Adani Mining Pty Ltd

NORTH GALILEE BASIN RAIL PROJECT

Environmental Impact Statement

Chapter 13 Waste

November 2013

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13. Waste

13.1 Purpose of chapter

This chapter documents a waste assessment of the North Galilee Basin Rail Project (NGBR Project). The scope of the waste assessment was defined by the following tasks:

- Identification of waste generating activities
- Characterisation of waste
- Estimation of waste volumes
- Identification of waste management facilities
- Identification of waste management options.

This waste chapter was prepared in accordance with the Terms of Reference (TOR) for the NGBR Project. A table that cross-references the contents of this chapter and the TOR is included as Volume 2 Appendix A Terms of Reference cross-reference.

All mitigation and management measures identified within this chapter are included within Volume 2 Appendix P Environmental management plan framework.

This waste chapter may be read in conjunction with assessments within other chapters of this EIS. These include:

- Management of acid sulfate soil and contaminated land, described in Volume 1 Chapter 5 Topography, geology, soils and land contamination
- Stormwater runoff, described in Volume 1 Chapter 9 Water resources
- Dust and exhaust emissions, described in Volume 1 Chapter 10 Air quality
- Control measures to reduce the likelihood or severity of accidental spills, discussed in Volume 1 Chapter 18 Hazard, risk, health and safety
- Potential impacts of accidental spills on environmental values are discussed in Volume 1 Chapter 6 Nature conservation Section 6.4.1and Volume 1 Chapter 9 Water resources Section 9.4.1.

13.2 Methodology

13.2.1 Study area

The study area for the waste assessment was defined by the NGBR Project footprint, comprised of the final rail corridor (nominal 100 m wide corridor) and ancillary infrastructure. The application of the study area was to identify on site waste generating activities during the construction and operation of the NGBR Project. The waste assessment also involved a broader search for regional waste management facilities as a means of identifying options to manage waste.

13.2.2 Data sources

The waste assessment relied on the following data sources:

- North Galilee Basin Rail Concept Design Report (Aarvee Associates 2013)

- Publicly available Environmental Impact Statements (EIS) for similar projects, including:
  - Carmichael Coal Mine and Rail Project EIS (Adani 2012)
  - Kevin's Corner EIS (GVK Hancock 2011)
- Industry knowledge of waste management facilities.

13.2.3 Legislation and guidelines

Legislation relevant to this waste chapter is as follows.

- *Environmental Protection Act 1994*
- *Environmental Protection Regulation 2008*
- *Environmental Protection (Waste Management) Regulation 2000*
- *Waste Reduction and Recycling Act 2011*
- *Waste Reduction and Recycling Regulation 2011*.

The *Environmental Protection (Waste Management) Regulation 2000* is presently undergoing statutory review. It is proposed that waste tracking requirements under this Regulation will be incorporated into the *Waste Reduction and Recycling Act 2011*.

The applicability of legislation, including the above, to approvals for the NGBR Project is discussed in Volume 1 Chapter 20 Legislation and approvals.

Guidelines relevant to this waste chapter are as follows:

- Sustainable Procurement Guide (Commonwealth of Australia 2013)
- Queensland Procurement Policy (State of Queensland 2013)
- AS 1940-2004 The storage and handling of flammable and combustible liquids
- AS 2187.1-1998 Explosives – Storage, transport and use
- AS 4123.7-2006 Mobile waste containers – Colours, markings, and designation requirements.

Waste

The *Environmental Protection Act 1994*, Section 13 defines waste as any gas, liquid, solid or energy that is:

> *(a) left over, or an unwanted by-product, from an industrial, commercial, domestic or other activity; or*
>
> *(b) surplus to the industrial, commercial, domestic or other activity generating the waste.*

Any of the above approved for beneficial reuse under the *Waste Reduction and Recycling Act 2011* is not considered waste under the *Environmental Protection Act 1994*.

Waste and resource management hierarchy

The *Waste Reduction and Recycling Act 2011*, Section 9 defines the following waste and resource management hierarchy:

The waste and resource management hierarchy is the following precepts, listed in the preferred order in which waste and resource management options should be considered:

> *(a) AVOID unnecessary resource consumption;*

(b) REDUCE waste generation and disposal;

(c) REUSE waste resources without further manufacturing;

(d) RECYCLE waste resources to make the same or different products;

(e) RECOVER waste resources, including the recovery of energy;

(f) TREAT waste before disposal, including reducing the hazardous nature of waste;

(g) DISPOSE of waste only if there is no viable alternative.

General environmental duty

The *Environmental Protection Act 1994*, Section 319 defines a general environmental duty to:

not carry out any activity that causes, or is likely to cause, environmental harm unless all reasonable and practicable measures to prevent or minimise the harm [are taken]

Trackable waste

The *Environmental Protection (Waste Management) Regulation 2000* prescribes responsibilities for generators, transporters and receivers of trackable waste.

For a given trackable waste, the responsibilities of the generator are to:

- Record prescribed information about a waste
- Give trackable waste only to authorised waste transporter
- Provide prescribed information to the waste transporter
- Provide prescribed information to the Department of Environment and Heritage Protection
- Keep records for five years.

13.2.4 Desktop assessment

Identification of waste generating activities

This task involved a review of the North Galilee Basin Rail Concept Design Report (Aarvee Associates 2013) to identify waste generating activities that would occur in the study area. The waste generating activities were then separated into the following stages of the NGBR Project:

- Site preparation
- Construction
- Operation
- Decommissioning and rehabilitation.

Activities considered for their potential to generate waste included: clearing and grubbing, cut and fill earthworks, delivery of construction materials, production of construction materials on site, chemical or mechanical processes, storage of hazardous materials, track and train maintenance, and decommissioning and rehabilitation activities.

Characterisation of waste

This task involved the characterisation of waste expected from each waste generating activity. Waste was characterised in accordance with classification of regulated waste under Part 2 of the *Waste Reduction and Recycling Regulation 2011* in order to determine potential legal obligations under the *Waste Reduction and Recycling Act 2011*. This classification is as follows:

- Commercial and industrial waste
- Construction and demolition waste
- Other regulated waste (Schedule 1).

Definitions of commercial and industrial waste under the *Waste Reduction and Recycling Regulation 2011*, Section 4 relevant to this chapter include:

> *(a) manufacturing and industrial processes;*
>
> *(e) activities carried out at a domestic premises under a commercial arrangement;*
>
> *(f) accommodation services.*

Construction and demolition waste under the *Waste Reduction and Recycling Regulation 2011* takes its meaning from the *Building Act 1975*, Section 5 and therefore includes waste generated by:

> *a) building, repairing, altering, underpinning (whether by vertical or lateral support), moving or demolishing a building or other structure*
>
> *b) excavating or filling* [for or incidental to the above activities].

Regulated waste is defined under Schedule 7 of the *Environmental Protection Regulation 2008* and reproduced in Schedule 1 of the *Waste Reduction and Recycling Regulation 2011*.

Regulated waste was subcategorised as trackable waste in accordance with Schedule 1 of the *Environmental Protection (Waste Management) Regulation 2000*.

Estimation of waste volumes

This task involved a review of the North Galilee Basin Rail Concept Design Report (Aarvee Associates 2013) to determine the likely volume of each type of waste. For certain waste types not explicitly quantified in the report, typical quantities were established with reference to publicly available literature on waste management for similar projects (refer Section 13.2.2). In lieu of publicly available information, nominal volumes were estimated for the purpose of identifying potential waste impacts and appropriate waste management options.

Identification of suitable waste management facilities

This task involved the identification of suitable waste management facilities in the region of the NGBR Project through a review of publicly available information and industry knowledge. The type of facility in terms of its capacity to handle given types and quantities of waste was also researched.

Identification of onsite waste handling

This task involved a review of the North Galilee Basin Rail Concept Design Report (Aarvee Associates 2013) to identify proposed and likely locations for onsite waste handling.

Identification of potential waste impacts

This task involved the identification of potential waste impacts on environmental values. The waste assessment referred to the definition of an environmental value under Section 9 of the *Environmental Protection Act 1994* as:

(a) a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety

Identification of waste management options

This task involved:

- Development of onsite waste management measures
- Selection of appropriate offsite waste management facilities.

The development of onsite waste management measures was undertaken with due consideration to the waste and resource management hierarchy defined in the *Waste Reduction and Recycling Act 2011*, the general environmental duty defined in the *Environmental Protection Act 1994* (refer to Section 13.2.3) and Queensland's Waste Reduction and Recycling Strategy 2010-2020 (State of Queensland 2010).

In selecting appropriate facilities, the proximity of the facility to the locations for onsite waste handling was considered, as well as the capacity of the facility to handle the types and quantities of waste expected from the NGBR Project.

13.2.5 Limitations

The level of detail of the waste assessment was limited to the information provided in the North Galilee Basin Rail Concept Design Report (Aarvee Associates 2013) and publicly available literature for similar projects.

Waste volumes provided in this chapter are indicative only, for the purpose of identifying potential waste impacts and appropriate waste management options. Although the volumes of waste generated through each stage of the NGBR Project may differ from the conceptual or typical volumes provided, identified waste management options would scale with actual volumes.

Quarries and borrow areas will be required to support the construction of the NGBR Project. Materials to be sourced from quarries and borrow areas include general fill, gravel, aggregates, ballast and capping layer material. Waste materials of this type are considered in this chapter. Other types of waste associated with quarries and borrow areas (e.g. green waste, packaging waste, food waste, overburden) have not been estimated at this time. It is considered that management options identified for these types of waste from other ancillary infrastructure would apply.

13.3 Existing environment

13.3.1 Waste facilities

Suitable waste facilities identified in the region of the NGBR Project are listed in Table 13-1. The listed facilities are located in local government areas of Whitsunday Regional Council (WRC) or Isaac Regional Council (IRC). Charges and disposal fees apply to all commercial operators. Recycling services are available, but differ in each local government area.

Table 13-1 Waste facilities

Facility	Location	Type	Operating hours
Kelsey Creek	WRC	Landfill	Monday to Friday 8 am to 4 pm Saturday and Sunday 8 am to 5 pm
Cannonvale	WRC	Resource recovery centre	Monday to Sunday 6 am to 6 pm
Bowen	WRC	Landfill	Monday to Friday 7:30 am to 6 pm; Saturday and Sunday 9 am to 6 pm
Collinsville	WRC	Resource recovery centre	Monday, Wednesday, Friday to Sunday 7 am to 6 pm
Carmila	IRC	Resource recovery centre	Monday 8 am to 12 pm Wednesday 2 pm to 5 pm Friday to Sunday 8 am to 12 pm
Clermont	IRC	Resource recovery centre	Monday to Sunday 8 am to 5 pm
Dysart	IRC	Resource recovery centre	Monday to Sunday 7 am to 4 pm
Glenden	IRC	Resource recovery centre	Monday to Sunday 7 am to 4 pm
Greenhill	IRC	Resource recovery centre	Monday 1 pm to 5 pm; Wednesday 9 am to 1 pm Friday 1 pm to 5 pm Saturday and Sunday 1 pm to 5 pm
Middlemount	IRC	Resource recovery centre	Monday to Sunday 7 am to 4 pm
Moranbah	IRC	Resource recovery centre	Monday to Sunday 8 am to 5 pm

Facility	Location	Type	Operating hours
Nebo	IRC	Resource recovery centre	Thursday to Sunday 12 pm to 5 pm
St Lawrence	IRC	Resource recovery centre	Tuesday 8 am to 11 am Thursday to Sunday 8 am to 11 am

The nearest of the identified waste facilities to the NGBR Project were:

- Bowen Landfill (WRC), approximately 16 km from chainage seven kilometres
- Collinsville Resource Recovery Centre (WRC), approximately 17 km from chainage 100 km
- Glenden Resource Recovery Centre (IRC), approximately 38 km from chainage 200 km.

These facilities receive waste and operate as waste transfer stations to other waste facilities in the region. The main waste management facilities in each local government area are described below, given the availability of this information. It is expected that the nearest identified waste facilities to the NGBR Project would be able to receive and accept similar types of waste to the main waste management facilities in each of the local government areas. The nearest identified waste facilities to the NGBR Project are the preferred option for waste disposal.

Whitsunday Regional Council

Kelsey Creek Landfill (WRC) is the main waste management facility in WRC, approximately 70 km from chainage 10 km. The landfill accepts general and regulated wastes for disposal, and various wastes for recycling including:

- Green waste
- Maintenance fluids (engine oil)
- Electrical waste (white goods)
- Batteries
- Tyres
- Waste chemical containers (drums).

WRC also offers comingled recycling at drop off facilities for the following waste streams:

- Plastic bottles (types 1, 2, 3 and 5)
- Steel and aluminium cans
- Glass bottles and jars
- Cartons, cardboard and paper.

During the public consultation process, it was indicated by the WRC that the Kelsey Creek Landfill would be of a sufficient capacity for waste from the NGBR Project.

Isaac Regional Council

Moranbah Resource Recovery Centre (IRC) is the main waste management facility in IRC, approximately 75 km from chainage 230 km. The centre accepts regulated wastes for disposal, and various wastes for recycling including:

- Green waste
- Maintenance fluids (engine oil)
- Electrical waste (white goods)
- Batteries
- Tyres
- Spoil
- Waste concrete
- Waste glass, metal and plastic
- Waste wood, paper and cardboard.

During the public consultation process, it was indicated by the IRC that the Moranbah Resource Recovery Centre would be of a sufficient capacity for waste from the NGBR Project.

Regulated waste is also accepted at Dysart Resource Recovery Centre.

13.4 Waste inventory

13.4.1 Overview

The following waste inventory contains the identification of waste generating activities, characterisation of waste and estimate of waste volumes, for each stage of the NGBR Project. In line with the definition of waste under the *Environmental Protection Act 1994* (refer Section 13.2.3), waste volumes are reflective of waste prior to any waste management options being undertaken, including avoidance.

Details regarding hazardous substances to be used during the life of the NGBR Project including relevant toxicity, biodegradability and hazard information, are provided in Volume 1 Chapter 18 Hazard, risk, health and safety.

13.4.2 Site preparation

The following waste generating activities were considered likely to occur during pre-construction:

- Clearing and grubbing
- Topsoil stripping
- Construction camp establishment
- Haul roads, access roads and laydown construction
- Fencing (temporary and permanent).

Table 13-2 contains an inventory of wasted generated by the above activities, their classification (regulated waste status under the *Waste Reduction and Recycling Regulation 2011* and / or trackable waste status under the *Environmental Protection (Waste Management) Regulation 2000*) and estimated volumes for the pre-construction stage.

Rubbish and debris includes any unexpected waste encountered during clearing and grubbing, such as scrap metal, plastic and wood. Where unexpected finds are a potential source of land contamination, such as farm dumps, decommissioned livestock dips or chemical drum storage areas, the appropriate management measures for land contamination will be taken (refer Volume 1 Chapter 5 Topography, geology, soils and land contamination).

Waste generated during construction camp establishment includes predominately construction material offcuts and packaging waste such as pallets, plastic wrapping, cable reels and metal straps / bands.

Table 13-2 Waste inventory (pre-construction)

Activity	Waste	Classification	Volume (m^3)
Clearing and grubbing	Green waste	Construction and demolition waste	11,169[1]
	Rubbish and debris	Construction and demolition waste	23[2]
Topsoil stripping	Topsoil	Construction and demolition waste	5,000[3]
Construction camp establishment	Waste concrete	Construction and demolition waste	90[4]
	Waste metal	Construction and demolition waste	90[4]
	Waste wood	Construction and demolition waste	90[4]
	Waste glass	Construction and demolition waste	90[4]
	Waste plastic	Construction and demolition waste	90[4]
Fencing (temporary and permanent)	Waste metal	Construction and demolition waste	61[5]

[1] Based on above ground biomass calculation undertaken in Volume 1 Chapter 11 Greenhouse gas

[2] Nominal figure, based on assumed one cubic metre per hectare, applied to construction camps (9.46 ha each)

[3] Nominal figure; topsoil stripping minimum depth will be nominated by future geotechnical assessment

[4] Based on one 10 cubic metre skip per week, per camp, for a nine week site establishment period

[5] Based on 0.1 cubic metre per kilometre of fencing, for both sides of the final rail corridor (613.8 km)

13.4.3 Construction

The following waste generating activities were considered to occur during construction:

- Clearing and grubbing
- Topsoil stripping
- Cut and fill earthworks
- Drainage structure and bridge construction
- Welding
- Ballasting and tamping
- Construction camp operation
- Plant and equipment operation.

Table 13-3 contains an inventory of wasted generated by the above activities, their classification (regulated waste status under the *Waste Reduction and Recycling Regulation 2011* and / or trackable waste status under the *Environmental Protection (Waste Management) Regulation 2000*) and estimated volumes for the two year construction stage.

Rubbish and debris comprises any unexpected waste encountered during clearing and grubbing, and may include scrap metal, plastic and wood.

Waste generated during construction includes packaging waste such as pallets, plastic film wrap, cable reels and metal straps / bands. Concrete batch plants may also generate a large number of bulk bags. Packaging waste generated during cut and fill earthworks includes packaging for ANFO (ammonium nitrate / fuel oil) explosives, including pallets with explosive residues and detonator boxes, which will be required for blasting. Shotcrete will be used to stabilise problematic soil used in cut and fill earthworks, which may generate waste bulk bags. As problematic soils will be avoided, a minimal volume of waste shotcrete is expected.

Wastewater generated by construction camp operation includes grey water and sewage. Clinical and related waste includes sharps, pharmaceutical products, and human tissue waste. Food waste, waste paper and cardboard, plastic, metal (including aluminium cans), glass and electrical waste will be generated by construction camp residents, as well as any office facilities included at the construction camp.

Maintenance fluids generated during plant and equipment operation include paints, solvents, lubricants and oils. Hydrocarbon and water mixtures or emulsions, including oil and water mixtures or emulsions, will be generated in plant and equipment wash-down areas.

Gaseous emissions from plant and equipment are quantified in Volume 1 Chapter 10 Air quality.

Table 13-3 Waste inventory (construction)

Activity	Waste	Classification	Volume (m^3)
Clearing and grubbing	Green waste	Construction and demolition waste	187,496[1]
	Rubbish and debris	Construction and demolition waste	318[2]
Topsoil stripping	Topsoil	Construction and demolition waste	50,000[3]
Cut and fill earthworks	Spoil	Construction and demolition waste	307,371[4]
	Waste shotcrete	Construction and demolition waste	<10
	Waste bulk bags	Construction and demolition waste	<10
	Waste ANFO packaging	Construction and demolition waste	<10
Drainage structure and bridge construction	Waste concrete	Construction and demolition waste	5,437[5]
	Waste bulk bags	Construction and demolition waste	5,437[11]
	Waste pallets	Construction and demolition waste	5,437[12]
	Waste metal	Construction and demolition waste	127[13]
Welding	Waste metal	Construction and demolition waste	139[6]
Ballasting and tamping	Waste ballast	Construction and demolition waste	Negligible[7]
Construction camp operation	Food waste	Commercial and industrial waste	1192[8]
	Wastewater	Commercial and industrial waste	155,125[9]
	Sewage sludge and residues, including nightsoil and septic tank	Item 53, Schedule 1 of the *Waste Reduction and Recycling Regulation 2011*	1,551[10]

Activity	Waste	Classification	Volume (m^3)
	sludge	Item K130, Schedule 1 of the *Environmental Protection (Waste Management) Regulation 2000* Item N190 (Filter cake, other than filter cake waste generated from the treatment of raw water for the supply of drinking water), Schedule 1 of the *Waste Reduction and Recycling Regulation 2011*	
	Waste paper	Commercial and industrial waste	1192[8]
	Waste cardboard	Commercial and industrial waste	1192[8]
	Waste plastic	Commercial and industrial waste	1192[8]
	Waste metal	Commercial and industrial waste	216[8]
	Waste glass	Commercial and industrial waste	216[8]
	Electrical waste	Commercial and industrial waste	<10
	Clinical and related waste	Item 14, Schedule 1 of the *Waste Reduction and Recycling Regulation 2011* Item R100, Schedule 1 of the *Environmental Protection (Waste Management) Regulation 2000*	<10
	Pharmaceuticals, drugs and medicines	Item 44, Schedule 1 of the *Waste Reduction and Recycling Regulation 2011* Item R120, Schedule 1 of the *Environmental Protection (Waste Management) Regulation 2000*	<10

Activity	Waste	Classification	Volume (m^3)
Plant and equipment operation	Maintenance fluids	Item R100 (grease trap waste), Schedule 1 of the *Environmental Protection (Waste Management) Regulation 2000* Item G150 (halogenated solvents), Schedule 1 of the *Environmental Protection (Waste Management) Regulation 2000*	440[14]
	Hydrocarbons and water mixtures or emulsions, including oil and water mixtures or emulsions	Item 37, Schedule 1 of the *Waste Reduction and Recycling Regulation 2011*	440[14]
	Tyres	Item 61, Schedule 1 of the *Waste Reduction and Recycling Regulation 2011* Item T140, Schedule 1 of the *Environmental Protection (Waste Management) Regulation 2000*	<10
	Batteries	Item B100 (acidic solutions and acids in solid form), Schedule 1 of the *Environmental Protection (Waste Management) Regulation 2000*	<10

[1] Based on above ground biomass calculation (refer Volume 1 Chapter 11 Greenhouse gas); 218,532 tonnes, which converts to approximately 198,665 cubic metres (NSW Government 2004)

[2] Nominal figure, based on assumed 0.1 cubic metre per hectare, applied to 100 m final rail corridor (3,034 ha), bridge laydown areas and concrete batch plants (150.58 ha)

[3] Nominal figure; topsoil stripping minimum depth will be nominated by future geotechnical assessment

[4] Based on an assumed wastage rate of 10 per cent for imported fill (3,073,713 cubic metres); spoil due to excess cut will be confirmed during detailed design.

[5] Based on assumed wastage rate of 10 per cent for 36,275 cubic metres of concrete required for bridges and 18,098 cubic metres of concrete required for culverts

[6] Based on 0.005 cubic metres per weld, for 27,738 welds

[7] As ballast stockpiles will be established for construction and ongoing maintenance, wastage rate is considered negligible

[8] Based on one 10 cubic metre skip per week, per camp, for 104 weeks

[9] Based on 212,500 litres per day (730 days) of water usage; includes sewage

[10] Based on one per cent of wastewater

[11] Based on one concrete bulk bag (0.1 cubic metre) for each cubic metre of concrete required

[12] Based on one pallet (0.1 cubic metre) per concrete bulk bag

[13] Based on one cubic metre per bridge span

[14] Nominal figure

13.4.4 Operation

The following waste generating activities were considered to occur during operation:

- Construction legacy maintenance
- Rolling stock maintenance
- Track maintenance.

Table 13-4 contains an inventory of wasted generated by the above activities, their classification (regulated waste status under the *Waste Reduction and Recycling Regulation 2011* and / or trackable waste status under the *Environmental Protection (Waste Management) Regulation 2000*) and estimated volumes for each year of operation.

Green waste due to construction legacy maintenance includes extended clearing at the construction depot, hardstand areas and laydown areas.

Maintenance fluids generated during rolling stock maintenance operation include paints, solvents, lubricants and oils. Hydrocarbon and water mixtures or emulsions, including oil and water mixtures or emulsions will be generated by train washing or rainwater runoff. Waste rubber generated during rolling stock maintenance includes used earplugs and gloves.

The rolling stock maintenance depot will house 10 diesel storage tanks with a cumulative storage capacity of 1,050,000 litres. Management of waste diesel in the event of a spill has been considered in Section 13.5, but is otherwise not considered an ordinary waste stream.

Green waste and waste plastic due to track maintenance activities are expected to be generated from ongoing vegetation control, herbicide use and maintenance of the entire NGBR Project final rail corridor. The administrative requirements of maintenance teams will lead to the generation of wastewater, paper and food waste.

Table 13-4 Waste inventory (operation)

Activity	Waste	Classification	Volume (m^3)
Construction legacy maintenance	Green waste	NA	<10
Rolling stock maintenance	Maintenance fluids	Commercial and industrial waste	220
	Wastewater		
	Hydrocarbons and water mixtures or emulsions, including oil and water mixtures or emulsions	Item 37, Schedule 1 of the *Waste Reduction and Recycling Regulation 2011*	1,260[1]
	Waste chemical containers	Commercial and industrial waste	<10
	Waste plastic	Commercial and industrial waste	<10
	Waste paper	Commercial and industrial waste	<10
	Waste rags and absorbent materials	Commercial and industrial waste	<10
	Food waste	Commercial and industrial waste	<10
	Waste rubber	Commercial and industrial waste	<10
Track maintenance	Green waste	NA	1,875[2]
	Waste concrete	Construction and demolition waste	<10
	Waste metal	Construction and demolition waste	<10
	Waste wood	Construction and demolition waste	<10
	Waste ballast	Construction and demolition waste	<10

Activity	Waste	Classification	Volume (m^3)
	Waste paper	Construction and demolition waste	<10
	Food waste	Construction and demolition waste	<10
	Waste plastic	Construction and demolition waste	<10

[1] Based on 105,000 litre water requirement for washing per month, for 12 months (1,260,000 litres)

[2] Based on assumed one per cent of above ground biomass calculation (refer Volume 1 Chapter 11 Greenhouse gas); 218,532 tonnes, which converts to approximately 198,665 cubic metres (NSW Government 2004)

13.4.5 Decommissioning

Most decommissioning activities will occur at the end of the 90 year life of the NGBR Project. Appropriate rehabilitation strategies will be planned and refined throughout the life of the NGBR Project, and in accordance with any legislated requirements.

The following waste generating activities were considered to occur during decommissioning, in the event of full decommissioning taking place at the end of the NGBR Project life:

- Construction camp decommissioning – temporary construction infrastructure will be decommissioned as soon as they cease to serve their intended purpose. The sites of the decommissioned infrastructure will then be rehabilitated to a state consistent with the natural environment.
- Track decommissioning
- Maintenance facilities decommissioning.

Table 13-5 contains an inventory of wasted generated by the above activities, their classification (regulated waste status under the *Waste Reduction and Recycling Regulation 2011* and / or trackable waste status under the *Environmental Protection (Waste Management) Regulation 2000*) and estimated volumes for the entire decommissioning stage.

Locomotives, wagons, plant and equipment will be replaced as necessary throughout the life of the NGBR Project. As such, these components of the NGBR Project were not considered to be a waste source specific to the decommissioning phase. It was considered that locomotives, wagons, plant and equipment would be in working order at the time of decommissioning and would not be considered a waste.

Table 13-5 Waste inventory (decommissioning)

Activity	Waste	Classification	Volume (m^3)
Construction camp decommissioning	Waste concrete	Construction and demolition waste	473[1]
	Waste metal	Construction and demolition waste	473[1]
	Waste wood	Construction and demolition waste	473[1]
	Waste fittings, upholstery, and furniture	Construction and demolition waste	24[5]
	Electrical waste	Construction and demolition waste	24[5]
Track decommissioning	Waste concrete	Construction and demolition waste	5,438[2]
	Waste metal	Construction and demolition waste	70,014[3]
	Waste ballast	Construction and demolition waste	650,000[4]
Rolling stock maintenance depot decommissioning	Waste concrete	Construction and demolition waste	2,913[1]
	Waste metal	Construction and demolition waste	2,913[1]
	Waste wood	Construction and demolition waste	2,913[1]
	Waste fittings, upholstery, and furniture	Construction and demolition waste	291[5]
	Electrical waste	Construction and demolition waste	291[5]

[1] Nominal value, based on 10 cubic metres per hectare, per camp (9.46 ha each; 47.3 ha total) or for the rolling stock maintenance depot (178 ha)

[2] Based on total volume of concrete required for drainage structure and bridge construction

[3] Based on rail weight (60 kg/m) multiplied total length of track 758,480 m (Aarvee Associates 2013); 45,508.8 tonnes converts to approximately 70,014 cubic metres (NSW Government 2004)

[4] Based on total ballast requirement (650,000 cubic metres)

[5] Nominal value, based on one cubic metre per hectare, per camp (9.46 ha each; 47.3 ha total) or for the maintenance facilities (178 ha, 113.33 ha)

13.5 Waste management

13.5.1 Overview

Improper waste management can impact on a range of environmental values including soil, air, surface water and groundwater quality. Improper waste management may also cause a range of public health hazards. The potential impacts of the identified waste streams on environmental values, if unmanaged, are identified in Table 13-6.

Waste management for the NGBR Project will be undertaken with due consideration to the waste and resource management hierarchy defined in the *Waste Reduction and Recycling Act 2011*, the general environmental duty defined in the *Environmental Protection Act 1994* (refer to Section 13.2.3) and *Queensland's Waste Reduction and Recycling Strategy 2010-2020* (State of Queensland 2010).

Adani will also adhere to its obligations for trackable waste, under the *Environmental Protection (Waste Management) Regulation 2000*. Section 13.4 includes a preliminary characterisation of trackable waste generated by the NGBR Project.

Prior to disposing waste at a waste facility, Adani will seek approval from the relevant local government authority (refer Section 13.3.1).

The waste management strategy for the NGBR Project is described in Section 13.5.2. Waste management measures have been developed for the identified types of waste in accordance with the waste management strategy (refer Table 13-8). Although the waste management hierarchy has been considered for each waste type, not all waste management options are applicable to a given waste type. Some types of waste are non-recyclable, for example. As such, only the applicable waste management options are applied.

Table 13-6 Potential impacts

Waste type	Potential impact
Green waste	Fire hazard
	Emissions of greenhouse gases as vegetation rots
	Possible loss of nutrients in natural nutrient cycles
	Spread of weeds
	Visual impact
	Pest species
Packaging waste Rubbish and debris Waste pallets Waste bulk bags	Visual impact
	Source of litter
	Plastics may entrap native animals
Waste concrete Waste shotcrete	Localised increases in pH (wash out waste)
	Visual impact
Waste metal	Visual impact
	Localised soil contamination with potential to leach to surface and groundwater
	Human health risk (tetanus)
Waste ballast Waste wood Waste glass Waste plastic Waste rubber	Visual impact
	Source of litter

Waste type	Potential impact
Waste paper Waste cardboard Waste aluminium cans	
Waste solvents and paints	Contamination of soils, surface water and groundwater
Maintenance fluids	Toxicity to plants and animals
Hydrocarbons and water mixtures or emulsions	Degradation of water resources
Electrical waste Waste fittings and upholstery	Visual impact
	Source of litter
Food waste	May attract vermin
	Odour
	Disease, particularly through bacterial infection
Wastewater Sewage sludge and residues	Contamination of land, surface and groundwater
	Degradation of water resources
	Inhibition of native plant growth
	Increased nutrient levels in aquatic ecosystems, causing eutrophication and algal outbreaks
	Spread of disease
	Odour
Tyres	Fire hazard
	Toxic smoke if fire occurs
	Visual impact

Waste type	Potential impact
	Collect water which may harbour mosquitoes and other biting insects
Batteries	Release of acidic and/or metallic contaminants to land, surface water and groundwater
	Toxicity to plants and animals
	Degradation of water resources
	Inhibition of native plant growth
Spoil	Visual impact
	Dust generation
	Degradation of water resources
	Inhibition of native plant growth
Topsoil	Visual impact
	Dust generation
	Degradation of water resources
	Spread of weeds
Waste ANFO packaging	Fire hazard
	Safety hazard
	Visual impact
Clinical and related waste Pharmaceuticals, drugs and medicines	Health hazard

13.5.2 Waste management strategy

The key features of the waste management strategy are aligned with the waste and resource management hierarchy:

- AVOID unnecessary resource consumption:
  - Development of a Procurement Plan, including measures to avoid ordering surplus goods, services and materials (ordering to size), avoid packaging waste (ordering in bulk) and identification of suppliers with product stewardship arrangements
  - Establishment of temporary infrastructure in areas that were previously cleared, degraded or have naturally lower aboveground biomass
  - Substitution of emissions-intensive plant, equipment, fuel and power, in line with cleaner production principles (refer Volume 1 Chapter 11 Greenhouse gas)
- REDUCE waste generation and disposal:
  - Demarcation of areas to be cleared
  - Implementation of procedures at construction camps and offices to reduce waste
  - Maintenance of plant and equipment to maximise their efficiency
- REUSE waste resources without further manufacturing:
  - Assessment of waste for reuse, including beneficial reuse under the *Waste Reduction and Recycling Act 2011*, prior to collection
  - Segregate types of waste to maximise reuse potential and use of colour-coded bins to promote compliance
- RECYCLE waste resources to make the same or different products:
  - Treatment of wastewater in portable aerobic treatment plants
  - Use of authorised contractors to collect and recycle waste
  - Recycling of waste as compost, either onsite or offsite
  - Investigation into market demand for recyclable waste
- RECOVER waste resources, including the recovery of energy:
  - Investigation of waste management options for recovery of energy from waste
  - Product stewardship arrangements with suppliers that include recovery of resources or energy from waste
  - Investigation of options for a resource entitlement for sale of timber
- TREAT waste before disposal, including reducing the hazardous nature of waste:
  - Treatment of waste materials, such as water or topsoil, to maximise reuse and minimise hazard to environmental values
- DISPOSE of waste only if there is no viable alternative.

It is considered that the implementation of the waste and resource management hierarchy will mitigate potential impacts of waste on environmental values. The waste management strategy for the NGBR Project will implement additional measures targeted at protection of environmental values, including the following:

- Bins will be fitted with lids, to prevent attraction of vermin, insects and pests, and pooling of water

- Wastewater discharge limits and thresholds will be developed based on site location, ground conditions, vegetation, and proximity to waterways and groundwater sources
- Spoil and waste rock stockpiles will be sited away from waterways and managed to minimise erosion and runoff.

Waste storage

Waste segregation bins will be located at key construction components of the NGBR Project, including construction camps, concrete batch plants, bridge laydown areas, track laydown areas, construction depot areas and the construction yard (refer Volume 1 Chapter 2 Project description). Colour-coded waste segregation bins in accordance with AS 4123.7-2008 will be considered to promote compliance in accordance with AS 4123.7-2008 (refer Table 13-7). Wastes listed in Table 13-8 are colour coded in accordance with AS 4123.7-2008.

Table 13-7 Colour-coding scheme

Waste type	Colour
General waste	GREEN
Contaminated waste	YELLOW
Paper	BLUE
Cardboard	ORANGE
Aluminium cans	RED
Metal	GREY
Hydrocarbons	BROWN
Plastic	WHITE

Table 13-8 Waste management measures

Waste	Hierarchy	Management
Green waste	AVOID	Clearing will be avoided by placing temporary infrastructure in areas that were previously cleared, degraded or have naturally lower aboveground biomass.
	REDUCE	Areas to be cleared will be demarcated to reduce incidental clearing.
	REUSE	As far as practicable, cleared material will be chipped, mulched and stockpiled for reuse during rehabilitation. Materials with special habitat value, such as hollow bearing logs or trees, will be selectively removed for reuse during rehabilitation, or placed in nearby bushland.
	RECOVER	Adani may seek a resource entitlement under the *Forestry Act 1959*, for the recovery and sale of timber. In this case, an authorised contractor would be engaged to remove timber.
	DISPOSE	Declared weeds will be disposed in accordance with the weed and pest management plan (refer Volume 2 Appendix P Environmental management plan framework)
Rubbish and debris	RECYCLE	Rubbish and debris includes any unexpected waste encountered during clearing and grubbing, and may include scrap metal, plastic and wood. Such wastes will be stored for collection by an authorised contractor for offsite recycling, where recycling is considered feasible.
	DISPOSE	Where rubbish and debris is not recyclable, the waste will be removed to a storage location for collection by an authorised contractor for offsite disposal.
Food waste	AVOID	Procurement of surplus food will be avoided by adhering to a Procurement Plan.
	REDUCE	Food preparation at construction camps will reduce food waste, where practicable
	RECYCLE	Options to recycle food waste by worm farming for reuse as compost will be pursued where practicable.

Waste	Hierarchy	Management
	DISPOSAL	Putrescible waste will be stored at allocated bins at each construction camp, for collection by an authorised contractor, and disposed offsite.
Wastewater	AVOID	Generation of wastewater will be avoided by installation of water saving fixtures and waterless urinals at construction camps.
	REDUCE	Wastewater will also be reduced by efficiencies in collective washing of dishes, and potential collective washing of clothes.
	REUSE	Treated wastewater will be reused for dust suppression, where suitable.
	TREAT	Wastewater, including sewage and grey water, will be treated onsite at modular aerobic treatment units.
	DISPOSE	The method of disposal of treated wastewater will be dependent on water quality. Waste water discharge limits and thresholds will be developed based on site location, ground conditions, vegetation, and proximity to waterways and groundwater sources. Site based management plans (SBMP) will be developed to ensure that site-specific treatment and discharge requirements are complied with.
Sewage sludge and residues	DISPOSE	Sewage sludge and residues, including filter cake, will be stored in modular aerobic treatment units, for collection by an authorised contractor and disposed offsite.
Spoil	REDUCE	The NGBR Project is designed to adhere to the natural ground profile, where practicable, in order to reduce earthworks.
	REUSE	A cut and fill balance will be maintained wherever possible to maximise reuse of cut material as fill. Surplus cut material, including imported material, will be reused for other construction activities, such as backfill, building pads and roads.
	RECYCLE	Surplus material that cannot be reused will be stockpiled on site. Adani will explore options to recycle spoil wherever possible. For example, by providing this material to local governments for daily cover material of their landfill sites or to other construction projects in the region.

Waste	Hierarchy	Management
	DISPOSE	Surplus material that cannot be reused will be stockpiled on site before being moved to an appropriate landfill. Spoil agreements may be sought with landholders. All stockpiles will be sited away from waterways and managed to minimise erosion and sedimentation.
Waste shotcrete	AVOID	Problematic soils will be avoided and/or batters appropriately sloped during cut and fill earthworks, avoiding the requirement for shotcrete. Procurement of surplus concrete powder will be avoided by adhering to a Procurement Plan.
	RECYCLE	Waste shotcrete will be crushed and recycled where practicable.
	DISPOSE	Waste shotcrete that cannot be recycled will be stored for collection by an authorised contractor, and disposed offsite.
Waste ANFO packaging	AVOID	Procurement of surplus ANFO will be avoided by adhering to a Procurement Plan.
	REUSE	Product stewardship arrangements will be sought, with a view to pallets being reused under return to supplier arrangements.
	DISPOSE	Waste ANFO packaging will be collected and stored in designated storage areas for offsite disposal by an authorised contractor.
Topsoil	REUSE	Topsoil will be stockpiled for reuse during rehabilitation. Stockpiles will be managed to maintain soil structure and fertility.
	TREAT	Low quality topsoil will be treated with ameliorants to improve structure and fertility.
	DISPOSE	Surplus or unusable topsoil will be disposed at locations within the 100 m final rail corridor, or on adjacent land, subject to landholder agreement and relevant environmental approvals.
Waste concrete	AVOID	Procurement of surplus concrete powder will be avoided by adhering to a Procurement Plan.
	RECYCLE	Waste concrete will be crushed and recycled where practicable.

Waste	Hierarchy	Management
	DISPOSE	Waste concrete that cannot be recycled will be collected and stored in designated storage areas for offsite disposal by an authorised contractor.
Waste bulk bags	AVOID	To avoid generation of bulk bags, concrete powder will be sourced, where practicable, from quarries in the vicinity of the NGBR Project and transported in bulk by dump truck.
	REUSE	Product stewardship arrangements will be sought with concrete powder suppliers.
	RECYCLE	Waste bulk bags will be stored for collection by an authorised contractor and recycled offsite.
	DISPOSE	Where recycling is not considered feasible, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.
Waste ballast	AVOID	Procurement of surplus ballast will be avoided by adhering to a Procurement Plan.
	REUSE	All surplus ballast will be stockpiled at a ballast siding at the construction depot area (refer to Volume 1 Chapter 2 Project description), for reuse during maintenance activities.
Waste metal	AVOID	Procurement of surplus metal, including rail, will be avoided by adhering to a Procurement Plan.
	REDUCE	Waste metal will be reduce by limiting offcuts
	RECYCLE	Suitable rail offcuts or scrap metal (including metal bands from packaging of construction materials and hot waste from welding) will be stored for collection by an authorised contractor and recycled offsite. Market demand for this recyclable waste will also be considered.
Waste wood	AVOID	Procurement of surplus wood will be avoided by adhering to a Procurement Plan.
	REUSE	Waste wood will be stored on site for reuse, where practicable.

Waste	Hierarchy	Management
	RECYCLE	Waste wood that cannot be reused on site (including cable reels from packaging) will be collected in designated recycling containers for offsite disposal by an authorised contractor, where recycling is considered feasible. Market demand for this recyclable waste will also be considered.
Waste glass	AVOID	Procurement of glass for domestic uses will be avoided in the first instance for health and safety reasons (refer to Volume 1 Chapter 18 Hazard, risk, health and safety). Where glass is required for construction, procurement of surplus glass will be avoided by adhering to a Procurement Plan. Market demand for this recyclable waste will also be considered.
	RECYCLE	Waste glass will be stored at recycling bins at each construction camp, for collection by an authorised contractor and recycled offsite, where feasible.
	DISPOSE	Where recycling is not considered feasible, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.
Waste plastic	AVOID	Procurement of surplus plastic will be avoided by adhering to a Procurement Plan. Generation of food packaging will be avoided through supply of reusable lunch boxes, drink bottles and cutlery to the NGBR Project workforce.
	RECYCLE	Waste plastic will be stored at recycling bins at each construction camp, for collection by an authorised contractor and recycled offsite.
	TREAT	Plastic containers will be rinsed prior to disposal to prevent regulated waste liquids entering recycling bins.
	DISPOSE	Where recycling is not considered feasible, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.
Waste rubber	AVOID	Procurement of surplus rubber (e.g. gloves, earplugs, tyres) will be avoided by adhering to a Procurement Plan.

Waste	Hierarchy	Management
	RECYCLE	Waste rubber will be stored at recycling bins for collection by an authorised contractor and recycled offsite.
	DISPOSE	Where recycling is not considered feasible, or is contaminated, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.
Waste paper	AVOID	Procurement of surplus paper will be avoided by adhering to a Procurement Plan. Generation of food packaging will be avoided through supply of reusable lunch boxes, drink bottles and cutlery to the NGBR Project workforce.
	REDUCE	Waste paper in office and administration facilities will be minimised by enabling 'secure print' feature on all printers and by encouraging double-sided printing.
	RECYCLE	Waste paper will be shredded and, where feasible, utilised in composting. Waste paper will be stored at recycling bins at each construction camp, for collection by an authorised contractor, and recycled offsite, where feasible.
	DISPOSE	Where recycling is not considered feasible, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.
Waste cardboard	AVOID	Procurement of surplus cardboard will be avoided by adhering to a Procurement Plan. Generation of food packaging will be avoided through supply of reusable lunch boxes, drink bottles and cutlery to the NGBR Project workforce.
	RECYCLE	Waste cardboard will be stored at recycling bins at each construction camp, for collection by an authorised contractor, and recycled offsite, where feasible.
	DISPOSE	Where recycling is not considered feasible, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.

Waste	Hierarchy	Management
Waste aluminium cans	AVOID	Procurement of surplus aluminium cans will be avoided by adhering to a Procurement Plan. Generation of food packaging will be avoided through supply of reusable lunch boxes, drink bottles and cutlery to the NGBR Project workforce.
	RECYCLE	Waste aluminium will be stored at recycling bins at each construction camp, for collection by an authorised contractor, clubs or charities, and recycled offsite.
Electrical waste	AVOID	Procurement of surplus appliances and cabling will be avoided by adhering to a Procurement Plan.
	REUSE	Product stewardship arrangements will be sought, with a view to some electrical appliances being reused under return to supplier arrangements.
	RECYCLE	Electrical waste will be stored at recycling bins at each construction camp, for collection by an authorised contractor, and recycled offsite, where feasible. Market demand for this recyclable waste will also be considered.
	DISPOSE	Where recycling is not considered feasible, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.
Waste fittings, upholstery and furniture	AVOID	Procurement of surplus fittings, upholstery and furniture will be avoided by adhering to a Procurement Plan.
	RECYCLE	Waste fittings, upholstery and furniture will be stored at recycling bins at each construction camp, for collection by an authorised contractor, and recycled offsite, where feasible. Market demand for this recyclable waste will also be considered.
	DISPOSE	Where recycling is not considered feasible, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.
Waste rags and absorbent materials	AVOID	Procurement of materials will be avoided by adhering to a Procurement Plan.

Waste	Hierarchy	Management
	REUSE	Rags and absorbent materials used in rolling stock maintenance will be reused in ongoing maintenance activities as far as practicable.
	DISPOSE	Where reuse is not considered feasible, the waste will be collected and stored in designated waste storage areas for collection by an authorised contractor for offsite disposal.
Waste pallets	AVOID	Procurement of surplus pallets will be avoided by adhering to a Procurement Plan.
	REDUCE	Delivery of material on pallets will be limited wherever possible. If materials have to be delivered to site on pallets, ensure that pallets are returned to the supplier at time of delivery, where practicable.
	REUSE	Product stewardship arrangements will be sought, with a view to pallets being reused under the stewardship of the supplier.
	RECOVER	Options to recover wood from pallets by chipping, for reuse as mulch, will be pursued where practicable.
Clinical and related wastes	DISPOSE	Clinical and related waste (other than biohazards or sharps), including sanitary wastes, will be collected in designated waste containers for offsite disposal by an authorised contractor. Sharps and biohazards containers will be used for separate storage and disposal.
Pharmaceuticals, drugs and medicines	DISPOSE	Waste pharmaceuticals, drugs and medicines will be collected in designated containers for offsite disposal by an authorised contractor.
Maintenance fluids	AVOID	Maintenance fluids, such as lubricants, oils and diesel, will be stored in appropriate containers within bunded areas, in accordance with *AS 1940-2004*, to avoid the generation of waste from spills.
	RECYCLE	Used engine oil or fuel filters will stored for collection by an authorised contractor, and taken offsite for recycling.

Waste	Hierarchy	Management
	DISPOSE	Waste maintenance fluids will be collected and stored in designated waste storage areas for collection by an authorised contractor, and disposed offsite. Waste maintenance fluids will be stored in the same manner as unused maintenance fluids.
Hydrocarbons and water mixtures or emulsions	REUSE	Water separated and treated from hydrocarbon and water mixtures or emulsions, including oil and water mixtures or emulsions, will be reused in a similar manner to treated wastewater.
	TREAT	Hydrocarbon and water mixtures or emulsions, including oil and water mixtures or emulsions, will be treated by removal of solids, oil separation, disinfection, filtration and chlorine dosing.
	DISPOSE	Separated oil will be stored in designated waste storage containers and removed by an authorised contractor for disposal offsite.
Tyres	AVOID	Procurement of surplus tyres will be avoided by adhering to a Procurement Plan.
	REDUCE	Plant and equipment will be operated efficiently, to reduce the frequency of tyre replacements.
	RECYCLE	Options to recycle on site for local use will be explored. These options include the following: impact-absorbing surfaces; bitumen and road construction; pastoral and agricultural use; and civil engineering applications. The above actions would be subject to a beneficial reuse approval under the *Waste Reduction and Recycling Act 2011* (refer to Volume 1 Chapter 20 Legislation and approvals).
	DISPOSE	If options for reuse or recycling are not practicable, waste tyres will be stockpiled on site, for collection by an authorised contractor and disposed offsite.

Waste	Hierarchy	Management
Batteries	AVOID	Procurement of surplus batteries will be avoided by adhering to a Procurement Plan. Lead acid vehicle batteries will be stored in appropriate weatherproof battery storage containers, to avoid the generation of waste from leaks.
	RECYCLE TREAT DISPOSE	All batteries will be collected by an authorised contractor for offsite recycling, treatment or disposal. The most suitable options will be determined prior to construction and operation commencing.

13.6 Conclusion

This chapter describes the likely waste streams to be generated and waste management strategy for the NGBR Project, including appropriate waste management measures to be applied during construction and operation (refer Table 13-8). Waste volumes provided in this chapter are indicative only, for the purpose of identifying potential waste impacts and appropriate waste management options.

The waste management strategy for the NGBR Project described in this chapter will continue to be developed and refined during detailed design and will include –

- Development of a Procurement Plan (refer to Section 13.5.2)
- Formalisation of a waste management standard, typically as a component of environmental management across the NGBR Project (refer to Volume 1 Chapter 20 Environmental management plan), which provides instruction on:
  - Waste handling
  - General waste storage, including bin colour, size, location
  - Chemical storage, and associated material safety data sheets
  - Waste recording, including waste generation forms
  - Waste audits, include waste audit checklists
- Development of site based management plans for wastewater discharge
- Waste auditing and monitoring, including:
  - Actual waste generation volumes
  - Potential impacts to environmental values
  - Compliance with the waste management strategy.

Waste auditing and monitoring will ensure that the waste management strategy for the NGBR Project scales with actual waste volumes. The waste management strategy described in this chapter will ensure that waste from the NGBR Project is managed in an environmentally sound manner, and in accordance with any legislated requirements for waste tracking.