Appendix B2

Flora and Fauna Management Sub-plan

Infrastructure Works (Package 4)

Parramatta Light Rail – Stage 1

October 2019

PLR1INF-CPBD-ALL-PE-PLN-000004 Rev 5

NSW GOVERNMENT

THIS PAGE LEFT INTENTIONALLY BLANK

Flora and Fauna Management Sub-plan

Project Name: Parramatta Light Rail Stage 1
Infrastructure Contract

Project number	N81080
Document number	PLR1INF-CPBD-ALL-PE-PLN-000004
Revision date	14/10/2019
Revision	5

Rev.	Date	Prepared By	Reviewed By	Approved By	Remarks
A	22/03/2019	B.Cole	P.Monsted	P.Monsted	nil
B	15/04/2019	B.Cole	P.Monsted	P.Monsted	nil
0	16/04/2019	P. Monsted	D. Corish	R. Gardner	nil
1	14/06/2019	P.Monsted	D. Corish	R. Gardner	nil
2	26/07/2019	P.Monsted	P.Monsted	D. Jackson	nil
3	5/08/2019	D. Corish	P.Monsted	D. Jackson	nil
4	12/08/2019	D. Corish	P.Monsted	D. Jackson	nil
5	14/09/2019	D. Romero	P.Monsted	D. Jackson	nil

Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this plan is reviewed and approved. The Project Director is responsible for updating this plan to reflect changes to the project, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director and/or client before being distributed / implemented.

Revision	Details
Rev A	CPBD JV internal review.
Rev B	Incorporation of CPBJV review comments.
Rev 0	First draft submitted to TfNSW and ER. Revision issued for external stakeholder consultation.
Rev 1	Second draft submitted to TfNSW and ER for consultation.
Rev 2	Incorporation of external stakeholder consultation comments. Submission for ER endorsement.
Rev 3	Incorporation of ER comments and submission to ER for endorsement.
Rev 4	Incorporation of ER endorsement.
Rev 5	Incorporation DPIE comments from the 27 September 2019

Contents

1 Introduction 1

1.1 Context 1

1.2 Background 1

1.2.1 Parramatta Light Rail – Stage 1 description 1

1.2.2 Statutory Context 3

1.2.3 Stage 1 Delivery Strategy 3

1.3 Infrastructure Works 4

1.4 Relationship with SOM 5

1.5 Scope of the Sub-plan 5

1.6 Environmental Management System overview 6

2 Purpose and objectives 8

2.1 Purpose 8

2.2 Objectives 8

2.3 Targets 8

3 Environmental requirements 9

3.1 Relevant legislation and guidelines 9

3.1.1 Legislation 9

3.1.2 Guidelines and Standards 9

3.2 Ministers Conditions of Approval 10

3.3 Revised Environmental mitigation and management measures 21

3.4 Environmental Performance Outcomes 36

4 Consultation 37

5 Existing Environment 38

5.1 Endangered ecological communities 38

5.2 Threatened or otherwise significant flora species 38

5.3 Fauna habitat 40

5.4 Threatened fauna 41

5.5 Street Trees 42

5.6 Weeds, Pests and Pathogens 42

5.7 Aquatic fauna 43

5.8 Aquatic flora 43

6 Environmental aspects and impacts 44

6.1 Construction activities 44
6.2 Clearing and grubbing of native vegetation (including habitat) 44
6.3 Ecological impacts 44
6.4 Impacts on Trees 45
7 Environmental mitigation and management measures 46
7.1 Tree Protection 46
7.1.1 Tree Registers 46
7.1.2 Design Review for Impacts on Trees 46
7.1.3 Tree Protection Plans 48
7.2 Tree Offset Package 48
7.3 Flora and Fauna Management Strategies 48
7.3.1 Pre-clearing surveys 48
7.3.2 Vegetation Clearing Protocol 48
7.3.3 Fauna Rescue Procedure 48
7.3.4 Unexpected threatened species finds 49
7.3.5 Nest Box Strategy 49
7.4 Weed, Pest and Pathogen Control Procedure 50
7.5 Environmental control measures 51
8 Compliance management 67
8.1 Roles and responsibilities 67
8.2 Training 69
8.3 Monitoring and Inspections 69
8.4 Reporting 69
8.5 Auditing 69
9 Review and improvement 78
9.1 Continuous improvement 78
9.2 FFMP update and amendment 78
Appendix A – Vegetation Clearing Protocol 79
Appendix B - Fauna Rescue Procedure 81
Appendix C – PLR Plant and Equipment Clean Down Declaration 86
Appendix D – PLR Pre-Clearing and Grubbing Inspection Checklist 87
Appendix E – Endangered Ecological Community Maps 88
Appendix F - Consultation Evidence 89
Appendix G – Environmental Representative Endorsement 94

Tables

Table 3-1 Minister's Conditions of Approval relevant to the FFMP 10
Table 3-2 Revised Environmental mitigation and management measures relevant to this FFMP .. 21
Table 3-3 Environmental Performance Outcomes relevant to this FFMP 36
Table 4-1 Summary of Consultation and Approval 37
Table 5-1 Threatened or otherwise significant flora species 39
Table 5-2 Fauna habitat types 40
Table 5-3 Threatened fauna 41
Table 5-4 Aquatic fauna 43
Table 5-5 Classification of waterways 43
Table 7-1 Flora and fauna management and mitigation measures 52
Table 8-1 Roles and Responsibilities 67
Table 8-2 Inspection and Monitoring Requirements 70
Table 8-3 Reporting Requirements 73

Figures

Figure 1-1: Parramatta Light Rail Stage 1 Route 2
Figure 1-2: Parramatta Light Rail Stage 1 Delivery Strategy 4
Figure 1-3: Relationship between Infrastructure Works and Supply, Operate and Maintain Works . 5
Figure 1-4: Environmental Management System 7
Figure 7-1: Tree impact assessment hierarchy 47

Glossary / Abbreviations

Abbreviations	Expanded text
BA Act	*Biosecurity Act 2015*
BC Act	*Biodiversity Conservation Act 2016*
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval
CSSI	Critical State Significant Infrastructure
DECCW	Department of Environment Climate Change and Water
DPIE	NSW Department of Planning, Industry and Environment (the responsibilities of the former Department of Planning and Environment are now administered by the Department of Planning, Industry and Environment)
DPIE EES	Department of Planning, Industry and Environment - Environment Energy and Science Group (formerly Office of Environment and Heritage, OEH)
DPI	Department of Primary Industries
ECM	Environmental Control Map
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ER	Environmental Representative
ERSED	Erosion and Sediment
ESCP	Erosion and Sediment Control Plan
ETS	Electronic Ticketing System
EWMS	Environment Work Method Statement
FFMP	Flora and Fauna Management Plan
FM Act	*Fisheries Management Act 1994*

Abbreviations	Expanded text
IA	Independent Arborist
LGA	Local Government Area
NES	National Environmental Significance
NPW Act	*National Parks and Wildlife Act 1974*
OEH	The former NSW Office of Environment and Heritage. Functions of the OEH are now undertaken by the Department of Planning, Industry and Environment - Environment Energy and Science Group (DPIE ESS)
POEO Act	*Protection of the Environment Operations Act 1997*
Planning Approval	Infrastructure approval SSI 8285
REMMM	Revised Environmental Mitigation and Management Measure
SaM	Stabling and Maintenance
SPIR	Submissions and Preferred Infrastructure Report
TfNSW	Transport for New South Wales
The JV	CPB Contractors and Downer EDI Works Joint Venture
TPZ	Tree Protection Zone
TSC Act	The repealed *Threatened Species Conservation Act 1995*
UDRR	Urban Design Requirements Report

1 Introduction

1.1 Context

This Flora and Fauna Management Sub Plan (FFMP or Sub-plan) forms part of the Construction Environmental Management Plan (CEMP) for the Parramatta Light Rail Stage 1, Package 4 Infrastructure Works (Infrastructure Works). This FFMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA) SSI-8285, the revised environmental mitigation and management measures (REMMMs) and Environmental Performance Outcomes (EPO's) listed in *Parramatta Light Rail Stage 1 Westmead to Carlingford via Parramatta CBD and Camellia Environmental Impact Statement* (the EIS), as amended by the *Parramatta Light Rail (Stage 1) Westmead to Carlingford via Parramatta CBD and Camellia Submissions Report (incorporating Preferred Infrastructure Report)* (February 2018) (the SPIR). In addition, this Sub-plan addresses all applicable legislation and contractual requirements, including the PLR Stage 1 Infrastructure Contract Project Deed (ISD-17-6721).

1.2 Background

1.2.1 Parramatta Light Rail – Stage 1 description

Parramatta Light Rail is one of the NSW Government's major infrastructure projects being delivered to serve a growing Sydney.

Parramatta Light Rail Stage 1 (Stage 1) will connect Westmead to Carlingford via Parramatta Central Business District (CBD) and Camellia. Stage 1 is expected to be operational in 2023.

Stage 1 will create new communities, connect great places and help both local residents and visitors move around and explore what the region has to offer. The route will link Parramatta's CBD and train station to a number of key locations, including the Westmead Precinct, the Parramatta North Growth Centre, the new Western Sydney Stadium, the Camellia Town Centre, the new Powerhouse Museum and Riverside Theatre arts and cultural precinct, the private and social housing redevelopment at Telopea, the Rosehill Gardens Racecourse and the three Western Sydney University campuses.

In summary, the key features of Stage 1 include:

- A new dual track light rail network of approximately twelve (12) kilometres in length, including approximately seven (7) kilometres within the existing road corridor and approximately five (5) kilometres within the existing Carlingford Line and Sandown Line, replacing current heavy rail services
- Sixteen (16) stops that are fully accessible and integrated into the urban environment including a terminus stop at each end of Westmead and Carlingford
- High frequency 'turn-up-and-go' services operating seven days a week from 5am to 1am. Weekday services will operate approximately every 7.5 minutes in the peak period between 7am and 7pm
- Modern and comfortable air-conditioned light rail vehicles, nominally 45 metres long and driver-operated, each carrying up to 300 passengers.
- Intermodal interchanges with existing public transport services at Westmead terminus, Parramatta CBD and the Carlingford terminus
- Creation of two light rail and pedestrian zones (no general vehicle access) within the Parramatta CBD along Church Street (generally between Market Street and Macquarie Street) and along Macquarie Street (generally between Horwood Place and Smith Street)

- A Stabling and Maintenance (SaM) Facility located in Camellia for light rail vehicles (LRV) to be stabled, cleaned and maintained
- New bridge structures along the alignment including over James Ruse Drive and Clay Cliff Creek, Parramatta River (near the Cumberland Hospital), Kissing Point Road and Vineyard Creek, Rydalmere
- Alterations to the existing road network including line marking, additional traffic lanes and turning lanes, new traffic signals, and changes to traffic flows
- Relocation and protection of existing utilities
- Public domain and urban design works along the corridor and at Stop precincts
- Closure of the heavy rail line between Carlingford and Clyde
- Active transport corridors and additional urban design features along sections of the alignment and within Stop precincts
- Integration with the Opal Electronic Ticketing System (ETS)
- Real time information in light rail vehicles and at Stops via visual displays and audio.

An overview of Parramatta Light Rail Stage 1 route is shown in **Figure 1-1**.

Figure 1-1: Parramatta Light Rail Stage 1 Route

1.2.2 Statutory Context

The Parramatta Light Rail is subject to environmental impact assessment under the *Environmental Planning and Assessment Act 1979* (EP&A Act). It is classified as Critical State Significant Infrastructure (CSSI). The EIS assessed impacts for Parramatta Light Rail Stage 1 (Westmead to Carlingford). This covered the light rail and associated works including road enabling work.

Stage 1 received Infrastructure Approval from the Minister for Planning under Section 5.19 of the EP&A Act on 29 May 2018 (Critical State Significant Infrastructure Application SSI-8285), subject to the conditions provided in the Instrument of Approval, specifically Schedule B – Ministerial Conditions of Approval.

The Infrastructure Approval was subsequently modified under Section 5.25 of the EP&A Act on 21 December 2018 and 25 January 2019.

The planning approval, modifications and related environmental assessment documents are located at: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8285.

1.2.3 Stage 1 Delivery Strategy

Delivery of Stage 1 is achieved through the following five packages of work:

- **Enabling Works (Package 1)** – Local road network improvements including O'Connell Street and George Street (off-alignment)
- **Westmead Precinct Works (Package 2)** – Hawkesbury Road widening and demolition at Cumberland Hospital (east and west Campus)
- **Early Works (Package 3)** – Remediation of the Stabling and Maintenance (SaM) Facility.
- **Infrastructure Works (Package 4) (the subject of this Plan)** – Design and construction of civil works, public domain and light rail infrastructure up to road level/top of rail and to the top of the concrete slab at stops, including provision of utility services (excluding high-voltage power supply and cabling for rail systems), and decommissioning of the T6 Carlingford Line)
- **Supply, Operate and Maintain Works (Package 5)** – Design and construction of the light rail systems, high-voltage power supply and stops above slab level, the supply of light rail vehicles, and the design and construction of the SaM Facility, including all light rail operations, customer service and asset management.

Each package of work is to be delivered under separate contracts on behalf of the proponent Transport for NSW. While the packages will commence at different times under separate construction approvals, there will be periods during which the packages works will overlap. The interactions between the packages are shown in **Figure 1-2**.

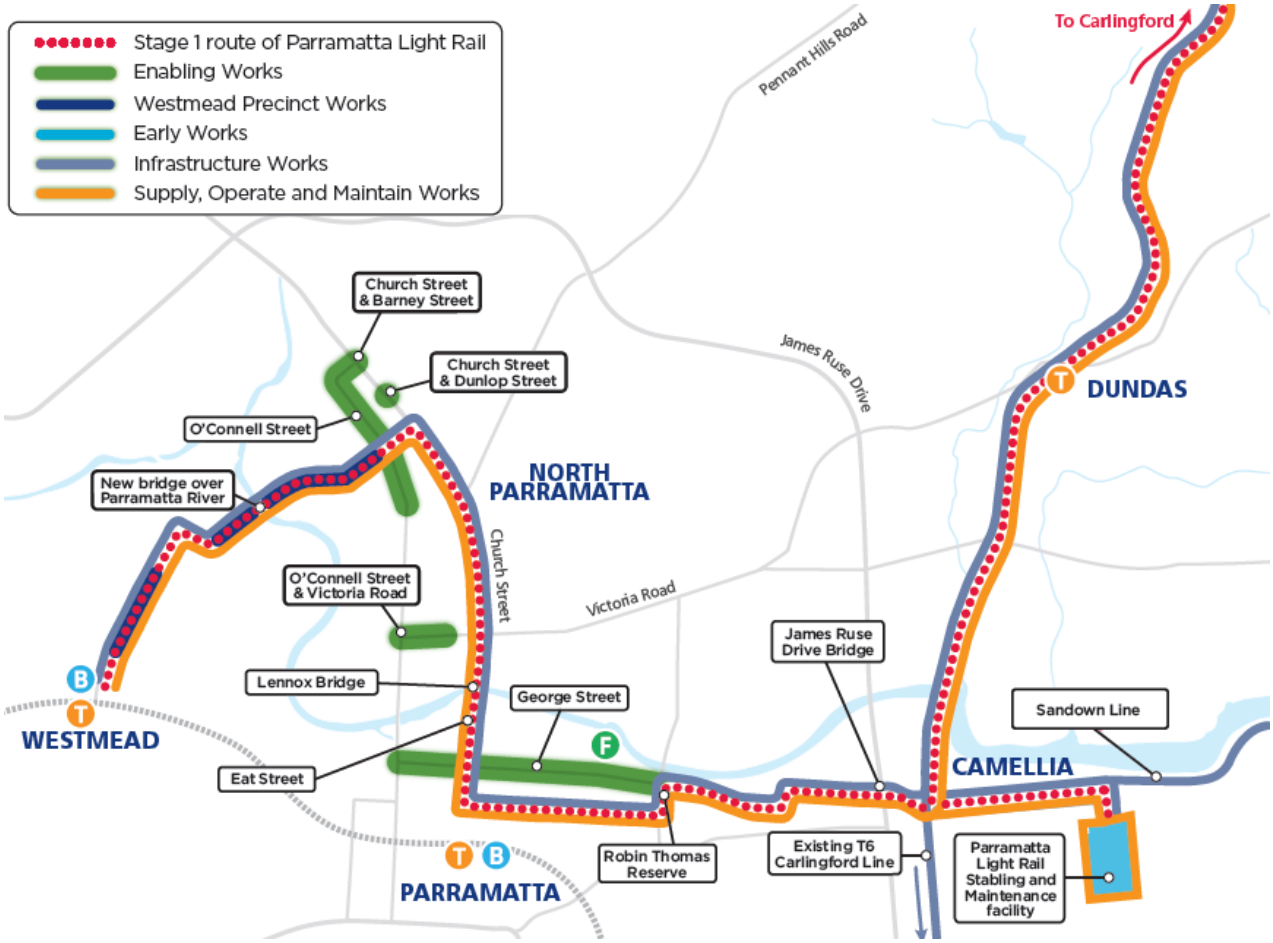


Figure 1-2: Parramatta Light Rail Stage 1 Delivery Strategy

1.3 Infrastructure Works

The CPB Contractors and Downer EDI Works Joint Venture (JV) has been engaged to deliver Package 4 – Infrastructure Works (INF).

In summary the Infrastructure Works include:

- Utility Services adjustment and relocation works (for more than minor impact)
- Property demolition to make space for the light rail tracks and ancillary facilities
- Decommissioning of the existing Carlingford T6 heavy rail line and disused Sandown Line
- Earthworks and retaining structures
- Drainage works
- Intersection signalling works
- The light rail civil infrastructure and Stop slabs
- Urban and architectural design and finishes of the corridor and public domain
- Rail, track slabs, ballasted track and grass tracks
- Footpath and kerb realignment including intersection works and road upgrades to accommodate light rail and other traffic (both temporary and permanent)
- New light rail bridges carrying the light rail over the Parramatta River (at Cumberland Hospital), James Ruse Drive, Vineyard Creek and Kissing Point Road and bridge strengthening and modifications to existing bridges as required

- Provision of the Active Transport Link for pedestrians and cyclists
- Staff and passenger facilities at each light rail terminus
- Rail/road interaction including traffic signals and road sharing
- Testing and commissioning of the Infrastructure Works.

1.4 Relationship with SOM

The Infrastructure Works is closely aligned to the Package 5, Supply, Operate and Maintain (SOM) Works which is being delivered by the Great River City Light Rail consortium. A graphical representation of the split in scope between the two packages is depicted in **Figure 1-3**.

The reasoning for dividing this work into two stages is to ensure that suitably qualified and experienced sub-contractors are in place for each specialised component; civil infrastructure, and operational systems. The Infrastructure Works will deliver the civil infrastructure components of Stage 1 and will not trigger the operational conditions with the exception of those that relate to detailed design.

An interface between the two Joint Ventures has been established to monitor cumulative impacts and the coordination of environmental complaints management, site management controls, and the delineation of incident reporting and non-conformance management. Opportunities to share information, materials and resources will also be explored to support an overall minimisation of biodiversity impacts (including trees).

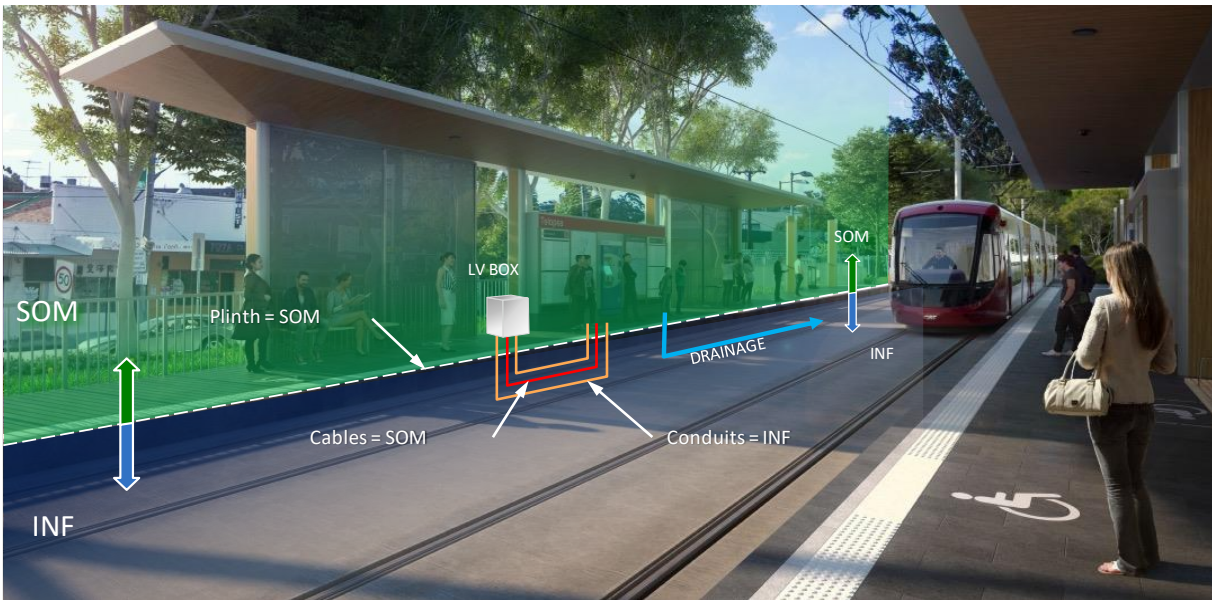


Figure 1-3: Relationship between Infrastructure Works and Supply, Operate and Maintain Works

1.5 Scope of the Sub-plan

The scope of this FFMP is to outline the mitigation and management measures the CPB Contractors and Downer EDI Works Joint Venture (the JV) will use to address potential impacts to trees and flora and fauna during Project construction, while complying with relevant approval, statutory and contract requirements. Sections 3.2, 3.3 and 3.4 provide compliance tables identifying where in this Sub-plan relevant requirements are addressed.

This Sub-plan is applicable to all activities during construction of the Project, including all areas where physical works will occur or areas that may be otherwise impacted by the construction works, and under the control of the JV. All the JV staff and sub-contractors are required to operate fully under the requirements of this plan and related environmental management plans, over the full duration of the construction program.

1.6 Environmental Management System overview

The environmental management system overview is described in Section 1.5 of the CEMP.

To achieve the intended environmental performance outcomes, CPB have established, implemented, maintained and continually improved an EMS in accordance with the requirements of ISO14001:2015. The CPB EMS will be adopted as the guiding environmental management framework for the Infrastructure Works.

The EMS consists of governance documentation, including this Sub-plans, procedures and tools as set out below and illustrated in **Figure 1-4**.

- **The JV Environment and Sustainability Policy** - Outlines the commitments and intentions established by the JV to ensure environmental performance and sustainability objectives and targets are achieved (Appendix A3 of the CEMP)
- **The CEMP** - This document details the processes and procedures to be implemented during the Infrastructure Works to comply with applicable CoA, REMMMs, EPOs, legislative obligations and contractual requirements
- **Environmental Management Sub-plans** - These documents describe procedures and controls for specific environmental aspects requiring more rigorous management strategies
- **Environmental Design Review Reports –** reports to accompany each design package that will demonstrate and consideration of environmental impacts including Trees
- **Environmental Work Method Statements (EWMS)** - Environmental Work Method Statements (EWMS) – Task-specific risk assessment prepared for high-risk construction activities. EWMS are focussed on activities with significant environmental risks
- **Environmental Control Maps (ECMs)** - Reflecting the outcomes of risk assessments, ECMs depict environmental risks and controls on site-specific maps
- **Geographic Information System (GIS)** -The GIS incorporate key features of the alignment and relevant environmental constraints. Features include waterways, heritage, biodiversity contamination and sensitive receivers amongst other site relevant features. The GIS forms the basis of Environmental Control Maps (ECMs)
- **Procedures, strategies and protocols** - Detailed procedures for inclusion in work packs.

Key interactions for this Sub-plan with other management plans include:

- **Grey-headed flying fox Monitoring Program –** the monitoring program required under CoA C9(c) has been prepared as a free-standing document. Recommendations from the monitoring program have been incorporated into this Sub-plan
- **Biodiversity Offset Strategy –** identifies the residual biodiversity impacts which require offsets (i.e. focus on endangered ecological communities and endangered species) and identifies the ecological values of the offsets (EIS, Technical Paper 4, Appendix F)
- **Tree Offset Package (Condition E107) –** identifies how impacts on trees (including urban street trees) and vegetation will be mitigated, managed, and compensated
- **Urban Design Requirements Report (UDRR)** – defines the landscape and architectural character for the Project including principles for the reinstatement of landscape areas including species selection
- **Soil and Water Management Sub-plan (SWMP)** – details a number of the controls relating to the management of erosion and sediment control and water quality which addresses parts of REMMM BI-4.

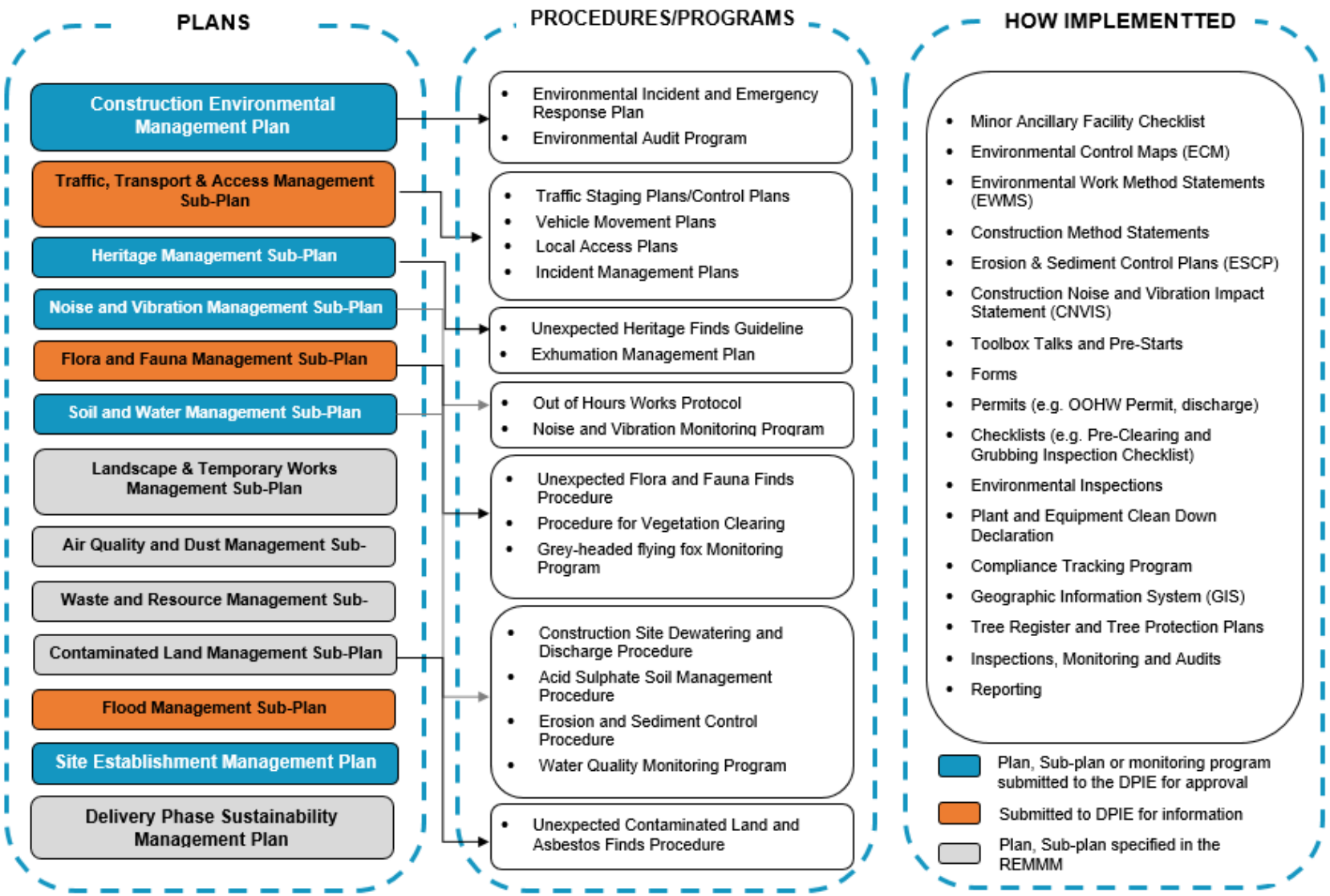


Figure 1-4: Environmental Management System

2 Purpose and objectives

2.1 Purpose

The purpose of this Sub-plan is to describe how construction impacts on flora and fauna will be avoided, minimised and/or managed during the construction of the Infrastructure Works.

2.2 Objectives

The objective of the FFMP is to ensure that all CoA, REMMMs and EPOs relevant to the protection of trees, native flora and fauna including threatened species and endangered ecological communities are described, scheduled and assigned responsibility as outlined in:

- Environmental Impact Assessment prepared for Parramatta Light Rail – Stage 1
- Submissions and Preferred Infrastructure Report prepared for Parramatta Light Rail – Stage 1
- Conditions of Approval granted to the project on 29 May 2018 and modifications
- PLR Stage 1 Infrastructure Contract Project Deed (Project Deed)
- Tree Offset Package
- Biodiversity Offset Strategy.

2.3 Targets

The following targets have been established for the management of flora and fauna impacts during the Project:

- Ensure full compliance with the relevant legislative requirements, CoA, REMMMs and EPOs
- Implement appropriate controls and procedures during construction activities to minimise adverse impacts to endangered ecological communities, threatened species and retained trees
- Minimise clearance of vegetation and trees
- Protect retained and adjacent vegetation and trees
- No disturbance to flora and fauna outside the proposed construction footprint and associated access roads and site compounds
- No increase in distribution or proliferation of weeds currently existing within the Infrastructure Works CSSI footprints
- No new weeds introduced to the Infrastructure Works CSSI footprints
- No transfer of plant diseases or pathogens to or from the Project work areas
- Effective rehabilitation/revegetation that meets ecological and landscaping objectives
- All fauna species encountered during construction are handled humanely in accordance with industry standards
- No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat
- No introduction of barriers to fauna movement and fish passage.

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

Legislation relevant to flora and fauna includes:

- *Biodiversity Conservation Act 2016*
- *Biosecurity Act 2015*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Planning and Assessment Act 1979*
- *Fisheries Management Act 1994*
- *Pesticides Act 1999.*

All legislation relevant to this FFMP is included in Appendix A1 of the CEMP.

3.1.2 Guidelines and Standards

The main guidelines, specifications and policy documents relevant to this Sub-plan include:

- Australian Standard AS 4373 Pruning of Amenity Trees
- Australian Standard 4970 – 2009 Protection of Trees
- Australian Standard 2303 - 2015 Tree Stock for Landscape Use
- Australian Standard 4970–2009 Protection of trees on development sites
- Australian Standard 4419-2003 Soils for Landscaping
- DECCW 2008. Hygiene protocol for the control of disease in frogs
- Department of Primary Industries Policy and Guidelines for Fish Habitat Conservation and Management (2013 update)
- Fish Friendly Passage Guidelines (Fairfull & Witheridge, 2003)
- IS Technical Manual Version 1.2, Infrastructure Sustainability Council of Australia (ISCA, 2016)
- NSW Government's: Arrive Clean, Leave Clean (2015)
- Parramatta Council's Parramatta Ways: Implementing Sydney's Green Grid
- Roads and Maritime Service's: Biodiversity Guidelines – Protecting and managing biodiversity on RTA projects (2011)
- Transport for NSW's Fauna Management Guidelines 3TP-SD-113/4.0
- Transport for NSW's Weed Management and Disposal Guideline 3TP-SD-110/2.0
- Transport for NSW's Vegetation Management (Protection and Removal) Guideline 9TP-SD-111/3.0
- Transport for NSW's Vegetation Offset Guide DMS-SD-087 (2016)
- Transport for NSW's Guide to Environmental Control Maps.

3.2 Ministers Conditions of Approval

The CoA relevant to this Sub-plan are listed Table 3-1. A cross reference is also included to indicate where the condition is addressed in this Sub-plan or other project management documents.

Table 3-1 Minister's Conditions of Approval relevant to the FFMP

CoA No.	Condition Requirements	Document Reference	How Addressed
A1	The CSSI must be carried out in accordance with the terms of this approval and generally in accordance with the description of the CSSI in the Parramatta Light Rail (Stage 1) Westmead to Carlingford via Parramatta CBD and Camellia Environmental Impact Statement (dated August 2017) (the EIS) as amended by (a) the Parramatta Light Rail (Stage 1) Westmead to Carlingford via Parramatta CBD and Camellia Submissions Report (incorporating Preferred Infrastructure Report) (February 2018) (the SPIR); (b) SSI 8285 Administrative modification (November 2018) (MOD 1); and (c) SSI 8285 Correction to Administrative modification (January 2019) (MOD 2).	Section 3.2 Section 3.3	Tables 3-1 and 3-2 outline how the conditions of this approval and the SPIR have been addressed in the development of this Sub-plan.

CoA No.	Condition Requirements	Document Reference	How Addressed
A5	Where the terms of this approval require a document or monitoring program to be prepared or a review to be undertaken in consultation with identified parties, evidence of the consultation undertaken must be submitted to the Secretary with the document or monitoring program or review. The evidence must include: (a) documentation of the engagement with the party(ies) identified in the relevant condition of approval before submitting the document for approval; (b) log of the points of engagement or attempted engagement with the identified party(ies) and a summary of the issues raised by the identified party(ies); (c) documentation of any follow-up with the identified party(ies), where feedback has not been provided, to confirm that the identified party(ies) has none or has failed to provide feedback after repeated requests; (d) outline of the issues raised by the identified party(ies) and how they have been addressed, including evidence that the party(ies) is satisfied the issues have been addressed; and (e) where there are outstanding issues raised by the identified party(ies) that have not been adopted, the reasons why they have not been/could not be adopted must be provided, including evidence of consultation with the relevant party(ies).	Section 4 Appendix F	Evidence of the consultation is provided in Section 4 and **Appendix F**. The Grey-Headed Flying Fox Monitoring Program has been prepared independently from this Sub-plan.

CoA No.	Condition Requirements	Document Reference	How Addressed
C3	The following CEMP Sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan and be consistent with the CEMP referred to in Condition C1:	Section 4 Appendix F This Sub-plan	Section 4 outlines the consultation requirements for this Sub-plan under the CSSI Approval in accordance with Condition C1. This Sub-plan has been provided to the relevant councils and agencies for consultation. Outcomes of this consultation have been incorporated into the Sub-Plan as summarised in Section 4 and **Appendix F**.
(e)	Flora and Fauna Biodiversity – Relevant Council(s), OEH – Submit to the Secretary for Information	This Sub-plan	During preparation of this Sub-plan, consultation was undertaken with DPIE ESS (formerly OEH), DPI Fisheries, the Biodiversity Conservation Trust and relevant councils (City of Parramatta Council and Cumberland Council). The outcomes of this consultation have been incorporated into the Sub-plan as summarised in Section 4.
C4	The CEMP Sub-plans must state how:	-	-
(a)	the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;	Section 2.2 Section 2.3	The Projects environmental objectives and targets are outlined in Section 2.2 and 2.3. These were derived to be measurable from regular inspection and monitoring.
(b)	the mitigation measures identified in the documents listed in Condition A1 will be implemented;	Section 3.3	Section 3.3 provides a guide to where the relevant REMMMs have been addressed in this Sub-plan.

CoA No.	Condition Requirements	Document Reference	How Addressed
(c)	the relevant terms of this approval will be complied with; and	Section 3.2	The terms of this approval are outlined in Section 3.2 and will be complied with through the preparation and implementation of this Sub-plan. Confirmation of compliance with the terms of approval will be undertaken in accordance with Section 8.
(d)	issues requiring management during construction, as identified through ongoing environmental risk analysis, will be managed.	Section 6 Appendix A2 of the CEMP	The issues requiring management are outlined in Section 6 of this Sub-plan which describes the construction activities and predicted impacts. The quantitative risk assessment for the Project is outlined in the CEMP and includes an environmental risk register for the construction activities associated with the Project (Appendix A2 of the CEMP). During construction the risk register will be reviewed annually at minimum and in response to significant issues, incidents or non-compliances.
C5	The CEMP Sub-plans must be developed in consultation with relevant government agencies (including Relevant Council(s)). Details of all information requested by an agency to be included in a CEMP Sub-plan as a result of consultation, including all copies of correspondence from those agencies, must be provided to the Secretary with the relevant CEMP Sub-plan.	Section 4 Appendix F	This Sub-plan has been provided to the relevant councils and agencies for consultation. The results of this consultation have been incorporated and summarised in Section 4 and **Appendix F**.
C6	Any of the CEMP Sub-plans may be submitted along with, or subsequent to, the submission of the CEMP but in any event, no later than one month before construction.	Section 4	This Sub-plan will be submitted no later than one month prior to construction for information. Details of this have been incorporated into Section 4.

CoA No.	Condition Requirements	Document Reference	How Addressed
C8	Construction must not commence until the CEMP and any CEMP Sub-plan specified in Condition C3 have been submitted to or approved by the Secretary. The CEMP and CEMP Sub-plans submitted to or approved by the Secretary, including any minor amendments approved by the ER, must be implemented for the duration of construction. Where construction of the CSSI is staged, construction of a stage must not commence until the CEMP and Sub-plans for that stage have been submitted to or approved by the Secretary. *Note: the requirement to submit or have a CEMP or CEMP Sub-plan approved is specified in Condition C3.*	Section 4	Construction will not commence until this Sub-plan has been submitted to the Secretary for information and will be implemented for the duration of construction. Details of this have been incorporated into Section 4.
C9	The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies for each to compare actual performance of construction of the CSSI against performance predicted in the documents listed in Condition A1 or in the CEMP: (c) Grey-headed flying fox Monitoring – OEH.	Table 7-1	TfNSW retains responsibility for CoA E101. The Grey-Headed Flying Fox Monitoring Program (PLR-TFNSW-CBD-PE-PRG-000001) has been prepared as a free-standing program by TfNSW. The requirements of this condition have been included as a mitigation measure HC6 and TF2 (Table 7-1). The JV will comply with the relevant mitigation measures outlined in the Program.

CoA No.	Condition Requirements	Document Reference	How Addressed
C14	Construction must not commence until the Secretary has received all of the required Construction Monitoring Programs, and all relevant baseline data for the specific construction activity has been collected.	Table 7-1	TfNSW retains responsibility for CoA E101. The Grey-Headed Flying Fox Monitoring Program (PLR-TFNSW-CBD-PE-PRG-000001) has been prepared as a free-standing program by TfNSW. The requirements of this condition have been included as a mitigation measure HC6 (Table 7-1). The JV will comply with the relevant mitigation measures outlined in the Program.
E100	The Proponent must avoid and/or minimise the removal of native vegetation or other bushland that provides habitat for native fauna with the objective of reducing impacts to threatened species, populations and ecological communities. Impacted vegetation must be rehabilitated in proximity to the area of disturbance with a diversity of endemic species (in the first instance) and locally native tree, shrub and groundcover species to the greatest extent practicable or offset in accordance with the Proponent's Biodiversity Offset Strategy and the Flora and Fauna Management Sub-plan required by Condition C3, in consultation with OEH, DPI Fisheries, and the Biodiversity Conservation Trust.	Table 7-1 Section 7.5 Appendix A	Measures to avoid and/or minimise the removal of native vegetation or other bushland are detailed in Table 7-1 (VM3, VM4 and TF1). Rehabilitation will be undertaken in accordance with the Urban Design Requirements Report (UDRR). Additional vegetation rehabilitation procedures are outlined in Table 7-1 (VM12, VM22 and TF3). **Appendix A** outlines the Procedure for Vegetation Clearing which will be communicated through site inductions, toolbox talks and pre-starts. This will be implemented throughout construction. The TfNSW Biodiversity Offset Strategy recommendation to provide for rehabilitation and/or planting of the riparian zone within Parramatta River will be contributed to through the JV's landscape package.

CoA No.	Condition Requirements	Document Reference	How Addressed
E101	During construction near the Parramatta River and Cumberland Hospital East and West, the Proponent must engage a suitably qualified and experienced fauna specialist to monitor the behaviour of the Grey-headed Flying-fox camp that resides in Parramatta Park in accordance with the Grey-headed Flying Fox Monitoring Program required by Condition C9 and implement mitigation measures, as required to minimise potential impacts to the camp. Monitoring must commence at least 12 months before the commencement of construction within 300 metres, unless otherwise agreed with the Secretary, of the camp to establish baseline behaviour. Monitoring must be undertaken regularly during construction (in consultation with OEH) with the results compiled in a monitoring report submitted to OEH each month. Monitoring should include species present, numbers, a map of the extent of the camp, breeding status, and condition of animals. If monitoring suggests that construction associated with the CSSI is changing the behaviour of the camp, the Proponent must consult with OEH to determine whether additional mitigation measures are required.	Table 7-1	TfNSW retains responsibility for CoA E101. The Grey-Headed Flying Fox Monitoring Program (PLR-TFNSW-CBD-PE-PRG-000001) has been prepared as a free-standing program by TfNSW. The requirements of this condition have been included as a mitigation measure HC6 (Table 7-1). The JV will comply with the relevant mitigation measures outlined in the Program.
E102	The Proponent must commission a suitably qualified and experienced Arborist with a minimum AQF Level 5 qualification in Arboriculture, that is independent of the design and construction personnel for the duration of construction. The Arborist must be approved by the Secretary before works commence and commissioned for the duration of construction.	Section 7.1.1	TfNSW retains responsibility for CoA E102. The nominated Independent Arborist was approved on the 21 August 2018 by the Secretary (letter reference DOC18/584975).

CoA No.	Condition Requirements	Document Reference	How Addressed
E103	The Arborist must: (a) be the principal point of advice in relation to the assessment and management of CSSI impacts on trees; (b) prepare a Tree Register of all trees within the CSSI footprint (either for the entire CSSI or separate areas where tree removal and/or pruning is proposed) before the removal of any trees; (c) identify those trees within the footprint that must be removed for construction to proceed or for CSSI operations; and (d) identify those trees where their fate is uncertain and may be retained, removed or pruned (either for construction or for ongoing maintenance during operation).	Section 7.1.1	TfNSW retains responsibility for CoA E103. The JV will provide documents, information, assistance and co-operation reasonably requested by the Independent Arborist in relation to this condition. Details of the role of the Independent Arborist and how the JV will interact with the Independent Arborist is outlined in Section 7.1.1.
E104	The Tree Register must include: (a) the georeferenced location of each tree; (b) those attributes as defined in AS 4970-2009 Protection of trees on development sites; (c) the tree retention value; (d) the outcomes of a visual assessment of the condition of the tree; (e) where a tree requires removal, whether, in the opinion of the Arborist, it can be successfully transplanted; (f) the extent of the proposed impact (complete removal or extent of pruning); (g) measures for the management, protection and monitoring of compensatory vegetation, for a minimum of two years from being planted; and (h) timing and responsibilities for the implementation of compensatory vegetation.	Section 7.1.1	TfNSW retains responsibility for CoA E104. The JV will provide documents, information, assistance and co-operation reasonably requested by the Independent Arborist in relation to this condition. The requirements of the IA Tree Register are outlined in Section 7.1.1

CoA No.	Condition Requirements	Document Reference	How Addressed
E105	For those trees identified as requiring removal in the Tree Register, the Proponent must demonstrate consideration of options to avoid or minimise impacts on trees through the detailed design and construction planning process. The options considered must include, but not be limited to: (a) consideration of operational requirements with existing tree locations; (b) consideration of the health of each tree, including its vigour and likely ability to survive in situ pruning or transplanting; (c) review of the construction methodology and layout to identify any options to avoid or minimise impacts on trees; (d) considering opportunities to narrow/move footpaths; (e) modification of the design to reduce impact to the tree (e.g. use of porous pavement); (f) reduction in the standard offsets required for underground services; and (g) where fencing, other ancillary infrastructure or services affect tree retention, relocation or alternative construction methods are considered to reduce impacts (e.g. from strip footings to pier footings for posts).	Section 7.1.1	Tree removal will be considered during detailed design against the criteria in CoA E105 by a suitably qualified Arborist engaged by the JV as described in outlined in Section 7.1.1. The conclusions of the design review will be provided to Independent Arborist (E102) to update the IA Tree Register. Additional trees that require lopping or removal during construction will be assessed by an Arborist (minimum AQF Level 5 qualification in Arboriculture) engaged by the JV. The assessment will be provided to the Independent Arborist (E102) for verification and to update the IA Tree Register. Tree Protection Plans will be prepared for all trees within 15m of the construction footprint by the JV Arborist and approved by the Independent Arborist. See Section 7.1.3.

CoA No.	Condition Requirements	Document Reference	How Addressed
E106	The Tree Register and any evidence required by Condition E105 must be submitted to the Secretary before the removal or damage (as defined by the Independent Arborist) of a tree for the purposes of the CSSI. The recommendations of the Independent Arborist must be outlined in the Tree Register and implemented by the Proponent, unless otherwise agreed by the Secretary.	Section 7.1.1	TfNSW retains responsibility for CoA E106. The JV will provide documents, information, assistance and co-operation reasonably requested by the Independent Arborist in relation to this condition. The Independent Arborist is responsible for submission of the Tree Register to the Secretary before removal or damage of any trees for the CSSI. The JV must implement the recommendations of the Independent Arborist outlined in the Tree Register.
E107	The Proponent must prepare and implement a Tree Offset Package for the CSSI in consultation with the independent Arborist required by Condition E102, and Relevant Council(s). The Package must consider the objectives and opportunities identified in Sydney Green Grid West Central District (Department of Planning and Environment, 2017), Greener Places (NSW Government Architect, 2017), and Parramatta Ways (Implementing Sydney's Green Grid) (City of Parramatta, 2017). The package must: (a) identify how impacts on trees and vegetation will be mitigated, managed, and compensated; (b) ensure that where trees are removed they are replaced at the following ratios regardless of their value, near the impact or, where this is not practicable, within other areas of the LGA or surrounding LGAs, in consultation with the relevant authority(s):	Section 7.1.1	TfNSW retains responsibility for CoA E107. The JV will provide information to allow TfNSW to prepare the Tree Offset Package. This information will be provided through the interface gateways for the IA Tree Register maintained by the Independent Arborist. The JV will develop an Urban Design Requirements Report (UDRR) that will implement the planting requirements of the Tree Offset Package. The JV will assist TfNSW (as it relates to the Infrastructure Scope of Works) in ensuring at least 80% offset works must be completed before CSSI operations commence.

CoA No.	Condition Requirements	Document Reference	How Addressed
	i) large trees (DBH greater than 60cm) – plant minimum of eight trees; ii) medium trees (DBH greater than 15 cm, but less than 60 cm) – plant minimum of four trees; and iii) small young trees (DBH less than 15cm) – plant minimum of two trees. (c) ensure a mix of species and a range of mature heights to provide visual diversity and benefits, in consultation with the Relevant Council(s); (d) street tree plantings are to have a minimum pot size of: i) 200 litres in the Parramatta CBD precinct; and ii) 75 litres in other streets; (e) tree planting in parks, open space, bushland, and within the Carlingford Line corridor, should be sized to suit the location, species and planting style, in consultation with the relevant authority(s); and (f) ensure at least 80% offset works must be completed before CSSI operations commence. Where the requirements of this condition cannot be met, the Proponent must provide documented evidence demonstrating how the matters in (a) to (f) were considered and provide information and justification for an alternative offset option for the Secretary's approval.		

3.3 Revised Environmental mitigation and management measures

Relevant REMMM are listed Table 3-2 below. This includes references to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

Table 3-2 Revised environmental mitigation and management measures relevant to this FFMP

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Design	GEN-1	A construction environmental management plan (CEMP) would be prepared for the construction phase of the project. The CEMP would provide a centralised mechanism through which all potential environmental impacts would be managed. The CEMP would document mechanisms for demonstrating compliance with the commitments made in the Environmental Impact Statement), the submissions report, as well as any other relevant statutory approvals (e.g. conditions of approval, licences and permits). The CEMP would outline a framework for the management of environmental impacts during construction, including further details on the following:	Pre-construction	Construction Environmental Management Plan	The CEMP provides a central mechanism for all potential environmental impacts and how they will be managed. The CEMP outlines the framework for the management of environment impacts. The CEMP has been prepared and will be implemented during construction.
Design	GEN-1	Flora and fauna management.	Pre-construction	This Sub-plan	The FFMP outlines the flora and fauna management for the Project. This Sub-plan complies with relevant approval, statutory and contract requirements.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	BI-1	The detailed design would demonstrate in the reporting for detailed design, consideration of measures to minimise potential biodiversity impacts include: • Consideration of DPI's Policy and guidelines for fish habitat conservation and management (2013 update) and the NSW Office of Water's Guidelines for controlled activities for the design of instream structures or riparian works. These elements of the design would be developed in consultation with DPI – Crown Lands and Water and DPI - Fisheries. • Options for minimising impacts on habitat connectivity, including establishment of native vegetation and habitat elements such as rock piles and large woody debris under the bridges to provide cover for fauna. • Opportunities for minimising the potential for injury and mortality of wildlife associated with OHW and fences would be investigated in consultation with an ecologist and implemented where practicable. • Investigating opportunities for collaborating with organisations and stakeholders to rehabilitate existing waterways along the project alignment (such as Vineyard Creek) as part of the Vegetation Offset Strategy.	Detailed design Construction	Table 7-1	Section 7.1.2 outlines the design review process where consideration of measures to minimise potential biodiversity impacts where practical will be documented. These commitments have been included in Section 7.5, Table 7-1 mitigation measures HC7, WP10 and VM21.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	BI-3	A flora and fauna management plan would be prepared as part of the CEMP. Specific measures would be identified in consultation with relevant government agencies. The flora and fauna management plan would include the following:	Pre-construction	This Sub-plan Section 4 Section 7	This Sub-plan has been provided to the relevant councils and agencies for consultation. The results of this consultation have been incorporated and summarised in Section 4 and Appendix E.
Flora and fauna management		• A requirement to prepare Environmental Control Maps in accordance with Transport for NSW's Guide to Environmental Control Map. The maps would delineate ecologically sensitive areas (such as habitat areas or locations of threatened species, populations or ecological communities), clearing extents, vegetation to be retained, and any other no go areas.	Pre-construction	Section 3.1.4 of the CEMP Table 7-1	Environmental Control Maps will be prepared in accordance with TfNSW's Guide to Environmental Control Map.
Flora and fauna management		• Procedures for the clearing of vegetation and the relocation of flora and fauna. Where possible, the removal of native vegetation would be minimised as far as practicable. Measures to minimise the removal of native vegetation would include:	Construction	Appendix A and B Table 7-1	Vegetation Clearing Protocol has been outlined in Appendix A of this Sub-plan. Relocation of flora and fauna has been outlined in Appendix B.
Flora and fauna management		• Use of high visibility fencing (such as barrier mesh) to delineate vegetation to be retained or limits of clearing.	Construction	Section 7.5	High visibility fencing will be used to mark out vegetation. This commitment has been included as mitigation measure VM2.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	BI-3 cont.	• A trained ecologist would accompany clearing crews in order to ensure disturbance is minimised and to assist any native animals to relocate to adjacent habitat.	Construction	Table 7-1 Appendix A Appendix B	Clearing crews will be accompanied by a trained ecologist. This has been included as mitigation measure VM13 and included in the Vegetation Clearing Protocol.
Flora and fauna management		• Measures to reduce disturbance to sensitive fauna.	Construction	Section 7.3 Appendix A Appendix B	These include having a trained ecologist complete a pre-clearing inspection (VM13), a vegetation clearing protocol and fauna rescue measures (WP1 to WP10), installation of nest boxes (HC1 and HC2) and relocation of salvaged hollows (HC3).
Rehabilitation		• Rehabilitation requirements, including identification of flora species and sources, and measures for the management and maintenance of rehabilitated areas (including for example a program of weed removal and monitoring).	Construction	Section 7.4 Appendix C Table 7-1	An UDRR will be developed for the PLR and implemented. Weed control requirements are outlined in Section 7.4 and Appendix C. This commitment has been included as mitigation measure TF3, PD6 and PD7.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	BI-3 cont.	• Weed management measures focusing on monitoring for early identification of invasive weeds and pathogens and detailed effective management controls for minimising the risk of introducing weeds and pathogens.	Construction	Table 7-1	This commitment has been included as mitigation measure VM15, PD2, PD3 and PD6.
Flora and fauna management		• Procedure for dealing with unexpected identification of Endangered Ecological Communities or threatened species during construction.	Construction	Appendix B Table 7-1	The Fauna Rescue and Release Program has been prepared in Appendix B and will be implemented. Procedures for dealing with unexpected identification of EEC is outlined in Section 7.3.4.
Compliance		• Auditing and monitoring of the plan.	Construction	Section 8.3 Section 8.4	Compliance management specific to monitoring and auditing is outlined in Sections 8.3 and 8.4 respectively.
Flora and fauna management	BI-4	The following measures would be adopted in the flora and fauna management plan to mitigate impacts on aquatic habitats during construction:		n/a	These measures have been adopted in the Soil and Water Management Sub-plan
Soil and water management		• Implementing the soil and water mitigation and management measures HY-7, SG-3, SG-4 and CM-3.	Construction	n/a	Addressed in the Soil and Water Management Sub-plan
Soil and water management		• Preparation of Acid Sulfate Soils/contaminated soils management plan.	Pre-construction Construction	n/a	Addressed in the Soil and Water Management Sub-plan

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Site establishment	BI-4 cont.	• Minimising the works footprint in and adjacent to watercourses, including establishment and marking of vegetation buffer zones in areas of vegetation removal in riparian zones.	Construction	Table 7-1	This commitment has been included in Section 7-5, mitigation measure AH1.
Design		• Crossing design would adhere to relevant policies and guidelines including the fish friendly passage guidelines (Fairfull and Witheridge, 2003) for waterway crossings and avoid/minimise disruption to fish movements and the Policy and guidelines for fish habitat conservation and management (Department of Primary Industries, 2013).	Construction	Section 7-5	Crossing design will adhere to relevant policies and guidelines. This commitment has been included in Section 7.5, mitigation measure AH2.
Site establishment		• Construction compounds would where feasible be located within previously disturbed areas, away from riparian vegetation (to the extent possible).	Construction	n/a	Addressed in the Site Establishment Management Plan
Construction		• Use of platforms/temporary wharfs in preference to weirs for instream construction works.	Construction	n/a	Addressed in the Soil and Water Management Sub-plan
Construction		• Use of floating booms around work zones.	Construction	n/a	Addressed in the Soil and Water Management Sub-plan
Construction		• Use of silt curtains around new piers during piling to restrict turbidity.	Construction	n/a	Addressed in the Soil and Water Management Sub-plan

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Construction	BI-4 cont.	• Bund integrity of equipment wash-downs would be maintained for all works on/near river banks.	Construction	n/a	Addressed in the Soil and Water Management Sub-plan
Construction		• Prohibition dumping of excavated materials or untreated runoff water in the river.	Construction	n/a	Addressed in the Soil and Water Management Sub-plan
Remediation		• Remediation and revegetation of disturbed watercourse bed banks and aquatic habitats as soon as possible following disturbance in accordance with the Guidelines for watercourse crossings on waterfront land (Department of Primary Industries, 2012) and the Policy and guidelines for fish habitat conservation and management (Department of Primary Industries, 2013).	Construction	n/a	Addressed in the Soil and Water Management Sub-plan This commitment has been included as mitigation measure AH3.
Flora and fauna management		• The relevant mitigation and management measures would be shown on Environmental Control Maps in accordance with Transport for NSW's Guide to Environmental Control Map.	Construction	n/a	Addressed in the Construction Environmental Management Plan
Flora and fauna management	BI-5	In addition to the mitigation and management measures described in BI-4, the following mitigation and management measures to avoid and minimise the risk to mangroves would be implemented during construction as part of the flora and fauna management plan. This would include (but is not limited to):	-	-	-

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	BI-5 cont.	Work area planning and management of activities to avoid removing existing mangrove plants.	Construction	Section 7.5	This commitment has been included in Section 7.5, mitigation measure MG2.
Flora and fauna management		Temporary wharf/platforms and vessel routes would be planned to avoid pneumatophore zones and minimise erosion.	Construction	Section 7.5	This commitment has been included in Section 7.5, mitigation measure VM10 and VM11.
Flora and fauna management		Remediation of disturbed banks with mangroves/native vegetation, and if required, use of mangrove shrubs/seedlings transplanted from disturbed areas.	Construction	Section 7.5	This commitment has been included in Section 7.5, mitigation measure MG1.
Flora and fauna management	BI-6	To mitigate fragmentation and reduced habitat connectivity, plant species chosen for revegetation under the bridges would be selected for their shade tolerance (e.g. rainforest understorey species native to the Sydney Basin Bioregion) even if these species are not usually found in the Alluvial Woodland/Riparian Forest vegetation types. This requirement would be translated into the UDRR, where appropriate.	Construction	Table 7-1 Urban Design Requirements Report (UDRR)	This commitment has been included in Section 7.5, as mitigation measure VM12. The requirements for the selection will be outlined in UDRR.
Flora and fauna management	BI-7	The flora and fauna management plan would include measures to mitigate habitat loss as a result of the project. These measures would be confirmed during preparation of the plan, and would include:	-	-	-

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
	BI-7 cont.	• Consideration would be given to fitting roost boxes to the bridges over existing creek crossings to provide roost sites for the Large-footed Myotis and other species of microbats (e.g. Eastern Bentwing-bat) which may utilise such structures. The quantity and location of roost boxes would be determined in consultation with an ecologist to meet the specific needs for the targeted species and would be installed prior to structure disturbance.	Construction	Section 7.3.5 Table 7-1	A Nest Box Strategy will be developed by a trained ecologist that will assess the structures over existing creeks identified in the EIS Biodiversity Assessment Report. This commitment has been included as mitigation measure HC1.
		• Nest boxes of a variety of designs would be installed including boxes suitable for roosting by microbats. Relocation of natural hollows by either affixing them to existing live retained trees or to poles/trunks of felled trees installed in revegetated areas would also be considered as an alternative to nest box installation. The quantity and location of roost boxes would be determined in consultation with an ecologist to meet the specific needs for the targeted species and would be installed prior to disturbance in the area.	Construction	Section 7.3.5 Table 7-1	A Nest Box Strategy will be developed by a trained ecologist. Nest boxes of a variety of designs will be installed including boxes suitable for roosting by microbats prior to disturbance in the area. This commitment has been included in Section 7.5, mitigation measure HC2.
		• Important habitat elements (e.g. large woody debris) would be moved from the construction area to locations outside the clearing area in native vegetation remnants or to stockpiles for later use in vegetation/habitat restoration.	Construction	Table 7-1	This commitment has been included in Section 7.5, mitigation measure HC4.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
	BI-7 cont.	• Development of contingency measures with relation to the potential impacts to the Parramatta Grey-headed Flying-fox camp. • Suitable winter-flowering vegetation would be preferentially planted in landscaped areas of the site to provide a winter foraging resource for migratory and nomadic nectar-feeding birds and the Grey-headed Flying-fox.	Pre-construction Construction	Table 7-1 Table 7-1	The Grey-Headed Flying Fox Monitoring Program has been prepared as a free-standing document. This commitment has been included in Section 7.5, mitigation measure HC5.
Flora and fauna management	BI-8	The flora and fauna management plan would include measures to minimise the likelihood of fauna injury or death during the clearing of vegetation including a staged habitat removal incorporating the following measures: • All habitat trees in the area to be cleared would be identified (by an arborist) and marked. • A pre-clearing procedure that encourages animals to leave prior to clearing. • Pre-clearing surveys would be conducted at least 12 to 48 hours prior to vegetation clearing to search for native wildlife (e.g. reptiles, frogs) which can be captured and relocated. • Where practical, felled habitat trees would be left on the ground for a further 24-hour waiting period prior to removal from the construction area or immediately moved to the edge of retained vegetation at the discretion of the supervising ecologist.	Construction	Table 7-1 Appendix A Appendix B	These requirements have been included in the Vegetation Clearing Protocol and Fauna Rescue Procedure These requirements will be communicated through site induction, toolbox talks and pre-starts. This commitment has been included in Section 7.5, mitigation measure WP1 to WP8.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
	BI-8 cont.	• All contractors would have the contact numbers of wildlife rescue groups in case animals are injured or orphaned during clearing and require veterinary assistance and/or extended care prior to release. • Relocation of animals to adjacent retained habitat would be carried out by an ecologist during the supervision of vegetation removal.			
Flora and fauna management	BI-9	The potential for translocation of threatened plant species as individuals or as part of a soil translocation process would be considered during the detailed development of the flora and fauna management plan prepared as part of the CEMP.	Construction	Section 7.3.4	There are no known threatened species within the Infrastructure Works CSSI footprint. In the event that threatened plant species is identified, a translocation feasibility assessment will be completed by trained ecologist.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	TR-1	The detailed design and construction planning would demonstrate in the design report that they have sought to avoid direct impacts to trees located near or on the alignment and minimise the level of impact identified in the EIS. Particular consideration would be given to those trees that: • Are large trees, as defined in the Transport for NSW Vegetation Offset Strategy. • Are medium or high retention value trees, as identified via application of the Significance of a Tree Assessment and Rating System endorsed by the Institute of Australian Consulting Arboriculturalists.	Design Construction	Section 7.1.1 Section 7.1.2 Section 7.1.3	The JV Tree Register will be developed and maintained by the JV Arborist, and submitted to the IA for verification and incorporation into the IA Tree Register. A design review for impacts to trees will be completed and included in the Environmental Design Review Report covering each design package. Tree Protection Plans will be prepared for all retained trees by the JV Arborist and approved by the IA.
Flora and fauna management	TR-2	An UDRR would be developed for the project which would include recommended tree species to be used for replacement planting in each of the precincts. Selection of tree species, size and planting locations would be carried out in close consultation with City of Parramatta Council.	Pre-construction	UDRR Table 7-1	An UDRR has been developed for the project and will be implemented. This commitment has been included as mitigation measure VM12.
Flora and fauna management	TR-3	The use of low impact construction techniques (on existing tree roots) for all works would be considered, where appropriate and feasible.	Construction	Table 7-1	This commitment has been included as mitigation measure VM6 and VM11. This will be communicated through site induction, toolbox talks and pre-starts.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	TR-4	All tree pruning and removal works, including any root pruning, would be carried out in accordance with Australian Standard AS 4373-2007, Pruning of Amenity Trees.	Construction	Section 7.1.3 Table 7-1	Table 7-1 details mitigation measures to be undertaken to reduce impacts on flora and fauna. This commitment has been included as mitigation measure VM14. This will also be included in Tree Protection Plans (Section 7.1.3, VM7, VM8 and VM9)
Flora and fauna management	TR-5	Where the loss of trees is unable to be mitigated, trees removed as a result of the project would be offset in accordance with the Transport for NSW's Vegetation Offset Guide (2016). The proposed offsetting activities would be documented in the Tree Offset Package to be developed for the project. The City of Parramatta Council's Parramatta Ways: Implementing Sydney's Green Grid would be considered as part of the development of a Vegetation Offset Strategy for the project.	Pre-construction	Section 7.2	The requirements will be outlined in the Tree Offset Package to be developed by TfNSW and implemented through the JVs landscape package. This commitment has been included as mitigation measure VM16.
Flora and fauna management	TR-6	Temporary tree protection measures would be installed prior to construction works commencing in accordance with AS 4970-2009 - Protection of Trees on Development Sites as required for any trees to be retained within active construction sites.	Pre-construction	Section 7.1.3 Table 7-1	This measure would be detailed in the Tree Protection Plans approved by the IA. This commitment has been included as mitigation measure VM17.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	TR-7	Where activities which could cause soil compaction within the tree protection zone (TPZ) of trees to be retained cannot be avoided (e.g. due to space constraints), opportunities to raise construction facilities (e.g. demountable) above the ground level or use of suitable ground protection measures beneath site access tracks (e.g. geotextile fabric) would be investigated and implemented, where feasible, so as to avoid impacting on the underlying tree roots, in accordance with Australian Standard AS 4970 Protection of Trees on Development Sites	Construction	Table 7-1	Table 7-1 details mitigation measures to be undertaken to reduce impacts on flora and fauna. This commitment has been included as mitigation measure VM18.
Flora and fauna management	TR-8	Selection of tree species, size and planting locations would be carried out in close consultation with local council and in accordance with the UDRR to be developed for the project.	Pre-construction	Table 7-1 UDRR	Table 7-1 details mitigation measures to be undertaken to reduce impacts on flora and fauna. This commitment has been included as mitigation measure VM12. An UDRR will outline the detailed selection process.

Outcome	Ref #	Commitment	Timing	FFMP Reference	How Addressed
Flora and fauna management	TR-9	As far as practical, the construction compounds would be configured so as to not directly impact on trees that would not already be directly impacted by the project. Where trees which can be retained are located within construction boundaries, exclusion fencing would be erected to protect these trees from construction activities. Similarly, for road network modifications away from the main alignment, these works would be carried out, as far as practical, so as to minimise any further impact on trees as a result of the project.	Construction	Table 7-1 SEMP	The layout of the construction compounds has taken into consideration the impact on trees. Table 7-1 details mitigation measures to be undertaken to reduce impacts on flora and fauna. This commitment has been included as mitigation measure VM5, VM19 and VM20.

3.4 Environmental Performance Outcomes

Relevant Environmental Performance Outcomes (EPOs) are listed in Table 3 3 below. This includes reference to requirement outcomes, the timing of when the commitment applies, and relevant documents or sections of the environmental assessment influencing the outcome and implementation.

Table 3-3 Environmental Performance Outcomes relevant to this FFMP

ID Ref#	Environmental Performance Outcome	Timing	FFMP reference	How Addressed
EPO-BI-1	The project would minimise impacts on biodiversity through the implementation of relevant mitigation measures and the implementation of the Biodiversity Offset Strategy (BOS) for the project.	Design Construction Post Construction	Section 7 Section 8	The key focus of this EPO relates to ensuring impacts to trees are avoided, minimised and managed during design and construction. These include: • Environmental Design Review requirements from the JV and Independent Arborist • Maintenance of a Tree Register to record the fate of all trees • Approval process with the Independent Arborist for the major pruning, relocation or removal of all trees in the tree register. • Preparation of Tree Management Plans for all retained trees • Regular inspections of the condition of all trees • Post construction review of the fate of all retained trees. Where impacts have been demonstrated to be unavoidable, they will be offset in accordance with the Biodiversity Offset Strategy.

4 Consultation

In accordance with the CoA A5, the FFMP and was developed in consultation with the DPIE ESS (formerly OEH), DPI Fisheries, the Biodiversity Conservation Trust and relevant councils (City of Parramatta and Cumberland Council).

This Sub-plan will be submitted along with, or subsequent to, the submission of the CEMP, no later than one month before construction.

This consultation is intended to assist in development and finalisation of the Sub-plan. **Table 4-1** summarises relevant stakeholder reviews and response to review. Detailed consultation log and response to comments are provided in **Appendix F**.

Table 4-1 Summary of Consultation and Approval

Agency	Requirement	Status	Response	Date
DPIE ESS (formerly OEH)	Addition of nest box monitoring Addition of pre-works inspections of structures for bats	Addressed	Closed	16/07/2019
Biodiversity Conservation Trust	No comments	-	-	10/07/2019
DPI Fisheries	No comments	-	-	27/06/2019
City of Parramatta Council	Request that register of nest box be formed and provided to CoPC along with nest box monitoring.	Addressed	Closed	9/08/2019
Cumberland Council	No comments	-	-	17/07/2019

5 Existing Environment

The following sections summarise existing flora and fauna within and adjacent to the Infrastructure Works CSSI footprint including species, communities and habitats. The key reference documents are the Parramatta Light Rail Biodiversity Assessment Report prepared by WSP | Parsons Brinckerhoff (August 2017) which accompanied the Environmental Impact Statement Section 10.2 and Biodiversity Assessment Report.

5.1 Endangered ecological communities

Endangered Ecological Communities (EECs) listed in NSW under the Biodiversity Conservation Act (BC Act) have been located in the EIS study area and are listed below and detailed in **Appendix E**:

- River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions
- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions
- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions
- Sydney Turpentine-Ironbark Forest

Commonwealth listed EPBC Act listed EECs have been potentially occurring within the EIS study area and are listed below:

- Subtropical and Temperate Coastal Saltmarsh, however it was found that this area is considered to be disturbed Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion as opposed to Coastal Saltmarsh, and therefore is inconsistent with definitions of Coastal Saltmarsh as listed under the EPBC Act.
- Turpentine-Ironbark Forest in the Sydney Basin Bioregion, however detailed field survey and mapping of this vegetation has revealed that none of the Sydney Turpentine-Ironbark Forest potentially affected by the project meets the criteria for inclusion in the EPBC Act due to the lack of representative species from all structural layers, canopy cover and/or no patches greater than one hectare in area are found in the study area.

The location of these EEC in relation to the project is maintained in the JV's GIS for inclusion in ECMs. In addition, the JV Arborists assessment in the Design Review will advise on minimum buffer distances to existing EEC. The JV Tree Register will record the outcomes of the JV Arborist's and ecologist's assessment of potential impacts on individual trees and patches of vegetation including EEC. Tree Protection Plans will identify specific tree protection works for the maintenance of retained trees including those identified as EEC (and verified by the IA).

5.2 Threatened or otherwise significant flora species

No threatened flora species were recorded within the study area during the targeted seasonal surveys undertaken for the EIS. Threatened flora species with the potential to occur within the project corridor, and their conservation status, are listed in Table 5-1.

Table 5-1 Threatened or otherwise significant flora species

Common name	Scientific name	EPBC Act	BC Act	Likelihood of Occurrence
Downey Wattle	*Acacia pubescens*	V	V	**Moderate** - Potential marginal habitat.
Netted Bottle Brush	*Callistemon linearifolius*	NL	V	**Moderate** - Potential marginal habitat within study area, which is within known distribution.
Nil	*Epacris purpurascens subsp. purpurascens*	NL	V	**Moderate** - Potential marginal habitat.
Nil	*Pimelea curviflora subsp. curviflora*	V	V	**Moderate**
Spiked Rice-flower	*Pimelea spicata*	E	E	**Moderate** - Potential habitat will be highly disturbed if occurring within study area.
Plum-leaf Pomaderris	*Pomaderris prunifolia*	NL	E	**Moderate** - Potential marginal habitat within study area.
Magenta Lilly Pilly	*Syzgium paniculatum*	V	E	**Moderate** - Potential marginal habitat within the study area.
Tadgell's Bluebell	*Wahlenbergia multicaulis*	NL	E	**Moderate** - Marginal disturbed habitat present.
Narrow-leafed Wilsonia	*Wilsonia backhousei*	NL	V	**Moderate -** Potential habitat and records within study area and locality at Rosehill, Newington Nature Reserve and Sydney Olympic park.
Nil	*Dillwynia tenuifolia*	NL	V	**Moderate** - Potential marginal habitat.
Nil	*Epacris purpurascens var. purpurascens*	NL	V	**-**
Bynoes Wattle	*Acacia bynoeana*	V	E	**Moderate -** Marginal disturbed habitat present.
Narrow-leaved Black Peppermint	*Eucalyptus nicholii*	V	V	**Moderate** - Potential marginal habitat occurring within the study area.

Common name	Scientific name	EPBC Act	BC Act	Likelihood of Occurrence
Nil	*Leptospermum deanei*	V	V	**Moderate -** Potential marginal habitat within the study area.
Native Pear	*Marsdenia viridiflora subsp. viridiflora*	NL	E	**Moderate -** Marginal disturbed habitat present.
*NL: Not listed; V: Vulnerable; E: Endangered; CE: Critically Endangered.				

5.3 Fauna habitat

Fauna habitat types identified in the EIS within the Infrastructure Works footprint are summarised in **Table 5-2.**

Table 5-2 Fauna habitat types

Name	Habitat features
Sclerophyll open forest	• Forest Red Gum – Rough-barked Apple grassy woodland • Turpentine – Grey Ironbark open forest • Smooth-barked Apple – Turpentine – Blackbutt tall open forest.
Estuarine forest	• Mangrove Forests in estuaries • Flax-leaved Paperbark open to closed mesic forest on alluvial river flats • Swamp Oak swamp forest fringing estuaries.
Saltmarsh	• Very little saltmarsh exists in the aquatic ecology study area, with a total of 0.89 hectares mapped in the Parramatta LGA. Most saltmarsh mapped in the aquatic ecology study area occurs on the northern river bank in the vicinity of the Baludarri Wetlands in small patches that have low frequency of sensitive saltmarsh species such as the Vulnerable *Wilsonia backhousei*. • The Baludarri Wetlands are located to the east of James Ruse Drive on the northern bank of the Parramatta River about 250 metres north of the project alignment and are not expected to be affected by the project.
Groundwater dependant ecosystems	• Four vegetation communities associated with vegetation in Vineyard Creek Reserve at Telopea, and some vegetation along the Parramatta River were partially reliant on subsurface groundwater.
Disturbed land with limited native trees	• Cleared of their original native vegetation and terraced for urban development or for recreational parkland. • Typically occurred as cleared open areas with manicured lawns, garden beds, retained trees and planted trees. • Ground cover was often dominated by exotic grasses and herbaceous weeds.

Name	Habitat features
Aquatic habitat	• Upstream of Charles Street Weir (Parramatta CBD) comprise: ◦ Forest Red Gum – Rough Barked Apple grassy woodland of the alluvial flats of Cumberland plain ◦ Cumberland Swamp Oak Riparian Forest ◦ High occurrence of weeds and exotic species including Lantana (*Lantana camara*), Balloon vine (*Cardiospermum grandiflorum*), Giant Reed (*Arundo donax*), Canary Island Date Palm (*Phoenix canariensis*) and Ash *(Fraxinus* spp.) and Box Elder Maple (*Acer negundo*) • Downstream of Charles Street Weir (Parramatta CBD) Where not comprised of stone, concrete or reinforced by rocks, river banks are dominated by Grey mangroves which form mainly continuous bands of varying width. This general description, mapped as 'Estuarine Mangrove Forest', describes riparian vegetation from downstream of the Charles Street Weir, the riverbanks at the mouth of Clay Cliff Creek and near the rail bridge south of the University of Western Sydney.

5.4 Threatened fauna

One threatened fauna species; Grey-Headed Flying Fox, was recorded flying over the study area and is known to roost in a camp in Parramatta Park. Thirty other threatened fauna species were identified as potentially occurring in the area. These species were identified using database searches that found species as potentially occurring in the study area, as well as species that were potentially utilising the habitat within the study area. Eleven of those identified have a moderate or higher likelihood of occurrence are listed in Table 5-3.

Table 5-3 Threatened fauna

Common name	Scientific name	EPBC Act	BC Act	Occurrence likelihood
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	**Moderate/high** Roosting camp found adjacent to Cumberland Hospital.
Glossy Black-cockatoo	*Calyptorhynchus lathami*	E	V	**Moderate** - Marginal habitat present within study area and locality where the presence of Casuarina and Allocasuarina occur.
Varied Sittella	*Daphoenositta chrysoptera*	NL	V	**Moderate** - Potential habitat within remnant forest around Vineyard Reserve and adjacent to university campus.
Little Lorikeet	*Glossopsitta pusilla*	NL	V	**Moderate** - suitable habitat present within study area.

Common name	Scientific name	EPBC Act	BC Act	Occurrence likelihood
Little Eagle	*Hieraaetus morphnoides*	NL	V	**Moderate** - Marginal foraging habitat present within study area. May occur occasionally in forested areas of the subject site.
Swift Parrot	*Lathamus discolor*	CE	E	**Moderate** - Potential albeit disturbed habitat present within the study area.
Eastern Freetail-bat	*Mormopterus norfolkensis*	NL	V	**Moderate** - Marginal habitat within the study area.
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	NL	V	**Moderate** - Marginal foraging habitat within study area.
Greater Broad-nosed Bat	*Scoteanax rueppellii*	NL	V	**Moderate** - Marginal foraging habitat within study area.
Gang-gang Cockatoo	*Callocephalon fimbriatum*	NL	V	**Moderate** - Marginal habitat present within study area and locality.
Cumberland Plain Land Snail	Meridolum corneovirens	NL	E	**Moderate -** Marginal habitat within the study area**.**
*NL: Not listed; V: Vulnerable; E: Endangered; CE: Critically Endangered.				

5.5 Street Trees

Tree surveys were completed following the development of the EIS which have informed the IA Tree Register (Section 7.1.1). Street trees were identified in as one of the key environmental issues in the EIS. Street trees provide aesthetic values in Portion 1a -Westmead Precinct, Portion 1b – North Parramatta and Portion 1d – Rosehill and Camelia.

The construction of Project would require the removal of trees along the alignment or would have the potential to significantly impact the structural root zone of nearby trees, including those of moderate and high retention value.

5.6 Weeds, Pests and Pathogens

Industrial and residential development and associated weed invasion and soil disturbance have resulted in the loss and/or degradation of most of the original vegetation from the study area. Remaining areas of native vegetation now comprise bushland, generally in medium to poor condition with moderate to high density and diversity of weeds.

The Infrastructure Works CSSI footprint is currently inhabited by a range of pest species, most notably foxes and rabbits. Project activities have the potential to disperse pest species out of the development site across the surrounding landscape and increase the ability of pest species to utilise habitats due to habitat modification. However, in the context of the Project this impact is predicted to be minimal, as all vegetation in the study area is likely to be impacted by foxes and cats.

Several known NSW pathogens have potential to impact on biodiversity because of moving between infected sites or due to spreading contaminated material during construction. Of these,

three are listed as a key threatening process under either the EPBC Act and/or the Biodiversity Conservation Act 2016 including:

- Dieback caused by Phytophthora (Root Rot; EPBC Act and BC Act)
- Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis (EPBC Act and BC Act)
- Introduction and establishment of exotic Rust Fungi of the order Pucciniales on plants of the family Myrtaceae (BC Act).

These three pathogens have all been recorded in the Sydney basin bioregion and have potential to occur within the Infrastructure Works CSSI footprint. The construction of the Project may increase the risk of disturbing and spreading these pathogens.

5.7 Aquatic fauna

Database searches revealed twenty EPBC Act listed aquatic threatened fauna and communities as potentially within locality of the study area. Of these, the likelihood of occurrence assessment identified one threatened fauna species as having a moderate or high likelihood of occurring; Black Rock Cod as detailed in **Table 5-4** below.

Table 5-4 Aquatic fauna

Habitat	Species
Parramatta River South	Black Rock Cod (*Epinephelus daemelii*)

Aquatic habitats identified within the study area included areas along the Parramatta River, Clay Cliff Creek and Vineyard Creek. The habitat features of these are detailed in **Table 5-2**. The fisheries habitat classification for Parramatta River is proved in **Table 5-5**.

Table 5-5 Classification of waterways

Waterway	Classification #	Description
Parramatta River	Class 1 – Major key fish habitat with habitat sensitivity Type 2: Moderately sensitive key fish habitat.	Marine or estuarine waterway or permanently flowing or flooded freshwater waterway (e.g. river or major creek), habitat of a threatened or protected fish species or 'critical habitat'.

Classification in accordance with NSW DPI Fisheries Guidelines

5.8 Aquatic flora

No threatened aquatic flora species were identified as having a moderate or high likelihood of occurring within the study area.

6 Environmental aspects and impacts

6.1 Construction activities

Key construction activities of the Project that could result in impacts to terrestrial and aquatic flora and fauna include:

- Bulk earthworks
- Bridge construction
- Utility realignment works
- Culvert and drainage works
- Site access including temporary waterway crossings
- Slope or embankment creation and stabilisation process
- Noxious weed treatment including herbicide spraying
- Works within and adjacent to watercourses
- Noise and vibration impacts
- Disturbance of soils resulting in dust, potential erosion and the mobilisation of sediment and contaminants
- Use of chemicals/fuels (potential for spills)
- Generation of waste products

Refer also to the Risk Register included in Appendix A2 of the CEMP.

6.2 Clearing and grubbing of native vegetation (including habitat)

The EIS identifies clearing of approximately 0.5 - 0.62 hectares of native vegetation. The extent of clearing will be monitored during the detailed design and construction to avoid or minimise impacts.

6.3 Ecological impacts

Likely and/or potential impacts associated with Project are discussed in Chapter 10 of the EIS and the accompanying Biodiversity Assessment Report.

Vegetation clearance and habitat loss are likely to be the largest impacts for terrestrial biodiversity associated with the project. The extent of vegetation and habitat loss is summarised in Table 8.2 of the Biodiversity Assessment Report. This identified clearing of approximately 0.62 hectares of remnant native vegetation, including 0.44 hectares of EECs. Overall, approximately 300 individual trees would be removed. However, most individual tree losses would comprise of horticultural plantings (within the Miscellaneous ecosystem) being of limited native vegetation composition.

Other ecological impacts would include:

- Potential impacts to plant species and endangered ecological communities
- Direct and indirect impacts to fauna
- Loss of habitat
- Fragmentation of habitats and wildlife corridors
- Barrier effects on wildlife and riparian corridors (such as the erosion of genetic stock, impacts on home ranges, territorial disputes, increased competition etc.)

- Introduction of priority weeds not currently occurring in the Infrastructure Works CSSI footprint
- Spread of plant diseases
- Spread of feral animals
- Physical, chemical and biological changes to aquatic environments
- Edge effects (such as weed invasion, pests and disease) and a reduction in native flora and fauna
- Disturbance to aquatic and riparian habitats potentially resulting in contamination and siltation of waterways.

In the absence of appropriate mitigation measures, there is the potential for significant impact on flora, fauna and ecological communities identified as occurring, or with the potential to occur, within the Project corridor. The Environmental Control Measures provided in Table 7-1 aim to mitigate as far as practicable the potential impacts as they relate to pre-construction, construction and post-construction phases of the Project.

6.4 Impacts on Trees

The construction of the project will require removal or relocation of trees including street trees that cannot be avoided within the permanent or temporary construction footprint.

Other trees will require pruning of limbs or disturbance to roots. The extent of pruning of limbs or disturbance to roots will influence the ongoing viability of the trees.

7 Environmental mitigation and management measures

7.1 Tree Protection

7.1.1 Tree Registers

IA Tree Register

The Independent Arborist (IA) will be responsible for preparing and maintaining a register of all trees within the CSSI footprint and identifying trees that must be removed, retained, pruned or those whose fate is uncertain (the IA Tree Register). Trees that have been earmarked for clearing throughout the Infrastructure Works CSSI footprint will be detailed within the IA Tree Register as conditioned within the CoA (condition E106).

Before removal or damage of a tree, the IA Tree Register and any other evidence or consideration must be submitted to the Secretary. The recommendations of the Independent Arborist must be outlined in the Tree Register and implemented by the Proponent, unless otherwise agreed by the Secretary.

JV Tree Register

The JV Arborist will implement, update and maintain a JV Tree Register for the duration of the Infrastructure Works to track any changes in impact on trees or patches of vegetation arising from progressing the detailed design and / or construction methodology and inform the IA's Tree Register.

The JV Tree Register must be used to record:

- Outcomes of the JV Arborist's and Trained Ecologist's assessment of potential impacts on individual trees and patches of vegetation
- Outcome of the assessment as to whether the tree or patch of vegetation is to be retained, relocated, pruned or removed, and a link to the relevant Environmental Design Review Report to justifying the decision
- Progress and date of actions to remove or relocate trees or patches of vegetation.

The JV Tree Register will be maintained in a geographic information system (GIS). The JV Tree Register will include, as a minimum, the attributes identified in the Table 1 - Tree Register Requirements for all trees to be removed in Infrastructure Contract Scope and Performance Requirements (SPR) Appendix N, Section 1.4.1.

The JV Tree Register will be used to track any changes in impact on trees or patches of vegetation arising from progressing the detailed design and/or construction methodology, cross-referenced to the relevant Environmental Design Review Report.

The JV Tree Register will be submitted to the IA with every updated revision. The IA will be responsible for verifying and cross checking the information provided within the JV Tree Register and updating the IA Tree Register accordingly to ensure that the IA Tree Register is the single accurate source of information.

7.1.2 Design Review for Impacts on Trees

During detailed design, the impacts to trees of each design package must be assessed by the JV Arborist and documented in the Environmental Design Review Report prepared for each design package. For those trees identified as requiring removal, the JV must demonstrate consideration of options to avoid or minimise impacts on trees. The options considered will include, but not be limited to:

- Consideration of operational requirements with existing tree locations
- Consideration of the health of each tree, including its vigour and likely ability to survive in situ pruning or transplanting
- Review of the construction methodology and layout to identify any options to avoid or minimise impacts on trees
- Considering opportunities to narrow/move footpaths
- Modification of the design to reduce impact to the tree (e.g. use of porous pavement)
- Reduction in the standard offsets required for underground services; and
- Where fencing, other ancillary infrastructure or services affect tree retention, relocation or alternative construction methods are considered to reduce impacts (e.g. from strip footings to pier footings for posts).

The Environmental Design Review Reports will include:

- An up to date copy of the JV Tree Register (as relevant)
- An impact assessment in accordance with the hierarchy detailed in Section 2.1 of Vegetation Offset Guide (TfNSW, 2016a) (refer to **Figure 7-1**) for each location where it proposed to remove, prune or relocate a tree or patch of vegetation
- Document the application of the hierarchy, options assessment process, preferred option and resultant tree impact. The options considered will include, as a minimum:
    - Relocation of the design element away from the tree or patch of vegetation
    - Modification of the design to reduce the impact on the tree or patch of vegetation (e.g. use of porous pavement, minimise need for excavation, etc.)
    - Reduction in the standard offsets to underground services
    - Adoption of tree sensitive construction techniques.

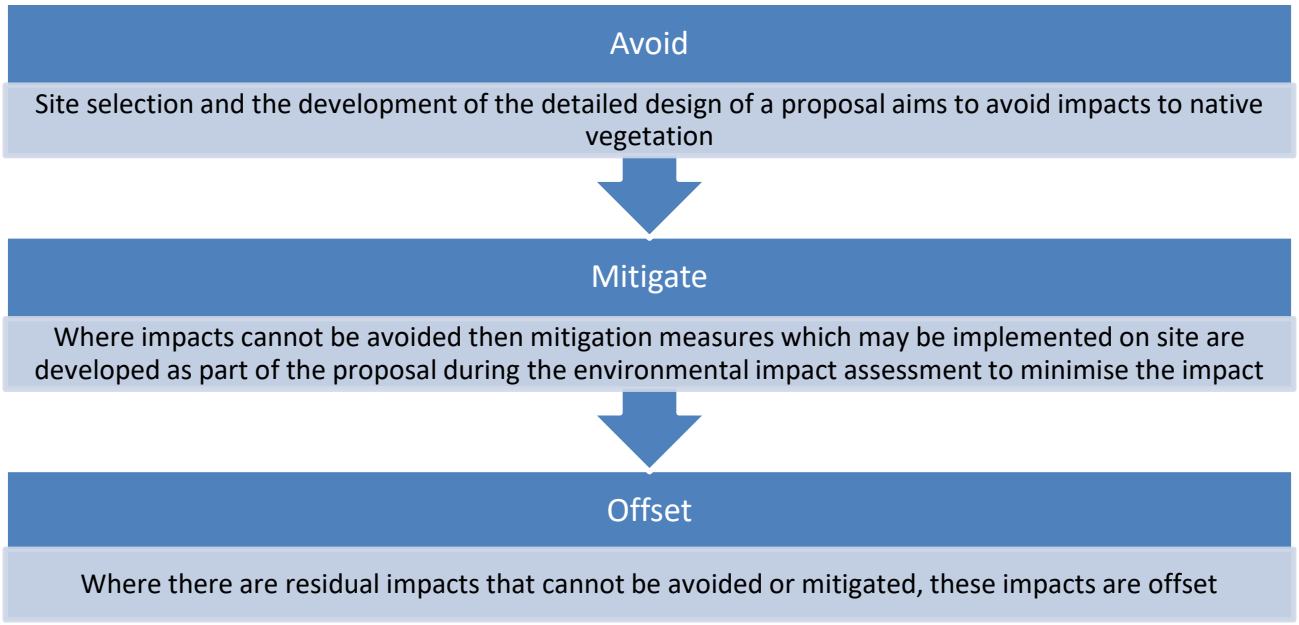


Figure 7-1: Tree impact assessment hierarchy

7.1.3 Tree Protection Plans

Tree Protection Plans will be prepared for all retained trees that are located within 15m of the Infrastructure Works footprint in accordance with AS 4970:2009 to identify specific tree protection works for the maintenance of retained trees.

The Tree Protection Plans must be submitted to and approved by the Independent Arborist prior to the commencement of works and be maintained on site for the full duration of the infrastructure works. Construction personnel must be inducted in the tree protection requirements.

The JV Arborist will undertake monthly inspections of the implementation of Tree Protection Plans. Actions raised from JV Arborist inspections will be noted in inspection reports and rectified immediately by the JV.

7.2 Tree Offset Package

TfNSW are responsible for the development of a Tree Offset Package in accordance with CoA E107 to identify how impacts on trees and vegetation will be mitigated, managed, and compensated and ensure that where trees are removed they are replaced.

The JV will comply with the Tree Offset Package through cooperation with the Independent Arborist to avoid and minimise impacts to trees and maintain the Tree Register.

The JV will provide landscaping in accordance with the Urban Design Requirements Report to comply with the Tree Offset Package.

7.3 Flora and Fauna Management Strategies

7.3.1 Pre-clearing surveys

Pre-clearing surveys will be completed in all areas where vegetation, trees or disturbance to other fauna habitat are planned. The pre-clearing surveys will include:

- Identification of habitat trees for two-phase clearing and determine nest box requirements for the Nest Box Strategy
- Assessment of structures for bat habitat
- Survey of weeds
- Tree assessments by the JV Arborist.

7.3.2 Vegetation Clearing Protocol

A Vegetation Clearing Protocol is provided in Appendix A to ensure that habitat trees, vegetation and structures cleared in a manner that avoids or minimises impacts to fauna. Key steps elements of the vegetation clearing protocol are:

- Demarcation of vegetation to be retained
- Pre-clearing inspection (within 12-48 hrs prior to clearing, identification of hollow trees, or other fauna habitats)
- Tree felling process
- Presence of trained ecologist for rescue and relocation of fauna during clearing works.

7.3.3 Fauna Rescue Procedure

A Fauna Rescue Procedure is provided in **Appendix B**. The procedure applies to all native and introduced species (domestic and pest) that are found on the Project site, including injured, shocked, juvenile and other animals.

Handling of fauna should be avoided where ever possible. Where handling of animals cannot be avoided, it should only be done by a licensed fauna ecologist or wildlife carer with specific animal handling experience. The fauna handler will keep a record of all fauna captured. This shall include:

- Species of fauna
- GPS location of tree/location from which fauna was captured
- State of fauna when captured (presence of injuries or disease)
- GPS location of relocation of species
- Any treatment administered to injured or distressed wildlife
- Release site details including microhabitat type location.

To minimise handling fauna, the pre-clearing assessments outlined in the Vegetation Clearing Protocol (**Appendix A**) will be implemented prior to clearing, ensuring that the Trained Ecologist will be on site during clearing of vegetation and habitat trees.

If fauna is discovered during construction activities, the procedure for unexpected discovery of fauna on-site, as described in the Fauna Rescue Procedure (**Appendix B**), will be implemented.

7.3.4 Unexpected threatened species finds

A comprehensive survey of all vegetation was conducted during December 2016 which identified threatened flora and fauna species and EECs pursuant to the *Biodiversity Conservation Act 2016*.

An unexpected threatened species find would be either:

- Threatened flora individual(s) (including EEC) that were not known of at the time of the EIS
- Occurrence of a threatened species not assessed in the EIS.

An unexpected threatened fauna procedure is included in **Appendix B**.

For unexpected threatened flora individual(s) that will be directly or indirectly impacted by the Project, the areas is to be protected and the potential for translocation of the threatened plant species as individuals or part of a soil translocation must be assessed by a trained ecologist and documented in a translocation feasibility assessment. If the assessment recommended translocation to be feasible (likely to result in survival of the individuals or part of a soil translocation), a Threatened Flora Translocation Plan must be prepared.

If a new threatened species not assessed in the EIS is identified, a Consistency Assessment must be prepared to assess the significance of the impacts to the species.

7.3.5 Nest Box Strategy

A Nest Box Strategy will be developed by a trained ecologist to determine the location, number and type of nest boxes that should be installed to provide compensatory habitat for hollow dependant fauna, and microbats at bridge structures.

The Nest Box Strategy will involve survey of trees / vegetation in the areas identified as ‘Areas Requiring Assessment’ in the Parramatta Light Rail Biodiversity Assessment Report (EIS Technical Report 4) Figure 8-1 -Assessment of Biodiversity Values. The surveys will identify the number and size of active or potential hollows in each tree, the density and quantity of nest boxes required and potential locations where they could be installed. The density and quantity of habitat replacement will reflect the proportion of habitat resources (i.e. hollows, food resources etc.) being removed. A ratio of 1:1 (hollows/roost sites removed: nest/roost boxes replaced) will be adopted.

Nest boxes of a variety of designs will be installed where necessary to accommodate different species likely to be utilising hollows as determined by the trained ecologist, including boxes suitable for roosting by microbats. Relocation of natural hollows by either affixing them to existing live retained trees or to poles/trunks of felled trees installed in revegetated areas may also be

considered as an alternative to nest box installation and will be addressed in the Nest Box Strategy.

The Nest Box Strategy will also assess feasibility of fitting roost boxes to the bridges over existing creek crossings to provide roost sites for the Large-footed Myotis and other species of microbats (e.g. Eastern Bentwing-bat) which may utilise such structures. These would be the following bridges:

- Bridge Street Bridge
- Lennox Bridge
- Macarthur Bridge
- Clay Creek Crossing Bridge
- USWP rail Bridge
- Kissing Point Bridge.

The assessment of bridges over existing creek crossings will consider suitability of habitat as well as engineering constraints (including heritage constraints) to the installation of roosting structures.

Nest boxes that are determined to be required in the Nest Box Strategy will be installed prior to removal of trees / vegetation or structure disturbance.

Monitoring of nest boxes will be completed six, twelve and eighteen months following installation to assess utilisation, effectiveness of this mitigation measures and any maintenance requirements.

7.4 Weed, Pest and Pathogen Control Procedure

Prevention of the establishment of weeds is the best and most effective form of weed control. To prevent the spread of weeds, the following measures should be considered and implemented as required:

- Ensure plant, equipment and clothing are free of soil and vegetative matter prior to being brought to site. **Appendix D** provides a Plant and Equipment Clean Down Declaration to be provided with all plant and equipment working on the project
- Minimise disturbance to existing native vegetation on the site
- Separate weed infested topsoils from weed free topsoils
- Control weed at suitable times to prevent the development of propagules (seed heads)
- Ensure erosion controls are in place to minimise the spread of weeds from run off
- Apply mulch and revegetate disturbed sites as soon as practical.

Where herbicides are to be used for control of weeds, the following measures will be assessed and implemented as required:

- Requirements for chemical use under the *Pesticides Act 1999* and Pesticides Regulation 2009, such as community notification measures
- Read and adhere to the information contained on herbicide labels
- Prepare a Pesticides Application Record form (9TP-FT-160)
- Use the appropriate technique of application for the identified weed
- Avoid application of herbicides during times when plants will be dormant such as winter and the hottest times of day in summer
- Avoid application during windy conditions and before rain
- Avoid application near waterways and other sensitive receivers. Where this is unavoidable select herbicides, which are suitable for the environment.

To minimise the impacts of weeds and pathogens to the biodiversity of the Infrastructure Works CSSI footprint, the principles of the Department of Energy and Environment's 'Arrive Clean, Leave Clean' procedure will be implemented throughout all aspects of construction (Australian Government, 2015). A summary of these principles is provided below:

- Identify construction activities with the potential to spread weeds and pathogens throughout the Infrastructure Works CSSI footprint (movement of plant and equipment from infested areas etc.)
- Ensuring all plant and equipment transported onsite are clean of weeds, seeds and soil/gravel – undertake an inspection of plant/equipment prior to transportation onsite
- Providing training to all staff during site inductions and toolbox talks regarding the importance of weed and pathogen management and associated processes
- Providing adequate vehicle wash-down locations at each Project site – washing down tyres and underneath vehicles prior to transporting materials from one location to another
- Monitoring wash-down procedures and weed/pathogen management procedures during construction to ensure procedures are suitable. Consider altering weed/pathogen management procedures as required.

7.5 Environmental control measures

A range of environmental requirements and control measures are identified in the various environmental documents, including the EIS, REMMM, EPOs, CoA and other Transport for NSW documents. Specific measures and requirements to address impacts on flora and fauna are outlined in Table 7-1.

Table 7-1 Flora and fauna management and mitigation measures

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
General					
FF1	The following information will be included in the Project Induction to ensure compliance with Biodiversity REMMMs: • The location of threatened vegetation species and EECs (**Appendix E**). • Requirement to undertake pre-clearing surveys prior to clearing. • Requirement to ensure presence of ecologist/fauna handler during clearing and other relevant construction activities. • Need for clearing limits. • Requirement to contact management in the event of a threatened species find or fauna encounter. • Tree protection measures.	Maps of the location of vegetation and EECs Mandatory Project Induction	Project induction	Induction staff/ Environment and Sustainability Manager	CoA C2(j)
Vegetation clearing, protection and management					
VM1	Vegetation clearing of the development site will be restricted.	Environmental Design Review Reports	Detailed design phase	Project Designers	E100 REMMM BI-3

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
VM2	Vegetation clearing extents and 'no-go' areas will be clearly identified. High visibility fencing (such as barrier mesh) will be used to delineate vegetation to be retained or limits of clearing.	Tree Protection Plans High visibility fencing	Pre-construction/ pre-clearing	JV Arborist Environmental Coordinator	REMMM BI-3
VM3	Where possible, the removal of native vegetation and disturbance during clearing will be minimised.	Environmental Design Review Reports Tree Protection Plans Vegetation Clearing Protocol	Design Construction	JV Arborist Environmental Coordinator	E100 REMMM BI-3
VM4	Trimming of vegetation will be prioritised over removal along the existing rail corridor and within development footprint.	Tree Protection Plans	Construction	Construction Team JV Arborist	REMMM BI-3
VM5	No locating of plant and machinery or stockpiling materials in the drip zone of trees to be retained.	Tree Protection Plans	Construction	JV Arborist Site Supervisor	REMMM TR-7 and TR-9
VM6	Where required, tree root investigation will be undertaken by non-destructive methods to determine the ongoing viability of the tree.	Tree Protection Plans	Pre-construction/ pre-clearing	JV Arborist Site Supervisor	REMMM TR-3

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
VM7	Amenity trees will not be pruned beyond the extent required for clearances.	Tree Protection Plans	Clearing	Site Supervisor JV Arborist	REMMM TR-4
VM8	Multiple smaller branches will be prioritised over larger branches when pruning. The extent of minor pruning works required is assessed by an arborist with a minimum AQF Level 3 qualification in Arboriculture.	JV Arborist Report	Clearing	Site Supervisor JV Arborist	Best practice
VM9	Major pruning works will be assessed by an arborist with an Australian Qualifications Framework (AQF) level of 5, and the assessment is endorsed by the Independent Arborist, before the works are implemented.	JV Arborist Report	Pre-clearing	Site Supervisor JV Arborist	REMMM TR-4
VM10	The disturbance footprint in mangrove areas will be minimised through work area planning and management of activities.	Environmental Design Review Reports	Detailed Design	JV Arborist	REMMM BI-5
VM11	Low impact construction techniques will be utilised during all works on existing tree roots to minimise impacts to tree root systems	Tree Protection Plans	Construction	JV Arborist	REMMM TR-3

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
VM12	Rehabilitation will be undertaken in accordance with the UDRR. Shade tolerant plant species will be selected for revegetation under bridge structures. Species selection, including the selection of tree species, size and planting location. will be carried out in close consultation with CoPC and in accordance with the UDRR. The UDRR will include recommended tree species to be used for replacement planting in each of the precincts.	UDRR	Revegetation	Urban Designers	REMMM BI-6
VM13	A trained and appropriately licenced ecologist will accompany clearing crews to ensure disturbance is minimised and to assist any native animals to relocate to adjacent habitat.	Vegetation clearing protocol	Clearing	Ecologist Environment and Sustainability Manager	REMMM BI-3
VM14	Tree pruning and removal works will be carried out in accordance with Australian Standard AS 4373-2007, Pruning of Amenity Trees.	AQF Level 3 Arborist	Clearing	Construction team Environment and Sustainability Manager	REMMM TR-4
VM15	Weed management measures will be implemented focusing on monitoring for early identification and management controls for minimising the risk of introducing weeds and pathogens	Pre-clearing survey Weed Monitoring	Pre-Construction	Trained Ecologist	REMMM BI-3

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
VM16	Where the loss of trees is unable to be mitigated, tree removal will be offset in accordance with Tree Offset Package. Proposed offsetting activities will be documented in the Tree Offset Package.	Tree Offset Package.	Pre-Construction	JV Arborist TfNSW	REMMM TR-5 Vegetation Offset Guide (TfNSW)
VM17	Temporary tree protection measures will be installed prior to construction works commencing in accordance with AS 4970-2009 - Protection of Trees on Development Sites as required for any trees to be retained within active construction sites.	Tree Protection Plans	Construction	JV Arborist Site Supervisor	REMMM TR-6
VM18	Where activities which could cause soil compaction within the tree protection zone (TPZ) of trees to be retained cannot be avoided (e.g. due to space constraints), opportunities to raise construction facilities (e.g. demountable) above the ground level or use of suitable ground protection measures beneath site access tracks (e.g. geotextile fabric) will be investigated and implemented, where feasible, so as to avoid impacting on the underlying tree roots, in accordance with Australian Standard AS 4970 Protection of Trees on Development Sites	Tree Protection Plans	Construction	JV Arborist Site Supervisor	REMMM TR-7 AS 4970 - Protection of Trees on Development Sites
VM19	Where trees which can be retained are located within construction boundaries, exclusion fencing will be erected to protect these trees from construction activities.	Tree Protection Plans	Construction	JV Arborist Site Supervisor	REMMM TR-9

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
VM20	For road network modifications away from the main alignment, these works will be carried out, as far as practical, to minimise any further impact on trees because of the project.	Tree Protection Plans	Construction	JV Arborist Site Supervisor	REMMM TR-9
VM21	Opportunities for collaborating with organisations and stakeholders to rehabilitate existing waterways along the project alignment (such as Vineyard Creek) will be investigated as part of the Vegetation Offset Strategy.	Environmental Design Review Reports UDRR TfNSW Biodiversity Offset Strategy TfNSW Tree Offset Package	Detailed Design Construction	Project Designers Environmental Team TfNSW	REMMM BI-1
VM22	Impacted vegetation must be rehabilitated in proximity to the area of disturbance with a diversity of endemic species (in the first instance) and locally native tree, shrub and groundcover species to the greatest extent practicable or offset in accordance with the Proponent's Biodiversity Offset Strategy.	UDRR TfNSW Biodiversity Offset Strategy	Revegetation	Urban Designers TfNSW	E100

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
Threatened flora and fauna					
TF1	The extent of clearing within or near EECs (**Appendix E**) will be minimised as far as practical during design and construction.	Arborists assessment in Design Review and Tree Protection Plans to advise on minimum buffer distances JV Tree Register ECM's	Pre-construction	Construction Team Trained Ecologist Environmental Team	REMMM BI-3
TF2	Recommendations of the Grey-Headed Flying Fox Monitoring Program will be implemented during the planning of works to reduce the disturbance to flying fox roosting sites.	Grey-Headed Flying Fox Monitoring progress reports	Pre-Construction	Environment and Sustainability Manager	REMMM BI-3
TF3	Rehabilitation in EECs will be monitored including identification of flora species to assess regeneration / revegetation success and review measures for the management and maintenance such as weed control, watering or mulch.	Weed monitoring	Construction	Trained Ecologist	REMMM BI-3

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
Wildlife protection					
WP1	A staged habitat removal process will be developed and implemented. Refer to the Vegetation Clearing Protocol in Appendix A.	Vegetation Clearing Protocol Pre-clearing Survey	Pre-clearing/ construction	Trained Ecologist	REMMM BI-8
WP2	Habitat trees to be cleared will be identified and marked by an Arborist survey. Refer to the Vegetation Clearing Protocol in Appendix A.	Tree Register Pre-clearing Survey	Pre-Construction	JV Arborist Trained Ecologist	REMMM BI-8
WP3	Pre-clearing procedure will be implemented that encourages animals to leave prior to clearing.	Vegetation Clearing Protocol Pre-clearing survey	Pre-Clearing/Construction	Trained Ecologist	REMMM BI-8
WP4	Pre-clearing surveys will be conducted at least 12 and no greater than 48 hours prior to vegetation clearing or works on structures with potential bat habitat to search for native wildlife which can be captured and relocated. Refer to the Vegetation Clearing Protocol in Appendix A.	Vegetation Clearing Protocol	Pre-Clearing/Construction	Trained Ecologist	REMMM BI-8

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
WP5	Where practical, felled habitat trees will be left on the ground for a further 24 hour waiting period prior to removal or will immediately be moved to the edge of retained vegetation. Refer to the Vegetation Clearing Protocol in Appendix A.	Vegetation Clearing Protocol Pre-clearing Survey	Clearing/Construction	Trained Ecologist	REMMM BI-8
WP6	All contractors will have the contact numbers of wildlife rescue groups in case animals are injured or orphaned during clearing.	Fauna Rescue Procedure Toolbox Briefings	Clearing	Trained Ecologist	REMMM BI-8
WP7	Relocation of animals to adjacent retained habitat will be undertaken by an ecologist during the supervision of vegetation removal. Refer to the Fauna Rescue Procedure in Appendix B.	Fauna Rescue Procedure	Clearing/Construction	Trained Ecologist	REMMM BI-8
WP8	The potential for translocation of threatened plant species as individuals or part of a soil translocation process will be considered. Refer to Section 7.4 of this Sub-plan	Unexpected Finds Report	Pre-construction	Environmental team	REMMM BI-9
WP9	Investigate and implement opportunities for minimising the potential for injury and mortality of wildlife in consultation with an ecologist where practicable.	Pre-clearing survey Next Box Strategy	Detailed design Construction	Trained Ecologist	REMMM BI-1

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
WP10	Opportunities for minimising the potential for injury and mortality of wildlife associated with overhead wiring and fences would be investigated in consultation with an ecologist and implemented where practicable.	Environmental Design Review Reports Ecologist	Detailed Design Construction	Project Designers Trained Ecologist	REMMM BI-1
Fauna habitat and connectivity					
HC1	The Nest Box Strategy will be developed to assess feasibility of fitting roost boxes to the bridges over existing creek crossings to provide roost sites for the Large-footed Myotis and other species of microbats (e.g. Eastern Bentwing-bat) which may utilise such structures. Roost boxes will be fitted to the bridge over the Parramatta River to provide roost sites for the Large-footed Myotis and other species of microbats (e.g. Eastern Bentwing-bat) prior to structure disturbance.	Nest Box Strategy Nest Boxes	Installed prior to structure disturbance	Trained Ecologist	REMMM BI-7

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
HC2	A Nest Box Strategy will be developed by a trained ecologist to assess the number, type and location of nest boxes required. The Strategy will be completed and replacement boxes implemented prior to clearing of trees / vegetation at locations where nest boxes area required. Nest boxes of a variety of designs will be installed including boxes suitable for roosting by microbats prior to disturbance in the area. A database of installed nest boxes will be developed and included in the Nest Box Installation Report. The database will include parameters such as size, type, target species as well as GPS location.	Nest Box Strategy Nest Boxes	Installed prior to disturbance in the area	Trained Ecologist	REMMM BI-7
HC3	Relocation of natural hollows will be considered as an alternative to nest box installation.	Nest Box Strategy Pre-clearing survey	Prior to disturbance in area	Trained Ecologist	REMMM BI-7
HC4	Important habitat elements (e.g. large woody debris) will be moved from the construction area to locations outside the clearing area in native vegetation remnants or to stockpiles for later use in vegetation/habitat restoration	Pre-clearing survey	Pre-construction / Construction	Trained Ecologist	REMMM BI-7
HC5	Winter-flowering vegetation will be preferentially planted in landscaped areas of the site to provide a winter foraging resource for migratory and nomadic nectar-feeding birds and the Grey-headed Flying-fox.	UDRR	Construction – landscaping	Landscaping contractor	REMMM BI-7

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
HC6	If monitoring suggests construction is changing Grey-headed Flying-fox camp behaviour, additional mitigation measures will be implemented.	The Grey-Headed Flying Fox Monitoring Program (PLR-TFNSW-CBD-PE-PRG-000001).	Construction	Environment and Sustainability Manager	CoA E101
HC7	Impacts upon habitat connectivity will be minimised by the inclusion of native vegetation and habitat elements such as rock piles and large woody debris under bridge structures to provide cover for fauna.	Environmental Design Review Reports	Detailed Design Construction	Project Designers Construction Team Environmental Team	REMMM BI-1
Aquatic habitats					
AH1	Vegetation buffer zones will be established in areas to be cleared in riparian zones to minimise works footprint in and adjacent to watercourses.	Environmental Design Review Reports Tree Protection Plans Delineation Fencing	Pre-construction/ prior to clearing	JV Arborist Trained Ecologist	REMMM BI-4

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
AH2	Crossing design will adhere to relevant policies and guidelines including the fish friendly passage guidelines (Fairfull and Witheridge, 2003) for waterway crossings and avoid/minimise disruption to fish movements and the Policy and guidelines for fish habitat conservation and management (Department of Primary Industries, 2013).	Environmental Design Review Reports	Detailed Design	Design Manager	REMMM BI-4
AH3	Disturbed watercourse bed banks and aquatic habitats will be remediated and revegetated as soon as possible following disturbance in accordance with the Guidelines for watercourse crossings on waterfront land (Department of Primary Industries, 2012) and the Policy and guidelines for fish habitat conservation and management (Department of Primary Industries, 2013).	UDRR	Construction	Construction team	REMMM BI-4
Pests and diseases					
PD1	Plant, equipment and clothing will be free of soil and vegetation matter prior to being brought to site.	Arrive Clean, Leave Clean' procedure	Pre-construction/ Construction	Plant Manager	Arrive Clean, Leave Clean Procedure
PD2	Weed infested soils and clean soils will be separated.	Weed Surveys	Pre-construction/ Construction	Trained Ecologist	REMMM WM-2

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
PD3	High-risk areas such as access roads, stockpiles and bare ground will be monitored for any signs of weeds.	Weed Monitoring	Construction	Environmental Team	REMMM BI-3
PD5	Weed infested plant material will be disposed of in accordance with the Arrive Clean, Leave Clean outlined in Appendix C.	Arrive Clean, Leave Clean Procedure Waste register	Pre-construction/ Construction	Environmental Coordinator	Arrive Clean, Leave Clean Procedure
PD6	Regular site inspections will be undertaken, of weed control in high risk areas such as recently weeded sites, new stockpiles and drainage lines. Follow up weed treatment will occur where required.	Weed Monitoring	Pre-construction/ Construction	Trained Ecologist	REMMM BI-3
PD7	A maintenance program will be implemented for any landscaping or revegetation undertaken as part of the Project. Maintenance will include watering and weed control as required. Any street tree plantings within the Parramatta Light Rail Corridor that dies within the maintenance period must be replaced	Weed Monitoring Plant Management Plans	Pre-Construction Construction	Trained Ecologist Landscape Contractor JV Arborist	REMMM BI-3
Mangroves					
MG1	Disturbed banks will be remediated with mangroves/native vegetation, and if required, mangrove shrubs/seedlings will be transplanted from disturbed areas.	UDRR	Pre-construction Construction	Site Supervisor	REMMM BI-5

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference
MG2	Work areas will be planned to avoid removing existing mangrove plants	Environmental Design Review Reports Tree Protection Plans Delineation Fencing	Pre-Construction	JV Arborist Trained Ecologist	REMMM BI-5

8 Compliance management

8.1 Roles and responsibilities

The JV Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.3 of the CEMP.

Key roles with relevant to the management of flora and fauna including avoidance, minimisation and management of impact on trees are identified in Table 8-1.

Table 8-1 Roles and Responsibilities

Role	Authority and Responsibility
Environment and Sustainability Manager	• Preparation of Environmental Design Review Reports
Environmental Coordinators	• Complete monthly inspections of vegetation no-go zone delineation. • Coordinate the trained ecologist to be in site at suitable times to complete pre-clearing inspections and supervision of clearing (when required)
Independent Arborist	The Independent Arborist (IA), as engaged by the IC, must be approved by the Secretary before works commence and hold a minimum AQF Level 5 qualification in Arboriculture. The IA is the principal point of advice in relation to the assessment and management of impacts on trees. Specific roles of the IA are to: • Prepare a Tree Register of all trees within the CSSI footprint before major pruning, relocation or removal. • The Tree Register must be prepared in accordance with the Planning Approval (CoA E104 and E105) and submitted to the Secretary before removal or damage of a tree as defined by the IA • Identify trees within the footprint that must be removed for construction to proceed or for CSSI operations • Identify trees where their fate is uncertain and may be retained, removed or pruned • Approve Tree Protection Plans prepared by the JV Arborist • Verify and certify that opportunities to avoid, minimise and manage impacts on trees arising from the Delivery Activities have been undertaken in accordance with the requirements of the Planning Approval and the TfNSW Vegetation Offset Guide • Verify and certify the Contractor's Tree Planting Register • Verify and certify the elements of the Contractor's Environmental Design Review Report relating to tree impacts and offsetting.

Role	Authority and Responsibility
JV Arborist (AQF Level 5)	• An Arborist with a minimum AQF Level 5 qualification in Arboriculture. • Will work with the Principal's Independent Arborist and will action any requirements within the timeframes reasonably required by the Independent Arborist • Undertake a detailed survey of all trees with potential to be impacted by the Infrastructure Works and record in the JV Tree Register • Conduct an impact assessment in accordance with the hierarchy detailed in Section 2.1 of Vegetation Offset Guide (TfNSW, 2016a) for each location where it is proposed to remove, prune or relocate a tree or patch of vegetation • Demonstrate that any tree proposed for pruning or relocation, which will be subject to medium or high impacts, will continue to remain viable in the long term • Prepare Tree Protection Plans • Undertake monthly inspections of tree protection works to assess compliance with the approved Tree Protection Plan and the health of the tree • Assess, advise and obtain endorsement from the Independent Arborist of any delivery activities proposed within the TPZ of the subject trees prior to commencement of those Delivery Activities • Undertake detailed assessment of major pruning works, and the assessment is endorsed by the Independent Arborist, before the works are implemented • Advise on the supplementary watering / nutrient program to improve the overall tree health and offset the pruning impacts • Prepare a Post-Construction Tree Report detailing the outcomes of a post-construction inspection of the trees that were retained and protected, pruned or relocated • Prepare and maintain the Tree Planting Register and provide to the IA to verify and certify
JV Site Arborists (AQF Level 3)	• An Arborist with a minimum AQF Level 3 qualification in Arboriculture. • Assess the extent of minor pruning works required.
Trained Ecologist	• Undertake pre-construction and bi-annual weed surveys and reporting • Prepare the Nest Box Strategy to determine the number, type and location of nest boxes required to compensate for loss of habitat and provide supplementary bat roosts on structures over rivers. • Pre-clearing Survey • Clearing Supervision, fauna rescue and relocation and salvage or fauna microhabitat features for reuse in reinstatement (hollows, logs).

Role	Authority and Responsibility
All personnel	• Be inducted in Tree Protection Plans that apply in areas of works • Observe and comply with vegetation no-go zones. • Only undertake tree removal, pruning or relocation following approval by and in accordance with the direction of the Independent Arborist.

8.2 Training

All employees, contractors and utility staff working on site will undergo site induction training relating to flora, fauna and tree management issues. The induction training will address elements related to flora, fauna and tree management issues management including:

- Existence and requirements of this Sub-plan and relevant legislation
- Specific species likely to be affected by works and how these species can be recognised
- Mulch stockpile location and management measures
- Fauna rescue requirements
- Weed control measures
- General flora and fauna management measures
- Specific responsibilities for the protection of flora and fauna.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in flora, fauna and tree management:

- Induction to the Tree Protection Plans applicable in each work area.
- Protocols for dealing with fauna encounters during vegetation clearing
- Tree flagging procedure that has been implemented, including what the various flagging colours mean
- Tree protection measures including implementation of AS 4970 – 2009
- The use of low impact construction techniques (on existing tree roots)
- Stockpiling and management of mulch
- Weed/pathogen identification and control.

8.3 Monitoring and Inspections

Monitoring and Inspections requirements relevant to the management of flora and fauna including avoidance, minimisation and management of impact on trees are identified in **Table 8-2**.

8.4 Reporting

Reporting requirements relevant to the management of flora and fauna including avoidance, minimisation and management of impact on trees are identified in **Table 8-3**.

8.5 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this Sub-plan, CoA and other relevant approvals, licenses and guidelines. Audit requirements are detailed in Section 3.8.4 of the CEMP.

Table 8-2 Inspection and Monitoring Requirements

Item	Scope	Timing	Frequency	Responsibility	Records / Reporting
Weed Surveys	Review of the status of weeds throughout the Infrastructure Works CSSI footprint	Prior to construction Construction	Prior to construction Bi-annually	Trained Ecologist	Internal
Detailed Survey of All Trees	Detailed survey of all trees with potential of major pruning, relocation or removal by construction or works	Design and Construction	Following each review of detailed design or construction methodology that results in proposed impacts to trees	JV's Arborist (AQF Level 5) Ecologist	Tree Register
Habitat Tree Assessment for Nest Boxes	Assessment of habitat trees and structures within the Infrastructure Works CSSI footprint to determine number of hollows likely to be removed to calculate the nest box requirements	Prior to construction	Once only	Trained Ecologist	Nest Box Strategy JV Tree Register
Nest Box Monitoring	Monitoring of nest boxes to assess utilisation, effectiveness of this mitigation measures and any maintenance requirements.	Six, twelve and eighteen months following installation	Three rounds	Trained Ecologist	Nest Box Monitoring Report
Structure Assessment for bat Roost Boxes	Assess feasibility of six structures over the river for the installation of bat roost boxes.	Prior to construction	Once only	Trained Ecologist	Nest Box Strategy

Item	Scope	Timing	Frequency	Responsibility	Records / Reporting
Pre-clearing Survey	Pre-clearing survey of vegetation / habitat / trees / structures 12-48 hrs prior to clearing.	12-48 hrs prior to clearing	Each time clearing occurs	Trained Ecologist	Pre-construction Survey & Clearing Supervision Report JV Tree Register
Clearing Supervision	Supervision of vegetation clearing for fauna rescue and salvage of habitat features.	12-48 hrs prior to clearing	Each time clearing occurs	Trained Ecologist	Pre-construction Survey & Clearing Supervision Report
Maintenance of no-go zones inspections	Inspection of high visibility fencing to delineate vegetation to be retained or limits of clearing.	Construction	Monthly (when works occurring within 50m of no-go zone)	Environmental Coordinator	Inspection records
Tree pruning assessment	Assessment of tree pruning	Construction	When pruning of trees is proposed	JV's Arborist (AQF Level 5)	JV Arborist Report
Tree protection works inspections	Inspections of tree protection works to assess compliance with the approved Tree Protection Plan and the health of the tree and identify supplementary watering / nutrient program to improve the overall tree health and offset the pruning impacts.	Construction	Monthly	JV's Arborist (AQF Level 5)	Inspection records
Rehabilitation in EECs / revegetation areas	Monitoring of regeneration / revegetation success and review measures for the management	Post rehabilitation	Quarterly	Environmental Coordinator Trained Ecologist	Inspection records

Item	Scope	Timing	Frequency	Responsibility	Records / Reporting
Pesticide Application Record	Record of the application of herbicide	Within 24 hrs of herbicide application	Each time herbicide is used	Landscape or weed control contractor	TfNSW Pesticides Application Record form – 9TP-FT-160
Post Construction Tree Inspections	Post-construction inspection of the trees that were retained and protected, pruned or relocated.	Within one month of the completion of infrastructure works	Once only	JV's Arborist (AQF Level 5)	Post Construction Tree Report

Table 8-3 Reporting Requirements

Report	Scope	Timing	Frequency	Responsibility	Submission
Environmental Design Review Reports	Consideration of environmental impacts including minimising the removal of native vegetation and disturbance during clearing. Provide Tree Register identifying trees impacted by the design package Matters described in 7.1.2	Design	With each stage of each design package	Project Designers with input from JV's Arborist	Independent Certifier
JV Tree Register	Document the impact assessment of each location where it is proposed to remove, prone or relocate a tree or patch of vegetation, and a link to the relevant Environmental Design Review Report to justifying the decision. Record the outcomes of the JV Arborist's and Trained Ecologist's assessment of potential impacts on individual trees and patches of vegetation. The progress and date of actions to remove or relocate trees or patches of vegetation from Tree protection works inspections.	Design Construction	Follow each review of detailed design or construction methodology that results in proposed impacts to trees Weekly throughout construction	JV's Arborist (AQF Level 5)	Independent Arborist

Report	Scope	Timing	Frequency	Responsibility	Submission
Tree Protection Plans	Plan for all retained trees (including but not restricted to those that are to be pruned to accommodate the Contractors Activities) that are located within 15 metres of the Infrastructure Works footprint, to identify any tree specific requirements as required.	Prior to the commencement of construction located within 15 metres of trees	Follow each review of detailed design or construction methodology that results in proposed impacts to trees	JV's Arborist (AQF Level 5)	Independent Arborist
JV Arborist Report	Tree pruning assessment	Construction	When pruning of trees is proposed	JV's Arborist (AQF Level 5)	Independent Arborist
Weed Survey Report	Review of the status of weeds throughout the Infrastructure Works CSSI footprint	Prior to construction Construction	Prior to construction Six monthly	Trained Ecologist	Internal
Nest Box Strategy	Assessment of habitat trees and structures within the Infrastructure Works CSSI footprint	Prior to construction	Once only	Trained Ecologist	Internal City of Parramatta Council
Next Box Installation Report	Report on the implementation of the Nest Box Strategy.	Completion of nest box installation	Once only Revised if additional next boxes are installed	Trained Ecologist	Independent Certifier City of Parramatta Council
Nest Box Monitoring Report	Summary report of the monitoring of nest box utilisation, effectiveness of and maintenance requirements.	Within one month of completion of each monitoring event	Three rounds	Trained Ecologist	TfNSW DPIE ESS City of Parramatta Council

Report	Scope	Timing	Frequency	Responsibility	Submission
Monthly Progress Reports	Progress against the requirements of the Sub-plan Management strategies to identify the need for, and to undertake, consistency reviews under the *Environmental Planning and Approval Act 1979* Data and status of tree impact assessment and the progress with tree plantings as required under the landscape designs, including an up to date Tree Register Progress reporting on tree removals, relocations and pruning Tree removals, relocations and pruning programmed for the next two months Maintenance and monitoring progress report Performance against the targets for 'avoidance, minimisation and management of impacts to trees' in the Deed Details of the Environmental Design Reviews undertaken, or in progress, during the reporting period	Monthly, within seven Business Day after the end of the relevant calendar month.	Monthly	Environment and Sustainability Manager with input from JV's Arborist	TfNSW

Report	Scope	Timing	Frequency	Responsibility	Submission
Quarterly Environment Reports	Details of the Tree Protection Plans in place during the reporting period, including summaries of monthly monitoring of tree protection measures; Updated Tree Register and progress of tree removals, relocations and pruning activities; and Update on the progress of the tree plantings as required under the landscape designs.	Within seven Business Days after the relevant quarter end	Quarterly from the commencement of works	JV Arborist	TfNSW
Pre-construction Survey & Clearing Supervision Report	Record of the trained ecologist's assessment of vegetation / habitat / trees 12-48 hrs prior to clearing. Record of the trained ecologist's supervision of vegetation clearing, fauna rescued / observed and habitat features salvaged.	Within one month of completion of clearing in any area	Each time clearing occurs	Trained Ecologist	Internal
Unexpected threatened species finds report (including translocation feasibility assessment)	Report of any unexpected threatened flora / fauna / EEC identified during design or construction including, in the case of threatened flora, feasibility assessment for translocation of the threatened plant species as individuals or part of a soil translocation.	Within two weeks of an unexpected find	As required	Trained Ecologist	TfNSW

Report	Scope	Timing	Frequency	Responsibility	Submission
Threatened Flora Translocation Plan	A detailed translocation plan for translocation of threatened plant species as individuals or part of a soil translocation.	Within one month of an unexpected find	As required	Trained Ecologist	TfNSW DPIE ESS Relevant Councils
Post construction ecological monitoring report	Summary report of the pre-construction survey & clearing supervision reports and weed survey.	Within one month of the completion of infrastructure works	Once only	Trained Ecologist	Internal
Register of Planted Trees	A register to track the status of plantings implemented by the Contractor under the Urban Design Requirements	Post construction	Within one month of the completion of infrastructure works.	JV's Arborist (AQF Level 5)	TfNSW Independent Certifier
Post Construction Tree Report	Report detailing the outcomes of a post-construction inspection of the trees that were retained and protected, pruned or relocated.	Within one month of the completion of infrastructure works	Once only	JV's Arborist (AQF Level 5)	TfNSW Independent Certifier

9 Review and improvement

9.1 Continuous improvement

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for identifying 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.

9.2 FFMP update and amendment

The processes described in Section 3.8 to Section 3.12 of the CEMP may result in the need to update or revise this Sub-plan. This will occur as needed.

Any revisions to the FFMP will be in accordance with the process outlined in Section 3.12 of the CEMP.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to 3.10.2 of the CEMP.

Appendix A – Vegetation Clearing Protocol

The following protocol outline the methodology for clearing of vegetation within the Project footprint following IA certification of the vegetation removal.

Before removal or damage of a tree(s), the IA's Tree Register will be submitted to the Secretary. The recommendations of the Independent Arborist will be outlined in the Tree Register and implemented by the JV, unless otherwise agreed by the Secretary.

Pre-Clearing Survey

Pre-clearing surveys will commence following the identification of trees to be removed and the marking of habitat trees. A Trained Ecologist will complete an assessment of habitat trees to be cleared 12-48 hours prior to the scheduled clearing works.

The following procedure should be followed before vegetation clearance commences:

- Pre-clearing checklist for sign-off by relevant parties before commencement of clearing
- Vegetation to be retained is to be clearly demarcated
- Where necessary, identification and relocation of habitat items for salvage under guidance by Trained Ecologist (coarse woody debris and/or bushrock)
- Pre-clearing search/check for fauna for relocation prior to clearing under guidance of Project ecologist
- The Trained Ecologist to identify areas of habitat suitable for the release of fauna displaced during clearing of habitat trees prior to the commencement of vegetation clearance.
- Trained Ecologist should be present during felling of habitat trees to capture fauna displaced during clearing. Uninjured fauna shall be captured and relocated into predetermined release habitat. Injured fauna shall be captured and taken immediately to the nearest wildlife carers or veterinary surgeon (refer to Fauna Rescue Procedures).

The Superintendent or the Environment and Sustainability Manager should inform clearing contractors of any changes to the sequence of clearing if required, and in accordance with the pre-clearing survey for the Project.

Assessment of structures for bat habitat

A Trained Ecologist will complete an assessment of bridges over existing creek crossings for the nest box strategy to determine potential for habitat for Large-footed Myotis and other species of microbats (e.g. Eastern Bentwing-bat) which may utilise such structures.

These would be the following bridges:

- Bridge Street Bridge
- Lennox Bridge
- Macarthur Bridge
- Clay Creek Crossing Bridge
- USWP rail Bridge
- Kissing Point Bridge.

At sited determined to have potential to provide habitat for microbats, a trained ecologist will complete a diurnal assessment 12-48 hour prior to the scheduled works to determine if microbats

are present. If confirmed to be present, the Trained Ecologist is to provide recommendations to reduce the impact to the species.

Vegetation Clearing within Project Footprint

Vegetation clearing and pruning works within the Project footprint would be undertaken in accordance with the pre-clearing survey and by suitably qualified staff/contractors using appropriate equipment and methods as identified below.

The following methods can be used for tree clearing works:

- Where feasible, trees can be felled using heavy machinery (e.g. excavators and bulldozers). Using this method trees are pushed in a safe direction and trees are felled with roots intact. This method would not require additional earthworks or tub-grinding to remove stumps
- In other situations, trees may be felled (whole or in portions) using chainsaws and accessed via tree climbing equipment or from an elevated work platform. Trees felled using this method will leave stumps that will need to be removed by other methods (digging or tubgrinding)
- Where habitat trees are to be removed, the Trained Ecologist or other suitably qualified professional shall be present. The methods outlined below will be used
- If using heavy machinery, habitat trees will be mechanically shaken or agitated prior to felling. This may result in fauna presenting at the entrance to hollows, or exiting the hollows completely prior to felling. If no fauna is seen following a brief period of observation, habitat trees should then be felled as carefully as possible. Where feasible, hollows should be facing upwards once trees have been felled. An inspection of the hollow would then be carried out to determine whether fauna is present. If present the fauna captured and relocated to an appropriate location, i.e. a similar habitat nearby and not impacted by the works
- If chainsaws are employed to fell habitat trees, hollow sections can be cut and lowered by rope so these can be inspected on the ground for fauna. Fauna capture and relocation is as recommended above
- Where pruning is required to accommodate the works (e.g. for low hanging branches or to remove safety hazards) as identified in the Tree Management Plan, branches will be pruned with appropriately sharp tools to enable a clean cut, close to the stem or trunk of plant.

Production and Stockpiling of Mulch

Stockpiling and re-use of mulch within the Project is the preferred method for managing this material. Where storage is an issue within the Project footprint, nearby offsite storage facilities will be identified in consultation with relevant Councils with mulch temporarily stored offsite before reapplication to site during landscaping works. In the event of excess mulch, consultation would be undertaken with Councils to discuss the potential for reuse of this material elsewhere within the Local Government Area (LGA) as applicable. The final option to be considered includes sending the excess material to an offsite composting or waste facility as required.

Mulch for re-use will be stockpiling in appropriate areas (e.g. in designated storage areas in the construction compound sites as per the Site Establishment Management Plan, or storage areas identified in consultation with local Council, and ideally in areas of mown grassland away from intact vegetation).

Mulch can be used for erosion and sediment controls (ERSED) and dust control measures, to be implemented in accordance with the relevant management plans for the Project (i.e. the Soil and Water Management Plan and Air Quality and Dust Management Plan respectively).

Reuse of mulch from exotic trees is not recommended onsite. Where stockpiling of mulch from exotic trees is required prior to offsite reuse or disposal, this will be in areas specifically assigned for this purpose and kept separate from native mulch. Where vegetation, including mulch is stockpiled, stockpiles will be limited to 3m in height. Stockpile temperature will be maintained by regular turning of stockpiles, as determined by temperature and moisture levels in specific stockpiles.

Appendix B - Fauna Rescue Procedure

This procedure aims to minimise impacts on fauna during the construction of the Project and applies to native and introduced species (domestic or pest) that are found on the Project site, including injured, shocked, juvenile and other animals.

Handling of fauna should be avoided where ever possible to reduce:

- Stress on animals
- Spreading of disease (e.g. Chytrid amphibian fungus)
- Risk to health or safety (e.g. venomous snakes, raptors, bats with potential to carry Australian bat lyssavirus).

Where handling of animals cannot be avoided, it should only be performed by a licensed fauna ecologist or wildlife carer with specific animal handling experience. To minimise the requirements to handle fauna, it is assumed that Pre-clearing assessments outlined in the Flora and Fauna Management Plan (FFMP), Appendix A Procedure for Vegetation Clearing, is completed prior to clearing.

Emergency Contacts

Contact	Contact Number
Trained Ecologist – TBC	TBC
Environmental and Sustainability Manager – Peter Monsted	0437 685 224
General Superintendent – Ken Murphy	0418 611 204
WIRES	1300 094 737
Parramatta Veterinary Hospital	(02) 9630 5520
TfNSW Environmental and Planning Manager – Richard Farmer	0452 318 524
Environmental Representative (ER) – Gillian Lehn	0438 355 346
Ecosure (TfNSW GHFF ecologist) for Grey-Headed Flying Fox Monitoring and observations	(07) 5508 2046

Trained Ecologist

A trained Ecologist shall be employed to undertake the pre-clearing surveys and supervision of clearing activities.

The Ecologist will be degree qualified, suitably experienced and with expertise in fauna rescue. The Trained Ecologist will manage and supervise all fauna rescue tasks to minimise the impacts on fauna. Wildlife rescue organisations may be used to assist in rescue, but will not manage the process.

Fauna Likely to be Directly Affected

While some mobile species, such as birds, may be able to move away from the path of clearing, other species likely to be directly affected by the works include:

- Less mobile species unable to move rapidly over relatively large distances (e.g. frogs and reptiles, nesting birds and juvenile fauna)
- Arboreal and scansorial mammals (possums)
- Microbats residing in structures (bridges and culverts)
- Other species using tree hollows (e.g. birds)
- Fish and aquatic fauna (e.g. fish or eels) in waterways.

For these species, construction activities will result in loss of roosting habitat and potential injury or mortality. Mobile species fleeing clearing areas are also at risk from collision with vehicles.

Fauna handling and rescue considerations

Table B-1 provides a summary of considerations for general handling and rescue of fauna.

Table B-1 Fauna handling and rescue considerations

Taxa / activity	Consideration
Handling of snakes	Handling of snakes can be unsafe and bites from these species can result in serious illness, organs damage or even death. Some species have anticoagulants that result in excessive bleeding. Handling of these species should be attempted by appropriately qualified personnel, and where possible, use of no-direct contact handling techniques (i.e. snake hook and bag, opposed to handling the animal).
Handling of bats / removal of structures (bridges and culverts)	Some species of bats carry the Australian Bat Lyssavirus (ABL): a form of rabies. Anyone handling bats should be vaccinated. Bats that are held should be stored in a calico bag or sealed bat nest box. Prior to clearing of existing structures, an assessment for microbats and other fauna residing in the structure shall be completed. If the assessment determines that microbats are likely roosting in the structure, a site-specific bat management strategy is to be developed to manage staged exclusion of the bats from the structure prior to removal.
Handling of frogs	Handling of frogs can result in the spread of the Amphibian Chytrid Fungus and shall be undertaken in accordance with the DECC Hygiene Protocol for Control of Disease in Frogs (DECC 2008). Frogs and tadpoles are to be placed into plastic bag (zip lock) or other plastic containers with a small amount of water and vegetation.

Taxa / activity	Consideration
Handling of mammals and birds	Mammals and birds can cause injury to handlers (e.g. bites, scratches) or themselves if handled incorrectly. Mammals and birds should be placed into a calico/hessian bag or a cardboard box. Possums can easily rip through calico bags and should be placed within double lined canvas bags.
Nestlings or juveniles	If habitat trees are found to contain nestlings or juveniles prior to felling it is preferable to leave trees intact until juveniles have vacated the nest or den. If construction timing does not permit this, attempts will be made to rescue juveniles for captive-rearing by a responsible wildlife group (such as Wires) and subsequent release into translocation sites. The success of this will depend upon the species, their stage of development and likely chances of survival. Alternatively, and only as a last resort, juveniles may be euthanized on-site, under the requirements outlined for euthanizing animals within this table.
Threatened species	If any habitat tree is found or suspected (based on fresh tree markings or scats) to contain any threatened species, the tree should be left in place for a minimum of two days and be re-inspected prior to felling.
Arboreal animals	If arboreal animals do not move or they cannot be captured because the tree hollow is too large, high or its recovery would breach WHS requirements, then the tree will be felled and animals recovered post-felling.
Handling of fish and aquatic species	Ensure that containers for holding aquatic species provide enough water and adequate aeration.
Relocation and release of animals general	Animals should only be released at a time and place that is suitable to the species that provides it with a likely chance of survival (i.e. release should not increase the risk of stress or predation to the species). Release should not take place during periods of heavy rainfall.
Release of nocturnal species	Nocturnal animals captured during the day will be immediately taken to adjacent bushland and placed into a relocated tree hollow or nest box or held until the evening and released shortly after dusk (see below for holding of animals).
Temporarily holding animals	Collected animals may be held for a short period of time (preferably less than 24 hours prior to release). This should only be undertaken if appropriate licensing is in place. Animals kept for any purpose will be secured in a container (see above) and stored in a quiet, ventilated and preferably dark location away for construction activities. Injured animals will require additional care and may need to be nursed on route to care.

Taxa / activity	Consideration
Injured Animals	Injured animals will be cared for according to specific animal care and ethics guidelines, and be given appropriate veterinary care, and if available, the services of one of the local animal welfare groups.
Euthanasia	In some instances, severely injured and pest animals may need to be euthanized. Any undertaking to euthanasia animals only be undertaken using a suitable technique (i.e. cervical dislocation for small mammals and ice slurry for introduced fish) or taken to a veterinarian for euthanasia. This will be done by personnel trained and competent (e.g. Trained Ecologist) and licenced in the use of acceptable methods of euthanasia. Personnel required to euthanize animals shall consider methods that are humane, painless and rapid.
Domestic animals (pets)	If there is a collar and tag, call the number provided and arrange for collection by the owner Take the animal to the nearest vet. Most veterinary clinics accept and hold lost dogs. They can scan the pet for a microchip to try and reunite the pet with its owner If none of the above are successful options, call City of Parramatta on 02 9806 5050 and report the stray for collection.
Pest species	Pest animals are not to be released and should be euthanized (see above).
Release site selection	During the preliminary pre-clearing assessments, the Trained Ecologist is to identify and assess suitable release sites for fauna adjacent to the Infrastructure Works CSSI footprint.

Contingency procedure for unexpected discovery of fauna on-site

If wildlife is discovered on site during activities that may harm the animal, or if the animal poses a risk to site personnel, the following procedure will be followed:

1. Stop all works near the animal and notify supervisor or superintendent, who is to notify the Trained Ecologist (or Environmental and Sustainability Manager if the Trained Ecologist is not present on site).
2. Provide exact location of the animal, clear directions to access the area and contact details for someone at the work front able to meet the Trained Ecologist or Wildlife Carer and show them where the animal is.
3. Establish an exclusion zone around the animal. Control plant and vehicle movements around this area.
4. Allow animal to leave the area without handling if the animal is mobile. Make sure the animal has a clear safe path to leave the Infrastructure Works CSSI footprint.
5. If the animal is unable or unwilling to leave the area of its own accord, only a licensed fauna ecologist or wildlife carer with specific animal handling experience should attempt to handle and relocate the animal.
6. If the Trained Ecologist or Wildlife Carer is not immediately available, the following may be suitable to reduce stress to fauna and reduce the risk of further injury:

7. Minimise the number of people around the animal
    a. Cover larger animals with a towel or blanket and place in a cardboard box or hessian bag
    b. Place smaller animals in a cotton back or shoe box
    c. Keep animal in a quiet, ventilated and preferably dark location away for construction activities
    d. Frogs and aquatic fauna to be places in a plastic bag or container with enough water.
8. If the animal cannot be safely handled:
    a. Maintain exclusion zone
    b. Supervise the animal until the Trained Ecologist or Wildlife Carer arrives.
9. The Trained Ecologist or Wildlife Carer will either:
    a. Relocate fauna to nearby areas that will not be disturbed by the Project construction works that contains similar / suitable habitat for the species.
    b. Hold the animal temporarily to release nocturnal animals at dusk or avoid period so heavy rainfall.
    c. Transport the animal to veterinary services for assessment if the animal is injured or stressed.
    d. Euthanize the animal using a suitable technique (i.e. cervical dislocation for small mammals and ice slurry for introduced fish).
10. If the animal is a threatened species that is NOT identified in the FFMP, the Environmental and Sustainability Manager is to notify the following relevant stakeholders:
    a. TfNSW Environmental and Planning Manager
    b. DPIE ESS Representative
    c. Environmental Representative (ER).
11. Following consultation with the relevant stakeholders, the Environment and Sustainability Manager or Trained Ecologist will implement any corrective actions and additional safeguards required.
12. If the animal has been injured, requires veterinarian assessment or euthanasia or is killed, an Environmental Incident Report is to be completed in accordance with the Environmental incident classification and reporting procedure.

Appendix C – PLR Plant and Equipment Clean Down Declaration

Prior to arriving on site or departing site, all vehicles, machinery and equipment shall be clean and visually free of:

- Plant matter
- Soil/mud.

This is a legal requirement, refer to http://www.weeds.gov.au/government/legislation.html for further information.

PART 1 – TO BE COMPLETED BY THE SENDER OF THE EQUIPMENT

Equipment Number	Equipment Description	Current Location	Date Cleaned

I declare that the equipment listed above has been thoroughly inspected by myself and is free of all soil/mud, seeds, plant matter (and fire ants where relevant).

Name: _____

Position: _____

Company: _____

Signature: _____

Date: _____

PART 2 – TO BE COMPLETED BY THE RECEIVER OF THE EQUIPMENT

I declare that the equipment listed above has been thoroughly inspected by myself and is in fact free of all soil/mud, seeds, plant matter (and fire ants where relevant) and is therefore suitable for entry to this site.

Name: _____

Position: _____

Signature: _____

Date: _____

Please provide a copy of this form to the Site Environmental Representative

Appendix D – PLR Pre-Clearing and Grubbing Inspection Checklist

Project:	**Project No:**
Requested By:	**Lease / Lot Number:**
Planned Clearing Start Date:	**Expected Completion Date:**

VEGETATION CLEARING LOCATIONS – ATTACH DRAWINGS / SKETCHES IF NECESSARY

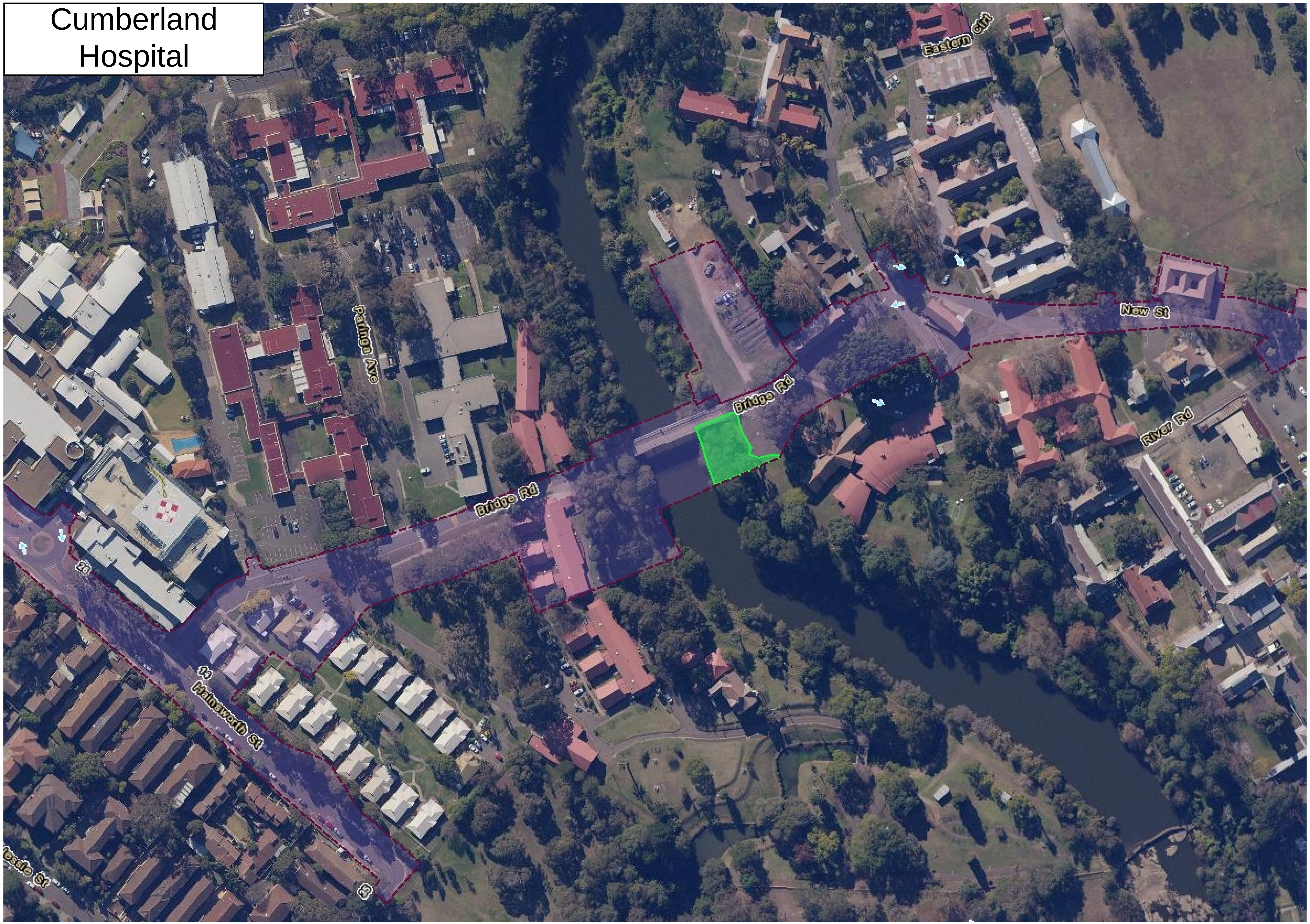
GPS Coordinates		Location	Comments

Has the vegetation to be cleared been clearly delineated?		Yes		No		
All trees / vegetation 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: _____						
Is there risk of weed infestation or spread?		Yes		No		
Were any animals observed? (If *Yes*, relocation required)		Yes		No		
Are any active nests present? (If *Yes*, relocation required)		Yes		No		
Are the proposed works covered by an existing Approval from the Independent Arborist?		Yes		No		
Have relevant workers been shown limit of clearing, advised of fauna handling procedures and any other SHE controls?		Yes		No		

Comments	
Inspection completed by: Signature/Role	**Date:**
Approval by Environmental Representative/Advisor: Signature/Role	**Date:**

Appendix E – Endangered Ecological Community Maps

Cumberland Hospital



Legend

- Project Boundary
- Endangered Ecological Community

PLR1	-	CPB-Downer	-	DRG	-	DWG	-	LOT No.	-	DRG No.	-	REV

Ref. No.	Completion rec.	Work package	Description	Designed	Verified	Approved
Ref No.	Comp. rec.	Package	Endangered Ecological Communities	dd/mm/yy	dd/mm/yy	dd/mm/yy

Scale 1: 2,000

0 54 107 Meters

Coordinate System: GDA 1994 MGA Zone 56 - Height Datum: AHD

This map is a user generated static output from CPB Contractors Web GIS Viewer and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

This drawing is confidential and shall only be used for the purpose of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the ISO 9001-2000 quality assurance.

Date Printed: 5-Aug-2019

Drawing Colour Coded - Print All Copies in Colour

Drawn by:	not provided
Designed by:	not provided
Dwg check by:	not provided
Des check by:	not provided
Approved by:	not provided

Parrmatta Light Rail - PLR1

Endangered Ecological Communities

FILE No:	n/a
SHEET No:	n/a
STATUS:	verified
DRG No:	DRG No.
EDMS No:	n/a

Western Sydney University
Vineyard Creek

Legend

- Project Boundary
- Endangered Ecological Community

PLR1 - CPB-Downer - DRG - DWG - LOT No. - DRG No. - REV

Ref. No.	Completion rec.	Work package	Description	Designed	Verified	Approved
Ref No.	Comp. rec.	Package	Endangered Ecological Communities	dd/mm/yy	dd/mm/yy	dd/mm/yy

Scale 1: 2,000

0 54 107 Meters

Coordinate System: GDA 1994 MGA Zone 56 - Height Datum: AHD

This map is a user generated static output from CPB Contractors Web GIS Viewer and is for reference only.
Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

This drawing is confidential and shall only be used for the purpose of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the ISO 9001-2000 quality assurance.

Date Printed: 5-Aug-2019

CPB CONTRACTORS

Downer
Relationships creating success

Drawing Colour Coded - Print All Copies in Colour

Drawn by:	not provided
Designed by:	not provided
Dwg check by:	not provided
Des check by:	not provided
Approved by:	not provided

Parrmatta Light Rail - PLR1
Endangered Ecological Communities

FILE No:	n/a
SHEET No:	n/a
STATUS:	verified
DRG No:	DRG No.
EDMS No:	n/a

Rydalmere Station

Legend

- Project Boundary
- Endangered Ecological Community

PLR1 - CPB-Downer - DRG - DWG - LOT No. - DRG No. - REV

Ref. No.	Completion rec.	Work package	Description	Designed	Verified	Approved
Ref No.	Comp. rec.	Package	Endangered Ecological Communities	dd/mm/yy	dd/mm/yy	dd/mm/yy

Scale 1: 2,000

0 54 107 Meters

Coordinate System: GDA 1994 MGA Zone 56 - Height Datum: AHD

This map is a user generated static output from CPB Contractors Web GIS Viewer and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

This drawing is confidential and shall only be used for the purpose of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the ISO 9001-2000 quality assurance.

Date Printed: 5-Aug-2019

CPB CONTRACTORS

Downer Relationships creating success

Drawing Colour Coded - Print All Copies in Colour

Drawn by:	not provided
Designed by:	not provided
Dwg check by:	not provided
Des check by:	not provided
Approved by:	not provided

Parrmatta Light Rail - PLR1

Endangered Ecological Communities

FILE No:	n/a
SHEET No:	n/a
STATUS:	verified
DRG No:	DRG No.
EDMS No:	n/a

Dundas Station

Legend

- Project Boundary
- Endangered Ecological Community

PLR1 - CPB-Downer - DRG - DWG - LOT No. - DRG No. - REV

Ref. No.	Completion rec.	Work package	Description	Designed	Verified	Approved
Ref No.	Comp. rec.	Package	Endangered Ecological Communities	dd/mm/yy	dd/mm/yy	dd/mm/yy

Scale 1: 2,000

0 54 107 Meters

Coordinate System: GDA 1994 MGA Zone 56 - Height Datum: AHD

This map is a user generated static output from CPB Contractors Web GIS Viewer and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

This drawing is confidential and shall only be used for the purpose of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the ISO 9001-2000 quality assurance.

Date Printed: 5-Aug-2019

CPB CONTRACTORS

Downer Relationships creating success

Drawing Colour Coded - Print All Copies in Colour

Drawn by:	not provided
Designed by:	not provided
Dwg check by:	not provided
Des check by:	not provided
Approved by:	not provided

Parrmatta Light Rail - PLR1

Endangered Ecological Communities

FILE No:	n/a
SHEET No:	n/a
STATUS:	verified
DRG No:	DRG No.
EDMS No:	n/a

Telopea Station

Legend

- Project Boundary
- Endangered Ecological Community

PLR1 _ CPB-Downer _ DRG _ DWG _ LOT No. _ DRG No. _ REV

Ref. No.	Completion rec.	Work package	Description	Designed	Verified	Approved
Ref No.	Comp. rec.	Package	Endangered Ecological Communities	dd/mm/yy	dd/mm/yy	dd/mm/yy

Scale 1: 2,000

0 54 107 Meters

Coordinate System: GDA 1994 MGA Zone 56 - Height Datum: AHD

This map is a user generated static output from CPB Contractors Web GIS Viewer and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

This drawing is confidential and shall only be used for the purpose of this project. The signing of this title block confirms the design and drafting of this project have been prepared and checked in accordance with the ISO 9001-2000 quality assurance.

Date Printed: 5-Aug-2019

CPB CONTRACTORS

Downer Relationships creating success

Drawing Colour Coded - Print All Copies in Colour

Drawn by:	not provided
Designed by:	not provided
Dwg check by:	not provided
Des check by:	not provided
Approved by:	not provided

Parrmatta Light Rail - PLR1

Endangered Ecological Communities

FILE No:	n/a
SHEET No:	n/a
STATUS:	verified
DRG No:	DRG No.
EDMS No:	n/a

Appendix F - Consultation Evidence

Table F- 1: Log of consultation with DPIE ESS as per A5(b) and (c)

In / Out	Date and time	Method of contact	Details of contact
Out	19&20/06/19	Workshops	PLR Infrastructure Package CEMP and Sub-plan briefing sessions.
Out	21/06/19, 18:19	Email	Issue of Flora and Fauna Management Sub-plan for review.
In	25/06/19, 18:04	Email	Response to Flora and Fauna Management Sub-plan review with comments register.
Out	8/07/19, 12:29	Email	Return of updated comments register confirming that recommendations had been incorporated into the plan.
In	16/07/19, 14:00	Email	Response confirming that DPIE ESS is satisfied with the response to the comments.

Table F- 2: Log of issues raised by DPIE ESS as per A5 (d) and (e)

Reference	Comment	How addressed	Management plan reference location
1.01	The Revised Environmental Mitigation and Management Measure BI-7 states that to mitigate habitat loss, nest boxes will be installed, as part of the flora and fauna management plan (FFMP). Also, it is noted that the FFMP includes monitoring of the outcomes of implementation of the plan. However, the monitoring of nest boxes only appears to involve confirmation that they have been installed (Table 8.2), there is no monitoring planned of whether the installation of nest boxes has effectively mitigated against the impact of habitat loss. OEH recommends there is ongoing monitoring of this mitigation measure to determine its effectiveness.	Comment has been incorporated into this revision of the FFMP. Monitoring of nest boxes will be completed six, twelve and eighteen months following installation to assess utilisation, effectiveness of this mitigation measures and any maintenance requirements. This has been added in Section 7.3.5 Nest Box Strategy, Table 8-2 Inspection and Monitoring Requirements and Table 8-3 Reporting.	Section 7.3.5 – Nest Box Strategy Section 7.5 – Environmental Control Measures, Table 7-1, Mitigation Measure HC2 Table 8-3 Inspection and Monitoring Requirements Table 8-3 Reporting,
1.02	Section 7.3.1 and Appendix B mention that pre-clearing surveys will be conducted on structures to assess whether bats are present. However, no procedures have been developed to ensure this happens and there is no mention in Table 7.1 of pre-clearing surveys of structures. It is suggested that the information in Table 7.1 is amended to make it clear that this will be part of the requirement of the pre-clearing survey, e.g. under Wildlife Protection.	Comment has been incorporated into this revision of the FFMP. Section 7.5 – Environmental Control Measures, Table 7-1, Mitigation Measure WP-5 has been updated to reference pre-clearing surveys prior 12 and no greater than 48 hours prior to vegetation clearing or works on structures with potential bat habitat. Table 8-2, Pre-clearing surveys has been updated to reference structures. Appendix A has had an additional section added for Assessment of structures for bat habitat at the bridges over water or other structures with potential habitat.	Section 7.5 – Environmental Control Measures, Table 7-1 Table 8-2, Pre-clearing surveys Appendix A Vegetation Clearing Procedure

Table F- 3: Log of consultation with Biodiversity Conservation Trust as per A5(b) and (c)

In / Out	Date and time	Method of contact	Details of contact
Out	21/06/19, 18:44	Email	Issue of Flora and Fauna Management Sub-plan for review.
In	24/06/19, 18:04	Email	Request for confirmation on Biodiversity Conservation Trust have been asked to review the CEMP and if there is particular input you would like from the BCT? Is the Light Rail corridor impacting upon a Conservation Agreement, Wildlife Refuge or a Biodiversity Stewardship Agreement? If not, this may be something that needs to be sent to Office of Environment and Heritage.
Out	28/06/2019, 16:47	Email	Response to query with reference to Condition E100 requiring consultation with the Biodiversity Conservation Trust for the Flora and Fauna Management Sub-plan.
In	10/07/2019, 15:55	Email	Biodiversity Conservation Trust confirmed that as there are no offsets required under the Biodiversity Offset Scheme and as there are no impacts on an existing Biodiversity Stewardship Agreement, Conservation Agreement or Wildlife Refuge as defined under the *Biodiversity Conservation Act* the BCT does not have any comment on the Parramatta Light Rail Flora and Fauna Management Sub-plan.

Table F- 4: Log of consultation with DPI Fisheries as per A5(b) and (c)

In / Out	Date and time	Method of contact	Details of contact
Out	21/06/19, 18:50	Email	Issue of Flora and Fauna Management Sub-plan for review.
In	27/06/19, 18:04	Email	Confirmation that DPI Fisheries has reviewed the Flora and Fauna Management Sub-plan Infrastructure Works, Parramatta Light Rail – PLR-INF-CPBD-PJT-EN-PLN-000009 Rev 1 (Appendix B2) and has no comments or objections.

Table F- 5: Log of consultation with City of Parramatta Council as per A5(b) and (c)

In / Out	Date and time	Method of contact	Details of contact
Out	19&20/06/2019	Workshops	PLR Infrastructure Package CEMP and Sub-plan briefing sessions.
Out	21/06/2019, 17:36	Email	Issue of Flora and Fauna Management Sub-plan for review.
In	10/07/2019, 12:56	Email	Response to Flora and Fauna Management Sub-plan review with comments register.
Out	16/07/2019 19:27	Email	Return of updated comments register confirming that recommendations had been incorporated into the plan.
Out	26/07/2019, 10:52	Email	Return of updated comments register confirming that recommendations had been incorporated into the plan.
In	9/08/2019 16:42	Email	Response confirming that City of Parramatta is satisfied with the response to the comments.

Table F- 6: Log of issues raised by City of Parramatta Council as per A5 (d) and (e)

Reference	Comment	How addressed	FFMP reference location

1.03	Installation of nest boxes and types. COPC Request there is an inclusion requiring the arborist/ ecologist to create and maintain a database of installed nest boxes, and that; a. Database to include size, type, target species and GPS location for all installations on Council land. Can include under 'How Addressed' column. b. that nest boxes are monitored for activity over the course of the project c. that database is handed over to Council at the completion of the project	The requirement for the development of a database of nest boxes has been added to Table 7-1, Mitigation Measure HC2. Monitoring of nest boxes will be completed six, twelve and eighteen months following installation to assess utilisation, effectiveness of this mitigation measures and any maintenance requirements. This has been added in Section 7.3.5 Nest Box Strategy, Table 8-2 Inspection and Monitoring Requirements and Table 8-3 Reporting. CoPC has been added to the nominated recipients in Table 8 3 Reporting Requirements for the Nest Box Strategy, Nest Box Installation Report and Nest Box Monitoring Reports.	Section 7.3.5 – Nest Box Strategy Section 7.5 – Environmental Control Measures, Table 7-1, Mitigation Measure HC2 Table 8-3 Inspection and Monitoring Requirements Table 8-3 Reporting,

Table F- 7: Log of consultation with Cumberland Council as per A5(b) and (c)

In / Out	Date and time	Method of contact	Details of contact
Out	19&20/06/19	Workshops	PLR Infrastructure Package CEMP and Sub-plan briefing sessions.
Out	21/06/19, 17:31	Email	Issue of Flora and Fauna Management Sub-plan for review.
In	11/07/19, 17:01	Email	Response to CEMP and Sub-plan review received. No comments provided for the Flora and Fauna Management Sub-plan.
Out	16/07/19	Email	Email requesting confirmation that Cumberland Council has no feedback on the Flora and Fauna Management Sub-plan.
In	17/07/19	Email	Email confirming that Cumberland Council has no feedback on the Flora and Fauna Management Sub-plan.

Appendix G – Environmental Representative Endorsement

15 May 2020

Transport for NSW

Attention to: **Megan Haberley**
Senior Manager Environment
Parramatta Light Rail
130 George St, Parramatta, NSW 2150

Review of Appendix B2 – Flora and Fauna Management Sub-Plan.
Infrastructure Works Stage 1 - Parramatta Light Rail
(PLR1INF-CPBD-ALL-PE-PLN-000004 Rev 5)

Pursuant to SSI8285 Condition of Approval A23 (d) i), as the approved Environmental Representative, I confirm that I have reviewed the updated Appendix B2 – Flora and Fauna Management Sub-Plan. Infrastructure Works Stage 1 - Parramatta Light Rail (PLR1INF-CPBD-ALL-PE-PLN-000004, Rev 5), dated 14/10/2019, prepared by CPB Downer Joint Venture, for consistency with the requirements of the Conditions of Approval.

In my opinion the updates to the aforementioned document are minor in nature and consistent with the requirements included in or required under the terms of the Conditions of Approval for the Parramatta Light Rail (Stage 1) development, with the exception of the following:

It is noted that the Urban Design Requirements Report has been prepared and contains the requirements around rehabilitation of impacted vegetation in proximity to the area of disturbance (CoA E100).

Yours sincerely,

Australian Quality Assurance & Superintendence Pty Ltd (AQUAS)

Gillian Lehn
Environmental Representative
phone: +61 2 9956 9963 | fax: 02 9954 1951 | mobile: +61 438 355 346 |
email: gillian.lehn@aquas.com.au |

Filename : *AQ1148.05 PLR CPBD FFMP Rev5 endorsement 200515*

Parramattalightrail.nsw.gov.au
Parramattalightrail@transport.nsw.gov.au
1800 139 389
Level 10, 130 George Street Parramatta 2150