PROJECT CHINA STONE

Non-Mining Waste Management 21

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21 NON-MINING WASTE MANAGEMENT

21.1 INTRODUCTION

This section describes waste and land contamination issues relevant to Project China Stone (the project). It is restricted to discussion of the management of non-mining wastes. Waste generated from the processing of coal (i.e. tailings and rejects material) and fly ash generated by the power station is discussed in Section 7 – Tailings and Power Station Waste Storage Facilities and Section 8 – Rehabilitation, and is therefore not discussed in this section.

21.2 WASTE

21.2.1 Introduction

This section describes the regulatory framework relevant to non-mining wastes to be generated by the project and summarises the way in which wastes will be managed, the environmental values to be protected and the principles of cleaner production. The section also provides an inventory of anticipated wastes.

21.2.2 Regulatory Requirements

The *Waste Reduction and Recycling Act 2011* (WRR Act), the *Waste Reduction and Recycling Regulation 2011* (WRR Regulation), the *Environmental Protection (Waste Management) Regulation 2000* (EPR Waste), the *Environmental Protection Act 1994* (EP Act) and the *Environmental Protection Regulation 2008* (EP Regulation) provide the legal and strategic framework for managing wastes in Queensland. The WRR Act sets out a waste management hierarchy where waste management options are considered in a structured order as follows:

1 Waste avoidance (most preferred);

2 Waste reduction;

3 Waste reuse;

4 Waste recycling;

5 Recover waste resources;

6 Treat waste; and

7 Waste disposal (least preferred).

The EPR Waste requires tracking of certain regulated wastes known as ‘trackable wastes’. Trackable wastes are listed in Schedule 1 of the EPR Waste and include waste oils, solvents, empty drums, tyres, etc. Waste tracking enables regulatory agencies to track certain wastes from place of generation to place of storage, recycling, treatment or disposal, under a documented chain of custody. It also enables regulators to ensure that trackable wastes are transported by suitably licensed waste transport contractors to a facility licensed to accept the waste.

The Department of Environment and Heritage Protection (EHP) recently conducted a state-wide review of waste management in Queensland in order to provide a framework for sustainable waste management. The *Queensland Waste Avoidance and Resource Productivity Strategy (2014–2024)* (EHP, 2014) outlines the high level direction for waste reduction and recycling in Queensland over the next 10 years.

21.2.3 Environmental Values

Environmental values to be protected when managing waste are:

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

21.2.4 Cleaner Production

Principles of cleaner production will form an important component of the project's waste management system and will be achieved through:

- Focusing on waste avoidance as a key outcome through selective purchasing, reuse and recycling;
- The preferential selection and use of the most appropriate processes and equipment utilising best practicable technology;
- The reuse of resources that would otherwise be classified as wastes, via a comprehensive reuse and recycling program; and
- The reuse of products for their designated purpose where safe and practicable (e.g. the reuse of wooden pallets for storage).

Further information on the achievement of each of the above principles is presented in Section 21.2.6.

21.2.5 Waste Management System

The proponent will develop and implement a waste management system for the project. It will be based on the regulatory requirements, values and principles described in the previous sections.

The project's waste management system will:

- Meet the requirements of the WRR Act, WRR Regulation, EPR Waste, EP Act and EP Regulation;
- Provide for the identification of waste types;
- Commit to the use of licensed waste transport contractors; and
- Outline the process for tracking of relevant regulated wastes.

The system will aim to protect environmental values by providing a framework to:

- Reduce the quantity of hazardous wastes through the application of the waste management hierarchy;
- Ensure that wastes are handled, stored and disposed of in a manner that minimises impacts on air, water and land resources and protects the health of people working on the project and in the surrounding community; and
- Minimise land disturbance associated with on-site disposal areas.

The waste management system will be subject to a continual improvement process with the aim of identifying new opportunities for waste minimisation and addressing any new waste streams generated. Key features will include:

- Engagement of professional, licensed waste management contractors working within the provisions of the WRR Act, WRR Regulation and the EPR Waste to remove waste from the site for reprocessing, recycling or transport to a licensed landfill site, as necessary.

- Segregation and secure containment of all regulated waste until removed from the site by a licensed regulated waste transporter for recycling by a licensed recycler, or disposal in a licensed regulated waste disposal facility.
- Compilation and maintenance of waste tracking records for all regulated waste in accordance with EPR Waste.
- Segregation of waste into colour coded bins where possible. The bins will be located at strategic locations to maximise the recovery and recycling of wastes.
- Design and management of an on-site landfill to dispose of general (non-regulated and non-hazardous) wastes in accordance with the Queensland Government *Guideline - Landfill Siting, Design, Operation and Rehabilitation, EM2319, Version 2* (EHP 2013). The landfill will be located within the in-pit overburden emplacement adjacent to the northern ramp (Figure 21-1). The site would be selected using a risk-based approach including assessment of potential impacts on surface and groundwater. The landfill would be designed as a lined system with a leachate containment system to prevent potential contamination of surface or groundwater. A management plan would also be developed for the operation of the landfill. The landfill is discussed further in Section 21.3.5.
- Employee awareness. This will be achieved through:
  - Communication of waste generation volumes, trends, performance and management costs; and
  - Environmental awareness training programs.
- Regular environmental auditing.
- Biennial hazardous materials auditing.

Section 21.2.6 describes the way in which the waste management hierarchy will be addressed, whilst Table 21-1 summarises the proposed waste management strategies for each waste stream identified for the project.

21.2.6 Waste Minimisation and Management

Best practice waste management strategies have been selected with consideration of the waste management hierarchy listed in Section 21.2.2. The way in which the waste management hierarchy has been considered is discussed below and summarised for each waste in Table 21-1.

- Waste avoidance (1) (most preferred) – Where possible, raw materials will be delivered in bulk form. Where bulk delivery is not feasible, consideration shall be given to the purchase of products based on minimalist packaging and use of biodegradable materials.
- Waste reduction (2) – Waste reduction strategies will be implemented based on the waste management hierarchy, to ensure minimal waste products are generated. This will include targets to reduce quantities of hazardous wastes.
- Waste reuse (3) – Table 21-1 lists the items that will be refurbished, where possible, and reused. These include ventilation tubes, hoses, pipe work and associated components such as butterfly valves, cabling fixings and hangers, plastic and steel rib plates, steel mesh and conveyor rollers. Fine coal rejects from the Coal Handling and Preparation Plant will also be used as feed coal to generate electricity for the project on-site. This is further discussed in Section 4 – Project Description.
- Waste recycling (4) – A recycling program will be established and promoted, encouraging the recycling of waste materials such as paper, cardboard, scrap metal and air filters. Waste oils and metals (including metal drums) will be recycled where possible. In particular, waste oil (including recycling and/or recovery) will be managed in accordance with the *Product Stewardship Arrangements for Oil Administrative Guidelines* (DEH 2005).

- Recover waste resources (5) – Segregation of waste types will be implemented to maximise recovery and recycling of wastes where possible.
- Treat waste (6) – Waste products are not proposed to be treated on the project site. Where appropriate, waste materials that require treatment, will be stored on-site in secure containment areas, and removed off-site by registered waste transporter to be processed as appropriate.
- Waste disposal (7) (least preferred) – Where disposal is required, the proponent will endeavour to minimise the quantity and/or volume of such waste materials. General wastes will be disposed in the on-site landfill or may be temporarily stored prior to transfer to a suitably licensed waste disposal facility by a registered waste transporter, prior to the landfill's construction.

Wastes will be separated and stored for collection, transport, recycling, recovery or disposal as described in the waste inventory (Section 21.2.7). Wastes will be collected, handled and stored so as to protect mine site staff, community health and prevent nuisance. Management measures to be adopted will include:

- Covering general refuse bins to contain odour, reduce leachate and exclude vermin;
- The use of mosquito and vermin control if necessary; and
- The removal of wastes from site on a regular basis.

21.2.7 Waste Inventory

The main wastes anticipated to be generated by the project include:

- Green waste;
- Scrap metal;
- Waste oils, other hydrocarbons and miscellaneous chemicals;
- Batteries and tyres;
- Sewage; and
- General waste.

Wastes associated with mine construction activities and operational activities within the project site are presented in Table 21-1 together with the source, projected annual quantity and proposed management strategy for each waste.

21.2.8 Waste Reporting

The proponent will maintain an inventory of all waste types and quantities produced on the site and their applicable disposal method in accordance with WRR Act and EPR Waste. The proponent will also submit annual National Pollution Inventory reports in accordance with the *National Pollutant Inventory Guide* (SEWPaC 2012) and associated manuals (e.g. *Emission Estimation Technique Manual for Mining*, SEWPaC 2012) as required.

Table 21-1 Estimated Maximum Wastes Generated (Per Annum)

WASTE CATEGORY	GENERAL COMPOSITION	SOURCE	QUANTITIES – CONSTRUCTION	QUANTITIES – OPERATIONS	MANAGEMENT STRATEGIES (WASTE MANAGEMENT HIERARCHY LEVEL)
Non-regulated					
General Waste	Food scraps; wood & non-reusable pallets; non-Class 1, 2, 5 plastics	Kitchenettes, crib rooms, administration areas, workshop, etc.	260 t	1,200 t	Prior to construction of the on-site landfill, wastes will be stored in green bins for periodic transport off-site by a licensed waste transport contractor to a licensed landfill (7). Following construction of the on-site landfill, wastes would be disposed at the on-site landfill (7).
Recyclable Waste	Aluminium steel cans; Class 1, 2, 5 plastics; paper; cardboard; carbon brushes for motors; rubber	Kitchenettes, crib rooms, administration areas, workshop, etc.	150 t	1,500 t	Stored on site in purple bins for regular transport off-site by licensed waste transport contractor for recycling , if practicable (4). Confidential paper will be segregated into confidential locked paper bins for shredding and recycling (4).
Refurbishable Items	Ventilation tubes; hoses; manifolds and couplings; pipe work and associated components and fittings; cabling fixings and hangers; (some) drill steels and roof bolts; plastic dome plates; butterfly plates, wing nuts; plastic and steel rib plates; steel mesh; conveyor rollers	Underground operations and maintenance workshops	60 t	450 t	Majority of items will be stockpiled within a designated area before being returned to the warehouse. If condition is acceptable, items will be reused directly (3). Other items will be transported off site by a licensed carrier, to be refurbished or recycled by a licensed contractor (4). Where items are at the end of their useful life, they will be collected and disposed of as appropriate for that material (e.g. metal components to the scrap metal bins) (5). Where items are contaminated with hydrocarbons, they will be managed as regulated waste (6, 7).
Green Waste	Grass; cleared timber	Clearing of vegetation	11,000 ha	< 10 t	Mulched and/or placed in timber stacks to provide habitat, where feasible (4). Vegetation cleared for the project may also be burned, where necessary (7).

WASTE CATEGORY	GENERAL COMPOSITION	SOURCE	QUANTITIES – CONSTRUCTION	QUANTITIES – OPERATIONS	MANAGEMENT STRATEGIES (WASTE MANAGEMENT HIERARCHY LEVEL)
Scrap Metal	Steel; copper; brass; cast iron; stainless steel; electrical cable; wire; aluminium; any item considered to be metal (ferrous or non-ferrous) including machine parts	Structures and equipment not suitable to be reconditioned; Heavy machinery scrapping	1,000 t	< 10 t	Smaller items are to be placed within blue scrap metal skips for collection by a licensed contractor (4, 5). Larger items will be left in an accessible location where specific collection arrangements can be made (4, 5). All grease and oil is to be removed prior to placement in skips. A licensed contractor will remove all scrap metals for transport to a licensed waste recycling facility (4).
Personal Protective Equipment and Small Items	Gloves; hardhats; safety glasses; gumboots; water coolers	Bathhouse; contractor facilities	< 1 t	< 1 t	Waste items are to be collected in designated black bins and cages, packed in sacks and stored in the warehouse for transport to a licensed recycling facility (4).
Air Filters	Engine air filters	Vehicle and Machinery maintenance at workshop	< 1 t	< 1 t	Waste items are to be placed within designated air filter recycling bins for collection and transported to a licensed contractor for cleansing, testing and reuse (3).
Wooden Pallets	Reusable pallets	Warehousing and workshop	< 1 t	< 1 t	Wooden pallets will be reused where possible (3). Non-reusable pallets will be considered as general waste (7).
Regulated					
Waste Oils, Grease and Sludge	Waste oils, grease and sludge	Vehicle and machinery maintenance at workshop, maintenance and shutdown work	3,000 kL	2,500 kL	Waste oil will be collected and stored in designated waste oil containers, and transported by a licensed regulated waste contractor to a licensed regulated waste receiver for reuse (3), recycling (4) or disposal (7). Waste grease will be collected in sealed 205 L drums and transported by a licensed regulated waste contractor to a licensed regulated waste disposal facility for disposal by high temperature incineration (7).

WASTE CATEGORY	GENERAL COMPOSITION	SOURCE	QUANTITIES – CONSTRUCTION	QUANTITIES – OPERATIONS	MANAGEMENT STRATEGIES (WASTE MANAGEMENT HIERARCHY LEVEL)
Empty Chemical Drums	20 L drums; 205 L drums	Administration area, underground and surface facilities	10 t	50 t	All drums will be segregated and sealed prior to collection by a licensed waste contractor. Waste will be taken to a licensed waste receiver where drums and containers will be rinsed and recycled (4).
Paints	General paint	Establishment and renovation of buildings	< 5 kL	< 5 kL	Collection and storage in a sealed and bunded waste paint designated area for collection by licensed regulated waste contractor to a licensed regulated waste receiver for disposal (7).
Tyres	Tyres	Light vehicles, heavy equipment	550	1,200	Segregation and storage in a designated area < 200 m^2 and 3 m high, with no grass or other flammable material within a 10 m radius. Further segregation and retreading where practical (3). Residual wastes for collection by a licensed regulated waste contractor to a licensed regulated waste receiver for recycling (4), recovery (5) or disposal (7).
Oily Water	-	Interceptors within industrial areas, wash pads, workshop, refuelling station, fuel farm	1,500 kL	3,000 kL	Cleaned effluent from the oily water management system will flow to a dam for reuse onsite (3). Decanted hydrocarbons will be stored within a waste oil container. Waste oil will be transported off-site by a suitably licensed waste carrier to a licensed waste receiver for separation and recycling (4), recovery (5) or disposal (7).

WASTE CATEGORY	GENERAL COMPOSITION	SOURCE	QUANTITIES – CONSTRUCTION	QUANTITIES – OPERATIONS	MANAGEMENT STRATEGIES (WASTE MANAGEMENT HIERARCHY LEVEL)
Sewage Effluent	On-site disposed effluent	Underground facilities, Mine Industrial Area (MIAs), accommodation village	320,000 kL	320,000 kL	A package sewage treatment plant with a capacity of 140 kL/day will be constructed within each of the MIAs and the accommodation village. Effluent from the treatment process (6) will be pumped to settlement ponds from which the treated effluent will be sprayed to pasture (3) in accordance with relevant regulatory requirements. The use of treated effluent in areas of human contact will be avoided. Sludge from the treatment process will be collected by a licensed waste contractor and transported to a sewage treatment plant for treatment (6) and disposal (7).
Septic Tank Waste	Off-site disposed tank wastes	Portable facilities	2,800 kL	4,600 kL	Septic tank waste will be recycled into the sewage treatment plant. Waste will be treated (6) and disposed of (7) under the arrangements described for sewage effluent.
Waste Grease Cartridges	Waste grease cartridges	Maintenance and shutdown work	300 kL	500 kL	Collection and storage in sealed 205 L drums. Drums will be removed from site by a licensed regulated goods carrier and transported to a regulated waste disposal facility for disposal by high temperature incineration (7).
Miscellaneous Hydrocarbon Wastes	Oily rags; absorbent and other oil spill cleanup products	General maintenance, underground and workshop activities	< 20 t	< 20 t	Oily rags and oil spill kit materials will be collected within regulated waste wheelie/industrial bins, before being transported by a licensed waste transport contractor to a licensed waste disposal facility for recovery (5) and/or disposal (7).

WASTE CATEGORY	GENERAL COMPOSITION	SOURCE	QUANTITIES – CONSTRUCTION	QUANTITIES – OPERATIONS	MANAGEMENT STRATEGIES (WASTE MANAGEMENT HIERARCHY LEVEL)
Miscellaneous Chemicals	Engine coolant; solvents; sealants etc	General maintenance, underground and workshop activities	< 20 kL	< 50 kL	Used coolants and coolant additives will be stored in a waste coolant tank and collected and reconditioned by the supplier (4). Other chemical wastes and concentrated solutions will be segregated and stored in sealed containers to prevent overflow or spillage. Such wastes will be transported off-site by a licensed regulated waste contractor to a licensed regulated waste receiver for treatment (6) and/or disposal (7) in accordance with the Material Safety Data Sheets and any other legislative requirements. Empty metal and plastic chemical containers will be managed as per Scrap Metal and General Waste, respectively.
Dry or Gel Cell Batteries	Cap lamp batteries	Portable electrical equipment (radios, phones, etc) within the workshop, underground and administration areas	< 1 t	< 1 t	Segregation and storage in designated battery containers in battery storage area for collection by a licensed regulated waste transport contractor for transport to a licensed regulated waste facility for recycling (4) or disposal (7).
Spent Vehicle Batteries (Lead Acid Batteries)	Vehicle batteries	Vehicle maintenance	< 15 t	< 15 t	Storage in designated area within battery storage containers. Batteries will be transferred to sealable battery crates and transported off site by a dangerous goods transport agent to a suitable waste handling facility for recycling (4) or treatment and disposal (7).

** Waste Management Hierarchy: Waste avoidance (1); Waste reduction (2); Waste reuse (3); Waste recycling (4); Recover waste resources (5); Treat waste (6); Waste disposal (7)*

21.3 LAND CONTAMINATION

21.3.1 Introduction

This section describes the control strategies to prevent land contamination from the project.

21.3.2 Regulatory Requirements

Land contamination is managed in Queensland under the EP Act. Areas known to be contaminated by a hazardous contaminant are listed on the Contaminated Land Register (CLR) by the EHP. Activities that have been identified as having the potential to cause land contamination are called Notifiable Activities (NAs) and are defined under the EP Act. These include waste storage, petroleum or oil storage and landfilling. Properties where a notifiable activity is conducted are required to be listed on the Environmental Management Register (EMR).

Australian Standard *The storage and handling of flammable and combustible liquids* (AS 1940-2004) identifies the standards required for the storage and handling of flammable and combustible liquids in Australia. This standard sets out the requirements and recommendations for the safe storage and handling of flammable and combustible liquids including minimum acceptable safety requirements for storage facilities, operating procedures, emergency planning and fire protection.

21.3.3 Contaminated Land Site History

A history of the project site was compiled in accordance with the *Contaminated Land Assessment Guideline* (EHP 2014) in order to identify past and present potentially contaminating activities within the project site. Development of the site history was achieved through:

- A review of the CLR and the EMR;
- Analysis of aerial photography to identify historic and existing land uses with the potential to cause land contamination; and
- Discussions with the proponent to verify information concerning historical and existing land uses.

The findings of this site history are as follows:

- There are no properties on the project site that are listed on the CLR;
- There are no properties on the project site that are listed on the EMR; and
- There are no known historical or existing contaminated sites within the project site.

21.3.4 Proposed Notifiable Activities

A number of activities proposed to be undertaken on the project site have the potential to have a negative impact on the environment and/or result in land contamination. These activities, classed as Notifiable Activities (NAs), are listed under the EP Act. Table 21-2 provides a list of the NAs that may be undertaken on the project site as part of the project. This list will be refined as necessary during the detailed operations planning phase of the project, and details of areas with NAs will be provided to EHP, in accordance with legislative requirements.

Figure 21-1 provides the locations of the proposed NAs.

Table 21-2 Notifiable Activities

EP ACT SCHEDULE 3 NOTIFIABLE ACTIVITY	DESCRIPTION
NA 1 Abrasive Blasting	Carrying out abrasive blast cleaning (other than cleaning carried out in fully enclosed booths) or disposing of abrasive blasting material.
NA 7 Chemical Storage	Storing more than 10 t of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code.
NA 8 Coal Fired Power Station	Operating a coal fired power station
NA 14 Engine Reconditioning	Carrying out engine reconditioning work at a place where more than 500 L of any of the following are stored - ■ Halogenated and non-halogenated hydrocarbon solvents. ■ Dangerous goods in Class 6.1 under the dangerous goods code. ■ Industrial degreasing solutions.
NA 20 Landfill	Disposing of waste (excluding inert construction and demolition waste)
NA 29 Petroleum Product or Oil Storage	Storing petroleum products or oil - ■ In underground tanks with more than 200 L capacity; or ■ In above ground tanks with - – For petroleum products or oil in class 3 in packaging groups 1 and 2 of the dangerous goods code – more than 2,500 L capacity; or – For petroleum products or oil in class 3 in packaging groups 3 of the dangerous goods code – more than 5,000 L capacity; or – For petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS 1940, 'The storage and handling of flammable and combustible liquids' published by Standards Australia – more than 25,000 L capacity.

21.3.5 Contamination Prevention and Control

The risk of land contamination from project activities, including NAs, will be reduced through consideration of the design and construction of the facilities and post-mining rehabilitation. The considerations for each NA in each project phase are listed in the following sections. Section 22 – Hazard and Risk provides further information on the storage and handling of hazardous and dangerous materials.

Mine Establishment

Hydrocarbon and chemical storage areas will be designed and constructed in accordance with AS 1940 in order to contain and recover spills. Bunding will also allow for collection of stormwater for treatment or appropriate disposal.

On-Site Landfill

The on-site landfill will be used for the storage of general waste. It will be located in the in-pit overburden emplacement adjacent to the northern ramp of the open cut mining area (Figure 21-1). The operation of the landfill will involve the progressive filling of prepared landfill cells. The cells will be constructed with compacted low permeability overburden material at the base and cover layers. The cells will be filled and capped progressively over the life of the project as the overburden emplacement is developed. Due to the large scale of the open cut mining operations and the overburden emplacement, the proposed landfill concept can be readily incorporated into the progressive development of the constructed overburden emplacement.

Location of the landfill within the in-pit overburden emplacement will be advantageous from a water management perspective. The overburden emplacement in the surrounding areas can be readily constructed to ensure surface drainage is directed away from the active landfill area. Any relatively small volumes of surface runoff or seepage would report to the open cut pit. Any such water would form a very minor proportion of the open cut pit water and would be contained on site and re-used for mine water supply.

The landfill would be designed to ensure it does not give rise to any significant risk of environmental harm. It would pose no risk to flora and fauna given that it is within the in-pit overburden emplacement and would not require any additional land disturbance. Potential impacts from dust and noise would not be significant in comparison to the large scale open cut mining operations. Due to the remote location of the project site and the use of progressive capping, odour is also unlikely to be a significant issue. The final rehabilitation of the landfill would be readily achieved by capping of the final operating cell at least 5 m below the final surface of the overburden emplacement.

The landfill concept is considered to adequately address all potential environmental risks including the risk of land contamination. The landfill concept is also generally in accordance with the EHP Guideline – *Landfill Siting, Design, Operation and Rehabilitation*, and relevant sections of the EHP Guideline – *Application Requirements for Activities with Waste Impacts*.

The detailed design of progressive stages of the landfill will need to be integrated with the detailed overburden emplacement development schedule in the area. The detailed design and operating plan for the landfill will be in accordance with the EHP guidelines and will require EHP approval prior to the commencement of construction of the landfill.

Management of Sewage Effluent

As discussed in Table 21-1, package sewage treatment plants with a capacity of 140 kL/day will be constructed within each of the MIAs and the accommodation village. The locations of these areas relative to the project site boundary and project infrastructure is shown in Figure 21-1. These areas are all well above the 50 year Average Recurrence Interval flood levels (refer to Section 13 – Surface Water, Figure 13-11) and hence do not pose a significant risk to surface water contamination during flooding. Sewage treatment plants will be located within bunded areas with sufficient capacity to contain any accidental release of effluent to the receiving environment.

Effluent ponds will be constructed with low permeability liners to ensure there is no contamination due to seepage from the ponds. Treated effluent from each of the sewage treatment plants will be sprayed to gardens and pasture in accordance with regulatory requirements. Appropriate release locations will be determined during the detailed design stage to ensure that the release of treated effluent does not result in adverse impacts to water, land or other sensitive environmental features and values. The EIS studies on soil suitability, flooding potential, groundwater and vegetation characteristics will be used to inform the selection of an appropriate release location.

All treated effluent released to land will meet the EHP Model Mining Conditions contaminant release limits provided in Section 24 – Environmental Management (Attachment 24-4). These conditions are designed to ensure that the release of treated sewage effluent to land does not result in significant adverse health or environmental impacts. No release of treated effluent to sensitive environmental areas is proposed.

Operations

- Storage of waste hydrocarbons and miscellaneous chemicals in separate sealed and bunded areas to prevent soil contamination.
- Handling of waste hydrocarbons and miscellaneous chemicals in accordance with standard operating procedures to minimise potential for spillage and leakage.
- Training of key staff in spills prevention and clean up.
- Provision of oil spill cleanup kits at strategic locations as part of site emergency planning.
- Direction of workshop and truck wash-down area contaminants to an oil separator and sump for containment and subsequent treatment or appropriate disposal.

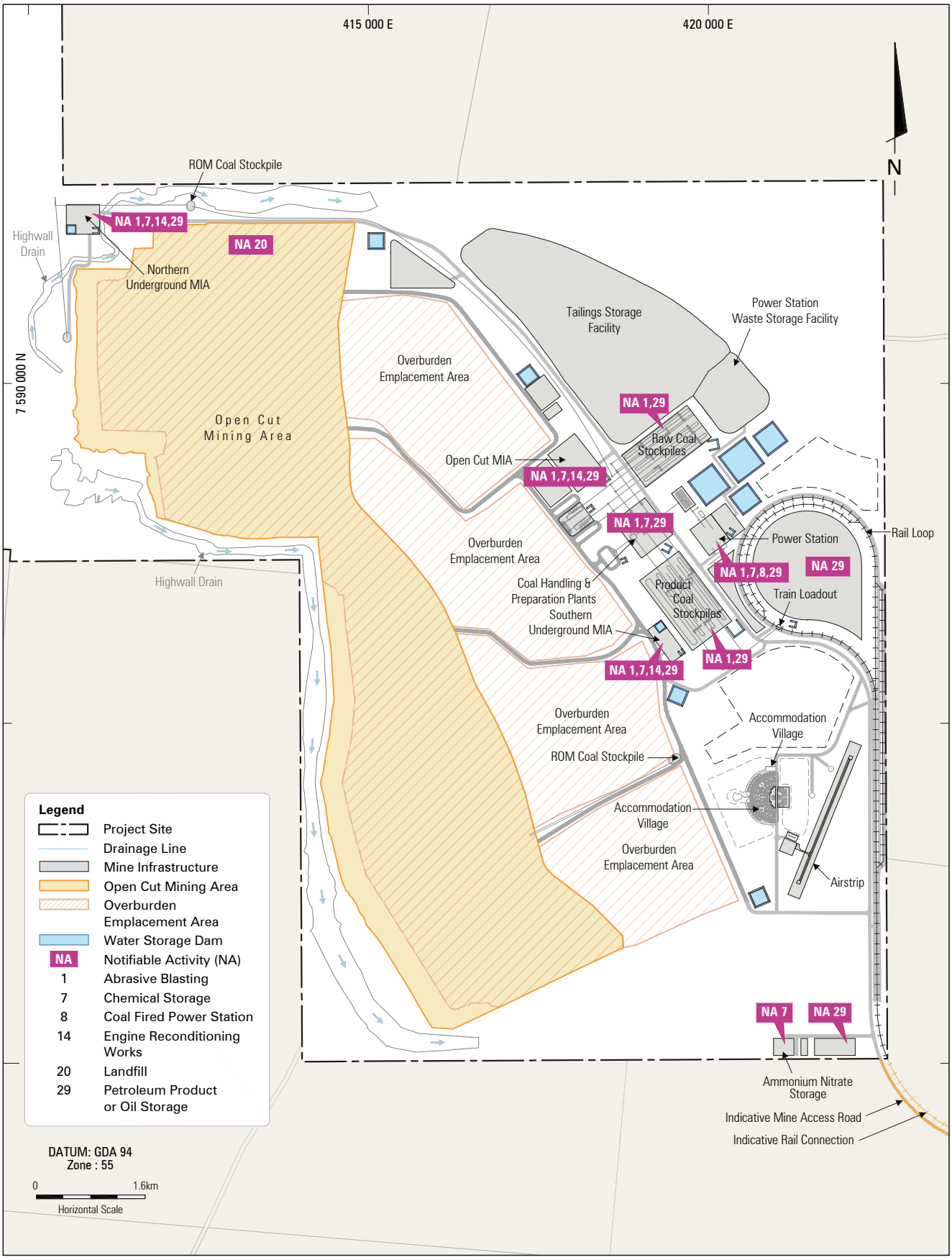
- Abrasive blasting work will be undertaken in a way that prevents overspray from escaping the area. This will be achieved by the use of screens, enclosures and/or an exclusion zone around the work area.
- Crushing of coal on site may result in the dispersal of fine coal material. Engineering controls such as the use of water sprays and the enclosing of the crushing area will be used to prevent coal dust dispersal and contamination of the surrounding area.
- Managing the on-site landfill to reduce the risk of contamination of surface and/or groundwater.
- The storage, handling and disposal considerations for waste materials generated by the project are discussed in Table 22-1.

Pit water from the underground and open cut operations will be used for dust suppression on the haul roads. The groundwater assessment concluded that pit water is not likely to have a high salinity, and is therefore unlikely to adversely affect surface soil condition. In addition, any adversely affected surface soil areas will be identified, assessed and remediated during final mine rehabilitation and site decommissioning.

Decommissioning

- Removal of hydrocarbon and chemical storage tanks and other infrastructure.
- Post-mine rehabilitation and site remediation (Section 8 – Rehabilitation).
- Assessment of the need for a site management plan in the event of any areas within the project site remaining on the EMR or CLR following mine closure.

FIGURES



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Indicative Locations of Notifiable Activities

FIGURE 21-1