



**Australian Government**

**Department of Infrastructure, Transport,  
Regional Development and Communications**

File Reference: F21/3792-16

Ben Armstrong  
Associate Director Environment Operations, Customer & Place Making  
Sydney Metro  
PO Box K659  
Haymarket NSW 1240

Dear Mr Armstrong

**Construction (Rail) Plan**

I write to notify you that, in accordance with Condition 38 of the Airport Plan, I have today approved the Construction (Rail) Plan (Rev 4) submitted by Sydney Metro on 3 March 2022. Thank you for Sydney Metro's engagement with the department over the last few months as these plans were developed.

Now that the Construction (Rail) Plan has been approved Sydney Metro is required:

- d. To take reasonable steps to ensure that each person involved in carrying out a development that is part of the Rail Development is informed of, and complies with, the approved Construction (Rail) Plan (Condition 45(3) of the Airport Plan).
- e. To maintain accurate records demonstrating implementation of, and compliance with, the approved Construction (Rail) Plan, and other applicable conditions contained in Section 3.11.6 of the Airport Plan. Records must be made available to the Infrastructure Department on request (Condition 46 of the Airport Plan).
- f. To publish information in a report about its compliance with the conditions set out in section 3.11.6 of the Airport Plan (Rail Conditions) and its implementation of the approved Construction (Rail) Plan (Condition 47 of the Airport Plan).
- g. To ensure that an independent audit of its compliance with the conditions set out in section 3.11.6 (except Condition 44) and condition 46 of the Airport Plan (Rail Conditions) is conducted, by an approved independent auditor, in respect of the 12-month period commencing with commencement of Rail Construction Works. The independent audit report must be submitted to the Infrastructure Department, with a copy provided to the Environment Department, within six months of the end of the period in respect of which the audit was conducted (Condition 48 of the Airport Plan).
- h. Unless otherwise agreed by an Approver, to publish the approved Construction (Rail) Plan on its website (Condition 50 of the Airport Plan).

If you have any queries in relation to this letter, please do not hesitate to contact me.

Yours sincerely

David Jansen  
Assistant Secretary  
Western Sydney Airport Regulatory Policy Branch

10 March 2022



# Sydney Metro Western Sydney Airport Construction (Rail) Plan

Sydney Metro Integrated Management System (IMS)

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## Document Control

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01	16 August 2021	Draft for WSA information
02	1 November 2021	Issued for DITRDC
03	25 January 2022	Final for DITRDC
04	3 March 2022	Final

## Terms and Definitions

Terms	Definitions
<b>AEPR</b>	Airports (Environment Protection) Regulations 1997
<b>AEW</b>	Advanced and Enabling Works
<b>AP</b>	Airport Plan
<b>AS</b>	Australian Standard
<b>CCS</b>	Community Communication Strategy
<b>CEMF</b>	Construction Environmental Management Framework
<b>CEMP</b>	Construction Environmental Management Plan
<b>CIZ</b>	Construction Impact Zone
<b>CNVS</b>	Construction Noise and Vibration Standard
<b>CoA</b>	Conditions of Approval
<b>CRP</b>	Construction (Rail) Plan
<b>CSSI</b>	Critical State Significant Infrastructure
<b>CTMF</b>	Construction Traffic Management Framework
<b>Cwth</b>	Commonwealth
<b>DAWE</b>	Department of Agriculture, Water and the Environment (Cwth)
<b>DECC</b>	NSW Department of Environment and Climate Change
<b>DITRDC</b>	Department of Infrastructure, Transport, Regional Development and Communications
<b>DPIE</b>	Department of Planning, Industry and Environment
<b>ECM</b>	Environmental Control Map
<b>ECZ</b>	Environmental Conservation Zone
<b>EESG</b>	NSW Environment, Energy and Science Group (formerly OEH)
<b>EIS</b>	Environmental Impact Statement
<b>EP&amp;A Act</b>	Environment Planning and Assessment Act 1979 (NSW)
<b>EPA</b>	NSW Environment Protection Authority
<b>EPBC Act</b>	Environment Protection and Conservation Act 1999 (Cwth)
<b>EPL</b>	Environment Protection Licence under the POEO Act
<b>ER</b>	Environmental Representative
<b>EWMS</b>	Environmental Works Method Statement
<b>E&amp;SMS</b>	Environment and Sustainability Management System
<b>IMS</b>	Sydney Metro Integrated Management System
<b>ISO</b>	International Standardization Organisation
<b>KPI</b>	Key Performance Indicator
<b>NSW</b>	New South Wales
<b>OCCS</b>	Overarching Community Communication Strategy
<b>OOHW</b>	Out-of-Hour Works

Terms	Definitions
<b>POEO Act</b>	Protection of the Environment Operations Act 1997 (NSW)
<b>Proponent</b>	The person or organisation identified as the proponent in Schedule 1 of the planning approval. In this case Sydney Metro Authority
<b>REMM</b>	Revised Environmental Mitigation Measure
<b>RMS</b>	NSW Roads and Maritime Services
<b>ROL</b>	Road Occupancy Licence
<b>SBT</b>	Station Boxes & Tunnelling
<b>SCAW</b>	Surface Civil & Alignment Works
<b>SCO</b>	Sydney Coordination Office
<b>Planning Secretary</b>	The Secretary of the Department of Planning, Industry and Environment
<b>SEMF</b>	Site Environmental Management Framework
<b>SM</b>	Sydney Metro
<b>SM WSA</b>	Sydney Metro Western Sydney Airport
<b>SM WSA EIA</b>	SMWSA EIS (formerly Appendix J): EPBC Act Final Environmental Impact Assessment of On-airport proposed action (EPBC 2019/8541)
<b>SMP</b>	Sustainability Management Plan
<b>SPIR</b>	Submissions and Preferred Infrastructure Report
<b>SSI</b>	State Significant Infrastructure
<b>SSTOM</b>	Stations Systems, Trains, Operations & Maintenance
<b>SWMS</b>	Safe Works Method Statement
<b>TfNSW</b>	Transport for New South Wales
<b>WSA</b>	Western Sydney Airport Co (ACN 618 989 272), the entity responsible for constructing and operating the Airport in accordance with the Airport Plan. For the purposes of the Airports Act 1996 (Cth), WSA is the “airport-lessee company” for WSI
<b>WSI airport</b>	Western Sydney International airport



# 1. Introduction

## 1.1. Sydney Metro

Sydney Metro is Australia's biggest public transport project. Services between Rouse Hill and Chatswood started in May 2019 on the new stand-alone metro railway system. The Sydney Metro network and program of work includes the Metro North West Line (which opened in May 2019), Sydney Metro City & Southwest (which is currently under construction and due to open in 2024), Sydney Metro West (with construction due to start in 2020) and Sydney Metro – Western Sydney Airport (the project). Potential future extensions to Schofields/Tallawong in Rouse Hill in the north and to Macarthur in the south are under consideration and are being safeguarded but do not form part of the project.

The Sydney Metro – Western Sydney Airport project (the project) is shown in Figure 1-1 and would become the transport spine for Greater Western Sydney, connecting communities and travellers with the new Western Sydney International (Nancy-Bird Walton) Airport (referred to as Western Sydney International) and the growing region.

The city-shaping project, from St Marys through to the new airport and the Western Sydney Aerotropolis, would provide a major economic stimulus for Western Sydney, supporting more than 14,000 jobs during construction for the NSW and national economies, including more than 250 new apprenticeships. The project comprises components that are located outside Western Sydney International (off-airport) and components that are located within Western Sydney International (on-airport). This series of CEMPs will address the on-airport components of the Project.

## 1.2. Construction (Rail) Plan

In accordance with the Airport Plan, under Condition 38, the Rail Authority must not commence Rail Construction Works until a Construction (Rail) Plan for the Airport Site and Associated Sites has been prepared and approved in accordance with this condition.

The requirements of Condition 38 are thus:

(2) The Rail Authority must:

(a) prepare; and

(b) submit to an Approver for approval;

a Construction (Rail) Plan in relation to the carrying out of the Rail Development.

(3) The criteria for approval of the Construction (Rail) Plan are that an Approver is satisfied that the Construction (Rail) Plan:

(a) sets out:

(i) the program and timetable for carrying out the Rail Development;

(ii) details of the construction methodology to be used for carrying out the Rail Development;

(iii) details, not inconsistent with the Land Use Plan in Part 2 of the Airport Plan, of the size and location of the parts of the Airport Site or an Associated Site on which Rail Construction Works are planned to occur;

(iv) measures to avoid or minimise, to the extent possible, impacts on parts of the Airport Site that have important biodiversity values that are outside of the Construction Impact Zone and Rail Construction Impact Zone;

(b) is consistent with the Construction Plan; and

(c) is otherwise appropriate.

(5) The approved Construction (Rail) Plan may provide for Rail Construction Works to be carried out in phases that commence at different times for different parts of the Airport Site or an Associated Site. If it does, the Rail Authority may prepare a CEMP in relation to one or more phases, and the criteria for approval of such a CEMP are taken to exclude any matter irrelevant to the phases for which approval is sought. A variation to a CEMP must be submitted for approval in accordance with condition 49 (Variation of Approved Plans), prior to commencement of any new phase.

### 1.3. Sydney Metro Western Sydney Airport

The Western Sydney Airport Plan sets out the vision for the development and operation of Western Sydney International and provides authorisation for Stage 1 of the airport. The construction of Stage 1 of the airport is expected to be completed to enable operations to commence in 2026 and will comprise a single runway, a terminal and other relevant facilities to accommodate around 10 million passengers annually as well as air freight traffic. Interface with Western Sydney International Rail access to Western Sydney International Airport would contribute to the success of the airport and the Western Parkland City, as it would facilitate passengers' and workers' journeys, reduce road congestion and support the economic viability of the airport.

The project is proposed to enter the airport site from the north and would include stations at the Airport Business Park and the Airport Terminal. The rail line would travel through the airport, before exiting the airport site beneath Badgerys Creek in the southeast of the airport site. Sydney Metro has been, and will continue, working closely with Western Sydney Airport to ensure design development and construction planning of the project is coordinated with the construction and operation of Western Sydney International.

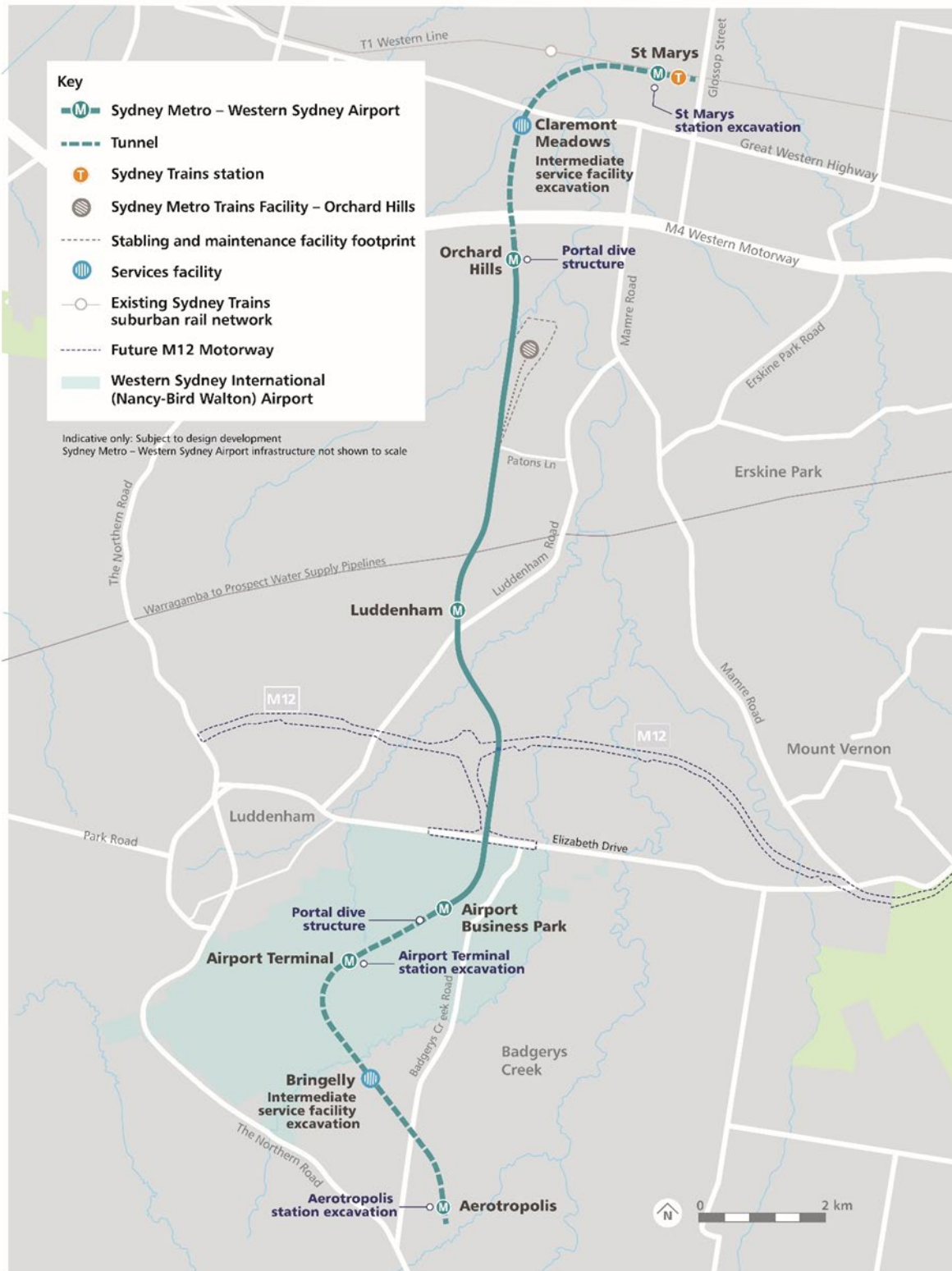
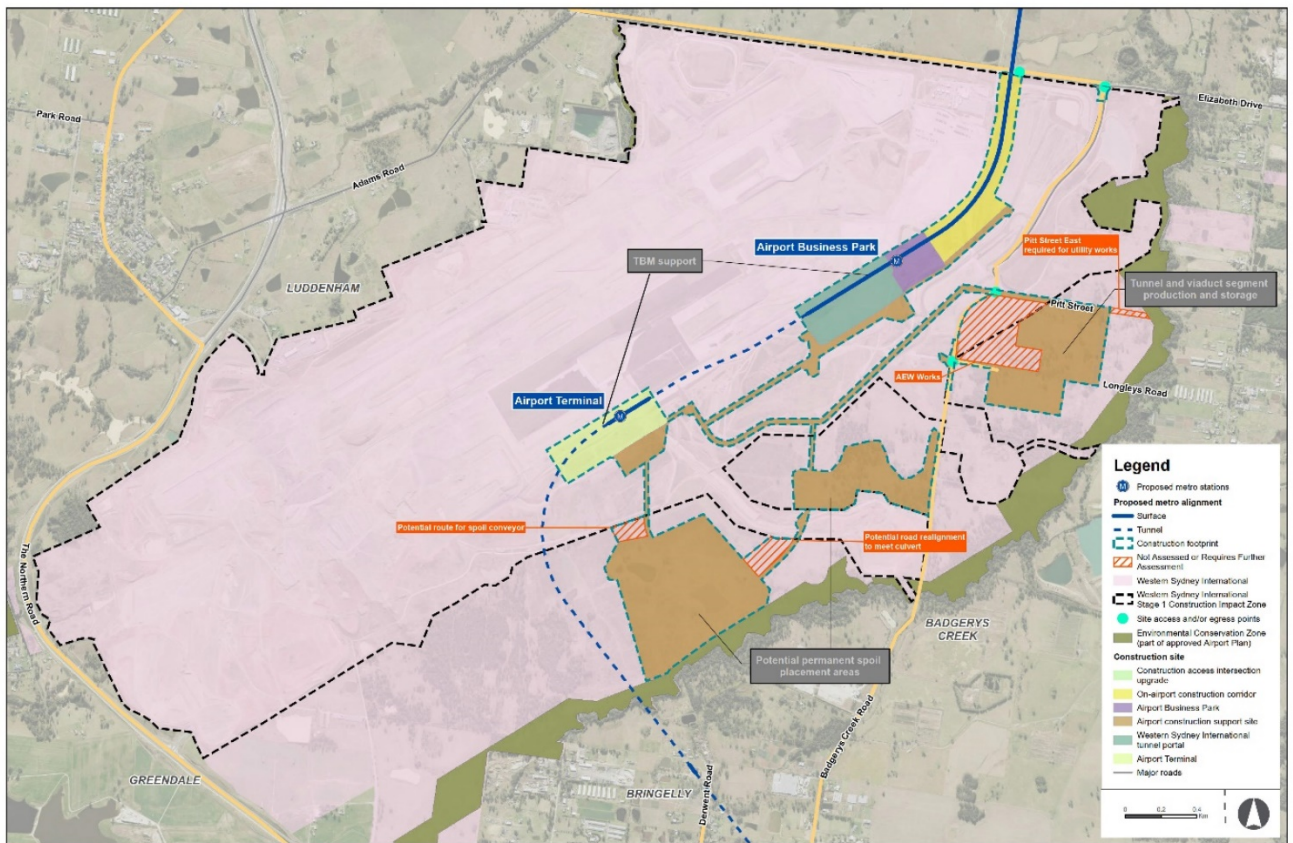


Figure 1-1 Sydney Metro Network

### 1.4. The Rail Construction Impact Zone

The Rail Construction Impact Zone (RCIZ) including the construction footprint and key construction sites proposed for use during the construction of the Project are shown in Figure 1-2. This figure also indicates the Western Sydney International Stage 1 CIZ and the Environmental Conservation Zone within Western Sydney International. The Rail Corridor is defined as the area within which permanent rail infrastructure will be accommodated as indicatively shown in Figure 1-2.



Indicative only, subject to design development. Proposed action construction footprint. Figure 1-1

Figure 1-2 Sydney Metro – WSA Rail Construction Impact Zone (RCIZ)

### 1.5. Sydney Metro environmental management system overview

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

The Project will be undertaken in accordance with the SM WSA CEMF and the associated CEMPs. The SM WSA CEMF provides the overarching management framework for the Project and references a suite of environmental management documents. It provides a structured and

systematic approach to environmental management and provides an expectation and guidance with regards to environmental management for the overall construction of the Project. The structure of the environmental management system for the Project is shown in Figure 1-3.

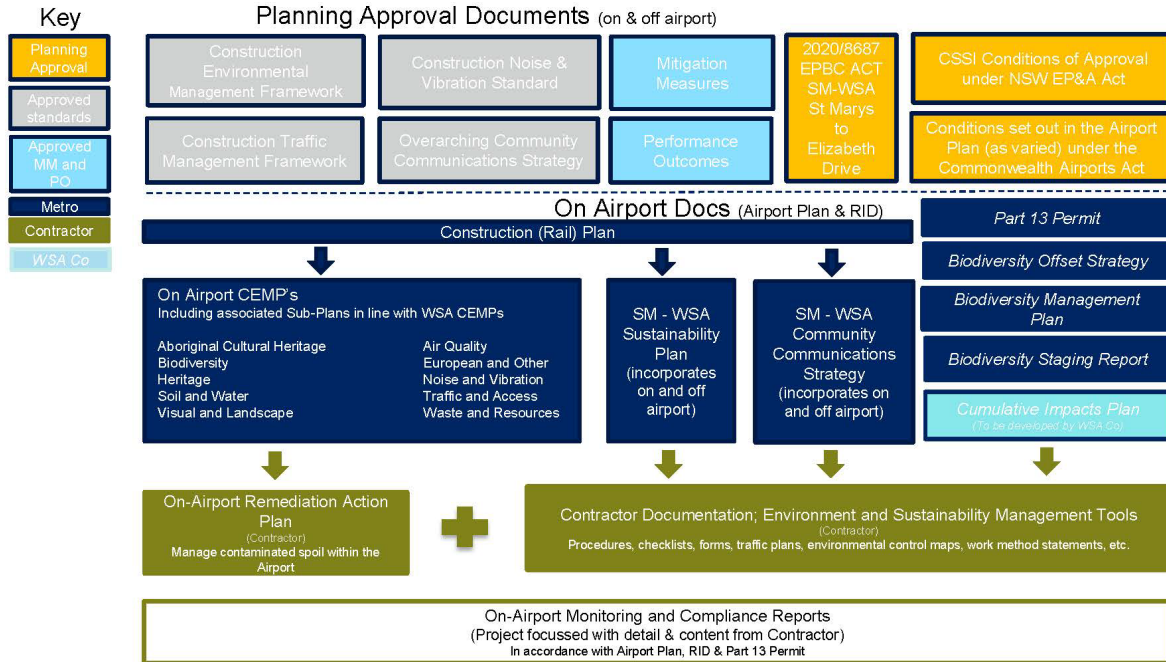


Figure 1-3 SMWSA Environmental Management System and CEMP context

## 2. Scope of works

### 2.1. Overall Project scope

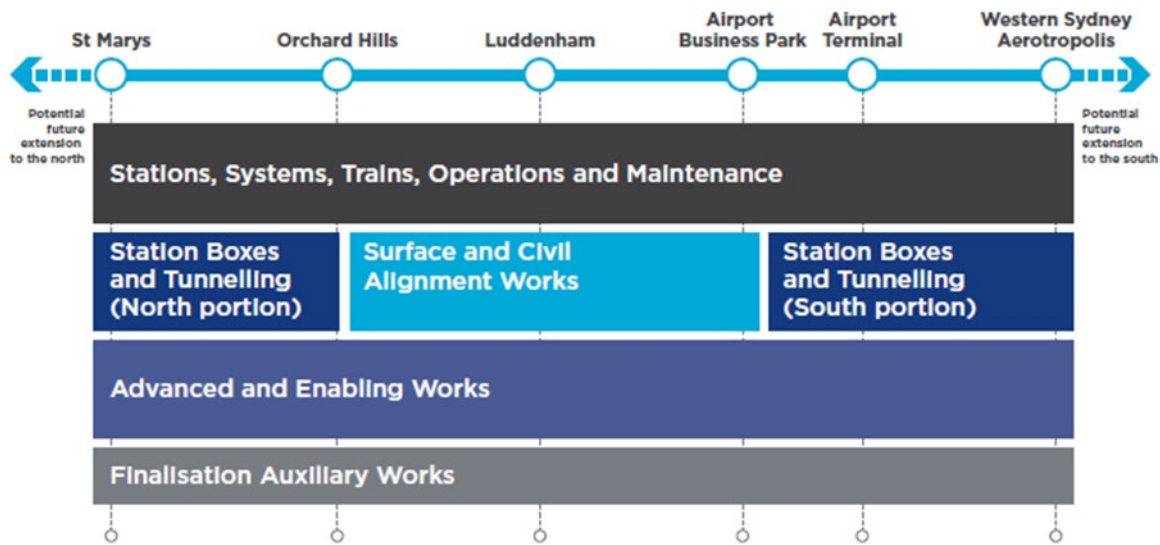
This Plan details the construction staging of the Sydney Metro Western Sydney Airport Project.

The delivery of the Project will be through a packaging strategy with a wide variety of package sizes, risk profiles and contracting entities. Each package will have different levels of environmental risk and environmental obligations, depending on the scope of works, location of works and sensitivity of the receiving environment and cultural heritage issues and relevant statutory requirements and obligations. The packages have been divided into:

- AEW – Advanced and Enabling Works
- SCAW – Surface and Civil Alignment Works
- SBT – Station Boxes and Tunnelling Works
- SSTOM – Stations, Systems, Trains, Operations and Maintenance

The Project comprises the following key on-airport features (which is consistent with the Airport Plan and EIA Chapter 4):

- Around two kilometres of surface rail alignment within Western Sydney International (SCAW)
- Around 3.3 kilometres of twin rail tunnels (including tunnel portal) within Western Sydney International (SBT)
- Around three kilometres of twin rail tunnels between Western Sydney International and the Aerotropolis Station (SBT)
- Two new metro stations, Airport Business Park Station and Airport Terminal Station (SSTOM);
- All operational systems and infrastructure (SSTOM)
- A rail segment factory comprising a concrete batch plant and stockpile area (SBT and SCAW)
- A spoil stockpile area (SBT and SCAW)



Details of the Project construction activities, staging and programming including the phases of works is described in the Sydney Metro Construction (Rail) Plan (2021) as required by the Airport Plan Variation.

The proposed construction activities that would be undertaken for the Project include:

- preparatory activities (AEW, SSTOM, SCAW SBT)
- advanced and enabling works (AEW) (see section 2.2 for more information)
  - utilities (power, gas, water) installation for the TBMs and concrete manufacturing facilities,
- main construction works including:
  - tunnelling and associated works (SBT)
  - corridor and associated works (SCAW)
  - stations and associated works (SSTOM)
- rail systems fitout (SSTOM)
- activities required for tunnel and viaduct segment manufacture and storage and temporary haulage roads (SBT and SCAW)
- finishing works and testing and commissioning (FAW)

The Project would also include the potential permanent placement of spoil at two sites to support the development of future stages of the airport. Interface with EC1 Badgerys Creek ECZ will need to be considered particularly surface water management particularly with respect to potential increase in elevation.

Airport EIS and Airport Plan require pre-existing surface water & groundwater flows and drainage to be maintained. A soil & water OEMP will be required for the stockpile to demonstrate compliance with AEPR r.4.01 General duty not to pollute and relevant sections of r.4.04 including any potential impact on Aboriginal cultural heritage values

It is anticipated that the Project construction works would commence in 2021 and take about five years to complete, subject to planning approval. The Operational SM WSA opening is anticipated to align with the opening of passenger services for Western Sydney International in 2026. An indicative main construction program for the project is shown in Figure 2-2 below.

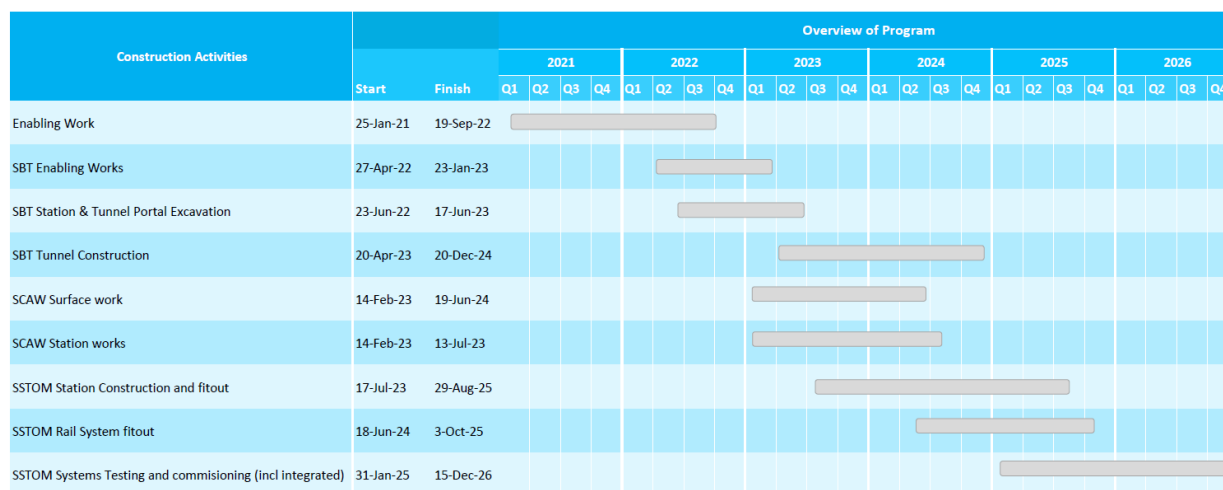


Figure 2-1 Indicative on-airport construction program for the project

## 2.2. Preparatory activities

Preparatory activities for the Project are required to establish key construction sites and facilitate construction activities.

The majority of the preparatory activities are expected to commence in advance of main construction works, such as tunnelling and station excavation, while some preparatory activities would continue concurrently with the main construction works. Preparatory activities would include:

- detailed site investigations and subsequent clearance works
  - including heritage survey and salvage as per the survey and salvage plan (Appendix C of the Aboriginal Cultural Heritage CEMP);
- provision of construction haul roads;
- relocating, adjusting and protecting utilities and services affected by the proposed action;
- supplying power, water and other utilities to construction sites and other areas within the construction footprint;
- vegetation clearance (as permitted);
  - including seed collection; and
- establishment of construction sites.



## 2.3. Advanced and Enabling Works (AEW)

Enabling works for the project are required to establish key construction sites and facilitate construction activities. The majority of the enabling works will commence in advance of the main construction works, such as tunnelling and station excavation, while some enabling works will continue concurrently with the main construction works.

The following will be undertaken in the AEW package of works:

- preparatory works such as site investigation, vegetation and other site clearance, demolition, and modifications to the existing road network
- power supply for the precast yard and tunnel boring machines (TBMs) from Kemps Creek Substation to the Western Sydney Airport site with associated under-bores under Badgerys Creek and South Creek
- construction power and water supply for Airport Business Park
- gas supply for the precast yard
- concurrent management of work sites
- utility adjustments as required to facilitate the project.

## 2.4. Station Box and Tunnelling (SBT)

The following will be undertaken in the SBT package of works:

- around 3.3 kilometres of twin TBM rail tunnels, plus associated portal dive structures, earthworks, vegetation clearance, permanent spoil placement areas, and tunnel support activities
- station box excavations with temporary ground support at Western Sydney Airport Terminal
- the manufacture of precast tunnel segments within the on-airport support sites.

The tunnel and excavation method will be driven by ground conditions likely to be encountered during construction, the project design and program. The methodology described below is indicative and will be developed by the construction contractor(s) when appointed.

Tunnel excavation methodologies for the project would include:

- bored tunnels for the Western Sydney International to Bringelly tunnel
- other techniques including the use of road-headers or excavators to excavate non-standard sections of tunnels including cross-passages and tunnel stubs.

## 2.5. Surface and Civil Alignment Works (SCAW)

The following will be undertaken in the SCAW package of works:

- around two kilometres of surface rail alignment and associated works including, embankments and cuttings, vegetation clearance, earthworks and rail systems fit out
- Western Sydney Airport drainage swale overbridge, including foundations, bearings, abutments, transitions, superstructure and interfaces with the M12, Elizabeth Drive and Airport access roads.
- Earthworks (for example, cuttings and embankments) will also be required at locations along the project alignment to achieve required levels for the surface track alignment.
- Manufacture of precast viaduct and bridge segments (this will no longer occur at the on-airport support sites)

## 2.6. Stations, Systems, Trains, Operations and Maintenance (SSTOM)

The following will be undertaken in the SSTOM package of works:

- station fit out, precinct and transport integration works
- finishing works and testing and commissioning
- operation of the Western Sydney Airport metro service.
- Vegetation clearance is not anticipated to form part of the SSTOM scope of works as clearing will have been completed during earlier construction stages.

## 2.7. Finishing Auxiliary Works (FAW)

The FAW stage is still being developed at the time of this report, however the FAW stage of the project does not include any biodiversity offset requirements as all vegetation clearing will have been completed during earlier construction stages.

### 3. Construction sites

The Project’s construction activities will be carried out within and to the south-east of the WSI airport Stage 1 CIZ. The indicative works at proposed construction sites required for the construction of the Project are shown in Figure 3-1 to Figure 3-8. The use of these sites will be confirmed by the construction contractor(s) (when appointed) in consultation with Western Sydney Airport.

Location	Preparatory activities	TBM launch	TBM support	TBM retrieval	Spoil handling and removal	Roadheader launch/support	Ancillary facility construction	Stabling and maintenance facility construction	Major earthworks	Bridge and viaduct construction	General civil works	Concrete batch plant	Equipment and material laydown	Rail system fitout	Site offices and worker amenities	Water treatment plant	Potential acoustic shed	Vehicle parking
<b>On-airport</b>																		
On-airport construction corridor	✓				✓		✓		✓	✓	✓		✓	✓	✓			✓
Airport Business Park	✓				✓		✓		✓		✓		✓	✓	✓			✓
Western Sydney International tunnel portal	✓	✓	✓		✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓
Airport Terminal	✓		✓		✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓
Airport construction support site	✓				✓				✓		✓	✓	✓	✓	✓			✓

Note: TBM retrieval would occur outside the Project at the Aerotropolis Station

Figure 3-1 Indicative on-airport construction activities at the Project construction sites

Note: TBM retrieval would occur outside the proposed action at the Aerotropolis Core Station site

#### 3.1. On-airport construction corridor

The on-airport construction corridor is located within the Western Sydney International Stage 1 Construction Impact Zone and consists of the rail corridor between Elizabeth Drive and Airport Business Park Station. The site would support the construction and fit-out of this section of the alignment within Western Sydney International.

A temporary crossing of the Western Sydney International drainage swale may be required to support work within the on-airport construction corridor. The on-airport construction corridor is shown in Figure 3-2.

##### 3.1.1. Airport Business Park

The Airport Business Park construction site is located within the Western Sydney International Stage 1 Construction Impact Zone. The site would support the construction of Airport Business Park Station.

Key construction works would include:

- construction of the rail alignment including earthworks for the transition of the rail alignment from surface to in-cutting
- construction of an access road to Airport Business Park Station from Badgerys Creek Road
- construction of Airport Business Park Station structures, finishes and fitout.

The location and an indicative layout of the construction site, including vehicle access/egress is provided in Figure 3-3.

### 3.1.2. Western Sydney International Tunnel Portal

The Western Sydney International tunnel portal construction site is located within the Western Sydney International Stage 1 Construction Impact Zone, southwest of the Airport Business Park construction site.

Key construction works would include:

- construction of the rail alignment including earthworks for the transition of the rail alignment from in-cutting to in-tunnel
- tunnel boring machine (TBM) launch
- TBM support including spoil handling
- construction of the tunnel portal
- finishing works.

The location and an indicative layout of the construction site, including vehicle access/egress is provided in Figure 3-4.

### 3.1.3. Airport Terminal

The Airport Terminal construction site is located within the Western Sydney International Stage 1 Construction Impact Zone. The site would effectively be separated into two sites, one supporting the construction of Airport Terminal Station and the other supporting tunnelling activities for the Western Sydney International to Bringelly tunnel. Key construction works would include:

- earthworks to accommodate the station and tunnelling activities
- TBM maintenance and relaunch
- TBM support including spoil handling
- construction of Airport Terminal Station structures, finishes and fitout.

The location and an indicative layout of the construction site, including vehicle access/egress is provided in Figure 3-5.

## 3.2. Airport construction support site

The airport construction support site sits across both the Western Sydney International Stage 1 Construction Impact Zone and the area located outside of the Western Sydney International Stage 1 Construction Impact Zone (refer to Figure 2-1) for the boundary between these two areas). The airport construction support site comprises multiple ancillary areas where the key construction activities would include:

- construction and use of haulage roads to support the construction of the proposed action

- activities required for the production and storage of viaduct and tunnel lining segments, including concrete batching, site offices and construction worker car parking
- potential permanent placement of spoil.

The combination of sites would support construction activities at all proposed action construction sites as well as the production of viaduct and tunnel segments to be transported and used both for proposed action and project off-airport construction sites as appropriate. The lining for the tunnel would be assembled from precast concrete segments and installed progressively as the TBM moves forward. The precast concrete tunnel segments, would be manufactured using concrete from a dedicated concrete batching plant and stored at a tunnel segment precast facility, located at the airport construction support site. The precast facility would produce about 300 tunnel lining ring segments per day. The segments would be transported via trucks within Western Sydney International for the proposed action. Precast concrete tunnel segments would also be manufactured at this facility for use in sections of the tunnel located outside of the airport site. The tunnel segments would be transported from the facility on the surrounding road network to their required destination.

The facility will be designed to meet all flood modelling requirements to ensure surface water is diverted from moving across the site and all on-site runoff is captured and treated effectively prior to leaving the site of the concrete batching area and manufacturing storage facility. The location and an indicative layout of the tunnel and viaduct segment production and storage area, including vehicle access/egress is provided in Figure 3-6.

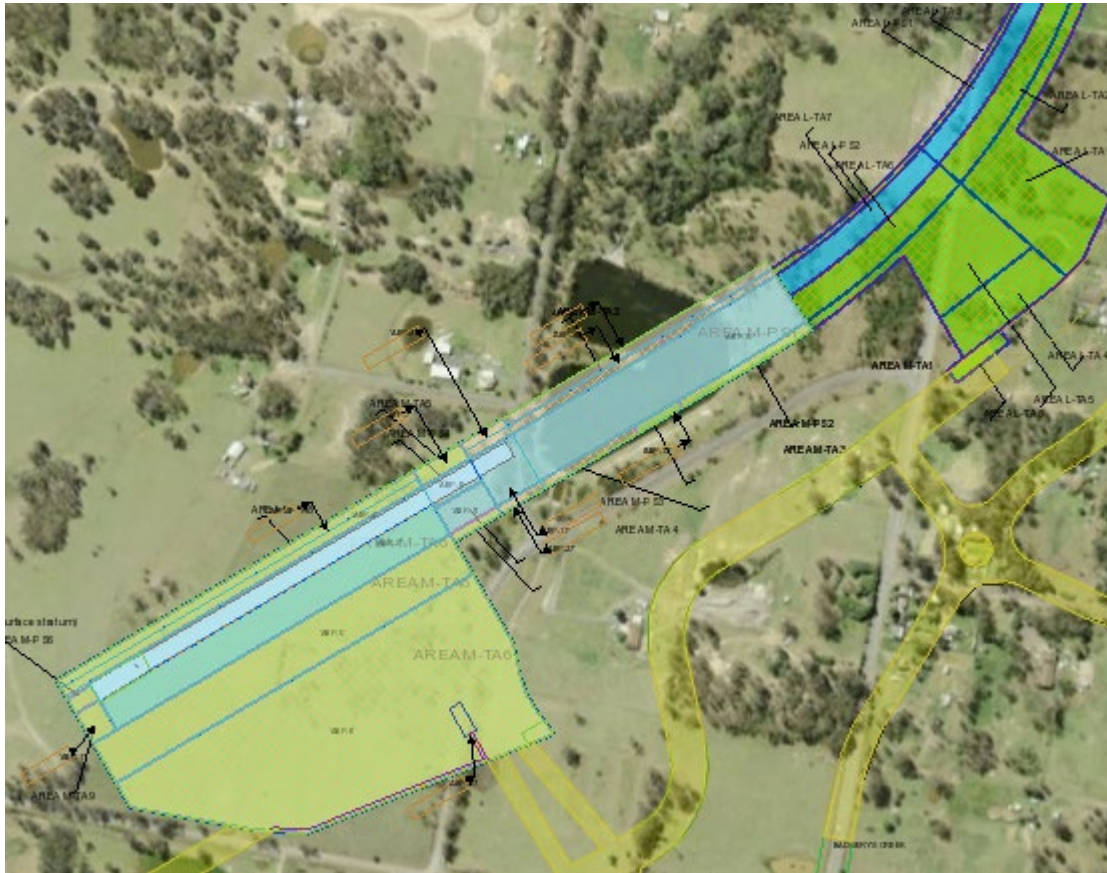


Figure 3-2 Airport Business Park and Tunnel Portal indicative construction site



Figure 3-3 Airport Terminal indicative construction site layout



Figure 3-4 Tunnel and viaduct segment production and storage inactive construction site layout



### **3.2.1. Potential permanent spoil placement areas**

An opportunity has been identified to reuse material from the project as fill material for future development at Western Sydney International. Subject to relevant approvals and agreement with Western Sydney Airport, spoil from both within and outside of the airport site could be placed at permanent spoil placements areas.

The potential permanent spoil placement areas form part of the airport construction support site. Up to 1.9 million cubic metres of spoil could be permanently placed on-airport. Further design work and consideration of compaction levels has determined that 1.9 million cubic metres of spoil cannot be wholly accommodated at the permanent spoil placement area identified within the Draft Environmental Impact Assessment so a second area has been identified, in consultation with Western Sydney Airport (refer to Figure 2-7).

The extent to which the potential permanent spoil placement areas are used would be confirmed during design development and construction planning in agreement with Western Sydney Airport. The placement of spoil would avoid the Environmental Conservation Zone along Badgerys Creek (discussed further below). The potential permanent spoil placement areas will be accessed from the proposed construction haul road network within the airport site.

The Rail Development has developed a number of mitigation measures to address potential impacts as a result of the permanent placement area. These are in place to protect the ECZ, Badgerys Creek, the surrounding landscape and any erosion and sediment or contamination which could result as a result of poor management of spoil.

These measures can be found in the risk, management and monitoring sections of the Biodiversity, the Soil and Water, the Traffic and Access and Visual and Landscape and Waste and Resources CEMPs.

The proposed potential permanent spoil placement areas are located outside of the Western Sydney International Stage 1 Construction Impact Zone (refer to Figure 2-8). The location of these areas has been determined in consultation with Western Sydney Airport to align with future development needs. Authorisation for the long-term management of the permanent spoil placement areas would be the responsibility of Western Sydney Airport. In accordance with the RID, Sydney Metro will manage the excavated material within the permanent spoil placement area in consultation with the Airport Environmental Officer.

### **3.2.2. Tunnel and viaduct segment production and storage**

Isolated remnant native vegetation is present in the area to the south and southeast of this construction site. Vegetation outside of the construction footprint for this site would not be disturbed. To minimise edge effects and indirect impacts associated with noise, light and weeds on surrounding biodiversity values, a 20 metre buffer was identified around the outer limit of the south and south east boundaries of this site to protect the nearby remnant native vegetation in moderate to good condition (refer to Figure 2-9).



Figure 3-5 permanent spoil placement area- buffer zones

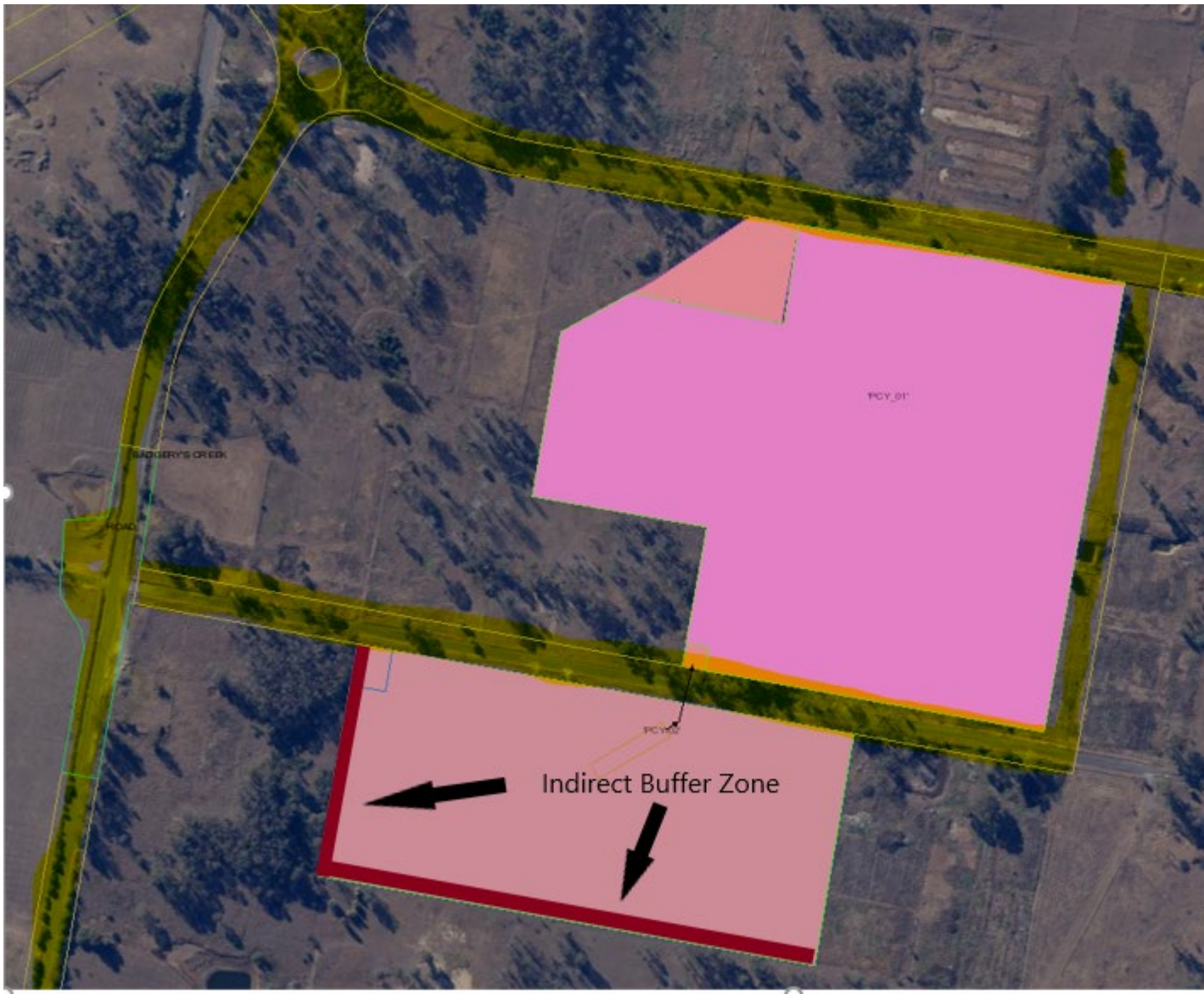


Figure 3-6 Tunnel and viaduct segment production and storage construction site- buffer zones

## 4. Construction methods

### 4.1. Tunnelling and associated works

The tunnel and excavation method would be driven by ground conditions likely to be encountered during construction, the project design and program. Based on the current understanding of the existing ground conditions, the proposed methodology for the proposed action is to utilise a bored tunnel approach. The methodology described below is indicative and would be developed by the construction contractor(s) when appointed and will be detailed in the Construction (Rail) Plan [refer to Chapter 8.0 of the SMWSA EIA (Environmental management and mitigation)].

A summary of this indicative construction methodology is provided below.

#### 4.1.1. Bored tunnel construction methodology

A TBM typically consists of a shielded cutting head and trailing backup support services and mechanisms. At the front of the shield is a rotating cutter head (shown in Figure 2-10) and behind the cutter head is a chamber where the excavated spoil would be collected and transferred via a conveyor or slurry pipe back to the TBM launch site or other retrieval point as required. The TBM would be propelled forward by hydraulic jacks pushing off the previously excavated sections of rock. Gaps between the excavated tunnel wall and the tunnel lining would be filled with cement-based grout.

It is anticipated that two TBMs would be required for the Western Sydney International to Bringelly tunnel.

The lining for the tunnel would be assembled from precast concrete segments and installed progressively as the TBM moves forward. The precast concrete tunnel segments, would be manufactured using concrete from a dedicated concrete batching plant and stored at a tunnel segment precast facility, located at the airport construction support site (see Section 4.2.3 of SMWSA EIA and example in figure 4-1 below). The precast facility would produce about 300 tunnel lining ring segments per day. The segments would be transported via trucks within Western Sydney International for the proposed action. Precast concrete tunnel segments would also be manufactured at this facility for use in sections of the tunnel located outside of the airport site. The tunnel segments would be transported from the facility on the surrounding road network to their required destination.

The estimated rate of tunnel advance by the TBMs would be around 100 metres per week.

**Figure 4-1 Photo of a tunnel boring machine at Epping Station on the Metro North West Line**





**Figure 4-2 Photo of the tunnel segment storage area at Marrickville for the Sydney Metro City & Southwest project (indicative example of the proposed facility within Western Sydney International)**

#### 4.1.2. Tunnel boring machine launch and retrieval

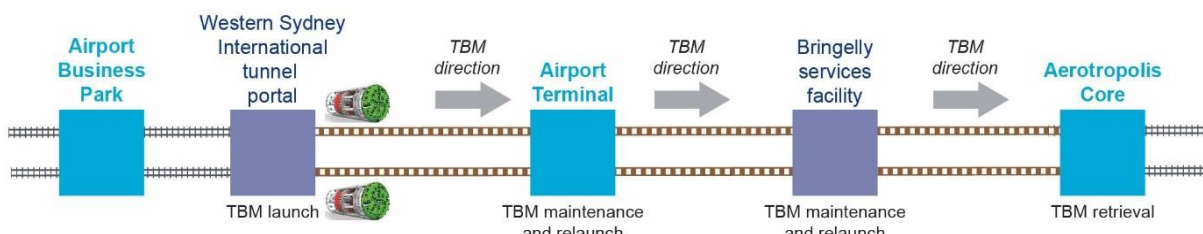
The indicative strategy for launch and retrieval of the two TBMs for the Western Sydney International to Bringelly tunnel is as follows:

- both TBMs would be launched from the Western Sydney International tunnel portal construction site and driven south-west towards the Airport Terminal construction site. TBM support activities would be carried out at the Western Sydney International tunnel portal construction site until the TBM reaches the Airport Terminal construction site
- the TBMs would receive maintenance west of the Airport Terminal station box before being relaunched to the southeast towards the Bringelly services facility. At this time, relevant infrastructure to support TBM operations including grout plant(s) and ventilation fans would be relocated (as required) from the Western Sydney International tunnel portal construction site to the Airport Terminal construction site. TBM support activities (including spoil handling) would commence from this location and continue until tunnelling is completed
- at the Bringelly services facility (see Section 4.1.4 of the SMWSA EIA), the TBMs would receive maintenance before being relaunched southeast towards the Aerotropolis Core construction site
- on completion of tunnelling, the TBMs would be disassembled and retrieved from a temporary shaft excavated at the Aerotropolis Core construction site. The shaft would be decommissioned and backfilled following the retrieval of the TBMs.

Tunnel spoil would be removed from the Western Sydney International tunnel portal and Airport Terminal construction sites. See Section 4.2.9 of the SMWSA EIA for further information regarding spoil management.

**Figure 4-3 Indicative Western Sydney International to Bringelly TBM strategy**

#### WESTERN SYDNEY INTERNATIONAL TO BRINGELLY TBM STRATEGY



### 4.1.3. Tunnel boring machine support activities

TBM operations require surface construction areas for logistics support and material handling including:

- TBM delivery, assembly and commissioning
- high voltage power supply
- fresh air ventilation (fresh air ventilation fans would operate 24 hours per day, seven days per week during tunnelling)
- water supply
- drainage and water treatment plant
- grout plants
- spoil handling, stockpiling and removal facilities
- workforce facilities
- acoustic shed if required to mitigate environmental impacts.

TBM support activities would primarily be carried out at the following construction sites:

- Western Sydney International tunnel portal site
- Airport Terminal construction site.

### 4.1.4. Tunnel portal construction

A tunnel portal would be constructed about 400 metres southwest of Airport Business Park Station (the northern extent of the Western Sydney International to Bringelly tunnel). A dive structure would be constructed at the tunnel portal to transition the rail track from surface to in-tunnel through the portal.

Construction of the dive structure and tunnel portal would generally involve:

- piling along the edge of the dive structure to form the walls
- excavating below proposed track level
- placing of precast and cast in-situ concrete for the cut-and-cover section and to form the tunnel portal.

A tunnel ventilation facility would also be provided as part of the tunnel portal (see Section 4.1.4 of the SMWSA EIA).

### 4.1.5. Other tunnel excavations

Cross-passages would be excavated between bored twin tunnels roughly every 240 metres using small roadheaders (specialised excavation machines) and/or excavators with rock hammers.

Additionally, rooms would be excavated with rock hammers at various points along the bored twin tunnels for rail systems services.

### 4.1.6. Corridor and associated works

Earthworks (for example, cuttings and embankments) would be required in the On-airport construction corridor (see Figure 2-1) to achieve required levels for the surface track alignment. Sections of cut and embankment batters would not typically require structural support; however, where necessary structural support can be provided by retaining walls, piles and soil nails. Earthworks would also be required along the proposed action alignment for drainage structures and water quality basins.

The general sequence for earthworks would be as follows:

- ground stabilisation works as required
- construction of bored pile wall or similar infrastructure where required
- earthworks cut and fill to design levels

- construction of retaining structures and drainage elements where required as the earthworks progresses.

#### 4.1.7. Stations and associated works

Two stations are proposed as part of the proposed action. The construction method for the stations is summarised in Table 4-1 with further detail provided below. The methodology described below is indicative and would be confirmed by the construction contractor(s) when appointed.

The construction of the stations would consist of structural works (for the station box) and station fitout works. Station fitout works are generally similar for the two stations and the methodology for these works is described in Section 4.2.7 of the SMWSA EIA.

Station	Vertical alignment	Construction method (structural works)
Airport Business Park	Surface (shallow cutting)	Surface
Airport Terminal	Underground	Cut-and-cover box

Table 4-1 Indicative station construction method

Where the design and site conditions allow, stations would be constructed using modular design elements to minimise the construction timeframes. This approach involves the installation of structures (for example, station buildings and canopies) comprising modularised components.

#### 4.1.8. Surface station construction method

Surface station construction is proposed at Airport Business Park Station. At this location the rail track transitions from surface to in-cutting. The station would be constructed at the surface level (or slightly below) relative to the finished surface level at Western Sydney International. The excavation method for the surface station would be consistent with typical minor excavation and levelling works.

Structural works for the surface level station would involve the construction of:

- support columns and foundations for vertical transport structures and the station buildings
- the platform structure
- vertical transport structure and the pedestrian accesses
- the platform canopy
- the emergency egress stairs
- the station buildings.

The structures outlined above would be constructed using a combination of:

- conventional formwork and cast in situ concrete
- precast concrete elements
- pre-fabricated steel structures and
- standard blockwork and/or steel framing.

The construction of the station buildings would occur concurrently with the station construction.

#### 4.1.9. Cut-and-cover station construction method

Cut-and-cover construction is proposed for Airport Terminal Station. A typical construction method for cut-and-cover station excavation would involve excavating the station from the surface and using pile walls to support the surrounding soil and rock.

Structural works for the underground stations would involve the construction of:

- platforms
- vertical supports
- mezzanine levels and rooms
- roof slabs (covering the station box).

The structures outlined above would be constructed using a combination of:

- conventional formwork and cast in situ concrete
- precast concrete elements
- pre-fabricated steel structures and
- pre-fabricated platform canopy components.

#### 4.1.10. Station fitout, precinct and transport integration works

The mechanical and electrical fitout of the stations consists of two major elements, the rail systems located at the stations and the services required for the function of the stations. For the underground Airport Terminal Station, the initial fitout of mechanical and electrical services would occur concurrently with the structural works via openings left in the floors and roof structure. This would include the installation of large equipment such as ventilation fans. The final fitout of mechanical and electrical services would occur after the completion of structural works and concurrently with the architectural fitout.

The architectural fitout of the stations would occur on completion of the station structural works and involves the final finishes for the stations, such as glazing, wall and ceiling cladding, and floor finishes.

The precinct and transport interchange works for Airport Business Park Station and Airport Terminal Station would be provided as part of the wider development of Western Sydney International. The elements to be constructed at each station is detailed in Section 4.1.3 of the SMWSA EIA.

#### 4.1.11. Rail systems fitout

The rail systems fitout works are described in Table 4-2. Indicative access points for the rail systems fitout would be via the construction sites described in Section 4.2.3 of the SMWSA EIA. Access points would be confirmed by the construction contractor(s) when appointed

Item	Work
Ventilation	The majority of tunnel ventilation equipment for the proposed action would be located at the tunnel portal facility, stations and services facility (the latter to be constructed as part of the project off-airport).
Track slab and rail fastening	The track slab would be formed by mass concrete pours with rail fasteners incorporated into the pours. Rail fasteners would be designed to mitigate operational noise and vibration where required. Ballast track form may also be used for surface sections of track.



<p>Rail track installation, fixing and welding</p>	<p>Rail track would be delivered to the access points at each of the construction sites. Where there is surface access to the tunnels (i.e. the tunnel portal), rail track sections would be welded together in lengths and then transported underground.</p> <p>Where there is no surface access to the tunnel, standard rail lengths would be delivered and lowered down via access shafts such as at the Airport Terminal construction site.</p> <p>For the surface rail, rail would be delivered to site and welded or pre-welded in the casting yard and delivered to site and welded into position.</p>
<p>Cable and equipment installation</p>	<p>Dedicated cable routes would be provided within the tunnel environment for signalling, communications and electricity and surface sections.</p> <p>Signal equipment rooms would be provided at each station and alongside the surface alignment as required. Communication rooms would also be provided at each station.</p> <p>Galvanised steel troughs and poles and masts for communications systems and lighting would also be provided.</p>
<p>Overhead wiring</p>	<p>For the tunnels, overhead wiring would be installed at regular intervals on the track.</p> <p>For surface rail, overhead wiring structures would be installed into the track subgrade.</p>

Table 4-2 Rail systems fitout

## 5. Finishing works and testing and commissioning

### 5.1. Finishing works

Following the completion of the main construction works, the contractor would remove construction equipment from the construction sites. Where relevant, sites that were occupied temporarily and do not form part of the operational footprint for the proposed action would be returned in condition agreed to with Western Sydney Airport.

Any landscaping works required would be consistent with the Airport Plan and with Western Sydney Airport's intentions for these locations.

### 5.2. Testing and commissioning

Testing and commissioning of the rail line and communication/signalling systems would be carried out to ensure that all systems and infrastructure have been installed and are operating according to Sydney Metro's operational requirements.

Once all services are installed, testing and commissioning of the whole system would occur. During the final stages of commissioning, test trains would run on the line to test the signalling system and controls and the traction power supply.

### 5.3. Approach to identifying and selecting additional construction related elements

As set out in the Final EIA, while every endeavour has been made to identify and quantify the likely land requirements for construction of the proposed action, the construction contractor or Western Sydney Airport may require changes to elements of construction. This may include:

- additional or revised construction haulage routes and refinements to the construction sites and potential permanent spoil placement areas
- changes to water quality and detention basins
- additional utility works (or other minor construction works) outside of the construction footprint.

Any changes to the works will be managed through construction planning and, consultation with Western Sydney Airport. Changes to elements of construction will be reviewed against the Sydney Metro – Western Sydney Airport Final EIA and the relevant conditions of approval within the Airport Plan September 2021, with consideration of what level of flexibility was provided in the planning documentation. These reviews will be documented using Sydney Metro's planning approval procedures and templates.

## 6. Construction equipment, resources and materials

### 6.1. Construction hours

The majority of the station fitout and other above ground construction activities would be carried out during standard construction hours, as defined by the Interim Construction Noise Guideline and the Western Sydney Airport Noise and Vibration Construction Environmental Management Plan (Western Sydney Airport, 2019f):

- 7am to 6pm Monday to Friday
- 8am to 1pm Saturdays
- no works on Sundays or public holidays.

Activities resulting in impulsive or tonal noise emissions would generally be limited to these hours. Activities that may be carried out outside the standard construction hours would include:

- tunnelling works and other underground works
- works within acoustic sheds
- tunnel fitout and associated works
- underground station fitout works
- spoil haulage, deliveries and TBM activities at Western Sydney International tunnel portal and the Airport Terminal
- spoil haulage associated with placement of material at the potential permanent spoil placement areas within the airport construction support site
- activities at the tunnel segment precast facility within the airport construction support site, including transport of material to support segment production and segment deliveries
- the delivery of oversized materials or materials outside approved hours as required by the NSW Police or other authorities for safety reasons
- emergency situations where it is required to avoid the loss of lives and property and/or to prevent environmental harm
- testing and commissioning
- other works (e.g. utility works).

With the exception of emergencies, activities would not take place outside standard construction hours without prior notification of Western Sydney Airport and the affected community.

In relation to on-airport out-of-hours work, this would be undertaken in accordance with the existing Western Sydney Airport out-of-hours work procedure.

### 6.2. Plant and Equipment

The indicative plant and equipment expected to be used during construction of the proposed action is summarised in Figure 6-1. The actual plant and equipment used at each work site would be confirmed by the construction contractor(s).

Location	Bulldozer	Compressor	Concrete pump	Concrete truck	Roadheader	Concrete saw	Crusher	Excavator	Generator	Gantry crane	Hand tools	Jackhammer	Mobile crane	Pile boring rig	TBM	Vibratory roller	Water cart
<b>On-airport</b>																	
On-airport construction corridor	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓		✓		✓	✓
Airport Business Park	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓			✓	✓
Western Sydney International  tunnel portal site	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Airport Terminal	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Airport construction support site	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓			✓	✓

Figure 6-1 Plant and equipment at proposed construction sites

### 6.3. Water requirements

A combination of recycled and potable water would be used during construction for activities such as tunnelling, earthworks, site facilities, dust suppression, concreting and landscaping. Water would be sourced from water treatment plants, sedimentation basins and rainwater tanks where feasible. Temporary Water mains for the TBM and manufacturing facilities and any other water supply will be installed through the airport site and along Longleys Road and parts of Badgerys Creek Road.

### 6.4. Power supply

High voltage construction power would likely be provided to the Western Sydney International tunnel portal construction site to support tunnelling activities via a new connection from the existing Kemps Creek substation located at Devonshire Road, Kemps Creek (to the east of Western Sydney International). Generators may be used for construction power before the mains power supply becoming available.

The construction power route would primarily be constructed in areas outside of the airport site with only a small section of the route proposed to be constructed within Western Sydney International.

The extent of the indicative construction power supply route within Western Sydney International would generally follow internal Western Sydney International roads or temporary haulage roads for the proposed action. The construction power route is expected to enter the airport site from the east along Pitt Street via an under bore under the ECZ and then trenched.

### 6.5. Utility protection, adjustment and relocation

There are a number of active and disused utilities within the construction footprint of the proposed action. Utilities that are located both above ground and below ground have the potential to be affected by construction of the proposed action.

The locations of utilities have been identified based on Dial Before You Dig searches and a review of utility data, including as-built surveys, and agency and council records. The utility provider within the airport site is Western Sydney Airport (power, communications and stormwater infrastructure).

Where an existing utility conflicts with the proposed action, it may be necessary to:

- provide physical protection for the utility, where the utility is not directly affected but may be indirectly affected by vibration or accidental impact
- modify construction methods to avoid impacting a nearby utility
- divert the utility around the construction footprint.

## 7. Construction traffic and access

Haulage routes for vehicles accessing the proposed action construction footprint are provided in Section 7.1 of the SMWSA EIA. Additional or revised construction haulage routes and refinements to the construction sites and potential permanent spoil placement areas within Western Sydney International may be required during design development and construction planning, subject to agreement with Western Sydney Airport.

The indicative temporary access and egress to construction sites would be subject to confirmation by the construction contractor(s) and Western Sydney Airport. Further information relating to construction traffic impacts is provided in Section 7.1 of the SM - WSA EIA. For the proposed action, indicative road network adjustments are anticipated to include:

- minor modification to a Western Sydney International internal access road to connect to temporary haulage roads (located within the on-airport construction corridor)
- upgrade to sections of Longleys Road and Badgerys Creek Road, including intersection works where Longleys Road and Badgerys Creek Road intersect to provide heavy vehicle access.
- an additional haulage route accessing the potential permanent spoil placement areas from Badgerys Creek Road is subject to further design development and is being considered to minimise spoil haulage distances and to reduce the number of heavy vehicles accessing the on-airport haulage roads from the intersection of Badgerys Creek Road and Longleys Road.

Measures to manage potential traffic impacts associated with temporary road modifications are described in Section 8.4 of the SMWSA EIA.

## 8. Other construction elements

### 8.1. Site investigations and subsequent works

Detailed investigations would be required before the start of main construction works. Detailed investigations that would be carried out as preparatory activities would include:

- site survey
- utility investigations
- geotechnical investigations including groundwater monitoring
- contamination investigations and subsequent remediation works (if required).

### 8.2. Vegetation clearing

It has been assumed that all vegetation within the Western Sydney International Stage 1 Construction Impact Zone has already been cleared as part of the Stage 1 airport development.

As part of the proposed action additional vegetation clearing will be required in some areas outside of the Western Sydney International Stage 1 Construction Impact Zone. The construction footprint has been located to minimise the need for vegetation clearing in these areas, where possible. The location of each biodiversity offset area is shown in Figure 8-1.



Figure 8-1 Project on-airport stages and biodiversity offset areas (Sydney Metro – Western Sydney Airport Biodiversity Staging Report, October 2021)

No vegetation clearing is proposed within the Environmental Conservation Zone (ECZ) along Badgerys Creek. A Part 13 permit may be required under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to enable clearing of listed threatened species to occur.

### 8.3. Spoil management

Indicative cut and fill volumes along the proposed action alignment are summarised in Table 8-1. The volumes include earthworks required to achieve required ground surface levels for surface (shallow cut and embankment) and in-cutting sections as well as the construction of the bored twin tunnels and the excavation of station boxes.

Location	Cut volume (m <sup>3</sup> )	Fill volume (m <sup>3</sup> )
Western Sydney International - Elizabeth Drive to Airport Business Park	130,000	75,000
Airport Business Park	25,000	15,000
Airport construction support site	65,000	65,000
Airport Business Park to Aerotropolis Core (including Airport Terminal and Western Sydney International to Bringelly tunnel)	1,065,000	75,000
<b>Total</b>	<b>1,285,000</b>	<b>230,000</b>
<b>Balance</b>	<b>1,055,000 surplus</b>	

Table 8-1 Indicative cut and fill volumes

The estimates are based on the assumption that cut material can be used as fill for the project, which may not be the case if unsuitable material is encountered during earthworks. Fill volumes do not include reuse opportunities beyond the project which would reduce surplus volumes. Spoil volumes would be confirmed by the construction contractor(s) when appointed.

As discussed in Section 4.2.3 of the SMWSA EIA, up to 1.9 million cubic metres of spoil could be permanently placed on- airport within the potential permanent spoil placement areas at the airport construction support site. The reuse of spoil at this location would reduce potential impacts that would otherwise be associated with the movement of this spoil to other reuse locations via the public road network. Reuse of spoil within Western Sydney International would be performed in accordance with the Airport Plan, Construction (Rail) Plan and any relevant CEMPs, including any subsequent variations to those plans. Other opportunities to reuse spoil would also continue to be investigated as the project design progresses.

This could involve use of spoil as fill material elsewhere within the proposed action construction footprint, within the project construction footprint outside of the airport site or possibly by other projects in the area, such as the future M12 Motorway project. Temporary stockpiling sites would be established as required throughout the construction footprint for the proposed action. This would include stockpiling sites to stockpile material excavated from the tunnel as well as other sources of excavated material from the proposed action.



Spoil removal from construction sites would be via trucks on the road network. Refer to 7.1 for details on haulage routes and Section 7.10 of the SMWSA EIA for further information regarding spoil management

## 8.4. Construction water management

### 8.4.1. Treated water discharge

The excavation of the tunnels and Airport Terminal Station and shaft are likely to intercept groundwater, resulting in the need to capture, treat and reuse or discharge water. Where appropriate, treated water would be re-circulated to the tunnel cutting face and used for surface dust suppression.

Treated water that cannot be recirculated would be discharged from the sites via construction water treatment plants (refer to Table 8-2). The reuse of treated water would be maximised during the construction works. Where surplus treated water needs to be discharged from the sites, subject to the relevant performance outcomes in Chapter 8.0 (Environmental management and mitigation), it may be discharged to Badgerys Creek via Western Sydney International swale.

Other reuse options including Sydney Water trade waste agreement(s) and use of treated water at Western Sydney International and other nearby projects (such as the future M12 Motorway) would be investigated during construction planning.

Location	Discharge point	Indicative discharge volume when discharging (litres per second)
Western Sydney International tunnel portal	Badgerys Creek via Western Sydney International swale	10-50
Airport Terminal	Badgerys Creek via Western Sydney International swale	10-25

Table 8-2 Indicative Treated water discharge from construction water treatment plants

### 8.4.2. Surface water management

Surface water management at the construction sites would be managed through the implementation of standard erosion and sediment control mitigation measures in accordance with the SM-WSA Soil and Water (SW) CEMP which has been developed to be consistent with the WSA SW CEMP.

Within Western Sydney International, construction water would be pumped to water quality basins, treated and then reused or discharged via constructed swales to Badgerys Creek or left to evaporate in the surrounding landscape.

Opportunities would be considered to maximise the reuse of construction water.

## 9. Environmental Management

### 9.1. Meeting AEPR Requirements

The Airport Plan introduces the requirements for this plan and the Sustainability, Community Plans and CEMPs as well as an obligation for the Project to meet the requirements of the Airports (Environment Protection) Regulations 1997. While all efforts have been made to incorporate the AEPR requirements within the forementioned plans, there is an obligation to expressly acknowledge where the Project needs to meet the AEPR requirements.

In particular, the Project needs to ensure it maintains the principles under the AEPR of not polluting, preserving habitat and preventing offensive noise being emitted from the Project site. This is especially important for the ECZ particularly adjacent to the permanent spoil placement areas where surface and groundwater, biota and indigenous heritage sites, the CEMPs will ensure that due diligence occurs prior to any clearing and that management measures are implemented to manage erosion and sediment control and that any contaminants are identified and controlled.

The permanent spoil stockpile areas will be designed with slopes and height to ensure stability as well as installing measures such as fencing, bunding and vegetation to manage movement of materials. These measures include procedures, hold points, the implementation of buffers, on and off-site water management, inductions, inspections, monitoring programs and audits. Remedial Action Plans will be developed for of known contamination and the management thereof with unexpected finds procedures for any potential unknown occurrences.

Monitoring programs will ensure water and air quality does not exceed the accepted limits of contamination. Measures are also included in the CEMPs to address any exceedances.

### 9.2. Environmental Management and link to the CEMPs

While this Construction (Rail) Plan describes the activities associated with the SM – WSA Rail Development, it is linked to the 9 mandatory CEMPs and the Sustainability and Communications Plan. These together form the Environmental Management System for SM – WSA. This section will link the CEMPs with the activities described above in Table 9-1 below.



Location	Activity	Aspect	Potential Impacts	CEMP
Surface alignment from Elizabeth Drive	Earthworks Rail placement	Bulk earthworks Soil movement and transfer Material stockpiles and emplacement areas Bridge construction and waterway crossings Operation of compounds Movement of vehicles Use of artificial lights	Site conditions and prior site disturbance Water quality Soil types and the mobilisation of sediments Contamination and pollution Visual impacts Traffic impacts	Traffic and Access Noise and Vibration Landscape and Visual Waste and Resources Air Quality Soil and Water Cumulative Impacts Plan Community Communications
Airport Business Park	Excavation structural works (for the station box) station fitout works	Bulk earthworks Soil movement and transfer Indirect Off-road human and vehicular activity during and after construction	Water quality impacts associated with the discharge of process and treated wastewater from tunnelling Influence on drawdown of groundwater around the site Noise and Vibration Visual impacts	Traffic and Access Noise and Vibration Landscape and Visual Waste and Resources Air Quality Soil and Water Cumulative Impacts Plan Community Communications
Western Sydney International Tunnel Portal	Ground stabilisation works as required Construction of bored pile wall or similar infrastructure where required Earthworks cut and fill to design levels	Bulk earthworks Soil movement and transfer Segment installation Movement of vehicles Use of artificial lights	Water quality impacts associated with the discharge of process and treated wastewater from tunnelling Influence on drawdown of groundwater around the site Traffic impacts Materials management, handling and stockpiling Light spill Noise	Traffic and Access Noise and Vibration Landscape and Visual Waste and Resources Air Quality Soil and Water Cumulative Impacts Plan Community Communications



Tunnelling		<p>Truck movements                  Spoil production                  Interaction with Groundwater                  Wastewater collection and treatment                  Materials management, handling and stockpiling</p>	<p>Water quality impacts associated with the discharge of process and treated wastewater from tunnelling                  Influence on drawdown of groundwater around the site                  Spoil management and containment                  Potential contamination                  Vibration</p>	<p>Traffic and Access                  Noise and Vibration                  Landscape and Visual                  Waste and Resources                  Air Quality                  Soil and Water                  Cumulative Impacts Plan                  Community Communications</p>
Potential permanent spoil placement areas		<p>Bulk earthworks                  Soil movement and transfer                  Material stockpiles and emplacement areas                  Concrete production                  Segment manufacture                  Operation of compounds                  Movement of vehicles                  Use of artificial lights                  Clearing native vegetation                  Topsoil stripping                  Bulk earthworks                  Soil movement and transfer                  Material stockpiles and emplacement areas                  Operation of stockpile area                  Movement of vehicles</p>	<p>Sediment-laden runoff entering into ECZ (affecting biodiversity and heritage - Inadvertent damage to Aboriginal items via Soil disturbance through excessive erosion from surface water runoff) and potentially Badgerys Creek.                  Contamination of stormwater runoff due to construction activities (including accidental spills) and runoff of spoil.                  Changes to flow regime from new infrastructure.                  Uncontrolled discharge of process water into the stormwater system.                  Loss of native vegetation                  Loss of potential habitat                  Potential for fauna mortality                  Potential for increase in weeds and pathogens</p>	<p>Aboriginal Cultural Heritage                  European and Other Heritage                  Traffic and Access                  Noise and Vibration                  Landscape and Visual                  Waste and Resources                  Air Quality                  Soil and Water                  Biodiversity (including seed collection)                  Cumulative Impacts Plan                  Community Communications</p>
Tunnel and viaduct segment production and storage		<p>Clearing native vegetation                  Topsoil stripping</p>	<p>Sediment-laden runoff entering into ECZ (affecting biodiversity and heritage) and potentially Badgerys</p>	<p>Aboriginal Cultural Heritage                  European and Other Heritage</p>



		<p>Bulk earthworks                  Soil movement and transfer                  The transport of materials to site                  Material stockpiles and emplacement areas                  Concrete production                  Segment manufacture                  Operation of compounds                  Movement of vehicles                  Use of artificial lights</p>	<p>Creek.                  Contamination of stormwater runoff due to construction activities (including accidental spills).                  Changes to flow regime from new infrastructure.                  Uncontrolled discharge of process water into the stormwater system.                  Loss of native vegetation                  Loss of potential habitat                  Potential for increase in weeds and pathogens                  Damage to the road surface by construction heavy vehicles</p>	<p>Traffic and Access                  Noise and Vibration                  Landscape and Visual                  Waste and Resources                  Air Quality                  Soil and Water                  Biodiversity (including seed collection)                  Cumulative Impacts Plan                  Community Communications</p>
Utilities		<p>Road improvements and upgrades                  Clearing, grubbing and surface earthworks                  Drainage construction                  Horizontal Directional Drilling                  Operation of compounds and facilities                  Construction works that directly interface with the public.</p>	<p>Traffic queuing and increased travel times                  Noise and vibration                  Reduced access to public facilities</p>	<p>Aboriginal Cultural Heritage                  European and Other Heritage                  Traffic and Access                  Noise and Vibration                  Landscape and Visual                  Waste and Resources                  Air Quality                  Soil and Water                  Biodiversity (including seed collection)                  Cumulative Impacts Plan                  Community Communications</p>

**Unclassified**

**Sydney Metro – Integrated Management System (IMS)**

**(Uncontrolled when printed)**



### 9.3. Management of the Environmental Conservation Zone buffer

The airport construction support site has been located outside of the Environmental Conservation Zone consistent with the intent of the Airport Plan and recognising the environmental values of Badgerys Creek and associated remnant native vegetation. Acknowledging that Badgerys Creek is a 4th order waterway, a riparian buffer of 40 metres (measured from top of bank) was identified, consistent with the NSW waterway guidelines and NSW Biodiversity Assessment Method (BAM).

In addition, to further minimise edge effects and indirect impacts associated with noise, light and weeds on surrounding biodiversity values, a 20 metre buffer was identified around the outer limit of remnant native vegetation adjacent to Badgerys Creek, including vegetation that lay outside the 40 metre riparian buffer already identified.

The layout of the construction footprint within the airport construction support site (which accommodates the potential permanent spoil placement areas and related activities, as well as associated environmental protection control features such as sedimentation ponds) has been altered to ensure these buffers are not impacted. Given the Western Sydney International setting is within a predominately cleared agricultural landscape already subject to a wide range of disturbances, the maintenance of these prescribed buffer distances and the associated distances are considered suitable to minimise edge effects and indirect impacts on surrounding environmental values.

## 10. Western Sydney International Stage 1 project interface

Construction of the proposed action within the Western Sydney International Stage 1 Construction Impact Zone is likely to begin on a cleared and level site. Ongoing consultation with Western Sydney Airport has ensured the design of temporary proposed action infrastructure also considers the temporary infrastructure required for construction of the Western Sydney International Stage 1 project. In addition, construction planning for the proposed action has taken into consideration the WSA Construction Plan.

Construction activities and infrastructure for the proposed action that would occur outside the Western Sydney International Stage 1 Construction Impact Zone (wholly or partially) would include:

- activities required for tunnel and viaduct segment manufacture and storage
- potential permanent spoil placement areas
- upgrade at the intersection of Longleys Road and Badgerys Creek Road
- temporary haulage roads
- site offices and construction worker car parking. Refer Figure 2-1 for further information.

A number of internal roads are being delivered in this area as part of the Western Sydney International project. Internal vehicle access arrangements for the proposed action have been developed to utilise these roads where possible. Temporary haulage roads for the proposed action would be constructed to connect the Western Sydney International internal roads to construction infrastructure for the proposed action.

Construction planning for the proposed action has considered the initial design of the intersection (roundabout) with Elizabeth Drive and the realigned Badgerys Creek Road and would deliver an additional northbound exit for the intersection to facilitate construction vehicle access to the off-airport construction corridor as well as a separate new access to the west to access the on-airport construction corridor. This is not part of the proposed action but is provided for context.

There would be continued consultation between Sydney Metro and Western Sydney Airport as part of the ongoing development of the construction approach for the two projects. Opportunities for the construction of the proposed action to integrate with construction activities for Western Sydney International would be developed as the project design and construction planning is refined.

### 10.1. Cumulative Impacts

Cumulative impacts are defined as impacts caused from the activities carried out by or on behalf of WSA and SM-WSA concurrently, in relation to the construction of the WSI and SM-WSA respectively, which are greater than the impacts of only one of these developments being constructed, and which:

- a) are the subject of investigation by the Airport Environment Officer; or
- b) are the subject of complaints from third parties; or
- c) are likely, if not addressed, to place WSA or SM-WSA in breach of its obligations under the relevant regulations or conditions of an Approval relating to:
  - i. Air quality



- ii. Noise
- iii. Water quality (surface water and groundwater)
- iv. Vibration
- v. Night works (out-of-hours)
- vi. Traffic changes due to cumulative impacts of construction of the initial airport development (WSA) and initial rail development (SM-WSA).

Cumulative impacts also include offsite impacts arising from the construction of the WSI and SMWSA. A Cumulative Impacts Plan has been developed by WSA to provide a tool and structure for the WSA and SM-WSA Projects to use to identify potential cumulative impacts and develop processes to prevent the cumulative impacts or implement mitigation measures which will control the outcomes of the activities.

A robust identification process has been implemented through the plan as well as monitoring and reporting requirements which meet the current CEMP requirements for each Project.

## 10.2. Compliance with the Land Use Plan

### 10.2.1. Land Use Categories

The on-airport support sites are located within the:

- BD2 Business Development (Reservation) (155ha); and
- AD4 Aviation Reservation (511 ha)

### 10.2.2. BD2 Business Development (Reservation)

The following activities are in the BD2 area:

- Link, Pitt and Longleys Roads upgrades
- Precast yards for both SCAW and SBT

These proposed road works activities would be defined as “Other requirements” under Part 2 of the Airport Plan and have been designed to meet Australian Road standards to be capable of operating for the duration of the Rail Development. These roads are temporary roads which will be removed and rehabilitated at the end of the Rail Development requirements, but meet the ABC design and other requirements in that time. The roads are being constructed to assist the Rail Development and ultimately the implementation of the Rail Access as per Condition 2.1.9.4. The works will not interfere with the final airport design nor its operation.

The works comply with permissible uses of BD2 in the interim and meet the overarching requirements.

### 10.2.3. AD4 Aviation Reservation

The following activities are in the AD4 area:

- Permanent Spoil Placement Areas

These activities fit in with the allowable activities of the airport land use zones as they:

- will not render the land unfit, or affect the capacity of the land to be used, for aviation purposes;
- are capable of being removed or relocated easily and economically; and

- appropriate provisions or arrangements are in place to ensure that the land can be vacated when needed for aviation purposes.

By meeting the height requirements of the RID, such that finished surface of Excavated Material placed on the Fill Sites must be no higher than RL78m, or 3.0 metres below the future second runway Finished Surface Level, not including depth of topsoil, Sydney Metro are ensuring the permanent spoil placement area fit with the allowable activities.

The Rail Development activities all have regard to biodiversity values in this zone and potential adverse impacts on neighbouring environmentally sensitive areas. The design, construction and operation consider the sensitivity of, and proximity to, the biophysical environment, including Badgerys Creek and have included appropriate mitigation strategies, such as the provision of buffers and measures to protect the ECZ and any sensitive biodiversity or heritage features in its proximity.

## References

Commonwealth Department of Infrastructure and Regional Development, 2016. Airport Plan (September 2021)

Commonwealth Department of Infrastructure and Regional Development, 2016. Western Sydney Airport Environmental Impact Statement, 2016

EPBC Act Final Environmental Impact Assessment of on-airport proposed action (EPBC 2019/8541)

Sydney Metro – Western Sydney Airport, Airport Biodiversity Staging Report, October 2021

Western Sydney Airport, Construction Plan – Stage 1 Development, July 2021

## **Appendix A – Environment & Sustainability Statement of Commitment**



# Environment & Sustainability Statement of Commitment

Sydney Metro will deliver great services, places and transport infrastructure for our customers while protecting the environment, contributing to economic prosperity and delivering social benefits for the communities we serve. We have a duty to undertake our activities in the interest of the greater good, to move beyond compliance and be a genuine leader in both environmental management and sustainability.

Sydney Metro is committed to:

- Minimising our impacts and leaving a positive environmental and social legacy;
- Delivering a resilient asset and service for our customers;
- Collaborating with stakeholders to innovate and drive sustainable outcomes; and
- Embedding sustainability into our activities;

To deliver on these commitments Sydney Metro will:

### Leave an environmental and social legacy

- Protect the environment, prevent pollution and comply with legal and other requirements.
- Manage resources and waste efficiently, exploring opportunities to minimise waste, use recycled and low impact materials and reduce our environmental footprint.
- Promote a diverse and inclusive workforce and supply chain, build capability and capacity within industry, and increase Aboriginal participation.
- Responsibly minimise environmental and social risks in our supply chain.
- Create liveable places that are well integrated and promote active and sustainable transport.
- Conserve and enhance the natural environment and our built and cultural heritage.
- Work collaboratively with delivery partners to provide social benefits to the communities in which we work.

### Drive resilience

- Tackle climate change and contribute to the NSW Government target of net zero emissions.
- Deliver Sydney Metro assets and operations that are resilient to a changing climate, and work with stakeholders to proactively respond to emerging challenges and opportunities.
- Promote the greening of our cities to help combat the 'urban heat island' effect.

### Collaborate to deliver sustainable outcomes

- Align with and respond to Transport for NSW policy and other NSW Government priorities.
- Establish and maintain positive relationships with communities and stakeholders to harness local knowledge and maximise opportunities to add value across the project lifecycle.
- Collaborate and consult with Aboriginal stakeholders to understand how we can best respect and celebrate Aboriginal cultural values including Designing with Country.
- Provide industry leadership by setting benchmarks, encouraging innovation and driving continual improvement with our delivery partners.
- Increase environmental awareness amongst staff and customers to drive more sustainable behaviours.

### Embed sustainability

- Establish robust objectives and targets that are measurable and take into account whole-of-life considerations.
- Maintain an environmental management system that is integrated into our projects and continually improved to enhance environmental performance.
- Apply effective assurance processes to monitor environment and sustainability performance including ensuring accountability, incentivising beyond compliance behaviours and implementing corrective actions as required.
- Embed sustainability considerations into key project decisions across the project lifecycle.
- Provide appropriate training and resources to meet our obligations and commitments.
- Publicly report on sustainability performance.



**Jon Lamonte**  
Chief Executive, Sydney Metro

This Statement of Commitment supersedes previous versions of the Sydney Metro Environment & Sustainability Policy and aligns with the cluster wide TfNSW Environment and Sustainability Policy which has been adopted by Sydney Metro. It applies to all people working for Sydney Metro.

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