

WASTE & LAND CONTAMINATION

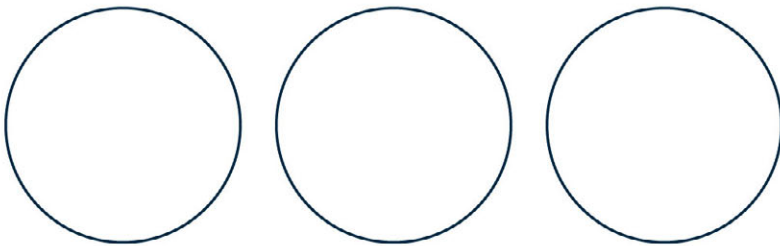


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8 WASTE & LAND CONTAMINATION

This section describes waste and land contamination issues relevant to the Ensham Central Project.

8.1 WASTE

8.1.1 Introduction

This section describes the regulatory framework relevant to wastes generated by the project and summarises the way in which project wastes will be managed. The section also provides an inventory of expected wastes based on waste volumes generated by the current Ensham Mine and experience with similar mines.

The proponent has an existing, comprehensive Waste Management Program, which addresses all issues relevant to the management of waste from open cut mining operations. This program will be extended to address waste issues associated with the project. These include waste from construction activities, underground mining and the operation of the washplant. The project will not alter the open cut mining production rate, and consequently will not affect the nature or annual quantity of waste generated by open cut mining operations. However, given that the project will extend the life of open cut mining operations, this section includes a discussion of the way in which wastes from open cut mining operations are managed.

Key features of the Waste Management Program are detailed in Section 8.1.4.

8.1.2 Regulatory Requirements

The *Environmental Protection (Waste Management) Policy 2000 (EPP Waste)* and *Environmental Protection (Waste Management) Regulation 2000 (EPR Waste)* together with the *Environmental Protection Act 1994 (EP Act)* and the *Environmental Protection Regulation 1998 (EPR)* provide the legal and strategic framework for managing wastes in Queensland. Section 2 – Regulatory Framework of this EIS describes the main aspects of this legislation relevant to the project. The *EPP Waste* 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 re-use;
3. waste recycling;
4. energy recovery from waste; and
5. waste disposal (least preferred).

The *EPR Waste* requires tracking of certain regulated wastes known as trackable wastes (e.g. waste oils, solvents, empty drums, etc). Waste tracking enables regulatory agencies to track certain regulated wastes from place of generation to place of storage, recycling, treatment or disposal. Put simply, it enables regulators to ensure that trackable wastes are transported by suitably licensed waste transport contractors to a facility licensed to accept the waste.

8.1.3 Environmental Values

Environmental values to be protected when managing waste are:

- the life, health and wellbeing of people;
- the diversity of ecological processes and associated ecosystems; and
- land use capability having regard to economic consideration.

8.1.4 Current Waste Program

The Ensham Waste Management Program has been designed to meet the requirements of the *EPP Waste*, *EPR Waste*, *EP Act* and *EPR* and provides for the identification of waste types, the use of licensed waste transport contractors and relevant tracking of regulated wastes. This program protects environmental values by providing a framework to:

- Reduce the quantity and hazardous nature of wastes through 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 at the Ensham Mine and the surrounding community; and
- Minimise land disturbances associated with on site disposal areas.

The Waste Management Program is subject to continual improvement particularly to identify new opportunities for minimisation and address any new wastes streams generated.

Key features of the program include:

- employee awareness:
 - communication of waste generation volumes and management costs; and
 - environmental awareness training programs.
- engagement of professional, licensed waste management contractors;
- regular environmental auditing; and
- biennial (every two years) hazardous substance auditing.

Section 8.1.5 describes the way in which the Waste Management Program addresses the waste management hierarchy.

Section 8.1.6 provides a waste inventory, including project wastes and the proposed waste management strategies.

8.1.5 Waste Minimisation and Management

Waste management strategies outlined in the existing Waste Management Program have been selected with consideration for the waste management hierarchy detailed above.

Expected waste streams were identified and are documented in Section 8.1.6. Examples of how the waste management hierarchy was considered during the conceptual and design stages are described below and summarized for each waste in Table 8-1.

Waste Avoidance

Where possible, raw materials will be delivered to the site in bulk form.

Product coal is transported to export and domestic markets in bulk, avoiding the generation of waste packaging. Therefore consideration of *The National Packaging Covenant* (National Packaging Covenant Council, 2005) is not warranted.

Waste Re-use

Suitable cleared vegetation and timber will be used for habitat reinstatement where possible. Truck tyres will be retreaded, where practical, and the residue will be disposed of on site in overburden emplacement areas.

Waste Recycling

The Ensham Mine has established waste recycling programs for waste oils and metals (including metal drums and vehicle batteries). In particular, waste oil management, including recycling and/or recovery, is consistent with the *Product Stewardship Arrangements for Waste Oil Guidelines* (DEH, 2004). In addition, recycling programs for paper and cardboard will be established.

Energy Recovery from Waste

As identified in *A National Approach to Waste Tyres* (Environment Australia, 2001) tyres have more fuel energy than coal. While energy recovery of tyres (e.g. to a cement kiln in Gladstone) is an option for future consideration, transportation and gate costs for recovery are not viable. On site disposal is standard practice at mines and is recognised in the proponent's current Environmental Authority.

Coal seam gas is released during underground mining operations. Energy recovery is not viable given the predicted low coal seam gas production rates and on site electricity generation is not considered viable. Greenhouse gas emissions are discussed in more detail in Section 13 – Air Quality.

Disposal

Where disposal is required, the proponent will endeavour to minimise the quantity and/or volume of waste. Wastes will be separated and stored for collection, transport and recycling, recovery or disposal as described in the waste inventory.

Wastes will be collected, handled and stored so as to protect mine site staff and community health and prevent nuisance including:

- Covered general refuse bins to contain odour, reduce leachate and exclude vermin;
- Use of mosquito and vermin control; and
- Removal of general refuse from site on a weekly basis.

8.1.6 Waste Inventory

The main wastes generated by the project are:

- green waste;
- scrap metal;
- waste oils, other hydrocarbons and miscellaneous chemicals;
- batteries and tyres;
- sewage and sewage sludge;
- sediments; and
- general waste.

Overburden, rejects and tailings are described in detail in Section 7 - Rehabilitation and therefore have not been included in the inventory below.

Wastes associated with construction activities, the open cut mine, the underground mine, and washplant are presented in Table 8-1 together with the source, quantity and proposed management strategy for each waste.

8.1.7 Waste Reporting

The project activities and emissions trigger the threshold for reporting to the National Pollutant Inventory (NPI). Section 2.2.1 of this EIS describes the mechanism under which reporting is required. Emissions to air, land and water from project activities such as coal mining, fuel storage and explosive detonation, will need to be reported to the NPI. The proponent will continue to submit annual NPI reports in accordance with the *National Pollutant Inventory Guide* (2004) and associated manuals (e.g. *Emission Estimation Technique Manual for Mining* (2001)).

**Table 8-1
Estimated Annual Mine Construction and Operational Wastes**

Waste Material	Source	Quantity and Units (per year)			Management Strategies (Waste management hierarchy level)*
		Construction (for 3 yrs)	Open Cut (12 Mtpa for additional 6 years)	Underground Mine and Wash Plant (operation) (8 Mtpa for 12 years)	
<i>Non Regulated</i>					
Green Waste	Clearing of vegetation	1,500 m ³	3,500 m ³	N/A	Suitable vegetation and logs to be used for habitat reinstatement (2) in accordance with the vegetation clearing procedure (Section 16). Residue to be burned under Permit (5).
Scrap Metals	Construction activities, infrastructure maintenance and workshops	5 Tonnes	3 Tonnes	2 Tonnes	Segregation and recycling (3) at licensed waste recycling facility.
Dredged Sediment	Sediment from sediment traps/dams and washdown area.	80 m ³	100 m ³	50 m ³	Clean sediment to be disposed of in the overburden emplacement area (5). Sediment contaminated with coal to be placed in the tailings dam (5).
Timber/Wooden Pallets	Workshop	< 1 Tonne	< 1 Tonne	< 1 Tonne	Reused where possible (2). Residue to off site licensed landfill (5).
Cardboard and Waste Paper	Packaging and administration	4 Tonnes	5 Tonnes	3 Tonnes	Segregated then stored on site in designated areas and collected for recycling (3).
General Rubbish	Kitchenettes, crib rooms, administration areas, workshop, accommodation areas, etc	2,000 m ³	3,300 m ³	2,200 m ³	Stored on site in covered bins for transport (weekly) off site by licensed waste transport contractor to licensed landfill (5).
<i>Regulated</i>					
Waste Oils	Machinery maintenance	10 KL	300 KL	100 KL	Collected and stored in bunded tank. Transported by licensed regulated waste contractor to a licensed regulated waste receiver for recycling (3) or recovery (4).
Oil Filters	Machinery maintenance	4 Tonnes	6 Tonnes	4 Tonnes	Collected and stored in sealed area. Transported by licensed regulated waste contractor to a licensed regulated waste receiver for recycling (3), recovery (4) and disposal (5).
Hydrocarbon Contaminated Material	Dragline, workshop and shut downs (rags, absorbents and hydraulic hoses)	25 Tonnes	5 Tonnes	15 Tonnes	Collected for transportation off site by a regulated waste transport contractor to a licensed regulated waste facility for recovery (4) and/or disposal (5).

Waste Material	Source	Quantity and Units (per year)			Management Strategies (Waste management hierarchy level)*
		Construction (for 3 yrs)	Open Cut (12 Mtpa for additional 6 years)	Underground Mine and Wash Plant (operation) (8 Mtpa for 12 years)	
Miscellaneous Chemicals	Machinery maintenance (coolant, solvents, etc.)	Varies	6,700 L	5,000 L	Transported off site by a regulated waste contractor to a licenced regulated waste receiver for treatment (4) and/or disposal (5) in accordance with Material Safety Data Sheets/legislative requirements.
Metal Drums	Petroleum and chemical storage	2 Tonnes	3 Tonnes	2 Tonnes	Drained for oil recovery (see above), collected and crushed on site then sold as scrap metal (3).
Heavy Vehicle Tyres	Heavy mining and earthmoving equipment Note – there is no on site servicing of light vehicles	100 Tyres	130 Tyres	100 Tyres	Retreaded where practical (2). Onsite use in civil engineering structures (2) and disposal in overburden emplacement areas in accordance with licence conditions (5).
Spent Vehicle Batteries (Lead-acid batteries)	Vehicle maintenance	40 Batteries	400 Batteries	400 Batteries	Stored under cover for collection by a licensed regulated waste transport contractor for transport to a licensed regulated waste facility for recycling (3), treatment (4) and disposal (5).
Grease	Dragline, workshop and shut downs	20,000 L	80,000 L	26,000 L	Collected on site for transportation by a licensed regulated waste transport contractor for off site chemical fixation then disposal as inert material in licensed landfill (5).
Oily Water	Oily water from bunded areas which cannot be drained into an oil pollution control system.	2,000 L	2,000 L	2,000 L	Segregation and stored on site in bunded tank. Transported off site by licensed regulated waste transport contractor to a licensed regulated waste receiver for recovery (4) or disposal (5).
Sewage Effluent	Accommodation and administration areas	18 ML	60 ML	13 ML	On site disposal in a series of ponds (5). A proportion of the waste water is used for road watering (2). A new sewage treatment facility will be required for accommodation of the project workforce and will be constructed and operated in accordance with legislative requirements.
Sewage/Septic Waste	Crib room	1 ML	3ML	2ML	Removed off site by licensed regulated waste transport contractor to a licensed regulated facility for disposal (5).

* Note
(1) waste avoidance (most preferred)
(2) waste re-use
(3) waste recycling
(4) energy recovery from waste
(5) waste disposal (least preferred)

8.2 LAND CONTAMINATION

8.2.1 Introduction

This section identifies areas of land contamination that could be affected by the project and describes the control strategies to prevent land contamination from the project.

8.2.2 Legislative Framework

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 EPA. Activities that have been identified as likely to cause land contamination have been identified as Notifiable Activities and are defined under the *EP Act*. These include activities such as petroleum storage and landfilling. Properties where a Notifiable Activity is conducted are required to be listed on the Environmental Management Register (EMR) by the EPA.

Australian Standard AS1940 - 2004 *The storage and handling of flammable and combustible liquids* identifies the standards required for the storage and handling of petroleum 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.

8.2.3 Potential for Contamination

A site history was compiled in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (EPA, 1998) to identify past and present potentially contaminating activities within the project area. The site history included:

- A review of the EPA's CLR and EMR.
- Inspection of documentation regarding site notifiable activities as submitted by the proponent to the EPA.
- Analysis of aerial photography to identify historical and existing land uses with the potential for land contamination.
- Discussions with the proponent to verify information concerning historical and existing land uses.

The findings of this site history are as follows:

- The properties on which the project is located are not listed on the CLR.
- As part of the existing approved operations, Notifiable Activities are conducted on two of the proponent's properties and therefore these properties are listed on the EMR (Figure 8-1). Notifiable Activities conducted on these properties include Petroleum Product Storage and Disposal of Mine Wastes (Lot 32 on RP908643) and Landfilling (Lot 31 on CP864573). These activities will continue to be managed to prevent contamination and this management will not be affected by the project.
- There are no known historical or existing contaminated sites within the project area.

8.2.4 Contamination Prevention and Control

Project activities with the potential to contaminate land include petroleum and chemicals storage and handling, and overburden, rejects and tailings disposal. The location of these activities is identified on Figure 8-1. The management of overburden, rejects and tailings is discussed in

Section 7 – Rehabilitation. Land contamination from project activities will be prevented through the design and construction of the facilities and post-use rehabilitation. For example:

Design and Construction

- Petroleum and chemical storage areas will be designed and bunded in accordance with AS1940: *The storage of flammable and combustible liquids* to contain and recover spills. Bunding will also allow for collection of stormwater for treatment or appropriate disposal.

Operations

- Storage of waste hydrocarbons and miscellaneous chemicals in 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 clean up kits at strategic locations as part of site emergency planning.
- Direction of workshop and truck wash down area contaminants to a sump for containment and subsequent treatment or appropriate disposal.
- Control of any leachate or surface runoff from the tailings area.

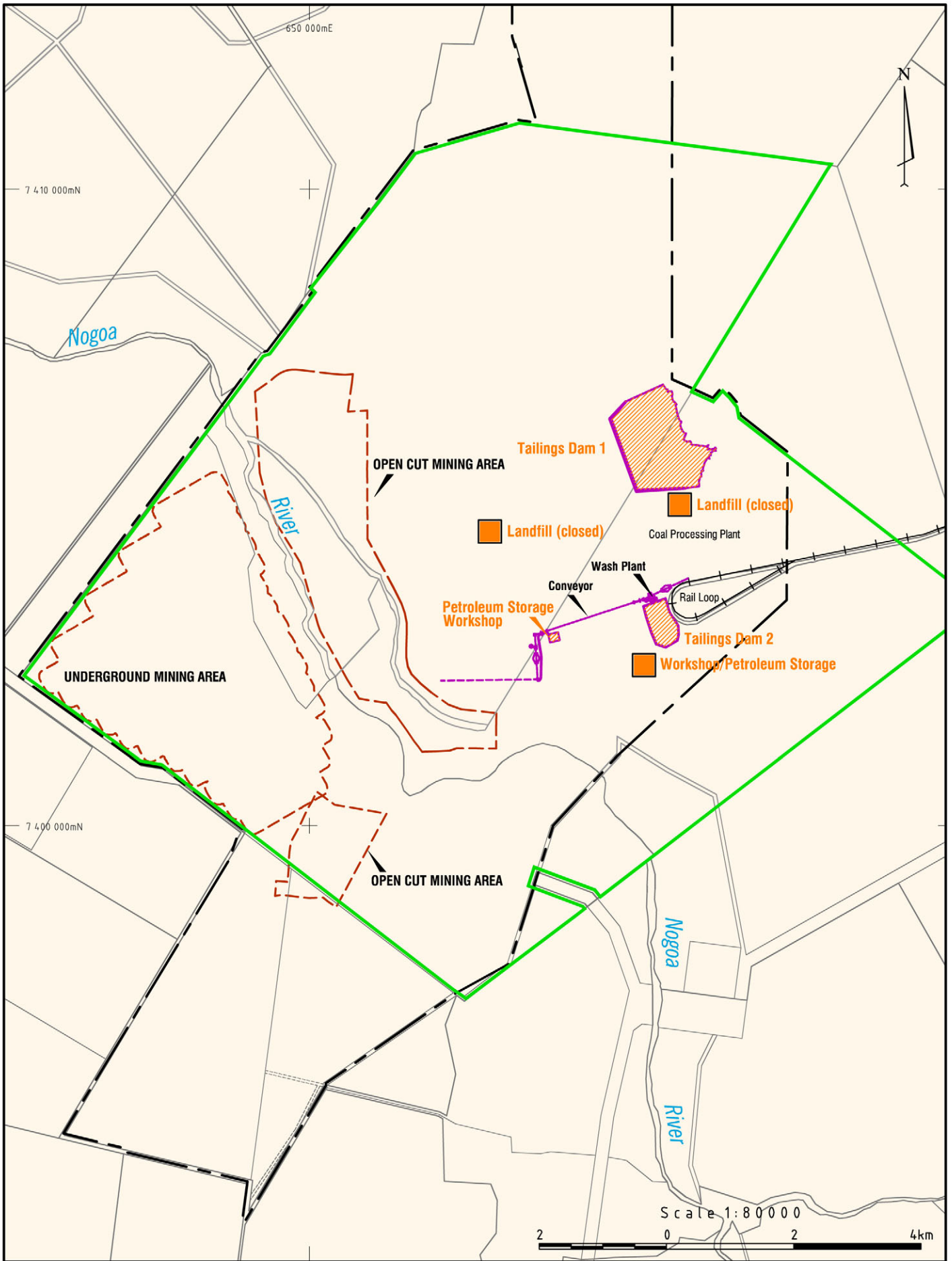
Decommissioning

- Removal of underground storage tanks.
- Capping of tailings dams post-use to isolate tailings (Section 3 – The Proposal and Section 7 - Rehabilitation).
- Post-mine rehabilitation and site remediation is described in more detail in Section 7 – Rehabilitation.

As required, details of new areas with notifiable activities will be provided to the EPA. These will include the tailings dams and petroleum storage associated with underground mining and the washplant.

Acid generation from overburden is extremely unlikely given the lack of oxidisable sulphur and the excess Acid Neutralising Capacity of these materials as described in the *Geochemical Characterisation of Overburden and Rejects Assessment (Appendix A)*. Design of overburden emplacement areas and the progressive remediation strategy are described in detail in Section 3 – The Proposal and Section 7 - Rehabilitation of this EIS.

FIGURES



ENSHAM CENTRAL PROJECT

-  Notifiable Activity Location
-  Areas of Potential Land Contamination
-  Boundary of Ensham Land on EPA Environment Management Register
-  Mining Lease and Mining Lease Application Area
-  Project Infrastructure

Notifiable Activities and Areas of Potential Land Contamination