

Construction Waste and Resource Management Plan

Supply, Operate and Maintain Package

Parramatta Light Rail

December 2021

PLR1SOM-GLR-ALL-PM-PLN-000039 Rev 1



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Approval and authorisation

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Endorsed by Environmental Representative	See Appendix D
Signed	
Dated	16th December 2021
Approved on behalf of Transport for NSW by	
Signed	
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Approved on behalf of Great River City Light Rail by	
Signed	
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About this release

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Glossary/ Abbreviations

Abbreviations	Expanded text
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval
CLMP	Contaminated Land Management Plan
CSSI	Critical State Significant Infrastructure
CT	Contaminant Thresholds
CWRMP	Construction Waste and Resource Management Plan
DPIE	NSW Department of Planning, Industry and Environment
ECM	Environmental Control Map
EIS	Environmental Impact Statement
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environmental Protection Licence
ER	Environmental Representative
GRCLR	Great River City Light Rail
ISCA	Infrastructure Sustainability Council of Australia
ISO	International Organization for Standardization
LRVs	Light Rail Vehicles
NEPC	National Environment Protection Council
NGER	National Greenhouse and Energy Reporting
OEH	Office of Environment and Heritage (former; now moved to NSW Department of Premier and Cabinet, and NSW Department of Planning, Industry and Environment)
PLR	Parramatta Light Rail (Westmead to Carlingford)
POEO Waste	Protection of the Environment Operations Waste Regulation 2014
Project, the	Supply, Operate and Maintain Contract for PLR
RAP	Reclaimed asphalt pavement
REMMM	Revised Environmental Mitigation and Management Measures
Resource	Resource covers energy, fuel, oil, water and other materials used for construction of the project.
SaMF	Stabling and Maintenance Facility
SMS	Spoil Management Strategy
SOM	Supply, Operate and Maintain

SPIR	Submissions and Preferred Infrastructure Report
TPS	Traction Power Substations
TSS	Total suspended solids
TfNSW	Transport for New South Wales
VENM	Virgin Excavated Natural Material
WARR	Waste Avoidance and Resource Recovery
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>
WRAPP	Waste Reduction and Purchasing Policy

1 Introduction

1.1 Context

This Construction Waste and Resources Management Plan (CWRMP or Plan) is a Plan to the Construction Environmental Management Plan (CEMP) for the Parramatta Light Rail (PLR) Supply, Operate and Maintain (SOM) Contract (Package 5).

PLR is one of the NSW Government's major infrastructure projects being delivered to serve a growing Sydney. PLR will connect Westmead to Carlingford via Parramatta Central Business District (CBD) and Camellia. PLR is expected to be operational in 2023. More detailed description of the overall PLR Project is provided in Section 1.2.

The PLR Project received planning approval on the 29 May 2018 (SSI 8285) and subsequently modified twice with approvals issued on 21 December 2018 and 25 January 2019 respectively. This CWRMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA) and the revised environmental mitigation and management measures (REMMM) listed in the *Parramatta Light Rail Stage 1 Westmead to Carlingford via Parramatta CBD and Camellia Environmental Impact Statement (EIS)*, as amended by the *Parramatta Light Rail (Stage 1) Westmead to Carlingford via Parramatta CBD and Camellia Submissions Report (incorporating Preferred Infrastructure Report)* (February 2018) (SPIR) and all applicable legislation.

1.2 Background and project description

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

In summary, the key features of PLR include:

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

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

An overview of PLR route is shown in Figure 1-1.

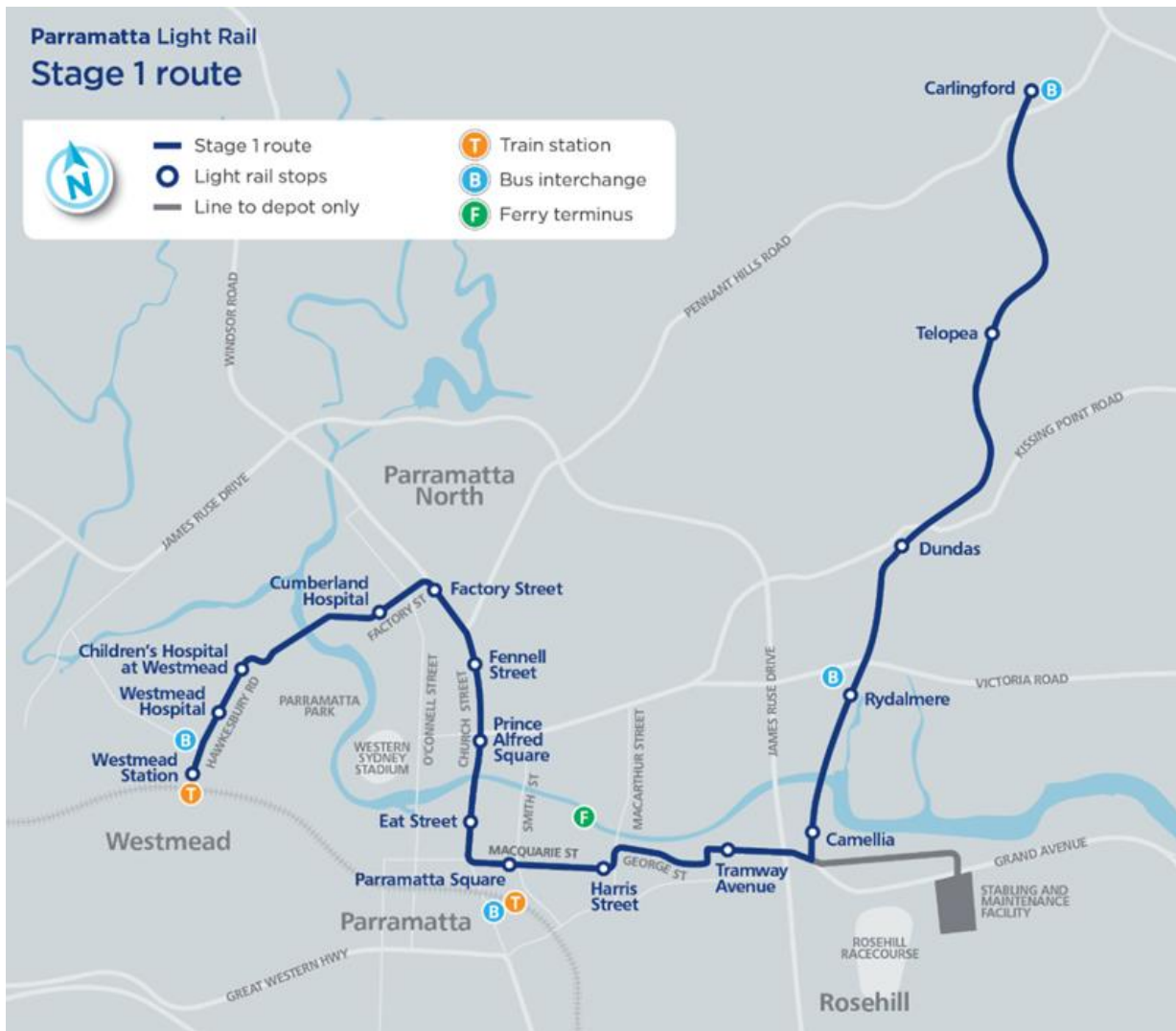


Figure 1-1: Parramatta Light Rail Route

1.2.1 Statutory Context

PLR has been subject to environmental impact assessment under the *Environmental Planning and Assessment Act 1979* (EP&A Act). It is classified as Critical State Significant Infrastructure (CSSI).

Detailed environmental impact assessments have been carried out and approved by the Minister for Planning. The Planning Approval for PLR is described in Section 1.2.2.

1.2.2 PLR Planning Approval

The Parramatta Light Rail was approved by the Minister for Planning on 29 May 2018, under Section 5.19 of the *Environmental Planning and Assessment Act (EP&A Act) 1979*. An environmental impact statement (EIS) was prepared as part of the infrastructure application (SSI-8285) as was a submissions and preferred infrastructure report (SPIR) following public exhibition of the EIS.

The Infrastructure Approval has subsequently been modified twice under Section 5.25 of the EP&A Act, with approvals issued on 21 December 2018 and 25 January 2019 respectively. The modifications related to changes to conditions of approval (CoA) not the physical description of PLR.

The Infrastructure Approval, modifications and related environmental assessment documents can be found at: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8285.

1.3 Staging of the PLR works

The PLR comprises approximately 12km alignment from Westmead to Carlingford via Camellia and consists of a mix of both on-street and dedicated corridor.

PLR is being delivered under five delivery packages as detailed in the Staging Report:

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

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

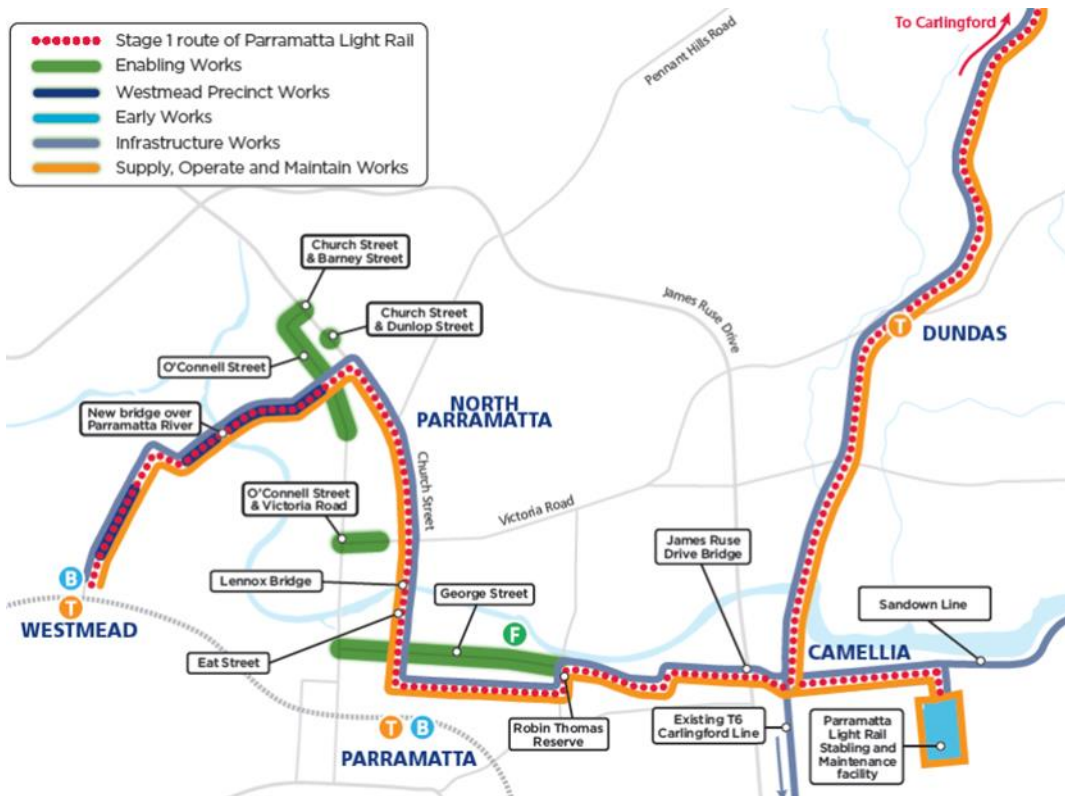


Figure 1-2: Parramatta Light Rail Delivery Package Interface

1.4 Project description for Supply, Operate and Maintain - Package 5

As System Integrator for PLR, the SOM Contractor's activities include:

- Delivery activities
- Light rail vehicle procurement
- Operation and maintenance.

The delivery activities include all investigation, selection, specification, design, approvals, construction, manufacture, installation, testing & commissioning, operational readiness and activities to transition from the delivery phase to the operations phase.

In summary the package includes the following. Figure 1-3 further details these activities.

- All works above and additional to the platform concrete foundation slab at all stops
- Stabling and maintenance facility
- Central control system
- Light rail signalling system
- Elements of the road intersection signalling system
- Communications and passenger information systems
- Power Supply system
- Procurement of light rail vehicles (LRV)
- Maintenance plant and machinery for the LRVs

- Earthing & bonding, electrolysis and electromagnetic compatibility
- Electronic ticketing system for top up or ticket machine and fixed location reader.

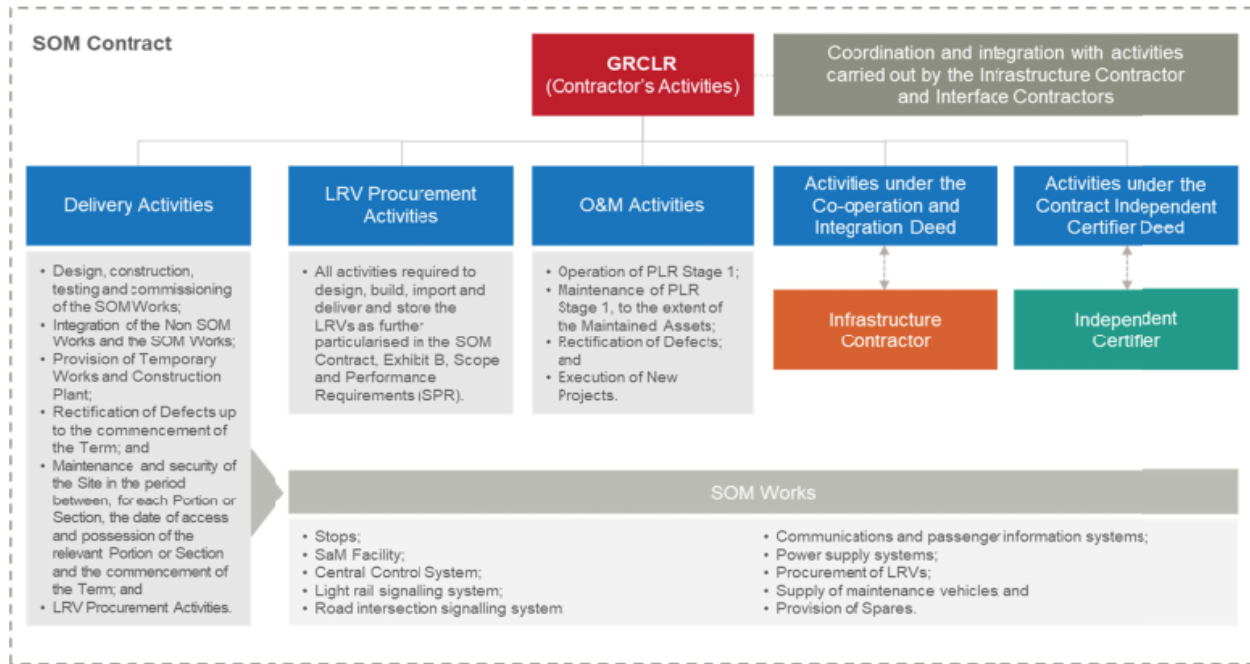


Figure 1-3: SOM contract activities for PLR

Great River City Light Rail (GRCLR) is responsible for the delivery of the SOM works for PLR. GRCLR has sub-contracted out the supply component of these works to Construcciones y Auxiliar de Ferrocarriles (CAF) who has engaged Thales, General Electric and Laing O'Rourke Australia (LORAC) to undertake the design and construction activities associated with the supply component of the works, which includes the design and construction related activities including testing and commissioning, and excludes all operational and maintenance activities.

GRCLR is the owner of the Construction Environmental Management Plan (CEMP) and Plans, and is responsible for ensuring implementation of and compliance by all subcontractors during construction works of the SOM package, which include the construction of the light rail systems (including high-voltage power supply), stops above slab level, as well as the stabling and maintenance facility. Further detail on the Project is provided below.

1.4.1 Stops

Light rail stops would be constructed after the Infrastructure Contractor has completed the stop slabs and access, with works at each stop commencing progressively after the completion of the adjacent linear segment of track infrastructure. There are sixteen stops that would be constructed. The stops will be in the following locations:

- Westmead Station
- Westmead Hospital
- Children's Hospital at Westmead
- Cumberland Hospital
- Factory Street
- Fennell Street
- Prince Alfred Square

- Eat Street
- Parramatta Square
- Harris Street
- Tramway Avenue
- Camellia
- Rydalmere
- Dundas
- Telopea
- Carlingford.

1.4.2 Stabling and maintenance facility

A stabling and maintenance facility (SaMF) will be constructed at 6 Grand Avenue, Camellia on a former industrial site adjacent to the Rosehill Gardens Racecourse. The facility will provide for maintenance, repair, refurbishing, upgrading, stabling, cleaning of light rail vehicles and a base for infrastructure maintenance activities and will operate 24 hours a day and 7 days a week.

Administration and staff facilities, as well as the operations control centre for the light rail network, will be located within the maintenance building. Parking for staff and visitors will be provided on site, including maintenance vehicle parking. An electrical substation will be located at the site to power the facility and light rail.

1.4.3 Substations

Traction Power Substations (TPS) would generally comprise prefabricated structures, with the manufactured off-site. On-site works would typically comprise excavation, foundation preparation and construction, and the installation of conduits and other in-situ works (i.e. electrical works) prior to the installation of the prefabricated substation building and security fencing surrounding the site. Note that the demolition of existing buildings at TPS sites will be undertaken by the Infrastructure Contractor and is outside of the scope of this Plan.

1.4.4 Rail systems

The installation of rail systems would include the installation of overhead wiring and jewellery, rail signalling and associated infrastructure and systems. The overhead wiring structures and footings will be constructed by the Infrastructure Contractor, as will be the combined services route within which the rail systems conduits will be installed.

1.5 Scope of this Plan

The scope of this CWRMP is to outline how GRCLR proposes to manage and control waste generation, handling and disposal during construction of the SOM scope of work for PLR (see Section 1.4), whilst ensuring compliance with the relevant contract, approval and statutory requirements. It has been prepared for Stage 3 Activity, as per Staging Report Revision 6.03.

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

1.6 Relationship with relevant works packages

1.6.1 Infrastructure contractor – Parramatta Connect (Package 4)

The Infrastructure Works is closely aligned to the Package 5, Supply, Operate and Maintain (SOM) Works. A graphical representation of the split in scope between the two packages is depicted in Figure 1-4. The reason for dividing this work into two packages is to ensure that suitably qualified and experienced sub-contractors are in place for each specialised component; civil infrastructure, and operational systems. The Infrastructure Works will deliver the civil infrastructure components and will not trigger the operational conditions, except for those that relate to detailed design.

An interface between the two packages has been established to monitor cumulative impacts and the coordination of environmental complaints management, site management controls, and the delineation of incident reporting and non-compliance management.

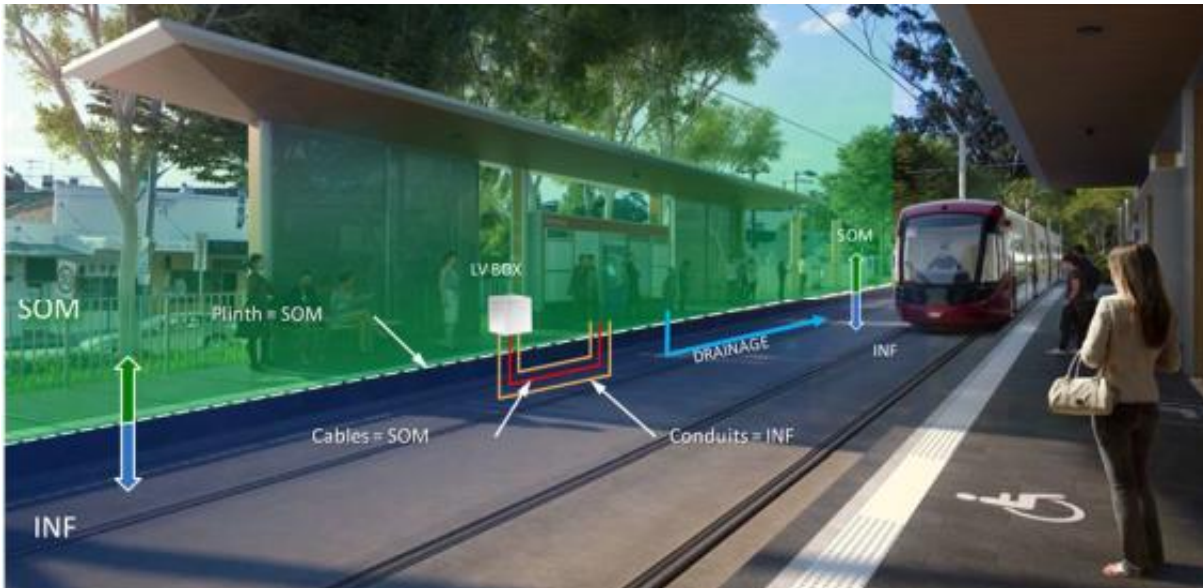


Figure 1-4: Relationship between Infrastructure Works and SOM Works

1.6.2 Remediation contractor – Ventia (Package 3)

The SOM contract is dependent on the completion of the remediation works at the stabling and maintenance facility (SaMF) site, by the remediation contractor.

The remediation works will deliver the remediated site, including any details of any ongoing management requirements, and will not trigger the construction and operational conditions, except for those that relate to detailed design. The Remediation Contractor will provide GRCLR with a Long Term Environmental Management Plan (LTEMP) for the SaMF, the LTEMP will include all construction, operation, management, maintenance and monitoring requirements for the SaMF. GRCLR will implement the requirements relevant to the construction of the Stabling and Maintenance facility.

Ongoing management for the remedial works on the SaMF site will be implemented through a Long Term Environmental Management Plan (LTEMP) which will be approved by the Site Auditor, as part of the issuing of the Site Audit Statement (SAS) for the site. The LTEMP will be a stand-alone document, and all monitoring and reporting will be managed through the processes and procedures in the LTEMP, and not through the SOM CEMP.

An interface between the two packages has been established to ensure the remediated site meets the design requirements for the construction, operation and maintenance of the site.

1.7 Environmental management systems overview

The construction of the SaMF will be managed in accordance with the GRCLR Integrated Management System (IMS) which includes an Environmental Management System (EMS). The EMS will be adopted as the guiding environmental management framework for the Project. The EMS is compliant with AS/NZS ISO 14001:2015. The EMS is integrated with the project wide IMS which includes assurance, quality and health and safety, management systems

The EMS will guide the development of the Project's governance documentation, including this SEMP, the CEMP and associated management plans, procedures and management tools to achieve the commitments and intentions established by the GRCLR Environment and Sustainability Policy, to ensure environmental performance and sustainability objectives and targets are achieved.

All works carried out on the site will be in accordance with:

- Minister's Conditions of Approval (CoA) SSI-8285
- Revised Environmental Mitigation and Management Measures (REMMMs)
- Environmental Performance Outcomes (EPO's)
- AS/NZ ISO 14001
- All applicable legislation
- Project Deed
- GRCLR IMS.

1.7.1 Construction Environmental Management Plan

A CEMP will be prepared for the SOM contract (Package 5). This CEMP provides the system to manage and control the environmental aspects of the SOM contract (Package 5) during construction. It also provides the overall framework for the system and procedures to ensure environmental impacts are minimised and legislative and other requirements are fulfilled.

The CEMP will be endorsed by the ER and provided to the Secretary for approval at least one month prior to the commencement of construction. In accordance with CoA C8 construction will not commence until the CEMP and the associated management plans specified in CoA C3 are approved by the Secretary or provided to the Secretary for information (as required by CoA C3).

1.7.2 Environment management plans

Subject-specific environmental management plans will be prepared to support the CEMP. These documents are prepared to identify requirements and processes applicable to specific impacts or aspects of the SOM contract (Package 5). They address the relevant requirements of the CoAs, REMMMs and EPOs. A list of construction management plans for the SOM contract (Package 5) and their approval requirements are provided in Table 1-1.

Table 1-1 - Environmental management plans

Document name	Document number	Approval pathway/ requirement
Traffic, Transport and Access Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000032	REMMM GEN-1 CoA C3 (a) REMMM TT-25

Document name	Document number	Approval pathway/ requirement
Flora and Fauna Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000033	REMMM GEN-1 CoA C3 (e) REMMM BI-3
Noise and Vibration Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000034	REMMM GEN-1 CoA C3 (b) REMMM NV-1
Soil and Water Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000035	REMMM GEN-1 REMMM HY-6
Heritage Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000037	REMMM GEN-1 CoA C3 (d) REMMM AB-2 REMMM HE-21
Air Quality Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000038	REMMM GEN-1 REMMM AQ-1
Construction Waste and Resource Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000039	REMMM GEN-1 REMMM WM-2
Contaminated Land Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000040	REMMM GEN-1 REMMM CM-3
Site Establishment Management	PLR1SOM-GLR-ALL-PE-PLN-001002	REMMM GEN-1 CoA C18 REMMM GEN-2
Flood Management Plan	PLR1SOM-GLR-ALL-PM-PLN-000047	REMMM GEN-1 CoA C3 (c) REMMM HY-4

1.7.3 Sustainability Management Plan

TfNSW has prepared a Sustainability Strategy to comply with CoA E136 and EPO-SU-1 for the PLR including the SaMF. The management of the Sustainability Strategy's requirements associated with the construction of the SaMF will be addressed in the Sustainability Management Plan (Ref PLR1SOM-GLR-ALL-PM-PLN-000015). Implementation of the Sustainability Management Plan will be managed by the GRCLR Environment and Sustainability Manager. The plan will demonstrate how the relevant commitments in the Sustainability Strategy (CoA 136 and EPO-SU-1) will be implemented for the construction of the SaMF..

The Sustainability Strategy identifies targets for management of waste and resource impacts during the construction of the SaMF, which are outlined in Section 2.3.

1.7.4 Interaction with other management plans

Key interactions for this Plan with other management plans include:

- Contaminated Land Management Plan, which details the controls and requirements for managing contaminated soils and asbestos
- Soil and Water Management Plan, which addresses chemical storage and spill response and stockpile management
- Delivery Phase Sustainability Management Plan, which defines the sustainability targets, addresses the tracking and reporting of waste and energy, and provides detailed strategies to achieve resource reductions.

2 Purpose and objectives

2.1 Purpose

The purpose of this Plan is to describe how GRCLR proposes to manage waste and resources during construction of the SOM scope of work for the PLR Project. This CWRMP has been prepared for Stage 3 Activity B as per Staging Report Revision 6.03.

2.2 Objectives

The key objectives of the CWRMP are to:

- Ensure the Project is constructed in compliance with all relevant Conditions of Approval (CoA), Revised Environmental Mitigation and Management Measures (REMMMs), Environmental Performance Outcomes (EPOs), the Project Deed (Section 1.8 of Exhibit B, SPR – Appendix D) and licence/permit requirements
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3 of this Plan.
- Ensure the preferred waste management hierarchy of avoidance, minimisation, reuse, recycling and finally disposal is followed
- Where possible, reuse excavated materials as fill on other parts of PLR in preference to disposing off-site in accordance with Office of Environment and Heritage's (OEH) Waste Classification Guidelines (DECCW 2009b)
- Achieve an ISCA score of 70 (as built)
- Achieve the waste re-use / recycling targets as nominated below
- The Project team is dedicated to implementing resource conservation best practice, in accordance with the Sustainability Management Plan. This includes conservation of materials, water and energy use, and the reduction of greenhouse gases.

2.3 Targets

The following targets have been established by the Parramatta Light Rail Sustainability Strategy for the management of waste and resource impacts during the Construction of the SaMF:

- 100% of usable spoil (by volume) to be beneficially reused
- 95% of inert and non-hazardous construction and demolition waste (by volume) to be diverted from landfill
- The project would also reuse 100 per cent of paving and other reusable materials or facilitate reuse of such materials
- 60% of office waste (by volume) to be diverted from landfill
 - 100% of paper cardboard, plastic, glass, steel
- 15% reduction in total water consumption
- 50% replacement of potable water by non-potable water
- 15% reduction in materials lifecycle impacts compared to the base case
- 3% to 9% of materials/products by value have an ISCA approved environmental label

- Use reusable formwork where possible
- 5% reduction from identified base case assumptions using TfNSW Carbon Estimation Reporting Tool (CERT).

Where targets cannot be achieved, construction of the SOM works would demonstrate all reasonable and feasible measures have been taken to achieve as close to the targets as possible.

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

Legislation and regulations relevant to waste and energy management includes:

- *Protection of the Environment Operations Act (POEO Act) 1997*
- *Protection of the Environment Operations (Illegal Waste Disposal) Act 2013*
- *Protection of the Environment Operations (Waste) Regulation 2014*
- *Waste Avoidance and Resource Recovery Act 2001*
- *NSW Waste Minimisation and Management Regulation 1996*
- *Contaminated Land Management Act 1997*
- *National Greenhouse and Energy Reporting Act 2007*
- *Environmentally Hazardous Chemicals Act 1985*
- *Biosecurity Act 2015*
- *Work Health and Safety Act 2011-NSW*

3.1.2 Guidelines and standards

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

- *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 (EPA, 2014)*
- *NSW Government Resource Efficiency Policy (GREP) (OEH 2014)*
- *Waste Classification Guidelines Part 1: Classifying waste (EPA, 2014)*
- *Waste Classification Guidelines Part 2: Immobilisation of waste (EPA, 2014)*
- *Best Practice Waste Reduction Guidelines for the Construction and Demolition Industry (tools for Practice), (Natural Heritage Trust, 2000)*
- *Excavated Natural Material Exemption 2014 (EPA, 2014)*
- *Excavated Natural Material Order 2014 (EPA, 2014)*
- *Excavated Public Road Material Exemption 2014 (EPA, 2014)*
- *Excavated Public Road Material Order 2014 (EPA, 2014)*
- *Raw Mulch Exemption 2016 (EPA, 2016)*
- *Reclaimed Asphalt Pavement Exemption 2014 (EPA, 2014)*
- *Reclaimed Asphalt Pavement Order 2014 (EPA, 2014)*
- *Recovered Aggregate Exemption 2014 (EPA, 2014)*
- *Recovered Aggregate Order 2014 (EPA, 2014)*
- *Guidelines on Resource Recovery Exemptions - Land Application of Waste Materials as Fill (2011, DECCW)*

- Storing and Handling Liquids, Environmental Protection: Participants Manual (NSW DECC, 2007)
- National Environment Protection (assessment of site contamination) Measure (NEPC, 1999)
- PLR Stage 1 Sustainability Strategy (TfNSW, 2018)
- IS Technical Manual v1.2 (ISCA, 2018)
- Waste Reduction and Purchasing Policy (NSW Department of Environment and Conservation, 2006)
- ISO 20400:2017 Sustainable Procurement – Guidance (ISO, 2017)Transport for NSW’s Water Discharge and Reuse Guideline (7TP-SD-024/3.0)

3.2 Minister's Conditions of Approval

The CoA relevant to this Plan are listed in Table 3-1 below. A cross reference is also included to indicate where each condition is addressed in this Plan or other Project management documents.

Table 3-1: Conditions of Approval relevant to the CWRMP

CoA No.	Condition Requirements	Document Reference	How Addressed
C4	The CEMP Sub-plans must state how:		
	(a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;	Section 3.4	Section 3.4 outlines how each relevant EPO will be achieved. These targets were derived from the EIS to be measurable during the Project's inspections and monitoring.
	(b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;	Section 8 Section 7	Compliance with the performance outcomes will be checked by the implementation of a comprehensive monitoring/inspection/auditing programme (Section 8). Section 7 identifies the waste and resource initiatives as management measures listed in Condition A1. Also addressed in Tables 3-2.
	(c) the relevant terms of this approval will be complied with; and	Section 8 Section 7	Compliance with the performance outcomes will be checked by the implementation of a comprehensive monitoring/inspection/auditing programme (Section 8).

			Section 7 identifies the waste and resource initiatives as management measures listed in Condition A1. Also addressed in Tables 3-1.
	(d) issues requiring management during construction, as identified through ongoing environmental risk analysis, will be managed.	Section 4	Specific management issues during construction are outlined in the Environmental Aspects and Impacts Section (Section 4), and in Section 3.5 of the CEMP.
E127	Waste generated during construction and operation must be managed in accordance with the following priorities: (a) waste generation must be avoided and where avoidance is not reasonably practicable, waste generation must be reduced;	Section 5.1.1	Section 5.1.1 details measures to avoid and reduce waste generation during construction following the waste management hierarchy. Operational waste management would be addressed in the Operational Environmental Management Plan.
	(b) where avoiding or reducing waste is not possible, waste must be re-used, recycled, or recovered; and	Section 5.1.2	Section 5.1.2 sets out how waste would be reused or recycled during construction. Operational waste management would be addressed in the Operational Environmental Management Plan.
	(c) where re-using, recycling or recovering waste is not possible, waste must be treated or disposed of.	Section 5.1.3	Section 5.1.3 sets out how waste would be disposed of during construction. Operational waste management would be addressed in the Operational Environmental Management Plan.

E128	The importation of and storage of Virgin Excavated Natural Material (VENM), and the treatment, processing, reprocessing or disposal of any other waste must comply with the <i>Protection of the Environment Operations Act 1997</i> and the <i>Protection of the Environment Operations (Waste) Regulation 2014</i> , where orders or exemptions apply under the regulation’.	Sections 5, 7 and Appendix C	Wastes and VENM will be managed as set out in Sections 5, 7 and Appendix C.
E129	Waste must only be exported to a site licensed by the EPA for the storage, treatment, processing, reprocessing or disposal of the subject waste, or in accordance with a Resource Recovery Exemption or Order issued under the <i>Protection of the Environment Operations (Waste) Regulation 2014</i> , or to any other place that can lawfully accept such waste. Disposal of waste at these facilities must include GPS tracking of waste vehicles, audits of waste facility receipts and cross verification with the facility. All asbestos waste over 10m ³ must be tracked through EPA’s WasteLocate service.	Section 5.1.3 and 5.4 WD7 in Table 7.1	Section 5.1.3 details the requirements for waste disposal, specifically the requirement to include GPS tracking for waste vehicles and audits of waste facility receipts. Environmental Control Measure WD7 (Table 7.1) states that all asbestos waste over 10m ³ will be tracked through the EPA’s WasteLocate Service.
E130	All waste must be classified in accordance with the EPA’s Waste Classification Guidelines, with	Section 5.2	Section 5.2 sets out the Waste Classification Guidelines that will be adhered to during construction of the Project.

	appropriate records and disposal docket retained for audit purposes.		
E131	Asbestos or asbestos-contaminated materials be uncovered during demolition and construction activities of the CSSI must be strictly managed in accordance with the requirements under the Protection of the Environment Operations (Waste) Regulation 2014 and any guidelines or requirements in force at the date of this approval and issued by the EPA in relation to those materials.	Table 5-1	Table 5-1 states that asbestos is to be managed in accordance with the Environment Operations (Waste) Regulation 2014.

3.3 Revised Environmental Mitigation and Management Measures

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

Table 3-2: Revised Environmental management measures relevant to this CWRMP

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
GEN-1	<p>A construction environmental management plan (CEMP) would be prepared for the construction phase of the Project. The CEMP would provide a centralised mechanism through which all potential environmental impacts would be managed. The CEMP would document mechanisms for demonstrating compliance with the commitments made in the EIS, the submissions report, as well as any other relevant statutory approvals (e.g. conditions of approval, licences and permits). The CEMP would outline a framework for the management of environmental impacts during construction, including further details on the following:</p> <ul style="list-style-type: none"> • Traffic, transport and access management. • Noise and vibration management. 	Pre-construction	This plan in its entirety fulfils the requirement of this commitment in relation to waste and resource management.	This CWRMP documents mechanisms for demonstrating compliance with the commitments made in the EIS, SPIR and other relevant statutory approvals that are relevant to waste and resource management.

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	<ul style="list-style-type: none"> • Heritage management. • Air quality and dust management. • Soil and water management. • Flora and fauna management. • Waste and resource management. • Site compound and ancillary works management. • Landscape and temporary works management. • Emergency and incident response management. <p>The CEMP would be prepared by the responsible contractor(s) and approved by the Secretary of the NSW DP&E.</p>			
HY-6	A soil and water management plan would be prepared as part of the CEMP. Specific measures would be identified in consultation with relevant government agencies and would be consistent with the	Not applicable to this CWRMP.		

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	<p>principles and practices detailed in Landcom's (2004) Managing Urban Stormwater: Soils and Construction. The objectives and strategies of the soil and water management Plan would include the following:</p> <ul style="list-style-type: none"> Minimise the extent and duration of exposed surfaces (particularly those works that have the greatest potential to disturb soils that are contaminated or have a high erosion and runoff hazard). 			
	<ul style="list-style-type: none"> Develop and implement adequate water quality control measures prior to the carrying out of significant earthwork or bridge construction activities. 		Not applicable to this CWRMP. Addressed in the SWMP	
	<ul style="list-style-type: none"> Minimise and manage impacts on water quality and downstream receiving environments during instream activities. 		Not applicable to this CWRMP. Addressed in the SWMP	
	<ul style="list-style-type: none"> Flood response measures for activities located on land affected by the 20-year ARI flood level (e.g. 		Not applicable to this CWRMP. Addressed in the SWMP	

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	Stabling/substation support construction compounds).			
	<ul style="list-style-type: none"> Where possible, reuse excavated materials as fill on other parts of the Project in preference to disposing off-site in accordance with OEH's Waste Classification Guidelines (2016). 	Construction	Section 5.1	Section 5.1 sets out the management hierarchy that would be followed for the Project.
	<ul style="list-style-type: none"> Areas of potential contamination concern would be identified and works in these areas managed to minimise disturbance. 	Not applicable to this CWRMP. Addressed in the SWMP and CLMP		
	<ul style="list-style-type: none"> Excavate pre-classified contaminated materials and transfer such materials directly into haulage trucks for off-site disposal at a waste facility licensed to accept the contaminated material. 	Construction	Section 5.1.3 WH2 in Table 7.1	Section 5.1.3 outlines the approach to waste disposal, including contaminated materials. Appendix A lists waste facilities close to the site and the appropriate licences held for acceptance of contaminated materials.
	<ul style="list-style-type: none"> Transport for NSW would also undertake consultation with DPI Fisheries with respect to the development for the CEMP, and Erosion and 	Not applicable to this CWRMP Addressed in the SWMP		

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	<p>Sediment Control Plan for the Project.</p> <ul style="list-style-type: none"> Develop procedures for the assessment, handling and stockpiling of potentially contaminated materials, in accordance with OEH's Waste Classification Guidelines (2016). 	Construction	Sections 5.1.4 and 5.2	Section 5.4 details the procedure for handling and storing waste, including potentially contaminated materials. Section 5.2 sets out the waste classification guidelines that will be adhered to during construction of the SaMF.
HY-7	<p>During construction of SOM activities especially during construction of SaM/Substations and stops, any water collected from the worksites would be treated and discharged in accordance with current guidelines to avoid any potential contamination or local stormwater system impacts. These guidelines include:</p> <ul style="list-style-type: none"> The Blue Book - Managing Urban Stormwater: Soils and Construction (Landcom, 2004 and DEC 2008). Transport for NSW Water Discharge and Reuse Guideline 7TPSD-024. 	Construction	Section 5.2. See also Soil and Water Management Plan	Section 5.2 sets out the preferred approach and targets for reuse and disposal of wastes that are likely to be found on site, including any potentially contaminated water.

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	All water (including groundwater) requiring disposal during construction would be tested and treated in accordance with the Transport for NSW Water Discharge and Reuse Guideline 7TPSD-024 and the Waste Classification Guidelines (OEH, 2016) prior to disposal. If required, water treatment would occur to ensure guidelines are met prior to water disposal. Treatments may include sediment basins and pH neutralisation.			
WM-1	<p>During detailed design and detailed construction planning, the following resource and material minimisation initiatives would be explored, and if determined to be reasonable and feasible, implemented:</p> <ul style="list-style-type: none"> Use of recycled materials, such as the maximum permitted recycled content for asphalt and concrete (including use of fly ash and blast furnace slag). 	<p>Detailed design Pre-construction</p>	Section 6 and Table 7.1	RCN 2 commits to the consideration of using recycled content in materials. RCN6 states that concrete mixes for all applications where specifications and supply do not limit, will have a minimum 25% substitution of fly ash or 50% blast furnace slag in accordance with AS5100.5.
	<ul style="list-style-type: none"> Use of modular, prefabricated and precast structural and finishing materials. 	<p>Detailed design Construction</p>	<p>Section 1.4 Section 6 and Table 7.1</p>	Substations and elements of the stops would be prefabricated offsite.

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	<ul style="list-style-type: none"> Use of recycled materials and local low embodied energy materials for light rail stops. 	Detailed design Pre-construction	Table 7.1	The emission intensity of materials will be considered as part of procurement (EW1). Products and materials containing recycled content or packaging would be used as a preference to non-recycled materials if determined to be feasible and reasonable (RCN2).
	<ul style="list-style-type: none"> Use of wastewater or recycled water to reduce potable water demand during construction and operation. 	Detailed design Construction	Section 6 Table 7.1	<p>Non-potable water will be used where possible during construction for dust suppression and end-of-project landscaping (Section 6).</p> <p>Where practicable, wastewater will be recycled for onsite uses including dust suppression and vehicle wash-down (EW14).</p>
	<ul style="list-style-type: none"> Design track components, structures and stops for disassembly to enable readily separation of parts for recovery and recycling. 	Detailed design	Not applicable to construction	The REMMM is related to design and not applicable to the CWTMSP.

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	<ul style="list-style-type: none"> Water efficient fixtures and fittings at the stabling and maintenance facility, including the light rail vehicle (LRV) wash facility. 	Detailed design	Not applicable to construction	Not applicable to construction.
	<ul style="list-style-type: none"> Rainwater harvesting infrastructure at the stabling and maintenance facility to provide non-potable water for operational uses. 	Detailed design	Not applicable to construction	Not applicable to construction.
WM-2	A waste and resource management plan would be prepared for the Project as part of the overall CEMP. This plan would set out details for managing waste generation and resource consumption. The plan would be informed by the Parramatta Light Rail Sustainability Plan and the requirements of the Waste Avoidance and Resource Recovery Act 2001. The objectives and strategies of the waste and resource management plan would include the following:	Pre-construction Construction	This CWRMP	This plan in its entirety fulfils the requirement of this commitment in relation to waste and resource management.
	<ul style="list-style-type: none"> Construction waste would be managed through the waste hierarchy established under the Waste Avoidance and 	Construction	Section 5.1	Section 5.1 sets out the waste hierarchy that will be followed during construction of the SaMF.

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	Resource Recovery Act 2001 management hierarchy.			
	<ul style="list-style-type: none"> Classification of waste during construction in accordance with the current guidelines 	Construction	Section 5.2	Section 5.2 sets out the approach for waste classification.
	<ul style="list-style-type: none"> Segregation of waste into stockpiles of spoil, concrete, steel, timber, paper and cardboard to make it easier to recycle components and prevent cross contamination. 	Construction	Table 7-1	WH1 sets out the procedures for waste segregation and stockpiling to prevent cross contamination.
	<ul style="list-style-type: none"> Procurement of materials would be carried out on an 'as needed' basis to reduce over-ordering and wastage, and exploring opportunities to reuse materials, where applicable. 	Construction	Table 7.1	RCN7 commits to consideration of material wastage during procurement and reuse of materials.
	<ul style="list-style-type: none"> Targets for the recovery, recycling or reuse of construction waste, and beneficial reuse of spoil. A Construction Waste, Reuse, Recycling and Energy Plan would be prepared as part of the CEMP. It would ensure resource and materials use, waste disposal and energy use is minimised by tracking and reporting performance, and 	Pre-construction	Section 8	Section 8 provides detail on the tracking and reporting of performance against the requirements of the Plan.

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	applying corrective action as required.			
	<ul style="list-style-type: none"> Identification of carbon and energy strategies and initiatives to minimise carbon and energy use associated with construction (e.g. selection of equipment, inclusion of renewable energy sources to power temporary facilities and equipment, designing site offices for energy efficiency, and efficient operation of vehicles and equipment). 	Pre-construction	Section 6	Section 6 outlines the carbon and energy strategies, including conservation of materials, energy use, and the reduction of greenhouse gases, in accordance with the Sustainability Strategy
	<ul style="list-style-type: none"> Consideration of materials mitigation and management measures including use of recycled materials, recycling and reuse of materials on site, use of materials with lower embodied impact, and consideration of whole of life costs during procurement. 	Pre-construction/ construction	Section 6	RCN1, RCN2, RCN3, RCN5, RCN6 commits to the consideration of using existing materials where fit for purpose, as well as recycled content in materials.
	<ul style="list-style-type: none"> Prior to disposal/removal or reuse off-site, all wastes would be classified in accordance with the waste classification guidelines (Waste Classification Guidelines (OEH, 	Construction	Section 5 Table 7.1	Classification of wastes is detailed in Section 5.2. WR4 requires the classification of waste in accordance with the

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	<p>2016) and Waste Avoidance and Resource Recovery Strategy 2014-2021 (EPA, 2014) to ensure the most appropriate disposal or reuse option</p>			<p>Waste Classification Guidelines.</p>
	<ul style="list-style-type: none"> Monitoring and compliance requirements. 	<p>Pre-construction</p>	<p>Section 8</p>	<p>GRCLR will carry out regular monitoring and inspections to ensure the requirements of this Plan are being implemented in accordance with Section 8 of the CEMP.</p> <p>Section 8 of this Plan details how monitoring and compliance requirements will be met.</p>
<p>WM-3</p>	<p>The project would achieve a diversion rate for construction waste from landfill of a minimum of 90 per cent of waste by volume, with a target of 95 per cent. The project would also reuse 100 per cent of paving and other reusable materials or facilitate reuse of such materials. Contaminated waste which cannot be diverted from landfill would be excluded from this calculation. Where targets cannot be achieved, the Project</p>	<p>Construction</p>	<p>Section 2.3</p>	<p>Targets are set out in Section 2.3.</p>

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	must demonstrate all feasible measures have been taken to achieve as close to the targets as possible.			
WM-4	Construction waste would be segregated and stockpiled on site, with materials such as bricks and tiles, timber, plastic, metals and existing track materials (such as rail and ballast materials) being separated where practicable and sent to a waste facility with recycling capabilities.	Construction	Section 5.3 and Appendix A	Section 5.3 sets out the process for segregating and stockpiling waste for recycling. Appendix A contains a list of waste facilities and their licence and recycling capacity.
WM-5	The disturbance, movement and disposal of asbestos containing materials would be carried out in accordance with the Work Health and Safety Regulation 2011 and other relevant guidelines.	Construction	Section 3.1.2 WH5 in Table 7.1	WH5 states that asbestos will be dealt with in accordance with the appropriate legislation and guidelines. Section 3.1.2 identifies the Work Health and Safety Guidelines.
WM-6	Where possible and fit for purpose, spoil would be beneficially reused within the Project before off-site reuse or disposal options are pursued. A spoil management strategy would be developed prior to the commencement of construction and implemented during construction. The strategy would	Pre-construction/ Construction	Appendix C of this CWRMP	Appendix C of this document contains the Spoil Management Strategy which sets out the spoil management approach, in line with the waste management hierarchy in Section 5.1.

Ref # REMMM	Commitment	Timing	CWRMP reference	How addressed
	identify spoil disposal sites and describe the management of spoil on-site and during off-site transport.			

3.4 Environmental Performance Outcomes

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

Table 3-3: Environmental Performance Outcomes relevant to this WRMP

ID Ref#	Environmental Performance Outcome	Timing	CWRMP reference	How Addressed
EPO-SU-1	The project would be carried out in accordance with the Parramatta Light Rail Sustainability Strategy.	Construction	Sections 2.3, 5, 6 and 7	Targets from the strategy are provided in Section 2.3. Sections 5, 6 and 7 set out strategies to achieve the targets
EPO-SU-2	The project would comply with the relevant requirements of the NSW Government Resource Efficiency Policy.	Construction	Section 7 (EW-1)	The procurement process will consider the following: The fuel efficiency of the construction plant and equipment in accordance with requirements of the NSW Government Resource Efficiency Policy
EPO-SU-3	The project would aim to achieve 100 per cent offset of the greenhouse gas emissions associated with consumption of electricity during operation.	The EPO is not relevant to the construction of the SaMF.		
EPO-SG-3	Any contamination on project sites would be remediated to suit future land use.	Construction	Section 5.2	Waste classification is identified in Section 5.2.

4 Environmental aspects and impacts

4.1 Construction waste streams and resource use

4.1.1 Waste

The following potential construction related waste streams and quantities have been identified as per Table 4-1 below:

Table 4-1: Identified Waste Streams and quantity estimates

Aspect	Waste Type	Waste Classification	Estimated Quantity (Tonne)
Earthworks and Utilities	Excavated Waste / Spoil	General Solid Waste	To be re-used on-site where possible. Estimated 150T
	Asbestos and other hazardous materials	Contaminated Waste or Special Waste	Unknown – subject to unexpected finds.
Structures and Building Infrastructure	Construction Waste, timber, formwork, concrete	General Solid Waste (non-putrescible)	20T / month
	Piling	General Solid Waste (non-putrescible)	<20T
	Steel	Recycling	Estimated 50T
General	Sewerage	Effluent (sewerage)	100T / month
	Office Waste	General Solid Waste (putrescible)	2T / month
		Comingled Recycling	0.5T / month
		Paper and Cardboard	0.5T / month
	Construction Waste	General Solid Waste (non-putrescible)	20T / month
	Contaminated Water	Contaminated Liquid Waste	Unknown – subject to rain events and groundwater ingress

4.1.2 Resources

The following sources of construction related resource consumption (fuel and power) have been identified:

- Procurement and delivery of materials to site
- Site establishment, including compound set up
- Earthworks around TPS sites
- Concrete laying
- Operation of site compounds and lighting
- Construction plant
- Demobilisation and removal of waste from the site.

4.2 Impacts

The mismanagement of waste streams has the potential to result in the following impacts:

- Excessive waste being directed to landfill
- Various types of waste being generated and stored onsite, with the potential for misclassification
- Incorrectly classified waste/contaminated material delivered to a landfill not licensed to receive the material
- Pollution of surface and groundwater assets (groundwater assets is not applicable for the SAM facility, as it is heavily polluted)
- Land contamination
- Greenhouse gas emissions due to consumption of energy from non-renewable resources
- Consumption of non-renewable resources like energy, diesel and other chemicals

These impacts will be avoided through the effective implementation of this CWRMP. If environmental pollution occurs as a result of waste mismanagement, the strategies set out in Appendix A of the Contaminated Land Management Plan (CLMP) or Section 7 of the CEMP would be actioned.

5 Waste management

5.1 Waste management hierarchy

To achieve positive waste and resource management outcomes, the Project will adopt waste management strategies in accordance with the waste hierarchy (EPA, 2018) and requirements identified in the CoA, EIS, SPIR, *NSW Waste Avoidance and Resource Recovery Act 2001* (WARR Act) and the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21* (EPA 2014). Where waste cannot be avoided, reused or recycled it will be classified and disposed of appropriately. Waste management methods would progress to the next stage in the hierarchy only after options are exhausted to achieve the measures higher in the hierarchy.

Figure 5-1 shows the waste hierarchy that will be followed to reduce the generation of waste and achieve the targets set out in Section 2.3 of this CWRMP.

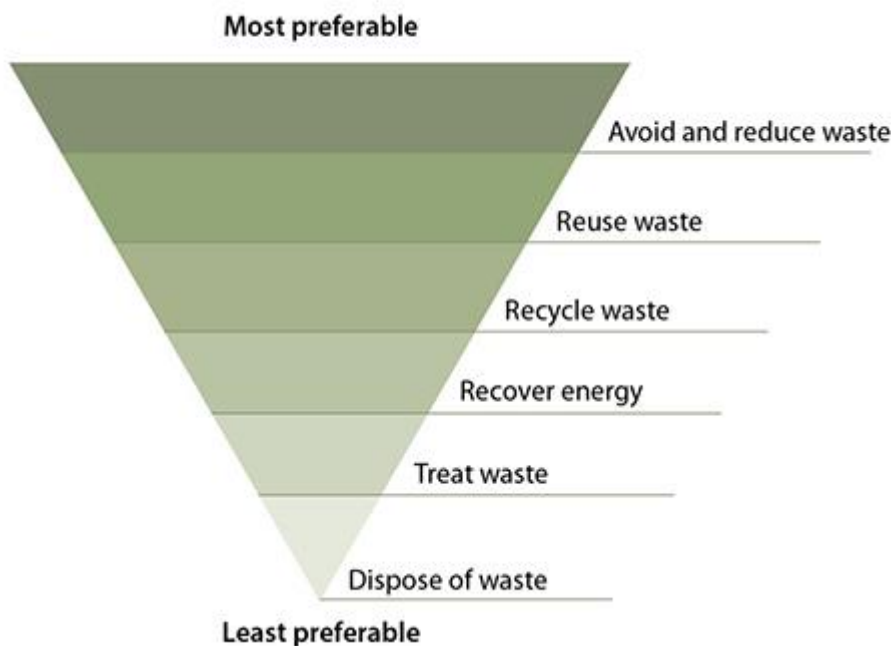


Figure 5-1: Waste Hierarchy (EPA, 2018)

5.1.1 Waste avoidance/reduction

The waste hierarchy nominates avoidance of waste as the most important priority. During the construction phase, the following measures will be implemented to avoid and reduce creation of waste:

- Ensuring that the necessary planning is undertaken to enable efficient management of the delivery and storage of materials, so as to avoid spoilage of materials
- Wherever possible, establishing agreements with suppliers for 'take back' arrangements for packaging/pallets/drums
- Highlighting the minimisation of packaging as an important factor in the product procurement process
- Ensuring correct types and quantities of materials are ordered, essentially avoiding excess material waste

- Coordinating site activities to minimise waste through utilisation of unused materials
- Employing trained and qualified plant and machinery operators to avoid damage to materials and reduce wastage of consumables during plant and machinery maintenance
- Ensure that stored supplies are properly protected from the weather.

5.1.2 Reuse and recycling

In accordance with the waste hierarchy principles (see Figure 5-1), when avoiding and reducing waste is not possible, waste is to be reused onsite or offsite for the same or a similar use or recovered through recycling or reprocessing.

Waste separation and segregation will be promoted onsite to facilitate reuse and recycling as a priority of the waste management program, as follows:

- Waste segregation onsite – Waste materials will be separated onsite into dedicated bins/areas for either reuse onsite or collection by a waste contractor and transported to offsite facilities.
- Waste separation offsite at an appropriately licenced facility – Wastes to be deposited into one bin where space is not available for placement of multiple bins, and the waste is to be sorted offsite by a waste contractor.

5.1.3 Waste disposal

Waste (and contaminated spoil) disposal is to be in accordance with the *Protection of the Environment Operations Act 1997* and the *Waste Avoidance and Resource Recovery Act 2001*. Wastes that are unable to be reused or recycled will be disposed of offsite to an appropriately licenced waste management facility following classification (refer to section 5.2). Locations of waste management/ disposal facilities which could be used during construction are included in Appendix A. The appendix would be updated if additional waste facilities are identified.

Pre-classified contaminated materials would be transferred directly into haulage trucks for offsite disposal at a waste facility licensed to accept the contaminated material.

Vehicles disposing of waste offsite will be required to have GPS tracking devices enabled. Regular audits of waste facility receipts will be undertaken by the D&C Environment and Sustainability Manager, and cross referenced with the waste facility. Details of waste types, volumes and destinations are to be recorded in the Waste Management Register (Appendix B).

Asbestos waste over 10m³ must be tracked through the EPA's WasteLocate Service.

5.2 Classification of waste streams

The classification of waste is undertaken in accordance with the EPA Waste Classification Guidelines Part 1: Classifying Waste (2014). This document identifies six classes of waste: Special, Liquid, Hazardous, Restricted Solid, General Solid (putrescible) and General Solid (non-putrescible) and describes a six-step process to classifying waste. That process is described below. Table 5-1 identifies the construction activities and associated waste classifications that are considered relevant to this construction of the SaMF.

Step 1: Is it 'special waste'?

Establish if the waste should be classified as special waste, following the EPA Waste Classification Guidelines outlined above. Special wastes are clinical and related, asbestos, waste tyres.

Note: Asbestos and clinical wastes must also be managed in accordance with the requirements of Clauses 42 and 43 of the Protection of the Environment Operations (Waste) Regulation 2005.

Step 2: If not special, is it 'liquid waste'?

If it is established that the waste is not 'special waste' it must be decided if it is 'liquid waste'. Liquid waste means any waste that:

- has an angle of repose of less than 5° above horizontal;
- becomes free flowing at or below 60° Celsius; or
- when it is transported is generally not capable of being picked up by a spade or shovel.

Liquid wastes are sub-classified into:

- Sewer and stormwater effluent
- Trackable liquid waste according to Protection of the Environment Operations (Waste) Regulation 2005 Schedule 1 Waste to which waste tracking requirements apply
- Non-trackable liquid waste.

Step 3: If not liquid, has the waste already been pre-classified by the NSW EPA?

The EPA has pre-classified several commonly generated wastes in the categories of hazardous, general solid waste (putrescibles) and general solid waste (non-putrescibles). If a waste is listed as 'pre-classified', no further assessment is required.

Step 4: If not pre-classified, is the waste hazardous?

If the waste is not special waste (other than asbestos waste), liquid waste or pre-classified, establish if it has certain hazardous characteristics and can therefore be classified as hazardous waste.

Hazardous waste includes items such as explosives, flammable solids, substances liable to spontaneous combustion, oxidizing agents, toxic substances and corrosive substances.

Step 5: If the waste does not have hazardous characteristics, undertake chemical assessment to determine classification

If the waste does not possess hazardous characteristics, it needs to be chemically assessed to determine whether it is hazardous, restricted solid or general solid waste (putrescible and non-putrescible). If the waste is not chemically assessed, it must be treated as hazardous.

Waste is assessed by comparing Specific Contaminant Concentrations (SCC) of each chemical contaminant, and where required the leachable concentration using the Toxicity Characteristics Leaching Procedure (TCLP), against Contaminant Thresholds (CT).

Step 6: Is the general solid waste putrescible or non-putrescible?

If the waste is chemically assessed as general solid waste, a further assessment is available to determine whether the waste is putrescible or non-putrescible. The assessment determines whether the waste is capable of significant biological transformation. If this assessment is not undertaken, the waste must be managed as general solid waste (putrescible).

The types of wastes which may be generated during construction are outlined within classifications in Table 5-1.

Table 5-1: Classification of potential waste streams

Construction activity	Waste type	Waste classification	Potential storage receptacle	Proposed reuse/recycling/disposal methods
Construction	Concrete	General solid waste (non-putrescible)	Stockpile	Crushed and reused where possible. Remainder sent offsite for recycling.
	Timber	General solid waste (non-putrescible)	Timber skip bin or construction waste bin for offsite segregation	Recycle/reuse of material onsite or send offsite to recycling facility
	Metal	General solid waste (non-putrescible)	Scrap metal bin	Recycle/reuse of material onsite or send offsite to recycling facility.
	Cabling and lighting	General solid waste (non-putrescible)	Scrap metal bin	Send offsite to a recycling facility.
	Redundant utility services	General solid waste (non-putrescible)	Scrap metal bin	Copper wires and pipes to be sent off-site to recycling facility. Separately stockpiled at various locations onsite before being sent offsite to a licensed waste facility.
		Asbestos waste	Bagged until disposed of through approved contractors	Asbestos containing materials to be disposed of in accordance with Clauses 42 and 43 of the POEO (Waste) Regulation 2005.
Plastics – PVC pipes, sheeting	General solid waste (non-putrescible)	Plastic bin	Recycle/reuse of material onsite or send offsite to recycling facility.	

	Packaging – pallets, crates, cartons, plastics and wrapping materials	General solid waste (non-putrescible)	Skip bins for recycling	Return to material supplier or send offsite for recycling.
Excavation and Trenching	Surplus soil	Virgin Excavated Natural Material (VENM)/Excavated Natural Material (ENM),	Stockpile	<p>Re-used on site where possible.</p> <p>For material to be considered VENM, it must meet the requirements of the <i>Protection of the Environment Operations Act 1997</i>. Where an excavated material cannot be classified as VENM, it may be eligible for reuse under the <i>ENM Exemption/Order 2014</i>.</p> <p>Surplus material may also be reused off-site if they meet the above requirements. Material will be managed appropriately (no mixing of different types) to ensure any materials reused on and offsite meet the relevant VENM and ENM requirements.</p>
	Contaminated soil	Various (Depends on waste classification)	Stockpiles (separate for each classification and banded and contained)	Unless contaminated soil can be appropriately treated and validated on site, it will be disposed of in accordance with the EPA Waste Classification Guidelines Part 1: Classifying Waste (2014).
	Non-destructive digging slurry	Various (Depends on waste classification)	Tanker	Transported to a liquid waste facility (Bettergrow Pty), which

				separates solids and liquids to allow for their reuse.
	Collected surface/groundwater.	Liquid waste	Tanker/lined basin	Wastewater to be reused on site where it fulfils Total Suspended Solids (TSS) criteria. Refer to the TfNSW Water Discharge and Reuse Guideline for more information.
Maintenance	Liquid waste, oils, lubes, wastewater etc.	Liquid waste	Appropriate bunded containers	Liquid waste not suitable for reuse will be stored in appropriate bunded containers in locked storage areas and removed off-site to a licensed waste facility.
Dust Suppression	Wastewater	Liquid waste	Tanker/lined basin	Collected wastewater that cannot be reused on site (e.g. for dust suppression) would be removed by a licensed contractor and taken to a licensed facility for treatment or disposal.
Administration & site office operations	Office waste (recyclables – paper, cardboard, aluminium, plastic containers)	General solid waste (non-putrescible)	Recycling bins for plastic, metal and paper	Recyclables placed in recycling bin and removed offsite to recycling facility by waste subcontractor.
	Office waste (municipal general waste – food organics, cigarettes and non-recyclable waste)	General solid waste (non-putrescible)	General waste bins	Removed from site to a licensed waste facility.

	Sanitary waste	Special waste (clinical waste)	Sanitary bins	Removed offsite to a licensed waste facility and disposed of as clinical waste.
	Sewage	General solid waste (putrescible)	Contained storage tank	Pump out to licensed facility.
Spill Response	Absorbent material, oil-soaked rags (that only contain non-volatile petroleum hydrocarbons and do not contain free liquids)	Hazardous waste	Bunded and contained storage facility	Removed from site to a licensed waste facility.

5.3 Waste handling and storage

Where waste is required to be handled and stored onsite prior to onsite reuse, or transported offsite for recycling/disposal, the following measures will apply. The design and location of waste storage areas will ensure no waste escapes into the environment.

- Spoil, topsoil and mulch are to be stockpiled onsite in allocated areas, where appropriate, and mitigation measures for dust control and surface water management will be implemented as per the Construction Air Quality Management Plan and the Construction Soil and Water Management Plan.
- Liquid wastes are to be stored in appropriate containers in bunded areas until transported offsite. Bunded areas will have the capacity to hold 110 per cent of the liquid waste volume for bulk storage or 120 per cent of the volume of the largest container for smaller packaged storage.
- Hazardous waste will be managed by appropriately qualified and licensed contractors, in accordance with the requirements of the Environmentally Hazardous Chemicals Act 1985. Bunded storage facilities will be provided at compound locations where required.
- All other recyclable or nonrecyclable wastes are to be stored in appropriate covered receptacles (e.g. bins or skips) in appropriate locations onsite and contractors commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.

5.3.1 Waste Tracking

Consistent with the Protection of the Environment Operations (Waste) Regulation 2014 the following wastes potentially encountered/generated are required to be tracked within NSW:

- Hazardous wastes as defined by Table 3 in the NSW EPA 'Waste that must be tracked' guideline
- Liquid waste (Category 1 trackable waste)
- More than 100 kilograms of asbestos waste or more than 10 square meters of asbestos sheeting in any single load
- More than 200 kilograms of waste tyres, or 20 tyres (whichever is heavier)
- Waste oil/water, hydrocarbon/water mixtures emulsions, and
- Wastes listed in Table 1 of the NSW EPA 'Waste that must be tracked' Guideline.

Details of waste types, volumes and destinations will be recorded in the Waste and Spoil Management Register for all waste movements off site for the construction of the SaMF. The NSW EPA Waste Locate system will be used to track asbestos waste and waste tyres (if any), whilst the online waste tracking system developed by EPA will be utilised to track all other trackable waste.

5.4 Waste exemption

The Protection of the Environment Operations (Waste) Regulation 2014 enables the EPA to grant exemptions to the licensing and payment of levies for the land application or use of waste where it can be demonstrated that no harm to the environment or human health will occur.

The EPA has issued general exemptions for a range of commonly recovered, high volume and well characterised waste materials that allow their use as fill or fertiliser at unlicensed, off-site facilities.

Under the Protection of the Environment Operations (Waste) Regulation 2014, there are a number of resource recovery orders and exemptions currently in force. The general resource recovery exemptions that may be applicable to this work are defined in Table 5-2 below. These are general gazette orders and exemptions that do not require approval.

Prior to utilising these exemptions, the waste needs to be adequately classified using the waste classification hierarchy in Section 5.2 in order to make sure that the waste meets the requirements of Table 5-2. This may include sampling and testing. Once classified, these exemptions may be used to enable the reuse of waste rather than disposing of it at a licenced facility.

A specific exemption may be granted where an application is made to the EPA. Records and docketts should be retained for audit purposes in accordance with CoA E130.

Table 5-2: Resource recovery exemptions

Exemption/Order	General conditions
Effluent Exemption 2014	<p>The effluent can only be applied to land for the purposes of irrigation or as a soil amendment material.</p> <p>The consumer must apply the effluent within a reasonable period of time.</p>
The Excavated Natural Material Exemption 2014	<p>The chemical concentration or other attributes of the excavated natural material listed in the Excavated Natural Material Exemption must not be exceeded.</p> <p>The excavated natural material can only be applied to land as engineering fill or used in earthworks.</p> <p>ENM handling, processing and testing requirements are outlined in detail in the exemption.</p>
The Mulch Exemption 2016	<p>Raw mulch can only be applied to land for the purposes of filtration or as a soil amendment material or used either singularly or in any combination as input material(s) to a composting process.</p> <p>The consumer must land apply the raw mulch within a reasonable period of time.</p>
The Recovered Aggregate Exemption 2014	<p>The chemical concentration or other attribute of the recovered aggregate listed in the Recovered Aggregate Exemption must be met.</p> <p>The recovered aggregate can only be applied to land for road making activities, building, landscaping and construction works.</p>
The Reclaimed Asphalt Pavement Exemption 2014	<p>Reclaimed asphalt can only be applied to land for road related activities including road construction or road maintenance.</p>

6 Resource management and conservation

The Project team is dedicated to implementing resource conservation best practice, in accordance with the Sustainability Management Plan. This includes conservation of materials, water and energy use, and the reduction of greenhouse gases. The following efficient work practices will be considered as part of the Project.

- Developing and implementing procedures to minimise energy use
- Monitoring and recording quantities of materials used, waste to be beneficially reused and waste to be recycled during the construction stage
- Conducting awareness programs for all site personnel regarding energy conservation methods
- Establishing administrative policies and incentives to reduce greenhouse gas production and energy consumption
- Project contractors will be encouraged to identify and implement their own discipline or trade specific measures
- Site office and facilities established with energy efficient equipment
- Selection of low-carbon concrete mixes
- Use of recycled materials, such as the maximum permitted recycled content for asphalt and concrete (including use of fly ash and blast furnace slag)
- Use of modular, prefabricated and precast structural and finishing materials.
- Energy efficient lighting in office/compound facilities. Include LEDs or T5 energy efficient lighting
- External facility lighting to utilise motion detection and light sensors or standalone solar-powered lamp posts
- External lights to utilise LEDs
- Maximise use of battery-operated small tools to reduce the use of generators and air powered tools
- Switch off computers, computer screens, heating, air conditioning and other equipment at the end of each day or when not in use. Ensure staff awareness of energy consumption and mitigation methods
- Orientate site cabins to maximise natural lighting through office/compound windows
- Installation of split-duct reverse cycle air conditioning units
- Non-potable water will be used where possible during construction for dust suppression
- Investigate the connection to recycled water facilities that may be available
- Water efficient fixtures and fittings installed in site sheds
- Waterless urinals used onsite.

Sustainable procurement, including use of materials with lower embodied energy and minimisation of whole of life costs, are addressed in the Sustainability Management Plan.

7 Environmental control measures

A range of environmental requirements and control measures are identified in the various environmental documents, including the SPIR, CoA, Project Deed and other PLR project documents. Project-specific management measures and requirements to address waste management and resource use are outlined in Table 7-1.

Table 7-1: Waste, energy, and water management and mitigation measures

ID	Measure/Requirement	When to implement	Responsibility	Reference
GENERAL				
WR1	<p>The NSW government’s Waste Management Hierarchy of “avoid-reduce-reuse-recycle-dispose” will be followed as the framework of waste and resource management throughout the Project.</p> <p>Toolbox talks and training will include details of waste, energy and water management. The toolbox talks are used to ensure environmental awareness (including issues regarding waste management) continues throughout construction, in accordance with the CEMP.</p>	Construction	Senior Construction and Staging Manager / Design and Construct Environment and Sustainability Manager	CoA E127, WM-2
WR2	Waste management measures from this CWRMP will be included in relevant Work Method Statements and Environmental Control Maps to be developed prior to the commencement of specific activities.	Construction	Site Engineer / Design and Construct Environment and Sustainability Manager	Good practice
WR3	All staff and subcontractors will undergo a site induction and ongoing toolbox talks that will detail waste minimisation and reuse management measures (including the waste management hierarchy) and energy consumption.	Construction	Design and Construct Environment and Sustainability Manager / Site Supervisor	CEMP Good practice

ID	Measure/Requirement	When to implement	Responsibility	Reference
WR4	All liquid and/or non-liquid waste generated on site shall be assessed and classified in accordance with Waste Classification Guidelines and managed appropriately according to its classification.	Construction	Design and Construct Environment and Sustainability Manager	WM-2, CoA E130
WR5	Waste materials generated by the Project will be re-used either on-site or off-site where possible, including the re-use of spoil for construction works, topsoil in landscape works, and the use of mulch for erosion and sediment controls.	Construction	Design and Construct Environment and Sustainability Manager / Site Engineer / Senior Construction and Staging Manager	WM-2 WM-6
WASTE HANDLING				
WH1	All waste types shall be classified and segregated on site, where space permits, ready for disposal/reuse or recycling, and to prevent cross-contamination.	Construction	Senior Construction and Staging Manager	WM-6
WH2	Pre-classified contaminated materials would be transferred directly into haulage trucks for offsite disposal at a waste facility licensed to accept the contaminated material.	Construction	Design and Construct Environment and Sustainability Manager/ Site Engineer	HY-6

ID	Measure/Requirement	When to implement	Responsibility	Reference
WH3	Where practicable, the collection and reuse of captured ground and surface water (wastewater) for dust suppression wash down and use in amenities or revegetation will be carried out.	Construction	Design and Construct Environment and Sustainability Manager/ Site Engineer	WM-1
WH4	Wastewater not reused on-site will be discharged in accordance with the • Transport for NSW's Water Discharge and Reuse Guideline (7TP-SD-024/3.0).	Construction	Design and Construct Environment and Sustainability Manager	WM-1
WH5	Asbestos waste management will be undertaken in accordance with the relevant legislations and guidelines.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	E131, WM-2
WH6	Any soil or fill materials imported to site for landscaping purposes, including recycled aggregates, must be accompanied by documentation to validate that the materials are suitable for use onsite in accordance with any legislative requirements.	Construction	Design and Construct Environment and Sustainability Manager/ Site Engineer	WM-1
MATERIAL SELECTION/ RESOURCE CONSUMPTION				
RCN1	Where practicable, surplus existing materials will be identified and utilised where fit for purpose.	Prior to construction / construction	Design and Construct Environment and Sustainability Manager/ Site Engineer	WM-6, WM-2

ID	Measure/Requirement	When to implement	Responsibility	Reference
RCN2	Products and materials containing recycled content or packaging would be used as a preference to non-recycled materials if determined to be feasible and reasonable. This information would be retained and reported.	Prior to construction / construction	Design and Construct Environment and Sustainability Manager	WM-1, WM-2
RCN3	All photocopying and printing paper will contain at least 80% recycled content with documentation to verify its environmental qualities.	Prior to construction / Construction	Design and Construct Environment and Sustainability Manager	WM-1
RCN4	Appropriate storage arrangements would be set up to guard against product degradation or damage from weathering or moisture.	Prior to construction / construction	Senior Construction and Staging Manager	Good practice
RCN5	All mulch reused onsite to be managed in accordance with RMS Environmental Direction 25: Management of Tannins from Vegetation Mulch.	Construction	Design and Construct Environment and Sustainability Manager/ Site Engineer	Mulch Order 2016

ID	Measure/Requirement	When to implement	Responsibility	Reference
RCN6	<p>Source concrete from members of Cement Concrete and Aggregates Australia or a similar international association or organisation by agreement with TfNSW.</p> <p>Concrete mixes for all applications where specifications and supply do not limit, will have a minimum 25% substitution of fly ash or 50% blast furnace slag in accordance with AS5100.5</p>	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	WM-3, WM-1 Project Deed
RCN7	Procurement of materials would be carried out on an 'as needed' basis to reduce over-ordering and wastage, and exploring opportunities to reuse materials, where applicable.	Prior to construction / Construction	Senior Construction and Staging Manager	WM-2
RCN8	Where possible, use of modular, prefabricated and precast structural and finishing materials.	Prior to construction / Construction	Senior Construction and Staging Manager	WM-1
WASTE DISPOSAL				
WD1	Waste will be managed and disposed of in accordance with the POEO Act. Reporting requirements and procedures for the reduction of generation of waste, resource recovery and use of recycled materials are detailed within this Plan.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	POEO Act

ID	Measure/Requirement	When to implement	Responsibility	Reference
WD2	All waste materials removed from the Project shall only be directed to a waste management facility or premises lawfully permitted to accept the materials.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	CoA E129
WD3	Waste generated outside the Project will not be brought onto the Project, except as expressly permitted by a licence or waste exemption under the POEO Act, if such a licence is required in relation to that waste.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	CoA E129
WD4	Wastes generated onsite will be stored in a way to prevent unauthorised access and uncontrolled release.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	Good practice
WD5	The relevant licenses of waste facilities utilised for the disposal of project waste will be obtained (on a regular basis if necessary) to ensure they are legally able to accept that waste.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	CoA E129
WD6	All trucks transporting wastes off site will be GPS tracked, and appropriately licensed to carry the materials to appropriately licensed waste facilities.	Construction	Senior Construction and Staging Manager	CoA E129

ID	Measure/Requirement	When to implement	Responsibility	Reference
WD7	<p>The disturbance, movement and disposal of asbestos containing materials would be carried out in accordance with the Work Health and Safety Regulation 2011 and other relevant guidelines.</p> <p>Asbestos waste over 10m³ will be tracked through the EPA WasteLocate Service.</p>	Construction	Site Engineer	WM-5, CoA E129
WD8	Any noxious weeds will be disposed of to a licenced facility (See Appendix A), in accordance with the <i>Noxious Weed Order 2014</i> .	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	<i>Noxious Weed Order 2014</i>
WD9	All construction waste shall be classified by an appropriately qualified person prior to disposal. ENM/VNM shall be classified in accordance with the Spoil Management Strategy set out in Appendix C.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	WM-6

ID	Measure/Requirement	When to implement	Responsibility	Reference
ENERGY AND WATER CONSERVATION				
EW1	<p>The procurement process will consider the following:</p> <ul style="list-style-type: none"> • Locally produced goods and services to reduce transport fuel emissions • Emissions intensity of construction materials • The fuel efficiency of the construction plant and equipment (compliance with the NSW Government Resource Efficiency Policy) • Accurate estimates of resource requirements to minimise wastage. 	Procurement / Prior to construction	Design and Construct Environment and Sustainability Manager / Senior Construction and Staging Manager	WM-1, WM-2
EW2	Project planning will aim to minimise double handling of materials, long haulage distances and additional fuel use.	Prior to construction	Design and Construct Environment and Sustainability Manager / Senior Construction and Staging Manager	Good practice
EW3	Vehicles and other equipment will be switched off when not in operation for periods of more than 15 minutes to minimise energy consumption.	Construction	Site Engineers	Good practice
EW4	All mains water and electricity used will be metered to allow site consumption to be monitored and recorded.	Prior to construction/ Construction	Administration Manager/Senior Construction and Staging Manager	Good practice

ID	Measure/Requirement	When to implement	Responsibility	Reference
EW5	All new office equipment, kitchen appliances and portable heating/cooling units procured must be energy efficient and display energy efficiency labels/tags. They must not contain or use Chloro-fluoro carbon (CFC) gases.	Prior to construction/ Construction	Administration Manager/Senior Construction and Staging Manager	Good practice
EW6	All office computers, photocopiers and printers must be automated to shutdown overnight.	Prior to construction / Construction	Design and Construct Environment and Sustainability Manager / Senior Construction and Staging Manager	Good practice
EW7	All temporary buildings should be appropriately insulated and positioned in a manner to reduce the need for additional heating or cooling requirements.	Prior to construction	Administration Manager/Senior Construction and Staging Manager	Good practice
EW8	Construction activities that typically have a high potable water use will be reviewed to identify viable opportunities for water use reduction (e.g. use of dust suppressants and other measures).	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	Good practice
EW9	All hoses will be fitted with a trigger nozzle or device to prevent uncontrolled water flow.	Construction	Senior Construction and Staging Manager	Good practice
EW10	Water efficient fixtures and fittings will be installed in all temporary buildings and waterless urinals will be used onsite.	Construction	Administration Manager/Senior Construction and Staging Manager	Good practice

ID	Measure/Requirement	When to implement	Responsibility	Reference
EW11	Where possible and feasible external facility lighting will utilise motion detection and light sensors or standalone solar-powered lamp posts. Where possible all external lighting to utilise LED bulbs.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	Good practice
EW12	Maximise use of battery-operated small tools to reduce the use of generators and air powered tools.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	Good practice
EW13	Low carbon concrete mixes and biodiesel mixes will be selected where reasonable and feasible.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	Good practice
EW14	Where practicable, wastewater will be recycled for onsite uses including dust suppression and vehicle wash-down.	Construction	Design and Construct Environment and Sustainability Manager/ Senior Construction and Staging Manager	PROJECT DEED 4.8
REPORTING				
RE1	A waste management register (Appendix B) will be maintained until the completion date. The register is to record the type, amount and date when waste is reused, recycled, stockpiled and disposed of.	Construction	Design and Construct Environment and Sustainability Manager/ Site Engineer	WM-3

ID	Measure/Requirement	When to implement	Responsibility	Reference
RE2	Receipts and dockets for waste transfer and disposal will be retained for audit purposes and checked to ensure all details are correct.	Construction	Design and Construct Environment and Sustainability Manager/ Site Engineer	WM-3, E129, E130
RE3	Collect and report all data necessary for NGERs annually	Construction	Design and Construct Environment and Sustainability Manager/ Site Engineers	<i>National Greenhouse and Energy Reporting Act 2007</i>
RE4	Complete TfNSW Waste Data Collection Worksheet 9TP-FT-436	Construction	Design and Construct Environment and Sustainability Manager/ Site Engineers	TfNSW Project Deed

8 Compliance management

8.1 Roles and responsibilities

The roles and responsibilities for the construction of the SaMF are outlined in Section 4.2 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 7 of this Plan. The GRCLR Environment and Sustainability Manager will provide environmental oversight, direction and leadership regarding the environmental management of the Project. The Design and Construction Environment Manager is responsible for the on site environmental management and reports to the GRCLR Environment and Sustainability Manager.

8.2 Training

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

- Existence and requirements of this Plan
- Relevant legislation
- Incident response, management and reporting
- Waste reporting requirements
- Requirements of the waste hierarchy
- Waste/ recycling storage requirements
- Energy efficient best practices
- Expectations for ISCA targets relevant to waste and resource management
- Other specific responsibilities for waste and reuse management.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in waste and energy management.

Further details regarding staff induction and training are outlined in Section 5 of the CEMP.

8.3 Monitoring and inspection

GRCLR will carry out regular monitoring and inspections to ensure the requirements of this Plan are being implemented in accordance with Section 8 of the CEMP. Independent inspections to confirm GRCLR's compliance with waste management requirements will be carried out by TfNSW and the appointed Environmental Representative.

Table 8-1 outlines the monitoring and inspection activities that will be undertaken during construction to ensure GRCLR, waste contractors and construction contractors implement the requirements of this Plan.

Table 8-1: Monitoring and Inspection Requirements

Item	Responsibility	Frequency
Monitor waste volumes diverted from landfill by obtaining records of waste collections and their final destinations.	Design and Construct Environment Manager	Monthly
Undertake weekly waste & energy inspections and record results on the environment inspection checklist.	Design and Construct Environment Manager	Weekly
Maintain and document the types and volumes of wastes generated, re-used, recycled and disposed of.	Design and Construct Environment Manager	Daily/as required
Inspect stockpiled and segregated waste collection points. Ensure it is clearly signposted, collections are at the correct frequency.	Design and Construct Environment Manager	Daily/as required
Monitor and record resource usage during construction works (e.g. energy, water, fuel, oil, etc.).	Design and Construct Environment Manager	Monthly
<p>ISCA Was-1 (Level 2) credit –</p> <p>Monitoring of all wastes is undertaken during construction</p> <p>AND</p> <p>Waste monitoring and management has been managed, reviewed or audited by a suitably qualified professional.</p> <p>AND</p> <p>Waste handling and disposal/recycling all the way to final destination has been audited at appropriate intervals.</p>	Design and Construct Environment Manager	<p>The monitoring would need to be regular (e.g. monthly)</p> <p>AND</p> <p>Waste monitoring and management must be managed, reviewed or audited at least annually for construction</p> <p>AND</p> <p>Auditing to final destination must be undertaken at least 6 monthly for construction.</p>

Monitor or model materials lifecycle impacts using ISCA materials calculator or another suitable lifecycle assessment tool across the infrastructure lifecycle	Design and Construct Environment Manager	Use the results of the lifecycle assessments to inform materials selection during design and construction
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Additional requirements and responsibilities in relation to inspections are documented in Section 8 of the CEMP.

8.4 Auditing

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

Audit requirements are detailed in Section 8.3 of the CEMP.

Internal auditing of at least one final destination waste facility will be undertaken at least 6-monthly during construction of the SaMF. Final destination means at least to a waste facility where the waste is transformed into another product or material or into landfill. Physical sorting of waste is not considered a final destination. The audit would include a physical/visual verification of the final destinations. The audit would only focus on the significant waste streams and each audit may cover a particular significant waste stream.

8.5 Reporting

Waste and resource reporting would include the following:

8.5.1 Waste management register

A waste management register shall be maintained which identifies all waste produced on site and its subsequent management. The register shall document the following:

- Type and quantity of waste
- Whether the waste is to be recovered (either for use on-site or off-site) or sent for disposal
- Tracking information of waste streams
- Upon removal of waste from site – date of removal, transport contractor information and final destination.

All relevant documentation such as dockets and receipts will be retained within the register (example attached as Appendix B).

8.5.2 Waste avoidance and resource recovery reporting

Waste avoidance and resource recovery reporting would be completed annually and following completion of construction. There are three components to the report to be addressed, as follows:

- Purchasing data: data on the amount of material purchased by the Project to enable construction works listed under the contract
- Waste and recycling data: data on the amount of material generated and recycled by GRCLR during work under the contract
- Project initiatives and barriers: provide information taken to reduce waste, recycle resources and purchase recycled content materials in the course of completing work under the contract.

8.5.3 National Greenhouse and Energy Reporting

The National Greenhouse and Energy Reporting (NGER) Scheme was introduced in 2007 to provide data and accounting in relation to greenhouse gas emission and energy consumption and production. The scheme requires companies to report information including

- Diesel usage
- Electricity from site generators
- Bitumen and asphalt produced
- Explosives used onsite (not relevant to SOM works)
- Amount of acetylene.

All subcontractors involved in the Project will be requested to submit fuel usages in order to determine total diesel usage. GRCLR shall conduct annual reporting of NGERs as well as undertake external audits of subcontractors to ensure that their data is adequate for reporting purposes.

9 Review and improvement

9.1 Continuous improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for 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 non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

Regular inspection and review of performance against environmental objectives will be undertaken in accordance with the procedures detailed in Section 7.5 of the CEMP.

In accordance with Section 9 of the CEMP, periodic assessments and reviews of this CWRMP will be conducted by project management personnel. This review will generate actions for the continual improvement of this Plan.

Possible non-conformances with this Plan include non-compliance with the CoA, REMMMs, EPOs and environmental control measures outlined in this Plan (refer to Section 3.2, Section 3.3, Section 3.4 and Section 7 of this Plan).

All incidents and non-conformances are to be reported and investigated and corrected in accordance with Section 8.6 of the CEMP to ensure effective waste and resource management practices at all times.

9.2 CWRMP update and amendment

The processes described in Section 8 and 9 of the CEMP may result in the need to update or review this Plan. This will occur as needed.

The review will generate actions for the continual improvement of the Plan. The responsible environmental manager will record the outcomes of the review, including subsequent changes, how the site/project team will be informed of the changes and when the reviewed Plan will be submitted to the ER for review and approval. The updated Plan must be endorsed by the ER before updates are distributed.

Only the GRCLR Environment and Sustainability Manager, or delegate, has the authority to change any of the environmental management documentation.

A copy of the updated Plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 10.2 of the CEMP.

Appendix A- Location of Waste Facilities

Facility Name	Location	Type of Licensed Activity	EPA Licence #
Australian Native Landscapes Badgerys Creek	210 Martin Road, Badgerys Creek 2171	<ul style="list-style-type: none"> • Non-thermal treatment of general waste • Waste storage - other types of waste • Composting 	4625
Brandown Pty Ltd	Lot 90 Elizabeth Drive, Kemps Creek 2171	<ul style="list-style-type: none"> • Land-based extractive activity • Waste disposal by application to land 	5186/12618
SUEZ Auburn Resource Recovery Centre	Old Hill Link, Sydney Olympic Park NSW 2127	<ul style="list-style-type: none"> • Recovery of general waste • Non-thermal treatment of general waste • Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste • Waste storage - other types of waste • Waste storage - waste tyres 	4547
SUEZ Ryde Resource Recovery Centre	145 Wicks Road, North Ryde, NSW 2113	<ul style="list-style-type: none"> • Recovery of general waste • Non-thermal treatment of general waste • Waste storage - waste tyres • Waste storage - other types of waste • Waste storage - hazardous, restricted solid, liquid, clinical 	4527

Facility Name	Location	Type of Licensed Activity	EPA Licence #
		and related waste and asbestos waste	
SUEZ Kemps Creek Resource Recovery Park	1725 Elizabeth Drive, Kemps Creek 2178	<ul style="list-style-type: none"> • Generation of electrical power from gas • Waste storage - other types of waste • Waste disposal by application to land 	4068
SUEZ Lucas Heights Resource Recovery Park	Little Forest Rd, Lucas Heights NSW 2234	<ul style="list-style-type: none"> • Non-thermal treatment of liquid waste • Waste storage - waste tyres • Waste storage - other types of waste 	5065

Facility Name	Location	Type of Licensed Activity	EPA Licence #
		<ul style="list-style-type: none"> Waste disposal by application to land 	
SUEZ Wetherhill Park Resource Recovery Facility	20 Davis Road, Wetherill Park, NSW 2164	<ul style="list-style-type: none"> Non-thermal treatment of hazardous and other waste Waste storage - other types of waste Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste 	4548
SUEZ Seven Hills Resource Recovery Centre	29 Powers Road, Seven Hills, NSW 214	<ul style="list-style-type: none"> Recovery of general waste Waste storage - other types of waste Non-thermal treatment of general waste Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste Waste storage - waste tyres 	7246
Cleanaway Erskine	85-87 Quarry Road, Erskine Park, NSW 2759	<ul style="list-style-type: none"> Solid waste management General solid waste (non-putrescible) General solid waste soils (special asbestos) Low level contaminated soils 	20986

Facility Name	Location	Type of Licensed Activity	EPA Licence #
		<ul style="list-style-type: none"> • Construction and demolition waste • Clean fill (ENM/VENM) 	
Cleanaway Resource Co	35-37 Frank Street, Wetherill Park, NSW 2164	<ul style="list-style-type: none"> • Recovery of general waste • Waste storage - other types of waste 	20937
Cleanaway Homebush Bay Liquid Treatment Plant	Corner of Pondage Link and Hill Rd, Homebush Bay, NSW 2127	<ul style="list-style-type: none"> • Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste • Non-thermal treatment of hazardous and other waste 	4560
Veolia Environmental Services	37 Grand Avenue, Camellia, NSW 2142	<ul style="list-style-type: none"> • Waste storage - other types of waste • Recovery of general waste 	4806
Veolia Environmental Services Clyde Transfer Terminal	Parramatta Road, Clyde, NSW 2142	<ul style="list-style-type: none"> • Non-thermal treatment of general waste • Waste storage - other types of waste 	11763
Veolia Environmental Services Horsley Park Waste Management Facility	Wallgrove Road, Horsley Park, NSW 2175	<ul style="list-style-type: none"> • Composting • Non-thermal treatment of general waste • Waste disposal by application to land 	11584

Facility Name	Location	Type of Licensed Activity	EPA Licence #
Dial A Dump Industries	76-82 Burrows Road, Alexandria, NSW 2015	<ul style="list-style-type: none"> • Waste storage - other types of waste • Non-thermal treatment of general waste 	4679
Closed Loop (Simply Cups Australia)	Level 1/40 Albert Rd, South Melbourne VIC 3205	<ul style="list-style-type: none"> • Coffee Cup Recycling 	N/A
TerraCycle	2/80 Albion St, Surry Hills NSW 2010	<ul style="list-style-type: none"> • Safety Equipment and Protective Gear • Cigarette Waste • Office Supplies • Breakroom Waste 	N/A

Appendix B- Waste Management Register

Date	Waste Classification	Description of waste	Waste source or stockpile identification	Volume / weight	Transporter include licence	Destination (address)	Description of disposal or reuse	Receipt # / waste docket / invoice

Appendix C – Spoil Management Strategy

Introduction

This spoil management strategy (SMS) has been prepared to fulfil REMMM WM-6, which states:

A spoil management strategy would be developed prior to the commencement of construction and implemented during construction. The strategy would identify spoil disposal sites and describe the management of spoil on-site and during off-site transport.

The purpose of the strategy is to:

- Minimise spoil removal and associated impacts on stakeholders, community and the environment
- Maximise the beneficial reuse of spoil material from the Project.

Material types

Topsoil occurs between approximately 50-300mm of natural ground surface. Topsoil reuse shall be maximised on site to minimise the import of external topsoil for revegetation and landscaping purposes wherever practicable.

The material below the topsoil is considered to be spoil and is defined as any earthen material that is surplus to requirements or unsuitable for reuse within the Project works.

Topsoil and spoil will be sampled, analysed and characterised in accordance with the EPA Waste Classification Guidelines Part 1: Classifying Waste (2014), as required by the CWRMP. Further information regarding the classification of VENM and ENM is provided below.

The SaMF has no topsoil present. The SaMF is currently notified under the *Contaminated Land Management Act 1997*. Soils and groundwater at the site are known to contain hexavalent chromium, volatile chlorinated hydrocarbons (VCHs) and asbestos due to historical industrial activities.

The SaMF is currently being remediated (subsurface) to a level to allow commercial/industrial land use under NSW EPA audit scheme prior to the commencement of construction of the stabling and maintenance facility (under a separate planning approval process).

Virgin Excavated Natural Material (VENM)

As the works are taking place within existing road corridors and dense urban areas, it is expected that little, if any, excavated material can be classified as VENM. If suspected VENM, spoil will be subject to testing and reused on site for landscaping and other suitable uses.

Excavated Natural Material (ENM)

The majority of the spoil excavated as part of the SOM activities are expected to be classified as ENM, and will be reused in accordance with the Protection of the Environment Operations (Waste) Regulation 2014 (the Waste Regulation) current general resource recovery exemption: Excavated Natural Material Exemption 2014.

Other waste types

Spoil not classified as either VENM or ENM due to contamination from either construction material or other sources shall be characterised in accordance with the EPA Waste Classification

Guidelines Part 1: Classifying Waste (2014) as required by the CWRMP. This may include classification as General Solid Waste, Hazardous Waste or Special Waste.

Any previously unidentified contaminated material will be tested and disposed of in accordance with the Unexpected Finds Procedure in Appendix A of the Contaminated Land Management Plan.

Resource recovery exemptions

The Waste Regulation enables the EPA to issue 'resource recovery exemptions' which allow for the beneficial reuse of wastes via land application or for use as a fuel. This regulation enables a project to comply with the principle of 'wastes to resources for beneficial reuse' (where the wastes are fit for beneficial reuse).

During the Project, materials may be encountered that do not meet the VENM or ENM classification but is also not contaminated material. In these circumstances the D & C Environment Manager will check for existing resource recovery exemptions such as:

- Excavated Public Road Material Exemption 2014 (EPA)
- Raw Mulch Material Exemption 2014 (EPA)

Onsite management

Storage of spoil

Material which can be reused onsite, but which cannot be directly replaced will be stored in designated stockpile areas onsite. Material of different types will be segregated to prevent mixing. Where space is restricted material may require temporary storage offsite prior to reuse onsite.

All spoil material requiring disposal will be classified according to the EPA Waste Classification Guidelines 2014.

The Design and Construct Environment and Sustainability Manager and Site Engineer will identify storage areas prior to commencement of construction in each area, primarily to ensure that disturbance to local residents is minimised, local amenity is maintained, and to protect receiving waters from potential runoff.

Erosion and Sediment Control Plans (ESCPs) prepared for specific areas will contain details on the locations and control measures for stockpiling. The relevant Environmental Control Maps (ECMs) will also provide general measures for the location and management of stockpiles.

Stockpile management

Stockpiles would:

- Generally be located within the road reserve or at sites specifically identified for compound, stockpiling and/or batching plant location
- Be located on flat, grassed or hard-standing areas where possible. Stockpiles will not to be placed on native vegetation
- Be covered where practical to do so
- Be labelled, separated and easily accessible
- Stockpile management will be documented in the Waste Management Register (Appendix B)
- Be located more than two metres from existing native vegetation, concentrated water flow, active roads, gutters, drains and other restricted areas including residential areas, places of public access and site buildings

- Generally be located away from steep slopes (note: temporary stockpiles of vegetation may be required on steep slopes during clearing operations)
- Be located away from the drip line of trees
- Be located on sites above the 20 ARI flood level
- Be constructed as low, flat elongated mounds where possible
- Have sediment fences down-slope to prevent runoff and measures upslope to divert water away from the stockpile
- Be appropriately treated where practical, including covering unconsolidated stockpiles with geofabric, hydro mulch or other revegetation applicants where stockpiles are to be left standing for extended periods, stabilising and binding after appropriate shaping
- Be accessible for the purpose of dust suppression (e.g. application of water sprays, covers, binding agents etc).

Spoil reuse

A target of 100% has been set for the reuse of usable spoil within the SOM Project, in accordance with the Parramatta Light Rail Sustainability Strategy.

Once the spoil has been classified as suitable to reuse or meets the requirements of a resource recovery exemption. The following spoil reuse hierarchy will be implemented on the Project:

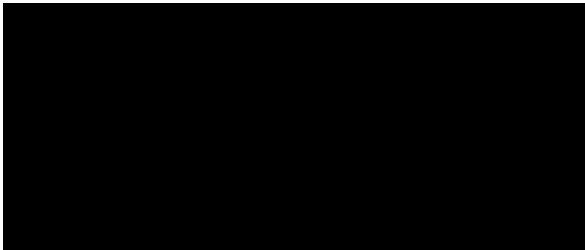
1. Reuse spoil within the Project
2. Reuse the spoil within the wider Parramatta Light Rail Project
3. Reuse the spoil at another TfNSW project
4. Reuse the spoil at an alternative beneficial location, such as a land development
5. Relocate Spoil to a TfNSW owned or approved long term storage facility for later reuse

Spoil disposal

Any spoil that cannot be reused will be disposed of in accordance with the following measures:


- Ensure all spoil/waste material removed from the site is assessed and classified in accordance with the EPA Waste Classification Guidelines 2014
- Ensure that any spoil transported from the site is taken to a place that can lawfully accept it
- Use appropriately licensed waste transporters for the transportation of spoil to offsite locations.

Appendix D – Environmental Representative Endorsement



16 December 2021

Transport for NSW

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

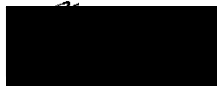
**Review of Construction Waste and Resource Management Plan.
Supply, Operate and Maintain Package - Parramatta Light Rail
(PLR1SOM-GLR-ALL-PM-PLN-000039 Rev 1)**

Pursuant to SSI8285 Condition of Approval A23 (d) i), as the approved Environmental Representative, I confirm that I have reviewed the Construction Waste and Resource Management Plan, Supply, Operate and Maintain Package - Parramatta Light Rail (PLR1SOM-GLR-ALL-PM-PLN-000039 Rev 1), dated 3/12/2021, prepared by Great River City Light Rail, for consistency with the requirements of the Conditions of Approval.

The amendments to the aforementioned document do not increase the magnitude of impacts on the environment and do not compromise the ability of the Project to meet approval or legislative requirements. These amendments are classified as minor and are approved in accordance with Condition of Approval C8. The document continues to be consistent with the requirements included in or required under the terms of the Conditions of Approval for the Parramatta Light Rail (Stage 1) development

Yours sincerely,

Australian Quality Assurance & Superintendence Pty Ltd (AQUAS)




Environmental Representative
phone: + |
email: 

Filename : AQ1148.05 PLR GLR WRMP Rev1 endorsement 211216