

12. Waste

This section provides information on the types and quantities of wastes likely during the different phases of the Project and their likely treatment/disposal methods. Potential impacts and mitigation measures for waste management for the proposed Project have also been identified.

12.1 Environmental values

In the context of waste management, environmental values are impacted through resource loss and environmental impacts on both the project area and disposal areas relevant to the Project.

The Environmental Values to be protected, as described in the EPA's *Environmental Protection (Waste Management) Policy 2000* are:

- The life, health and wellbeing of people
- The diversity of ecological processes and associated ecosystems
- Land use capability, having regard to economic considerations

12.2 Current waste management practices

12.2.1 General

The following details the existing QR operations at the Callemondah Rollingstock Yard.

Wastewater

All wastewater from the rollingstock wash down discharges to an onsite wastewater treatment plant. A unique feature of this plant is the coal filter, which traps any oil in the wastewater. The expended coal is burnt in the boilers of the QAL refinery in Gladstone.

Treated water from this plant is used onsite for toilet flushing and garden watering. Any excess is discharged to sewer under a trade waste permit issued by Gladstone Regional Council (GRC) (formerly Gladstone City Council).

Hazardous waste

A waste management contractor with an appropriate EPA approval removes all regulated waste, which includes sewage from the site's septic systems.

Waste management services

QR has a contract with a waste management company for the disposal of rollingstock repair facility wastes. The following wastes are recycled under these contracts:

- Waste oil
- Scrap metal
- Paper and cardboard

The waste contractor either transports general waste to the Gladstone transfer station or directly to GRC's Benaraby landfill.

Benaraby landfill is located off the Bruce Highway at the township of Benaraby, approximately 50 km south of the township of Mount Larcom. The Benaraby landfill has an operational life of at least 50 years and can accept general waste and regulated waste which meets allowable leaching contaminant levels. The Benaraby landfill can also accept recyclable wastes, including green waste, white goods, oil and batteries.

12.3 Waste management

Wastes will be generated both during the construction and operational phases of the Project. This section describes the potential waste production and management during these phases. It provides an indicative waste inventory through the identification of likely waste streams. An outline of proposed waste management strategies, having regard to the *Environment Protection (Waste Management) Policy 2000* principles of the waste management hierarchy of waste avoidance, reuse, recycling, treatment and disposal has also been provided.

Where solid or liquid wastes are to be disposed of offsite, the following details are provided:

- Typical facilities (locations) to which wastes would be sent for disposal
- Target rates of recycling
- Indication of how the transport of wastes from the site to the disposal facility will be undertaken
- Methods for the disposal of hazardous wastes and materials in the event of an accident/incident
- Onsite storage and treatment requirements for wastes, including waste receptors as per the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines
- The impact waste may have on the environment

The waste management strategies also consider segregation of waste, storage of waste, monitoring and reporting programmes, and cleaner production programs.

12.3.1 Waste streams

The waste streams produced during the construction and operational phases of the Project will be distinctly different. During the construction phase, significant quantities of waste with varying compositions could be generated from activities, including vegetation clearing and stripping, bulk earthworks, including cut and cover and directional drilling, miscellaneous structures, materials supply, maintenance of construction equipment and construction site/amenities.

Demolition wastes

Existing structures located within the project area may be demolished during the construction phase. This will include, but is not limited to, rural infrastructure, pipe work, timber, concrete and bitumen. The wastes to be generated will mostly be concrete-based, glass, steel, metal or plastic pipes and vegetation.

Regulated wastes generated during the demolition activities will be reused or recycled where possible or disposed of in accordance with a Waste Management Sub Plan.

Excavation wastes

Excavation activities associated with the Project will generate a large amount of spoil, largely consisting of soil and rocks from construction areas. Management of the spoil (eg storage, reuse and disposal) will largely depend on spoil quality. Disposal of clean spoil will be through onsite reuse, reuse within other projects or as engineered fill at approved sites. Further waste management strategies will focus on the prevention of dust and wind erosion, sediment runoff, the spread of fire ants and the spread of weeds or other pathogens.

Regulated wastes generated during the demolition activities such as contaminated spoil will be reused or recycled where possible or disposed of in accordance with the Waste Management Sub Plan. The potential presence of contaminated soils has been discussed and assessed in further detail in Section 4.

Packaging materials

Materials delivered to site often come with packaging materials. This consists largely of timber pallets, crates, cartons, plastics, and wrapping materials, all of which need to be disposed of once the product has been utilised. Minimisation of packaging of raw products will be strongly encouraged.

Stormwater runoff from the construction site

During periods of rainfall, runoff has the potential to become contaminated prior to its discharge from the site if not appropriately managed. Also, stormwater can result in siltation of the drainage system and offsite impacts if appropriate sediment and erosion controls are not implemented. This issue is discussed in Section 8.

An industrial wastewater treatment plant will be constructed to service the Aldoga Rail Yard during operation. The location and design of the facility will be finalised during detailed design along with the necessary license conditions.

Wastes from operation of construction equipment

Various heavy vehicles and construction equipment will be utilised for the duration of the construction phase. Liquid hazardous wastes from cleaning, repairing, and maintenance of this equipment will be generated. Likewise leakage or spillage of hydrocarbons and chemicals during construction will be managed and disposed of appropriately.

Regulated wastes such as tyres, batteries and hydrocarbons will be reused or recycled where possible or disposed of in accordance with the Waste Management Sub Plan.

Non-hazardous liquid wastes

Non-hazardous liquid wastes will be generated through the use of workers' facilities such as toilets and kitchen facilities. Appropriate liquid waste disposal systems will be utilised such as a temporary or packaged onsite sewage treatment plant.

The location and design of the facility will be finalised during detailed design along with the necessary license conditions. It is intended that the onsite sewage treatment plant (STP) would be constructed prior to the peak construction workforce coming on line. The capacity requirement for the system will be determined during detailed design.

General wastes

This encompasses office wastes, scrap materials and biodegradable wastes. Due to the variety of waste streams likely to be generated, sorting and segregation will be undertaken. The "recyclability" of the waste, disposal method, storage requirements and volume will be taken into consideration.

During the operational phase of the Project, wastes could be generated from indiscriminate roadside dumping, operation of substandard vehicles, roadside vehicle repairs and vehicle accidents.

The generation of a detailed waste inventory during both construction and operation will aid in monitoring the movement and correct disposal of wastes. At a minimum, the waste inventory will contain information on the volumes of waste, type of waste, location of the storage area, disposal method, frequency of disposal and any special requirements or warnings regarding the waste. Table 12.1 is a typical example of a waste inventory. Once design and construction details are finalised this inventory will be updated and completed in more detail.

Hazardous waste

During construction and operation, clearly marked skip bins will be used to collect hazardous waste materials which are expected to include solvents, paints, cleaning fluids, greases, acids and alkali materials. These wastes will be removed, tracked and disposed of by a suitably licensed waste contractor. Waste oils will be collected and tracked separately as they are suitable for reuse or reprocessing.

Sewage and domestic wastewater

During construction domestic wastewater from lunchrooms and amenities shall be collected by temporary facilities for offsite disposal at the Yarwun STP. At the Aldoga Rail Yard where the construction activities are concentrated, temporary facilities will be superseded upon completion of a gravity sewage collection system, pump station, rising main and onsite sewage treatment plant.

During rail infrastructure operation domestic-type wastewater will be collected from:

- Decanting from locomotives
- Workshops toilets and showers
- Office toilets

Details of the proposed sewage treatment are contained in Section 2.

Trade waste/industrial wastewater

Locomotives and wagons require washing prior to maintenance and servicing. A dedicated washdown facility is to be constructed to efficiently carry out this task.

Details of the proposed wastewater treatment plant are contained in Section 2.

12.3.2 Waste inventory

Construction waste

The types and quantities of construction wastes and their likely treatment/disposal methods are listed in Table 12.1.

Table 12.1 Rail infrastructure construction wastes

Waste type	Waste characteristic	Source	Estimated quantity (tonnes/annum)	Likely treatment/disposal	Potential environmental impact
Green waste	Inert	Site clearing	100	Trees used whole for erosion control or chipped and used onsite for erosion control and landscaping.	Dust generation

Waste type	Waste characteristic	Source	Estimated quantity (tonnes/ annum)	Likely treatment/disposal	Potential environmental impact
Giant rats tail grass	Inert	Site clearing	10	Incinerated on site or bagged and transported to Benaraby landfill. For further information refer Section 5.	Transport impacts
Concrete	Inert	Remnants from concrete pours	50	Broken up and used as fill material in bulk earthworks or removed to Benaraby landfill	Transport impacts and landfill space
General building materials	Inert	Construction	100	Benaraby landfill	Transport impacts and landfill space
Empty drums and containers – suitable for return to supplier	Regulated if they contain regulated waste products such as paint, oil etc. Otherwise inert	Supply of chemicals, paint, oil, cleaning agents etc	5	Return to supplier	Transport impacts
Empty drums and containers – suitable for recycling	Regulated if they contain regulated waste products such as paint, oil etc. Otherwise inert	Supply of chemicals, paint, oil, cleaning agents etc	5	Recycling	Transport impacts
Empty drums and containers – not suitable for recycling	Regulated if they contain regulated waste products such as paint, oil etc. Otherwise inert	Supply of chemicals, paint, oil, cleaning agents etc	5	Triple rinse on site, crush and puncture prior to disposal in Benaraby landfill	Containment and treatment of rinse water, transport impacts and landfill space
Electrical cables	Inert	Cable off cuts	10	Recycling	Recycling wastes and transport impacts
Timber crates and pallets	Inert	Supply of machinery and parts	30	Returned to supplier where possible Remainder chipped and used onsite for landscaping	Transport impacts, dust generation
Scrap steel	Inert	Steel off cuts	50	Recycling	Transport impacts
Plastics	Inert	Pipe and conduit of cuts	5	Benaraby landfill	Transport impacts and landfill space
Oil and lubricants	Regulated waste	Machinery oil changes and lubrication	2	Recycling	Storage and transport impacts
Oil filters	Regulated waste	Vehicle servicing	0.25	Recycling	Transport impacts

Waste type	Waste characteristic	Source	Estimated quantity (tonnes/ annum)	Likely treatment/disposal	Potential environmental impact
Cleaning rags	Regulated waste	Vehicle servicing	0.1	Regulated waste contractor	Transport impacts and landfill space
Tyres	Regulated waste	Vehicle servicing	10	Regulated waste contractor	Storage and transport impacts, landfill space
Lead acid batteries	Regulated waste	Vehicle servicing	0.5	Recycling	Storage and transport impacts
Paints and solvents	Regulated waste	Painting	0.5	Recycling	Storage and transport impacts
Sewage	Regulated waste	Construction workforce	20 kL per day	Packaged treatment plant or Benaraby Wastewater Treatment Plant (Yarwun)	Transport and treatment/ disposal impacts
Domestic: food, wrapping	General waste	Construction workforce	15	Benaraby landfill	Transport impacts and landfill space
Domestic: recyclables eg cans, plastic bottles, glass	General waste	Construction workforce	15	Recycling	Transport impacts

The main water sources for the Project, stormwater drainage systems, and the location and design of the proposed rail infrastructure are detailed in Section 2. Potential impacts on the existing environmental values such as water quality and biodiversity are discussed in the relevant sections of this EIS.

Rail infrastructure operational wastes

The types and quantities of rail infrastructure operational wastes are listed in Table 12.2.

Green wastes and timber are to be chipped and reused onsite to minimise the quantity of waste removed from site. Where suitable, wastes will be recycled, and sewage will be treated by an onsite sewage treatment plant before disposal through onsite effluent irrigation. Section 2 contains further details.

Waste avoidance will be addressed through reuse of wastes generated onsite where possible and waste minimisation practices will be encouraged.

Table 12.2 Rail infrastructure operational wastes

Waste type	Waste characteristic	Source	Estimated quantity (tonnes/annum)	Likely treatment/disposal	Potential environmental impact
Green waste	Inert	Landscape maintenance	1	Chipped and used onsite for landscaping	Transport impacts
Giant rats tail grass	Inert	Landscape maintenance and weed eradication	10	Incinerated on site or bagged and transported to Benaraby landfill. For further information refer Section 5.	Transport impacts
Concrete	Inert	Left-overs from concrete pours	1	Cast into moulds for future use	Transport impacts
Bitumen/asphalt	Inert	Left-overs from road extensions/repairs	0.25	Spread in designated area	Transport impacts
Timber	Inert	Non-recyclable wooden pallets and cable reels	20	Chipped and used onsite for landscaping	Transport impacts
Paper and cardboard	Inert	Packaging and office paper	5	Recycling	Transport impacts
Plastics (non-recyclable)	Inert	Packaging	5	Benaraby landfill	Transport impacts and landfill space
Abrasive blasting residue	Regulated waste	Maintenance painting	2	Benaraby landfill with approval	Transport impacts and landfill space
Waste paint and containers	Regulated waste	Maintenance painting	0.100	Approved disposal facility	Transport impacts
Bulk bins	Inert/regulated waste	Bulk fuel and chemical supply	5	Returned to supplier	Transport impacts
Waste oil and lubricants	Regulated waste	Vehicle and plant servicing Oil skimmer in industrial wastewater treatment plant (locomotive, wagon washing)	50	Recycling or waste oil facility	Transport impacts
Used oil and air filters	Regulated waste	Vehicle and plant servicing	5	Recycling facility	Transport impacts
Oil spill clean up materials	General/regulated waste	Vehicle and plant servicing	5	Oil is removed in a cyclone and recycled, waste pads are sent to landfill	Transport impacts and landfill space
Vehicle coolant	Regulated waste	Vehicle servicing	3	Approved disposal facility	Transport impacts
Lead acid batteries	Regulated waste	Vehicle and plant servicing	2	Recycling	Transport impacts

Waste type	Waste characteristic	Source	Estimated quantity (tonnes/ annum)	Likely treatment/disposal	Potential environmental impact
Tyres	Regulated waste	Vehicle servicing	5	Benaraby landfill	Transport impacts and landfill space
Metal	Inert	Vehicle and plant maintenance	20	Recycling	Transport impacts
Electrical and computer equipment	Inert	Plant maintenance	0.5	Recycling/landfill	Transport impacts and landfill space
Electrical cable	Inert	Plant maintenance	0.5	Recycling	Transport impacts
Domestic: food, wrapping	General waste	Construction workforce	10	Benaraby landfill	Transport impacts and landfill space
Domestic: recyclables eg cans, plastic bottles, glass	General waste	Construction workforce	10	Recycling	Transport impacts
Sewage		Workforce	Approx. 50 kL/day	Treatment by onsite sewage plant	Energy use
Wastewater treatment plant sludges	Regulated waste	Onsite sewage and industrial wastewater treatment plants	0.5 m ³ per day	Approved disposal facility	Energy use Transport impacts and landfill space

Rail infrastructure decommissioning waste

The types and quantities of rail infrastructure decommissioning wastes and their likely treatment/disposal methods are listed in Table 12.3. The estimated quantities of decommissioning waste will be determined during the detailed design phase of the Project.

It is expected that major decommissioning will take place in approximately 50 to 100 years time. It is forecast that recycling opportunities will increase as raw materials become scarce and recycling technology improves over this period of time. The infrastructure facility will be designed to facilitate recycling of materials during decommissioning.

Table 12.3 Rail infrastructure decommissioning waste

Waste type	Waste characteristic	Source	Likely treatment/disposal	Potential environmental impact
Steel	Inert	Structural steel, pipe work, operational equipment and building sheeting	Recycling	Transport impacts
Concrete	Inert	Building foundations, building floors, paths and equipment footings	Recycling	Transport impacts, dust and noise
Bitumen/asphalt	Inert	Roads	Recycling	Transport impacts
Timber	Inert	Building trim and building utilities	Benaraby landfill	Transport impacts

Waste type	Waste characteristic	Source	Likely treatment/disposal	Potential environmental impact
Electrical equipment	Inert	Facility operations	Reuse or recycle as appropriate	Transport impacts
Electrical cables	Inert	Lighting and power supply	Recycling	Transport impacts
Machinery	Inert	Facility operations	Reuse or recycle as appropriate	Transport impacts
Plastics suitable for recycling	Inert	Electrical conduits and operational equipment	Recycle	Transport impacts
Plastics not suitable for recycling	Inert	Electrical conduits and operational equipment	Dispose to Benaraby landfill	Transport impacts
Chemicals	Regulated waste	Water treatment, cleaning	Reuse or dispose to Benaraby landfill as appropriate	Transport impacts
Oil	Regulated waste	Vehicle and equipment lubrication	Recycle	Transport impacts
Grease	Regulated waste	Vehicle and equipment lubrication	Recycle	Transport impacts
Solvents	Regulated waste	Parts washing	Reuse or dispose to a hazard waste facility as appropriate	Transport impacts and or landfill space
Paints	Regulated waste	Maintenance painting remnants	Reuse or dispose to a hazard waste facility as appropriate	Transport impacts and or landfill space

12.4 Mitigation measures

The measures proposed to mitigate potential waste impacts for the Project are discussed in Section 20.

12.5 Management of hazardous materials or dangerous goods

Products likely to be stored at construction compounds include:

- Petroleum or other oil products
- Hazardous materials/dangerous goods residues and containers

The Material Safety Data Sheets will be kept at the storage location of any of these hazardous materials or dangerous goods.

It is not intended to store explosives in the worksites during construction. Explosive materials may be transported to the project area as required by the construction programme. Storage and transport of materials will be undertaken according to the following:

- Australian Code for the Transport of Dangerous Goods by Road and Rail
- AS 1216 Classification, Hazard Identification and Information Systems for Dangerous Goods
- AS 1678 Emergency Procedure Guides – Transport
- AS 1940 Storage and Handling of Flammable and Combustible Liquids
- AS 3780 The Storage and Handling of Corrosive Substances
- AS 2809 Road Tank Vehicles for Dangerous Goods

- AS 2931 Selection and Use of Emergency Procedure Guides for Transport of Dangerous Goods
- AS 2187 Explosives – Storage, Transport and Use

All vehicles will be equipped with a spill kit. All vehicle handlers will be fully aware of the spill response plan. Appropriate spill response plans will be prepared.

12.6 Commitments

The relevant waste commitments for the Project include:

- Prepare and implement construction and operational Waste Management Sub Plans.
- Integrate waste management strategies into the detailed design phase of the Project.
- All wastes that are generated shall be stored, handled and transferred in a proper and efficient manner and will not be released into the environment or transported offsite by an appropriately licensed carrier and disposed of at an approved waste disposal facility.