

# PROJECT MANAGEMENT PLAN

Flora and Fauna Project Management Plan  
Sydney Metro West – Western Tunnelling Package

## Document Details

|                        |  |
|------------------------|--|
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## Document Authorisation

|  |  |  |
|--|--|--|
| <b>Stephanie Mifsud</b><br><b>Approvals Manager</b>                                | <b>Hayley Young</b><br><b>Environment &amp; Sustainability Lead</b>                | <b>Simon Hussey</b><br><b>Project Director</b>                                       |
|  |  |  |
| Signature  | Signature  | Signature  |
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## DOCUMENT CONTROL

The current document version number and date of revision are shown in the document footer. All changes made to the Management Plan during its implementation on a live project are to be recorded in the amendment tables below.

### Revision History

| Revision | Date       | Description of changes                         | Prepared by    | Approved by  |
|----------|------------|--|----------------|--------------|
| A        | 17/01/2022 | Early Works Submission                         | Joel Callaghan | Simon Hussey |
| B        | 04/03/2022 | Draft for stakeholder consultation             | Joel Callaghan | Simon Hussey |
| C        | 04/04/2022 | Revised draft for stakeholder consultation     | Joel Callaghan | Simon Hussey |
| D        | 18/05/2022 | Final draft following stakeholder consultation | Larissa Abbott | Simon Hussey |
|          |            |  |                |              |

## Terms and Definitions

| Term | Definition   |
|------|--|
| BAM  | Biodiversity Assessment Method   |
| BC   | <i>Biodiversity Conservation Act 2016</i>                              |
| BDAR | Biodiversity Development Assessment Report                             |
| CEMF | Construction Environmental Management Framework                        |
| CEMP | Construction Environmental Management Plan                             |
| CSSI | Critical State Significant Infrastructure                              |
| DPI  | Department of Primary Industries (NSW)                                 |
| DPE  | Department of Planning and Environment (NSW)                           |
| EA   | Environmental Advisor  |
| ECM  | Environmental Control Measures   |
| EEC  | Endangered Ecological Communities                                      |
| EIS  | Environmental Impact Statement   |
| EM   | Environmental Manager  |
| EMS  | Environmental Management System  |
| EPA  | Environmental Protection Authority                                     |
| EPBC | <i>Environmental Protection and Biodiversity Conservation Act 1999</i> |
| EPL  | Environmental Protection License                                       |
| ER   | Environmental Representative   |
| ESCP | Erosion and Sediment Control Plan                                      |
| ESR  | Environmental Site Representative                                      |
| EWMS | Environmental Work Method Statement                                    |
| FBA  | Framework for Biodiversity Assessment                                  |
| FFMP | Flora and Fauna Management Plan  |
| FM   | <i>Fisheries Management Act 1994</i>                                   |
| GALC | Gamuda Australia – Laing O’Rourke Consortium                           |
| GDE  | Groundwater Dependent Ecosystems                                       |
| GGBF | Green and Golden Bellfrog  |
| HTW  | High Threat Weed   |
| IS   | Infrastructure Sustainability  |
| ISC  | Infrastructure Sustainability Council                                  |
| MCoA | Ministers’ Condition of Approval                                       |
| MSF  | Maintenance and Stabling Facility                                      |
| PCT  | Plant Community Types  |
| PM   | Project Manager  |
| PMS  | Parramatta Metro Station   |

| Term | Definition   |
|------|--|
| POEO | <i>Protection of the Environment Operations Act 1997 (NSW)</i> |
| REMM | Revised Environmental Mitigation Measures                      |
| SDS  | Safety Data Sheet  |
| SM   | Sydney Metro   |
| TEC  | Threatened Ecological Communities                              |
| VDP  | Vegetation Disturbance Permit                                  |
| VRZ  | Vegetation Retention Zones                                     |
| WMS  | Westmead Metro Station   |
| WON  | Weeds of National Significance                                 |



# 1 INTRODUCTION

## 1.1 Project Description

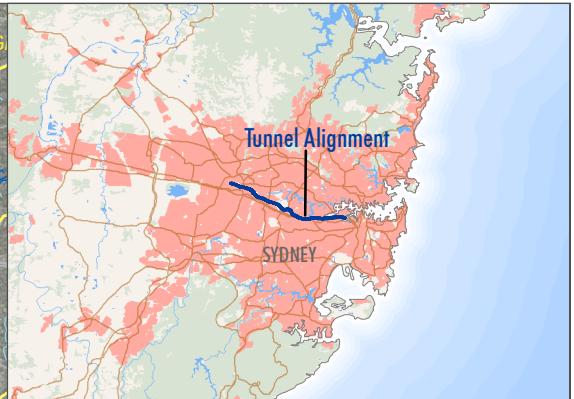
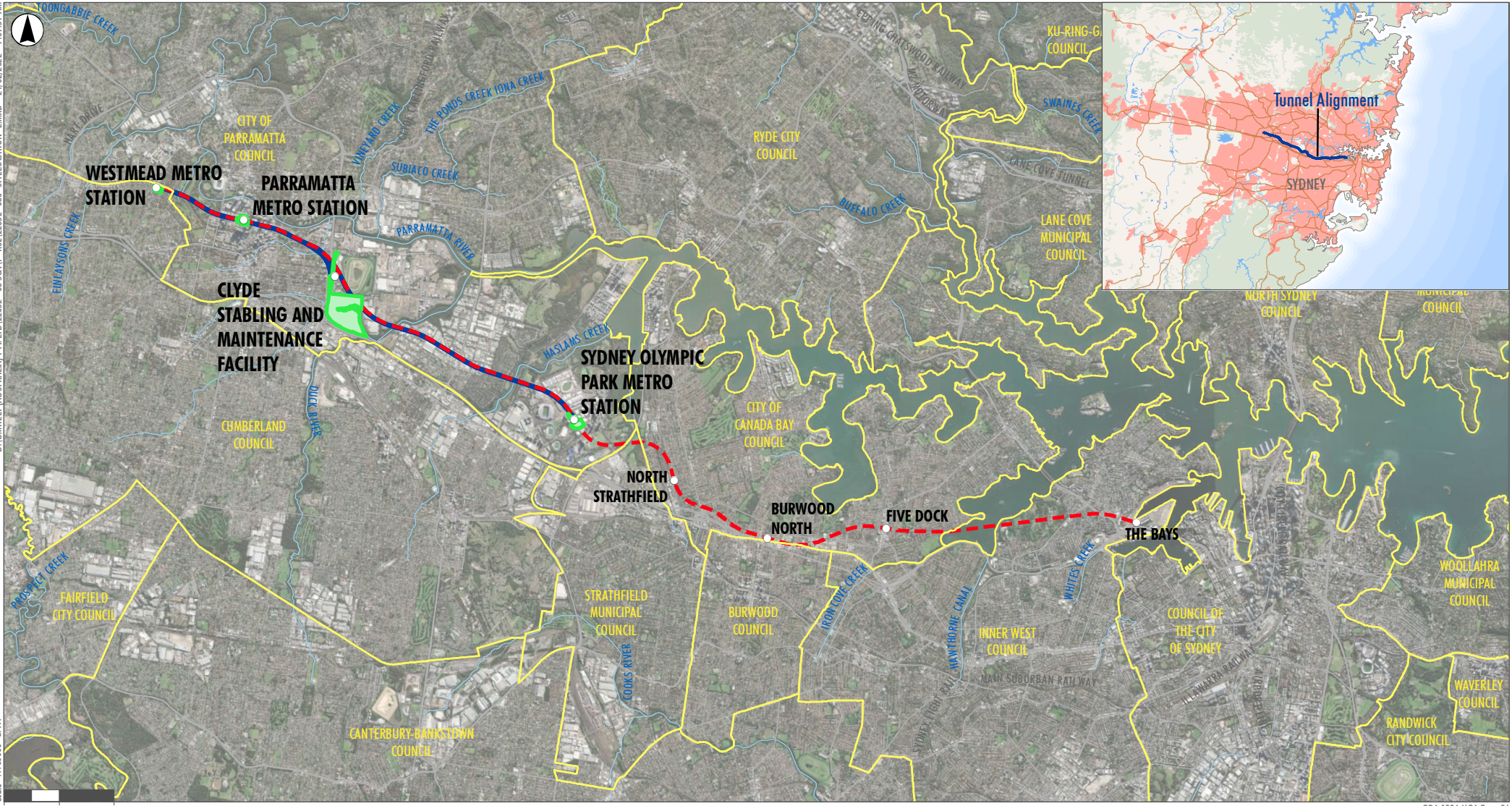
The scope of the work being undertaken under the Sydney Metro West Western Tunnelling Package works (WTP) (the Project) includes but is not limited to, the following:

- Westmead Station box excavation, including temporary support, stub tunnels, partially mined station cavern and crossover cavern including permanent lining and support
- Parramatta Station, including excavation of station box and associated support
- Clyde Maintenance and Stabling Facility (MSF), including permanent dive structure, portal, spur running tunnels, spur tunnel junction cavern, bulk earthworks, civil structures, utilities corridor, road crossing and creek diversion
- Rosehill Services Facility, including shaft excavation, permanent lining and lateral support
- A precast segment manufacturing facility at Eastern Creek
- Demolition and site clearance works
- Tunnelling between Sydney Olympic Park (SOP) and Westmead. Tunnelling will be undertaken by placing the tunnel boring machines (TBMs) at the Rosehill Services Facility box and retrieved out at the SOP Station Box and then placed back at the Rosehill Services Facility and retrieved at the Westmead Station Box. No surface works are proposed at SOP except for the retrieval of the TBM.

Refer to Figure 1 for the location of the WTP project.

D:\UMWELT (AUSTRALIA) PTY LTD\2052 - 03 SRV\F R02\2052\_036 SITE\LOCATION 2.MXD 24/02/2022 9:09:57 AM

Scale 1:100,000 at A4



- Legend**
- Surface Construction Sites
  - The Project (Western Tunnelling Package)
  - Sydney Metro West Concept and Stage 1
  - Approved Station Sites
  - Local Government Boundary
  - Road
  - Drainage Line
  - Railway Line

## 1.2 Context

The Construction Environmental Management Plan (CEMP) and sub-plans have been developed for the delivery of the WTP. It will be delivered by Gamuda Australia Laing O'Rourke Consortium (GALC). This Flora and Fauna Management Plan (FFMP) forms part of the CEMP (SMWSTWTP-GLO-1NL-EV-PLN-000001).

Sydney Metro West – Westmead to The Bays Concept and Stage 1 received planning approval on 11 March 2021 (SSI 10038). The Project comprises the WTP, which is the western portion of Stage 1 of SSI 10038, from Sydney Olympic Park to Westmead. This FFMP has been prepared to address requirements of the Minister's Conditions of Approval (MCoA) and any modifications to the MCoA, Revised Environmental Management Measures (REMMs) listed in the Sydney Metro West – Submissions Report, dated 20 November 2020, the Construction Environmental Management Framework (CEMF) requirements and all applicable legislation as they relate to the Project.

## 1.3 Environmental Management System Overview

An overview of the Environmental Management System (EMS) is provided in the CEMP Section 3.

Key interactions for this sub-plan with other management plans in the EMS include:

- Site Establishment Management Sub-plan
- Soil and Water Management Sub-plan
- Heritage Management Sub-plan
- Air Quality Management Sub-plan
- Noise and Vibration Management Sub-plan
- Groundwater Management Sub-plan
- Waste Management Sub-plan
- Spoil Management Sub-plan.

## 1.4 Consultation Requirements

In accordance with MCoA C5, this FFMP was prepared in consultation with relevant government agencies including:

- Department of Planning and Environment (DPE) – Environment, Energy, and Science (ESS),
- Department of Primary Industries (DPI) Fisheries
- Sydney Olympic Park Authority (SOPA) (in respect of Sydney Olympic Park)
- City of Parramatta Council, and
- Cumberland City Council.

Consultation was undertaken over a 21-day period, commencing on 8 April 2022 with the submission of the FFMP. The Consultation approach was applied across all plans and stakeholders and included issuing of the document to stakeholders accompanied by an introductory workshop. Following receipt of comments two weeks later, an offer was made to hold a comment review workshop to discuss and close comments directly with the stakeholder the following week. A second workshop would also be made available should there be any outstanding or technical issues requiring further discussion.

An introductory meeting was held on 24 March with City of Parramatta Council, 1 April with SOPA and 7 April with Cumberland City Council, which was organised by Sydney Metro and delivered by GALC. At the introductory meeting, GALC introduced themselves, the project team and outlined the scope of the WTP. The consultation approach was presented, and feedback invited on that approach. No issues were raised on the consultation approach during the introductory meetings.

None of the stakeholders took the offer of a comment review workshop in relation to their review of this FFMP.

Details of issues raised by stakeholders during consultation is provided in Attachment 2, including copies of correspondence in accordance with MCoA A6. The approach to consultation is further outlined in the CEMP.

## 1.5 Certification and Approval

Sydney Metro West – Westmead to The Bays Concept and Stage 1 was subject to environmental impact assessment under the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). It was also declared a Critical State Significant Infrastructure (CSSI) by the Minister for Planning & Public Spaces (the Minister).

An Environmental Impact Statement (EIS) has been prepared under Division 5.2 of the EP&A Act and in accordance with Part 3 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. Following exhibition of the EIS, an Amendment Report and Submissions Report were also prepared. After an assessment was carried out, the Minister determined that the Sydney Metro West – Stage 1 would be approved subject to conditions.

The planning approval (Infrastructure Approval SSI 10038) and related environmental assessment documents are located at: <https://www.planningportal.nsw.gov.au/major-projects/project/25631>.

This FFMP will be approved by the Planning Secretary (DPE). This FFMP will be submitted to the ER for endorsement and the Planning Secretary for approval no later than one (1) month before the commencement of construction. Construction will not commence until this FFMP has been endorsed by the ER and approved by the Planning Secretary, unless otherwise agreed by the Planning Secretary.

This FFMP, as submitted to the ER, including any minor amendments approved by the ER, will be implemented for the duration of construction.

## 2 PURPOSE AND SCOPE

### 2.1 Purpose

The purpose of this FFMP is to describe the flora and fauna management approach that will be employed by the Gamuda Australia – Laing O'Rourke Consortium (GALC) and its subcontractors during construction of the Project. This sub plan forms an integral part of the project CEMP and GALC's EMS. It applies to all works associated with Project works and establishes the environmental management controls to be implemented.

This FFMP outlines how GALC will comply with and implement the applicable flora and fauna requirements of the:

- Sydney Metro Construction Environmental Management Framework (CEMF)
- Minister for Planning and Public Space's Conditions of Approval for the Project (MCoA)
- Revised Environmental Mitigation Measures (REMMs)
- SSI Modifications - Modification 1 Administrative Modification
- SSI Modifications - Modification 2 Clyde Stabling and Maintenance Facility – Current Status (16 May 2022) being: More Information Required
- Infrastructure Sustainability Council (ISC) Infrastructure Sustainability (IS) rating tool.

This FFMP has been prepared to incorporate publicly available information relating to Modification 2 for the Clyde MSF. The current status of Modification 2 (at 16 May 2022) being: More Information Required. This FFMP will be revised following approval of Modification 2 (e.g. based on information from DPE determination documentation, assessment report etc) and to comply with any new requirements of subsequent revised MCoA.

### 2.2 Scope

This sub-plan outlines the mitigation and management measures that GALC will use to address potential flora and fauna impacts during construction of the Project, while complying with relevant approval, statutory and contract requirements.

Specifically, this sub-plan addresses environmental aspects and impacts that relate to:

- Site establishment activities
- Removal and trimming of vegetation and trees, including street trees
- Demolition of existing structures
- Realignment of Duck Creek and A'Becketts Creek, Clyde (to be partly enclosed in proposed culverts and remainder to be retained as a naturalised channel)
- Set up and use of material, plant and spoil storage areas during construction
- Movement of vehicles and plants to and from the construction site
- The use of machinery and equipment such as mobile cranes, excavators, concrete pumps, piling rigs
- Introduction of car parks, acoustic sheds, spoil sheds, laydown areas, workshops, dangerous goods storage, wheel wash, site offices and staff amenities during construction
- Adjustment of road networks
- Noise barriers and hoardings

- Construction of open dive structures
- General earthworks
- Operation of construction lighting during night-time construction works.

### 3 OBJECTIVES AND TARGETS

The key objectives of the FFMP are to ensure that impacts to flora and fauna are minimised and are within the scope permitted by the MCoA. To achieve these objectives, the targets in Table 1 have been established for the management of flora and fauna impacts during the Project construction.

Table 1: Flora and fauna targets and performance criteria

| Objective  | Target  | Measurement Tool   |
|--|---|--|
| Avoid and minimise impacts on flora and fauna.   | Adverse impacts on native flora and fauna as a result of construction activities are avoided (where possible) and minimised, including the clearing of native vegetation.   | Weekly site inspections, visual surveillance, Pre-clearing Permit, Tree Register, implementation of flora and fauna control measures and auditing.   |
| Compliance with the MCoA, REMMs, CEMF requirements and relevant legislation as it applies to the Project | Full compliance   | Compliance Reporting   |
| Design waterway modifications and crossings to incorporate best practice principles.                     | Incorporate best practice principles for waterway modifications (including Duck Creek and A'Becketts Creek) in design plans and construction management plans.<br>Significant impacts to flow regimes in receiving waterways are avoided. | Design review procedure, monitoring of groundwater dependent ecosystems and waterway function (part of the monitoring and auditing actions).   |
| Retain and enhance existing flora and fauna habitat wherever possible.                                   | Include control measures in the FFMP that ensures all existing flora and fauna on site is protected from accidental impacts during construction.  | Weekly site inspections, visual surveillance, implementation of flora and fauna control measure and auditing.<br>Condition monitoring at Duck Creek / A'Becketts Creek.<br>Groundwater dependent ecosystem monitoring.<br>Revegetation monitoring program. |
| Appropriately manage the spread of weeds and plant pathogens.  | Include control measures in the FFMP that manages the potential risk of spreading weeds and pathogens.  | Management of retained vegetation.<br>Revegetation monitoring program.   |
| Ensure project personnel are aware and competent in their responsibilities in relation to the            | 100% of project personnel aware of responsibilities under the CEMF and this FFMP  | Project induction and training register<br>Compliance management program   |

| Objective   | Target  | Measurement Tool  |
|---|---|---|
| management of flora and fauna   |   |   |
| Meet IS rating tool requirements and objectives in the Sustainability Management Plan | <p>Level 1 for credit Lan-1 'Previous Land Use' showing that at least 25% of the land used for the project is previously disturbed.</p> <p>Level 2 for credit Lan-3 'Contamination and remediation' demonstrating that site assessment follows the recommended approach in Schedule A 'Recommended general process for assessment of site contamination' of National Environment Protection (Assessment of Site Contamination) Measure 1999, with remediation options identified and selected using a sustainability hierarchy, as well as the sustainability appraisal of remediation option being undertaken against sustainability indicators in Table 1 of 'A Framework for Assessing the Sustainability of Soil and Groundwater Remediation'</p> <p>Level 1 for credit Lan-4 'Flooding Design' to show there is no increase in flood risk from the construction, as the run-off, flood risk, and potential increased flood risk elsewhere as a result of the project have all been assessed over their expected working life, in line with the requirements of 'Flood plain management in Australia: best practice principles and guidelines'.</p> <p>Note. Eco-1 'Ecological value' and credit Eco-2 'Habitat connectivity' will be scoped out.</p> | <p>Lan-1: EIA and Site Layout calculations</p> <p>Lan-3: Contamination reports, remediation action plans, audit reports, audit qualifications</p> <p>Lan-4: Design report</p> |



## 4 ENVIRONMENTAL REQUIREMENTS

### 4.1 Legislation and Standards

GALC obligations include satisfying the requirements and complying with the provisions of the relevant legislation, guidelines, and policies, as well as international and Sydney Metro’s standards. Details are provided in Table 2.

Table 2: Relevant legislations, standards, guidelines, and specifications

|                               |  |
|-------------------------------|--|
| Legislation                   | <p><i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Commonwealth) (EPBC Act).<br/> <i>Biodiversity Conservation Act 2016</i> (NSW) (BC Act)<br/> <i>Biosecurity Act 2015</i> (NSW)<br/> <i>Fisheries Management Act 1994</i> (NSW) (FM Act)<br/> <i>Pesticides Act 1999</i> (NSW)<br/> <i>Environmental Planning and Assessment Act 1979</i> (NSW)<br/> <i>Protection of the Environment Operations Act 1997</i> (NSW)<br/> <i>National Parks and Wildlife Act 1974</i> (NSW)<br/> <i>State Environmental Planning Policy (Coastal Management) 2018</i> (NSW)</p>   |
| Standards                     | AS/NZS ISO 14001: Environmental Management   |
| Guidelines and Specifications | <p>Best Practice Management Guidelines for <i>Phytophthora cinnamomi</i> within the Sydney Metropolitan Catchment Management Authority Area (Botanic Gardens Trust 2008)<br/>         New South Wales Weed Control Handbook (DPI 2018)<br/>         Hygiene protocol for the control of disease in frogs (DECC 2008)<br/>         Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom 2004) and Volume 2 (Department of Environment and Climate Change 2008) (the “Blue Book”).<br/>         Australian Standard AS 4373 Pruning of Amenity Trees<br/>         Australian Standard 4970 – Protection of trees on development sites<br/>         Commonwealth Significant Impact Guidelines for the Green and Golden Bell Frog (2009)<br/>         Commonwealth Approved Conservation Advice for <i>Litoria aurea</i> (Green and Golden bell Frog) (TSSC 2014)<br/>         EPA Resource Recovery Order 2014 – Raw Mulch;<br/>         EPA Resource Recovery Exemption 2014 – Raw Mulch<br/>         Fish Passage Requirements for Waterway Crossings, Fairfull and Witheridge, 2003<br/>         Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings – November 2003<br/>         Guidelines for Fish Habitat Conservation and Management – Update 2013 (DPI, 2013)<br/>         Guidelines for riparian corridors on waterfront land (DPI Water, 2012)<br/>         Guidelines for vegetation management plans on waterfront land (DPI Water, 2012)<br/>         Guidelines for watercourse crossings on waterfront land (DPI Water, 2012)</p> |

Guidelines for instream works on waterfront land (DPI Water, 2012)  
 Guidelines for outlet structures on waterfront land (DPI Water, 2012)  
 NSW Department of Primary Industries, Why Do Fish Need to Cross the Road (DPI Fisheries, 2003)  
 Biodiversity Assessment Method (BAM) (DPIE 2017)  
 Relevant recovery plans, priority action statements and best practice guidelines, including relevant Australian Standards  
 Risk Assessment Guidelines for Groundwater Dependent Ecosystems (DPI 2012)

## 4.2 Approvals, Licenses and Permits

This FFMP has been developed to satisfy the requirements of MCoA C1. A full list of applicable MCoAs, REMMs, CEMF requirements and EPL condition requirements is provided in Attachment 1 of this FFMP.

Other legislation relevant to this FFMP is included in Attachment 2 of the CEMP.

### 4.2.1 Biodiversity Offsets

Before any vegetation clearing or tree removal is undertaken for vegetation that must be offset, including the credits specified below, Biodiversity Credits would be purchased and retired by Sydney Metro. The retirement of credits would be carried out in accordance with the offset rules of the BC Act. Offset requirements are as follows:

- PCT 920: Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion – Poor (3 credits)
- Myotis macropus / Southern Myotis (3 credits)
- For impacts of up to 27 individuals and 0.14 hectares of Downy Wattle (as per the Modification 2 Report) habitat equating to 1 credit.

The requirement to retire credits in MCoA D4 may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the class and number of species credits, as calculated by the Biodiversity Offsets Payment Calculator.

Evidence of the retirement of credits required by MCoA D4 will be submitted to the Planning Secretary for information within one (1) month of receiving evidence of the retirement of credits and / or a certificate confirming payment under MCoA D5 before any vegetation clearing or tree removal that must be offset.

## 4.3 IS Rating Tool Requirements

| Credit      | IS Rating Tool Requirement  | Document Reference            |
|-------------|---|-------------------------------|
| Lan-1<br>L1 | 25% of the land used for the project is previously disturbed.   | Design and management reports |
| Lan-3<br>L1 | Site assessment follows the recommended approach in Schedule A 'Recommended general process for assessment of site contamination' | Soil and Water Management     |

| Credit      | IS Rating Tool Requirement   | Document Reference                      |
|-------------|--|---|
|             | of National Environment Protection (Assessment of Site Contamination) Measure 1999. Remediation options are identified and selected using a sustainability hierarchy.  | Sub-plan (SWMP) Remediation Action Plan |
| Lan-3<br>L2 | Sustainability appraisal of remediation options is undertaken against the sustainability indicators in Table 1 of 'A Framework for Assessing the Sustainability of Soil and Groundwater Remediation'.  | Section 10.4                            |
| Lan-4<br>L1 | The run-off, flood risk, and potential increased flood risk elsewhere as a result of the project have all been assessed over their expected working life, in line with the requirements of 'Flood plain management in Australia: best practice principles and guidelines' and appropriate flood resilience measures have been included in the design so that there is no increase in flood risk. | SWMP                                    |

## 5 EXISTING ENVIRONMENT

### 5.1 General Landscape Features

The landscape features surrounding the Project construction sites are outlined below.

#### 5.1.1 Bioregions and Sub-regions

**Bioregion:** Sydney Basin

**Sub-regions:** Cumberland Plain

#### 5.1.2 BioNet NSW Landscapes

**Ashfield Plains:** Undulating hills and valleys on horizontal Triassic shale and siltstone, occasional quartz sandstones especially near the margin of the Port Jackson landscape. General elevation 0 to 45 m and a local relief of less than 20 m (Jacobs, 2020).

**Port Jackson Basin:** Deep elongated harbour with steep cliff margins on horizontal Triassic quartz sandstone. Small pocket beaches and more extensive Quaternary estuary fill of muddy sand at the head of most tributary streams. General elevation 0 to 80 m and local relief between 10 m to 50 m (Jacobs, 2020).

#### 5.1.3 Rivers, Streams and Estuaries

The Project construction sites are located within the Parramatta River/Port Jackson subcatchment of the Sydney Metro catchment (Department of Primary Industries, 2019). The tunnel alignment would pass at depth beneath Domain Creek, Clay Cliff Creek, Duck River, Haslams Creek, Saleyards Creek, Powells Creek and Iron Cove. As part of the works, structures would be built within and over A'Becketts Creek and Duck Creek (Jacobs, 2020).

#### 5.1.4 Wetlands

Mapped areas of wetland listed under State Environmental Planning Policy (Coastal Management) 2018 are present within 200 m of the Project construction sites. This includes vegetation along the Duck River and Mason Park wetlands (Jacobs, 2020).

#### 5.1.5 Habitat Connectivity

The habitat surrounding the Project construction sites have a low degree of connectivity to other areas of habitat due to impacts of urbanisation. Habitat within the study area generally occurs as small, isolated fragments.

North of Westmead Metro Station, there is a broken corridor of habitat that connects Coopers Creek and Toongabbie Creek to Darling Mills Creek and eventually the Parramatta River. The corridor then follows Duck River to the south. This corridor does not interact with the Project.

A corridor begins at Haslams Creek which provides a north south corridor from the Parramatta River to the vegetation along the M4 Motorway. Haslams Creek is also linked to Powells Creek forming a wetland corridor which would likely be used by birds and bats. The Sydney Metro West tunnels would pass beneath Haslams Creek (at about 30 m below ground level).

Planted trees and gardens surrounding the Project construction sites also provide some connectivity for mobile species such as the Grey-headed Flying-fox and birds that can use the resources available in urban areas (Jacobs, 2020).

### 5.1.6 Areas of Outstanding Biodiversity Value

None.

### 5.1.7 Native Vegetation

Approximately 0.72 hectares of native vegetation within the Project construction sites, including 0.18 hectares of native vegetation approved in the Stage 1 EIS and 0.54 hectares of native vegetation approved in the Modification 2 Report for Clyde Dive.

## 5.2 Native Vegetation

According to the Sydney Metro West – Stage 1 EIS, the Project construction sites support two Plant Community Types (PCTs), including PCT 920 at Clyde MSF and PCT 849 at Westmead Metro Station. The location of each PCT across the sites and their conformity to threatened ecological communities is outlined in Table 3 and shown on Figure 2 and Figure 3.

Since the preparation of the EIS, the construction boundary for Westmead Metro Station has been refined to avoid the clearing of any PCT 849 vegetation.

Planted native vegetation that does not conform to a NSW PCT occurs at Parramatta metro station construction site, and Sydney Olympic Park metro station construction site.

Table 3: PCTs within the Project Construction Sites (as from the Sydney Metro West – Stage 1 EIS and Modification 2 Report)

| Plant community type ID              | Plant community type name  | Condition class                        | Area within clearing area (ha) | Stage 1 location                         | Corresponding threatened ecological community  | Determination of PCT to meet the TEC listing   |
|--------------------------------------|--|--|--------------------------------|--|--|--|
| <b>Sydney Metro West Stage 1 EIS</b> |  |  |                                |  |  |  |
| 849                                  | Grey Box-Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion | Poor (vegetation integrity score 11.4) | 0.03                           | Westmead metro station construction site | Cumberland Plain Woodland in the Sydney Basin Bioregion listed as critically endangered under BC Act. Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, listed under the Commonwealth EPBC Act. | The PCT does not meet the definition for the TEC under the BC Act or the EPBC Act (Biosis 2021). |
| 920                                  | Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion      | Poor (vegetation integrity score 34.6) | 0.15                           | Clyde MSF and downstream                 | None   | n/a  |
| <b>Modification 2 Report</b>         |  |  |                                |  |  |  |
| 849                                  | Grey Box-Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion | Poor (vegetation integrity score 14.2) | 0.54                           | Clyde Dive construction site             | Cumberland Plain Woodland in the Sydney Basin Bioregion listed as critically endangered under BC Act. Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, listed under the Commonwealth EPBC Act. | The PCT does not meet the definition for the TEC under the BC Act or the EPBC Act (Biosis 2021). |

Source: Jacobs 2020 / Biosis 2021

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Legend

- Construction Boundary
- Tunnel Alignment
- Railway Line

Vegetation Community

- 849, Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

Image Source: Nearmap (October 2021) Data source: DFSI (2021)

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PARRAMATTA

GDA 1994 MGA Zone 56

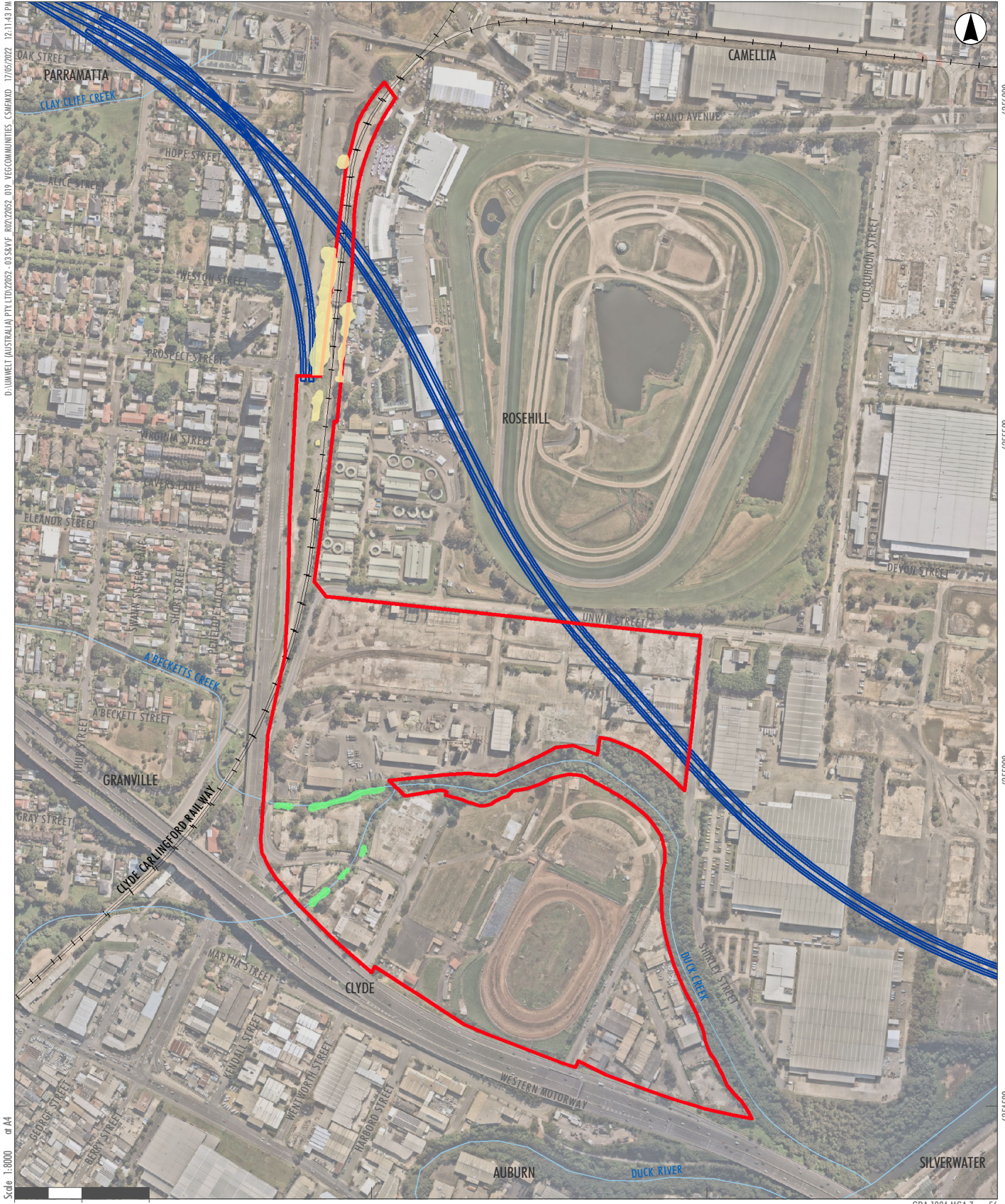
FIGURE 2  
Vegetation Communities (WMS)

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- Legend**
- ▭ Clyde Stabling and Maintenance Facility Construction Boundary
  - Tunnel Alignment
  - Railway Line
  - Drainage Line
- Vegetation Community**
- 849, Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion
  - 920, Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion

FIGURE 3

Vegetation Communities (CSMF)



## 5.3 Threatened Flora

A desktop review of databases and published information has generated a list of candidate species, documented in the EIS.

No threatened flora species were recorded during the field surveys conducted for the EIS (Jacobs, 2020). However, the proposed modification at Clyde Dive, as identified in the Modification 2 Report, requires the removal of 0.14 hectares of Downy Wattle (Biosis, 2021). This includes 0.01 hectares within the approved Project area (as identified in the EIS), as well as 0.13 hectares within the additional area required for construction, however this is not likely to result in a significant impact to species or communities listed under the EPBC Act.

The Downy Wattle located within the Clyde MSF (as per the Modification 2 Report) is highly isolated within urban development away from the remainder of the population. Additionally, the habitat within the Clyde MSF consists of largely unviable urban native/exotic planted vegetation and the soil profile within the location of the species has also undergone historic disturbance from construction of the former rail infrastructure, with limited recruitment observed by Biosis.

Biosis concluded that the removal of about 27 stems from a population of at least 4,655 within a 15 km radius of the Clyde MSF would result in the loss of 0.6 per cent of the overall population and is not likely to constitute a significant impact to the species population.

## 5.4 Threatened Fauna

Targeted threatened fauna surveys were not conducted for the EIS (Jacobs, 2020). Instead, the assessment of threatened fauna surveys was based on the presence of suitable habitat and the findings of previous surveys.

Southern Myotis (*Myotis macropus*) was assumed to be present within the Clyde MSF based on the presence of suitable habitat in the form of the Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion PCT (PCT 920), refer to Figure 5. Foraging habitat is present downstream along the Duck River. No potential roosting or breeding habitat was present. Figure 4 shows the location within which Southern Myotis was assumed present (threatened species polygon). Table 4 identifies the threatened fauna species assessed as likely to occur or assumed to occur within the Project construction sites. Habitat locations are illustrated on Figure 4 and Figure 5.

Table 4: Threatened fauna species likely or assumed to occur within the Project construction sites

| Species  | BC Act status | EPBC Act status | Location and habitat  |
|--|---------------|-----------------|---|
| Dusky Woodswallow<br>( <i>Artamus cyanopterus cyanopterus</i> )    | Vulnerable    | Not listed      | Commonly recorded near the Parramatta River. May forage in or over the mangroves in and adjacent to the construction sites. |
| Little Bent-winged Bat<br>( <i>Miniopterus australis</i> )         | Vulnerable    | Not listed      | May forage in and around the mangrove vegetation.   |
| Large Bent-winged Bat<br>( <i>Miniopterus orianae oceanensis</i> ) | Vulnerable    | Not listed      | May forage in and around the mangrove vegetation.   |

| Species   | BC Act status | EPBC Act status       | Location and habitat   |
|---|---------------|-----------------------|--|
| Eastern Coastal Free-tailed Bat<br>( <i>Micronomus norfolkensis</i> ) | Vulnerable    | Not listed            | May forage in and around the mangrove vegetation. Potential roosting habitat present throughout mangroves.   |
| Grey-headed Flying-fox ( <i>Pteropus poliocephalus</i> )              | Vulnerable    | Not listed            | Recorded in urban areas of Sydney. Some foraging habitat may be impacted (street trees, garden plantings and mangroves). No camps were recorded within the construction sites, however the nearest camp is located on Duck River approximately 800 m to the south-west of the Clyde MSF construction site. |
| Little Lorikeet<br>( <i>Glossopsitta pusilla</i> )                    | Vulnerable    | Not listed            | May forage in street trees within the construction sites on occasion.  |
| Swift Parrot<br>( <i>Lathamus discolor</i> )                          | Endangered    | Critically endangered | Vagrant birds are known to occasionally visit the street trees around the Sydney urban area but the likelihood of birds using the trees within the footprint as a continual source of habitat is low (Jacobs, 2020).   |
| Southern Myotis<br>( <i>Myotis macropus</i> )                         | Vulnerable    | Not listed            | Foraging habitat present (mangrove veg and Duck River). No roosting or breeding habitat was recorded during the EIS field surveys.   |
| Above tunnel alignment and within surrounding GDEs                    |               |                       |  |
| Australasian Bittern ( <i>Botaurus poiciloptilus</i> )                | Endangered    | Endangered            | Habitat present in saltmarsh downstream of the Clyde MSF construction site and in Mason Park wetlands located above the tunnels.   |
| Green and Golden Bell Frog<br>( <i>Litoria aurea</i> )                | Endangered    | Vulnerable            | Habitat present in wetlands of Haslams Creek that are located above the tunnels. Wetlands around Sydney Olympic Park (outside construction sites)  |

### 5.4.1 Hollow-bearing Trees

No large tree hollows (size classes were not defined within the EIS) were recorded during the field surveys for the EIS (Jacobs, 2020). Small tree hollows were acknowledged as potentially occurring however. For the purposes of this FFMP a small hollow is defined as having an opening between 5-10 cm across.



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PARRAMATTA

GDA 1994 MGA Zone 56

- Legend**
- Construction Boundary
  - Tunnel Alignment
  - Railway Line
- Threatened Ecological Communities**
- 849, Cumberland Plain Woodland

**FIGURE 4**  
**Threatened Biodiversity (WMS)**



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- Legend**
- ▭ Clyde Stabling and Maintenance Facility Construction Boundary
  - ▬ Tunnel Alignment
  - ▬ Railway Line
  - ▬ Drainage Line
  - ▬ Southern Myotis (*Myotis macropus*)
- Threatened Ecological Communities**
- ▭ PCT 1126, Coastal Saltmarsh
  - ▭ PCT 1234, Swamp Oak Floodplain Forest
  - ▭ PCT 849, Cumberland Plain Woodland

FIGURE 5

Threatened Biodiversity (CSMF)

## 5.5 Migratory and Marine Fauna Species

Table 5 identifies the migratory bird species that were assessed with a moderate likelihood of occurring in the Project construction sites (Jacobs, 2020). No important habitat for any of these species was identified within the Project construction sites.

Table 5: Migratory species with a moderate likelihood of occurring in the Project construction sites

| Listing               | Species  |
|-----------------------|--|
| Migratory marine      | <i>Apus pacificus</i> (Fork-tailed Swift)                |
| Migratory terrestrial | <i>Hirundapus caudacutus</i> (White-throated Needletail) |
| Migratory wetland     | <i>Actitis hypoleucos</i> (Common Sandpiper)             |
| Migratory wetland     | <i>Arenaria interpres</i> (Ruddy Turnstone)              |
| Migratory wetland     | <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)       |
| Migratory wetland     | <i>Calidris ferruginea</i> (Curlew Sandpiper)            |
| Migratory wetland     | <i>Calidris melanotos</i> (Pectoral Sandpiper)           |
| Migratory wetland     | <i>Calidris ruficollis</i> (Red-necked Stint)            |
| Migratory wetland     | <i>Calidris tenuirostris</i> (Great Knot)                |
| Migratory wetland     | <i>Charadrius bicinctus</i> (Double-banded Plover)       |
| Migratory wetland     | <i>Charadrius leschenaultii</i> (Greater Sand Plover)    |
| Migratory wetland     | <i>Charadrius mongolus</i> (Lesser Sand Plover)          |
| Migratory wetland     | <i>Charadrius mongolus</i> (Latham's Snipe)              |
| Migratory wetland     | <i>Limosa lapponica</i> (Bar-tailed Godwit)              |
| Migratory wetland     | <i>Limosa</i> (Black-tailed Godwit)                      |
| Migratory wetland     | <i>Numenius madagascariensis</i> (Eastern Curlew)        |
| Migratory wetland     | <i>Numenius phaeopus</i> (Whimbrel)                      |
| Migratory wetland     | <i>Pandion cristatus</i> (Osprey)                        |
| Migratory wetland     | <i>Pluvialis fulva</i> (Pacific Golden Plover)           |
| Migratory wetland     | <i>Tringa brevipes</i> (Grey-tailed Tattler)             |
| Migratory wetland     | <i>Tringa nebularia</i> (Common Greenshank)              |
| Migratory wetland     | <i>Tringa stagnatilis</i> (Marsh Sandpiper)              |

## 5.6 Groundwater Dependent Ecosystems

The EIS Technical Paper 10 (Biodiversity development assessment report) identifies all potential groundwater dependent ecosystems (GDEs) located in proximity to (about 1.5 km of) the Stage 1 construction sites and tunnel.

Additional investigations and assessment of potential impacts to GDEs would be carried out in accordance with REMM B3, as detailed in Section 7.1.

No aquatic groundwater dependent ecosystems (GDEs) have been mapped within a 1,500 m buffer of the Project construction sites (Bureau of Meteorology, 2017). The Atlas of GDEs does however map terrestrial GDEs within the locality (a 10 km buffer around the Project construction

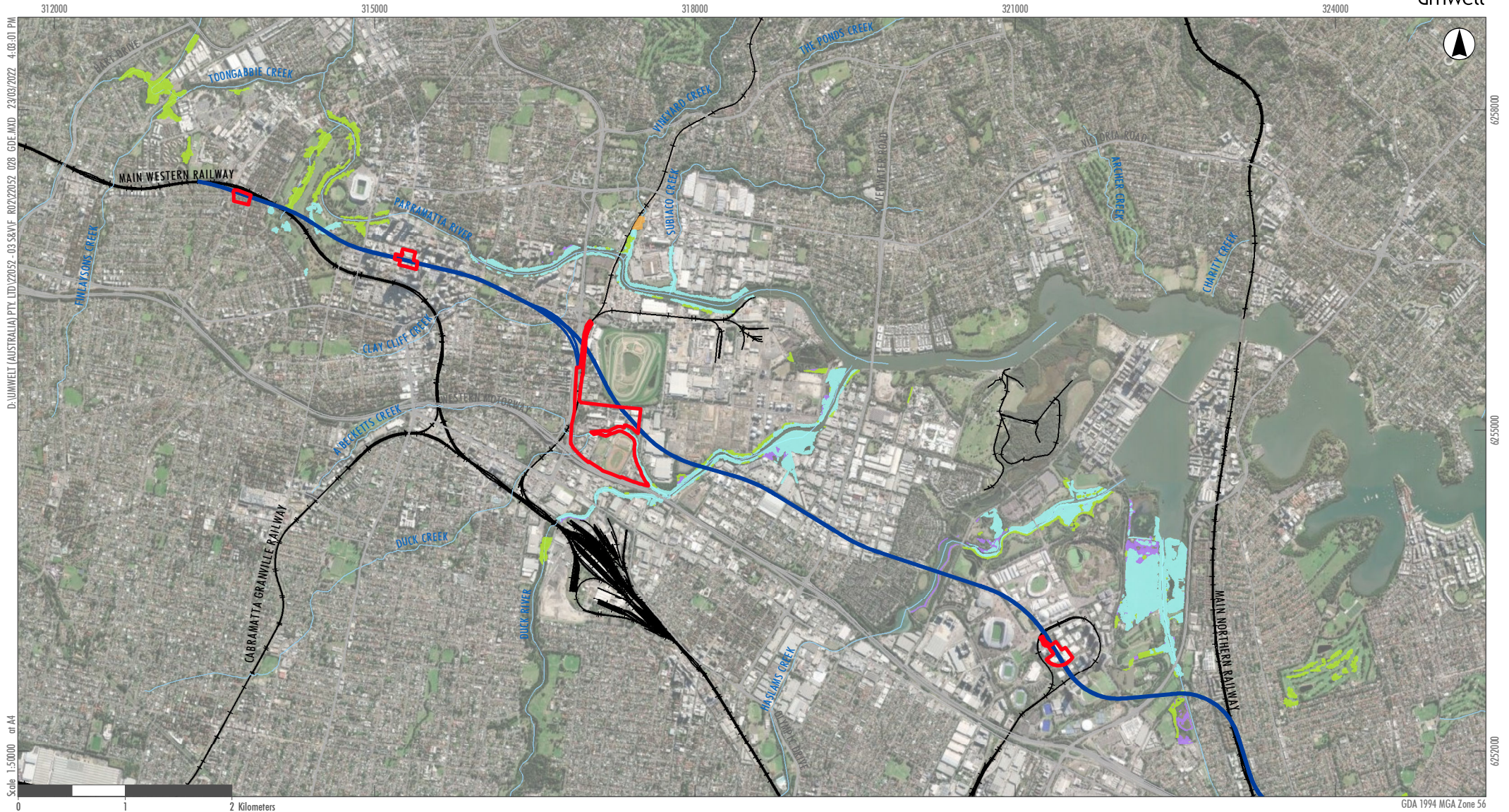
sites) that have the potential to be impacted by drawdown caused by station and shaft excavations (Jacobs, 2020).

Table 6 identifies the PCT / terrestrial GDE relationships within close proximity to the Project construction sites that may be impacted by the groundwater drawdown associated with the proposed excavations for the project. Figure 6 shows the location of GDEs within close proximity to Project construction sites.

*Table 6: GDEs within proximity to Project construction sites*

| PCT/GDE relationship   | Location  |
|--|---|
| PCT 849: Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion                    | <ul style="list-style-type: none"> <li>● Approximately 20 m north of the Westmead metro station construction site</li> <li>● In Parramatta Park approximately 200 m east of the Westmead metro station construction site.</li> </ul>  |
| PCT 835: Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion | <ul style="list-style-type: none"> <li>● Toongabbie Creek - approximately 1.2 km north-west of the Westmead metro station construction site.</li> <li>● Domain Creek in Parramatta Park - approximately 350 m east of the Westmead metro station construction site.</li> <li>● Parramatta River at two locations - approximately 650 m east of the Westmead metro station construction site and approximately 360 m north-west of the Parramatta metro station construction site.</li> </ul>  |
| PCT 1800: Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley  | <ul style="list-style-type: none"> <li>● Toongabbie Creek at two locations near the Westmead Metro Construction Site - one approximately 1.2 km north-west and the other 1 km to the north.</li> <li>● Finlaysons Creek - approximately 1 km north-west of the Westmead metro station construction site.</li> <li>● Immediately west of Mother Teresa Primary School at Westmead - approximately 500 m north-west of the Westmead metro station construction site.</li> <li>● Along Parramatta River approximately 460 m north-west of the Parramatta metro station construction site.</li> </ul> |

*Source: Jacobs 2020*



Legend

- |   |  |
|---|--|
| <span style="border: 2px solid red; display: inline-block; width: 15px; height: 10px;"></span> Surface Construction Sites | <b>Groundwater Dependent Ecosystem Likelihood</b>  |
| <span style="border-bottom: 2px solid blue; width: 20px; display: inline-block;"></span> Tunnel Alignment                 | <span style="background-color: cyan; width: 15px; height: 10px; display: inline-block;"></span> High likelihood terrestrial GDE                  |
| <span style="border-bottom: 1px solid grey; width: 20px; display: inline-block;"></span> Road                             | <span style="background-color: limegreen; width: 15px; height: 10px; display: inline-block;"></span> Moderate to High likelihood terrestrial GDE |
| <span style="border-bottom: 1px solid lightblue; width: 20px; display: inline-block;"></span> Drainage Line               | <span style="background-color: orange; width: 15px; height: 10px; display: inline-block;"></span> Not likely to be a GDE                         |
| <span style="border-bottom: 1px solid black; width: 20px; display: inline-block;"></span> Railway Line                    | <span style="background-color: purple; width: 15px; height: 10px; display: inline-block;"></span> Potential terrestrial GDE                      |

FIGURE 6  
Groundwater Dependent Ecosystems



## 5.7 Aquatic Biodiversity

### 5.7.1 Key Watercourses

Table 7 identifies watercourses within or close to the Project construction sites mapped as either key fish habitat or SEPP (Coastal Management) wetland.

Table 7: Key watercourses within or close to the Project construction sites

| Watercourse         | Description  | Key fish habitat | SEPP (Coastal Management) wetland | Impact*   |
|---------------------|--|------------------|-----------------------------------|---|
| Toongabbie Creek    | Third order stream approximately 1.2 km north-west of Westmead Metro Station             | Yes              | No                                | Unlikely to be impacted   |
| Darling Mills Creek | Fourth order creek approximately 1.5 km northeast of Westmead Metro Station              | Yes              | No                                | Unlikely to be impacted   |
| Parramatta River    | Main tributary of Sydney Harbour. Parramatta Metro Station is approximately 300 m south. | Yes              | Yes                               | Potential impacts from construction water discharges without mitigation |
| Clay Cliff Creek    | Second order creek. Tunnels will pass approximately 35 m beneath the creek.              | No               | Yes                               | Unlikely to be impacted   |
| Subiaco Creek       | Second order watercourse about 1.4 km north of the Clyde MSF                             | Yes              | No                                | Unlikely  |
| Duck River          | Third order estuarine waterway within the study area. Tunnels will                       | Yes              | Yes                               | Potential impacts from construction water discharges without mitigation |

| Watercourse      | Description  | Key fish habitat | SEPP (Coastal Management) wetland | Impact*   |
|------------------|--|------------------|-----------------------------------|---|
|                  | pass 30 m beneath.   |                  |                                   |   |
| Duck Creek       | Second order stream located within and adjacent to the Clyde MSF construction site | Yes              | Yes                               | Yes   |
| A'Becketts Creek | Second order stream located within and adjacent to the Clyde MSF construction site | No               | Yes                               | Yes   |
| Haslams Creek    | Second order stream. Tunnels pass about 30 m beneath                               | Yes              | Yes                               | Potential impacts from construction water discharges without mitigation |
| Saleyards Creek  | First order stream. Tunnels pass about 25 m beneath                                | Yes              | Yes                               | Unlikely  |

\*As assessed by Jacobs (2020) in the EIS biodiversity assessment

## 5.8 Marine Vegetation

Marine vegetation is protected under the *Fisheries Management Act 1994*. Within the Clyde MSF construction site, mangroves vegetation is present along Duck River and A'Becketts Creek. A permit is required to works that require the removal of marine vegetation (including mangroves). Refer to Attachment 3 of the CEMP for more detail.

## 5.9 Aquatic Fauna

The known aquatic ecology of the Parramatta River is limited to a few publicly available historical fish surveys, and no threatened aquatic species have been recorded. The EIS, desktop searches indicate that three threatened aquatic species with a moderate or higher likelihood of occurring in the locality; Black Rockcod (*Epinephelus daemeli*), White Shark (*Carcharodon carcharias*) and Grey Nurse Shark (*Carcharias taurus*). These species are unlikely to occur within the construction sites considered within this FFMP.

## 5.10 Weed Species

Weeds and exotic flora species were frequently recorded throughout the Project. A full list of the recorded weed and exotic flora species is available in Appendix B of the EIS Biodiversity Development Assessment Report (BDAR). Table 8 below identifies priority weeds for the Greater

Sydney Area and weeds of national significance. These species will be the most difficult and important to manage.

Table 8: Priority weed species for the Greater Sydney Region and Weeds of National Significance recorded within Project construction sites

| Weed species                                  | Priority weed | Weed of National Significance | Construction site | Location         |
|---|---------------|-------------------------------|-------------------|------------------|
| <i>Anredera cordifolia</i><br>(Madeira Vine)  | Yes           | Yes                           | Clyde MSF         | Duck Creek       |
| <i>Arundo donax</i> (Giant Reed)              | Yes           | -                             | Clyde MSF         | Duck Creek       |
| <i>Asparagus scandens</i><br>(Asparagus Fern) | Yes           | -                             | Clyde MSF         | A'Becketts Creek |
| <i>Cestrum parqui</i><br>(Green Cestrum)      | Yes           | -                             | Clyde MSF         | A'Becketts Creek |
| <i>Lantana camara</i><br>(Lantana)            | Yes           | Yes                           | Clyde MSF         | A'Becketts Creek |

## 5.11 Summary

A summary of the biodiversity values within the sites considered within this FFMP is detailed within Table 9.

Table 9: Summary of biodiversity values

| Location (inclusive of connecting tunnels) | Recorded Biodiversity  | Site Status  |
|--|--|--|
| Sydney Olympic Park Metro Station          | <ul style="list-style-type: none"> <li>● Groundwater dependent ecosystems (outside construction boundary)</li> <li>● Planted native vegetation</li> </ul>  | <ul style="list-style-type: none"> <li>● No vegetation clearing is required for the Project works</li> </ul>   |
| Clyde MSF / Rosehill Services Facility     | <ul style="list-style-type: none"> <li>● Groundwater dependent ecosystems (within and outside construction boundary)</li> <li>● Aquatic/marine ecology</li> <li>● Weeds and exotic vegetation</li> <li>● Planted native vegetation</li> <li>● PCT 920 Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion</li> <li>● <i>Myotis macropus</i> (Southern Myotis)</li> </ul> | <ul style="list-style-type: none"> <li>● The Demolitions Contractor has demolished several structures and cleared vegetation in the northern section of Clyde MSF (along Unwin Street)</li> <li>● Vegetation removal is required at the Clyde site</li> <li>● Instream works is required at Duck Creek / A'Becketts Creek</li> </ul> |
| Parramatta Metro Station                   | <ul style="list-style-type: none"> <li>● Groundwater dependent ecosystems (outside construction boundary)</li> </ul>   | <ul style="list-style-type: none"> <li>● There are no trees within the construction boundary.</li> <li>● The Demolitions Contractor has demolished the majority of buildings within the construction boundary.</li> </ul>  |
| Westmead Metro Station                     | <ul style="list-style-type: none"> <li>● Groundwater dependent ecosystems (within and outside construction boundary)</li> <li>● Weeds and exotic vegetation</li> <li>● Planted native vegetation.</li> </ul>   | <ul style="list-style-type: none"> <li>● The site has been cleared of all vegetation by the Demolitions Contractor prior to handover to GALC.</li> </ul>   |

## 6 ASPECTS AND IMPACTS

### 6.1 Construction Activities

The construction and operational phases of the development have the potential to impact biodiversity values within the Project which cannot be avoided. This would occur through direct and indirect impacts.

Construction activities with the potential to impact on flora and fauna during construction may include:

- Site establishment activities
- Removal and trimming of vegetation and trees, including street trees
- Demolition of existing structures
- Realignment of Duck Creek and A'Becketts Creek, Clyde (to be partly enclosed in proposed culverts and remainder to be retained as a naturalised channel)
- Set up and use of material, plant and spoil storage areas during construction
- Movement of vehicles and plants to and from the construction site
- The use of machinery and equipment such as mobile cranes, excavators, concrete pumps, piling rigs
- Introduction of car parks, acoustic sheds, spoil sheds, laydown areas, workshops, dangerous goods storage, wheel wash, site offices and staff amenities during construction
- Adjustment of road networks
- Noise barriers and hoardings
- Construction of open dive structures
- General earthworks
- Operation of construction lighting during night-time construction works.

### 6.2 Impacts

Direct impacts to biodiversity values include clearing of native vegetation, clearing of suitable habitat for threatened and protected flora and fauna species, and the installation of infrastructure. Indirect impacts to biodiversity values include ground water drawdown, soil and water contamination, creation of barriers to fauna movement or the generation of excessive dust, light or noise upon the surrounding environment.

Table 10 details the type, frequency, intensity, duration and consequence of the direct and indirect impacts to biodiversity values that may occur as a result of the Project. Impacts to biodiversity are described in detail in the EIS BDAR (Jacobs, 2020).

Table 10: Summary of impacts within the Project construction sites

| Location                          | Impacts  |
|-----------------------------------|--|
| Sydney Olympic Park Metro Station | <ul style="list-style-type: none"> <li>● Potential spread of weeds and exotic flora species</li> <li>● Potential spread of plant pathogens and disease</li> </ul>  |
| Clyde MSF                         | <ul style="list-style-type: none"> <li>● Direct clearing of 0.15 hectares of PCT 920</li> <li>● Direct impacts to <i>Myotis macropus</i> (Southern Myotis) habitat</li> <li>● Direct impact to potential threatened bird and microbat foraging habitat</li> <li>● Direct impacts to GDEs (PCT 920)</li> <li>● Potential impacts to GDEs outside the construction boundary</li> <li>● Impacts to key fish habitat</li> <li>● Potential spread of weeds and exotic flora species</li> <li>● Potential spread of plant pathogens and disease</li> </ul> |
| Parramatta Metro Station          | N/A  |
| Westmead Metro Station            | <ul style="list-style-type: none"> <li>● Potential impacts to GDEs outside the construction boundary</li> <li>● Potential spread of weeds and exotic species</li> <li>● Potential spread of plant pathogens and disease</li> </ul>   |
| Tunnelling                        | <ul style="list-style-type: none"> <li>● Potential impacts to key fish habitat</li> <li>● Potential impacts to GDEs overlying tunnel alignment</li> </ul>  |

Section 7 of this plan provides mitigation and management measures that will be implemented to avoid or minimise fauna and flora impacts during the delivery of the Project.

It is important to note that the EIS BDAR states that ‘indirect impacts such as those from groundwater drawdown are not expected to impact the habitat of threatened species based on groundwater modelling as detailed in Technical Paper 7 (Hydrogeology)’. A revised Groundwater Modelling Report will be prepared in accordance with MCoA D122 to assess the groundwater level drawdown effects from the Project. Refer to the Groundwater Management Sub-plan for more information.

Groundwater drawdown was identified as potentially impacting the following TECs within and outside the Project construction sites:

- Cumberland Plain Woodland in the Sydney Basin Bioregion (BC Act) (mapped as equivalent to Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (EPBC Act))
- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act)
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act) (mapped as equivalent to Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community (EPBC Act))
- Sydney Turpentine-Ironbark Forest (BC Act) (mapped as equivalent to Turpentine-Ironbark Forest of the Sydney Basin Bioregion (EPBC Act)).

Any impacts to these TECs from groundwater drawdown are likely to be minimal (Jacobs, 2020).

## 7 ENVIRONMENTAL MITIGATION AND MANAGEMENT MEASURES

Measures to manage flora and fauna impacts and reduce the risk of impact to species, communities and habitats will be implemented throughout the Project.

### 7.1 Standard Mitigation and Management Measures

Specific measures and requirements to meet the objectives of this Plan and to address impacts on flora and fauna are outlined in Table 11. These measures have been developed in line with the requirements in the EIS. As a minimum, the following will be incorporated at each construction site and documented on the Environmental Controls Map in Attachment 8 of the CEMP, where applicable.

Table 11: Environmental Mitigation and Management Measures

| Item  | Mitigation and Management Measure and Project site requirements   | Responsibility | Timing                                   | Reference                                   |
|---|---|----------------|--|---|
| SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist |   |                |  |   |
| <b>General Controls</b>   |   |                |  |   |
| 1.  | All site staff, including subcontractors must attend an induction which details mitigation measures relevant to this flora and weed management procedure. Flora management will be further communicated in toolbox talks and prestart briefings. Environmental Control Maps will include mitigation measures for flora and fauna. | EA             | Pre-construction and during construction | MCoA C1, C6, C-B8 and C11                   |
| 2.  | Appropriate erosion and sediment controls are to be installed in accordance with the requirements of the Blue Book (Landcom, 2004) and the Soil and Water Management Sub-Plan (SWMP) to minimise impacts to the receiving environment, including the implementation of an Erosion and Sediment Control Plan (ESCP).               | EA/CM/SS       | Pre-construction                         | MCoA C-B10, C1 and C6<br>REMM B1 and B3     |
| 3.  | Any work required outside of the approved clearing area identified in the EIS will be referred to the Environmental Manager for advice on further assessment and approval requirements.   | EA/CM          | During construction                      | MCoA D3                                     |
| 5.  | Environmentally sensitive areas will be fenced off and signposted for the duration of the Project construction, including all waterways' areas in or adjacent to the site which are excluded from the work areas.   | EA/CM/SS       | During construction                      | MCoA C11, D3 and D9<br>REMM B1              |
| 6.  | Where possible, construction activities would minimise disturbance to waterways and riparian land, through site fencing and signage. Stockpile areas and storage areas would be located away from waterways and riparian land, where feasible.  | EA/CM/SS       | During construction                      | MCoA C B8, C11 and D9<br>REMM B1<br>REMM B2 |
| 7.  | All plant and equipment would remain on haulage roads and paved surfaces as much as possible, so as to minimise damage to vegetation.   | CM/SS          | During construction                      | MCoA C11, D2 and D9                         |



| Item  | Mitigation and Management Measure and Project site requirements  | Responsibility | Timing                                    | Reference           |
|---|--|----------------|---|---------------------|
| SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist |  |                |   |                     |
| 8.  | Equipment storage areas and stockpile areas are to be located in cleared areas and not within drip zones of trees.   | CM/SS          | During construction                       | MCoA C11, D2 and D9 |
| 9.  | Stockpiling/storage of cleared timber is to be in designated areas and outside the tree protection zone of remaining trees.  | CM/SS/PE       | Pre-construction and during construction  | MCoA C11, D2 and D9 |
| 10.   | The site induction will include information on site speed limits to ensure all personnel obey the speed limit when operating heavy machinery and vehicles. This will be emphasised for areas where vehicle/fauna interactions are identified as high risk. | EA             | During construction                       | MCoA C6 and C11     |
| 11.   | Weekly site inspections to ensure environmental controls to minimise noise, vibration, light and dust are in place at all compound sites, particularly compounds operating on a 24-hour basis.   | SEA            | During construction                       | MCoA C11            |
| 12.   | Use of low sodium and / or directional lighting to avoid light spill into adjacent habitat areas, in order to avoid impacting on sensitive fauna.  | CM/SS          | During construction                       | MCoA C11            |
| 13.   | Use of acoustic shed for some construction activities to minimise noise and dust impacts.  | CM             | During construction                       | MCoA C11            |
| <b>Weed Control and Management</b>  |  |                |   |                     |
| 14.   | Use of herbicides would be in accordance with the <i>Pesticides Act 1999</i> , other relevant legislation, label directions and any relevant industry codes of practice.   | EA/SS          | During construction and post construction | MCoA C6 and C11     |
| 15.   | All herbicide applications will be undertaken with consideration to the <i>New South Wales Weed Control Handbook – A guide to weed control in non-crop, aquatic and bushland situations</i> (DPE, 2018)  | EA/SS          | During construction and post construction | MCoA C6 and C11     |

| Item  | Mitigation and Management Measure and Project site requirements   | Responsibility | Timing                                    | Reference                |
|---|---|----------------|---|--------------------------|
| SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist |   |                |   |                          |
| 16.   | Herbicides will not be applied: <ul style="list-style-type: none"> <li>• When plants are stressed on hot days</li> <li>• After seed has been set</li> <li>• Within 24 hrs of rain or when rain is imminent</li> <li>• During windy conditions when the use of herbicides may affect non-targeted areas.</li> </ul>                                      | EA/SS          | During construction and post construction | MCoA C6 and C11          |
| <b>Vegetation Clearing</b>  |   |                |   |                          |
| 17.   | During detailed construction design, clearing of native vegetation will be minimised to the greatest extent practicable with the objective of reducing impacts to threatened ecological communities and threatened species habitat, through investigating opportunities to revise the construction site boundary and location of construction elements. | SEA/CM         | Pre-construction and during construction  | MCoA C B8, D2, D3 and D9 |
| 18.   | Tree and urban canopy clearing would be avoided where possible.   | EA/CM/SS       | During construction and post-construction | MCoA C6 and C11          |
| 19.   | Canopy trimming would be considered where practicable prior to any mature <sup>1</sup> tree removal.  | EA/CM/SS       | During construction and post-construction | MCoA C6 and C11          |
| 20.   | Prior to any disturbance, clearing or grubbing activities in any locations the following will be in place: <ul style="list-style-type: none"> <li>• a Pre-Clearing Inspection Checklist (GA-FRM-HSE-149) will be completed</li> </ul>   | EA/CM/SS/PE    | During construction                       | MCoA C6 and C11          |

<sup>1</sup> For the purposes of this FFMP 'mature tree' has been defined as a tree with a diameter at breast height (DBH) of 15cm or where a suitably qualified arborist or ecologist determines a specific species to be mature at a smaller DBH.

| Item  | Mitigation and Management Measure and Project site requirements  | Responsibility | Timing                                    | Reference       |
|---|--|----------------|---|-----------------|
| SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist |  |                |   |                 |
|   | <ul style="list-style-type: none"> <li>A Permit to Clear (GA-FRM-HSE-150) will be issued</li> <li>No-go Zones for significant flora and fauna, fenced/flagged and sign posted prior to commencement of clearing in accordance with the Pre-Clearing Inspection Checklist; and</li> <li>A suitably qualified ecologist / Project Ecologist will conduct a search for any wildlife that may need to be removed and relocated where the Pre-clearing Inspection Checklist specifies. This ecologist pre-clearance inspection will occur within 48 hours of clearing.</li> </ul> |                |   |                 |
| 21.   | If grubbing is to be undertaken, then sediment and erosion controls must be in place (refer to SWMP) prior to grubbing to ensure that sediment laden water does not run off site.  | EA/CM/SS       | Pre-construction and during construction  | MCoA C6 and C11 |
| 22.   | Tree removal/clearing will be undertaken by a suitably qualified person.   | SEA/CM/PE      | During construction                       | MCoA C11        |
| 23.   | An Arborist will be present onsite when excavation works are required to encroach more than 10% of the tree protection zone of native vegetation.  | PE             | During construction                       | MCoA C11 and D9 |
| 24.   | Non-structural roots would be pruned by a clean diagonal cut and not exposed to air for more than 24 hours. The Project Arborist is responsible for undertaking the cutting of roots, or overseeing the cutting of roots when appropriate.   | SEA/CM/SS/PE   | During construction                       | MCoA C11 and D9 |
| 25.   | Cleared/removed weed-free vegetation will be used either on or off the Project where possible (e.g. for habitat, chipped for mulch and reused).  | CM/SS          | During construction and post-construction | MCoA C11 and D9 |
| 26.   | Any disposal of excess mulch and/or weeds will be in accordance with the Waste Management Plan and take into account the Raw Mulch Exemption and Order (EPA 2014).   | CM/SS          | During construction and post-construction | MCoA C11 and D9 |

| Item  | Mitigation and Management Measure and Project site requirements  | Responsibility | Timing                                    | Reference             |
|---|--|----------------|---|-----------------------|
| SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist |  |                |   |                       |
| <b>Site Restoration</b>   |  |                |   |                       |
| 27.   | A Landscaping or Revegetation Plan will be prepared by Sydney Metro to rehabilitate and / or renaturalise parts of Duck Creek and A'Becketts Creek that remain open channels at the Clyde MSF site. The plan would be implemented before operation of the Project commences.   | SEA/PE         | During construction and post-construction | MCoA C B10<br>REMM B2 |
| 28.   | Only species that are representative of PCT 920 (Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion) would be used in the revegetation of the riparian zone along the open channels to Duck Creek and A'Becketts Creek.   | SEA/PE         | During construction and post-construction | MCoA C B10<br>REMM B2 |
| 29.   | The Landscaping Plan for Clyde MSF (to be prepared by Sydney Metro) will be consistent with the DPI (2012) Guidelines for Vegetation Management Plans on Waterfront Land.  | SEA            | Post-construction                         | MCoA C B10<br>and C11 |
| <b>Fauna Management</b>   |  |                |   |                       |
| 30.   | Before the removal or clearing of any vegetation, or the demolition of structures identified as potential roosting sites for microbats at the Clyde MSF site commences, pre-clearing inspections for the threatened species would be undertaken in accordance with the Pre-Clearing Inspection Checklist (GA-FRM-HSE-149). | EA/CM/SS/PE    | Pre-construction and during construction  | MCoA D7               |
| 31.   | The inspections, and any subsequent survey and or relocation of fauna and associated management / offset measures, would be undertaken under the guidance of the Project Ecologist. Survey and relocation methodologies and management / offset measures are included in this FFMP, refer Section 7.6.                     | PE             | Pre-construction and during construction  | MCoA D7               |

| Item  | Mitigation and Management Measure and Project site requirements  | Responsibility | Timing                                   | Reference           |
|---|--|----------------|--|---------------------|
| SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist |  |                |  |                     |
| 32.   | In the event microbat roosting sites have been identified in Mitigation and Management Measure 30 and 31 survey will be undertaken to determine what species is present (as per Section 7.6). Bat boxes will be installed, or suitable habitat built within the Clyde MSF.   | EA/CM/SS/PE    | Pre-construction and during construction | MCoA D8             |
| 33.   | Bridges and culverts to be disturbed by construction activities will be checked for roosting bats within 48 hours prior to commencement of the works, including the temporary bridge at Clyde MSF.   | EA/PE/SS       | During construction                      | MCoA C11 and D7     |
| 34.   | If a threat to an animal is evident onsite, the Site Supervisor and/or Project Ecologist would be notified immediately. Works may need to cease if the animal is in danger or harmed until it has been relocated.  | SS/PE          | During construction                      | MCoA C6, C11 and D7 |
| <b>Fish Passage</b>   |  |                |  |                     |
| 35.   | During construction, works in and around waterways would be avoided, where practicable, to allow sufficient flow and fish passage similar to current conditions. Any in-stream works would ensure sufficient flow and fish passage, by minimising sediment disturbance and physical blocking (including large machinery).  | SEA/CM/SS      | During construction                      | REMM B1             |
| 36.   | The A'Becketts Creek and Duck Creek crossings would be designed to: <ul style="list-style-type: none"> <li>● Provide sufficient fish passage in accordance with Sydney Metro Environment and Sustainability Policy and guidelines for fish habitat conservation and management Update 2013 (DPI Fisheries NSW, 2013)</li> <li>● Incorporate suitable scour protection</li> </ul> | SEA/CM/SS/PE   | Pre-construction                         | REMM B2             |

| Item  | Mitigation and Management Measure and Project site requirements   | Responsibility | Timing                                    | Reference       |
|---|---|----------------|---|-----------------|
| SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist |   |                |   |                 |
|   | <ul style="list-style-type: none"> <li>Avoid worsening existing flow velocities downstream from the crossing locations, through implementing Mitigation and Management Measure 35.</li> <li>Incorporate a vegetated riparian zone within the realigned open channel sections, where feasible and reasonable, in the Landscaping or Revegetation Plan (to be prepared by Sydney Metro).</li> </ul> |                |   |                 |
| <b>Groundwater Dependent Ecosystems</b>   |   |                |   |                 |
| 37.   | Additional investigations and assessment would be completed to confirm the potential for impacts to groundwater dependent ecosystems due to groundwater drawdown, and to identify any required mitigation through design. This will be through a revised Groundwater Modelling Report in the Groundwater Management Sub-plan.   | SEA            | During construction and post-construction | REMM B3         |
| <b>Unexpected Species Finds</b>   |   |                |   |                 |
| 38.   | An unexpected discovery procedure for threatened flora and fauna species will be implemented to ensure that if flora or fauna are found, they are removed from the area to be cleared. Refer to Section 7.8 for the procedure.  | SEA/SS/PE      | During construction                       | MCoA C11        |
| <b>No-go Zones</b>  |   |                |   |                 |
| 39.   | Exclusion zones and no-go zones would be implemented in accordance with Section 7.5.<br><br>No-go zones would be obeyed at all times without a Permit to Enter a 'No-go Zone' (GA-FRM-HSE-151). Any damage to no-go zone fencing or signage would be reported to the Site Supervisor or Environmental Advisor immediately.  | EA/SS          | During construction                       | MCoA C6 and C11 |
| <b>Monitoring</b>   |   |                |   |                 |

| Item  | Mitigation and Management Measure and Project site requirements  | Responsibility | Timing                                    | Reference       |
|---|--|----------------|---|-----------------|
| SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist |  |                |   |                 |
| 40.   | Visual monitoring of flora and fauna will occur during environmental inspections. Any flora and fauna issues will be recorded in the Environmental Inspection Report (refer to Attachment 6 of the CEMP).          | EA             | During construction and post-construction | MCoA C6 and C11 |
| <b>Vehicle and Equipment Hygiene</b>  |  |                |   |                 |
| 41.   | Vehicle Plant and Equipment Movement Vehicle hygiene procedures will be implemented in accordance with Section 7.9.1, including washdown and inspection of vehicles and equipment entering the construction sites. | EA/CM/SS       | During construction                       | MCoA C6 and C11 |
| <b>Animal Handling</b>  |  |                |   |                 |
| 42.   | Should fauna be observed on the Project construction site during vegetation clearing activities, the Animal Handling Procedure in 7.7 will be followed.  | CM/SS/EA/PE    | During construction                       | MCoA C6 and C11 |
| <b>Pruning</b>  |  |                |   |                 |
| 43.   | Appropriate tools would be used for pruning of vegetation, including loppers, chainsaws and vehicle mounted saws.  | EA/CM/SS       | During construction                       | MCoA C6 and C11 |

## 7.2 Environmental Control Maps

ECMs have been prepared for each construction site, which outline the location of protection measures, monitoring requirements, environmental obligations and environmentally sensitive areas (refer to Attachment 8 of the CEMP). It is the practical application of the proposed control measures and an important tool to communicate these to all personnel including subcontractors.

Flora and fauna control measures identified on each ECM include:

- Location of No-go Zones and requirements for working within No-go Zones
- Location of Southern Myotis habitat, Mangrove Swamps and waterways
- Weed control procedures
- Vegetation clearing and pruning procedures
- Stockpiling and storage management
- Vehicle, Plant and Equipment Movement hygiene procedures.

## 7.3 Site Specific Mitigation Measures

Table 12 identifies the mitigation and management measures to be implemented to satisfy the CoA, CEMF and REMMs. Further detail of each management measure is provided in Section 7.2 to Section 7.10.

Table 12: Standard mitigation and management measures

| Construction site                 | Mitigation and management measures   |
|-----------------------------------|--|
| Sydney Olympic Park Metro Station | <ul style="list-style-type: none"> <li>• Weed and exotic species control and management</li> <li>• Plant pathogen and disease management</li> <li>• Fauna management protocols</li> </ul>  |
| Clyde MSF                         | <ul style="list-style-type: none"> <li>• Pre-clearing surveys</li> <li>• Vegetation retention zones</li> <li>• No-go zones</li> <li>• Weed and exotic species control and management</li> <li>• Plant pathogen and disease management</li> <li>• Erosion and sediment control</li> <li>• Fauna management protocols</li> </ul> |
| Parramatta Metro Station          | <ul style="list-style-type: none"> <li>• Weed and exotic species control and management</li> <li>• Plant pathogen and disease management</li> <li>• Erosion and sediment control</li> <li>• Fauna management protocols</li> </ul>  |
| Westmead Metro Station            | <ul style="list-style-type: none"> <li>• No-go zones</li> <li>• Weed and exotic species control and management</li> <li>• Plant pathogen and disease management</li> <li>• Erosion and sediment control</li> <li>• Fauna management protocols</li> </ul>   |



## 7.4 Vegetation Clearance

All vegetation clearance procedures and activities will be managed and implemented by the Site Supervisor, the Environment team and the Project Ecologist (as required) during construction phases of the development.

The pre-clearing procedures will be implemented where clearing is required, which is only anticipated at the Clyde MSF construction site. Within the clearing boundary, native vegetation should be retained where possible to meet the requirements of CoA C-B8, D2 and D9. No vegetation clearing is to occur within Vegetation Retention Zones (Section 8.2.1).

Trees that are required to be cleared are to be replaced with species that are locally native, urban-resilient, and are likely to provide native fauna habitat and foraging value. Trees will be replaced at a ratio of 2:1 while also achieving a net increase in overall canopy cover (CoA C-B8 and C-B9). This will be undertaken by another Contractor on behalf of Sydney Metro and is not included as part of the scope covered by this Plan.

Impacts to PCTs will not exceed those identified in the documents listed in MCoA A1, unless otherwise approved by the Planning Secretary. In requesting the Planning Secretary's approval, an assessment of the additional impacts(s) to PCTs and an updated ecosystem and / or species credit requirement under MCoA D4, if required, will be provided.

The following process will be followed to minimise the area of disturbance and the amount of vegetation to be cleared for the development:

- If the vegetation to be cleared is adjacent to vegetation that is not to be disturbed then delineate an exclusion zone around the vegetation that is not to be disturbed using fencing, flags, rope and 'no-go zone' signage. Proceed to the next step
- Check the vegetation that is to be cleared for hollows, rocky areas, or fauna habitat. If hollows, rocky areas, or fauna habitat are present refer to the hollow bearing tree/habitat removal procedure in Section 7.4.3. Proceed to the next step
- If sufficient, prune the minimal amount of branches and foliage instead of clearing it. Proceed to the next step if pruning is not sufficient and the clearing of vegetation needs to occur
- Clear the vegetation and move it to an approved area.

### 7.4.1 Pre-clearing Inspection Procedure

Pre-clearance survey will be carried out and the Pre-Clearing Inspection Checklist (GA-FRM-HSE-149) will be completed, refer to Attachment 4. The Pre-clearing Procedure is focused on identifying areas of ecological risk and the actions or measures to be implemented to minimise the ecological impacts to biodiversity values. Figures showing threatened species polygons and records, and the distribution of threatened ecological communities in the Project construction sites are shown in Section 5 of this FFMP.

The following inspections will be carried out as part of the Pre-Clearing Inspection before any clearing activities have begun:

- Has the vegetation to be cleared been clearly delineated? Are all trees / vegetation to be retained identified and No-Go Areas fenced off? Have any habitat trees been identified and appropriately marked?
- Is there risk of weed infestation or spread?
- Are there hollow-bearing trees or other habitat features such as buildings?

- Were any animals observed? Are any active nests present? If soil disturbance is to occur, have ESCPs been implemented?
- Have all equipment operators been shown limit of clearing, advised of fauna handling procedures, and any other controls?
- What is the physical demarcation of the limit of clearing?
- Are the proposed works covered by an existing Approval?

The results of these surveys will be provided to the construction personnel involved in vegetation clearing, through site inductions, toolbox talks and targeted training. Additionally the need for an ecological inspection to be undertaken within 48 hours of clearing will be identified.

The completion of the Pre-Clearing Inspection will form a Hold Point requiring sign-off from the Environmental Manager.

#### 7.4.2 Permit to Clear Procedure

After a Pre-Clearing Inspection Checklist has been completed, prior to any vegetation clearing, a Permit to Clear (GA-FRM-HSE-150) is to be acquired, refer to Attachment 3. The Permit to Clear procedure is designed to:

- Provide a hold-point to ensure the development is being undertaken in accordance with the approved clearance limits for the development
- Minimise the impact of the development on TECs, flora, fauna and their habitat by reducing impacts to native vegetation from clearing activities.

The following process is to be completed by the Construction Manager (and endorsed by the Environment Manager) to obtain a Permit to Clear:

1. Identify the location that is planned for clearing.
2. Confirm that the clearing activities are within the approved clearance boundaries for development.
3. Confirm if the clearing activities will contribute to the approved clearance limits for the development and that they will not be exceeded. In circumstances where clearing is trending towards its disturbance limit; it is the responsibility of the Environment Manager (or delegate) to provide internal guidance to the Site Supervisor to ensure that limits are not exceeded. If an exceedance does occur, the Site Supervisor will notify the Environmental Manager who will then advise the relevant agencies to determine corrective procedures.
4. Identify if timing constraints for threatened species are applicable when undertaking this work, i.e. are the clearing activities occurring during the critical life cycle events (breeding or nursing times) for the threatened species that were identified or assumed as being present within the Project construction sites (see Section 5.4). If so, the procedures presented in this section, as well as Sections 7.5, 7.6, 7.7 and 7.8 are to be known and implemented by those undertaking clearing activities.
5. Where there are ecological sensitives (for example if habitat features were identified in the Pre-Clearance Inspection Checklist), have the Project Ecologist undertake a site survey within 48 hours to confirm no potential direct impact to fauna. Identify the need to relocate any fauna in accordance with this Plan and identify if the Project Ecologist needs to be onsite during vegetation clearing activities.

Where vegetation is to be cleared, the Environment Manager (or delegate) is responsible for ensuring the following measures are implemented:

- The Permit to Clear procedure described above has been implemented.

- The procedures presented in this section, as well as Sections 7.5, 7.6, 7.7 and 7.8 have been communicated to those undertaking clearing activities and are being implemented.
- Photos, as-built records, and inspection records which documents the above are held for the life of the development's consent.

### 7.4.3 Vegetation Clearing Procedure

Where identified during a pre-clearing ecology survey (undertaken as part of the Permit to Clear procedure above), a qualified ecologist will be on-site during vegetation clearing activities.

#### 7.4.3.1 Habitat trees or Hollow bearing trees

Hollow bearing trees are an important habitat feature for a variety of native animals. Before clearing any hollow bearing or habitat trees, it is important to consider if animals are present. Where practicable, hollow bearing trees should not be removed when breeding is at its peak for threatened species recorded or assumed to be present within the Project construction sites. The following process will be followed to ensure no impacts to fauna occur:

1. Habitat or hollow-bearing trees have been marked with an 'H' and/or flagged with flagging tape (Photograph 1). If tape or paint has been removed it is to be re-applied. Additionally, if other hollow-bearing trees are identified they are to be marked in the same manner.



*Photograph 1 Hollow bearing tree marked for removal*

2. Clear the vegetation that is surrounding the hollow bearing or habitat trees first and leave the hollow bearing or habitat trees to stand for one night. Shake or knock the tree to encourage fauna to leave -this should occur the day before clearing. Proceed to the next step
3. Before removing any hollow bearing or habitat trees, the contractor ecologist is complete a visual inspection for signs of animal movement, or nest occupation, in the vegetation that is about to be cleared. Make sure the spotter can locate all the hollows/habitat within the vegetation that is about to be cleared and that the spotter has direct contact with the plant or chainsaw operator via radio and or visual contact. Proceed to the next step
4. Before clearing the vegetation, use an excavator or front-end loader to nudge the trunk of the tree as high as possible a few times. Wait 30 seconds and then repeat the process. If a chainsaw is being used to clear the vegetation or the tree is being removed in stages, then remove the non-hollow bearing branches first. Proceed to the next step
5. Once all the non-hollow bearing branches have been removed, begin removing the hollow bearing branches one by one. The next hollow bearing branch can only be removed once the spotter has checked the previous hollow bearing branch that was removed for fauna. Proceed to the next step
6. Any animals that escape during the clearing process are to be recorded and records maintained in an internal fauna finds register. If any animals are found and won't leave/are injured during the vegetation clearing process, then the 'Animal Handling Procedure' in Section 7.7 will be used
7. Felled trees are to be rolled so that the number of hollows blocked against the ground is minimised, where possible
8. Felled trees that may hold sheltering fauna are to remain in place at least overnight to allow any remaining fauna to escape. If such a tree is accidentally felled in the wrong direction to which it was planned and subsequently needs to be moved (i.e., blocks a track, road or similar), it can be moved on the day of felling to rectify the issue. In such circumstances, with consideration to safety or accessibility concerns, the tree must only be moved the minimum distance required to rectify the issue
9. All hollow bearing branches and or hollow bearing trees that have been cleared will be relocated to another area for habitat enhancement.

#### 7.4.3.2 Clearing in vicinity of rocky habitat or other features

In addition to hollow bearing trees, other fauna habitat features, such as rocky habitat, have been recorded as being present within the clearing area. The following process will be followed to ensure no impacts to fauna utilising these features occur:

1. Completion of actions recommended from the pre-clearing inspections where practicable, including (but not limited to) actions required to discourage fauna occupation and weed or feral fauna management requirements
2. Consider advice of the contractor ecologists from pre-clearance surveys for most appropriate and effective method of encouraging fauna to vacate the area prior to clearance date
3. If no active usage is identified, there is no further action required prior to clearing works.
4. Complete a visual inspection of the area immediately prior to any clearing works, including specific habitat to be cleared for fauna species and nests that may have become active since pre-clearing inspections
5. Inspect fauna habitat feature (rocky area, termite mounds, and animal den/burrows) after being partially cleared for remaining or injured fauna

6. Any animals that escape during the clearing process are to be recorded and maintained in an internal fauna finds register. If any animals are found and won't leave/ are injured during the vegetation clearing process, then the 'Animal Handling Procedure' in Section 7.7 will be used
7. Cleared rocks, that were identified as habitat, are to be scattered in an area of retained vegetation for habitat enhancement.

#### 7.4.4 Post-clearance Inspection

A Post-Clearance Inspection Checklist (GA-FRM-HSE-152) (refer to Attachment 5) is to be prepared by the Environmental Manager (or delegate) immediately after vegetation clearing works, detailing the type and area of vegetation cleared including, where relevant, confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts. This Checklist would be accompanied by any relevant GIS files.

The following will be carried out after any clearing activities are finished:

- Confirm that all clearing(s) were within vegetation clearing limits
- Check for any impacts on trees that were marked as 'to be retained' due to the clearing works
- Check for any impacts on trees that were identified as habitat trees
- Check that non-habitat trees were removed before habitat trees
- Check for impacts on fauna, nests, fauna features due to the clearing works
- Check whether any animals were shocked, injured, or killed as a result of the clearing works.
- Measure the area cleared, topsoil volumes, and survey the works location
- Ensure that Process: Fauna Management was followed for any faunas impacted by clearing works

A register will be maintained to record the number, and diameter at breast height of removed mature trees and the canopy cover. This will assist Sydney Metro in determining the number of replacement trees and ensure there is a net increase in the number of trees in accordance with CoA C-B8 and C-B9.

#### 7.4.5 Pruning

The use of heavy machinery will be avoided when clearing activities are adjacent to areas to be retained. Appropriate tools to use for pruning are loppers, chainsaws and vehicle mounted saws. In the first instance, hollow bearing limbs will be retained. If this is not possible, the hollow bearing limbs will be inspected by an ecologist/suitably qualified expert and placed in adjacent undisturbed vegetation to provide fauna habitat (inspection will be undertaken in line with the vegetation clearing procedure, refer to Section 7.4.3).

#### 7.4.6 Removal of Vegetation Outside Approved Clearing Boundaries

If construction activities require the removal of any vegetation that is outside of the approved clearing boundaries within the Project construction sites the following process will be followed:

1. The person who is conducting the clearing activity will notify the Environment Manager (or delegate) of the location and the need for the vegetation impact via the Pre-Clearance Inspection Checklist process
2. The Environment Manager (or delegate) will assess whether the vegetation is heritage listed, part of an EEC, a habitat tree, nominated for retention or protected under relevant legislation and is legally able to be removed and/or trimmed, in consultation with the Environmental Manager. Alternatives to removing the vegetation will also be investigated at this stage

3. A consistency assessment may be undertaken with the existing Approvals, depending on the outcome of the assessment in Step 2 above. If considered consistent with the existing approvals, a Consistency Report will be prepared and submitted to Sydney Metro for approval, as required.
4. The Environmental Manager will consult with the relevant stakeholders or authority if the vegetation is suspected to be heritage listed, part of an EEC, a habitat tree, nominated for retention or protected under relevant legislation.

#### 7.4.7 Monitoring the Total Clearing Footprint for the Project

Vegetation clearance will be undertaken in the areas identified within the clearing area in the BDAR prepared for the EIS (Jacobs, 2020) and Modification 2 Report (Biosis, 2021). Table 13 specifies the total amount of clearance that is permitted by the development.

*Table 13: Total amount of clearance permitted by the Project*

| PCT ID | PCT Name   | Corresponding TEC                                       | Clearing limit (ha) |
|--------|--|---|---------------------|
| 849    | Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion | Cumberland Plain Woodland in the Sydney Basin Bioregion | 0.57                |
| 920    | Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion        | -   | 0.15                |

Prior to any clearing, the Construction Manager and the Project Ecologist will liaise with each other to identify and display clearance boundaries for the Project construction sites. Survey teams and GIS databases will be used to inform and record clearing.

The cumulative amount of vegetation cleared will be progressively monitored by the Project Ecologist and Environmental Advisor. Prior to undertaking any clearing, the value to be cleared will be compared to the total approved area to be cleared to ensure that the development does not go past any of the clearing limits specified in Table 13.

#### 7.5 Exclusion Fencing and ‘No-Go Zone’ Procedures

To protect vegetation and fauna habitat that is outside of the approved clearance boundaries for the clearing areas, exclusion fencing and signage will be used to protect all areas containing vegetation and habitat that is not to be cleared which is located within proximity of other works activities associated with this Project.

‘No-go zones’ are any areas of native vegetation outside the designated clearing boundary as indicated on Figure 7 and Figure 8. These areas will be communicated to construction site personnel (including equipment operators) through site inductions, toolbox talks and targeted training prior to works taking place in the vicinity.

In total, two ‘no-go zones’ have been delineated. The ‘no-go zones’ are located at the following Project construction sites:

- Westmead Metro Station
- Clyde MSF.

Where the 'no-go zones' are in immediate proximity to works, they will be marked out by the Environmental Advisor. Typical measures to mark out the development's footprint will include:

- Use of temporary fencing
- Flag tape, para-webbing, or rope.

In the event access into a 'no-go zone' is required, a Permit to Enter 'No-Go Zone' (GA-FRM-HSE-151) will be acquired, refer to Attachment 6. This Permit aims to identify and justify the need to enter, the potential impact as a result and the need for additional consultation or approvals required.

Fencing around tree protection zones will be established for all mature trees to be retained. The Project Arborist will supervise establishment of fencing for trees where the tree protection zone is encroached by more than 10%. Tree protection zones will be established in accordance with Australian Standard 4970 – Protection of trees on development sites.



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- Legend**
- Construction Boundary
  - Tunnel Alignment
  - Railway Line
  - No Go Zone

**FIGURE 7**  
**No Go Zones (WMS)**





- Legend**
- ▭ Clyde Stabling and Maintenance Facility Construction Boundary
  - Tunnel Alignment
  - Railway Line
  - Drainage Line
  - - - No Go Zone

**FIGURE 8**  
**No Go Zones (CSMF)**

## 7.6 Microbat Management Procedure

Microbat management is required at Clyde Maintenance and Stabling Facility in accordance with Condition D7. This microbat management procedure applies within the microbat sensitivity zones, as shown on Figure 9.

An ecological survey of the site will be undertaken prior to any vegetation clearing activities and building demolition to identify trees and structures which could act as potential microbat roosting sites within the microbat sensitivity zone. This ecological survey will be undertaken either independently of or during the preclearing survey.

If there is evidence of microbat roosts identified during these surveys the following microbat management procedures will be carried out prior to the removal of that vegetation, or the demolition of those structures:

1. The Environmental Manager will be notified immediately.
2. Targeted surveys for microbats at potential roost sites will be carried out to identify the species present. Targeted surveys would be carried out in accordance with 'Species Credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018) for Southern Myotis as detailed below. If threatened microbat species are recorded, the Environmental Manager is to be notified and is responsible for notify relevant government agencies of the find.

### Southern myotis *Myotis macropus*

| Site                                  | Potential habitat is <2.5km riparian length. |                 |                                   |
|---------------------------------------|--|-----------------|-----------------------------------|
| Survey method                         | Survey period                                | Total effort    | Min. no. of nights/time searching |
| Harp trap or mist net                 | October–March                                | 16              | 4                                 |
| Roost search (buildings, bridges etc) | October–March                                | 1 per structure | 30 minutes per feature            |
| Acoustic detection                    | October–March                                | 16              | 4                                 |

**Survey methods:** *Harp trap or mist net* placed in areas of potential habitat. For larger water bodies mist nets may be necessary. Traps or nets should be set beside or preferably over pools of water along creeks or rivers, particularly in flat or areas of low relief if present. Traps can be set under bridges or culverts, or overhanging branches. The survey may use only mist nets, or a combination of harp traps and mist nets.

**Roost search:** Any bridges, tunnels, culverts or other structures identified as potential breeding habitat should be searched for bats or signs of bats (guano etc). A torch should be used and attention paid to inspecting cracks or seams in the roof. A handheld bat detector can alert the searcher to ultrasonic calls. If bats or signs of bats are observed, the bats may need to be captured to identify species and breeding status using traps, nets or other methods.

**Potential habitat:** The range of PCTs associated with the species (as per the TBDC) within 200 meters of any medium to large permanent creeks, rivers, lakes or other waterways (i.e. with pools/ stretches 3m or wider) (Anderson et al. 2005).

3. Where microbats are recorded, replacement roosting habitat in the form of microbat specific nest boxes must be installed at a 1:4 ratio prior to demolition and/or vegetation removal. Microbat nest boxes will be installed within the Duck Creek 'no-go zone'.
4. Following installation of nest boxes, staged microbat exclusion and relocation from occupied habitat will be carried out. Stage microbat exclusion and relocation will be carried out by a

suitably qualified ecologist. Once all microbats have flown or have been removed from the roost as confirmed by an ecologist, microbat exclusion measures such as timber, expanding foam, or plastic will be used to prevent re-entry. Microbat exclusion and removal must be carried out from May to September inclusive, outside of known breeding timeframes (October to mid-April).

5. Following microbat exclusion, roost sites can be cleared in accordance with the tree felling and fauna habitat removal procedure detailed in Section 7.4.3.

All handling of live microbats would be carried out by a qualified and vaccinated ecologist experienced in handling microbats. The ecologist must hold an Animal Care and Ethics Committee approval, a National Parks and Wildlife Service scientific licence for handling native flora and fauna and be vaccinated against Lyssavirus. Any microbats captured during nocturnal or diurnal inspections would be housed in small cloth bags and either:

- Relocated into bat boxes on the temporary bridge over Duck Creek (refer to Attachment 7), or
- Housed in a dark, cool, dry, quiet location for nocturnal release on the evening/night following capture.

The ecologist would determine the most appropriate option, giving consideration to the animal's welfare.

Bags containing microbats would be hung in a cool, dry place off the ground, preferably within a wire box for safety. Microbats housed in this way can be taken off site if required. Microbats of the same species would be housed together with no more than five in any one bag. In the event that other species are captured, large bats (head and body 75-95 mm) would not be grouped with smaller bats (head and body <75 mm) as some larger species predate on smaller species. The ecologist would be responsible for releasing any microbats in the evening at the site.

Housed microbats awaiting nocturnal release or relocation into the bat boxes would be placed in a dry and undisturbed place out of the direct sun. Microbats would be kept in a cool, shaded environment (<25°C) and be assessed for heat stress as required. If temperatures exceed 30°C, a cooler location within a local building would be sought.

Any microbats captured at night would be released that night if still dark or held until they could be placed into the bat boxes on the temporary bridge or held for release the following evening. Bats would not be held for longer than 24 hours.

Any microbats captured will be released in the Fauna Relocation Zone (see Section 7.7.3), immediately north of the confluence with Duck Creek and Duck River.



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**Legend**

- Clyde Stabling and Maintenance Facility Construction Boundary
- Tunnel Alignment
- Railway Line
- Drainage Line
- Microbat Sensitivity Zone

**FIGURE 9**

**Microbat Sensitivity Zones**

## 7.7 Animal Handling Procedure

### 7.7.1 General Protocols

The animal handling should be implemented at the following Project construction sites as applicable:

- Westmead Metro Station
- Parramatta Metro Station
- Clyde MSF
- Sydney Olympic Park Metro Station.

Should fauna be observed on the project site during vegetation clearing activities, and there is a risk these activities may harm the animal or pose risk to site personnel, the following steps are to be taken.

- Stop all work in the vicinity of the fauna and immediately notify the Project Ecologist
- If the animal is identified as a threatened species, then refer to the 'Unexpected Threatened Species Finds Procedure' in Section 7.8
- If possible, allow fauna to leave the area without intervention
- If fauna cannot or will not leave the area without intervention, the fauna are to be removed by a suitably qualified ecologist, licensed fauna ecologist or wildlife carer with specific animal handling experience using the following methodology:
  - cover larger animals with a towel or blanket and place it in a cardboard box and/or canvas bag.
  - place smaller animals in a cotton bag, tied at the top
  - keep the animal in a quiet, cool, ventilated and dark location away from noisy construction activities until it can be relocated
  - frogs will be transported in moistened plastic bags (1 frog/bag) with a small amount of leaf litter. The translocation of frogs shall be in accordance with the Hygiene Protocol for the Control of Disease in Frogs
  - if the animal cannot be handled (i.e., venomous reptiles):
    - exclude all personnel from the vicinity with fencing and/or signage
    - record the exact location of the animal/s and provide to the qualified ecologist or appropriate rescue agency (i.e., WIRES).

### 7.7.2 Injured Fauna

Should fauna be injured as part of the Project construction works, the follow steps are to be taken:

- Call the appropriate rescue agency immediately and follow any advice provided by the agency
- Once the rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the rescue agency
- In the event the rescue agency and/or local veterinary service cannot be contacted, the injured animal will be delivered to the relevant agency as soon as practicably possible.

The relevant fauna rescue services and local veterinary surgeries contact details are listed in Table 14.

Table 14: Fauna rescue services' contact details

| Project Construction Site         | Agency/Business   | Contact Number                      |
|-----------------------------------|---|-------------------------------------|
| All                               | Qualified Ecologist / Project Ecologist                     | +614 9949 9711 or<br>+614 2775 3321 |
| All                               | WIRES   | 1300 094 737                        |
| Westmead Metro Station            | Cottage Animal Hospital                                     | (02) 9890 7220                      |
| Parramatta Metro Station          | Cottage Animal Hospital                                     | (02) 9890 7220                      |
| Clyde MSF                         | Merrylands Vet  | (02) 9682 1547                      |
| Sydney Olympic Park Metro Station | Animal Referral Hospital<br>Homebush Veterinary Specialists | (02) 9758 8666                      |

### 7.7.3 Relocation of Fauna

Relocation of fauna from within the Project construction sites is to be carried out where possible by a qualified ecologist or wildlife rescuer and is to be recorded as part of the pre-clearance reporting obligations. If the animal is not injured or stressed, it may be released nearby in an area that is not to be disturbed by the works and in accordance with the following procedures:

- Site identified as a suitable release point by the qualified ecologist or wildlife rescuer
- Release site is to contain similar habitat (the same vegetation community if possible) and occur as close to the original capture location as possible without placing the animal in danger from the continuing constructing works
- If the species is nocturnal, release is to be carried out at dusk
- Release would generally not be carried out during periods of heavy rainfall
- Hollow-dependent species, particularly those with dependent young, shall be released into a temporary nest box.

Where necessary, fauna should be relocated to the closest 'fauna relocation zones' as shown on Figure 10 and Figure 11.

### 7.7.4 Fauna Handling Information

It is important to consider the following when handling fauna:

- Some animals require particular handling (e.g., venomous reptiles, raptors) and should only be handled by a qualified ecologist or wildlife carer with relevant skills and experience (e.g. WIRES representative)
- If handling bats, the handler must be vaccinated against the Australian Bat Lyssavirus (ABL – a form of rabies)
- Any frog handling will be carried out in accordance with the Hygiene Protocol for the Control of Disease in Frogs (DECC, 2008). This protocol recommends onsite hygiene precautions be carried out to minimise the transfer of disease between and within wild frog populations. Measures recommended include:
  - thoroughly cleaning/disinfecting footwear and equipment when moving from one site to another

- where necessary in high-risk areas, spraying/flushing vehicle tyres with a disinfecting solution
- cleaning/disinfecting hands between collecting samples/frogs (preference would be given to using bags, rather than bare hands to handle frogs). Limiting one frog or tadpole to a bag. Bags should not be reused.



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- Legend**
- Construction Boundary
  - Tunnel Alignment
  - Railway Line
  - Drainage Line
  - Fauna Relocation Zones

**FIGURE 10**  
**Fauna Relocation Zones (WMS)**

Image Source: Nearmap (October 2021) Data source: DFSI (2021)



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GDA 1994 MGA Zone 56

- Legend**
- Clyde Stabling and Maintenance Facility Construction Boundary
  - Tunnel Alignment
  - Railway Line
  - Drainage Line
  - Fauna Relocation Zones

FIGURE 11

Fauna Relocation Zones (CSMF)

## 7.8 Unexpected Threatened Species Finds Procedure

The unexpected threatened species finds procedure should be implemented at the following construction sites as required:

- Westmead Metro Station
- Parramatta Metro Station
- Clyde MSF
- Sydney Olympic Park Metro Station.

During the development's construction, operation and decommissioning phases, the 'Unexpected Threatened Species Finds Procedure' will be implemented whenever a threatened species is unexpectedly found within the Project construction site. Any nests found in habitat features to be removed during construction will be inspected by the contractor ecologist prior to clearing to determine whether fauna are using the nest, and whether relocation of the fauna and the nest to an adjacent area is viable. As a general principle, any native animals found within the Project construction site will be avoided. Fauna will only be handled by a qualified ecologist or wildlife carer with relevant skills and experience (e.g. snake handling), and only when necessary. Should threatened fauna, or suspected threatened fauna, be encountered, the procedure outlined below will be followed. If capture is required, the 'Animal Handling Procedure' in Section 7.7 will be used.

1. If native flora or fauna is found, stop work and determine if it is a threatened species
2. If the native flora or fauna that has been found is a threatened species, or it cannot be identified, notify the Environment Manager who will then notify the Project Ecologist of the found threatened species.
3. The Project Ecologist will assess the occupied habitat within the Project construction site, assess the likely impact, and develop management options
4. If the Project Ecologist identifies that an impact is not likely to occur to the threatened species, then recommence works and maintain regular inspections of the area where the threatened species was found. All personnel are to be notified of the threatened species find via toolbox talks. Proceed to the next step if the ecologist identifies that an impact is likely to occur to the threatened species
5. The Environmental Manager will consult with DPE EES as appropriate to determine appropriate mitigation measures. Seek and obtain the necessary approvals to recommence works
6. The Environmental Manager will notify the Department of the unexpected threatened species find
7. Recommence works once advice has been sought and implemented and the necessary approvals have been obtained.
8. Updating of ecological monitoring or off-set requirements may be undertaken, if required.

## 7.9 Weed and Pathogen Control and Management Procedure

Weed and pathogen control and management as detailed within Sections 7.9.1 to 7.9.6 should be implemented at the following construction sites:

- Westmead Metro Station
- Parramatta Metro Station
- Clyde MSF
- Sydney Olympic Park Metro Station.

### 7.9.1 Vehicle Plant and Equipment Movement Vehicle Hygiene Procedure

Vehicle Plant and Equipment Movement Vehicle hygiene procedures will be implemented for any vehicle that enters the Project construction sites during construction which is likely to contact the natural ground or weeds. The procedures include:

- Inspection upon arrival at site access laydown area
- Removal of dirt and/or plant matter from newly arrived vehicles at a designated washdown area by trained site personnel
- Washing and inspection prior to vehicles being given approval to enter the Project construction site
- Inspection and washing after leaving the Project construction site and prior to leaving the site
- Records of Inspections and washdowns will be recorded on a Vehicle Hygiene Register
- Any water from the washdown area will be managed in accordance with the ESCP.

### 7.9.2 Weed and Pathogen Inspection

During construction, the Environmental Advisor will do the following weed and pathogen inspections:

- Survey weed distribution across the Project construction sites monthly
- Survey weed species distribution and density in exclusion zones monthly
- Targeted weed inspections prior to clearing and grubbing in the affected area
- Survey weed distribution and abundance where a previous weed infestation has been identified
- Identification of Myrtle Rust infection or areas of unexplained dieback in retained vegetation
- Established and new infestations of invasive weeds will be mapped with GPS, including noting the species and degree of infestation, and capturing an image for monitoring purposes. Data collected from inspections will be used as a basis for implementing seasonal targeted weed control measures. Advice would be sought from the contractor ecologist or from the WeedWise website (<http://weeds.dpi.nsw.gov.au/>) in relation to treating new weed infestations.

Any occurrences of pathogens such as Myrtle Rust and unexplained dieback would be monitored and reported.

### 7.9.3 Weed Treatment

During all phases of the development weed control will be based on data collected from survey and inspections of the Project construction sites. Targeted weed control measures for any recorded outbreaks of Priority Weeds, WONS, or HTWs will be implemented within a fortnight of discovery. The aims of weed treatment include:

- Apply weed treatments to all mapped weed infestation areas
- Reduction in weed distribution by at least 50% in mapped infestation area
- No increase in the presence of weeds which were occurring prior to the development
- Weeds would be treated in line with advice from the consulting ecologist or WeedWise. The introduction and spread of weeds via vehicles and plant will be controlled by the Vehicle Hygiene Procedure provided in Section 7.9.1.

### 7.9.4 Herbicide Application Record

Herbicide application will only be carried out by authorised personnel that hold an herbicide application credential in accordance with SafeWork requirements. Herbicides will only be applied in accordance with the Safety Data Sheet (SDS) for that product. An Herbicide Application Record will be completed and public notifications made in accordance with relevant legislation, where herbicides are to be used in areas that could be accessed by members of the public. Only herbicides registered for use near water may be used near any waterways.

Herbicides will not be applied:

- When plants are stressed on hot days
- After seed has been set
- Within 24 hrs of rain or when rain is imminent
- During windy conditions when the use of herbicides may affect non-targeted areas.

The Environmental Advisor will ensure that a follow-up inspection is undertaken for identified weed infestation sites to ensure treatment was successful.

### 7.9.5 Weed Disposal

Where Priority Weeds, WONS, and HTWs are disturbed by construction activities, weeds and topsoil that may contain weed propagules will be removed and disposed of appropriately.

Where weeds cannot be effectively destroyed prior to topsoil stripping, weed contaminated topsoil will be isolated and either encapsulated by deep burying, or disposed of at an approved offsite licensed facility as directed by the Site Supervisor.

### 7.9.6 Ongoing Weed Management and Monitoring

Monitoring of weed infestations will occur as part of the routine environmental inspections throughout construction to determine effectiveness of management controls. The presence of any Priority Weeds, WONS, and HTW species and the necessary management actions will be noted on a weed inspection checklist.

## 7.10 Erosion and Sediment Control

Specific erosion and sediment control measures are detailed within the SWMP. These are to be implemented prior to any vegetation clearing.

## 8 REHABILITATION AND RE-VEGETATION

### 8.1 Summary

Table 15 identifies the rehabilitation and revegetation measures to be implemented at each of the Project construction sites. Further detail of each management measure is provided in Section 8.2.1 to Section 8.2.4.

Table 15: Summary of rehabilitation and revegetation measures

| Location                          | Management Type   |
|-----------------------------------|---|
| Sydney Olympic Park Metro Station | N/A   |
| Clyde MSF                         | <ul style="list-style-type: none"> <li>• Weed Management</li> <li>• Vegetation Retention Zones</li> </ul> |
| Parramatta Metro Station          | N/A   |
| Westmead Metro Station            | <ul style="list-style-type: none"> <li>• Weed management</li> <li>• Vegetation Retention Zones</li> </ul> |

### 8.2 Management of Retained Vegetation

#### 8.2.1 Vegetation Retention Zones

The Westmead Metro Station construction site boundary has been reduced to avoid impact to PCT 849 and mature trees. Additional opportunities for the retention and protection of mature trees would be identified during detailed construction planning, including amendments to Project construction site boundaries and location of construction elements. Canopy trimming would be considered where practicable, prior to any tree removal.

Vegetation retention zones (VRZs) protect remnant native vegetation within and adjacent to Project construction sites. In total, two vegetation retention zones have been delineated as shown in Figure 12 and Figure 13. The vegetation retention zones are located at the following Project construction sites:

- Westmead Metro Station
- Clyde MSF

Management actions to be carried out within the vegetation retention zones include:

- Weed management as detailed in Section 8.2.2.
- Revegetation and rehabilitation as detailed in Section 8.2.3.

Existing trees to be retained would be protected prior to the commencement of construction in accordance with Australian Standard AS4970 the Australian Standard for Protection of Trees on Development Sites and Adjoining Properties.

Sydney Metro will provide a net increase in the number of mature trees provided at a ratio of 2:1 within ten years of the date of the Project's MCoA or no later than the commencement of ten year operation of the Project (whichever is earlier).



- Legend
- Construction Boundary
  - Tunnel Alignment
  - Railway Line
  - Vegetation Retention Zone

FIGURE 12  
Vegetation Retention Zones  
(WMS)



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- Legend**
- Clyde Stabling and Maintenance Facility Construction Boundary
  - Vegetation Retention Zone
  - Tunnel Alignment
  - Railway Line
  - Drainage Line

**FIGURE 13**  
**Vegetation Retention Zones (CSMF)**

## 8.2.2 Weed Management

Weed and exotics species management zones (VRZs) will be managed for weed and exotic species by a suitably qualified bush regeneration contractor. In total, two weed and exotic management zones have been delineated as shown in Figure 14 and Figure 15. The weed and exotics management zones are located at the following Project construction sites:

- Westmead Metro Station
- Clyde MSF.

Weed management tasks to be carried out by a bush regeneration contractor are detailed in Table 16.

*Table 16: Management actions - weed and exotic species management zones*

| Action                | Detail   |
|-----------------------|--|
| Priority weed control | Weeds that are listed as 'priority weeds' for Greater Sydney must be removed from the site or controlled depending on the category of weed and according to the provisions of the Biosecurity Act. Priority weed control is to be carried out across the weed and exotic species management zones for the duration of the management works recommended in the FFMP. Works will be undertaken according to industry best practices.   |
| Primary weeding       | Primary weeding is the first round of weeding activity and involves the removal of most of the weed biomass present (shown in Figure A-1). Primary weeding methods include: <ul style="list-style-type: none"> <li>● 'cut-and-paint', 'frill and fill', long stem scrape or target spraying of woody weeds</li> <li>● hand-removal and spot spraying of smaller woody, vine and herbaceous weeds</li> <li>● spot-spraying and hand-weeding of annuals (e.g., Blackberry, Fireweed and Bidens pilosa).</li> <li>● primary weeding will occur prior to construction commencing.</li> </ul> |
| Secondary weeding     | Secondary weeding will involve the targeted removal of priority weed regrowth and hand removal and spot spraying of exotic grasses, herbaceous weeds and seedlings of woody weeds. Secondary weeding will occur approximately one to three months after the completion of primary weeding, depending on the amount of regrowth of herbaceous annuals (and other weeds that have an abundant seed source present in the soil).  |
| Maintenance weeding   | Maintenance weeding will occur after secondary weeding and be ongoing during construction works.   |
| Herbicide application | Herbicide application should follow the procedure detailed in Section 7.9.4 above.   |





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- Legend**
- Construction Boundary
  - Tunnel Alignment
  - Weeds and Exotic Flora Management Zone

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**FIGURE 14**  
**Weeds and Exotic Species Management Zones (WMS)**



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- Legend**
- Clyde Stabling and Maintenance Facility Construction Boundary
  - Tunnel Alignment
  - Railway Line
  - Drainage Line
  - Weeds and Exotic Flora Management Zone

**FIGURE 15**  
**Weeds and Exotic Species Management Zones (CSMF)**

### 8.2.3 Revegetation and Rehabilitation

A Revegetation Management Plan will be prepared and implemented for the renaturalisation of parts of Duck Creek and A'Becketts Creek and rehabilitation of the riparian corridor. Only species that are representative of PCT 920 (Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion) will be used in the revegetation of the riparian zone. Species that are locally native, are urban-resilient, and are likely to provide native fauna habitat and foraging value will be preferred. Sydney Metro is responsible for delivering this Revegetation Management Plan.

All other Landscaping Plans for the Project will be delivered by the Stations Contractor, where opportunities would be investigated with the relevant local council to provide plantings in proximity to the impacted.

There will be no impact to bat nest boxes installed within the areas of Duck Creek and A'Becketts Creek undergoing rehabilitation works, as they will be installed in mature native trees that will not be cleared. These nest boxes will also be marked with locations communicated to the regeneration sub-contractors.

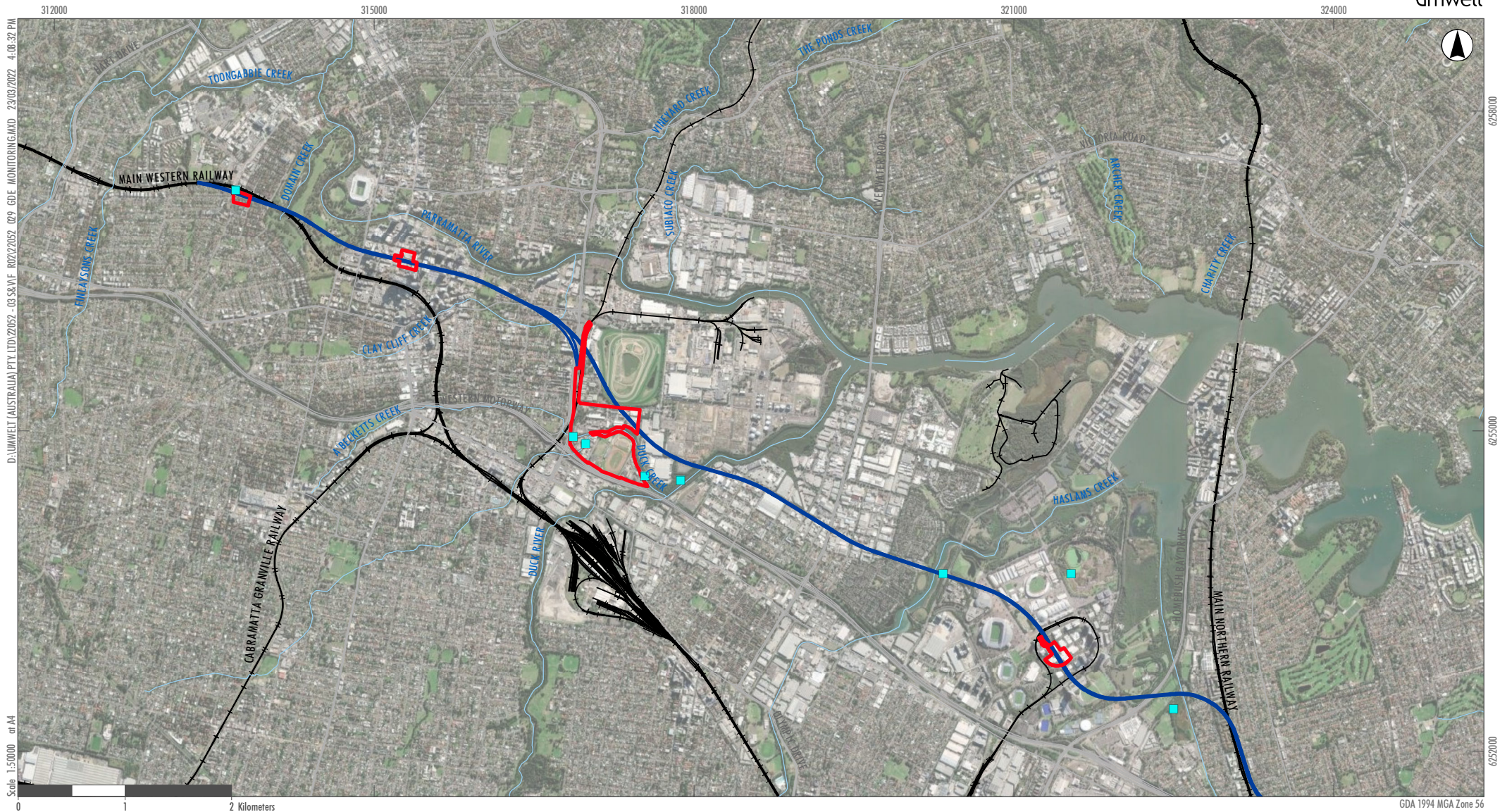
## 9 MONITORING ACTIONS

Two monitoring programs will be required to meet the CEMF, the MCoA and the REMMs (Attachment 1). This includes a GDE monitoring program to identify any impacts on groundwater dependent vegetation caused by the excavation and tunnelling works, and a revegetation monitoring program to track the effectiveness of the revegetation works (described in Section 8).

### 9.1 Groundwater Dependent Ecosystem Monitoring Program

Any persistent changes to groundwater dependent vegetation will be determined through the establishment of eight monitoring plots (Figure 16). The location of three of the monitoring plots correspond to the locations of the BAM vegetation integrity plots determined in the BDAR. The approximate location of all monitoring plots has been determined on the occurrence of GDEs relative to tunnelling or excavation works.

Refer to the Groundwater Monitoring Program for detail regarding GDE monitoring.



- Legend**
- Surface Construction Sites
  - Tunnel Alignment
  - Road
  - Drainage Line
  - Railway Line
  - GDE Monitoring Locations

Image Source: ESRI Basemap (2021) Data source: DSFI (2017); NPWS Estate (2019)

**FIGURE 16**  
**Groundwater Dependent Ecosystem**  
**Monitoring Plot Locations**

# 10 COMPLIANCE MANAGEMENT

## 10.1 Roles and Responsibilities

The GALC Project Team’s organisational structure and overall roles and responsibilities are outlined in Section 7 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 17 of this Plan.

Key roles with regards to the management of flora and fauna are identified in Table 17.

*Table 17: Roles and responsibilities*

| Role                         | Authority and Responsibility  |
|------------------------------|---|
| Environmental Manager        | <ul style="list-style-type: none"> <li>Develop and implement the FFMP</li> <li>Oversee flora and fauna monitoring in accordance with this sub-plan</li> <li>Oversee compliance tracking and reporting</li> <li>Oversee the keeping of all environmental records</li> <li>Release Hold Points</li> <li>Engage suitably qualified consultants to support implementation of this sub-plan</li> <li>In consultation with the Project Director and Construction Director, oversee the investigation and reporting of environmental incidents arising from flora and fauna impacts</li> <li>Regularly engage with the key stakeholders and other interface contractors to achieve environmental alignment.</li> </ul> |
| Project Ecologist            | <ul style="list-style-type: none"> <li>Carry out pre-clearance surveys across the Project construction sites where required</li> <li>Oversee vegetation clearing and fauna habitat removal</li> <li>Release Hold Points where required</li> <li>Microbat management</li> </ul>  |
| Project Arborist             | <ul style="list-style-type: none"> <li>Oversee cutting of roots</li> <li>Ensure Project compliance with ‘AS 4970-2009 Protection of trees on development sites’</li> </ul>  |
| Senior Environmental Advisor | <ul style="list-style-type: none"> <li>Complete inspections and monitoring, particularly of No-Go zones and site clearing limits (refer to Section 7.4.1)</li> <li>Complete reporting (refer to Section 10.3)</li> <li>Prepare ECMs to outline the controls in this sub-plan relevant to each work activity, particularly the identification of No-Go Zones and all site clearing limits</li> <li>Liaise with the ER and / or Sydney Metro regarding site inspections</li> <li>Respond to environmental incidents and non-conformances</li> </ul>   |
| Environmental Advisor        | <ul style="list-style-type: none"> <li>Delivery of toolbox / prestart presentation (or other specific training) to inform work crews of the controls documented in the ECMs</li> <li>Perform regular on-site liaison and inspections</li> <li>Provide environmental advice and assistance to construction personnel</li> </ul>  |

| Role                 | Authority and Responsibility   |
|----------------------|--|
|                      | <ul style="list-style-type: none"> <li>• Manage implementation of FFMP</li> <li>• Respond to environmental incidents and non-conformances</li> </ul>   |
| Construction Manager | <ul style="list-style-type: none"> <li>• Ensures compliance with this FFMP, procedures and ECMs</li> <li>• Work collaboratively with environment teams to ensure the mitigation and management measures in this FFMP are integrated into construction works</li> <li>• Ensure that flora and fauna impacts are always considered in forward planning and scheduling</li> </ul>   |
| Site Supervisor      | <ul style="list-style-type: none"> <li>• Install and maintain environmental controls in accordance with ESCPs and ECMs, including clear delineation of site boundaries and protection of No-Go Zones</li> <li>• Attend inspections with the Environmental Representative, Sydney Metro / ER, or other stakeholders</li> <li>• Implement corrective actions raised during environmental inspections in agreed timeframes</li> <li>• Notify the Environmental Representative any observed impacts on flora and fauna, including weed and pest infestations, clearing outside boundary limits, fish kills, unauthorised discharges, etc.</li> </ul> |
| All personnel        | <ul style="list-style-type: none"> <li>• Notify Site Supervisor of any observed impacts on flora and fauna, including weed and pest infestations, clearing outside boundary limits, fish kills, unauthorised water discharges, etc.</li> </ul>   |

## 10.2 Training

The general project induction will include a component on flora and fauna management to ensure that personnel understand the potential impacts from construction and the proposed mitigation measures.

The site induction training will address elements related to flora and fauna management including:

- Existence and requirements of this FFMP
- Clearing limits
- No-gone zones
- Relevant legislation
- Roles and responsibilities for flora and fauna management

Targeted training in the form of toolbox talks or tailored training sessions will also be provided to personnel with a key role in flora and fauna management. Specific training may include:

- Obligations and specific responsibilities under the Project MCoA including vegetation clearing practices to minimise impacts on species, including threatened species or endangered ecological communities identified as likely to occur on site
- Responsibilities pertaining to the protection of flora and fauna under the BC Act, the EPBC Act and other relevant legislation outlined in Section 4.1 of the FFMP
- Identification and recognition of No-go Zones and measures to avoid impact outside of authorised areas

- Recognition of specific species, such as the Green and Golden Bell Frog and Southern Myotis, which may be affected by the construction works
- Response procedures in the event of an unexpected threatened species find, fauna rescue and handling of fauna and location of nest boxes
- Response procedures for avoidance of weed and pathogen control, particularly the amphibian chytrid fungus affecting the Green and Golden Bell Frog.

Specific training will be provided to personnel likely to work within or in proximity (<50 m) to flora and fauna areas. Where required, toolbox /pre-start talks will also include limits of clearing, clearing procedures, weed identification and control measures and fauna handling protocols.

Further details regarding inductions and training are outlined in Section 9 of the CEMP.

### 10.3 Monitoring, Inspections and Reporting

Monitoring, inspection, and reporting requirements are outlined in Table 18.

Additional requirements and responsibilities in relation to monitoring and inspections are documented in the CEMP.



Table 18: Inspection, monitoring and reporting requirements

| Item                      | Frequency  | Standards   | Reporting  | Responsibility                            |
|---------------------------|--|---|--|---|
| <b>Inspection</b>         |  |   |  |   |
| Pre-clearance survey      | Prior to any clearance of an identified habitat area             | Pre-clearing Survey Procedure   | Pre-clearing survey report                           | Project Ecologist                         |
| Pre-clearance inspection  | Between 24 and 48 hours prior to vegetation clearance            | Pre-clearing Survey Procedure<br>No-go zones in place<br>Erosion and sediment controls in place   | Pre-clearance Inspection Checklist                   | Project Ecologist                         |
| Post-clearance inspection | Post vegetation clearance immediately after vegetation clearance | Post-clearing Survey Procedure  | Post-clearance Inspection Checklist<br>Tree Register | Project Ecologist                         |
| Site inspections          | Weekly inspections   | All flora and fauna management measures in place, maintained and effective, including: <ul style="list-style-type: none"> <li>● Erosion and sediment controls</li> <li>● Clearing limits</li> <li>● Protection of no-go zones</li> <li>● Construction water discharge practices</li> <li>● Chemical and fuel storage and spill response readiness</li> <li>● Concrete disposal and washout facilities.</li> </ul> Monitor health of retained vegetation<br>Revegetation/rehabilitation areas will be monitored during construction for performance and weed invasion during weekly site inspections, and any other inspections or audits undertaken as part of CEMP requirements. The performance of revegetation and presence of weed infestations would be reported as part of the inspection | Environment Inspection Checklist                     | Site Supervisor and Environmental Advisor |

| Item                             | Frequency  | Standards   | Reporting                          | Responsibility                              |
|----------------------------------|--|---|------------------------------------|---|
|                                  |  | process and include actions to be undertaken to manage performance.   |                                    |   |
| Independent site inspections     | As required  | Compliance with the requirements of this Plan and existing Approvals.   | ER Environmental Inspection Report | Environmental Representative / Sydney Metro |
| Visual surveillance              | Daily  | No-go zone fencing and signage in place and undamaged<br>Storage and stockpile areas maintained and being used appropriately<br>Weed and pathogen hygiene controls in place<br>Site speed limits obeyed at all times<br>Any threats to animals or unexpected finds of flora and fauna | Site Supervisor's diary            | Site Supervisor                             |
| Observations by Management       | Monthly  | Compliance with the requirements of this Plan   | Management Inspection Checklist    | Senior Environmental Advisor                |
| Flora and fauna control measures | <ul style="list-style-type: none"> <li>● At least weekly</li> <li>● Daily during periods of rainfall</li> <li>● Immediately before site closure greater than 48 hours</li> <li>● Within 24 hours of the cessation of a rainfall event causing:               <ul style="list-style-type: none"> <li>– runoff to occur on or from the premises prior to any major rainfall event forecasted.</li> </ul> </li> </ul> | Ensure that all flora and fauna control measures, including ERSED and boundary fencing, are installed on the premises are inspected and works undertaken to repair and/or maintain these controls if practicable and safe to do so.   | Environmental Inspection Checklist | Site Supervisor and Environmental Advisor   |

| Item  | Frequency  | Standards  | Reporting   | Responsibility   |
|---|--|--|---|--|
| <b>Monitoring</b>   |  |  |   |  |
| Microbat monitoring   | If required as a result of pre-clearing inspections, as per the Microbat Management Procedures |  | Site Supervisor and Project Ecologist                           |  |
| Groundwater Dependent Ecosystems (GDE) monitoring                         | As per the GDE monitoring program  |  | Site Supervisor, Environmental Advisor and Project Ecologist    |  |
| Weed and pathogen monitoring  | As per the Weed and Pathogen control and management procedure                                  |  | Site Supervisor and Project Ecologist                           |  |
| Attendance of ecologist or fauna spotter/catcher during habitat clearance | As required by Vegetation Disturbance Permit   | Pre-clearance survey procedure<br>Records of fauna capture and release       | Vegetation/<br>habitat<br>clearance<br>records<br>Fauna records | Project Ecologist and Senior Environmental Advisor     |
| Attendance of EA or arborist during excavations in tree protection zone   | Duration of excavation   | Pre-clearance survey procedure   | Vegetation/<br>habitat<br>clearance<br>records                  | Senior Environmental Advisor and Environmental Advisor |
| Rehabilitation monitoring   | Weekly after rehabilitation works commence   | Until area is stabilised   | Environmental Inspection Checklist                              | Site Supervisor and Environmental Advisor              |
| <b>Reporting</b>  |  |  |   |  |
| DPE Compliance Reporting  | Continuous   | Compliance tracking against the MCoA's applicable to flora and fauna aspects | Submission to DPE   | Senior Environmental Advisor                           |

Specific reports prepared in response to flora and fauna monitoring will capture detail including, but not limited, to:

- Within one working day of receiving a complaint, notify Sydney Metro;
- Within 5 working days provide Sydney Metro with a final report regarding the complaint;
- Detail of any corrective actions and confirmation of successful implementation
- Records of compliance with the MCoA, REMMs, CEMF requirements and management measures in this FFMP
- Records of compliance with procedures outlined in this FFMP
- Records of pre-clearing inspections undertaken
- Records of the release of the pre-clearing hold point
- Records of any management measures implemented
- Records of flora and fauna inspections undertaken.

## 10.4 Auditing

Audits (both internal and independent) will be undertaken to assess the effectiveness of environmental controls, compliance with this sub-plan, MCoA and other relevant approvals, licenses, and guidelines. These audits will be undertaken at planned intervals to provide information on whether the Project:

- Is meeting its compliance obligations
- Conforms to this sub-plan
- Determines if this sub-plan is effectively implemented and maintained.

GALC will undertake an internal audit within the first three months from commencement of construction and then annually for the FFMP.

The approach to internal and independent audits, including auditing schedule, is outlined further in Section 11.3 of the CEMP.

## 10.5 Environmental Incidents

Management of environmental incidents is detailed in Section 12.2 of the CEMP.

Examples of incidents as they relate to flora and fauna may typically include:

- Unapproved vegetation clearing
- Damage to threatened fauna habitat
- Spread of weeds and pathogens
- Contamination of waterways
- Unexpected threatened species finds.

## 10.6 Complaints Register

All complaints made by the community and stakeholders will be managed in accordance with the Sydney Metro's requirements, the Overarching Community Communication Strategy, including the Sydney Metro Construction Complaints Management System (CCMS) (2021), as well as relevant MCoAs (B1 – B6).

The CCMS will be implemented before the commencement of any construction works and maintained for the duration of construction. The CCMS will be available for a minimum for 12 months following completion of construction of Project.

The following information will be available to facilitate community enquiries and manage complaints before the commencement of work and for 12 months following the completion of construction:

- a) A 24- hour telephone number for the registration of complaints and enquiries about the Project
- b) A postal address to which written complaints and enquires may be sent
- c) An email address to which electronic complaints and enquiries may be transmitted
- d) A mediation system for complaints unable to be resolved.

This information will be accessible to all in the community regardless of age, ethnicity, disability or literacy level.

An electronic complaints register will be maintained on-site at all times. This register will record information on all complaints received about the Project during construction works and for a minimum of 12 months following the completion of construction. This register will include the following information:

- a) Number of complaints received
- b) Date and time of the complaint
- c) Number of people in the household affected in relation to a complaint, if relevant
- d) Method by which the complaint was made
- e) Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect
- f) Issue of the complaint
- g) Means by which the complaint was addressed and whether resolution was reached, with or without mediation
- h) If no action was taken, the reason(s) why no action was taken.

Community members and stakeholders making a complaint will be advised of the following information before, or as soon as practicable after, providing personal information:

- a) the complaints register may be forwarded to government agencies, including the Department (Department of Planning Industry and Environment, 4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150), to allow them to undertake their regulatory duties
- b) by providing personal information, the complainant authorises GALC to provide that information to government agencies
- c) the supply of personal information by the complainant is voluntary
- d) the complainant has the right to contact government agencies to access personal information held about them and to correct or amend that information (Collection Statement).

The Collection Statement will be included on the GALC or Project website to make prospective complainants aware of their rights under the *Privacy and Personal Information Protection Act 1998*. For any complaints made in person, the complainant will be made aware of the Collection Statement.

In accordance with the overarching CCMS, GALC will submit the complaints register in the online Consultation Manager system. Sydney Metro will provide the Complaints Register to the Planning Secretary upon request, within the timeframe stated in the request.

# 11 REVIEW AND IMPROVEMENT

## 11.1 Continuous Improvement

The Project Management Team will review the status and adequacy of the EMS including the CEMP and Sub-plans. The objective of the review will be to ensure that it meets current Sydney Metro and GALC requirements as well as relevant environmental standards.

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

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 nonconformances 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.

In order to ensure continual improvement and prevent recurring issues, this sub-plan will be reviewed in response to:

- Corrective actions arising from non-conformance, incidents, or audits
- Opportunity for improvement in environmental management performance which may be identified by the project team, ER or Sydney Metro
- Changes to the Gamuda Australia EMS.

Review of this sub-plan will occur annually as a minimum, or as needed in consultation with Sydney Metro and the ER. A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure as outlined in the CEMP.

## 11.2 Document Updates

The processes described above may result in the need to update or revise this sub-plan. This will occur annually as a minimum, or as needed, and may only be approved by the Environmental Manager, or delegate.

Where minor amendments are required to this FFMP, the revised FFMP will be issued to the ER for review and endorsement in accordance with MCoA A30(j).

## 11.3 Distribution

All GALC personnel and contractors will have access to this FFMP via the project document control management system.

The approved FFMP will be published on the GALC website within one week of being approved and be available until the end of the Construction Period.

A copy of the FFMP will be published and maintained on the Project website, in accordance with MCoA B11. The FFMP will be published within one week of its approval or before the commencement of any work to which they relate or before their implementation, as the case may be.

The document is uncontrolled when printed.

## REFERENCES

- Bureau of Meteorology (2017) Atlas of Groundwater Dependent Ecosystems [Online]. Available: <http://www.bom.gov.au/water/groundwater/gde/>
- Botanic Gardens Trust (2008) *Best Practice Management Guidelines for Phytophthora cinnamomi within the Sydney Metropolitan Catchment Management Authority Area*, Royal Botanic Gardens, Sydney.
- Department of Environment and Climate Change (2008) *Hygiene protocol for the control of disease in frogs*, Department of Environment and Climate Change, Sydney.
- Department of Planning, Industry and Environment (DPIE) (2017) Biodiversity Assessment Method.
- Department of Primary Industries (2003) *Policy and Guidelines for Fish Friendly Waterway Crossings*, State of New South Wales through Department of Industry, Sydney.
- Department of Primary Industries (2012) *Guidelines for Watercourse Crossings on Waterfront Land*, State of New South Wales through Department of Industry, Sydney.
- Department of Primary Industries (2018) *New South Wales Weed Control Handbook: A guide to weed control in non-crop, aquatic and bushland situations*, State of New South Wales through Department of Industry, Sydney.
- Department of Primary Industries (2019) Sydney Metro Catchment, retrieved 27 August 2019 from <https://www.dpi.nsw.gov.au/fishing/habitat/your-catchment/sydney-metro>.
- Fairfull, S. and Witheridge, G. (2003) *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings*. NSW Fisheries, Cronulla, 16 pp.
- Jacobs (2020) Sydney Metro West – Stage 1. Technical Paper 10: Biodiversity Development Assessment Report.
- Office of Environment and Heritage (2018) *'Species Credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method*, Office of Environment and Heritage, Sydney.
- Standards Australia Limited (2007) Australian Standard AS4373 Pruning of Amenity Trees, Standards Australia Limited, Sydney.
- Standards Australia Limited (2009) Australian Standard AS4970 Protection of Trees, Standards Australia Limited, Sydney.



# ATTACHMENTS

## Attachment 1 – Compliance Matrix

The MCoA, REMMs, CEMF requirements and EPL requirements that relate to this FFMP are detailed in the following tables.

**Drafting note - the table below will be updated to include the Conditions of Approval for the Modification 2 Report, when available.**

### MCoAs

| ID | Conditions of Approval  | Document Reference                                     |
|----|---|--|
| A2 | Stage 1 of the CSSI must only be carried out in accordance with all procedures, commitments, preventative actions, performance criteria and mitigation measures set out in the documents listed in Condition A1 of this schedule unless otherwise specified in, or required under, this approval.       | CEMP   |
| A6 | Where the conditions 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 Planning Secretary with the document. The evidence must include: |  |
|    | (a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval;   | Section 1.4, Attachment 2 and Section 10.2 of the CEMP |
|    | (b) a log of the dates of engagement or attempted engagement with the identified party and a summary of the issues raised by them;  | Section 1.4, Attachment 2 and Section 10.2 of the CEMP |
|    | (c) documentation of the follow-up with the identified party(s) where feedback has not been provided to confirm that the party(s) has none or has failed to provide feedback after repeated requests;   | Section 1.4, Attachment 2 and Section 10.2 of the CEMP |
|    | (d) outline of the issues raised by the identified party(s) and how they have been addressed; and   | Section 1.4, Attachment 2 and                          |

| ID    | Conditions of Approval  | Document Reference       |
|-------|---|--------------------------|
|       | (e) a description of the outstanding issues raised by the identified party(s) and the reasons why they have not been addressed.   | Section 10.2 of the CEMP |
| C-B2  | (c) renaturalisation of parts of Duck Creek and A'Becketts Creek and rehabilitation of the riparian corridor  | Section 8.2.3            |
| C-B8  | As many mature trees as practicable must be retained. In addition, within ten (10) years of the date of this approval or no later than the commencement of ten year operation of the CSSI (whichever is earlier) there must be a net increase in the number of mature trees provided at a ratio of 2:1.   | Section 8.2              |
| C-B10 | Parts of Duck Creek and A'Becketts Creek that remain open channels at the Clyde Stabling and Maintenance Facility site must be rehabilitated and / or renaturalised before operation of the CSSI commences. Native vegetation typical of the waterways of the Cumberland Plain, including species that are representative of PCT 920 (Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion) must be used in the revegetation of the riparian zone along the open channels to Duck Creek and A'Becketts Creek. This must include a preference for species that are locally native, are urban-resilient, and are likely to provide native fauna habitat and foraging value. Only species that are representative of PCT 920 must be used within the tidal limits of Duck Creek and A'Becketts Creek. | Section 8.2.3            |
| C1    | Construction Environmental Management Plans (CEMPs) and CEMP Sub-plans must be prepared in accordance with the Construction Environmental Management Framework (CEMF) included in the documents listed in Condition A1 of this schedule to detail how the performance outcomes, commitments and mitigation measures specified in the documents listed in Condition A1 of this schedule will be implemented and achieved during construction.  | CEMP and this document   |
| C5    | Of the CEMP Sub-plans required under Condition C1 of this schedule, the following CEMP sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of issues raised by a government agency during consultation must be included in the relevant CEMP Sub-plan, including copies of all correspondence from those government agencies as required by Condition A6 of this schedule. Where a government agency (ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why:  | Attachment 2             |
| C6    | The CEMP sub-plans must state how:  | This document            |

| ID  | Conditions of Approval  | Document Reference                           |
|-----|---|--|
|     | a) the environmental performance outcomes identified in the documents listed in Condition A1 of this schedule will be achieved;   |  |
|     | b) the mitigation measures identified in the documents listed in Condition A1 of this schedule will be implemented;   | This document                                |
|     | c) the relevant conditions of this approval will be complied with; and  | This document                                |
|     | d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.   | Section 6, Section 7 and Section 8, the CEMP |
| C7  | With the exception of any CEMP Sub-plans expressly nominated by the Planning Secretary to be endorsed by the ER, all CEMP Sub-plans must be submitted to the Planning Secretary for approval.   | Section 1.5                                  |
| C8  | The CEMP Sub-plans not requiring the Planning Secretary's approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all relevant undertakings made in the documents listed in Condition A1 of this schedule. Any of these CEMP Sub-plans must be submitted to the ER with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is phased no later than one (1) month before the commencement of that phase.  | Section 1.5                                  |
| C9  | Any of the CEMP Sub-plans to be approved by the Planning Secretary must be submitted to the Planning Secretary with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is phased no later than one (1) month before the commencement of that phase.  | Section 1.5                                  |
| C10 | Construction must not commence until the CEMP and all CEMP Sub-plans have been approved by the Planning Secretary or endorsed by the ER (whichever is applicable), unless otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans, as approved by the Planning Secretary or endorsed by the ER (whichever is applicable), including any minor amendments approved by the ER, must be implemented for the duration of construction. Where construction of Stage 1 of the CSSI is phased, construction of a phase must not commence until the CEMP and CEMP Sub-plans for that phase have been approved by the Planning Secretary or certified by the ER upon nomination by the Planning Secretary (whichever is applicable). | Section 1.5                                  |
| C11 | In addition to the relevant requirements of the CEMP, the Flora and Fauna CEMP Sub-plan must include, but not be limited to:  | Section 7, Section 8 and Section 9           |

| ID | Conditions of Approval  | Document Reference   |
|----|---|--|
|    | <p>a) site specific mitigation measures to manage impacts (including proposed techniques, timing, frequency and responsibility of implementing);</p> <hr/> <p>b) measures to minimise disturbance to habitat associated with Myotis Macropus / Southern Myotis, including demolition inspections by a suitably qualified ecologist of any vegetation to be cleared and any buildings or structures identified as potential roosting habitat for microbats that are to be demolished or refurbished;</p> <hr/> <p>c) measures to minimise and mitigate disturbance to mangrove forests at the Clyde Maintenance and Stabling construction site to the extent necessary; and</p> <hr/> <p>d) details for undertaking and mitigating vegetation clearance through improved environmental outcomes.</p> | <p>Section 7.6</p> <hr/> <p>Section 7.5 and Section 8.2.3</p> <hr/> <p>Section 7.4 and Section 8.2</p> |
| D2 | The clearing of native vegetation must be minimised to the greatest extent practicable with the objective of reducing impacts to threatened ecological communities and threatened species habitat.  | Table 11 and Section 8.2   |
| D3 | Impacts to plant community types must not exceed those identified in the documents listed in Condition A1 of this schedule, unless otherwise approved by the Planning Secretary. In requesting the Planning Secretary's approval, an assessment of the additional impacts(s) to plant community types and an updated ecosystem and / or species credit requirement under Condition D4 below, if required, must be provided.   | Section 7.4  |
| D4 | <p>Before any vegetation clearing or tree removal that must be offset, credits specified in the table below, must be purchased and retired. The retirement of credits must be carried out in accordance with the offset rules of the BC Act.</p> <p>Note: Credits have been calculated using the Biodiversity Assessment Method.</p>  | Section 4.2.1  |
| D5 | The requirement to retire credits in Condition D4 may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the class and number of species credits, as calculated by the Biodiversity Offsets Payment Calculator.   | Section 4.2.1  |
| D6 | The Proponent must submit evidence of the retirement of credits required by Condition D4 to the Planning Secretary for information within one (1) month of receiving evidence of the retirement of credits and / or a certificate confirming payment under Condition D5 before any vegetation clearing or tree removal that must be offset.   | Section 4.2.1  |
| D7 | Before the removal or clearing of any vegetation, or the demolition of structures identified as potential roosting sites for microbats at the Clyde Stabling and Maintenance Facility site commences, pre-clearing / demolition   | Section 7.6 and Section 7.4  |

| ID   | Conditions of Approval  | Document Reference          |
|------|---|-----------------------------|
|      | inspections for the threatened species must be undertaken. The inspections, and any subsequent relocation of fauna and associated management / offset measures, must be undertaken under the guidance of a suitably qualified and experienced ecologist. Survey and relocation methodologies and management / offset measures must be included in the Flora and Fauna CEMP Sub-plan required under Condition C5 (refer to Conditions of Approval) or the relevant Site Establishment Management Plan required by Condition A17 (refer to Conditions of Approval). |                             |
| D8   | In the event roosting sites have been identified under Condition D7, bat boxes must be provided, or suitable habitat built within the Clyde Stabling and Maintenance Facility site.   | Section 7.6                 |
| D9   | As many mature trees and as much urban canopy as practicable must be retained during construction. Canopy trimming should be considered where practicable prior to any mature tree removal.   | Section 7.1 and Section 8.2 |
| D120 | Drainage feature crossings (permanent and temporary watercourse crossings and stream diversions) and drainage swales and depressions must be carried out in accordance with relevant guidelines and designed by a suitably qualified and experienced person.  | The SWMP                    |

**REMMs**

| ID | Revised Environmental Mitigation Measure   | Document Reference |
|----|--|--------------------|
| B1 | During construction, sufficient flow and fish passage would be maintained similar to current conditions during in-stream works where feasible and reasonable   | Section 7.1        |
| B2 | The A'Becketts Creek and Duck Creek crossings would be designed to:  | Section 7.1        |
|    | a) Provide sufficient fish passage in accordance with Policy and guidelines for fish habitat conservation and management Update 2013 (DPI Fisheries NSW, 2013) |                    |
|    | b) Incorporate suitable scour protection   | Section 7.1        |
|    | c) Avoid worsening existing flow velocities downstream from the crossing locations   | Section 7.1        |
|    | d) Incorporate a vegetated riparian zone within the realigned open channel sections where feasible and reasonable.   | Section 7.1        |

| ID   | Revised Environmental Mitigation Measure  | Document Reference |
|------|---|--------------------|
| B3   | Additional investigations and assessment would be completed to confirm the potential for impacts to groundwater dependent ecosystems due to groundwater drawdown, and to identify any required mitigation through design.               | Section 7.1        |
| LV11 | Opportunities for the retention and protection of existing street trees and trees within the site would be identified during detailed construction planning.  | Section 8.2.1      |
| LV12 | Existing trees to be retained would be protected prior to the commencement of construction in accordance with Australian Standard AS4970 the Australian Standard for Protection of Trees on Development Sites and Adjoining Properties. | Section 8.2.1      |
| LV13 | Trees removed by Stage 1 would be replaced to achieve no net loss to tree numbers and/or canopy in proximity to the site as a minimum in the long term (and part of future stages of Metro West).                                       | Section 8.2.1      |
| LV14 | Opportunities would be investigated with the relevant local council to provide plantings in proximity to the impacted areas prior to construction commencing where feasible and reasonable  | Section 8.2.3      |

### **CEMF Requirements**

| Clause | Requirement  | Document Reference |
|--------|--|--------------------|
| 3.4(d) | (iii) For each plan under the CEMP include a matrix of the relevant Conditions of Approval or Consent referencing where each requirement is addressed; | Attachment 1       |
|        | (iv) For each plan under the CEMP, set objectives and targets, and identify measurable key performance indicators in relation to these;                | Section 3          |
| 10.1a  | The following flora and fauna management objectives will apply to construction:  |                    |
|        | (i) Minimise impacts on flora and fauna;   | This FFMP          |
|        | (ii) Design waterway modifications and crossings to incorporate best practice principles;  | Table 11, the SWMP |
|        | (iii) Retain and enhance existing flora and fauna habitat wherever possible; and   | Section 8.2.1      |
|        | (iv) Appropriately manage the spread of weeds and plant pathogens.   | Section 8.2        |

| Clause | Requirement   | Document Reference                 |
|--------|---|------------------------------------|
| 10.2a  | Principal Contractors will develop and implement a Flora and Fauna Management Plan which will include as a minimum:   |                                    |
|        | (i) The ecological mitigation measures as detailed in the environmental approval documentation  | Section 7, Section 8, Attachment 1 |
|        | (ii) The responsibilities of key project personnel with respect to the implementation of the plan   | Section 10.1                       |
|        | (iii) Procedures for the clearing of vegetation and the relocation of flora and fauna   | Section 7.4                        |
|        | (iv) Details on the locations, monitoring program and use of nest boxes by fauna  | Section 7.6 and 10.3               |
|        | (v) Procedures for the demarcation and protection of retained vegetation, including all vegetation outside and adjacent to the construction sites   | Section 8.2                        |
|        | (vi) Plans for impacted and adjoining areas showing vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities have been recorded   | Sections 5.2, 5.3 and 5.4.         |
|        | (vii) Vegetation management plan(s) for sites where native vegetation is proposed to be retained  | Section 8.2.1                      |
|        | (viii) Identification of measures to reduce disturbance to sensitive fauna  | Sections 7.6, 7.7 and 7.8          |
|        | (ix) Rehabilitation details, including identification of flora species and sources, and measures for the management and maintenance of rehabilitated areas (including duration of the implementation of such measures)  | Section 8.2.3                      |
|        | (x) Weed management measures focusing on early identification of invasive weeds and effective management controls   | Section 7.9                        |
|        | (xi) A procedure for dealing with unexpected Endangered Ecological Community (EEC) threatened species identified during construction, including cessation of work and notification of the Department, determination of appropriate mitigation measures in consultation with the DPIE EES (including relevant relocation measures) and updating of ecological monitoring or off-set requirements | Section 7.8                        |
|        | (xii) Details on the methodology for vegetation mapping and survey  | Section 7.4.1                      |
|        | (xiii) Ecological monitoring requirements   | Sections 7.4.7, Section 9 and 10.3 |
|        | (xiv) Compliance record generation and management   | Section 10                         |

| Clause | Requirement  | Document Reference |
|--------|--|--------------------|
| 10.2b  | Principal Contractors would undertake the following ecological monitoring as a minimum:  |                    |
|        | (i) A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor’s Environmental Manager (or delegate). The pre-clearing inspection will include, as a minimum: <ul style="list-style-type: none"> <li>● Identification of hollow bearing trees or other habitat features</li> <li>● Identification of any threatened flora and fauna</li> <li>● A check on the physical demarcation of the limit of clearing</li> <li>● An approved erosion and sediment control plan for the worksite</li> <li>● The completion of any other pre-clearing requirements required by any project approvals, permits or licences.</li> </ul> | Section 7.4.1      |
|        | (ii) The completion of the pre-clearing inspection will form a HOLD POINT requiring sign-off from the Contractor’s Environmental Manager (or delegate) and a qualified ecologist;  | Section 7.4.1      |
|        | (iii) A post clearance report, including any relevant Geographical Information System (GIS) files, will be produced that validates the type and area of vegetation cleared including confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts.   | Section 7.4.4      |
| 10.2c  | The Principal Contractor’s regular inspections will include a check on the ecological mitigation measures and project boundary fencing.  | Section 10.3       |
| 10.2d  | The following compliance records would be kept by the Principal Contractor:  |                    |
|        | (i) Records of pre-clearing inspections undertaken;  | Section 10.3       |
|        | (ii) Records of the release of the pre-clearing hold point;  | Section 10.3       |
|        | (iii) Records of ecological inspections undertaken.  | Section 10.3       |

### Environment Protection Licence

The Project construction activities are designated as ‘**Railway activities—railway infrastructure construction**’ under Schedule 1 of the POEO Act. Scheduled activities under clause 48 of the POEO Act, require an Environmental Protection Licence (EPL) for the premise at which a scheduled activity is carried on. The EPL typically regulates the emissions of potentially offensive odours and dust.



The FFMP will address the following EPL requirements (**placeholder**):

| ID | EPL Condition | Document Reference |
|----|---------------|--------------------|
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ISSUE DATE: 18/05/2022  
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## Attachment 2 – Stakeholder Consultation

### Engagement Log

| Stakeholder                | Date of Engagement/ Attempted Engagement   |
|----------------------------|--|
| DPI Fisheries              | <ul style="list-style-type: none"> <li>Sydney Metro sent DPI Fisheries an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document</li> <li>DPI Fisheries provided comments on 13/04/2022</li> </ul>   |
| DPE EES                    | <ul style="list-style-type: none"> <li>Sydney Metro sent DPE EES an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document</li> <li>DPE EES contacted Sydney Metro on 05/05/2022 stating that they could not provide comments on the FFMP within the 21-day consultation period</li> </ul> |
| SOPA                       | <ul style="list-style-type: none"> <li>Sydney Metro sent SOPA an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document</li> <li>SOPA provided comments on 27/04/2022</li> </ul>   |
| City of Parramatta Council | <ul style="list-style-type: none"> <li>Sydney Metro sent the City of Parramatta an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document</li> <li>The City of Parramatta Council provided comments on 09/05/2022</li> </ul>   |
| Cumberland City Council    | <ul style="list-style-type: none"> <li>Sydney Metro sent the Cumberland City Council an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document</li> <li>The Cumberland City Council did not provide comments within the 21-day consultation period</li> </ul>                              |

### Comments Register

| Stakeholder   | Comment Raised  | GALC Response | Where Addressed |
|---------------|---|---------------|-----------------|
| DPI Fisheries | Section 4.1 lists the appropriate guidelines and specifications to support DPI Fisheries best practise requirements and these have been | Noted.        | Section 4.1     |

| Stakeholder                | Comment Raised  | GALC Response   | Where Addressed |
|----------------------------|---|---|-----------------|
|                            | carried into adequate mitigation and management measures.   |   |                 |
|                            | Section 5.1.7 notes that additional areas of native vegetation are to be impacted and will be subject of SSI-10038-Mod-2. DPI requests to be notified if PCT920 (Mangroves) are to be additionally impacted. PCT920 was incorrectly offset under the Biodiversity Conservation Act (2016) and any additional impacts need to be offset under the Fisheries Management Act (1994).   | Noted.<br>SSI-10038-Mod-2 will not be impacting on additional areas of PCT 920 (Biosis 2021) therefore notification is not required.  | N/A             |
| City of Parramatta Council | Section 5.1.7 mentions that “ <i>the Modification 2 report for the Clyde MSF (SSI-10038-Mod-2) has identified additional areas of native vegetation to be impacted by Project works. This will be included in this sub-plan once approved.</i> ” Will this additional native vegetation loss trigger the requirement to retire additional Biodiversity Offset Credits under the <i>Biodiversity Conservation Act 2016</i> ?   | The Biodiversity Development Assessment Report prepared for Modification 2 states that there are no additional offsetting requirements based on the impacts to Plant Community Types. There are however, additional offsetting requirements based on the impacts of up to 27 individuals and 0.14 hectares of Downy Wattle habitat equating to 1 credit (Biosis 2021) | N/A             |
|                            | Section 7.4.5 states: “If this is not possible the hollow bearing limbs will be inspected by an ecologist/suitably qualified expert and placed in adjacent undisturbed vegetation to provide fauna habitat.”. Does this imply that the ecologist is expected to access the tree/hollow-bearing branch? If so, a qualified arborist (having relevant climbing experience) would be more suitable to undertake this work where the hollow-bearing branch cannot be inspected from the ground. | Removal of hollow-bearing limbs will be undertaken in line with the vegetation clearing procedure (refer to Section 7.4.3).<br>In the event that a threatened species is identified in a hollow, the Project Ecologist will determine the next steps to be undertaken, which may include engaging an arborist.  | Section 7.4.3   |

| Stakeholder | Comment Raised  | GALC Response   | Where Addressed                    |
|-------------|---|---|------------------------------------|
|             | <p>Section 7.5 states: “Tree protection zones will be established around mature trees to be retained. Tree protection zones should be established in accordance with Australian Standard 4970 – Protection of trees on development sites.” It is unclear what qualifies as a ‘mature’ tree. Tree protection fencing should be installed around trees that are to be retained and where construction works are within or nearby the trees’ Tree Protection Zones (as per AS 4970 – 2009. This Tree Protection fencing should be installed under Project Arborist supervision.</p>  | <p>‘Mature tree’ has been defined in Section 7.1 as a tree with a diameter at breast height (DBH) of 15cm or where a suitably qualified arborist or ecologist determines a specific species to be mature at a smaller DBH.</p> <p>Text has been added to Section 7.5 to clarify that tree protection fencing would be undertaken with supervision from the Project Arborist for circumstances where the Tree Protection Zones is encroached by more than 10%.</p> | <p>Section 7.1 and Section 7.5</p> |
|             | <p>Point 23 in Table 11 states: “The Project Ecologist will be present onsite when excavation works are within the critical root zone of native vegetation to confirm if an arborist is required.” An ecologist is not qualified to make this determination. I suggest the project arborist is supervising any excavation that encroaches into the Tree Protection Zone by more than 10% (i.e. representing ‘major’ encroachment’ as per AS 4970 - 2009). I also note that ‘critical root zone’ is not a term used in AS 4970 – 2009, i.e. it is unclear what this term refers to. The two relevant terms used are Tree Protection Zone (TPZ) and Structural Root Zone (SRZ).</p> | <p>The ‘critical root zone’ has been revised to ‘tree protection zone’ throughout the document.</p> <p>Point 23 has been revised to state that the Project Arborist will be present when excavation requires encroachment of more than 10% of the tree protection zone.</p>   | <p>Section 7.1</p>                 |
|             | <p>Point 24 in Table 11 – reference should be made that the cutting of roots should be undertaken by the Project Arborist or supervised by the Project Arborist.</p>  | <p>Point 24 has been revised to state that the Project Arborist will be responsible for undertaking the cutting of roots, or overseeing the cutting of roots when appropriate.</p>  | <p>Section 7.1</p>                 |

| Stakeholder | Comment Raised   | GALC Response   | Where Addressed |
|-------------|--|---|-----------------|
|             | Point 27, 28 and 29 of Table 11 and section 8 should include a requirement to widen the vegetated riparian zones (VRZ) in accordance with NSW Department of Industry <i>Guidelines for controlled activities on waterfront land - Riparian Corridors</i> (2018). Being a minimum VRZ of 20m for Duck Creek and minimum VRZ of 10m for A'Becketts Creek, so to provide an adequate buffer zone between the proposed stabling and maintenance facility and waterways. In addition, a Vegetation Management Plan rather than a Landscape Plan should be required to guide the renaturalisation and rehabilitation of the two riparian corridors to meet condition C-B2 and C-B10. | The impact has been defined for the Project and outlined in the Minister's Conditions of Approval. Refer to MCoA C-B8, which outlines the requirement for retaining as many mature trees as possible.<br><br>Renaturalisation and rehabilitation of Duck Creek and A'Becketts Creek is out of scope for the Project and currently Sydney Metro's responsibility. Implementation of a Vegetation Management Plan will be considered if the scope is revised. | Section 8       |
|             | The F&F Management Plan should be updated to incorporate the requirement of engaging a Project Arborist to ensure tree protection measures/viable tree retention will be implemented in line with AS 4970 – 2009.  | The Project Arborist has been included in Section 10.1, which outlines their role and responsibilities.<br><br>The Project Arborist will be engaged for any activities that may impact mature trees to be retained.   | Section 10.1    |
|             | The conditions appear to be silent in terms of what tree species are to be used to offset the lost trees (at a ratio the 2:1). The F&F management plan should specify that these offset trees will be locally native species.  | Text has been added to Section 7.4 to clarify that trees to be replaced will be species that are locally native, are urban-resilient, and are likely to provide native fauna habitat and foraging value.<br><br>Please note that this is out of scope for the Project.  | Section 7.4     |
| SOPA        | Trees from original Abattoir works and Olympic era street trees. 7.4 Vegetation Clearance – pre clearing procedures (when a nominated SOPA   | Re will be no trees removed as part of this project scope at Sydney Olympic Park  | N/A             |

| Stakeholder | Comment Raised  | GALC Response  | Where Addressed |
|-------------|---|--|-----------------|
|             | representative would attend). Table 11: Environmental Mitigation & Management Measures also highlights awareness of ‘avoiding canopy tree clearing’. SOPA strongly recommends the retention and protection the 500sqm group of Abattoir era urban canopy trees/Olympic street trees adjoining the site.   |  |                 |
|             | The submitted document appears incomplete with many of the figures and attachments missing. In particular, SOPA would like to see the figure showing the location of where monitoring of groundwater dependent ecosystems will occur.   | This comment appears to be referring to a technical error when viewing the document. All figures and attachments are included in the FFMP.   | N/A             |
|             | Monitoring of work being proposed within the habitats of Sydney Olympic Park should be detailed.  | Details of groundwater and groundwater dependant ecosystems monitoring is included within the Groundwater Monitoring Program.  | Section 9.1     |
|             | The key ecological issue of relevance to SOPA is the impact of groundwater and stormwater discharges to aquatic ecology and the document provides no information on this, instead referring to a separate stormwater sub-plan. There is a risk posed to breeding Green and Golden Bell Frogs in the Northern Water Feature and thus both groundwater and stormwater should be discharged to a creek system rather than to a freshwater wetland. | The Soil and Water Management Sub-plan, Groundwater Monitoring Program and Surface Water Quality Monitoring Program has been prepared for the Project and provided to SOPA for review.<br><br>No groundwater or stormwater will be discharged into a freshwater wetland at Sydney Olympic Park. If the discharge points at Sydney Olympic Park changes as construction planning progresses, SOPA will be consulted to determine the best approach to minimising risk to Green and Golden Bell Frogs. | N/A             |

**Comments Register – Outstanding Issues**

| Stakeholder | Comment Raised | GALC Response | Proposed Action |
|-------------|----------------|---------------|-----------------|
|             |                | N/A           |                 |

**Meeting Minutes**



## Document Transmittal

|                        |   |
|------------------------|---|
| <b>Transmittal No:</b> | SMWSTWTP-GLO-TX-000090  |
| <b>Contract No:</b>    | WTP - 00013/13065 - Western Tunnelling Works Design and Construction Deed |
| <b>Sub Contract:</b>   | WTP   |
| <b>Date:</b>           | 14 April 2022, 07:58 AM   |

| Issued | Name  |
|--------|---|
| By     | Liem Ngo (Gamuda Laing O'Rourke Consortium) |

| Issued | Name   |
|--------|--|
| To     | Andrew Hendy (Sydney Metro) ; Alicia Hatton (Sydney Metro) ; Kate Brooks (Sydney Metro)  |
| Cc     | Hayley Young (Gamuda Laing O'Rourke Consortium) ; Steph Mfsud (Gamuda Laing O'Rourke Consortium) ; Andy Thompson (Gamuda Laing O'Rourke Consortium) ; Huw Griffiths (Gamuda Laing O'Rourke Consortium) ; Tom Olorenshaw (Gamuda Laing O'Rourke Consortium) |

|                         |  |
|-------------------------|--|
| <b>Reason for Issue</b> | Issued for Information                                   |
| <b>Subject</b>          | <b>Cumberland Council Meeting Minutes - 7 April 2022</b> |

Dear all

Please find attached for your information, minutes for the meeting with Cumberland City Council on 7 April 2022.

Regards

Liem Ngo

Stakeholder and Community Engagement Manager  
 Sydney Metro West – Western Tunnelling Package  
 Gamuda Australia Laing O'Rourke Consortium

[Click here to download all Transmittal files.](#)

| Item | Document No                                    | Title  | Rev  | Sts | Type | Design Lots | Alt Doc No |
|------|--|--|------|-----|------|-------------|------------|
| 1    | <a href="#">SMWSTWTP-GLO-WMD-CY-MIN-000001</a> | Meeting Minutes - Cumberland City Council - 7 April 2022 - Project introduction and environmental management plans | A.01 | S2  | MIN  |             |            |

# MEETING MINUTES

## Meeting details

|                      |   |  |
|----------------------|---|--|
| <b>Meeting title</b> | Briefing for Cumberland City Council - Sydney Metro West Western Tunnelling Package Project and Environmental Management Plan consultation introduction |  |
| <b>Date   Time</b>   | 7 April 2022, 15:30-16:15   |  |
| <b>Location</b>      | MS Teams (online)   |  |
| <b>Attendees</b>     | Gamuda Australia Laing O'Rourke (GLC):  | Simon Hussey, Andy Thompson, Hayley Young, Huw Griffiths, Tom Olorenshaw, Liem Ngo, Stephanie Mifsud |
|                      | Sydney Metro (SM)   | Andrew Hendy, Kate Brooks, Nikita Cullum   |
|                      | Cumberland City Council (CCC)   | Daniel Cavallo, Shona Porter, Daniel Anderson  |

## Item Information

1 Introductions and welcome

**Introductions of meeting participants were conducted**

## 2 Western Tunnelling Package & CEMP Consultation

2.1 **Andy Thompson delivered a presentation to provide an overview of the Sydney Metro West Western Tunnelling Package (WTP) including:**

- Introduction about Gamuda Australia and Laing O'Rourke
- Introducing the project team and key providers
- A construction overview, including project staging

2.2 **Tom Olorenshaw provided an overview of key construction, which will include:**

- HV trenching to bring in power supply for plant equipment will commence mid-2022 and will last 3-5 months
- Local area works to facilitate deliveries. Changes to kerbs, traffic lights and installation of pedestrian fencing to improve road safety are currently still in design. CCC will be consulted on proposed designs.
- Excavation works will start in 2023 and continue into 2024. This includes for the excavation of the station box, stub tunnels and cross over cavern. An acoustic shed will be built to mitigate noise from excavation.
- Tunnel Boring Machine (TBM) removal will from Westmead site will take approximately 6-8 weeks.

**Andy Thompson noted that Sydney Metro by changing the TBM launch site from Westmead to Rosehill, has substantially reduced the impact on Westmead due to the tunnel segments no longer needing to be delivered regularly to the Westmead site.**

2.3 **Liem Ngo provided an overview of potential stakeholder impacts, mitigation and engagement**

2.4 **Stephanie Mifsud presented the WTP Project's environmental approvals framework, including:**

- The environmental approvals process, including the Construction Environmental Management Plans.
- WTP Environmental Management plans framework and their interconnectedness with a range of WTP



| Item | Information   |
|------|---|
|      | <p>procedures and strategies</p> <ul style="list-style-type: none"><li>• CEMP relationship with the WTP project's environmental management systems</li><li>• Inviting feedback on the various tranches of the CEMP, with the first tranches to submitted shortly to SOPA and other key stakeholders for consultation, with a 4-week consultation process proposed, involving:</li><li>• Step 1. 2-weeks for written feedback, Step 2 - in week 3, a comment review workshop for subject matter experts to address CCC feedback, Step 3 - in week 4, CEMPS to be amended to address comments discussed in the workshop</li></ul> |

|          |   |
|----------|---|
| <b>3</b> | <b>Questions and Answers (CCC questions, GLC or SM answers)</b> |
|----------|---|

**Q. What is the depth of the tunnels?**

A. Station box is between 30 and 37m from surface, stub tunnels are 25 metres from surface and the crown of the cross cavern tunnel is 15m from the surface.

**Q. Does tunnel depth limit basement depth for future developments?**

A. (GLC) Potentially. There will be restrictions on depth from operating rail lines which may impact future developments.

Action: GLC, via Sydney Metro/TfNSW will provide CCC with depth restrictions for future development.

**Q. With respect to the environmental management plans, is GLC seeking technical advice or fact-checking?**

A. Both. If the Council has feedback on technical issues GLC welcomes those issues being raised at this early stage so it can be discussed. GLC suggests that any feedback clearly identify the particular sections of a plan and clearly states the outcome CCC wants.

Action: Sydney Metro, when sending plans to CCC for review and feedback should address to Daniel Cavallo and copied to his EA, Sarah Hussein, to coordinate input from CCC.

|  |                       |
|--|-----------------------|
|  | <b>Meeting finish</b> |
|--|-----------------------|

|          |                     |
|----------|---------------------|
| <b>4</b> | <b>Next meeting</b> |
|----------|---------------------|

Date: Consultation workshop date to be determined

Time: TBD

Location: TBD



West

## Document Transmittal

|                        |                                  |
|------------------------|----------------------------------|
| <b>Transmittal No:</b> | SMWSTWTP-GLO-TX-000072           |
| <b>Contract No:</b>    | WTP - Western Tunnelling Package |
| <b>Sub Contract:</b>   | WTP                              |
| <b>Date:</b>           | 07 April 2022, 09:47 AM          |

| Issued | Name                                |
|--------|-------------------------------------|
| By     | Liem Ngo (Gamuda Laing O'Rourke JV) |

| Issued | Name  |
|--------|---|
| To     | Alicia Hatton (Sydney Metro) ; Andrew Hendy (Sydney Metro) ; Nick Nathans (Sydney Metro) ; Kate Brooks (Sydney Metro) |
| Cc     | Hayley Young (Gamuda Laing O'Rourke JV) ; Steph Mfsud (Gamuda Laing O'Rourke JV)                                      |

|                         |  |
|-------------------------|--|
| <b>Reason for Issue</b> | Issued for Information   |
| <b>Subject</b>          | <b>SOPA Project &amp; CEMP briefing - Meeting Minutes - 1 April 2022</b> |

Dear all

Please find attached for your information, meeting minutes for the 1 April 2022 meeting with SOPA.

Regards  
Liem Ngo

[Click here to download all Transmittal files.](#)

| Item | Document No                                   | Title   | Rev | Sts | Type | Design Lots | Alt Doc No |
|------|---|---|-----|-----|------|-------------|------------|
| 1    | <a href="#">SMWSTWTP-GLO-QLP-SK-MN-000001</a> | SOPA Project & CEMP briefing - Meeting Minutes - 1 April 2022 | -01 | S2  | MIN  |             |            |

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Attachment(s):

# MEETING MINUTES

| Meeting details                        |  |  |  |                   |  |                                      |   |
|--|--|--|--|-------------------|--|--------------------------------------|---|
| <b>Meeting title</b>                   | Briefing for SOPA - Sydney Metro West Western Tunnelling Package Project and Environmental Management Plan consultation introduction   |  |  |                   |  |                                      |   |
| <b>Date   Time</b>                     | 1 April 2022   |  |  |                   |  |                                      |   |
| <b>Location</b>                        | MS Teams (online)  |  |  |                   |  |                                      |   |
| <b>Attendees</b>                       | <table border="0"> <tr> <td>Gamuda Australia Laing O'Rourke (GLC):</td> <td>Simon Hussey, Andy Thompson, Hayley Young, Huw Griffiths, Liem Ngo, Stephanie Mifsud</td> </tr> <tr> <td>Sydney Metro (SM)</td> <td>Nick Nathan (Facilitator/Chair), Andrew Hendy, Alicia Hatton, Sarah Lepre, Nikkita Cullum, Ian Subramanian</td> </tr> <tr> <td>Sydney Olympic Park Authority (SOPA)</td> <td>Sally Hamilton, John Ferguson, Vivienne Albin, Julie Currey</td> </tr> </table> | Gamuda Australia Laing O'Rourke (GLC): | Simon Hussey, Andy Thompson, Hayley Young, Huw Griffiths, Liem Ngo, Stephanie Mifsud | Sydney Metro (SM) | Nick Nathan (Facilitator/Chair), Andrew Hendy, Alicia Hatton, Sarah Lepre, Nikkita Cullum, Ian Subramanian | Sydney Olympic Park Authority (SOPA) | Sally Hamilton, John Ferguson, Vivienne Albin, Julie Currey |
| Gamuda Australia Laing O'Rourke (GLC): | Simon Hussey, Andy Thompson, Hayley Young, Huw Griffiths, Liem Ngo, Stephanie Mifsud   |  |  |                   |  |                                      |   |
| Sydney Metro (SM)                      | Nick Nathan (Facilitator/Chair), Andrew Hendy, Alicia Hatton, Sarah Lepre, Nikkita Cullum, Ian Subramanian   |  |  |                   |  |                                      |   |
| Sydney Olympic Park Authority (SOPA)   | Sally Hamilton, John Ferguson, Vivienne Albin, Julie Currey  |  |  |                   |  |                                      |   |

| Item | Information               |
|------|---------------------------|
| 1    | Introductions and welcome |

## **Introductions of meeting participants were conducted**

Nick Nathan (SM) provided an overview of the Sydney Metro West Project, including the three tunnelling packages and of the Stage 3 EIS currently open for public consultation.

Alicia Hutton (SM) introduced the GLC team, including Andy Thompson (GLC) to provide details about the Western Tunnelling Package (WTP)

|          |   |
|----------|---|
| <b>2</b> | <b>Western Tunnelling Package &amp; CEMP Consultation</b> |
|----------|---|

### **2.1 Andy Thompson delivered a presentation to provide an overview of the Sydney Metro West Western Tunnelling Package (WTP) including:**

- Introduction about Gamuda Australia and Laing O'Rourke
- Introducing the project team and key providers
- A construction overview, including project staging
- Explanation of the combined Sydney Metro West construction site, including the WTP and the Central Tunnelling Package (CTP) sections
- The stages for the TBM retrieval and nozzle construction, site demobilisation and handover to CTP contractor

### **2.2 Liem Ngo provided an overview of potential stakeholder impacts, mitigation and engagement**

### **2.3 Stephanie Mifsud presented the WTP Project's environmental approvals framework, including:**

- The environmental approvals process, including the Construction Environmental Management Plans.
- WTP Environmental Management plans framework and their interconnectedness with a range of WTP procedures and strategies
- CEMP relationship with the WTP project's environmental management systems
- Inviting feedback on the various tranches of the CEMP, with the first tranches to submitted shortly to



| Item | Information |
|------|-------------|
|------|-------------|

SOPA and other key stakeholders for consultation, with a 4-week consultation process proposed, involving:

- Step 1. 2-weeks for written feedback, Step 2 - in week 3, a comment review workshop for subject matter experts to address SOPA feedback, Step 3 - in week 4, CEMPS to be amended to address comments discussed in the workshop

|          |  |
|----------|--|
| <b>3</b> | <b>Questions and Answers (SOPA questions, GLC or SM answers)</b> |
|----------|--|

**Q. Will the WTP project tunnel under Haslams Creek?**

A. Yes

**Q. Is a site auditor involved and will a meeting be setup with SOPA?**

A. (GLC) Yes, Kylie Lloyd has been appointed the WTP site auditor and a meeting can be set up. It was noted that CTP will have a separate site auditor.

Action: GLC to set up meeting between the site auditor and SOPA.

**Q. Will the issues raised by SOPA during the CEMP consultation be addressed and closed out?**

A. (GLC) Yes. The workshop is designed to have the subject matter experts present to address SOPA's feedback and ensure any necessary changes to the CEMPs to reflect the discussions.

**Q. When will more detailed stakeholder engagement occur?**

A. (GLC) Since GLC is not planning to take possession of the site until December 2023 or early 2024. More detailed stakeholder engagement is likely to commence in first half of 2023. Although it was noted that both parties welcome dialogue on any issues that may emerge in the meantime.

**Q. How will the CEMPs be transmitted for consultation**

A. (GLC) GLC will submit to Andrew Hendy at Sydney Metro who will then distribute to respective stakeholder and interface managers to send to SOPA and other key stakeholders for consultation.

**Q. Is there an unexpected finds protocol?**

A. (GLC) Yes, there is.

**Q. Can the feedback given to CTP be shared with the WTP team?**

A. (SM) Feedback from consultation on CTP plans should be included within the respective plans which are now publicly available. Andrew Hendy will provide links to the GLC Environment and Planning team.

**Q. How with Sydney Metro coordinate WTP and CTP activities?**

A. (SM) Nick Nathan will coordinate CTP and WTP teams for SOP interface, via joint SOPA meetings or meet separately with each contract teams, as required.

|  |                       |
|--|-----------------------|
|  | <b>Meeting finish</b> |
|--|-----------------------|

|           |                     |
|-----------|---------------------|
| <b>10</b> | <b>Next meeting</b> |
|-----------|---------------------|

Date: Consultation workshop date to be determined (late April/early May)

Time: TBD

Location: TBD

**Meeting Summary****Total Number of Participants**

20

**Meeting Title**

SMW Introduction and CEMP Sub-Plans Briefing

**Meeting Start Time**

3/24/2022, 3:59:12 PM

**Meeting End Time**

3/24/2022, 4:46:41 PM

**Meeting Id**

18d00fea-6311-4935-8a5d-d89b04fb3722

| <b>Full Name</b>    | <b>Join Time</b>      | <b>Leave Time</b>     | <b>Duration</b> |
|---------------------|-----------------------|-----------------------|-----------------|
| Tania Page          | 3/24/2022, 3:59:12 PM | 3/24/2022, 4:46:41 PM | 47m 29s         |
| Andy Thompson (GAB) | 3/24/2022, 3:59:20 PM | 3/24/2022, 4:46:37 PM | 47m 17s         |
| Sarah Lepre         | 3/24/2022, 3:59:51 PM | 3/24/2022, 4:46:35 PM | 46m 44s         |
| Andrea Giusa        | 3/24/2022, 3:59:55 PM | 3/24/2022, 4:46:41 PM | 46m 45s         |
| Ngo, Liem           | 3/24/2022, 4:00:04 PM | 3/24/2022, 4:46:37 PM | 46m 33s         |
| Steph Mifsud (GAB)  | 3/24/2022, 4:00:09 PM | 3/24/2022, 4:46:37 PM | 46m 28s         |
| Griffiths, Huw      | 3/24/2022, 4:00:25 PM | 3/24/2022, 4:46:38 PM | 46m 13s         |
| Andrew Hendy        | 3/24/2022, 4:00:26 PM | 3/24/2022, 4:46:38 PM | 46m 11s         |
| Bishwanand Mishra   | 3/24/2022, 4:00:30 PM | 3/24/2022, 4:46:36 PM | 46m 6s          |
| Nikkita Cullum      | 3/24/2022, 4:00:32 PM | 3/24/2022, 4:46:36 PM | 46m 4s          |
| Jim Tsom            | 3/24/2022, 4:00:34 PM | 3/24/2022, 4:46:39 PM | 46m 4s          |
| Hayley Young (GAB)  | 3/24/2022, 4:01:17 PM | 3/24/2022, 4:46:36 PM | 45m 19s         |
| Pino Todarello      | 3/24/2022, 4:01:22 PM | 3/24/2022, 4:46:35 PM | 45m 12s         |
| Phillip Kelly       | 3/24/2022, 4:01:35 PM | 3/24/2022, 4:46:36 PM | 45m             |
| Ian Subramaniam     | 3/24/2022, 4:01:35 PM | 3/24/2022, 4:46:35 PM | 45m             |
| Simon Hussey (GAB)  | 3/24/2022, 4:01:55 PM | 3/24/2022, 4:46:36 PM | 44m 41s         |
| Adrian Mihaila      | 3/24/2022, 4:03:52 PM | 3/24/2022, 4:46:36 PM | 42m 44s         |
| Stuart Pike         | 3/24/2022, 4:04:52 PM | 3/24/2022, 4:46:36 PM | 41m 43s         |
| Matthew Marrinan    | 3/24/2022, 4:05:05 PM | 3/24/2022, 4:46:36 PM | 41m 30s         |
| Sasi Kumar          | 3/24/2022, 4:06:28 PM | 3/24/2022, 4:46:36 PM | 40m 8s          |

**Email**

Tania.Page2@transport.nsw.gov.au  
andy.thompson@gamuda.com.au  
Sarah.Lepre@transport.nsw.gov.au  
agiusa@cityofparramatta.nsw.gov.au  
LNgo@laingorourke.com.au  
steph.mifsud@gamuda.com.au  
HuwGriffiths@Laingorourke.com.au  
Andrew.Hendy@transport.nsw.gov.au  
BMishra@cityofparramatta.nsw.gov.au  
Nikkita.Cullum@transport.nsw.gov.au  
JTsom@cityofparramatta.nsw.gov.au  
hayley.young@gamuda.com.au  
PTodarello@cityofparramatta.nsw.gov.au  
Phillip.Kelly2@transport.nsw.gov.au  
Ian.Subramaniam@transport.nsw.gov.au  
simonhussey@gamuda.com.au  
AMihaila@cityofparramatta.nsw.gov.au  
SPike@cityofparramatta.nsw.gov.au  
Matthew.Marrinan@transport.nsw.gov.au  
SKumar@cityofparramatta.nsw.gov.au

**Role**

SM, Snr Project Manager Interfaces West  
GALC, Surface Works Construction Manager  
SM, Project Officer Environment  
CoPC, Heritage Advisor  
GALC, Stakeholder & Engagement Manager  
GALC, Environmental Manager  
GALC,  
SM, Manager Environment  
CoPC, Senior Catchment Referral Engineer  
SM, Graduate  
CoPC, Supervisor Catchment Management  
GALC, Environment & Sustainability Lead  
CoPC, Supervisor Open Space & Natural Resources  
SM, Stakeholder & Engagement Manager  
SM, Project Manager Interfaces West  
GALC, Deputy Project Director  
CoPC, Health & Building Services Manager  
CoPC, Team Leader Environmental Health Compliance  
SM, Snr Manager Environment  
CoPC, Development Manager Sydney Metro



**Copies of Correspondence**



8 April 2022

Attn Ms Shona Porter  
Executive Manager City Strategy  
Cumberland City Council  
PO Box 42  
MERRYLANDS NSW 2160

Dear Shona,

**Sydney Metro SSI 10038 – Western Tunnelling Package – Gamuda Australia and Laing O’Rourke Consortium – Construction Flora and Fauna Management Sub-plan; Construction Noise and Vibration Management Plan; Construction Noise and Vibration Monitoring Program**

The Western Tunnelling Package (WTP) Package was recently awarded to Gamuda Australia and Laing O’Rourke Consortium (GALC). These works form part of the Sydney Metro West – Concept and Stage 1 (major civil construction between Westmead and The Bays) planning approval.

An introductory presentation was arranged by Sydney Metro and provided by GALC on 7 April 2022.

The planning approval requires the preparation of environmental management plans prior to construction commencing. Please find attached the WTP Construction Flora and Fauna Management Sub-plan; Construction Noise and Vibration Management Sub-plan; and, Construction Noise and Vibration Monitoring Program, issued to the Cumberland City Council for consultation.

Accompanying this letter is the following documents:

- WTP Flora and Fauna Management Sub-plan
- WTP Noise and Vibration Management Sub-plan
- WTP Noise and Vibration Monitoring Program

We are commencing a 3-week consultation process with you as of 8 April 2022 with this submission. During this period, we will hold a comment workshop in the third week (towards end of week commencing 25 April 2022). Your attendance is not mandatory, but highly advised to ensure you get the most out of the opportunity.

As the comment workshop is intended to respond to your comments, we would also like to receive comments prior to the workshop, preferably by 22 April 2022. Please provide any comments via comments register or in Teambinder.

The consultation process will conclude on the date of the final workshop.

---

**Sydney Metro**

Level 43, 680 George Street, Sydney NSW 2000 | PO Box K659, Haymarket NSW 1240  
T 02 8265 9400 | [sydneymetro.info](http://sydneymetro.info) | ABN 12 354 063 515

Should you have any questions or comments on the attached, please do not hesitate to contact Matthew Marrinan, Senior Manager Environment on [Matthew.Marrinan@transport.nsw.gov.au](mailto:Matthew.Marrinan@transport.nsw.gov.au) or 0475 966 938.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'B. Armstrong', with a stylized flourish extending to the right.

**Ben Armstrong**  
Associate Director Environment

Sydney Metro



8 April 2022

Attn Mr Sasi Kumar  
Development Project Manager – Sydney Metro West  
City of Parramatta Council  
PO Box 32  
PARRAMATTA NSW 2124

Dear Sasi,

**Sydney Metro SSI 10038 – Western Tunnelling Package – Gamuda Australia and Laing O’Rourke Consortium – Construction Flora and Fauna Management Sub-plan; Construction Noise and Vibration Management Plan; Construction Noise and Vibration Monitoring Program**

The Western Tunnelling Package (WTP) Package was recently awarded to Gamuda Australia and Laing O’Rourke Consortium (GALC). These works form part of the Sydney Metro West – Concept and Stage 1 (major civil construction between Westmead and The Bays) planning approval.

An introductory presentation was arranged by Sydney Metro and provided by GALC on 24 March 2022.

The planning approval requires the preparation of environmental management plans prior to construction commencing. Please find attached the WTP Construction Flora and Fauna Management Sub-plan; Construction Noise and Vibration Management Sub-plan; and, Construction Noise and Vibration Monitoring Program, issued to the Parramatta City Council for consultation.

Accompanying this letter is the following documents:

- WTP Flora and Fauna Management Sub-plan
- WTP Noise and Vibration Management Sub-plan
- WTP Noise and Vibration Monitoring Program

We are commencing a 3-week consultation process with you as of 8 April 2022 with this submission. During this period, we will hold a comment workshop in the third week (towards end of week commencing 25 April 2022). Your attendance is not mandatory, but highly advised to ensure you get the most out of the opportunity.

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The consultation process will conclude on the date of the final workshop.

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Yours sincerely

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**Ben Armstrong**  
Associate Director Environment

Sydney Metro



8 April 2022

Attn: Sally Hamilton  
Director, Environment and Planning  
Sydney Olympic Park Authority  
Locked Bag 3  
SYDNEY OLYMPIC PARK NSW 2127

Dear Sally,

**Sydney Metro SSI 10038 – Western Tunnelling Package – Gamuda Australia and Laing O’Rourke Consortium – Construction Flora and Fauna Management Sub-plan; Construction Noise and Vibration Management Plan; Construction Noise and Vibration Monitoring Program**

The Western Tunnelling Package (WTP) Package was recently awarded to Gamuda Australia and Laing O’Rourke Consortium (GALC). These works form part of the Sydney Metro West – Concept and Stage 1 (major civil construction between Westmead and The Bays) planning approval.

An introductory presentation was arranged by Sydney Metro and provided by GALC on 1 April 2022.

The planning approval requires the preparation of environmental management plans prior to construction commencing. Please find attached the WTP Construction Flora and Fauna Management Sub-plan; Construction Noise and Vibration Management Sub-plan; and, Construction Noise and Vibration Monitoring Program, issued to the Sydney Olympic Park Authority (SOPA) for consultation.

Accompanying this letter is the following documents:

- WTP Flora and Fauna Management Sub-plan
- WTP Noise and Vibration Management Sub-plan
- WTP Noise and Vibration Monitoring Program

We are commencing a 3-week consultation process with you as of 8 April 2022 with this submission. During this period, we will hold a comment workshop in the third week (towards end of week commencing 25 April 2022). Your attendance is not mandatory, but highly advised to ensure you get the most out of the opportunity.

As the comment workshop is intended to respond to your comments, we would also like to receive comments prior to the workshop, preferably by 22 April 2022. Please provide any comments via comments register or in Teambinder.

The consultation process will conclude on the date of the final workshop.

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Yours sincerely

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**Ben Armstrong**  
Associate Director Environment

Sydney Metro



8 April 2022

Attn Susan Harrison  
Senior Team Leader Planning  
NSW Department of Planning, Industry and Environment  
Environment, Energy and Science Group  
Locked Bag 5022  
PARRAMATTA NSW 2124

Dear Susan,

**Sydney Metro SSI 10038 – Western Tunnelling Package – Gamuda Australia and Laing O’Rourke Consortium – Construction Flora and Fauna Management Sub-plan**

The Western Tunnelling Package (WTP) Package was recently awarded to Gamuda Australia and Laing O’Rourke Consortium (GALC). These works form part of the Sydney Metro West – Concept and Stage 1 (major civil construction between Westmead and The Bays) planning approval.

The planning approval requires the preparation of environmental management plans prior to construction commencing. Please find attached the WTP Construction Flora and Fauna Management Sub-plan, prepared by GALC issued and to the Department of Planning and Environment – Environment, Energy and Science for consultation in accordance with CSSI 10038 Condition of Approval C5.

Accompanying this letter is the following document:

- WTP Flora and Fauna Management Sub-plan

We are commencing a 3-week consultation process with you as of 8 April 2022 with this submission. During this period we can hold an initial briefing session Monday, Tuesday or Wednesday of next week (week commencing 11 April 2022) at a time suitable to you. We will also hold a comment workshop in the third week (towards end of week commencing 25 April 2022). Your attendance is not mandatory, but highly advised to ensure you get the most out of the opportunity.

As the comment workshop is intended to respond to your comments, we would also like to receive comments prior to the workshop, preferably by 22 April 2022. Please provide any comments via comments register or in Teambinder.

The consultation process will conclude on the date of the final workshop.

Should you have any questions or comments on the attached, please do not hesitate to contact Matthew Marrinan, Senior Manager Environment on [Matthew.Marrinan@transport.nsw.gov.au](mailto:Matthew.Marrinan@transport.nsw.gov.au) or 0475 966 938.

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Yours sincerely

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**Ben Armstrong**  
Associate Director Environment

Sydney Metro



8 April 2022

Attn Ms Josi Hollywood  
Fisheries Manager – Coastal Systems Unit  
NSW Department of Primary Industries – Fisheries  
Locked Bag 1  
NELSON BAY NSW 2315

Dear Josi,

**Sydney Metro SSI 10038 – Western Tunnelling Package – Gamuda Australia and Laing O’Rourke Consortium – Construction Flora and Fauna Management Sub-plan**

The Western Tunnelling Package (WTP) Package was recently awarded to Gamuda Australia and Laing O’Rourke Consortium (GALC). These works form part of the Sydney Metro West – Concept and Stage 1 (major civil construction between Westmead and The Bays) planning approval.

The planning approval requires the preparation of environmental management plans prior to construction commencing. Please find attached the WTP Construction Flora and Fauna Management Sub-plan, prepared by GALC issued and to the Department of Primary Industries – Fisheries for consultation in accordance with CSSI 10038 Condition of Approval C5.

Accompanying this letter is the following document:

- WTP Flora and Fauna Management Sub-plan

We are commencing a 3-week consultation process with you as of 8 April 2022 with this submission. During this period we can hold an initial briefing session Monday, Tuesday or Wednesday of next week (week commencing 11 April 2022) at a time suitable to you. We will also hold a comment workshop in the third week (towards end of week commencing 25 April 2022). Your attendance is not mandatory, but highly advised to ensure you get the most out of the opportunity.

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Yours sincerely

A handwritten signature in blue ink, appearing to read 'B. Armstrong', with a stylized flourish at the end.

**Ben Armstrong**  
Associate Director Environment

Sydney Metro

# Attachment 3 – Permit to Clear Form

**PART 01: Request Details**

|   |                              |                                   |                  |
|---|------------------------------|-----------------------------------|------------------|
| <b>Project / Site:</b>                                  |                              | <b>Date:</b>                      |                  |
| <b>Permit Holder:</b>                                   |                              | <b>Position:</b>                  |                  |
| <b>Purpose of Ground Disturbance:</b>                   |                              |                                   |                  |
| <b>Total Disturbance Area (ha):</b>                     |                              | <b>Start date of disturbance:</b> |                  |
| <b>Estimated Topsoil Depth (mm):</b>                    |                              | <b>End date of disturbance:</b>   |                  |
| <b>Estimated Topsoil Volume (m<sup>3</sup>):</b>        |                              | <b>Machinery to be used:</b>      |                  |
| <b>Map (attached):</b>                                  | <input type="checkbox"/> Yes | <input type="checkbox"/> No       | <b>Comments:</b> |
| <b>Completed Risk Work Pack:</b>                        | <input type="checkbox"/> Yes | <input type="checkbox"/> No       | <b>Comments:</b> |
| <b>GPS Coordinators of Area Planned to be Disturbed</b> |                              |                                   |                  |

Once the above is completed please forward to Environmental Representative/Advisor for processing.

|  |                           |
|--|---------------------------|
| <b>Permit No.:</b>   |                           |
| <b>Received by Environmental Advisor / Representative:</b> |                           |
| <b>Submitted to Client for Approval:</b>                   |                           |
| <b>Followed Up:</b>  | <b>Approval Received:</b> |

**PART 02: Permit Conditions** (To be completed by the area supervisor responsible for the works)

| Condition  | Date | Initial | Comments |
|--|------|---------|----------|
| 2.0 No clearing to be undertaken until this Permit to Clear is completed, approved and all permit conditions understood and in place.  |      |         |          |
| 2.1 Disturbance area delineated with flagging tape or appropriate barrier and/or fencing.  |      |         |          |
| 2.2 Pre-Clearing Inspection Checklist completed  |      |         |          |
| 2.3 Exclusion areas identified and boundaries marked and clearly visible.  |      |         |          |
| 2.4 Appropriate Cultural Heritage permit/s are in place where applicable (check with Client)   |      |         |          |
| 2.5 Where required, ground engaging equipment confirmed as weed free.  |      |         |          |
| 2.6 Operators working in the area have been shown the clearing limits by Area Supervisor.<br>Personnel undertaking works are appropriately trained and aware of environmental risks. |      |         |          |
| 2.7 Large, woody vegetation to be stockpiled separately in approved location or used for erosion and sediment control or fauna habitat.  |      |         |          |
| 2.8 Disturbance area inspected for fauna and habitat trees and relocated, where applicable.  |      |         |          |
| 2.9 Topsoil to be removed to a ____mm depth  |      |         |          |

|      |   |  |  |  |
|------|---|--|--|--|
|      | Subsoil to be removed to a ____mm depth   |  |  |  |
| 2.10 | Topsoil to be stockpiled in approved areas.<br>Subsoil to be stockpiled separately in approved areas. |  |  |  |
| 2.11 | Topsoil and subsoil stockpiles are to be less than 2m high.   |  |  |  |
| 2.12 | Topsoil stockpiles to be signposted and mapped.   |  |  |  |
| 2.13 | Area to be surveyed post disturbance to ensure no unauthorised disturbance.                           |  |  |  |
| 2.14 | Post Clearing Inspection Checklist to be completed at completion of clearing.                         |  |  |  |
| 2.15 | <Insert other conditions as required>   |  |  |  |

**PART 03: Sign Off**

**Site Environment Representative OR Project Manager Sign Off**

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

**Client Representative Sign Off (if needed)**

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

**Area Supervisor Sign Off**

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

**Equipment operators involved in clearing have been advised of land disturbance permit conditions and understand requirements / clearing boundary.**

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

|              |  |                   |  |              |  |
|--------------|--|-------------------|--|--------------|--|
| <b>Name:</b> |  | <b>Signature:</b> |  | <b>Date:</b> |  |
|--------------|--|-------------------|--|--------------|--|

## Attachment 4 - Pre-Clearing Inspection Checklist

## Pre-Clearing Inspection Checklist

|  |                          |                                 |                          |                           |
|--|--------------------------|---------------------------------|--------------------------|---------------------------|
| <b>Project</b>   |                          | <b>Project No.</b>              |                          |                           |
| <b>Requested by</b>  |                          | <b>Lease/Lot No.</b>            |                          |                           |
| <b>Planned Clearing Start Date</b>   |                          | <b>Expected Completion Date</b> |                          |                           |
| <b>Vegetation Clearing Locations – Attach Drawings / Sketches / Maps (as applicable)</b>                                     |                          |                                 |                          |                           |
| <b>GPS Coordinates</b>   | <b>Location</b>          | <b>Comments</b>                 |                          |                           |
|  |                          |                                 |                          |                           |
|  |                          |                                 |                          |                           |
| <b>Item</b>  | <b>Yes</b>               | <b>No</b>                       | <b>N/A</b>               | <b>Comments</b>           |
| Has the vegetation to be cleared been clearly delineated?  | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| Are all trees / vegetation to be retained identified and No-Go Areas fenced off? <b><u>State how in Comments.</u></b>        | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| Have any habitat trees been identified and appropriately marked? <b><u>State how in Comments.</u></b>                        | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| Is there risk of weed infestation or spread?   | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| Were any animals observed? (if Yes, relocation required)   | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| Are any active nests present? (if Yes, relocation required)  | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| If soil disturbance is to occur, have ERSED controls been installed?   | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| Have all equipment operators been shown limit of clearing, advised of fauna handling procedures, and any other SHE controls? | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| Are the proposed works covered by an existing Approval?  | <input type="checkbox"/> | <input type="checkbox"/>        | <input type="checkbox"/> |                           |
| <b>If yes, note permit number:</b>   |                          | <b>Expiry Date:</b>             |                          | <b>And attach a copy.</b> |
| <b>Comments</b>  |                          |                                 |                          |                           |
|  |                          |                                 |                          |                           |
| <b>Inspection Completed by:</b><br>Signature/Role  |                          |                                 | <b>Date:</b>             |                           |
| <b>Approval by Site Environment Rep:</b><br>Signature/Role   |                          |                                 | <b>Date:</b>             |                           |



# Attachment 5 – Post-Clearing Inspection Checklist

## Post-Clearing Inspection Checklist

|   |                          |                          |                          |                        |  |
|---|--------------------------|--------------------------|--------------------------|------------------------|--|
| <b>Project</b>  |                          |                          |                          | <b>Project No.</b>     |  |
| <b>Completed by</b>   |                          |                          |                          |                        |  |
| <b>Vegetation Clearing Start Date</b>   |                          |                          |                          | <b>Completion Date</b> |  |
| <b>Vegetation Clearing Locations – Attach Drawings / Sketches/ Maps if necessary</b>  |                          |                          |                          |                        |  |
|   | <b>GPS Coordinates</b>   | <b>Location</b>          |                          | <b>Comments</b>        |  |
|   |                          |                          |                          |                        |  |
|   |                          |                          |                          |                        |  |
|   |                          |                          |                          |                        |  |
| <b>Item</b>   | <b>Yes</b>               | <b>No</b>                | <b>N/A</b>               | <b>Comments</b>        |  |
| Was all clearing conducted within the vegetation clearing limits?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                        |  |
| Were any trees marked as 'to be retained' impacted by the works?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                        |  |
| Were any habitat trees impacted by the clearing works?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                        |  |
| Were non-habitat trees removed before habitat trees?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                        |  |
| Were any fauna, nests, or other fauna features impacted by the clearing works?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                        |  |
| Were any animals shocked, injured, or killed because of the clearing works? If <b>Yes</b> , <u><b>detail actions in Comments.</b></u> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                        |  |
| Where applicable, have topsoil volumes and stockpile locations been surveyed and recorded?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                        |  |
| <b>Comments</b>   |                          |                          |                          |                        |  |
|   |                          |                          |                          |                        |  |
| <b>Inspection Completed by:</b><br>Signature/Role   |                          |                          | <b>Date:</b>             |                        |  |
| <b>Approval by Site Environment Rep:</b><br>Signature/Role  |                          |                          | <b>Date:</b>             |                        |  |

## Attachment 6 - Permit to Enter A 'No-Go' Zone

**Permit to Enter 'No-Go' Zones to be submitted to Environment Manager 2 days prior to entry. Entry must not occur to any part of the area until this permit has been approved.**

|                           |  |                                  |  |
|---------------------------|--|----------------------------------|--|
| <b>Project Name:</b>      |  | <b>Project No.:</b>              |  |
| <b>Organisation Name:</b> |  | <b>Permit No.:</b>               |  |
| <b>Start Date:</b>        |  | <b>Expected Completion Date:</b> |  |

**PROTECTED AREA LOCATION (S) – ATTACH DRAWINGS / SKETCHES IF NECESSARY**

| Ch. From | Ch. To | Up/Down | Location | Comments |
|----------|--------|---------|----------|----------|
|          |        |         |          |          |
|          |        |         |          |          |
|          |        |         |          |          |

**PART 01: Notification** (To be completed by Project Engineer or Site Environment Rep)

|   |  |  |  |
|---|--|--|--|
| <b>Description of Works:</b>                          |  |  |  |
| <b>Justification as to why entry is required:</b>     |  |  |  |
| <b>Protected Area:</b>                                |  |  |  |
| EECs <input type="checkbox"/>                         | Contaminated / Hazardous Land <input type="checkbox"/> | Riparian Areas outside footprint <input type="checkbox"/>      | Cultural Heritage Sites <input type="checkbox"/> |
| Habitat Trees <input type="checkbox"/>                | Threatened Species <input type="checkbox"/>            | Other Environmentally Sensitive Areas <input type="checkbox"/> | Other, specify: _____                            |
| <b>Map included with approximate location marked?</b> |  | Yes <input type="checkbox"/> No <input type="checkbox"/>       |  |
| <b>Specify plant to be used:</b>                      |  |  |  |
| <b>No. of Workers:</b>                                |  |  |  |
| <b>Proposed vegetation or ground disturbance:</b>     |  |  |  |

**PART 02: Investigation** (To be completed by Site Environmental Co-ordinator/Manager)

| Items   | Yes                      | No                       | Comments |
|---|--------------------------|--------------------------|----------|
| Is entry into the protected area absolutely necessary to complete construction works? Consider other methods that reduce the need to enter the protected areas. | <input type="checkbox"/> | <input type="checkbox"/> |          |
| Will the works impact on the protected area in any way?   | <input type="checkbox"/> | <input type="checkbox"/> |          |
| Is a pre-entry assessment required to determine the condition of the habitat? Are photos required to compare with post-entry condition?                         | <input type="checkbox"/> | <input type="checkbox"/> |          |
| Have relevant authorities been consulted?   | <input type="checkbox"/> | <input type="checkbox"/> |          |
| Is approval required from an authority prior to entry?  | <input type="checkbox"/> | <input type="checkbox"/> |          |
| Is a justification report required?   | <input type="checkbox"/> | <input type="checkbox"/> |          |
| Other?  | <input type="checkbox"/> | <input type="checkbox"/> |          |
| Are special conditions or instructions for entry required?  | <input type="checkbox"/> | <input type="checkbox"/> |          |

|   |  |
|---|--|
| <b>Process Special Permit Entry Request Further</b> | No <input type="checkbox"/> <b>Entry Not Permitted</b><br>Yes <input type="checkbox"/> <b>Continue to Process Form</b> |
|---|--|

**PART 03: Permit Induction** (Carried out by Site Environmental Co-ordinator/Manager)

| Inductee | Signature | Date | Position | Employer |
|----------|-----------|------|----------|----------|
|          |           |      |          |          |
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|          |           |      |          |          |
|          |           |      |          |          |

**PART 04: Special Conditions or Instructions for Entry**  
 (Completed by Site Environment Rep/Manger)

Click or tap here to enter text.

**PART 05: Approval to Enter 'No-Go' Zones**

Approval has been given to enter protected or 'no-go' areas for the purposes identified in Part 01 by those inducted in Part 03 and with reference to any conditions identified in Part 04.

| Name (Environmental Manager) | Signature | Approval Date | Expiry Date |
|------------------------------|-----------|---------------|-------------|
|                              |           |               |             |

## Attachment 7 – Indicative Site Layout

Preliminary construction site layouts at each construction site are provided below, which are generally in accordance with the EIS. However, the Project construction sites are subject to final detailed design and may change after the preparation of this document, based on opportunities for improvement and considerations of access, worker, and public safety, environmental and community (such as noise or light) impacts, COVID 19 Health Orders and other pertinent factors.

In consideration of this, at the completion of the detailed design process, final layouts will be reviewed for consistency against the Infrastructure Approval in accordance with Section 5.25 of the *Environmental Planning & Assessment Act 1979* (EP&A Act). At this time, layout changes following completion of detailed design will be captured in a revision to this document along with responses to Project requirements updated where applicable.

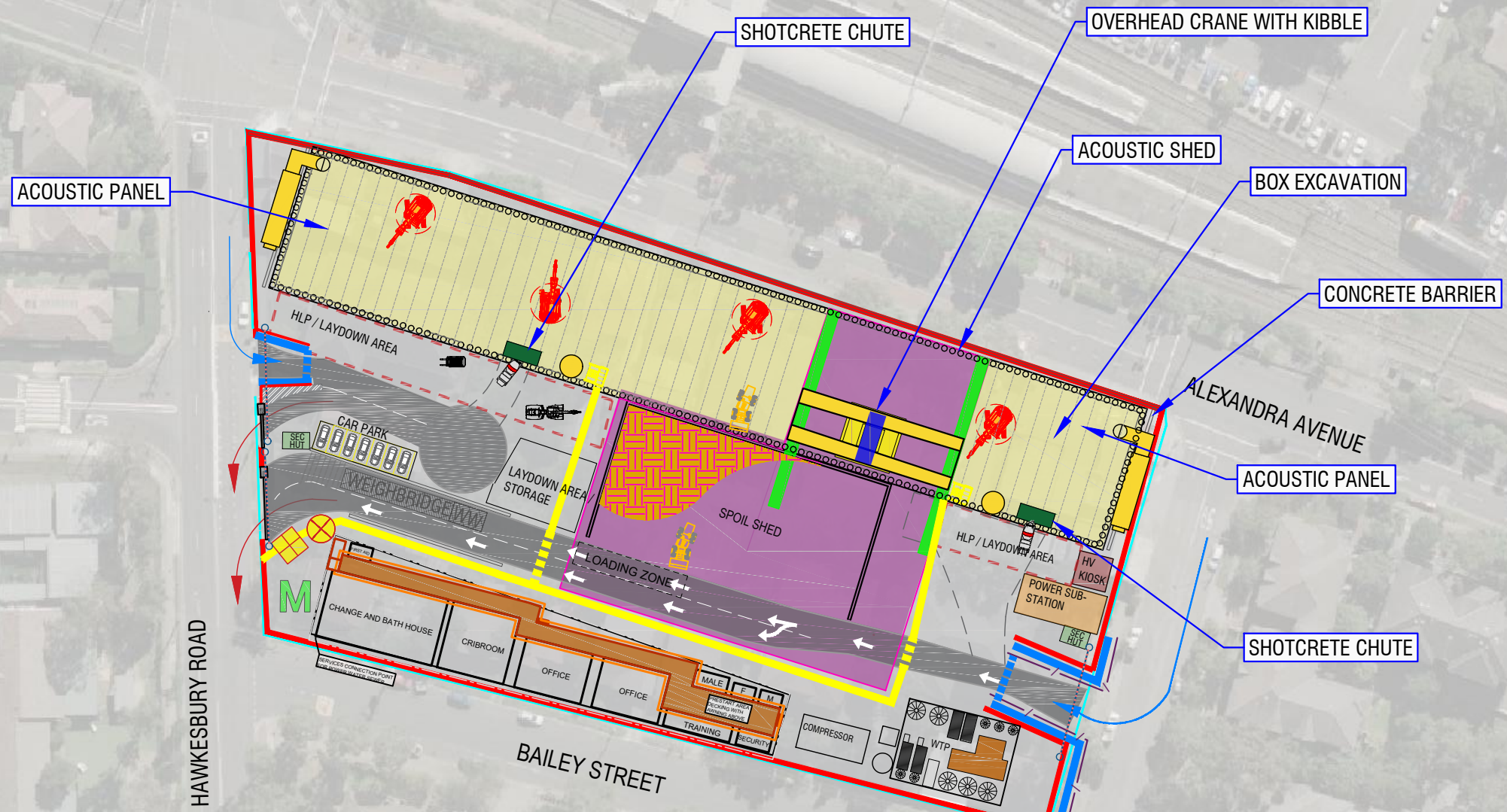
The construction site layouts provided below show the indicative final (i.e. during operation of the site for the purpose of Project construction) layout of each construction site. It is noted that sites will progress through interim phases of site establishment prior to this final state being achieved.

Interim site layouts are generally short in nature, and it is proposed final site layouts will be achieved within about six months of the commencement of construction.

Following completion of detailed design, final site layouts may be updated during construction to reflect a change in methodology or optimisation of available space. In the case of such adjustments to site layouts as provided below, where these have no greater impact to the environment, community or compliance as described herein, these changes will not necessitate an update to this document.

**STAGE 3 - BOX EXCAVATION (5 MONTHS)**

- PERIMETER FOR TRAFFIC PROTECTION
- ACOUSTIC SHED
- STATION BOX EXCAVATION
- VENTILATION INSTALLATION
- SUPPORT EQUIPMENT INSTALLATION
- SERVICES RETICULATION



| LEGEND              |  |
|---------------------|--|
| STAIR TOWER         |  |
| CONCRETE BARRIER    |  |
| CONCRETE DROP CHUTE |  |
| MATERIAL HOIST      |  |
| SPOIL               |  |

**NOT FOR CONSTRUCTION**

**DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR**

**ISSUED FOR TENDER DESIGN**

| REV. | BY  | DATE       | DESCRIPTION             | APPD. |
|------|-----|------------|-------------------------|-------|
| A    | S.S | 07.10.2021 | ISSUE FOR TENDER DESIGN |       |

A3 Original Co-ordinate System: MGA Zone 56 Height Datum: A.H.D. This sheet may be prepared using colour and may be incomplete if copied

SCALES

1:1000 FULL SIZE A3

NOTE: Do not scale from this drawing. ALT. DRG No. [Alt. Drg. No.]

CLIENT

Service Providers

DRAWN: JESSIE LI  
 DESIGNED: SAVANNAH SANG  
 DRG CHECK: \_\_\_\_\_  
 DESIGN CHECK: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_

**SYDNEY METRO**  
 THE WESTMEAD STATION  
 MOBILISATION & SITE ESTABLISHMENT - STAGE 3  
 BOX EXCAVATION  
 SITE LAYOUT

STATUS: TENDER DESIGN SHEET 3 OF 6

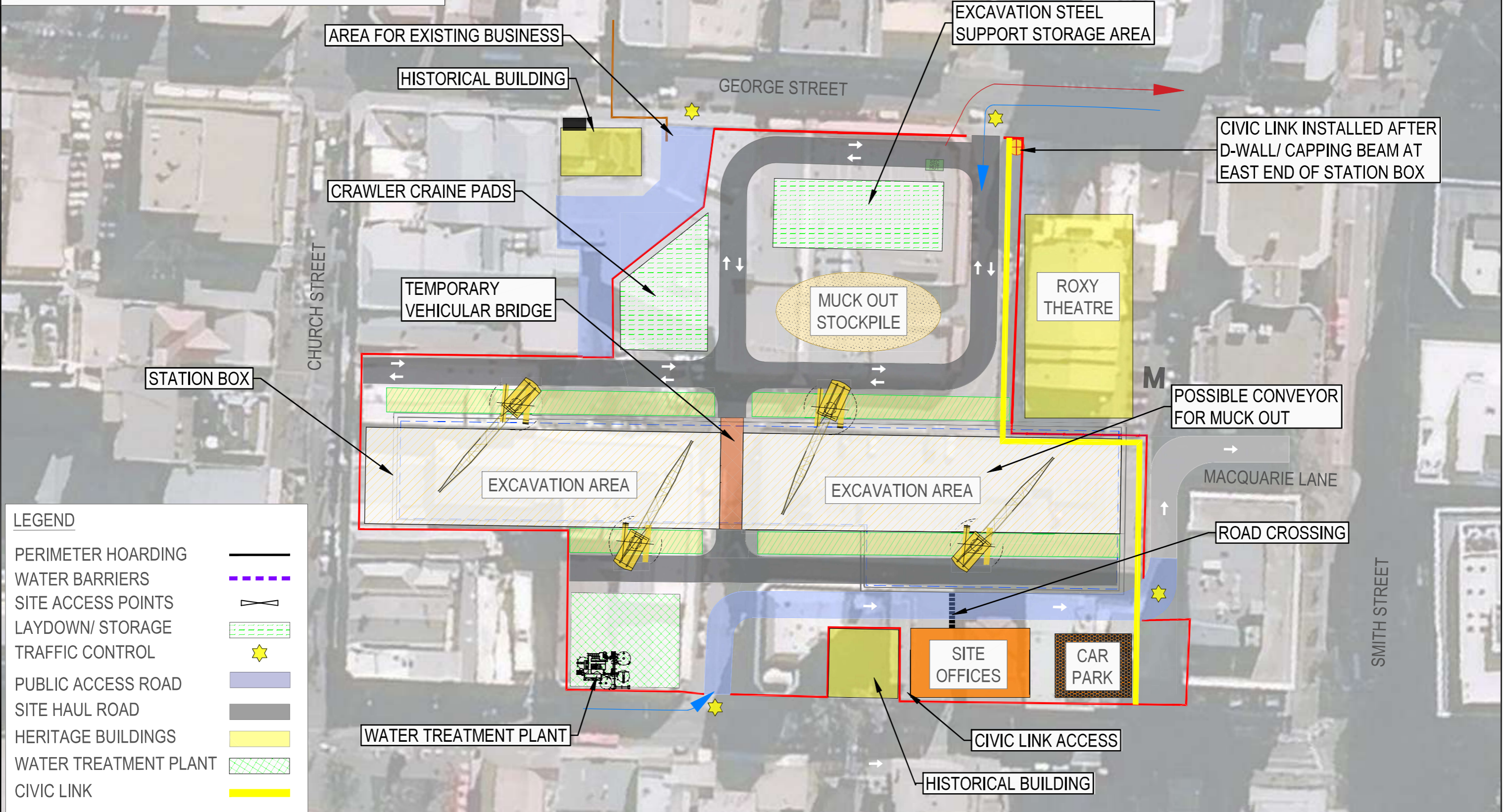
DRG No: SMWSTWTP-GALC-WMD-SN650-MB-DRG-000003 REV. A

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 100mm AT FULL SIZE

**STAGE 3 - (BOX AND NOZZLES EXCAVATION - 13 MONTHS)**

- STATION BOX NOZZLE EXCAVATION
- INSTALLATION OF TEMPORARY SUPPORT FRAMES
- FRP WORKS TO NOZZLE AND BOX INVERT
- TRAVERSING OF THE TBM'S

Plot Date: 12/04/22 - 15:10 C:\Users\Public\Tumblull\Engineering\James\tool - 220328\_GLO\_Drawing\Files\Lang O'Rourke\PARRAMATTA STATION\Drawings\SMW215-CALC\PTAS\20-MB-DRG-000001\PARRAMATTA\_2021\_1007.dwg



**LEGEND**

|                       |         |
|-----------------------|---------|
| PERIMETER HOARDING    | —       |
| WATER BARRIERS        | - - - - |
| SITE ACCESS POINTS    | ⊘       |
| LAYDOWN/ STORAGE      | ▨       |
| TRAFFIC CONTROL       | ★       |
| PUBLIC ACCESS ROAD    | ▭       |
| SITE HAUL ROAD        | ▭       |
| HERITAGE BUILDINGS    | ▭       |
| WATER TREATMENT PLANT | ▨       |
| CIVIC LINK            | ▭       |

**NOT FOR CONSTRUCTION**

**DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR**

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| REV. | BY   | DATE       | DESCRIPTION             | APPD. |
|------|------|------------|-------------------------|-------|
| -    | -    | -          | -                       | -     |
| C    | M.J. | 12.04.2022 | -                       | -     |
| B    | M.S. | 19.11.2021 | ISSUE FOR TENDER        | H.G.  |
| A    | J.L. | 07.10.2021 | ISSUE FOR TENDER DESIGN | -     |

A1 Original  
Co-ordinate System: MGA Zone 56  
Height Datum: A.H.D.  
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SCALES

10 0 20m  
1:1000 FULL SIZE A3

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SERVICE PROVIDERS

|              |                |
|--------------|----------------|
| DRAWN        | MATTHEW STUART |
| DESIGNED     | HUW GRIFFITHS  |
| DRG CHECK    |                |
| DESIGN CHECK |                |
| APPROVED     |                |

**SYDNEY METRO**  
THE PARRAMATTA STATION  
MOBILISATION AND SITE ESTABLISHMENT - STAGE 3  
BOX EXCAVATION AND NOZZLES EXCAVATION  
SITE LAYOUT

STATUS: TENDER DESIGN SHEET 3 OF 6





DRG No: SMWSTWTP-GALC-PTA-SN700-MB-DRG-000003 REV. C



**STAGE 3 - PEAK PRODUCTION (6 MONTHS)**

- COMPLETE FRP FOUNDATIONS FOR RETAINING WALLS AND FINAL INSTALLATION
- CULVERTS COMPLETION
- OVERPASS CONSTRUCTION ONGOING
- START BACKFILL WITH TUNNEL SANDSTONE ROSEHILL TO SOP SPUR TUNNEL SPOIL
- COMPLETE RETAINING WALL
- CONSTRUCT KAY STREET DIVERSION
- COMPLETE ROAD TIE IN WORKS FOR FUTURE TRAFFIC SWITCH
- DRAINAGE OUTLET INSTALLATION

**LEGEND**

- SPOIL COMING FROM ROSEHILL AND CLYDE DIVE 
- EARTHWORKS IN PROGRESS 
- CULVERTS 
- UTILITY CORRIDOR COMPLETED 

ROSEHILL STAGING DRAWINGS SHOWN SEPARATELY IN OTHER SET OF DRAWINGS

UNWIN STREET DIVERSION AND OVERPASS WORK IN PROGRESS

CLYDE DIVE STAGING SHOWN IN OTHER SET OF DRAWINGS

SEDIMENT BASIN

START BACKFILL MSF PLATFORM

WATERMAIN TO BE GROUTED ONCE NEW WATERMAIN IS COMMISSIONED

INTERNAL HAUL ROAD AND SPOIL COMING FROM ROSEHILL SHED AND CLYDE DECLINE SHED

**ISSUED FOR TENDER DESIGN**


Plot Date: 08/10/21 - 18:18  
 C:\Users\jessie.li\OneDrive - CJC Management\Desktop\gamuda\01 CAD working\SM215-GALC-CLJ-BD700-MB-DRG-000003 Clyde MSF Staging 20211007.dwg

100mm AT FULL SIZE

| REV. | BY  | DATE       | DESCRIPTION             | APPD. |
|------|-----|------------|-------------------------|-------|
| A    | D.K | 22.09.2021 | ISSUE FOR TENDER DESIGN | A.C   |

A3 Original Co-ordinate System: MGA Zone 56 Height Datum: A.H.D. This sheet may be prepared using colour and may be incomplete if copied

SCALES



1:3000 FULL SIZE A3

NOTE: Do not scale from this drawing. ALT. DRG No. [Alt. Drg. No.]

CLIENT



Service Providers

DRAWN: JESSIE LI  
 DESIGNED: JEAN-FRANCOIS KIETL  
 DRG CHECK: \_\_\_\_\_  
 DESIGN CHECK: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_

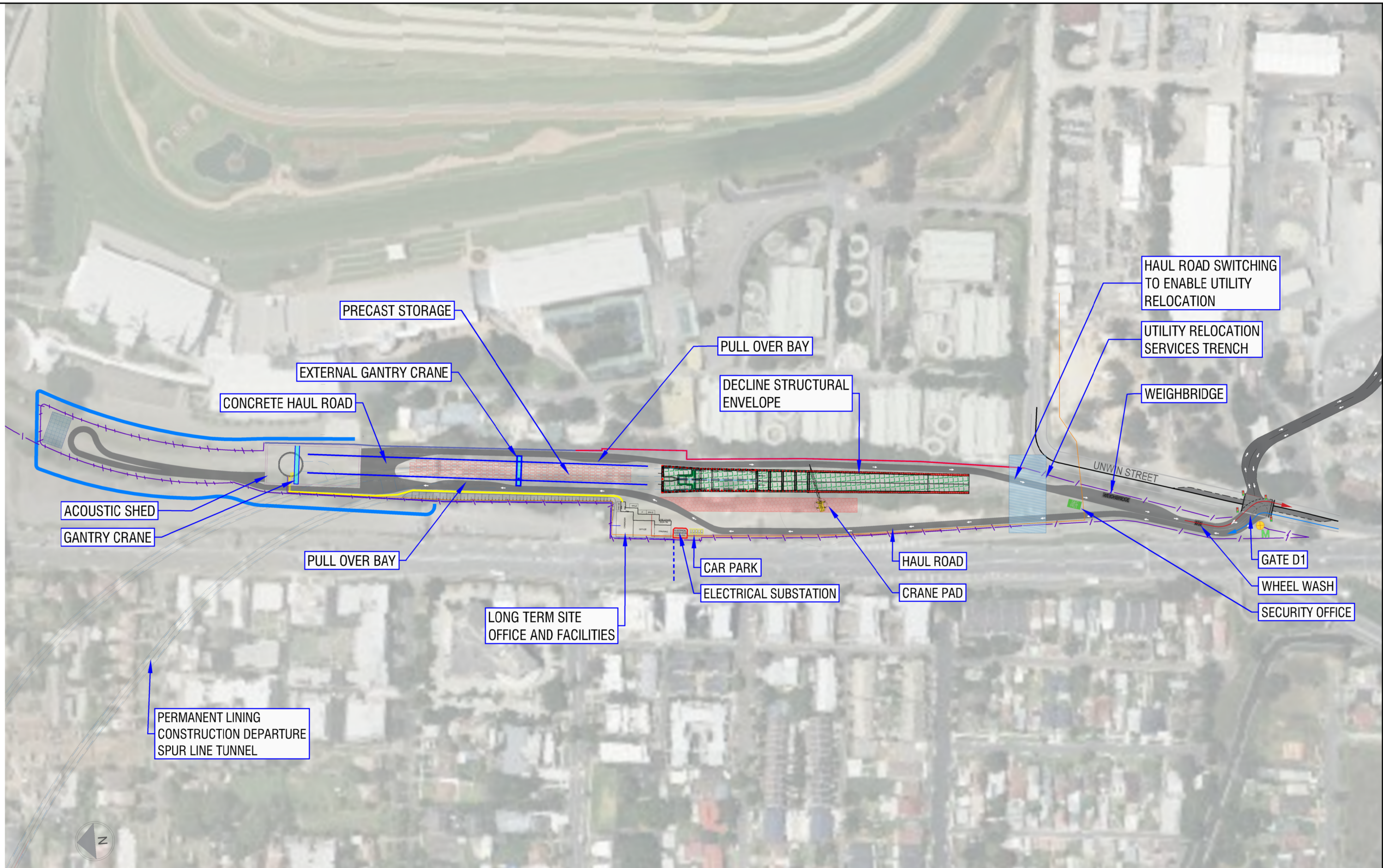
**SYDNEY METRO**  
 CLYDE MSF CLYDE DECLINE AND ROSEHILL  
 MOBILISATION AND SITE ESTABLISHMENT - STAGE 3  
 PEAK PRODUCTION  
 SITE LAYOUT

STATUS: TENDER DESIGN SHEET 3 OF 7

DRG No: SMWSTWTP-GALC-CLJ-BD700-MB-DRG-000003 REV. A

Plot Date: 03/12/21 - 09:46 C:\Users\MatthewStuart\OneDrive\Documents\333191\GAMUDA\JESSIE LI SECONDMENT\04 DESIGN\05 Digs\01 CAD\CAD\SMW215-GALC-SMDT220-MB-DRG-00001.dwg

100mm AT FULL SIZE



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**ISSUED FOR TENDER DESIGN**

| REV. | BY     | DATE       | DESCRIPTION | APPD. |
|------|--------|------------|-------------|-------|
| A    | M.J.S. | 03.12.2021 | FOR REVIEW  | J.N.  |
|      |        |            |             |       |
|      |        |            |             |       |
|      |        |            |             |       |

A1 Original Co-ordinate System: MGA Zone 56 Height Datum: A.H.D. This sheet may be prepared using colour and may be incomplete if copied

SCALES

1:2500 FULL SIZE A3

NOTE: Do not scale from this drawing. ALT. DRG No. [Alt. Drg. No.]

CLIENT

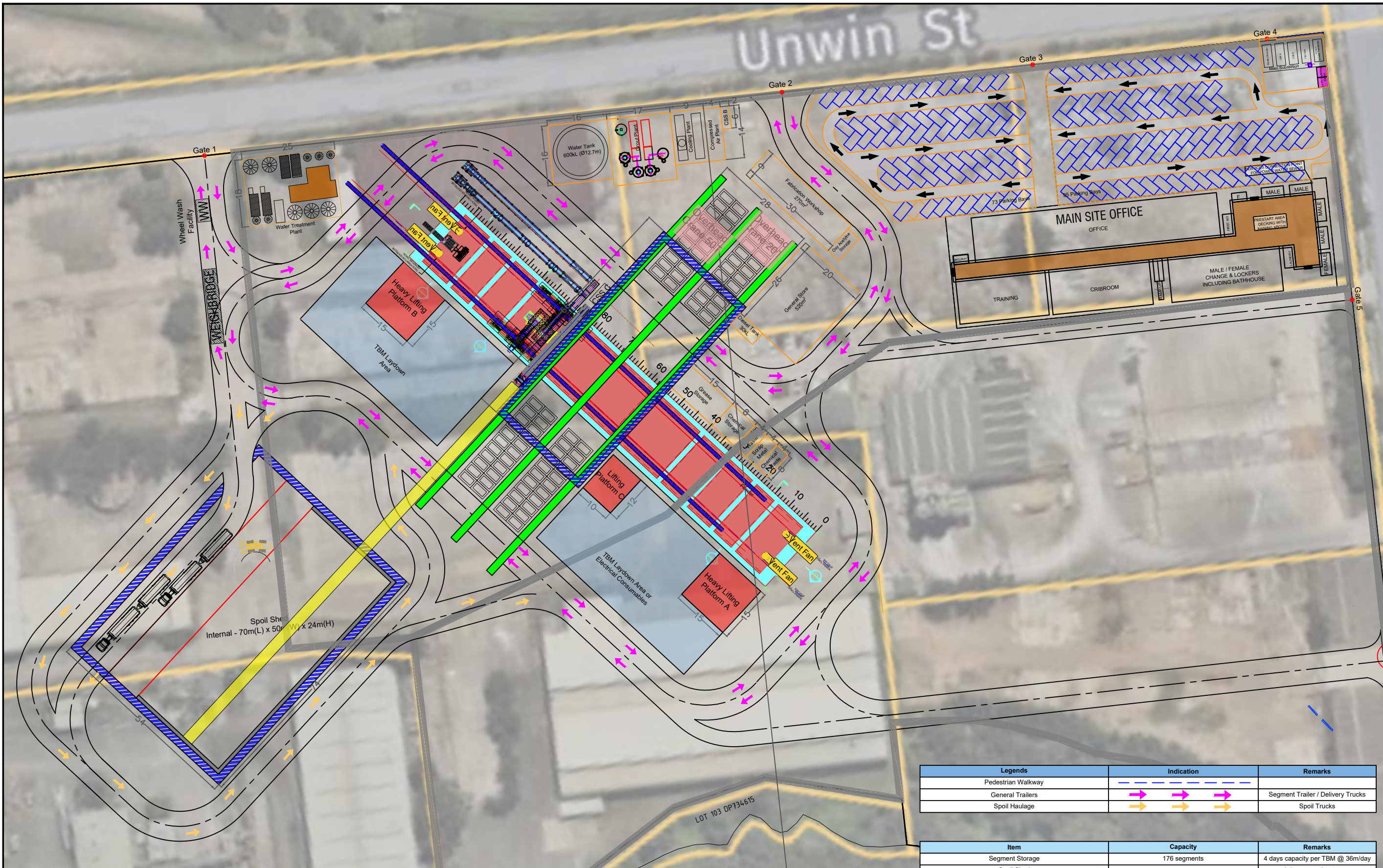
Service Providers

DRAWN: MATTHEW STUART  
 DESIGNED: MATTHEW STUART  
 DRG CHECK: \_\_\_\_\_  
 DESIGN CHECK: JEREMY NETHERCOTT  
 APPROVED: \_\_\_\_\_

**SYDNEY METRO**  
 THE CLYDE DIVE AND PORTAL STRUCTURE  
 TUNNEL LINING AND PORTAL CONSTRUCTION  
 SITE LAYOUT  
 PRECAST STORAGE LAYOUT

STATUS: TENDER DESIGN SHEET 14 OF 14

DRG No. SMWSTWTP-GALC-SWD-TD700-MB-DRG-003014 REV. A



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| Legends            | Indication | Remarks                           |
|--------------------|------------|-----------------------------------|
| Pedestrian Walkway | --- --     |                                   |
| General Trailers   | → → →      | Segment Trailer / Delivery Trucks |
| Spoil Haulage      | → → →      | Spoil Trucks                      |

| Item            | Capacity              | Remarks                           |
|-----------------|-----------------------|-----------------------------------|
| Segment Storage | 176 segments          | 4 days capacity per TBM @ 36m/day |
| Spoil Shed      | 15,000 m <sup>3</sup> | 4 days capacity storage           |

| REV. | BY   | DATE       | DESCRIPTION                                   | APPD. |
|------|------|------------|---|-------|
| E    | M.S. | 03.03.2022 | DIMENSIONS & REVISED WATER TANK               | -     |
| D    | D.B. | 21.02.2022 | ROUTE, SEGMENT STORAGE, OVERHEAD CRANE        | -     |
| C    | S.S. | 10.02.2022 | REVISED ROUTE, PLANT, SITE OFFICE AND PARKING | -     |
| B    | S.S. | 04/02/2022 | AWAY FROM HANDOVER AREA                       | -     |
| A    | T.O. | 28.01.2022 | OPTION FOR POST TENDER                        | -     |

| SCALE |
|-------|
|       |

| CLIENT                        |
|-------------------------------|
| NSW GOVERNMENT   SYDNEY METRO |

| SERVICE PROVIDERS       |
|-------------------------|
| DRAWN: Shazwan/Mohan    |
| DESIGNED: Shazwan/Mohan |
| DRG CHECK: _____        |
| DESIGN CHECK: _____     |
| APPROVED: _____         |

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**SYDNEY METRO**  
 ROSEHILL STATION  
 SITE LAYOUT OPTION (AWAY FROM HANDOVER AREA)  
 TBM ESTABLISHMENT  
 SITE LAYOUT

STATUS: POST TENDER | SHEET 1 OF 1 | REV. A

