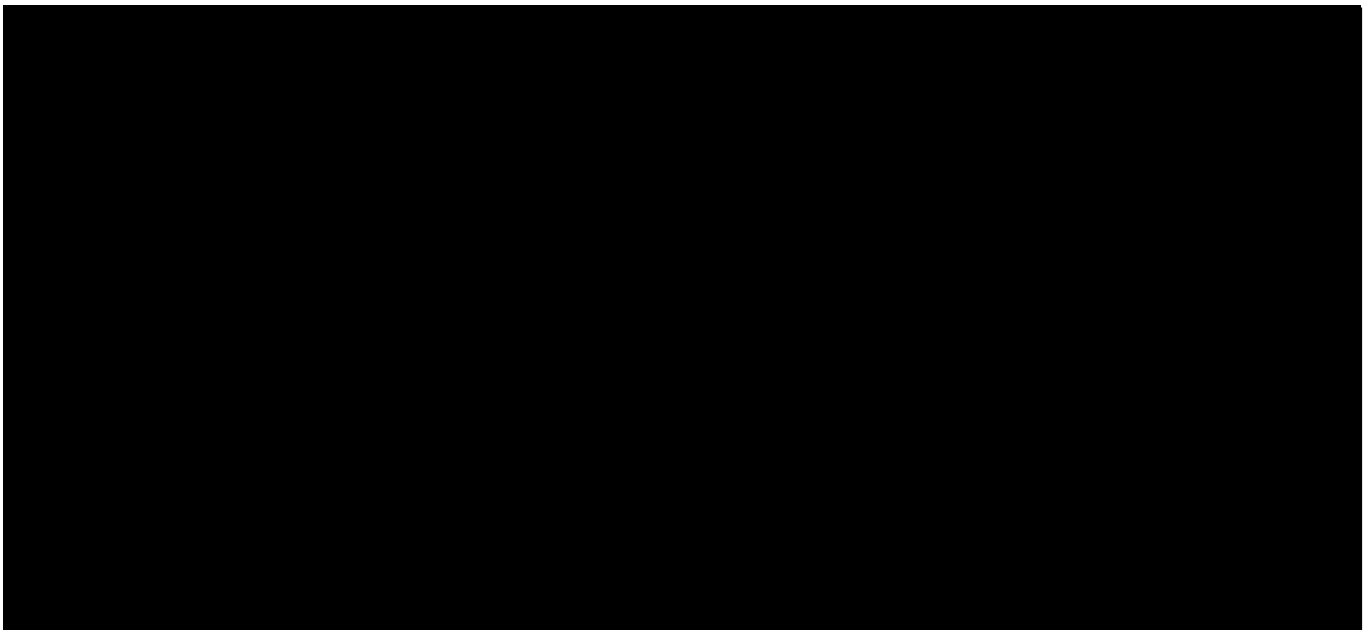




CBGU D&C JV

# Waste Resource Recovery Management Plan

Cross River Rail Project – Tunnel, Stations and Development Package (TSD)



Document number: CRRTSD-EN-ENMP-CBGU-000026

Revision date: 7/04/2020

Revision: 2

# Compliance Matrix

Table 1 Compliance matrix

CRRDA REFERENCE	REQUIREMENT	ADDRESSED IN SECTION
Coordinator-General’s change report – whole of project refinements 2019		
Schedule 1 – Environmental Design Requirements		
11 (a)	The Project is designed to minimise waste generation and maximise the reuse and recycling of waste materials generated by the Project during its construction and operation.	This Plan
11 (b)	Opportunities are investigated during the detailed design phase for the use of recycled materials, including for Project infrastructure produced from concrete, road base, asphalt and other construction materials.	This Plan
11 (c)	During detailed design, the feasibility of re-using material excavated from the Project is investigated.	This Plan

## Details of Revision Amendments

### Document Control

The CBGU Project Director is responsible for ensuring that this Plan is reviewed and approved. The Project Environment & Sustainability Manager is responsible for updating this Plan to reflect changes to the Project, legal and other requirements, as required.

### Amendments

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

### Distribution and Authorisation

The CBGU Project Director is responsible for the distribution of this Plan. The controlled master version of this document is available for distribution as appropriate and maintained on TeamBinder. All circulated hard copies of this document are deemed to be uncontrolled.

All personnel employed on the Project will perform their duties in accordance with the requirements of this Plan, supporting management plans, and related procedures.

# Table of Contents

1	Introduction.....	1
1.1	Background.....	1
1.2	Context.....	1
1.3	Objectives.....	1
1.4	Legislative Framework.....	1
1.4.1	Commonwealth Legislation.....	1
1.4.2	State Legislation.....	1
1.4.3	Approvals, Permits and Licences.....	2
1.4.4	Guidelines and Standards.....	2
2	Required Outcomes.....	4
2.1	Coordinator-General Conditions.....	4
2.2	Performance Criteria.....	4
2.3	Objectives and Targets.....	4
3	Impacts and Mitigation Measures.....	6
3.1	Impacts.....	6
3.1.1	Waste Stream Assessment.....	1
3.2	Mitigation Measures.....	1
3.2.1	General requirements.....	1
4	Compliance Management.....	6
4.1	Roles and Responsibilities.....	6
4.2	Induction and Training.....	6
4.2.1	Environmental Induction.....	6
4.2.2	Environmental Training.....	6
4.3	Communication.....	6
4.4	Incidents and Emergencies.....	6
4.4.1	Incident Notification.....	6
4.4.2	Incident Types.....	6
4.4.3	Incident Prevention Management.....	6
4.4.4	Incident Investigation.....	7
4.4.5	Complaint Management.....	7
5	Inspections, Monitoring, Auditing and Reporting.....	8
5.1	Environmental Monitoring.....	8
5.1.1	Performance Monitoring.....	8
5.1.2	Auditing.....	8
5.1.3	Corrective Action.....	8
5.2	Reporting.....	9

5.2.1	Monthly Report .....	9
5.2.2	Incidents and Non-Compliance Reporting.....	9
5.3	Documentation and Communication .....	9
5.3.1	Environmental Records .....	9
5.3.2	Document Control .....	9
5.3.3	Review .....	9
5.3.4	Communication.....	10
Appendix A.....		11

## Table of Tables

Table 1	Compliance matrix.....	i
Table 2	Referenced Documents .....	v
Table 3	Terms.....	vi
Table 4	Environmental approvals, permits and licences .....	2
Table 5	Project sustainability targets for the management of waste and resource .....	5
Table 6	Estimated percentage of material removed from site during the construction period.....	6
Table 7	Estimated quantities of waste generated by staff during construction.....	7
Table 8	Estimated volumes of general waste generated during construction .....	7
Table 9	Estimated total quantities of material removed from the various work sites as waste during construction .....	1

## Table of Figures

Figure 1	Waste and Resource Management Hierarchy.....	2
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## Referenced Documents

The following provides a list of referenced documents either as a sub-plan to this plan or referenced from.

Table 2 Referenced Documents

Document Number	Document Name	Location of Controlled Version
Referenced Project Plans include:		
CRRTSD-EN-ENMP-CBGU-000001	Air Quality Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000005	Climate Change and Sustainability Management Plan	TeamBinder
CRRTSD-EN-MPL-CBGU-000019	Construction Environmental Management Plan	TeamBinder
CRRTSD-TM-MPL-CBGU-000012	Construction Traffic Management Plan	TeamBinder
CRRTSD-CS-MPL-CBGU-000036	Construction Worksite Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000016	Erosion and Sediment Control Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000007	Hazard and Risk Management Plan	TeamBinder
	Hazardous Materials and Dangerous Goods Management Plan	TeamBinder
CRRTSD-TM-MPL-CBGU-000014	Haulage Management Plan	TeamBinder
CRRTSD-SH-MPL-CBGU-000003	Occupation Health & Safety Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000006	Spoil Placement Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000002	Waste Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000017	Water Quality Management Plan	TeamBinder

Note: this Management Plan may not contain the current version of the documents listed above. Refer to the 'location of controlled version' for the most current version.

## Glossary of Terms

Table 3 Terms

Term	Meaning
AQMP	Air Quality Management Plan
BCC	Brisbane City Council
CBD	Central Business District
CBGU	Design & Construct Contractor comprising a joint venture with CPB Contractors Pty Ltd, BAM International Australia Pty Ltd, Ghella Pty Ltd and UGL Engineering Pty Ltd
CCSMP	Climate Change and Sustainability Management Plan
CEMP	Construction Environmental Management Plan
CG	Coordinator-General
CGCR	Coordinator-General change reports
CRR	Cross River Rail
CSEP	Community and Stakeholder Engagement Plan
CTMP	Construction Transport Management Plan
CWMP	Construction Worksite Management Plan
DA	Delivery Authority
DEHP	Department of Environment and Heritage Protection (now DES)
Delivery Authority	Cross River Rail Delivery Authority
DES	Department of Environment and Science
EMR	Environmental Management Register
EP Act	Environmental Protection Act 1994 (Qld)
EPP (Water)	Environmental Protection (Water) Policy 2009 (Qld)
ERA	Environmentally Relevant Activity
ESCP	Erosion and Sediment Control Plan
HGMP	Hazardous Goods Management Plan
HMP	Haulage Management Plan
HRMP	Hazard and Risk Management Plan
ISCA	Infrastructure Sustainability Council of Australia
km	Kilometre
Project	Cross River Rail Project
PSTR	Project Scope and Technical Requirements
OHSMP	Occupation Health & Safety Management Plan
QLD	Queensland
QR	Queensland Rail

Term	Meaning
RNA	Royal National Agriculture and Industrial Association
SDP	Soil Disposal Permit
SDS	Safety Data Sheets
SPMP	Spoil Placement Management Plan
TBM	Tunnel Boring Machine
TSD	Tunnel, Stations and Development
TeamBinder	Proprietary software used as part of the Project wide Electronic Document Management System
VENM	Virgin Excavated Natural Material
WHSQ	Workplace Health and Safety Queensland
WMP	Waste Management Plan
WRRMP	Waste and Resource Recovery Management Plan
WQMP	Water Quality Management Plan
WWTP	Waste Water Treatment Plant



# 1 Introduction

## 1.1 Background

The Design and Construction Joint Venture comprising of CPB Contractors Pty Ltd, BAM International Australia Pty Ltd, Ghella Pty Ltd and UGL Engineering Pty Ltd (CBGU D&C JV or CBGU) is responsible for delivering the Cross River Rail (CRR) Project (the Project) on behalf of the Cross River Rail Delivery Authority (the Delivery Authority).

This Waste Resource Recovery Management Plan should be read in conjunction with the Project's overarching Construction Environment Management Plan (CEMP).

The CEMP provides specific details regarding the background of the Project, the scope of the Project and the staging and timing of key milestones associated with the construction of the Project.

## 1.2 Context

This Waste Resource Recovery Management Plan (WRRMP) forms part of the Construction Environmental Management Plan (CEMP) developed for the construction of the Project. The WRRMP describes how the CPBU D&C JV will manage waste resource recovery and minimise impacts during construction of the Project

## 1.3 Objectives

The objectives of this WRRMP which is a sub-plan of the CEMP are to:

- Develop waste management principles (avoid, reduce, reuse and recycle) and sustainable disposal strategies
- Create targets to recover and re-use construction waste, all classes or categories of waste
- Take all reasonable and practicable steps to minimise the impacts of handling and disposal of construction waste at the worksites, and at the disposal sites.

## 1.4 Legislative Framework

### 1.4.1 Commonwealth Legislation

No Commonwealth legislation is specifically relevant to this WRRMP.

### 1.4.2 State Legislation

State legislation that is relevant to the Project and this WRRMP includes:

- *Cross River Rail Delivery Authority Act 2016*
- *Environmental Protection Act 1994*
- *Environmental Protection Regulation 2008*
- *Waste Reduction & Recycling Act 2011*
- *Waste Avoidance and Recovery Act 2001*
- *Building Act 1975*
- *City of Brisbane Act 2010*
- *Economic Development Act 2012*

- *Local Government Act 2009*
- *Transport Infrastructure Act 1994*
- *State Development and Public Works Organisation Act 1971*
- *Environmental Protection (Waste ERA Framework) Amendment Regulation 2018*
- *Planning Act 2016*
- *Work Health and Safety Act 2011*
- *Environmental Protection (Regulated Waste) Amendment Regulation 2018*
- *Waste Reduction & Recycling (Waste Levy) Amendment Bill 2019*

### 1.4.3 Approvals, Permits and Licences

CBGU will obtain licences, permits and approvals as required by law and maintain them as required throughout the delivery phase of the project. No condition of the Infrastructure Approval removes the obligation for CBGU to obtain, renew or comply with such necessary licences, permits or approvals.

Approvals expected to be required for the Project, that relate to air quality impacts and management are identified in Table 4 below.

Table 4 Environmental approvals, permits and licences

Approval / Permit / Licence	Regulatory Authority	Responsibility / Timeframe	Items approved
Contaminated Soil – Disposal Permit	Department of Environment and Science	CBGU Minimum 10 day approval timeframe.	Disposal of contaminated material
Contaminated Soil – Owner Approval	Queensland Rail	CBGU Timeframe will be dependent on site owner.	Disposal of contaminated material
Waste Exemption – Contaminated Material	Department of Environment and Science	CBGU Minimum 30 day approval timeframe	Waste as exemption waste
Clean spoil disposal	Varied – depending on location of spoil disposal	Spoil haulage contractor. Timeframe varies depending on proposed disposal location. Some locations may already be approved for disposal – for example at Port of Brisbane	Disposal of clean spoil

### 1.4.4 Guidelines and Standards

The main guidelines, specification and policy documents relevant to this WRRMP include:

- Department of Environment and Science (DES), Waste tracking obligations for PFAS in Queensland guideline

- DES 2011, End of Waste (EOW) guideline
- DES 2018, Managing waste tracking in Queensland guideline
- Workplace Health and Safety Queensland (WHSQ) 2011, How to Safely Remove Asbestos Code of Practice
- Workplace WHSQ 2011, How to Manage and Control Asbestos in the Workplace Code of Practice
- Queensland Government *Waste - Everybody's Responsibility Queensland Waste Avoidance and Resource Productivity Strategy (2014-2024)*
- Infrastructure Sustainability Council of Australia 2018, IS v2.0 Technical Manual.

## 2 Required Outcomes

The following environmental design requirements and environmental outcomes must be achieved throughout construction of the Project. The environmental outcomes may be achieved by meeting the performance criteria in this WRRMP.

### 2.1 Coordinator-General Conditions

Throughout construction, the following Imposed Condition/s must be achieved.

#### **Schedule 1 – Environmental Design Requirements**

*11 a) The Project is designed to minimise waste generation and maximise the reuse and recycling of waste materials generated by the Project during its construction and operation*

*11 b) Opportunities are investigation during the detailed design phase for the use of recycled materials, including for Project infrastructure produced from concrete, road base, asphalt and other construction materials*

*11 c) During the detailed design, the feasibility of re-using material excavated from the Project is investigated.*

### 2.2 Performance Criteria

Construction activities are conducted in accordance with this Waste Resource Recovery Management Plan (WRRMP), this WRRMP addresses the following requirements:

- Waste management principles (avoid, reduce, reuse and recycle) and sustainable disposal strategies are implemented;
- Targets to recover and re-use construction waste for all classes or categories of waste; and
- All reasonable and practicable steps are taken to minimise the impacts of handling and disposal of construction waste at the worksites, and at the disposal sites.

### 2.3 Objectives and Targets

The key objective of the WRRMP is to ensure that the generation of waste and the consumption of resources are minimised during construction of the Project. To achieve this objective, the targets in Table 8 have been established for the management of waste and resources during the Project.

The waste and resource targets in Table 5 relate to the overall targets of the construction aspect of the Project and is managed in accordance with the requirements and recovery targets set out in the ISCA IS v2.0 Technical Manual and the Queensland Government *Waste - Everybody's Responsibility Queensland Waste Avoidance and Resource Productivity Strategy (2014-2024)*. The level 3 sustainability targets are adopted for the construction phase of the Project.

Table 5 Project sustainability targets for the management of waste and resource

Waste Type	Level 3
	Targets for landfill diversion
Spoil (uncontaminated)	100%
Non-hazardous waste	>90%
Office Waste	>60%

**Notes:**

*Spoil – uncontaminated excavated clay, gravel, sand, soil or rock that is not mixed with any other type of waste and resulting from construction activities. Re-use of spoil off site may include use for landfill capping if the material is genuinely inert and is used as capping material. Note that acid sulphate soils are not included in this definition.*

*Inert and non-hazardous waste – Bricks, concrete, paper, plastics, glass, metal and timber, asphalt, rejected or unwanted tyres, pallets, metals resulting from construction activities (loosely equivalent to Construction & Demolition waste). Hazardous waste including asbestos and contaminated soil are excluded.*

*Office waste – Office and packaging waste including paper, cardboard, plastics and food waste that is generated from office activities.*

# 3 Impacts and Mitigation Measures

A range of potential impacts to the environment and potential environmental mitigation measures are outlined below.

## 3.1 Impacts

Key activities that will generate or contribute to waste material throughout construction of the Project are provided in the Waste Management Plan (WMP). The uncontrolled impacts within plan relate to the volumes of waste generated through the construction phase of the Project.

The percentage of material present during construction which is to be removed from site at the end of the construction has been estimated for a number of material types and is outlined in Table 6 below.

Table 6 Estimated percentage of material removed from site during the construction period

Material Type	Percentage of Material Removed from Site During Construction	
	Lower Estimate (%)	Upper Estimate (%)
Concrete (excluding precast items)	4	6
Steel (including reinforcing)	1	3
Formwork*	100	100
Hazardous excavated material	100	100
Paints, chemicals and solvents	1	4
Oils, lubricants and grease**	5	10
Cabling, conduits and ducting	2	5

**Notes:**

\* Formwork is used on a temporary basis during construction and would be removed from site at the end of the construction period.

\*\* The proportion of oil to be removed from site during TBM decommissioning has not been included in this table. An allocation has been included in Table 9. The exact quantity of oil removed during decommissioning of each TBM would be determined by the specifications of the TBM machine.

An estimate of the anticipated quantity of material generated during construction of the Project which is then removed from site is outlined in Table 7, Table 8 and Table 9. These estimates are based on the information available in this conceptual stage of design, as well as experience on similar transport

infrastructure projects. The quantities allocated per location vary due to differences in station design and construction methodology. The actual quantities of materials removed from each worksite may differ from these initial estimates.

Table 7 Estimated quantities of waste generated by staff during construction

Type of Waste	Estimate rate of generation	Estimated quantity removed from site*
General waste (food scraps and other non-recyclable waste) from office and construction staff	0.6 kg / person / week	690 kg / week
Paper and cardboard waste from office staff	1.6 kg / person / week	160kg / week (recyclable)
Other recyclable waste (containers, drink bottles, etc.) from office and construction staff	0.3 kg / person / week	345 kg / week (recyclable)

**Note:**

\* all worksites at peak workforce commitment, based on 100 Full Time Equivalent (FTE) office staff and 1050 FTE construction staff

Table 8 Estimated volumes of general waste generated during construction

Year	Estimate volume of generated general waste (m <sup>3</sup> )					
	Northern Portal	Roma Street	Albert Street	Woolloongabba	Boggo Road	Southern Portal
2019	0	936	936	936	936	0
2020	0	6,300	5,472	6,300	5,472	3,060
20210	4,200	10,944	9,360	10,944	10,944	6,360
2022	4,200	15,600	10,800	15,600	15,600	6,360
2023	0	3,600	3,600	3,600	1,800	1,800
2024	0	480	480	480	480	480

**Note:**

General waste consists of the type of wastes identified in Appendix A.

Table 9 Estimated total quantities of material removed from the various work sites as waste during construction

Location	Concrete (excl. precast items) (m <sup>3</sup> )	Steel (incl. reinforcing) (tonne)	Formwork (m <sup>2</sup> )*	Hazardous excavated material (bulk cubic metres) ****	Paints, chemicals & grease solvents (Litres)	Oils, Lubricants & Grease (Litres)	Fire retardants (m <sup>3</sup> )	Cabling, conduits and ducting (m <sup>3</sup> )	Waste water *** (kL/day)	Immiscible Liquids (Oil water / sludge) (tonne)	Tyres (tonne)
Northern Portal	800	80	800	5,861	100	100	<10	12	6		
Roma Street	2,700	190	5,200	6,456	400	1,500	<10	35	580		
Albert Street	2,500	310	5,750	403	400	1,500	<10	35	181		
Woolloongabba	2,250	190	5,500	825	400	10,000 – 12,800 **	<10	55	512	100 (allocation for all locations)	25 (allocation for entire construction period)
Baggo Road	2,500	310	4,500	5,039	400	1,500	<10	35	101		
Southern Portal	1,100	80	2,200	2,000	100	100	<10	12	34		



**Notes:**

*TBC: To be confirmed*

*\* Formwork is used on a temporary basis during construction and would be removed from site at the end of the construction period. It has been assumed that 5-10% of the formwork is removed as waste with >90% of the formwork removed for further use on this or other projects, along with other construction equipment, machinery and tools.*

*\*\* An allocation has been included for oil removed during TBM decommissioning. The exact quantity of oil removed during decommissioning would be determined by the specifications of the TBM machine.*

*\*\*\* Waste water includes water used in the operation of the TBMs and water used for dust suppression, but does not include sewage or grey water. Additionally, ground water seepage into tunnels has not been included in waste water as this is dependent on site conditions and cannot be estimated at present.*

*\*\*\*\* Hazardous excavated material assumes no contaminated material is encountered during tunnel boring activities.*

### 3.1.1 Waste Stream Assessment

A waste stream assessment was undertaken and is outlined Appendix A. The waste stream assessment addresses the following:

- Waste Regulator Status
- Waste Category
- Waste Stream Description
- Waste Sources (Activity and/or location)
- Storage Method
- On Site Treatment
- Disposal Method
- Environmental / Human Impact.

## 3.2 Mitigation Measures

The following advisory mitigation measures may be implemented to achieve the nominated environmental outcomes and performance criteria. Additional or different mitigation measures can be applied to achieve the environmental outcomes and performance criteria.

### 3.2.1 General requirements

The following general requirements for waste management is provided in the subsections below. The mitigation measures provided are consistent with the Climate Change and Sustainability Management Plan (CCSMP) for waste and resource management hierarchy.

The waste management procedure for CRR will follow the waste management hierarchy shown in in Figure 1. While these principles lead towards best practice in waste management, it is recognised that they are not always achievable and/or practicable due to the nature of the waste product, availability of capable receiving facilities, health and safety implications and associated costs that may be involved. The waste stream assessment (Appendix A) provides mitigation measures (i.e. in respect to the waste management hierarchy) for non-regulated and regulated waste. The WRRMP must be read in conjunction with the WMP.

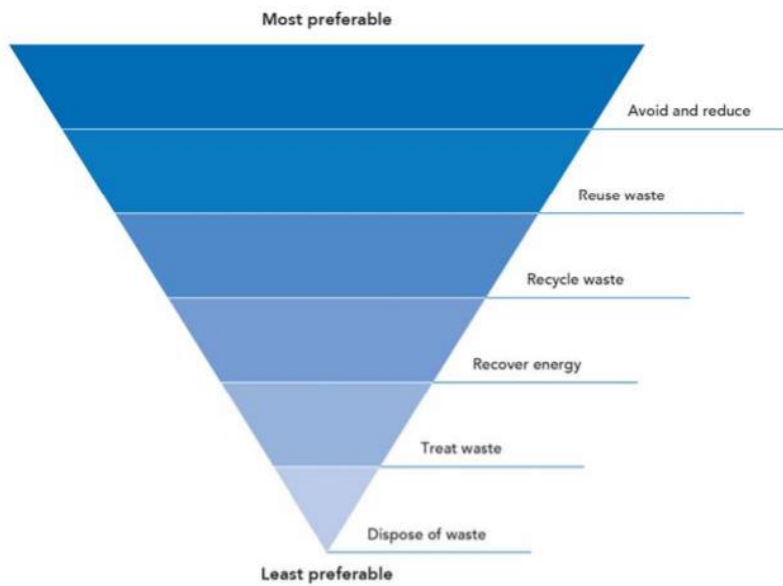


Figure 1 Waste and Resource Management Hierarchy

### 3.2.1.1 Avoid and reduce

The following strategies for avoiding and reducing (where avoidance is not possible) waste generation onsite have been identified:

- Identify and implement measures for avoiding waste generation and, if avoidance is not reasonable or practicable, reducing on-site waste generation
- Utilise the integrated and automated Synergy database to identify, quantify and monitor waste generation
- Implementation of Project office sustainability measures through the selection of energy and resource efficient goods and equipment (e.g. low wattage fluorescent lighting, inverter air conditioning, insulation panelling to reduce energy consumption, waterless urinals, foot pedal or automatic shutoff hand waste basins and rainwater harvesting to reduce water consumption) (Refer to CCSMP)
- Where reasonable and practicable, order goods in bulk to minimise packaging waste, and where practicable, return packaging materials to the supplier
- Develop and implement arrangements with suppliers to return unused construction materials to the supplier. Encourage Project workers to avoid or reduce waste through inductions and toolbox talks (from the Outline Construction Environmental Management Plan - Outline Waste Management Plan (OWMP) p7).

### 3.2.1.2 Reuse

The following reuse strategies (e.g. the identification of waste materials that would otherwise be destined for landfill disposal) have been identified:

- Train staff to identify opportunities for reuse, where practicable
- Identify and implement strategies for the reuse of waste products generated during construction

- Where reasonable and practicable, chip and mulch vegetation cleared for the Project and re-use mulched material for landscaping purposes
- Engage a salvage specialist to identify opportunities in the open market for reuse of materials that are not able to be reused in the Project
- Where reasonable and practicable, provide for the re-use of:
  - Excavated material as fill at approved fill sites
  - Concrete formwork throughout the Project
  - Reinforced steel structures in the Project
  - Structures, including culverts, cabling, poles and similar infrastructure (OWMP p 7).

### 3.2.1.3 Recycle

The following recycling strategies have been identified:

- Develop and implement Project specific recycling strategies
- Consider using materials and products that have a recycled content wherever cost/performance competitive, and where environmentally preferable to the non-recycled alternative
- Where reasonable and practicable, transfer kerb and pavement materials (concrete, asphalt) to crushing and recycling plants
- Provide separate recycling bins, skips and storage areas for recyclable materials at all construction worksites for construction-specific waste materials and general refuse
- Investigate the availability of treated wastewater, stormwater runoff or groundwater inflow for site activities, such as dust mitigation, wash-down uses or watering landscape works
- Where reasonable and practicable, segregate metals for recycling
- Collect empty oil and fuel drums and other containers for return to licensed recycling facilities. This is to be done by a licensed contractor
- Ensure that sufficient loading / unloading space at construction worksites to allow waste materials to be sorted for recycling and reuse (OWMP p7).

### 3.2.1.4 Recover

The following strategies for the recovery of waste during construction have been identified:

- Recovery of fixtures, such as lights and other electrical fittings, doors, wash basins, toilets, windows and sheds, through sales and / or charity organisations
- Recovery of rail infrastructure for later use such as ballast, rail tracks, concrete sleepers, gantries, signals and fencing
- Engaging a salvage specialist to identify opportunities for resource recovery
- If recovered items and materials are to be sold, this should occur in line with due processes for disposing of such items and materials in a commercial market (OWMP p8).

### 3.2.1.5 Treatment

The following treatment strategies have been identified:

- The treatment of solid waste must not be undertaken on site during construction. All commercial forms of treatment must be undertaken at approved offsite facilities
- Groundwater must be treated through purpose built management systems with subsequent water used during construction. Excess water will be captured by a drainage system at each of the stations and portals, and either transferred to the onsite waste water treatment plants (WWTP), treated and reused on site during construction (OWMP p 8).

Refer to Construction Worksite Management Plan (CWMP) for WWTP sites.

### 3.2.1.6 Residual Waste

Waste unable to be reused, recycled, recovered or treated must be disposed of in appropriately licensed commercial landfill sites and sewage treatment systems (OWMP p 8).

#### 3.2.1.6.1 Disposal

Waste disposal is to be in accordance with Australian standards, legislative requirements and guidelines. Wastes that are unable to be reused or recycled will be disposed of off-site to a licensed landfill facility following classification.

#### 3.2.1.6.2 Hazardous materials or dangerous goods

This section should be read in conjunction with the Hazardous Goods Management Plan (HGMP), with the following strategies for hazardous materials and dangerous goods identified:

- Undertake the storage and transport of any hazardous materials or dangerous goods (including fuel and hazardous waste) in accordance with relevant Australian standards, legislative requirements and guidelines
- Hazardous materials and potential sources of hazardous wastes must be documented, and a register of hazardous and regulated waste updated and maintained as required. The register is required to be updated for each new hazardous material introduced on site
- Safety Data Sheets (SDS) must be required to be kept at the storage location of all hazardous materials and dangerous goods
- Undertake refuelling and maintenance activities within designated bunded areas to minimise the potential for soil and water contamination from these activities
- Prepare and implement, if required, spill response measures in relation to hazardous materials and dangerous goods. Refer to Occupational Health & Safety Management (OHSMP) and HGMP.
- Comply with the Energy Networks Association Industry Guideline in the removal and disposal of sulphur hexafluoride (SF<sub>6</sub>) filled electrical equipment (OWMP p 8-9).

#### 3.2.1.6.3 Contaminated soil

Managing and disposing of contaminated soil to an approved disposal site is to be done in accordance with the requirements of the EP Act.

The following applies to contaminated soil:

- Manage and dispose of contaminated soil to an approved disposal site in accordance with the requirements of the EP Act (OWMP p 9).
- Refer to Contaminated Land Management Plan (CLMP) for further details regarding contaminated and CWMP for onsite disposal sites.

#### **3.2.1.6.4 Asbestos**

All waste materials suspected of containing asbestos must be disposed of to an appropriately licensed landfill by a certified asbestos waste contractor. The above section (3.2.1.6.3) applies to asbestos in soil. If stockpiled, material is to be placed in bunded area within an exclusion zone, wetted down and covered (OWMP p 9).

#### **3.2.1.6.5 Groundwater**

Groundwater must be captured by a drainage system at each of the underground stations and portals, treated and reused onsite for construction. Refer to CWMP for further details regarding WWTP (OWMP p 9).

#### **3.2.1.6.6 On-site waste storage**

Where waste is required to be handled and stored on-site prior to on-site reuse or off-site recycling/disposal, the following measures apply:

- Maintain accessible and stable areas at construction worksites for the storage of waste materials
- Ensure provision of bins at worksite common areas, fitted with lids and serviced to avoid overflowing and spills (OWMP p 9-10)
- Liquid wastes are to be stored in appropriate containers in bunded areas until transported off-site (refer to Hazardous and Risk Management Plan (HRMP) (OCLMP p 8)
- Hazardous wastes will be managed by appropriately qualified and licensed contractors, in accordance with relevant Australia standards, legislative requirements and guidelines

#### **3.2.1.6.7 Waste transport**

Where waste is required to be transported to a waste disposal site, the following measures apply:

- Ensure the movement of hazardous materials and regulated wastes occur at non-peak times to minimise the possibility of traffic conflicts and associated risks
- Transportation of hazardous wastes, regulated wastes and contaminated soils must be undertaken by a suitably licensed waste contractor
- Ensure that waste transport contractors have the necessary qualifications and permits prior to undertaking waste transportation activities for the Project
- Conduct waste tracking in accordance with legislative requirements, including identifying any exemptions from waste tracking
- Refer to Spoil Placement Management Plan (SPMP), Haulage Management Plan (HMP) and Construction Traffic Management Plan (CTMP) for further information regarding waste transport and haulage routes (OWMP p 8).

# 4 Compliance Management

## 4.1 Roles and Responsibilities

The organisational responsibilities and accountabilities in relation to environmental management throughout Project construction works are outlined in the overarching CEMP.

## 4.2 Induction and Training

### 4.2.1 Environmental Induction

All CBGU staff, subcontractors and visitors to worksites must attend general induction training that covers general environmental management requirements, site-wide controls and site-specific and work specific risks and mitigation measures. Further details regarding environmental induction requirements have been outlined in the overarching CEMP.

### 4.2.2 Environmental Training

Details regarding environmental training requirements have been outlined in the overarching CEMP.

## 4.3 Communication

Communication strategies including internal communication, external and Government Authority consultation, and stakeholder and community liaison must be undertaken in accordance with the CEMP and the Communications and Stakeholder Engagement Plan (CSEP).

## 4.4 Incidents and Emergencies

### 4.4.1 Incident Notification

The immediate response to all incidents is to make the area safe and undertake measures to prevent further environmental harm. The Environment and Sustainability Manager, Shared Services Director and Project Director should be notified immediately in the event of an environmental incident.

Further details regarding Incident Notification, have been outlined in the overarching CEMP.

### 4.4.2 Incident Types

Incidents include, but are not limited to:

- Any breach of the legislation or an approval or permit condition
- Contamination of waterways or land
- Impact to level or contamination of groundwater
- Unauthorised dumping of waste
- Spills of fuel, oil chemical or other hazardous material.

### 4.4.3 Incident Prevention Management

Incident Classification and Procedure has been identified within the overarching CEMP.

#### 4.4.4 Incident Investigation

The Incident Investigation process has been specified in the overarching CEMP.

#### 4.4.5 Complaint Management

All complaints are to be dealt with in accordance with the complaints management procedure outlined in the CEMP.



# 5 Inspections, Monitoring, Auditing and Reporting

This section outlines the compliance processes that have been adopted by CBGU to ensure compliance with the Coordinator-General Conditions and any other legislative requirements. The section below details specific requirements relating to Inspections, monitoring, auditing requirements have not been outlined in the overarching CEMP.

## 5.1 Environmental Monitoring

### 5.1.1 Performance Monitoring

Monitoring will be undertaken at various locations to validate the impacts predicted for the Project and to measure the effectiveness of environmental controls and implementation of this WRRMP. The monitoring also helps in addressing any potential Community Complaints that may be made. The monitoring requirements specific to waste are outlined below.

- Routine daily site inspections will include monitoring capacity of waste storage facilities and arranging collections as required, monitoring for the presence of vermin or odours in association with waste storage or handling and monitoring for the presence of litter and general worksite tidiness
- Records of the following waste management information, as a minimum, must be kept throughout the construction phase:
  - resource use and waste generated from construction works
  - waste recovered and re-used
  - waste disposed to landfill
  - waste transporter or contractor details (including company name, licensed operator name and license number) (Outline WMP p 11).

This information will also be required to fulfil the sustainability objectives of the Project in order to achieve the relevant ISCA Waste credits.

Monitoring for waste management should be undertaken in accordance with the WMP, HGMP and CLMP as appropriate.

### 5.1.2 Auditing

Audits will be undertaken to assess the effectiveness of environmental controls, compliance with the CEMP, compliance with Environmental Design Requirements, and other relevant permits, approvals, and guidelines. There will be a monthly internal audit undertaken by CBGU as per the CEMP, who is to report findings to the Environmental Monitor. This includes reporting on compliance with the CEMP and the Imposed Conditions.

Audits will be undertaken in accordance with the overarching CEMP.

### 5.1.3 Corrective Action

Corrective actions must be undertaken where monitoring or validated complaints indicate the environmental outcomes or Imposed Conditions are not achieved in relation to particular works, either because the

performance criteria have not been met, or mitigation measures have not been implemented. Where corrective actions become necessary, the specific works that do not achieve the environmental outcomes or meet the Imposed Conditions must cease until the corrective actions have been developed and implemented.

The process for developing and implementing Correction Actions has been specified within the overarching CEMP.

## 5.2 Reporting

### 5.2.1 Monthly Report

To ensure compliance with Coordinator-General Condition 6 and where relevant the CEMP, CBGU will prepare and submit a monthly report within 6 weeks from the end of the month.

### 5.2.2 Incidents and Non-Compliance Reporting

Environmental incidents meeting the criteria of an NCE shall be notified verbally as soon as practical and in writing within 48 hours of becoming aware of an incident occurring. Notification will generally be undertaken by the Environment and Sustainability Manager or delegate. Additional notification of the incident to the relevant authorities, EM and parent companies will also be undertaken as required.

Further details regarding reporting, including provision of interim and detail reports have been provided in the overarching CEMP.

## 5.3 Documentation and Communication

### 5.3.1 Environmental Records

The process for managing and collecting environmental records is detailed in the overarching CEMP. All relevant records in relation to waste resource recovery must be maintained in accordance with these requirements.

### 5.3.2 Document Control

Document control requirements have been specifically addressed within the overarching CEMP.

### 5.3.3 Review

Revisions to this WRRMP may be required during the Project to reflect changing circumstances or identified deficiencies. Revisions may result from:

- Management Review
- Audit (either internal or by external parties)
- Complaints or non-conformance reports
- Changes to the Company's standard system.

Revisions shall be reviewed and approved prior to issue. Updates to this WRRMP are numbered consecutively and issued to holders of controlled copies

### 5.3.4 Communication

All internal and external communication with all stakeholders including the public, Coordinator-General, government agencies and the Delivery Authority must be done in accordance with the requirements of the CEMP.

# Appendix A

## Waste Stream Assessment

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
Non-Regulated Waste	Organic products	Green waste	Vegetation removal/land clearing for rail infrastructure and access, landscape maintenance	Temporarily stockpiled on or off site prior to mulching/reuse	Mulched and reused in landscaping or as soil treatment measures	None required - reuse onsite as mulch and for rehabilitation works. Surplus material to BBC green waste facility or commercial operator for mulching/composting	If not handled or stored properly, potential to spread weed, potential fire hazard. If disposed to landfill contributes to methane generation
		Cardboard/paper	Construction work sites (office, kitchen, stores)	Colour coded recycling bins provided	Separation by individual disposers	Removal by waste contractor for recycling	Within landfills decomposing paper products generate methane which is a greenhouse gas
		Food scraps/ kitchen waste	Construction work sites (kitchen) Construction	Colour coded food scrap bins, worm farm or composting bin	Separation by individual disposers	Removal by waste contractor for composting. Alternatively landfill if insufficient source separation	Potential odour production and vermin attraction if not handled appropriately. If landfilled contributes to greenhouse gas emissions from landfills

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
	Inert Materials	Topsoil	At grade construction	Temporarily stockpiled on or off site for reuse	Soil amelioration may be required prior to reuse i.e. application of gypsum, minerals, etc.	None required. Surplus material to commercial operator provided certified as not contaminated	If not stored or handled appropriately contribute to siltation of drainage, waterways/creeks
		Ballast	Track realignment and construction	Stockpiled	Reuse on rail corridor	Ballast storage area	Reusing of ballast aids in the reduction of material quarried for more ballast
	Construction Waste	Concrete from Building foundations, building floors, paths and equipment footings, concrete sleepers, concrete slabs, concrete beams, concrete columns, blocks and bricks, leftovers from pouring	Construction activities	Segregated into skips/stockpiles specific to concrete waste / concrete wash bays	Crushed/processed/ broken up and used as fill in bulk earthworks, drainage material, pipe bedding, erosion control, pavements, roads, etc.	Reuse on site or removal by waste contractor for recycling	Unnecessary use of landfill capacity if disposed to landfill. Runoff from concrete truck wash bays can increase alkalinity of surface water - this water needs to be contained and managed appropriately. Crushing concrete has potential to generate dust and noise emissions

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
		Asphalt from roads, leftover from road extensions	Construction activities	Segregated asphalt types into skips or stockpile areas	Mix with new asphalt during production of hot mix paving for road use, pot holes, and low use trafficable roads (may need to be done offsite)	Removal by waste contractor for recycling and reprocessing	Unnecessary use of landfill capacity if disposed to landfill. Reuse aids in reduction of need for more bituminous/asphalt product
		Timber from building materials - treated and untreated timber, structural timber / sleepers / fencing / plywood / doors / particleboard	Construction and demolition activities	Segregated into skips specific to timber off cuts	Sorting to identify timber suitable for reuse in various construction activities	Removal by waste contractor for recycling	Unnecessary use of landfill capacity if disposed to landfill. Reuse aids in reduction of need for more timber products. Plywood and Particleboard are timber products bonded with adhesives (resins) generally not suitable for composting. Possible refuse derived fuel at appropriately licensed facilities
		Timber from packaging material (pallets, crates)	Material delivery	Segregated into skips specific to timber off cuts	Reduce the amount of packaging sent to the site in	Return to supplier or recycle with other timber products	Unnecessary use of landfill capacity if disposed to landfill.

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
					consultation with the suppliers		Reuse aids in reduction of need for more timber products. Plywood and Particleboard are timber products bonded with adhesives (resins) generally not suitable for composting. Possible refuse derived fuel at appropriately licensed facilities
		Glass - window glass, sheet glass	Construction activities	Segregated in skips specific to glass	Segregation	Removed by waste contractor for reuse/recycle	Unnecessary use of landfill
		Glass beverage containers (recyclable)	Construction work sites	Coloured coded glass recycling bins to be provided	Separation by individual disposers	Removal by waste contractor for recycling	Unnecessary use of landfill
		Electrical cable off cuts	Overhead wires, underground services, construction office fit outs and maintenance	Segregated with scrap metals	Separation by individual disposers	Removal by scrap metal dealer	Recycling reduces need for virgin metals. Unnecessary use of landfill capacity if disposed to landfill. Recycled



Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
							metals are a valuable resource
		Lighting: Fluorescent light tubes, high intensity discharge lamps, compact fluorescent lamps, other mercury containing lamps	Construction activities	Segregated and stored for collection	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Removal by a licenced waste contractor for resource recovery/recycling	Mercury containing items. Mercury is a potent neurotoxin in humans and a toxic heavy metal when accumulated in the environment
	Metal	Steel off cuts, structural steel (including tracks), pipe work, operational equipment, building sheeting	Construction activities	Skips specific to waste steel to be provided during construction	Segregation by workers and storage in designated location	Removal by waste contractor for recycling. Monetary incentives can be obtained for recycling of waste steel.	Recycling of steel aids in the reduction of mining raw materials. Using recycled metal reduces energy consumption in comparison with creating a product with raw materials
		Copper pipes and copper electrical cables, aluminium, corrugated roofing iron	Overhead wire installation, underground services installation, construction office fit outs	Skips specific to waste metal to be provided during construction	Segregation by workers and storage in designated location	Reuse/sell to scrap metal dealers	Recycling of steel aids in the reduction of mining raw materials. Using recycled metal reduces energy consumption in comparison with

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
							creating a product with raw materials
		Aluminium beverage cans	Construction work site (workers)	Coloured coded aluminium recycling bins to be provided	Separation by individual disposers	Removal by waste contractor for recycling	Using recycled metal reduces energy consumption in comparison with creating a product with raw materials
	Plastics	Pipe and conduit offcuts, plastic piping, flooring vinyl	Construction activities	Segregated into plastic waste stream	Segregation into skips specific to material	Removal by waste contractor for recycling	Using recycled materials reduces energy consumption in comparison with creating a product with raw materials. Material unable to be recycled or reused will be disposed to landfill
		Material/equipment packaging (shrink wrap/pallet wrap/bubble wrap, Poly-Styrene)	Materials delivery	Segregated into plastic waste stream	Avoid delivery to site, then segregation	Avoid where possible then reuse/recycle	Using recycled materials reduces energy consumption in comparison with creating a product with raw materials. Material unable to be recycled or

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
							reused will be disposed to landfill
		Food/beverage containers/wrappers (recyclable)	Construction work sites	Coloured coded recycling bins to be provided	Separation by individual disposers	Recycle	Using recycled materials reduces energy consumption in comparison with creating a product with raw materials. Material unable to be recycled or reused will be disposed to landfill
		Food/beverage containers/wrappers (non-recyclable)	Construction work sites	general waste bins	None	Landfill	Using recycled materials reduces energy consumption in comparison with creating a product with raw materials. Material unable to be recycled or reused will be disposed to landfill
	General waste	mixed waste, unsegregated, unsorted waste (not regulated waste)	Construction work sites	general waste bins and skips	None	Landfill	

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
	Liquid wastes	Groundwater inflow	groundwater inflow into tunnel potentially mixed with tunnel wash-down water	Tunnel drainage system, holding tank may be required	Treated at on-site/off-site Waste Water Treatment Plant (WWTP)	Discharge to appropriate surface water (if quality acceptable) or if not suitable, then to sewer, alternatively may be suitable for reuse as wash-down water or other CRR water uses to reduce potable water consumption	Minimise groundwater inflow through design measures such as water proofing; may be suitable water to reduce potable water usage of CRR
		Pavement/surface water /stormwater runoff from construction sites	Construction activities	Stormwater retention/detention ponds/sediment pond	Sediment/silty water pond or onsite WWTP	If suitable onsite effluent irrigation/offsite discharge to waterway otherwise connection with municipal sewage/septic tanks/discharged into waterway	Potential land and water contamination, siltation of waterways and creeks. Monitor downstream surface water offsite disposal points.
	Soil	Acid Sulphate Soil spoil	Construction within land in ASS area (i.e. rail corridor)	Bunded stockpile for treatment/ disposal or direct haul to spoil storage area or waste disposal facility	Lime treatment as per procedure	Treated material reuse on site or removal by waste contractor to spoil storage area	Leaching of acid into the previously uncontaminated environment. Audit handling and quantity; validate

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
							treatment effective and reused or disposed appropriately
Regulated Waste	Hazardous waste	Oil spill clean-up kit materials, cleaning/maintenance rags	Construction work sites, plant and machinery workshops	Segregated in bins/skips specific for oily rags/materials, etc. in accordance with AS 1940	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Removed by a licensed specialist hazardous waste contractor for offsite treatment/disposal	Land and water contamination including both surface and groundwater if not handled and stored appropriately. Also a potential fire hazard.
		Empty plastic or metal drums/containers (recyclable)	Supply of chemicals, paint, oil, cleaning fluids, etc.	Store on banded pallets in accordance with AS1940	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Return to supplier for reuse or licensed specialist hazardous waste contractor for offsite treatment / disposal	Land and water contamination including both surface and groundwater if not handled and stored appropriately. Also a potential fire hazard.
	Liquid wastes	Oils, lubricants, grease, hydrocarbons, diesel, petrol	Machinery / vehicle / rolling stock / track repair machines oil changes and lubrication during construction and operation	In accordance with AS 1940	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Removed by a licensed specialist hazardous waste contractor for offsite treatment/disposal	Land and water contamination including both surface and groundwater if not handled and stored

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
							appropriately. Also a potential fire hazard.
		Paints and solvents	Painting stations/noise barriers/rail infrastructure, cleaning	Bunded compound or self bunded pallets	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Removed by a licensed specialist hazardous waste contractor for reuse/offsite treatment/disposal	If not handled appropriately, potential land and water contamination
		Wash-down water	Wash-down of transport vehicles, construction site wheel wash	Dedicated wash-down bay for vehicles holding tank may be required	If unsuitable for offsite discharge to waterway then treated at on-site or offsite WWTP	Connection with municipal sewage or discharged to council stormwater	Potential land and water contamination. Water meter on wash-down water supply system - monitor water usage and subsequent wash-down water treatment and disposal
			Wash down of transport vehicles, tunnel wash down water potential mixed with groundwater inflow	Tunnel drainage system, holding tank may be required	If unsuitable for offsite discharge to waterway then treated at on-site or offsite WWTP	Connection with municipal sewage or discharged to council stormwater	Treated tunnel wash-down water may be suitable for reuse onsite to reduce potable water usage of CRR

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
		Pavement/surface runoff/stormwater	Construction activities	Stormwater retention / detention ponds / sediment pond	If unsuitable for offsite discharge to waterway then treated at on-site or offsite WWTP	Connection with municipal sewage or discharged to council stormwater	Potential land and water contamination.
		Sewage	Construction work sites during construction	Holding tanks and pumping stations	Treated at off-site WWTP	Connection with municipal sewage or septic tanks	Health impacts and surface water contamination if sewage not managed appropriately. Water meter on potable water supply - monitoring water usage
	Tyres	End of life tyres (Shredded/bald tyres)	Machinery and plant servicing	Segregated into stockpiles for removal off site	Segregation	Tyre recycling facility	Inappropriate handling and storage potential health and environmental concerns; fires in stockpiles can release toxic gases, pollute waterways, tyre stockpiles provide breeding habitats for mosquitoes. Audit handling and quantity of tyres

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
							used for project and confirm recovery / reuse / recycling
	Batteries	Lead-acid; lithium hydride; Ni-Cd	Spent batteries from vehicles, construction machinery, portable equipment	Bunded compound	Segregation	Removed by a licensed contractor to a battery recycling facility or waste disposal facility licensed to receive regulated wastes	Contain lead, lead compounds and/or sulphuric acid. Lead compounds are toxic humans and the environment. Acid is corrosive. Audit handling and quantity of batteries used for project and confirm recovery, reuse, recycling, disposal
	Chemical	Contaminated earth / spoil	Construction within land listed on the EMR/CLR (i.e. rail corridor)	Refer to Section 3.2.1.6.6	Sampling to determine contamination levels and required treatment	Removal once disposal permit is obtained from DES and remediation where appropriate	Leaching of the contaminants into the previously uncontaminated environment. Audit handling and quantity; validate contaminated soil removed and treated/disposed appropriately.



Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
		Empty drums/containers (non-recyclable)	Supply of chemicals, paint, oil, cleaning fluids, etc.	Storage In accordance with AS 1940 (bunded area)	Rinse in designated area on site (if appropriate), crush and puncture prior to dispatch to recycler or disposal	Removed by a licensed specialist hazardous waste contractor for offsite reuse / treatment / disposal	Land and water contamination including both surface and groundwater. Also a potential fire hazard. Audit appropriate onsite handling procedures, haulage and destination
	Contaminated soil	Excavated contaminated material	Tunnel / underground station construction	Refer to Section 3.2.1.6.6	None	Removed by a licensed specialist waste contractor in accordance with site management plan for offsite treatment or disposal to landfill	Leaching of the contaminants into the previously uncontaminated environment. Audit handling and quantity; validate contaminated soil removed and treated / disposed appropriately.
		Asbestos in soil	Tunnel / underground station construction	Refer to Section 3.2.1.6.4	None	Offsite disposal by appropriately licensed sub-contractor to a licenced landfill facility	Asbestos fibres can cause cancer if respirable fibres are inhaled. Audit handling and quantity; validate contaminated soil

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Environmental / Human Impact
							removed and treated / disposed appropriately.
		Sediment in sediment retaining structures - contaminated with hydrocarbon or heavy metal (or other) pollutants	Maintenance of drainage structures or sediment ponds	Bunded stockpile for treatment/ disposal or direct haul to waste disposal facility	Sampling and laboratory analysis to determine contamination levels	Removal once disposal permit is obtained from DES and remediation where appropriate	Leaching of the contaminants into the previously uncontaminated environment. Audit handling and quantity; validate contaminated soil removed and treated/disposed appropriately.