and ongoing assessment of grassland and woodland condition. Monitoring and	Monitoring will be carried out as per section 9.3 which also lists triggers for corrective actions. Vegetation condition targets are listed in section 2.3 including: Revegetation of disturbed areas will have 70% ground cover over 90% of disturbed areas, Failed vegetation patches greater than 5 m2 will be revegetated, High threat exotic plant cover greater than 5% will be controlled. Ground cover will achieve seed set across at least 80% of area. Native species will be used in areas of native vegetation removal.

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
			<p>evaluation of success will include a reflection on the seasonal conditions for the previous period.” This does not appear to be linked to assessment of mitigation measures. “Monitoring during construction will be monthly inspections of high disturbance areas, groundcover, protected woodland areas and boundary fence lines.” No method, objectives or reporting or outcomes have been provided. Section 10 continuous improvement needs to be built into a monitoring plan, otherwise no opportunity for DPE/OEH review. Annual review is required.</p>	
16	<p>Include all biodiversity-related monitoring details in the BMP instead of referring to other management plans</p>	No	<p>Reporting is detailed in the EMS (page 48). Groundcover management?</p>	<p>Groundcover management is clearly provided in this BMP. Numerous other protocols and procedures that would otherwise be contained in separate management plans (identified in V04) have been provided in section 11. This item has been thoroughly addressed.</p>

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
17	Provide a detailed weed management strategy for controlling the growth of exotic ground cover, addressing any non-native species likely to reduce condition of PCT 45, as required by Condition 12, over the life of the project	Part	<p>Priority weeds” used in Table 8-1, 8-2 and Section 9.3 is not defined. Exotic species management not addressed (apart from a mention). Includes mowing procedure in 11.2, which is not to be implemented. Timing of inspections is ambiguous: 11.3.2 mentions both monthly and “as required”. Any hay, straw or other mulching material brought onto the site must be certified weed free. Exotic species cover recorded in PCT 45 biobanking plots was generally very low (<1%). The trigger 10% cover for weed control is too high. It should be similar to the baseline/existing conditions (10% would be appropriate for a cultivated paddock). Needs to include action for eradicating new exotic species that appear during or post-construction. Herbicide must be suitable for use within native vegetation.</p>	<p>Section 11.3.2 "Weeds will be classified with reference to NSW WeedWise profiles." Monitoring including for weeds is detailed in section 9.3 and it is not ambiguous and clearly states "monthly during construction and annually during operations" "As required" is in addition to regular monitoring, for example if weeds need to be controlled during operations to ensure corrective actions have been successful.</p>

No	Recommendations by OEH on V04	Addressed	OEH Comments on V05	Proponent Response
18	Clarify the purpose of the mowing/slashing activity detailed in Section 8.3.2.	Yes		
19	Revise weed management protocols to remove fire management activities and outcomes for fuel reduction	No	Table 8-2 includes weed control based on spring mowing, according to the Grassland Management Procedure. This is inappropriate and conflicts with advice in Appendix B.	Section 11.3.2 describes numerous actions for weed control (mowing isn't one of them). The purpose of mowing is primarily to reduce the fuel load and has been identified as necessary to reduce the risk of fire. There may be unavoidable conflicts between protecting assets and biodiversity.
20	Provide details of fire management requirements for native vegetation in the development site and compare fuel load measures to ecological indicators used in the ecological management strategy (for protecting and promoting the growth of native plant species).	No	Still not integrated with biodiversity management and monitoring. How does assessing 5000 kg/ha dry matter fit into grassland monitoring? Confirm if the array area is to be mowed for fire management, not just the firebreaks.	Management of the grassland encompasses both biodiversity and reducing fire risk. It would not be appropriate to remove fire management practices from section 11.2, when they may impact biodiversity. Whether the impact is adverse or beneficial will be assessed through grassland monitoring. Yes the array "indirect impact zones" will be mowed and/or grazed.
21	Outline the vegetation communities to be established on rehabilitated areas, species composition, their area and a diagram showing their location.	No	No mapping provided. Species lists for all vegetation types must be provided from the BAR.	OEH, DPE, construction staff and operational staff all have access to species lists provided in the BAR, thus references to the BAR should be sufficient.

APPENDIX B GRASSLAND MONITORING PROGRAM AND TARGET CRITERIA

B.1 PCT 45 MONITORING METHODS

Darlington Point Solar farm Report by Dr Jodi Price (Charles Sturt University)

Objectives of monitoring and management

It is difficult to predict the effects of the PV panel arrays on grassland biodiversity and composition as studies have not been conducted. The monitoring program aims to identify any impacts of the solar arrays on biodiversity of PCT45 Plains Grassland and to outline an adaptive management program to maintain or enhance biodiversity. Regular monitoring and reporting will address if changes to management are required. The monitoring program has also been designed to contribute information on the effects of solar farms on grasslands. The expected impacts are summarised below and are the focus of the monitoring program:

- The solar farm will affect the grassland mostly through microclimatic changes, in relation to rainfall distribution, shading and temperature changes under the solar array
- Other impacts are alterations to disturbance regimes from biomass removal required to reduce fire risks and disturbance from construction activities

Biodiversity monitoring

Monitoring of biodiversity to determine impacts will be conducted in two main ways: temporal sampling to compare biodiversity with the baseline Biobanking assessment and spatial, to compare control plots with those under solar panels (these will also be sampled seasonally). Due to the short time frame of monitoring and dynamic nature of grasslands in response to climatic conditions the spatial plots (compared under solar panels with controls) are important to enable greater detection of impact. The protocol will differ for the spatial and temporal monitoring scheme, due to differences in size of monitoring plots, but sampling will occur at the same time for both approaches.

- Monitoring will commence the first autumn or spring after the PV panels have been installed, and continue every autumn and spring
- Spring (Oct-Nov) is the best time for grassland sampling as this is when native forbs—which make up most of the diversity—can be detected
- Autumn sampling is also required to provide a comparison with the Biobanking baseline assessment
- Sampling will continue until the 2-3 year post construction reporting requirement

Survey protocol

- Biobanking assessment - plots (20 x 20 m) will be located in the original Biobanking assessment plots where possible. Sampling will follow the Biobanking protocol. Control plots will be established as near as possible to the Biobanking plots (see Figure 8-1)

- Permanent 1 x 10 m plots will be established throughout the array area (minimum number of 20 plots under the solar arrays and 10 plots in control areas). These plots are designed to determine the impacts of the solar panels on areas which are beneath the maximum horizontal width of the panels. In each 1 x 10 m plot, 5 permanently marked 1 x 1 m plots will be established (see Figure 9-6). The control plots will be established in areas not affected by the PV arrays and where possible these will be paired with 'impact' plots (see Figure 8-1). The exact location of plots will be determined after construction and a site visit. In the absence of any obvious environmental gradients plots will be set up to be representative of the entire area of the farm (see Figure 8-1).
- For each of these 1 x 1 m plots, data will be collected on
 - Species richness and cover estimates for all plant species (in 5% intervals)
 - % cover of bare ground, dry plant matter (litter) and cover of non-vascular plants in 5% intervals
 - A photographic image
 - Biomass will be measured using rising plate method or 'golf ball method'

Microclimatic changes under solar arrays

To determine the impact of the solar arrays on microclimatic conditions, changes in temperature, light availability and soil moisture will also be assessed at regular intervals in the sampling plots. This will assist in interpreting any changes in grassland biodiversity.

Disturbance management and fire risk

Management of the site to reduce fire risk may be required. Biomass control to reduce fire risk is required when dry matter exceeds 5000 kg/ha. Biomass at the grassland is not expected to regularly reach this amount of biomass and may only occur in high rainfall years. Biomass estimates from the site were on average 2878 kg/ha and ranged from 944 - 4052 kg/ha (McCormick and Orchard 2018).

Biomass management will be conducted by mowing when required to reduce fire risk and will occur in late summer or autumn when it is optimal to promote species richness in grasslands. Mowing can have positive impacts on biodiversity but the effects can be negative when cuttings are not removed. Litter can reduce diversity in grasslands by reducing germination and seedling establishment (and can have similar impacts to reductions in light availability). Ideally, mowing should be followed by raking to remove cut material, this will be examined in the control plots located outside of the main PV array area (see Figure 8-1). Biomass removal via mowing or grazing should be avoided from October to January to promote growth and recruitment of native plants.

Grazing will not be used for biodiversity management or fuel reduction as it is considered harder to manage precisely and is not considered to add value to biodiversity. The removal of grazing to Plains Grassland with a conservative stocking history is unlikely to result in major changes to biodiversity. However, removal of grazing can have positive, negative or neutral responses. A negative response that can occur is if exotic species are being controlled by grazing (there are some examples of wild oats increasing with grazing removal). Monitoring will determine if weed cover and richness is increasing and if management is required. Grazing will only be used if deemed useful for management of weeds, and other weed control methods will also be explored.

The impacts of mowing with retention of cut material is unknown and will be monitored and adapted if required. A monitoring trial will be established outside of the main solar array area (see Figure 8-1). Here, five control plots (1 x 10 m) will be established as per Figure 9-6 in which no mowing will occur (as long as

no fire risk is posed). An additional five plots (1 x m) will be established to compare mowing + raking to remove cut material and five plots (1 x m) to compare mowing-raking without removal of cut material. Mowing will occur at the same time as any mowing in the solar array area that occurs for fuel reduction.

Analysis of impacts

- Temporal data from the Biobanking assessment will determine if native plant species richness has been maintained at 11.44 or reduced below the benchmark value of 8
- Spatial analysis of control plots and those directly beneath the panels will compare if there are significant differences in species richness in areas beneath the panels
- Other impacts of the solar arrays will be examined by determining if species composition has changed due to alterations to the microclimate (e.g. if there have been shifts in exotic species, if broad-leaf plants have been favoured by altered microclimate)
- Temporal analysis of species richness and composition data will be used to examine the trajectory of change in the grassland. It is expected that the disturbance from construction may impact on the grassland in comparison to benchmark assessments and hence comparing patterns through time will help to determine if there are permanent shifts in richness and composition or if the grassland is in a trajectory of recovery. This will enable more accurate prediction of longer term effects.
- Data will be analysed annually to determine if adaptive management is required

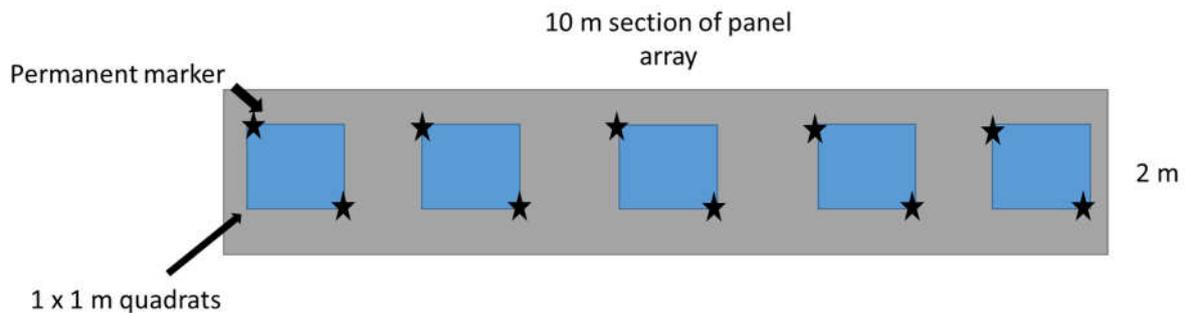


Figure 10-11: Grassland monitoring test plot layout

Monitoring plot arrangement for spatial comparisons of control plots with areas beneath solar panels and for control plots comparing mowing and raking. Permanent plots of 1 x 10 m will be established in areas under solar panels (see Figure 8-1 for location). Sampling will be conducted in the 1 x 1 m quadrats which will be located directly beneath the solar panels. The same sampling scheme will be established in control areas, not impacted by PV panels.

References

McCormick, J. and Orchard, P. (2018) *Report to Edify Energy on the proposed solar photovoltaic farm at Darlington Point: Effects of solar voltaic farm installation and operation on Riverine Plain Grasslands*, Charles Sturt University, Wagga Wagga, NSW.

B.2 BIODIVERSITY ASSESSMENT REPORT PLOT DATA

Life Form	Family	Species	Common Name	Exotic	Q2	Q4	Q5	Q6	Q15	Q20	Q24	Q25	Q26	Q27	Q28	Q29	Plots	PCT
Grass	Poaceae	<i>Austrostipa aristiglumis</i>	Plains Grass		50	60	40	50	80	50	0.1	80	60	70	5	15	12	1
Shrub	Malvaceae	<i>Sida cunninghamii</i>	Ridged Sida		3	0.1	0.1	0.1	0.1	1		2	0.1	0.1		0.1	10	KM2
Herb	Solanaceae	<i>Solanum esuriale</i>	Quena			0.1	0.1	1	5	0.1	1	2	0.1	3			9	1
Herb	Boraginaceae	<i>Heliotropium europaeum</i>	Potato Weed	*	1	0.1	1				0.1	0.1		0.1	3	5	8	
Herb	Oxalidaceae	<i>Oxalis perennans</i>	-		0.1	0.1			0.1	1	6		1		0.1	0.1	8	1
Grass	Poaceae	<i>Rytidosperma duttonianum</i>	-		15			25		20		1	5	15	0.1	5	8	1
Grass	Poaceae	<i>Chloris truncata</i>	Windmill Grass		5	5	5	5	0.1				5	10			7	1
Grass	Poaceae	<i>Walwhalleya proluta</i>	-		5	5	1	1		5			10	5			7	1
Herb	Chenopodiaceae	<i>Sclerolaena muricata</i>	Black Rolypoly		5	0.1	0.1		0.1		3				0.1		6	1
Herb	Asteraceae	<i>Vittadinia gracilis</i>	Woolly New Holland Daisy		0.1		5	0.1	0.1				1				5	KM1
Shrub	Asteraceae	<i>Xanthium spinosum</i>	Bathurst Burr	*		0.1	0.1		1		0.1					0.1	5	
Herb	Nyctaginaceae	<i>Boerhavia dominii</i>	Tarvine		1						1				0.1	0.1	4	
Grass	Poaceae	<i>Eragrostis spp.</i>	-					5	1			5	5				4	
Grass	Poaceae	<i>Lolium spp.</i>	Ryegrass	*	30	5									80	80	4	
Shrub	Chenopodiaceae	<i>Maireana aphylla</i>	Leafless Bluebush		0.1		0.1		0.1					0.1			4	KM1
Herb	Campanulaceae	<i>Wahlenbergia stricta</i>	Australian bluebell		1			0.1					0.1	0.1			4	
Grass	Poaceae	<i>Enteropogon acicularis</i>	-			1		1			0.1						3	
Grass	Poaceae	<i>Enteropogon ramosus</i>	Curly Windmill Grass			1	5					5					3	1
Herb	Boraginaceae	<i>Heliotropium amplexicaule</i>	Blue Heliotrope	*	1	0.1										0.1	3	
Rush	Juncaceae	<i>Juncus flavidus</i>	-								1		1	0.1			3	
Herb	Brassicaceae	<i>Lepidium africanum</i>	-	*	1										0.1	2	3	
Grass	Poaceae	<i>Austrostipa scabra</i>	Speargrass									1	5				2	KM1
Grass	Poaceae	<i>Chloris gayana</i>	Rhodes Grass	*								0.1		0.1			2	
Climber	Convolvulaceae	<i>Convolvulus erubescens</i>	Blushing Bindweed						1			0.1					2	KM2
Shrub	Chenopodiaceae	<i>Einadia hastata</i>	Berry Saltbush			0.1	0.1										2	KM1
Shrub	Chenopodiaceae	<i>Enchylaena tomentosa</i>	Ruby Saltbush			0.1	0.1										2	
Herb	Asteraceae	<i>Leiocarpa panaetioides</i>	Woolly Buttons		1		2										2	KM2
Graminoid	Lomandraceae	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush					1	0.1								2	
Shrub	Lamiaceae	<i>Marrubium vulgare</i>	White Horehound	*	0.1							1					2	
Herb	Polygonaceae	<i>Rumex brownii</i>	Swamp Dock						1			0.1					2	1
Herb	Malvaceae	<i>Sida corrugata</i>	Corrugated Sida							1		2					2	KM2
Herb	Rubiaceae	<i>Asperula conferta</i>	Common Woodruff			0.1											1	1
Grass	Poaceae	<i>Avena fatua</i>	Wild Oats	*								0.1					1	
Herb	Callitricaceae	<i>Callitriche spp.</i>	Starwort					1									1	
Herb	Cucurbitaceae	<i>Citrullus lanatus</i>	Watermelon	*							5						1	
Grass	Poaceae	<i>Cynodon dactylon</i>	Couch								4						1	
Tree	Myrtaceae	<i>Eucalyptus largiflorens</i>	Black Box		0.1												1	

Life Form	Family	Species	Common Name	Exotic	Q2	Q4	Q5	Q6	Q15	Q20	Q24	Q25	Q26	Q27	Q28	Q29	Plots	PCT
Rush	Juncaceae	<i>Juncus aridicola</i>	-					1									1	
Herb	Chenopodiaceae	<i>Maireana decalvans</i>	Black Cotton Bush			0.1											1	
Herb	Marsileaceae	<i>Marsilea</i> spp.	Nardoo			5											1	1
Herb	Malvaceae	<i>Modiola caroliniana</i>	Red-flowered Mallow	*							0.1						1	
Herb	Asteraceae	<i>Onopordum acanthium</i>	Scotch Thistle	*			0.1										1	
Grass	Poaceae	<i>Panicum effusum</i>	Hairy Panic											0.1			1	
Grass	Poaceae	<i>Paspalum dilatatum</i>	Paspalum	*							0.1						1	
Herb	Polygonaceae	<i>Polygonum aviculare</i>	Wireweed	*							0.1						1	
Herb	Asteraceae	<i>Senecio</i> spp.	-	*	0.1												1	
Herb	Scrophulariaceae	<i>Verbascum virgatum</i>	Twiggy Mullein	*												0.1	1	

APPENDIX C EXCLUSION ZONE TRANVERSE MAPS

Figure 1 – Area 1 (North West corner of the DPSF Solar Farm) for consideration of change to vegetation protection zone from 20m to 10m.

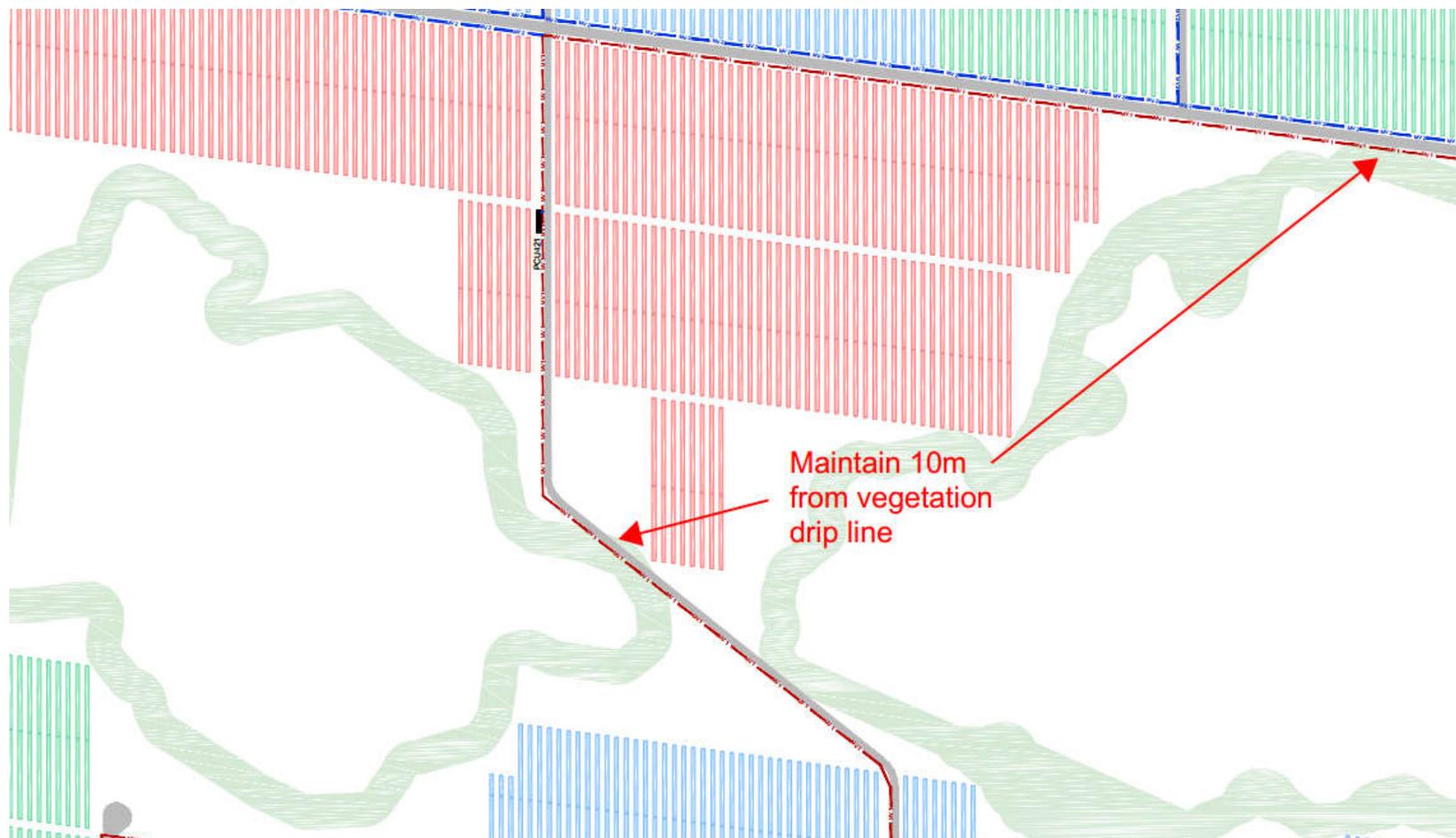


Figure 2 – Area 2 (Northern side of the DPSF Solar Farm) for consideration of change to vegetation protection zone from 20m to 10m

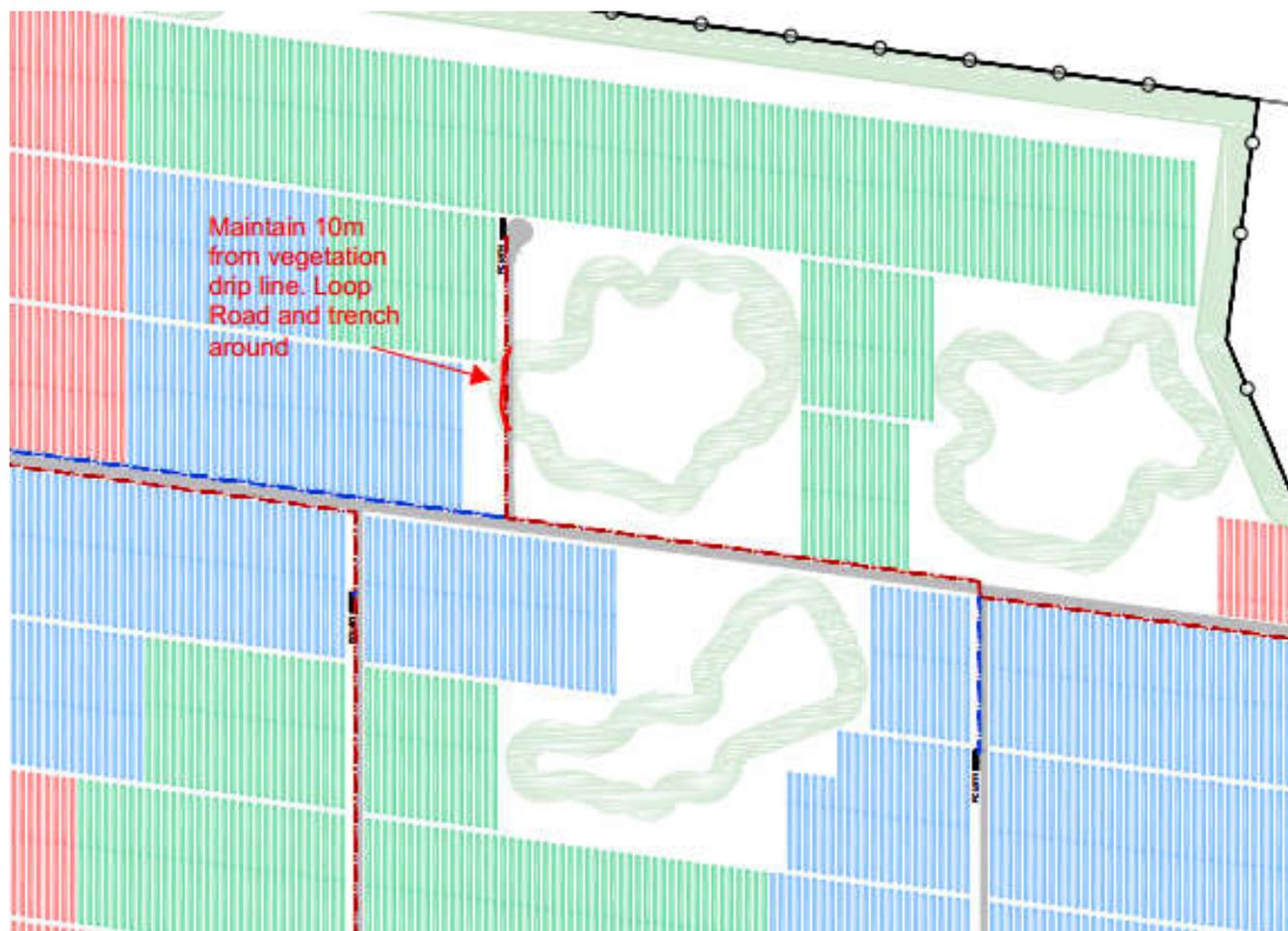


Figure 3 – Area 3 and 4 (Middle of the DPSF Solar Farm near powerline easement) for consideration of change to vegetation protection zone from 20m to 10m to still ensure protection of the retained vegetation

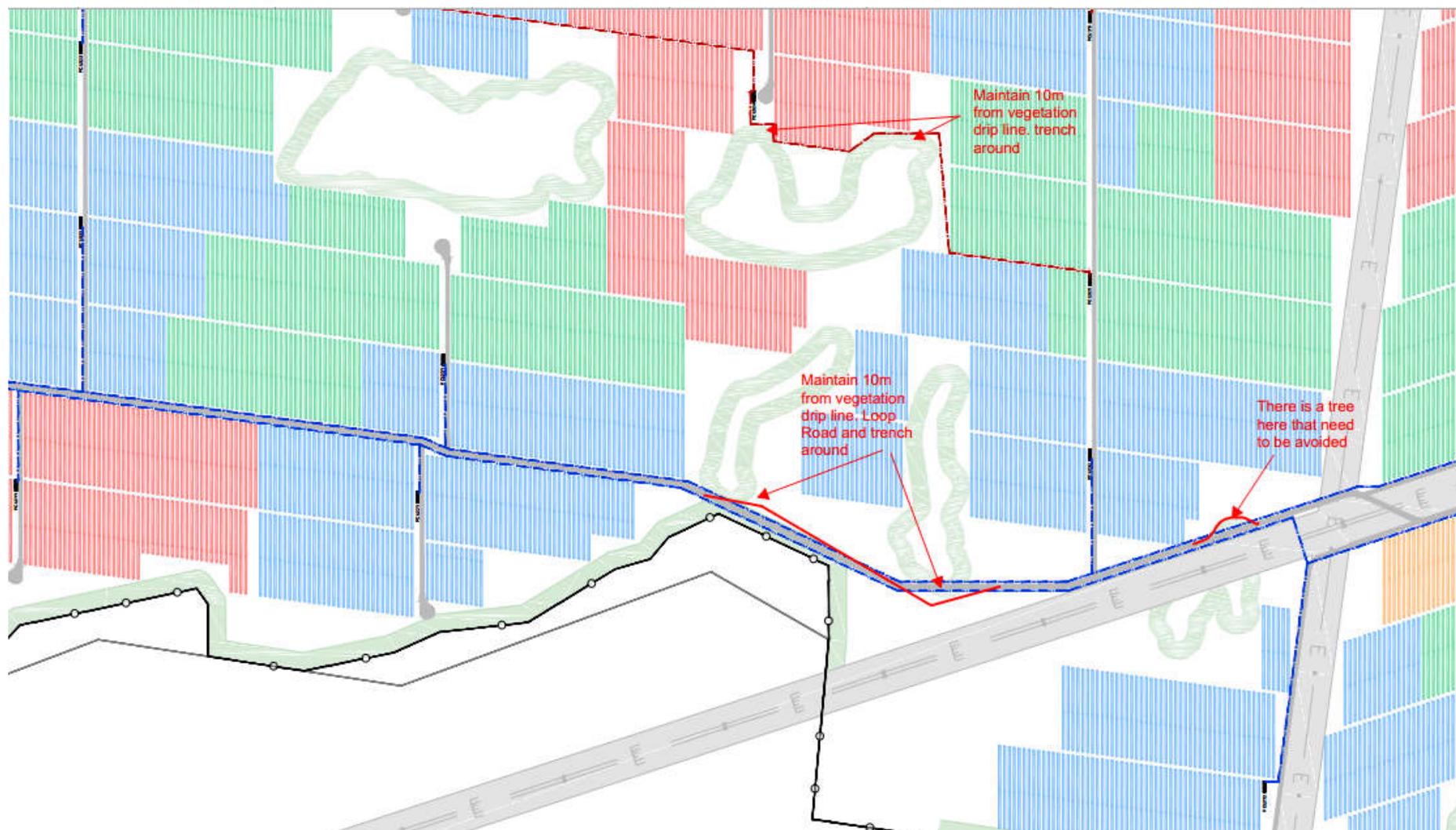


Figure 4 – Area 5 (South East corner of the DPSF Solar Farm near powerline easement) for consideration of change to vegetation protection zone from 20m to 10m

