



**EMERGENCY PREPAREDNESS AND RESPONSE PLAN FOR  
ESKOM WASTE DISPOSAL SITE AND TEMPORARY  
HAZARDOUS WASTE HANDLING FACILITY AT MATIMBA  
POWER STATION**

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## GLOSSARY

<b>Acute Ecotoxicity</b>	See LC <sub>50</sub>
<b>Acute Mammalian Toxicity</b>	See LD <sub>50</sub>
<b>Beneficial uses</b>	Use of sludge with a defined benefit, such as a soil amendment, manufacture of ceramics, pellets etc.
<b>Bioavailability</b>	Availability of a substance for uptake by a biological system
<b>Biosolids</b>	Stabilized Sludge. Organic solids derived from biological wastewater treatment processes that are in a state that they can be managed to sustainably utilize the nutrient, soil conditioning, energy, or other value
<b>BPEO</b>	Best Practicable Environmental Option. BPEO is the outcome of a systematic consultative and decision-making procedure that emphasizes the protection of the environment across land, air and water. It establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole at acceptable cost in the long term as well as the short term.
<b>Co-disposal (liquid with dry Waste)</b>	The mixing of high moisture content or liquid waste with dry waste. This affects the water balance and is an acceptable practice on a site equipped with leachate management measures
<b>Co-disposal (dewatered sludge with dry waste):</b>	The mixing of dewatered sludge with dry waste in a general landfill site or hazardous landfill site without affecting the water balance of the site
<b>Contaminate</b>	The addition of foreign matter to a natural system. This does not necessarily result in pollution, unless the attenuation capacity of the natural system is exceeded
<b>Faecal coliform</b>	Faecal coliforms are the most commonly used bacterial indicator of faecal pollution. Faecal coliforms are bacteria that inhabit the digestive system of all warm-blooded animals, including humans
<b>H</b>	Hazardous Waste or Landfill for Hazardous Waste
<b>H:h</b>	Hazardous Waste Landfill that can receive wastes with a hazard rating of 3 and 4
<b>H:H</b>	Hazardous Waste Landfill that can receive wastes with a hazard rating of 1 and 2
<b>Immobilisation</b>	Immobilization (or chemical stabilization) is a process in which the material is converted to a more chemically stable or more insoluble or more immobile form
<b>Incineration</b>	Incineration is both a form of treatment and a form of disposal. It is simply the controlled combustion of waste materials to a non-combustible residue or ash and exhaust gases, such as carbon dioxide and water

<b>Industrial wastewater</b>	Wastewater generated in a commercial, industrial, or manufacturing process
<b>Land disposal</b>	Application of sludge where beneficial use is not an objective. Disposal will normally result in application rates that exceed agronomic nutrient requirements or cause significant contaminant accumulation in the soil
<b>Landfill</b>	To dispose of waste on land, whether by use of waste to fill in excavation or by creation of a landform above grade, where the term "fill" is used in the engineering sense.
<b>LC<sub>50</sub></b>	The median lethal dose is a statistical estimate of the amount of chemical which will kill 50% of a given population of aquatic organisms under standard control conditions.
<b>LD<sub>50</sub></b>	The median lethal dose is a statistical estimate of the amount of chemical which will kill 50% of a given population of animals (e.g., rats) under standard control conditions.
<b>pH</b>	The logarithm of the reciprocal of the hydrogen ion concentration. The pH measures acidity/alkalinity and ranges from 0 to 14. A pH of 7 indicates the material is neutral. Moving a pH of 7 to 0, the pH indicates progressively more acid conditions. Moving from a pH of 7 to 14, the pH indicates progressively more alkaline conditions.
<b>Precautionary principle</b>	Where a risk is unknown; the assumption of the worst-case situation and the making of provision for such a situation.
<b>Receptor</b>	Sensitive component of the ecosystem that reacts to or is influenced by environmental stressors.
<b>Recycle</b>	The use, re-use, or reclamation of a material so that it re-enters the industrial process rather than becoming a waste.
<b>Sludge</b>	Solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Wastewater sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and material derived from wastewater sludge in a wastewater sludge incinerator. It does not include the grit and screenings generated during preliminary treatment of domestic wastewater in a treatment works
<b>Toxicity Characteristic Leaching Procedure (TCLP):</b>	A test developed by the USA Environmental Protection Agency to measure the ability of a substance to leach from the waste into the environment. It thus measures the risk posed by a substance to groundwater.

# 1 INTRODUCTION

## 1.1 Project Background

Envirolution Consulting (Pty) Ltd has been appointed by Eskom Holdings (Pty) Ltd (hereafter Eskom) to undertake the Environmental Impact Assessment (EIA) process for the proposed construction of a general landfill site, a temporary hazardous waste storage facility and a low hazardous waste cell (hereafter, The Project). The Project aims at accommodating the waste that is generated from the construction of the Medupi and Matimba Power Stations and the proposed coal 3 and 4 power stations in the Waterberg area.

The disposal, treatment and storage of waste on the land is governed by the National Environmental Management Waste Act of 2008 and therefore requires appropriate licensing from the responsible authority. The responsible authority for the issuing of licensing is the Department of Environmental Affairs: Pollution and Waste Management Directorate (DEA: Pollution and Waste). A series of documentation (i.e. Environmental Impact Report, Environmental Management Plan, the relevant specialist studies, closure and end use plan) including an emergency preparedness and response plan (EP & RP) are required to support the license application.

This document is an EP & RP and provides a summary of the most significant Environmental, Health and Safety issues associated with management of a waste disposal site and further provide the necessary information on how Eskom should respond in an event of emergencies that may emanate during the operation of the waste disposal site. The document further provides background information on Waste streams classification based on the DWAF Minimum Requirements for handling, classification and disposal of hazardous waste. Recommendations for the management of Environmental, Health and Safety impacts common to construction phase are not included and these are covered in the overall Environmental Management Plan for the Power Station, the draft EMP (**Appendix E** of the EIR) and the Operation plan (**Appendix E1** of the EIR) which is currently awaiting approval from DEA.

This document has been developed with due reference to the following documents:

- Department of Water Affairs and Forestry, Republic of South Africa, Bredenhann L, Fourie H.O. (Dr). (1998) **Waste Management Series, Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste**, Second Edition.
- Department of Water Affairs and Forestry, Republic of South Africa, Bredenhann L., Ball J.M. (1998). **Waste Management Series, Minimum Requirements for Waste Disposal by Landfill**, Second Edition.
- Envirolution Consulting (Pty) Ltd. (March 2009). **Environmental Impact Report for the Proposed Construction of an Eskom General Landfill and Hazardous Waste Storage Facility**, DEAT Reference No: 12/12/20/1399. *See all specialist reports and the draft EMP and the operational plan for the waste disposal site.*

It is therefore of utmost importance that this document be read in conjunction to the documents listed above.

## 1.2 Environmental and Legal Requirements

The management of the general and hazardous waste disposal site require an understanding of the legal requirement governing the handling and disposal of hazardous waste in South Africa and their implications thereof. The facility owner, operator, and collection and transportation contractor must also understand the regulatory requirements and implications thereof. A summary of the applicable legislation is as follows:

- **The Constitution of South Africa of 1996, (Act 108 of 1996)** (Government of South Africa, 1996) Section 24 of the constitution guarantees all South Africans the right to an environment that is not harmful to their health or wellbeing.
- **National Environmental Management Act 1998, (Act 107 of 1998)** (NEMA) regulates environmental management and this includes waste management but in much broader principles. The National Environmental Waste Management Act 59 of 2008 requires the implementation of governing principles such as duty of care, and the precautionary principle. Waste management must therefore comply to these governing principles, which are also set out in the Minimum Requirements (DWAF, 1998), before any disposal options can be considered.

The following key principles are fostered by NEMA and must therefore be considered:

- **Duty of care**  
The individual or organization that generates wastes incurs a duty of care that is owed to society. In this case it means that Eskom is responsible for the fate of the waste at all times and in all circumstances. Eskom is therefore responsible for disposal of their waste in a responsible manner, which includes the disposal at an appropriately permitted waste site depending on the classification of the waste. The waste contractor removing and disposing the waste must therefore provide the company with a safe disposal certificate, proving that waste has been handled, stored, transported and disposed of the waste according to approved permits/licences and legislation and in an environmentally sound and responsible manner.
- **Precautionary principle**  
The precautionary principle assumes that a waste or an identified contaminant of a waste is both highly hazardous and toxic until proven otherwise.
- **National Waste Management Bill (2007)** The National Environmental Management: Waste Management Bill, gazetted in January 2008, will entrench best practices in waste management into law, replacing the outdated and unsustainable 'end of pipe' approach with a new, more environmentally responsible and sustainable approach.
- **Waste Management Series - Minimum Requirements** The Waste Management Series produced by the Department of Water Affairs and Forestry in 1998 are currently used to provide guidance on the classification and disposal of general and hazardous waste. These requirements represent the lowest acceptable standards and are therefore termed **Minimum Requirements** (DWAF, 1998).

The series comprises three documents namely:

- Document 1: *Minimum requirements for the handling, classification and disposal of hazardous waste sets out the classification system.*
- Document 2: *Minimum requirement for waste disposal by landfill, addresses landfill classification and the siting, investigation, design, operation and monitoring of landfill sites* (DWAF, 1998).
- Document 3: *Minimum requirements for the monitoring of water quality at waste management facilities: addresses the monitoring of water quality at and around waste disposal facilities* (DWAF, 1998).

The Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste sets out a systematic framework for identifying and classifying the hazardous waste in accordance with the degree of risk that it poses. This document addresses important aspects of the hazardous waste disposal process so that the cradle to grave principle is implemented. The documents are intended to improve waste management in South Africa and to facilitate conformance with the international standards required by future trading partners and the Basel Convention. In terms of the Minimum Requirements (DWAF, 1998) all industrial waste is classified as possibly or potentially hazardous.

On a policy level and first principles level, waste management in general has been influenced by among others the National Waste Management Strategy and the Polokwane Declaration.

- The National Waste Management Strategy 1999 sets out goals and objectives and creates a framework for overall integrated waste management in South Africa.
- The Polokwane Declaration signed in September 2001 committed South Africa to achieving 50% reduction in the volume of waste generated and 25% reduction in volumes of land-filled waste by 2012 and a zero waste plan by 2022.

The list below summarizes the Acts which Eskom will have to comply with in the operation of the landfill:

- NEMA 107 of 1998
- NEMA Waste Act 59 of 2008
- Environment Conservation Act 73 of 1989
- Hazardous Substances Act 15 of 1973
- Occupational Health & Safety Act of 1993
- National Water Act 36 of 1998
- Atmospheric Pollution Prevention Act
- National Road Traffic Act 93 of 1996: Chapter VIII
- SABS Codes of Practice 0228 & 0229
- Asbestos Regulations 2001
- DWAF, 2nd Ed.1998. Waste Management Series. Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste
- DWAF, 2nd Ed.1998. Waste Management Series. Minimum Requirements for Waste Disposal by Landfill
- DWAF, 2nd Ed.1998. Waste Management Series. Minimum Requirements for Water Monitoring at Waste Management Facilities.

### 1.2.1 Glossary of Applicable Legislation

Act/Reg/Ord Name	Act/Reg/Ord No & Date	Notes/Remarks
NEMA Waste Act	59 of 2008	Control of storage, transfer, treatment and disposal of waste on land
National Environmental Management Act	107 of 1998	Environment Policy
National Water Act	36 of 1998	Control and management of surface and ground water pollution resulting from waste
Health Act.	63 of 1977	Control of health aspects of waste disposal and waste water treatment
Occupational Health & Safety Act.	85 of 1993	Exposure of workers to waste products.
National Road Traffic Act.	93 of 1996	Transportation of dangerous goods
Advertising on Roads and Ribbon Development Act.	21 of 1940	Disposal of wastes near proclaimed roads
Hazardous Substances Act.	15 of 1973	Control of disposal of substances causing injury, ill-health or death to humans
International Health Regulations Act.	28 of 1974	Control of systems to ensure the effective removal and safe disposal of excrement, refuse, waste water and other substances dangerous to health to all ports and airports.
Regional Service Control Act.	109 of 1985	Enabling RSC's to, inter alia, control disposal of waste.
Legal Succession to South African Transport Services Act	9 of 1989	Prohibition on dumping of waste within the areas of Transnet jurisdiction (See S.60).
Financial Relations Act.	65 of 1976	Delegation of powers from central to provincial government, including handling of wastes (See S.11 & Schedule 2).
Natal Ordinance.	21 of 1981	Prevention of Environmental Pollution.
Regs ito S.21(1) of the Water Act.	GN. No 991 18/05/1984	Water quality standards for water from waste disposal areas.
Regs ito S.26 of the Water Act	GNR. 283427/12/1985	Treatment of wastes from water care works (e.g. sewerage schemes).
Regs ito S.29 of the Cons. Of Agricultural Resources Act.	GNR 104825/05/1984	Protection of wetlands against pollution from wastes.
Regs ito S.2(a) of the Nuclear Energy Act.	GNR. 74016/04/1994	Declaration of certain substances, materials, and equipment as restricted material (Schedule 1), source material (Schedule 2), special nuclear material (Schedule 3) and nuclear related equipment (Schedule 4).
Regs ito S.2(1) of the Hazardous Substance Act.	R. 1381112/08/91	Amendment of Group 1 declaration.
Regs ito S2(1) of the Hazardous Substance Act.	R.138212/08/94	Declaration of Group 11.
Regs ito S.3A of the Hazardous	R.24626/01/93	Group IV exclusions and exemptions.

Substant Act.		
Regs ito S.29 of the Hazardous Substant Act.	R.24726/01/93	Regulations regarding Group IV substances
S.A. Constitution		
Asbestos Regulations	G No 7 2001	Regulates removal and disposal of Asbestos
SANS 10228		Identification & classification of dangerous goods for transport
SANS 10304:1		Classification of pesticides & stock remedies for sale & handling in SA

### 1.2.2 NEMA Waste Act 59 of 2008 (Section 20 Permit Requirements repealed)

Section 20 of the Environment Conservation Act (Act 73 of 1989) requires that all sites that are used for the storage, handling and disposal of waste require a permit prior to their operation. The waste related section of the Environment Conservation Act 73 of 1989 has been repealed by the National Environmental Management Waste Act 59 of 2008 as from the 1st of July 2009. The consequence is that all waste disposal site licensing from that date onwards will be done based on the provisions contained in chapter 5 of the NEM: Waste Act. The type of activities that require a waste license is provided in category A and B of the act.

### 1.2.3 Duty of Care Principles and Requirements for Transportation

Under the principle of Duty of Care, waste generators are legally required to provide adequate information on the nature of their waste to transporters and disposers of hazardous waste. Proper disclosure ensures vehicles are properly signed; carry the correct Transport Emergency procedures (TREM Card) in the event of an accident or spillage, and that the waste is disposed of in a proper and safe manner.

Incomplete or imperfect disclosure puts the public at risk should the transporter be involved in an accident, or may result in the waste being incorrectly treated and disposed.

The following information is therefore needed?:

- Key constituents of the waste, ideally an MSDS (Material Safety Data Sheet).
- Degree to which the constituents or concentrations may change
- Volumes to be transported
- Frequencies, if the service will be ongoing
- Basic description of the process that generated the waste

To determine the correct treatment/disposal method a representative sample of the waste must be submitted to an accredited laboratory for analysis. This analysis allows the disposal site operators to determine what treatment / disposal method needs to be employed. The method applied is derived from the DWAF (Department of Water and Forestry Affairs) requirements for waste classification and disposal.

From the sample and/or associated MSDS, the following information requirements are derived before the work order may be carried out:

- UN Number as per SANS 10228

- Shipping name as per SANS 10228
- Packing group as per SANS 10228
- Hazard class code and applicable class label as per SANS 10228 and 10229
- Subsidiary class code and applicable class label, if there is a subsidiary risk as per SANS 10228 and 10229
- CEFIC TREM card details
- PPE (personal protective equipment) requirements
- Any other special instructions

The choice of Landfill site used is determined by the Landfill site's permit. Thus waste cannot always be disposed of at the closest landfill, but based on its classification, the closest landfill that is permitted to properly dispose of that waste. A GMB+ classification has been considered for this waste disposal site.

### **Transportation To and from Site**

To ensure a peace of mind that my choice of Transporter (*referred to in the act as the Operator*) meets the requirements of the NTRA (National Transport and Roads Act), the key questions are:

- Is the Operator registered with the Department of Transport (DOT) as a dangerous goods operator?
- Is the vehicle to be used licensed to convey dangerous goods?
- Is the driver in possession of a valid PrDP-DG, (Professional drivers permit for Dangerous Goods) that the driver must have in his possession?
- What training is provided to the driver to ensure that:
  1. He can effectively drive and manage the type of vehicle he is going to use
  2. He is knowledgeable of the particular hazards and requirements of the intended load
  3. He can operate any special equipment provided on the vehicle, including the fire extinguishers
  4. He is trained in the use of protective clothing (PPE) if it is required.
- What emergency response procedures does the Operator have in place to ensure that in the event of an accident appropriate procedures are followed?

NTRA (National Transport and Roads Act) requires that there is an agreement between all relevant parties covering the loading, transportation and unloading of the dangerous goods to be transported. This agreement shall include at least the following:

1. the nature and quantity of the dangerous goods to be conveyed
2. the type and location of facilities at both the loading and unloading points
3. the timing schedule of the operation
4. Any special permits for the handling, transportation and storage of the dangerous goods.

To facilitate compliance an Operator Agreements, must be prepared and completed before dispatching a vehicle.

ESKOM must ensure, in accordance with the National Road Traffic Act, that:

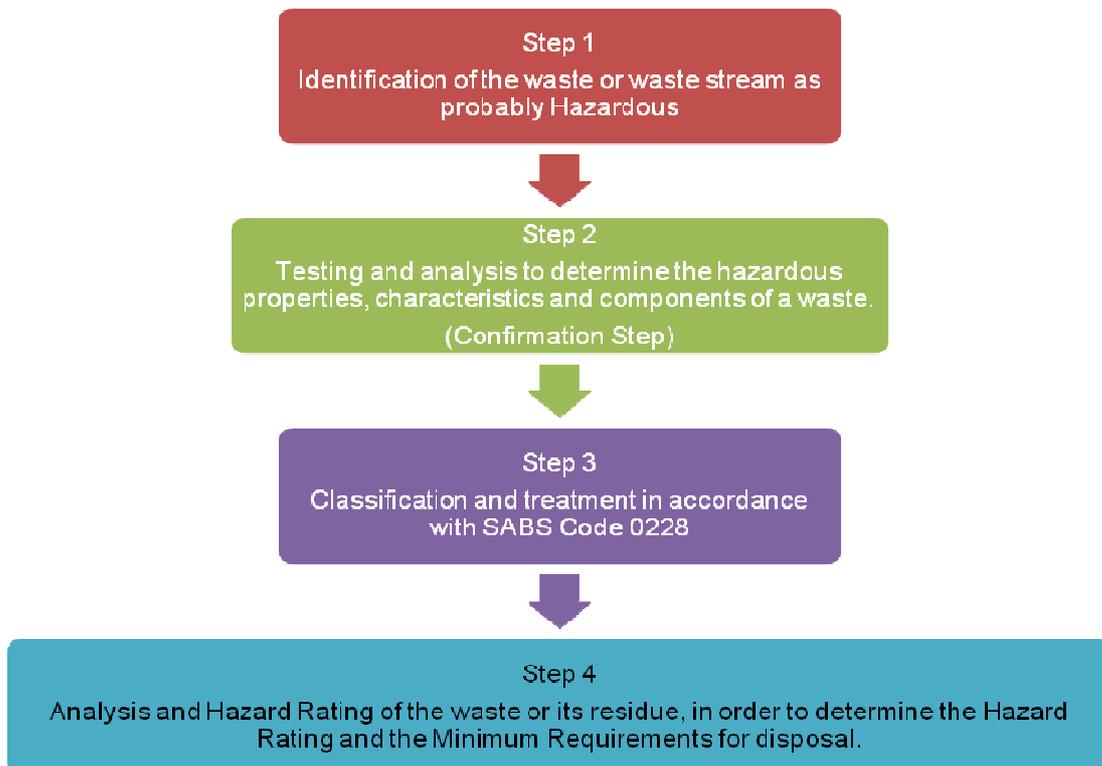
Emergency response plan  
 Eskom Landfill  
 November 2009  
 Enviroolution Consulting

1. the vehicle is carrying a dangerous goods operator card
2. and, if required under the Act, is registered as a dangerous goods vehicle
3. the vehicle is roadworthy
4. The vehicle has been prepared for the journey in accordance with a suitable standard schedule laid down by him.

### 1.3 Identification and classification of hazardous waste

This section provides a brief overview of the South African system for identification and classification of hazardous waste. ESKOM shall ensure that they familiarise themselves with this system and classification process as it will be critical to operations of the waste disposal site and has implications on the final disposal or treatment of the waste.

The system outlined in this document is in line with the *Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste* as published by the Department of Water Affairs and Forestry (DWAF) in 1998. In terms of the above guidelines, the classification and hazard rating of a hazardous substance follows the following four major steps: Philosophy



**Figure 1: Step for Classification of Hazardous Waste**

#### **Step 1**

There are a number of ways to identify a waste stream as probably hazardous including but not limited to the following:

- The Minimum Requirements (DWAF, 1998) provide a preliminary list of industries and processes which are likely to generate hazardous waste.
- Reviewing of Material Safety Data Sheets of substances used in processes from which the waste stream is generated.
- Technical knowledge of processes involved etc.

## Step 2

In terms of Minimum Requirements certain test should be done to determine the hazardous properties of a waste substance. Such test may include but not limited to the following:

- Explosiveness
- Flammability
- Corrosiveness
- Reactivity
- radio-activity and Toxicity.

## Step 3

Step 3 involves the classification and treatment in accordance of the SABS Code 0228: “*The identification and classification of dangerous goods and substances*” is a system which is used to classify hazardous substances for transport purposes (SABS, 2000). In this Code hazardous substances are given an identification number and divided into nine classes as described in **Table 1** below. The waste must, therefore, be tested against these classes to determine into which class it can be divided, and to determine the minimum requirements that must be met when the waste is disposed of (DWAF 1998).

**Table 1 SABS 0228/ SANS 10228 Classification of Dangerous goods and Substances (SABS, 2000)**

Class	Sub Class	Sub Class Description
1: EXPLOSIVES	1.1	MASS EXPLOSION HAZARD
	1.2	PROJECTION HAZARD , NOT MASS EXPLOSION HAZARD
	1.3	FIRE HAZARD AND MINOR BLAST AND / OR PROJECTION HAZARD
	1.4	PRESENT NO SIGNIFICANT HAZARD
	1.5	VERY INSENSITIVE SUBSTANCES
	1.6	EXTREAMLY INSENSITIVE SUBSTANCES
2 : GASES	2.1	FLAMMABLE GASES
	2.2	NON FLAMMABLE , NON TOXIC GASES
	2.3	TOXIC GASES
3 : FLAMMABLE LIQUIDS		
4 : FLAMMABLE SOLIDS	4.1	FLAMMABLE SOLIDS
	4.2	SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION
	4.3	SUBSTANCES THAT , ON CONTACT WITH WATER , EMIT FLAMMABLE GASES
5 : OXIDISING SUBSTANCES	5.1	OXIDISING SUBSTANCES
	5.2	ORGANIC PEROXIDES
6 : TOXIC & INFECTIOUS SUBSTANCES	6.1	TOXIC SUBSTANCES

7 : RADIOACTIVE MATERIAL 8 : CORROSIVES  9 : MISCELLANEOUS DANGEROUS GOODS	6.2	INFECTIOUS SUBSTANCES  SOLIDS LIQUIDS
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***Class 6 assigned danger rating (Toxic and Infectious)***

#### **Step 4**

Basically Step 4 involves the analysis (chemical characterization of the waste/substance) with the aim of determining its Hazard Rating. The hazard rating of waste is the toxicity of the waste after treatment. Hazard Rating is a system for classifying and ranking hazardous waste according to the degree of hazard they present (DWAF, 1998).

#### **1.4 Waste Stream Characteristics**

The section on the next page highlights all the categories of waste accepted on site and those that shall not be accepted or handled at this waste disposal facility.

***(Mark those wastes accepted on the site with an “√”. For wastes that are not accepted on site with an “X”)***

Industrial Process Waste:

- Acids/Alkalis
- CFC solvents
- Other halogenated solvents
- Non-halogenated solvents
- Other waste with halogenated solvent
- Ignitable waste
- Non-ignitable liquid waste
- Cyanides
- Waste water treatment (wwt) sludge
- Reactive waste (without cyanides)
- Metal bearing waste (not wwt sludge)
- Coolants - water based
- Oil/Coolant - petroleum based
- Metal chips and shavings
- PCBs
- Plastics
- Asbestos
- Grease
- Other

Solid Waste

- Paper / Cardboard
- Metal
- Wood
- Glass
- Plastic
- Other:

Medical Waste

- Cultures and stocks - infectious agents
- Pathological wastes
- Human blood and blood products
- Sharps (used and unused)
- Animal waste
- Isolation wastes
- Chemotherapy wastes
- AIDS-related wastes

Low Level Radioactive Waste

- Solid Isotopes
- Scintillation Vials
- Other:

Waste / Scrap Drums

- Steel drums
- Plastic drums
- Empty (< 1 cm drainable residue)
- Not empty ( $\geq$  1 cm drainable residue)
- Closed-Head
- Open-Head
- Meets UN specs for re-use
- Does not meet UN specs for re-use
- Other (specify)

Physical States

- Liquid
- Semi-solid
- Solid
- Gas

Diverse Hazardous Wastes

- Waste Laboratory Chemicals
- Waste Fuel Oils / Petrol
- Contaminated Soils
- Contaminated Construction Debris
- Other

## **2 WASTE MANAGEMENT SPECIFICATIONS**

The Environmental Specification outlined in the sections that follow is specific to the management of general and hazardous waste on site. The overall and generic environmental specifications are detailed on the draft EMP (**Appendix F** of the EIR for the landfill site).

### **2.1 Waste Minimisation**

First and foremost, ESKOM must ensure that all processes are designed and operated in such efficiency to prevent, or minimize, the quantities of wastes generated and hazards associated with the wastes generated in accordance with the following strategies:

- Substituting raw materials or inputs with less hazardous or toxic materials, or with those where processing generates lower waste volumes
- Applying technologies and process that convert materials efficiently, providing higher product output yields,
- Including modification of design of the production process, operating conditions, and process controls.
- Instituting good housekeeping and operating practices,
- including inventory control to reduce the amount of waste resulting from materials that are out-of-date, off-specification, contaminated, damaged, or excess to plant needs,
- Instituting procurement measures that recognize opportunities to return usable materials such as containers and which prevents the over ordering of materials.
- Minimizing hazardous waste generation by implementing stringent waste segregation to prevent the commingling of non-hazardous and hazardous waste to be managed.

### **2.2 Waste Recycling and Reuse**

Further to the above, ESKOM must ensure that necessary steps are taken to recycle and reuse as much of the hazardous waste generated and reduce the amounts disposed at the disposal site. The following are general measures that ESKOM must investigate and employ, and in turn will have direct impact on the waste disposal site:

- Evaluation of waste production processes and identification of potentially recyclable materials;
- Identification and recycling of products that can be reintroduced into the manufacturing process or industry activity at the site;
- Investigation of external markets for recycling by other industrial processing operations located in the region of the waste disposal site (e.g., waste exchange);
- Establishing recycling objectives and formal tracking of waste generation and recycling rates; and

- Providing training and incentives to employees and contractors in order to meet objectives

### **2.3 Collection and Transportation of Hazardous Waste**

The following recommendations and mitigation measures are specifically applicable to hazardous waste collection and transport operations to avoid and minimize environmental, health and safety impacts and humans and the environment:

- Transportation of industrial hazardous waste is a specialized activity requiring appropriate equipment/vehicles and suitably trained staff.
- Follow applicable national regulations and internationally accepted standards for packaging, labeling, and transport of hazardous materials and wastes;
- Use tanks and containers specially designed and manufactured to incorporate features appropriate for the wastes they are intended to carry;
- If drums or other containers are used to transport waste, containers should be in good condition and compatible with the waste and are adequately secured in the transport vehicle;
- Adequately label all transport tanks and containers to identify the contents, hazards, and actions required in various emergency situations.

### **2.4 Handling, Storage and Disposal of Hazardous Waste**

Because of the potential inherent risks of handling hazardous waste, it is especially important for operators of hazardous waste management facilities to understand and control the nature of the waste that is accepted for storage, treatment, or disposal. Failure to adequately identify and classify incoming waste could result in inadequate treatment or disposal or unintended reactions that could release hazardous substances or cause fires or explosions. Therefore, recommended measures to control waste receipts and general measures to mitigate risks at industrial hazardous waste management facilities include:

- Establish and maintain a close relationship with the waste generator to understand the process generating the waste and to monitor any changes in the process or waste characteristics;
- Sufficient personnel with the requisite qualifications should be available and on duty at all times. All personnel should undergo specific job training;
- Obtain a thorough understanding of the incoming waste. Such knowledge needs to take into account the waste characteristics and variability, the origin of the waste, the treatment and disposal under consideration, the nature of the waste residuals, if any, that may be generated during treatment, and potential risks associated with waste treatment and disposal;
- Implement a pre-acceptance procedure that includes, as applicable, tests of the incoming waste and documentation of the waste source (e.g., the processes

producing the waste, including the variability of the process), and identifying the appropriate treatment/disposal;

- Implement an acceptance procedure that includes, as applicable, procedures that limit the acceptance of waste to only that which can be effectively managed including effective disposal or recovery of residuals from waste treatment.
- Only accept waste if the necessary storage, treatment capacity, and disposition of any treatment residuals (e.g. acceptance criteria of the output by another treatment or disposal facility) are assured.
- The reception facility should include a laboratory to analyze incoming (only applicable for Hazardous Waste Site).

## **2.5 Spillage and Release control measures**

Overfills, vehicle accidents, and tank and piping failures can lead to releases during waste storage and handling. Mitigation measures, including physical protection, overfill protection, tank integrity, and secondary containment (banded areas) for tanks are some of the general mitigation measures. Recommended measures include:

- Hazardous waste must be contained in a banded area, and the bunding must be made of an impervious material. Further to this the banding must be of such capacity cable of handling 110% of the volume of the storage facility volume;
- Spill Kits and hazmat cleanup materials should always be available on site;
- Segregate hazardous wastes and materials from nonhazardous wastes and materials;
- Separate incompatible wastes, such as certain alkaline and acidic wastes that would release toxic gases if mixed; keep records of testing; store waste in separate drums or vessels based on their hazard classification;
- Lock out valves controlling material and waste transfer when not in use;
- Waste containers should be suitably labeled to include details of their contents and that their locations are recorded in a tracking system;
- Transfer or decant only one type of material at any one time;
- Conduct regular training and exercises for site staff regarding emergency procedures;
- Provide sufficient firewater containment to prevent uncontrolled discharge of water off site in the event of a fire.

## **2.6 Fire and Explosion control measures**

Hazardous waste and dangerous substances can, by the very definition be flammable and reactive and therefore special precautionary measures must be taken when handling these substances.

- Firefighting equipment appropriate to the type of waste received at the site should be available;
- Minimize the storage of flammable liquids on site (e.g. fuel, flammable wastes);
- Use of a nitrogen atmosphere for organic waste liquid with a low flashpoint stored in tanks;
- No Smoking is allowed in the facility and during all handling operations;
- Perform crushing and shredding operations under full encapsulation and under an inert or exhausted atmosphere for drums and containers containing flammable or highly volatile substances;
- Provide an emergency tipping area for waste loads identified to be on fire or otherwise deemed to be an immediate risk;
- Prepare and annually review a fire risk assessment;
- Ensure all staff are appropriately trained for fire and explosion hazards.

## **2.7 Record Keeping**

In line with the Waste management regulations and good international practice:

- Record of incoming and outgoing waste must be kept and these should include:
- Types and Categories of incoming and outgoing Wastes;
- Quantities of each waste type and category;
- Transporter details;
- Safe disposal certificate must always be returned and filed at the waste disposal site;
- Training records for all employees working on the hazardous waste facility.
- All records must be computerized or legible paper trails and cross-referenced, waste tracking easily accomplished.
- Records must be kept in database on site for at least 3 years or more.

## **2.8 Temporary Storage Facility design and house keeping**

In line with the Waste management regulations and good international practice:

- The hazardous waste storage facility or transfer of hazardous substances must be a bounded area with impervious surfaces;
- All active areas of the facility must be paved;

- Surface runoff must be contained and regarded as contaminated and hazardous and must not be allowed into the natural water stream or the general environment;
- All surface runoff from the waste disposal site must be recaptured through a sump, and either channelled to a treatment facility or contained in drums and disposed off as liquid hazardous waste at a properly permitted hazardous waste site.
- The temporary hazardous waste storage facility must be contrasted with a shade, to avoid precipitation or rain coming into contact with the hazardous substances;
- The waste disposal must be secured with controlled access;
- No unauthorized personnel must be allowed on site;
- The site entrance must be guarded or secured with controlled access;
- A clearly marked site Notice must be always posted at the site entrance;
- The Site Notice must reflect the following in the languages appropriate to the area:
  - ❖ Name of facility
  - ❖ Hours of operation
  - ❖ Type of waste accepted on site
  - ❖ Unauthorized wastes and activities
  - ❖ Emergency Calls and Contact details
- The waste disposal site must have adequate signage and marking of all key operational areas;
- Traffic control measures must be in place;
- The Site must have a weigh bridge or other type weight scales to measure the incoming and outgoing quantities of waste;

## **2.9 Pollution Control Measures**

In line with the Environmental management regulations and good international practice measures to adequately mitigate release of emissions and escape of pollutants into the environment, Surface waste, groundwater, soil and air must be put in place and implemented. Such recommended measures include:

### **2.9.1 Air Pollution Control Measures**

Although it is not anticipated that this waste disposal site will have significant potential for air emission release, the following measures should be considered and assessed:

- All point source emissions must be identified and each source that requires a permit has a valid permit;

- The waste disposal site must meet all permit conditions;
- Appropriate engineering controls (Best Available Technologies) must be in place;
- All required pollution control equipment must be installed;
- Air Quality monitoring is completed at least annually,
- Odor patrols are an ongoing part of operations, and personnel monitoring is completed in high exposure areas. Alternately, there is no opportunity for fugitive emissions. There have been no complaints.
- Complaints of potential air quality risks and concerns must be recorded and investigated.

### **2.9.2 Water Pollution Control Measures**

Although it is not anticipated that this waste disposal site will have significant potential for water pollution risks, the following measures should be considered and assessed for possible implementation:

- No process wastewater discharges are associated with site operations, or site-generated wastewater must be channelled to the normal storm water drains;
- All site generated wastewater must be considered potentially hazardous waste water and must be tested before release into natural course, and only released if it meets the DWAF General limits for discharge into natural watercourses (DWAF, 2003);
- Site-generated wastewater must be properly channeled through a well-designed system, and discharged to a local wastewater treatment plant,
- Discharges must be tested before release into natural course, and only released if it meets the DWAF general limits for discharge into natural watercourses (DWAF, 2003);
- Alternatively all site-generated wastewater must be captured through a sump and contained in drums and sent to a hazardous waste disposal facility;

### **2.9.3 Soil Contamination Control Measures**

Although it is not anticipated that this waste site will have significant potential for soil contamination risks, the following measures should be considered and assessed:

- No waste substances must be placed on bare ground;
- All working areas must be hard impervious surfaces;
- Measures to avoid leakages and Spillages on to bare ground and leakages must be undertaken;

- No process wastewater discharges are associated with site operations, or site-generated wastewater must be channelled to the normal storm water drains;

## **2.10 Training**

- Documented training and competency assessment is required for personnel involved in the management of hazardous material wastes.
- Training records shall be maintained;
- Training includes proper management of the waste streams, labeling, containers, emergency procedures outlined;
- Hazardous waste handlers and their supervisors / managers must complete training or on-the-job instruction relevant to their duties to include hazardous waste management procedures and contingency plan implementation.
- Training of all personnel must be completed before duties are assigned and training in terms of handling of hazardous waste must be repeated annually and as and when required.

### **3 EMERGENCY PREPAREDNESS AND RESPONSE PLAN**

**Sections 1 and 2** of this document have provided a comprehensive background pertaining to the applicable legislation pertaining to the management of a waste disposal site and the applicable procedures for characterising and classifying waste. The provision of an emergency response plan requires a good understanding of the waste legislation and thorough handling and management of the waste on site. An EP & RP has been provided in order to curb and control the risks that may emanate during the operational phase of the site.

#### **3.1 Purpose of the Emergency preparedness and response plan**

An emergency is an unplanned event when a project operation loses control, or could lose control, of a situation that may result in risks to human health, property, or the environment, either within the waste disposal site or in the local community. Emergencies do not normally include safe work practices for frequent upsets or events that are covered by occupational health and safety. Proper emergency planning and response are important elements of the site Environmental, Health and Safety Plan of a Hazardous Waste Handling, Storage and Disposal facility, and that help minimize employee exposure and injury.

There are a number of regulations, guidelines, standards which requires that the employer develop and implement a written emergency response plan to handle possible emergencies before performing hazardous waste site operations. The permit Holder for the waste disposal site in this case, Eskom Health and Safety officer must, develop an emergency preparedness and response or action plan complying to ensure the safe evacuation of personnel.

#### **3.2 Content of the Emergency preparedness and response plan**

The Emergency Preparedness and Response Plan must be commensurate with the risks of the waste disposal site and at the minimum include the following elements:

- Administration
- Pre-emergency planning,
- Emergency recognition and prevention,
- Emergency medical and first-aid treatment,
- Methods or procedures for alerting on-site employees,
- Safe distances and places of refuge,
- Site security and control,
- Personal protective and emergency equipment,
- Evacuation routes and procedures. and
- Training and Awareness

In addition to the above requirements, the plan must include site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local authorities, the South Africa Police Services (SAPS), and regulating agent i.e. DEA and Department of Labour etc.

#### **3.3 Use of the Emergency preparedness and response plan**

The procedures must be compatible with and integrated into the operational management plan (**Appendix E1 of the EIR**) of the site. The plan requirements also must be rehearsed regularly,

reviewed periodically, and amended, as necessary, to keep them current with new or changing site conditions or information.

### 3.4 Administration of the EP&RP

#### 3.4.1 Policy

The emergency response plan should be implemented in line with Eskom's Safety, Health and Environment Policy.

#### 3.4.2 Distribution

This Plan and procedures contemplated in this plan must be distributed to all personnel working on the site and the following designated responsible persons:

Designation	Name	Contact number
ESKOM Environmental Manager	Isabella Sekgothe (Acting Risk Manager)	014 763 8423
Matimba Power Station SHE Manager	Hardus Viljoen (Acting Safety Manager)	014 763 8467
Site Operator (Contractor)	Details to be provided during construction phase of the landfill	
Site Supervisor		
Site Security		

#### 3.4.3 Definitions

The procedures must be compatible with and integrated into the operational management plan of the site. The plan requirements also must be rehearsed regularly, reviewed periodically, and amended, as necessary, to keep them current with new or changing site conditions or information.

#### 3.4.4 Organogram

The organogram described in the draft EMP (**Appendix E of the EIR**) shall apply to the emergency response plan.

#### 3.4.5 Personnel roles and responsibilities

The Roles and Responsibilities described in the draft EMP (**Appendix E of the EIR**) shall apply to the emergency response plan.

#### 3.4.6 Communication procedures

The communication lines established in the draft EMP (**Appendix E of the EIR**) shall apply to the emergency response plan.

### **3.4.7 First-Aid Calls**

Eskom Safety Health and Environment officers must ascertain that all emergency contact numbers (first aid officers, ambulances, fire brigade, police, hospital etc) are conveniently posted at several site notice boards in order to assist in the event of an emergency.

### 3.5 Personal Protective Equipment and Emergency Actions

This section presents a summary of recommended practices for various substances. These recommendations supplement general work practices (e.g., no eating, drinking, or smoking where chemicals are used) and should be followed if additional controls are needed after using all feasible process, equipment, and task controls. Table 2 (page xviii) explains the codes used. Each category is described as follows:

SKIN	Recommends the need for personal protective clothing
EYES	Recommends the need for eye protection
WASH SKIN	Recommends when workers should wash the spilled chemical from the body in addition to normal washing (e.g., before eating)
REMOVE	Advises workers when to remove clothing that has accidentally become wet or significantly contaminated.
CHANGE	Recommends whether routine changing of clothing is needed.
PROVIDE	Recommends the need for eyewash fountains and/or quick drench facilities.

Table 2: PPE Guidance table

SYMBOLIC SIGN OF EQUIPMENT												
DESCRIPTION	Gas Mask	Dust Mask	Ear Protection	Safety harness	Rain Jacket	Hard Hats	Gum Boots	Safety Shoes / boots	Gloves	Safety Glasses	Cap and Sun block	High visibility vests
AREA/ TASK												
Site Operations		X	X					X	X	X	X	X
First aiders									X			

**The Site Operator Must Identify the Areas, Tasks and Roles of all personnel working and site and assign the appropriate Personal Protective Equipment as per the above PPE Guidance table.**

### **3.6 Training and Awareness**

- Before implementing the EP&RP, the SHE Coordinator and waste disposal Managers/Supervisors shall designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.
- The EP&RP must be reviewed with all employees at the following times:
  - Initially when the plan is developed,
  - whenever the employee's responsibilities or designated action under the plan change,
  - and whenever the plan is changed.
- At least annually employee meetings are to be held to train employees of the contents of the EP&RP and revise the plan as appropriate.
- Drills will be conducted and full participation encouraged.
- All training must be documented in writing and copies sent to Safety, Health and Environmental Manager of the Power Station.

### **3.7 Review of EP&RP**

- A copy of the Emergency Preparedness and Response Plan must be sent to the Matimba Power Station Safety, Health and Environmental, SHE Manager and this must be reviewed to ensure compliance with the overall emergency preparedness and response plan for the power station.
- Once the EP&RP Plan has been approved by the SHE Manager of the Power station, it must be integrated into the overall emergency preparedness and response plan for the power station.
- The EP&RP must be reviewed during the routing SHE inspections;
- The EP&RP must be maintained by the waste disposal site SHE Coordinator and made available to all employees and users of the waste disposal site.