WASTE MANAGEMENT PLAN VULCAN COMPLEX PROJECT Tenure number: ML700060

October 2021

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1 INTRODUCTION

The Vulcan Coal Mine (the VCM) is a small-scale coal mine operated by Vitrinite Pty Ltd (Vitrinite). The mine managers have a statutory obligation to manage waste risks on the mining lease. This Waste Management Plan has been developed to assist with managing these risks.

1.1 Context

The VCM operates on mining lease (ML) 700060 and under Environmental Authority (EA) number EA0002912. Queensland Coking Coal Pty Ltd and QLD Coal Aust No. 1 Pty Ltd are the joint holders of this EA, and both companies are owned by Vitrinite.

The site layout for VCM is shown on **Figure 1** below.

The Project is located in the Bowen Basin, Queensland. It lies adjacent to Saraji Road, 33 kilometres (km) southsoutheast of Moranbah and 34 km north-northwest of Dysart. It falls within the jurisdiction of the Isaac Regional Council. The Project is located immediately south and west of existing, large-scale coal operations including the Peak Downs and Saraji mines.

1.2 Purpose

This Waste Management Plan describes the objectives, management measures and monitoring program in place to manage non-mining waste on ML 700060 during the construction and operation of the Project.









2 Regulatory Environment

Statutory obligations pertaining to waste management are contained within the EA conditions, as well as within the *Waste Reduction and Recycling Act 2011*. These are summarised below.

2.1 EA Requirements

The EA contains a condition (C6) that requires the preparation of a Waste Management Plan and describes the information to be contained within this plan (**Table 1**). Vitrinite is bound by the *Environment Protection Act 1994* to adhere to all conditions of its EA.

Condition	Condition					
number						
C1	The environmental authority holder must plan and conduct activities on site to prevent any potential or actual release of a hazardous contaminant.					
C2	The environmental authority holder must not directly or indirectly release waste from the site to any watercourse, waterway, groundwater, wetland or lake.					
СЗ	Coal washing and disposal of coal reject materials from toll-washing must not occur on site.					
<i>C4</i>	Storage and Disposal of Tyres					
	Tyres must be stored and disposed of in accordance with the Operational policy – Disposal and storage of scrap tyres at mine sites ESR/2016/2380 Version 2.02, or the most recent revision available					
C5	Burning of waste					
	Unless otherwise permitted by the conditions of this environmental authority or with prior approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.					
<i>C6</i>	General Waste					
	A Waste Management Plan must be developed and implemented prior to the commencement of mining notified under condition A4.					
<i>C</i> 7	In accordance with condition C6, the Waste Management Plan must at a minimum include the following:					
	(a) a description of the activities that may generate waste;					
	(b) waste management control strategies, including:					
	(i) the types and amounts of wastes generated by the activities; (ii) segregation of the wastes:					
	(iii) storage of the wastes, transport of the wastes; and					
	(iv) monitoring and reporting matters concerning the wastes;					
	(c) how the waste will be dealt with in accordance with the waste management hierarchy (that is, avoid, reuse, recycling, energy recovery, disposal);					
	(d) the hazardous characteristics of the wastes generated including disposal procedures for hazardous wastes; and					
	(e) procedures for dealing with accidents, spills and other incidents; the indicators or other criteria on which the performance of the waste management program will be assessed; and staff training.					

Table 1 Conditions of the EA pertaining to waste management

2.2 Other Regulatory Requirements

The Waste Reduction and Recycling Act 2011 is the Queensland Government's principal instrument for governing the management of waste.

Other legislation that is relevant to the VCM includes:

- Environmental Protection (Regulated Waste) Amendment Regulation 2018;
- Environmental Protection (Waste ERA Framework) Amendment Regulation 2018;
- Waste Reduction & Recycling (Waste Levy) Amendment Act 2019;
- Waste Reduction & Recycling (Waste Levy) Amendment Regulation 2019;
- Queensland Waste Management and Resource Recovery Strategy 2019; and
- Waste Avoidance and Recovery Act 2001.



3 Waste Management Risk

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

3.1 Risks

Key activities that will generate or contribute to waste material throughout construction and operation of the VCM include:

- Construction waste;
- General solid waste generated by site staff, visitors, and other personnel;
- Workshop operation (waste oils, scrap metals, tyres; batteries); and
- Liquid waste from the treatment of sewage.

Details of the management of these risks are discussed in sections 5.5 and Error! Reference source not found..

Potential waste related impacts could include the following:

- Harm to flora, fauna, and the surrounding environment;
- Harm to human health;
- Dust resulting from the inappropriate storage, handing and disposal of wastes;
- Soil and water, including surface water and groundwater, contamination from inappropriate storage, spills, handling and disposal or solid and liquid waste and materials separated for recycling, reuse, or recovery; and
- Inefficient use of resources and inappropriate procurement of resources.

A waste stream assessment is provided in Appendix A of this Waste Management Plan.





4 Waste Management Objectives

The principal objective of this Waste Management Plan is to describe management measures and monitoring programs that fulfil the regulatory obligations of the VCM pertaining to waste, as summarised in the points below and described in **Section 2**;

- Ensure that the Project's impacts on waste management are minimised;
- Nominate the Project's monitoring and reporting requirements in relation to waste; and
- Monitor the effects of management and mitigation measures.

The project aims to follow the waste management hierarchy (Figure 2), which is a framework that guides the order of preference for managing waste. Waste should be avoided as a priority, after which options for reuse and recycling should be explored. The options of fuel production, energy production or disposal should be reserved for residual waste that is unsuitable for higher order options.



Figure 2 Waste Management Hierarchy (Waste Management and Resource Recovery Strategy [Qld])





5 Waste Management Measures

The following subsections describe the management measures to be implemented in order to manage VCM waste risks.

5.1 Principles of Waste Management

The *Queensland Waste Management and Resource Recovery Strategy* (Department of Environment and Science 2019) lists three strategic priories to support the transition to a zero-waste society:

- 1. Reducing the impact of waste on the environment and communities;
- 2. Transitioning towards a circular economy for waste; and
- 3. Building economic opportunity;

The waste management measures proposed by this Waste Management Plan incorporate each of these strategic priories, as discussed in the following sections.

5.2 Mitigation Measures

Management measures proposed to avoid and reduce, re-use and recycle material identified as part of this Waste Management Plan are detailed in the sections below.

5.2.1 Avoid and reduce

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

- Identify and implement measures for avoiding waste generation and, if avoidance is not reasonable or practicable, reducing on-site waste generation;
- Implementation of Project office sustainability measures through the selection of energy and resource efficient goods and equipment, where practicable (e.g. low wattage fluorescent lighting, inverter air conditioning, insulation panelling to reduce energy consumption, water efficient facilities and rainwater harvesting to reduce water consumption and wastage);
- Where reasonable and practicable, order goods in bulk to minimise packaging waste, and where practicable, return packaging materials to the supplier;
- Develop and implement arrangements with suppliers to return unused construction materials to the supplier; and
- Encourage Project workers to avoid or reduce waste through inductions and toolbox talks.

5.2.2 Reuse

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

- Train staff to identify opportunities for reuse, where practicable;
- Identify and implement strategies for the reuse of waste products generated;
- Where reasonable and practicable, chip and mulch vegetation cleared for the Project and re-use mulched material for stabilization and topsoil improvement.

5.2.3 Recycle

The following recycling strategies have been identified:

- Develop and implement Project specific recycling strategies;
- Consider using materials and products that have a recycled content wherever cost/performance competitive, and where environmentally preferable to the non-recycled alternative;
- Provide separate recycling bins, skips and storage areas for recyclable materials at around the project site;
- Investigate the availability and usability of treated wastewater, stormwater runoff or groundwater inflow for site activities, such as dust mitigation, wash-down uses or watering landscape works;
- Where reasonable and practicable, segregate metals for recycling;



- Collect empty oil and fuel drums and other containers for return to licensed recycling facilities. This is to be done by a licensed contractor; and
- Ensure that sufficient loading / unloading space at the project site to allow waste materials to be sorted for recycling and reuse.

5.2.4 Recover

The following waste streams have been identified for the recovery options:

- Recovery of waste oils;
- Scrap metals; and
- Tyres.

As per condition C4, tyres must be stored and disposed of in accordance with the Operational policy - Disposal and storage of scrap tyres at mine sites ESR/2016/2380 Version 2.02, or the most recent revision available.

5.2.5 Treatment

The following treatment strategies have been identified:

• Sewage wastes, both solid and liquid to be treated at a Wastewater Treatment Plant (WWTP)

5.2.6 Disposal

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

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

As per condition **C5**, unless otherwise permitted by the conditions of the environmental authority or with prior approval from the administering authority and in accordance with a relevant standard operating procedure, waste must not be burnt.

5.2.7 Hazardous materials or dangerous goods

This section identifies strategies for hazardous materials and dangerous goods:

- Undertake the storage and transport of any hazardous materials or dangerous goods (including fuel and hazardous waste) in accordance with relevant Australian Standards, legislative requirements and guidelines;
- Hazardous materials and potential sources of hazardous wastes must be documented, and a register of hazardous and regulated waste updated and maintained as required. The register is required to be updated for each new hazardous material introduced on site;
- Safety Data Sheets (SDS) must be kept at the storage location of all hazardous materials and dangerous goods;
- Undertake refuelling and maintenance activities within designated bunded areas to minimise the potential for soil and water contamination from these activities; and
- Prepare and implement, if required, spill response measures in relation to hazardous materials and dangerous goods.

5.2.8 On-site waste storage

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

- Maintain accessible and stable areas at construction worksites for the storage of waste materials;
- Ensure provision of bins at worksite common areas, fitted with lids and serviced to avoid overflowing and spills;
- Liquid wastes are to be stored in appropriate containers in bunded areas until transported off-site; and
- Hazardous wastes will be managed by appropriately qualified and licensed contractors, in accordance with relevant Australia Standards, legislative requirements and guidelines.



5.2.9 Waste transport

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

- Ensure the movement of hazardous materials and regulated wastes occur at non-peak times to minimise the possibility of traffic conflicts and associated risks;
- Transportation of hazardous wastes, regulated wastes and contaminated soils must be undertaken by a suitably licensed waste contractor;
- Ensure that waste transport contractors have the necessary qualifications and permits prior to undertaking waste transportation activities for the Project; and
- Conduct waste tracking in accordance with legislative requirements, including identifying any exemptions from waste tracking.





5.3 Education

Effective management of waste relies on broad stakeholder knowledge of the potential risks and the control requirements.

All personnel will be trained in waste management through education programs such as toolbox talks, posters and work area inspection reports. Where waste management is a critical component of an employee or contractor's role, further training will be implemented to address specific role requirements to ensure compliance with this Waste Management Plan and the conditions of the Environmental Authority.

5.4 Monitoring

Monitoring will be undertaken at various sensitive receptors to validate the impacts predicted for the Project and to measure the effectiveness of environmental controls and implementation of this Waste Management Plan. The monitoring requirements specific to waste are outlined below:

- Records of the following waste management information, as a minimum, must be kept:
 - o resource use and waste generated from construction works;
 - waste recovered and re-used;
 - waste disposed of to landfill; and
 - waste transporter or contractor details (including company name, licensed operator name and license number).

5.5 Management Systems & Strategic Responses

The environmental authority holder must, prior to the commencement of activities, develop and implement a risk management system for activities which mirrors the content requirements of the Standard for Risk Management (ISO31000:2018), or the latest edition of an Australian Standard for risk management, to the extent relevant to environmental management. The table in Appendix A details the risks and control measures used to minimise the risk levels for the management of waste at the Project site.

5.6 Roles & Responsibilities

The roles and responsibilities of personnel are listed in Table 2.

Table 2Roles and responsibilities

Responsible person	Management Measure	Timing
Health, Safety, Environment and	Oversee implementation of the Waste Management Plan	Throughout the construction, operational and rehabilitation phases
(HSEC) Superintendent	Prepare and give inductions to new staff and contractors	Throughout the construction, operational and rehabilitation phases
	Providing technical support to all departments and personnel on issues related to waste management	Throughout the construction, operational and rehabilitation phases
	Production and installation of waste posters in the tool box room	Prior to the start of the construction phase
	Oversee the revision of the Waste Management Plan	Throughout the construction, operational and rehabilitation phases
	Complete a Waste Stream Assessment (Appendix A)	Prior to Construction, then as part of the revision of the Waste Management Plan
Environmental Officer	Undertake regular inspections of waste segregation	As part of routine site environmental inspections
	Providing appropriate waste bins to adequately segregate waste and limit cross-contamination of waste streams	Prior to Construction
	Ensure waste records and tracking certificates are completed and kept on file	Weekly
All staff and	The collection and disposal of the waste that is generated	Throughout the construction, operational and



Responsible person	Management Measure	Timing
contractors	through its activities, including planned and un-planned shutdown operations	rehabilitation phases
	Understand their waste management responsibilities	Throughout the construction, operational and rehabilitation phases
	Ensure waste is placed in correct waste bin	Throughout the construction, operational and rehabilitation phases
	Assist in the disposal & recycling of regulated and non- regulated wastes to offsite locations.	Throughout the construction, operational and rehabilitation phases





6 Reporting

The following are the reporting requirements of this Waste Management Plan:

- Incidents relating to waste;
- A report in relation to waste management may also be prepared as and when required; and
- Third Party Reporting requirements as per condition A19 of the EA0002912.





7 Management Plan Revision

The following circumstances will trigger a revision of this Waste Management Plan:

- Revisions to the EA0002912 that change waste related conditions in Schedule C: Waste;
- Revisions to the *Waste Reduction and Recycling Act 2011*;
- Revisions to the Queensland Waste Management and Resource Recovery Strategy and/or
- Changes to waste management methodologies.

The HSEC Superintendent will be responsible for instigating and managing the revision.





8 References

Department of Environment and Science (2019) *Queensland Waste Management and Resource Recovery Strategy*. Department of Environment and Science, Queensland Government, Brisbane.





Appendix A

Waste Stream Assessment



Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Er
Non- Regulated Waste	Organic products	Green waste	Vegetation removal/land clearing for infrastructure and access, landscape maintenance	Temporarily stockpiled on or off site prior to mulching/reuse	Mulched and reused in landscaping or as soil treatment measures	None required - reuse onsite as mulch and for rehabilitation works.	If we co
		Cardboard/paper	Construction work sites (office, kitchen, stores)	Colour coded recycling bins provided	Separation by individual disposers	Removal by waste contractor for recycling	W me
		Food scraps/ kitchen waste	Construction work sites (kitchen) Construction	Colour coded food scrap bins, or composing bin	Separation by individual disposers	Removal by waste contractor for composting or onsite composting	Po ha gr
	Construction Waste	Timber from packaging material (pallets, crates)	Material delivery	Segregated into skips specific to timber off cuts	Reduce the amount of packaging sent to the site in consultation with the suppliers	Return to supplier or recycle with other timber products	Ui lai tir pro su ap
		Glass - window glass, sheet glass	Construction activities	Segregated in skips specific to glass	Segregation	Removed by waste contractor for reuse/recycle	Uı
		Glass beverage containers (recyclable)	Construction work sites	Coloured coded glass recycling bins to be provided	Separation by individual disposers	Removal by waste contractor for recycling	Uı
		Lighting: Fluorescent light tubes, high intensity discharge lamps, compact fluorescent lamps, other mercury containing lamps	Construction activities	Segregated and stored for collection	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Removal by a licenced waste contractor for resource recovery/recycling	M ne ac
	Metal	Pipe and conduit offcuts, plastic piping, flooring vinyl	Construction activities	Segregated into plastic waste stream	Segregation into skips specific to material	Removal by waste contractor for recycling	Us in ma be
		Steel off cuts, structural steel (including tracks), pipe work, operational equipment, building sheeting	Construction activities	Skips specific to waste steel to be provided during construction	Segregation by workers and storage in designated location	Removal by waste contractor for recycling. Monetary incentives can be obtained for recycling of waste steel.	Re ma co wi
		Copper pipes and copper electrical cables, aluminium, corrugated roofing iron	Overhead wire installation, underground services installation, construction office fit outs	Skips specific to waste metal to be provided during construction	Segregation by workers and storage in designated location	Reuse/sell to scrap metal dealers	Re ma co wi
		Aluminium beverage cans	Construction work site (workers)	Coloured coded aluminium recycling bins to be provided	Separation by individual disposers	Removal by waste contractor for recycling	Us co
	Miscellaneous	Material/equipment packaging (shrink wrap/pallet wrap/bubble	Materials delivery	Segregated into plastic waste stream	Avoid delivery to site, then segregation	Avoid where possible then reuse/recycle	Us in ma



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not handled or stored properly, potential to spread eed, potential fire hazard. If disposed to landfill potributes to methane generation

ithin landfills decomposing paper products generate ethane which is a greenhouse gas

otential odour production and vermin attraction if not andled appropriately. If landfilled contributes to evenhouse gas emissions from landfills

nnecessary use of landfill capacity if disposed to ndfill. Reuse aids in reduction of need for more mber products. Plywood and Particleboard are timber oducts bonded with adhesives (resins) generally not itable for composting. Possible refuse derived fuel at propriately licensed facilities

nnecessary use of landfill

nnecessary use of landfill

fercury containing items. Mercury is a potent eurotoxin in humans and a toxic heavy metal when ecumulated in the environment

sing recycled materials reduces energy consumption comparison with creating a product with raw aterials. Material unable to be recycled or reused will disposed to landfill

ecycling of steel aids in the reduction of mining raw aterials. Using recycled metal reduces energy onsumption in comparison with creating a product ith raw materials

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Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	Er
Status		wrap, Poly-Styrene)					be
		Food/beverage containers/wrappers (recyclable)	Construction work sites	Coloured coded recycling bins to be provided	Separation by individual disposers	Recycle	Us in ma be
	Plastics	Food/beverage containers/wrappers (non-recyclable)	Construction work sites	general waste bins	None	Landfill	Us in ma be
		mixed waste, unsegregated, unsorted waste (not regulated waste)	Construction work sites	general waste bins and skips	None	Landfill	
	Liquid wastes	Oil spill clean-up kit materials, cleaning/ maintenance rags	Construction work sites, plant and machinery workshops	Segregated in bins/skips specific for oily rags/materials, etc. in accordance with AS 1940	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Removed by a licensed specialist hazardous waste contractor for offsite treatment/disposal	La an ap
		Pavement/surface water /stormwater runoff from construction sites	Construction activities	Stormwater retention/detention ponds/sediment pond	Sediment/silty water pond or onsite WWTP	If suitable onsite effluent irrigation/offsite discharge to waterway otherwise connection with municipal sewage/septic tanks/discharged into waterway	Po wa wa
		Empty plastic or metal drums/containers (recyclable)	Supply of chemicals, paint, oil, cleaning fluids, etc.	Store on bunded pallets in accordance with AS1940	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Return to supplier for reuse or licensed specialist hazardous waste contractor for offsite treatment / disposal	La an ap
	Contaminated Soil	Oils, lubricants, grease, hydrocarbons, diesel, petrol	Machinery / vehicle / rolling stock / track repair machines oil changes and lubrication during construction and operation	In accordance with AS 1940	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Removed by a licensed specialist hazardous waste contractor for offsite treatment/disposal	La an ap
Regulated Waste	Hazardous waste	Paints and solvents	Painting stations/noise barriers/ infrastructure, cleaning	Bunded compound or self bunded pallets	Treated as a potential hazardous waste, handled and stored so that contamination does not occur	Removed by a licensed specialist hazardous waste contractor for reuse/offsite treatment/disposal	If co
		Wash-down water	Wash-down of transport vehicles, construction site wheel wash	Dedicated wash-down bay for vehicles holding tank may be required	If unsuitable for offsite discharge to waterway then treated at on-site or offsite WWTP	Connection with municipal sewage or discharged to council stormwater	Po on us di
	Liquid wastes	Oils, lubricants, grease, hydrocarbons, diesel, petrol	Wash down of transport vehicles, tunnel wash down water potential mixed with groundwater inflow	Tunnel drainage system, holding tank may be required	If unsuitable for offsite discharge to waterway then treated at on-site or offsite WWTP	Connection with municipal sewage or discharged to council stormwater	Tr
		Sewage	Construction work sites during construction	Holding tanks and pumping stations	Pumped to truck, transported and treated at WWTP	Connection with municipal sewage or septic tanks	He se



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disposed to landfill

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and and water contamination including both surface and groundwater if not handled and stored popropriately. Also a potential fire hazard.

otential land and water contamination, siltation of aterways and creeks. Monitor downstream surface ater offsite disposal points.

and and water contamination including both surface and groundwater if not handled and stored popopriately. Also a potential fire hazard.

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not handled appropriately, potential land and water ontamination

otential land and water contamination. Water meter n wash-down water supply system - monitor water sage and subsequent wash-down water treatment and sposal

reated tunnel wash-down water may be suitable for use onsite to reduce potable water usage

ealth impacts and surface water contamination if wage not managed appropriately. Water meter on otable water supply - monitoring water usage

Waste Management Plan – Vulcan Complex Project

Waste Regulatory Status	Waste Category	Waste Stream Description	Waste Sources (Activity and/or location)	Storage Method	On Site Treatment (if any)	Disposal Method	En
		Lead-acid; lithium hydride; Ni-Cd	Spent batteries from vehicles, construction machinery, portable equipment	Bunded compound	Segregation	Removed by a licensed contractor to a battery recycling facility or waste disposal facility licensed to receive regulated wastes	Co Le en qu reo
	Tyres	End of life tyres (Shredded/bald tyres)	Workshop	Segregated into stockpiles for removal off site	Segregation	Tyres must be stored and disposed of in accordance with the Operational policy - Disposal and storage of scrap tyres at mine sites ESR/2016/2380 Version 2.02, or the most recent revision available.	Ina en toz bre
	Batteries	Lead-acid; lithium hydride; Ni-Cd	Workshop	Bunded compound	Segregation	Removed by a licensed specialist waste contractor in accordance with site management plan for offsite treatment or disposal to landfill	Co Le en
	Chemical	Empty drums/containers (non-recyclable)	Supply of chemicals, paint, oil, cleaning fluids, etc.	Storage In accordance with AS 1940 (bunded area)	Rinse in designated area on site (if appropriate), crush and puncture prior to dispatch to recycler or disposal	Removed by a licensed specialist hazardous waste contractor for offsite reuse / treatment / disposal	La an ap de

Note: Waste Rock management is addressed in the Waste Rock Disposal Plan





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ontain lead, lead compounds and/or sulphuric acid. ead compounds are toxic humans and the avironment. Acid is corrosive. Audit handling and nantity of batteries used for project and confirm covery, reuse, recycling, disposal

appropriate handling and storage potential health and nvironmental concerns; fires in stockpiles can release exic gases, pollute waterways, tyre stockpiles provide reeding habitats for mosquitoes.

ontain lead, lead compounds and/or sulphuric acid. ead compounds are toxic humans and the avironment. Acid is corrosive.

and and water contamination including both surface ad groundwater. Also a potential fire hazard. Audit ppropriate onsite handling procedures, haulage and estination