

GUIDANCE NOTES

**FOR THE IMPLEMENTATION OF THE ENVIRONMENT
PROTECTION (STANDARDS FOR HAZARDOUS WASTES)
REGULATIONS 2001**

**Department of Environment
Ministry of Environment
June 2002**

This is the first version of the Guidance Notes prepared by the Ministry of Environment in collaboration with the following organisations :

Ministry of Local Government

Ministry of Labour

Ministry of Health

Ministry of Industry

University of Mauritius

**Societe de Traitement et d'Assainissement des Mascareignes
(STAM)**

This document is available for download on the website of the Ministry of Environment (<http://environment.gov.mu>)

We would welcome any suggestions, comments or views thereon, which may be submitted at the Ministry of Environment, 2nd Floor, Ken Lee Tower, Barracks street, Port-Louis, or via e-mail to envlaw@intnet.mu.

Your comments will be taken into account during the review of the present version of the Guidance Notes.

Ministry of Environment

25 June 2002

TABLE OF CONTENTS

- 1.0 INTRODUCTION**
 - 1.1 AIM OF THE REGULATIONS**
 - 1.2 AIM OF THE GUIDANCE NOTES**
- 2.0 OBLIGATIONS UNDER THE REGULATIONS**
 - 2.1 OBLIGATIONS OF THE CONSIGNOR**
 - 2.2 OBLIGATIONS OF THE CARRIER**
 - 2.3 OBLIGATIONS OF THE CONSIGNEE**
 - 2.4 IMPORT OF HAZARDOUS WASTES**
 - 2.5 EXPORT OF HAZARDOUS WASTES**
 - 2.6 PENALTIES**
 - 2.7 MANAGEMENT OF HAZARDOUS WASTES**
 - 2.8 FLOWCHART ON THE MOVEMENT OF HAZARDOUS WASTES**
- 3.0 GENERAL GUIDANCE NOTES ON:**
 - 3.1 WASTE MINIMISATION**
 - 3.2 IDENTIFICATION**
 - 3.3 CLASSIFICATION**
 - 3.4 HANDLING**
 - 3.5 PACKAGING**
 - 3.6 LABELLING**
 - 3.7 STORAGE**
 - 3.8 REPORTING**
 - 3.9 TRANSPORT**

4.0 LIST OF UNPERMITTED HAZARDOUS WASTE AT THE MARE CHICOSE LANDFILL

5.0 REFERENCES AVAILABLE FOR CONSULTATION.

6.0 ANNEX I : MATERIAL SAFETY DATA SHEET FOR EACH CLASS OF HAZARDOUS WASTE.

7.0 ANNEX II : A MOPDEL INVENTORY SHEET.

1.0 INTRODUCTION:

1.1 Aim of the regulations

The aim of the Environment Protection (Standards for Hazardous wastes) Regulations 2001 is to exercise a control on the export, collection, on-site treatment, transportation and disposal of hazardous waste. The importation of hazardous waste is prohibited while prior approval is required from the Enforcing Agency for the exportation of an hazardous waste.

The regulations lay down the obligations of hazardous waste generator in connection with waste minimisation, proper handling, storage, transport, pre-treatment and disposal of hazardous wastes.

Non-compliance with the regulations is an offence.

1.2 Aim of the guidance notes

These Guidance Notes have been prepared following the coming into force of the hazardous waste regulations on 01e 1st April 2002. These guidance notes aim at explaining the duties and the obligations of the persons involved in hazardous waste management (generators, carriers, persons carrying out treatment or disposal, and Government as officials) under the Hazardous Wastes Regulations 2001.

The objectives of these guidance notes are also to facilitate the implementation of these Regulations by providing further explanations to the stakeholders on the proper management of hazardous wastes.

1.3 Improper management of hazardous wastes can pose a serious threat to the environment, potentially contaminate resources (water, land, air) and hence can be detrimental to wildlife, vegetation and aquatic organisms.

1.4 Mismanagement of hazardous waste can also lead to occupational, safety and health problems such as respiratory illnesses, skin diseases, fires, explosion, generation of toxic gases which could be dangerous to both employees or other persons residing in the vicinity.

1.5 The Ministry of Local Government will henceforth enforce this parameter once the Environment Protection Act 2002 is promulgated and comes into force. It is the responsibility of the enforcing agency to ensure a proper tracking of the hazardous waste from the site it is generated to the disposal site by a system of **consignment notes**. In order to provide for a complete oversight of hazardous waste, consignment notes have been prepared for hazardous waste generators, wastes carriers and operators of hazardous waste disposal facilities to document the type, quantity, treatment and disposal of hazardous wastes.

1.6 A requirement of the transportation of Hazardous Wastes relates to the "Duty of Care" principle. This places responsibility for a waste on the Generator, and is supported by the "cradle-to-grave" principle, according to which a system of consignment notes accompanies each load of hazardous wastes until it is responsibly and legally disposed of. These consignment notes are transferred from one transporter to the next along with the load, should more than one transporter be involved. A complete copy of the consignment note must be returned to the point of origin once the waste is properly disposed of at a suitable, permitted facility. The main objective of the consignment notes system is to ensure that the hazardous wastes are never "lost".

1.7 Copies of the Consignment Notes are available at the enforcing agency.

OBLIGATIONS OF THE HAZARDOUS WASTES CONSIGNOR, HAZARDOUS WASTES CARRIERS AND HAZARDOUS WASTES CONSIGNEE UNDER THESE REGULATIONS:

2.0 Obligations of the consignor:

Definition of consignor:

A consignor in relation to a consignment of hazardous waste means the person who causes that waste to be removed from the premises at which it is being held. A consignor can therefore be a waste generator, or a person in charge of an interim disposal site or waste treatment facility.

The obligations of a consignor are:

- (i) to minimize the generation of a hazardous waste, provide a safe storage facility (subject to approval by the enforcing agency), and to properly label the waste.
- (ii) to complete 6 copies of part I of a consignment note and give them to the carrier.
- (iii) to make arrangement with the consignee (interim or final disposal site) before transportation of the hazardous waste.

2.1 Obligations of the waste generator are:

- (i) At the end of every 3 months, a waste generator shall:
 - (a) draw up in accordance with the Sixth Schedule an inventory of the quantity of hazardous waste generated, stored and disposed of by him; and
 - (b) forward a copy of such inventory to the enforcing agency.

2.2 Obligations of the carrier are:

Definition of carrier:

A carrier in relation to a consignment of hazardous waste means the person who collects that waste from the premises at which it is being held and transports it to another place. A carrier can be the company's own driver or the driver of a waste collecting vehicle.

The obligations of the carrier are:

- (i) to complete Part II of the 6 copies of the consignment note upon accepting the hazardous waste. The carrier will then give back 2 copies of the consignment note (white with black ink, pink) to the consignor, who shall keep one copy (not perforated white with black ink) and send the other copy of the consignment note (pink) to the enforcing agency.
- (ii) to give his four copies of the consignment note to the consignee (white with black ink, white with brown ink,

yellow, blue) at the time hazardous wastes are delivered at the treatment or disposal site.

2.3 Obligations of the consignee:

Definition of the consignee:

A consignee in relation to a consignment of hazardous waste, means the person to whom that waste is to be transported to. A consignee can be the operator or person in charge of an interim or final disposal site.

The obligations of the consignee are:

- (i) to fill in Part III of the four copies of the consignment note and to:
 - (a) retain one copy (white with black ink)
 - (b) give one copy (white with brown ink) to the carrier
 - (c) send one copy (yellow) to the consignor
 - (d) send the last copy (blue) to the enforcing agency

Note:

If the consignor does not receive back his copy (yellow) from the consignee within 7 days of the delivery of his hazardous waste to the carrier, he shall immediately inform the enforcing agency.

2.4 Import of Hazardous waste:

No person shall be allowed to import any hazardous waste.

2.5 Export of Hazardous waste:

Export of hazardous waste shall require the prior approval of the enforcing agency.

2.6 Penalties:

Failure to comply with the regulations will entail the application of penalties as scheduled under Section 85 of the EPA 2002. That is:

- (1)
 - (a) On a first conviction be liable to a fine not exceeding Rs 50,000 and to imprisonment for a term not exceeding two years;
 - (b) On second or subsequent offence relating to an environmental law, be liable to a fine not exceeding Rs 100,000 and to an imprisonment for a term of imprisonment not exceeding eight years.

- (2) In addition to any penalty under Section 85, the Court may-
 - (a) order the forfeiture of any object, machine, plant, vehicle or any article used in any way with the commission of an offence;
 - (b) order or prohibit the doing of any act to stop a continuing contravention.

2.7 Management of Hazardous Waste:

Please find overleaf a flowchart giving an overview of the proposed management of hazardous waste and a flowchart on the movement of consignment note..

3.0 GENERAL GUIDANCE NOTES FOR HAZARDOUS WASTE

Hazardous wastes can be composed of various types of chemical substances and in different proportion; the nature of the waste would depend on a wide range of parameters including toxicity of individual chemical processing etc.

3.1 WASTE MINIMISATION

Hazardous wastes once produced are often expensive to treat and dispose of. It is advisable to keep the quantities that require disposal and treatment as low as possible. Waste minimisation is the reduction of the volume of waste during production by means of different processes or clean technology. Hazardous waste minimisation includes any action that reduces the volume and toxicity of waste and include avoidance, recycling, recover and re-use. It also includes waste management technologies that lead to a reduction in volume and toxicity.

Waste minimisation can be achieved by adopting one or more of the following methods:

- (i) Segregation of the waste streams to avoid mixing of hazardous wastes with non-hazardous wastes.
- (ii) A review of storage methods and stock management may help to reduce wastage.
- (iii) Substitution of a hazardous chemical that is currently employed, by a chemical that is not hazardous or less hazardous.
- (iv) Modification of processes so that there is less wastage. (For example, it may be possible to change the steps in washing or cleaning process so that less acid or solvent is contaminated.)

- (v) Processing the waste to recover useful chemicals. (For example it may be possible to recover solvents by distillation or recover oil by cracking emulsions.)
- (vi) Adoption of good operation practices / good housekeeping/environment management systems (e.g. ISO 14000).
- (vii) Changing process technologies (e.g. replacing a chemical cleaning bath with mechanical cleaning)
- (viii) Making changes in the input material (includes purification and substitution) e.g. substitution of cyanate for cyanide in the electroplating industry , replacement of chlorinated solvents with non-chlorinated solvents..
- (ix) Making changes in the product (e.g. replacing oils containing PCB(polychlorinated biphenyl) with other oil or converting to air cooled transformers).

3.2 IDENTIFICATION:

The following ways can be used to identify Hazardous Wastes:

- (i) By comparing your waste generated with those specified in the First, Second and Third Schedules of the Hazardous Waste Regulations.
- (ii) By referring to the Material Safety Data Sheet (MSDS) for input materials.
- (iii) By carrying out laboratory testing and analyses to determine hazardous waste properties, characteristics and components of the waste.
- (iv) By conducting a mass balance. (procedure of balancing the material inputs and output of a process).
- (v) By performing a waste audit. (prepare flowchart, identify quantity of material coming in and going out).

3.3 CLASSIFICATION:

"Hazardous Waste" is a waste that has the potential, even in low concentrations, to have a significant adverse effect on public health and the environment because of its inherent toxicological, chemical and physical properties.

For the purpose of the regulations hazardous waste has been classified into 8 classes based on their hazardous waste properties. It is to be noted

that a hazardous waste can display more than one of the hazardous properties.

Below is a brief guide on the 8 classes of hazardous wastes:

3.3.1 Class 1:Explosives

Substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene.

An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or wastes) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings.

This class contains articles, preparations, and substances such as ammunition, TNT, dynamite and fireworks.

An accident may during the transportation of Class I chemicals involve an acute risk of explosion. Some substances in this class have toxic properties, and can penetrate the skin. The transport of specific articles or substances may be subjected various restrictions, including quantity. They may also be incompatible with other goods.

Knowledge of these hazards before transporting such hazardous wastes is a pre-requisite.

3.3.2 Class2: Gases, compressed, liquefied, dissolved under pressure or deeply refrigerated

This class contains

Compressed gases

Liquefied gases

Refrigerated liquefied gases

Compressed gases, when packed for transport, are dissolved into a solvent.

The term 'compressed' refers to gases under pressure but not in a liquid state. Gases are usually stored in cylinders. The pressure of the cylinder depends on the type of gas it contains. The cylinders should always be kept within the approved temperature range to avoid the risk of overpressure and which may constitute an explosion hazard.

Condensed gases are in a liquid state at relative low pressure. The contents are released as liquids which quickly evaporate forming gas clouds. The size of the clouds can be considerable.

Class 2.1 Inflammable gases:

include gas that at normal pressure and temperature, as a mixture of 13% or less with air, can ignite from a source of fire.

Class 2.2 Poisonous Gases:

Gases which are known to be poisonous enough to pose a health hazard belong to this category (carbon monoxide, ethylene oxide, hydrogen sulphide, sulphur dioxide and ammonia). Containers with toxic gases should never be loaded or stored together with food or feedstuffs. Acidic gases can react with alkaline gases to produce heat and smoke, which may create a fire risk. Some gases have more than one dangerous property. They can be both flammable and toxic (methyl ether) or corrosive and toxic (hydrogen chloride, chlorine)

3.3.3 Class 3: Inflammable liquids, liquid substances and preparations having a flash point equal to, or greater than 55⁰ C

An inflammable liquid has the ability to give off, at normal temperatures, vapours which are flammable. Benzene, kerosene, toluene, propanol, and various organic solvents used in pesticides are examples.

This class covers mixtures of liquids, as well as liquids containing solids in solution or suspension (wastes from paint, varnishes, lacquers, etc). Petroleum products and crude oil also belong to this class. Flammable liquids pose a risk of fire and explosion, and may lead to expensive environmental clean-up operations.

Inflammable liquids are liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc., but not including substances or wastes otherwise classified on account of their dangerous characteristics) which give off a flammable vapour at temperatures of not more than 60.5⁰C, closed cup test, or not more than 65.6⁰C open-cup test.

Many inflammable liquids can be charged with static electricity, for e.g. as a result of flowing in a pipe. This makes them both combustible and able to create a spark.

3.3.4 Class4: Inflammable solids, substances liable to spontaneous combustion; substances which in contact with water emit inflammable gases

Class 4.1 Inflammable solids:

Solid substances and preparations which readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the source of ignition can be classified here.

Solids, or waste solids, other than those classed as explosives, which under condition encountered in transport are readily combustible, or may cause or contribute to fire through friction.

This class consists of solids, which are readily combustible, those which may cause or contribute to fire through friction, and self-reactive substances. Sulphur and red phosphorus are common hazardous substances in this class. Examples of self-reactive compounds are azocarbamides, benzene sulphohydrazine and diazonium salts. Sawdust, hay and paper are not spontaneously combustible but are in this class because of incompatibility requirements in loading procedures.

When inflammable solids are handled there is a possibility of large amount of dust being released in the air. These mixtures of dust and air can lead to a dust explosion. Many inflammable solids give off hazardous fumes when they burn. The decomposition of self-reactive substances can be initiated by heat, contact with catalytic impurities (acids, bases, heavy metal compounds) friction or impact. Decomposition may result in the emission of toxic gases or vapours.

In order to ensure safety during transport, a self-reactive substance may be desensitised using a diluting agent compatible with the substance.

Class 4.2 Substances liable to spontaneous combustion:

Substance which in contact with water or damp air evolve highly inflammable gases in dangerous quantities.

Substances or wastes which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up on contact with air, and being liable to catch fire through friction.

Linseed oil (used in paint), copra, oily cotton waste, carbon and white phosphorous are examples of substances which can ignite spontaneously when in contact with air. These substances are liable to act as a source of ignition for other goods and storage structures. For examples there is a danger of fire if linseed oil spillage is wiped with rags which are then left to dry in the air. The rags can stay inactive for days before they actually ignite.

Class 4.3 Substances which in contact with water or damp air emit inflammable gases.

Substances or wastes which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

Carbides are among the substances in this class. An extremely inflammable gas, acetylene, is produced by adding water to calcium carbide. Aluminium and magnesium powders, zinc dust and some metal hydrides are in this class. In addition to the dangers of fire and explosion, goods belonging to this class can react with moisture on human skin and cause burns.

3.3.5 Class 5: Oxidising substances (agents) and organic peroxides.

Class 5.1 Oxidising substances (agents)

Substances or wastes which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion of other materials.

In this class are substances, such as chlorates, chlorites, nitrates, nitrites, chromic acid and concentrated hydrogen peroxide solution. These substances should be handled carefully and protected from heat or friction. An oxidising substance has oxygen bound into its structure. This is liberated by heating and can react with other materials or enhance fire. Many substances in this class are sensitive to impurities. Concentrated hydrogen peroxide solution begins to decompose if a few rust flakes happen to fall into the container. The reaction starts slowly but accelerates with time. It gives off oxygen which corrodes metallic materials. The decomposition of oxidizing goods can also involve liberation of toxic or corrosive gases, such as nitrogen oxides, which can be recognized from their deep brown to yellow-brown colour.

Class 5.2 Organic peroxides

Organic substances or wastes which contain the bivalent -O-O- structure are thermally unstable substances which may undergo exothermic self-accelerating decomposition.

This class covers peroxides of organic compounds. They should never be transported or stored with combustible goods. Special recommendations and provisions apply to some of the peroxides because of their high reactivity. In addition to the hazards of explosive decomposition and fire, they are sensitive to impact or friction. Many peroxides are toxic and some of them can provoke allergic reactions and damage the eyes.

3.3.6 Class 6: Poisonous (toxic) and infectious substances

Class 6.1 Poisonous (toxic) substances:

Substances and preparations including very toxic substances and preparations which if they are inhaled or ingested or if they penetrate the skin, may involve serious, acute or chronic health risks and even death.

The substances in this class are liable either to cause death or serious injury, or to be harmful when swallowed, inhaled or by skin contact. They can be gases, solids or liquids. Examples of substances in this class are cyanides, arsenic compounds, nicotine, chloroform.

Class 6.2 Harmful substances :

Substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve limited health risks.

Class 6.3 Infectious substances :

Substances containing viable micro-organisms, or their toxins which are known or reliably believed to cause disease in man or other living organisms.

3.3.7 Class 7: Radioactive substances Substances that emit radioactive emissions

Any material or combination of materials which spontaneously emits ionizing radiation and has a specific gravity greater than 0.002 microcuries per gram.

3.3.8 Class 8: Corrosives Substances and preparations which may destroy living tissue in contact

Substances or wastes which, by chemical reaction, will cause severe damage when in contact with living tissue, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport; they may also cause other hazards.

The corrosive substances form a large class. It can be subdivided into acids, bases and other materials. Examples of acids include hydrochloric acid, sulphuric acid. Sodium hydroxide, potassium hydroxide and sodium carbonate are alkalis or strong soluble bases. Other corrosive substances include antimony pentachloride (textile impregnation), aluminium chloride and hypochlorites.

The health hazard varies from corrosive to irritating, depending on type and concentration of the active substance.

Corrosive substances can also present other hazards. For example benzyl chloride is both toxic and corrosive.

3.4 HANDLING

- (i) It is the duty of all employers to ensure, so far as, is reasonably practicable the safety, health and welfare of its employees as per the Occupational Safety, Health and Welfare Act (OSHWA).
- (ii) Appropriate health and safety procedures according to best common practice must be followed to handle hazardous wastes and during clean up after spill. An example of material safety data sheets (MSDS) for each class of hazardous waste is *Annex I*. You are advised to consult the MSDS for the chemical you are handling.

Note: MSDS are available for consultation at the Labour Information centre, Ministry of Labour, Victoria House, Barracks street, Port-Louis.

- (iii) Safety equipment (eyewash/ emergency shower facilities, portable fire extinguisher, spill control and clean-up equipment, personal protective equipment appropriate to the waste materials stored) are to be provided and should always be in good working condition for use.

3.5 PACKAGING

Packaging of various specifications has been developed by industry in order to match the strength and integrity of the containers with the characteristics and hazards of the waste materials.

For example:

- Bulk liquid wastes are loaded in storage tanks at the factory and then transported in road tankers or demountable containers.
- Smaller lots of wastes are packaged in a variety of containers such as:
 - Drums (metal and non-metal)
 - Carton boxes
 - 'Big bags'
 - Other bags
 - Carboys
 - Cans

Some suggestions for packaging are:

Waste oils and solvents -200 litre steel bung drums or steel tankers

Solid or semi-solid organic wastes -200 litres steel clamp-lid drums

Inorganic liquid wastes -30, 45 or 200 litre plastic cans or polythene tanks.

The general principles to be followed when selecting a hazardous waste package are:

- (i) The container or package in which a hazardous waste is kept shall be designed and constructed so as to preclude spillage or leakage to the environment.

The material of the container or package shall not be susceptible to attack by the waste or liable to form harmful compounds with that waste.

The container should not react with the waste.

The container or package shall be designed to facilitate safe, complete or partial emptying.

Incompatible hazardous waste shall be stored separately container.

As far as it is reasonably practicable it is advisable to use the original container of the raw material for storing the hazardous wastes.

3.6 LABELLING

- (i) The container in which the hazardous waste is stored or carried shall be labelled according to the Fifth Schedule.
- (ii) Where a hazardous waste displays more than one of the qualifications specified in the Fifth Schedule, the waste generator or carrier shall ensure that the container displays labels showing each distinct qualification.
- (iii) Labels given for the class of hazardous waste shall be conspicuously displayed on the packaging so as to be clearly visible and readable. Any carrier carrying hazardous substances should have Emergency Information Panels containing the following emergency information:
 - Classification of the waste
 - Safety phrases and risk phrases
 - Hazard label
 - Technical name of the substance
 - Contact numbers and names of company

The label shall be of an appropriate colour and size with a view to render it clearly visible.

3.7 STORAGE

- (i) The use of any store, warehouse or other premises for the storage of a container or package containing a hazardous waste required the prior approval of the enforcing agency.
- (ii) The material shall be stored in such a way as not to cause any harm to the environment.

In general the following measures may be considered:

- (iii) the floor shall as far as possible, be covered with concrete or any suitable material.
- (iv) the entire site shall be surrounded by a concrete dyke or other equivalent structure designed to contain the waste under the worst spillage condition (110% of the capacity of the largest container).
- (v) the dyke area shall be graded to a sump.
- (vi) there shall not be any opening in the dyke that may allow waste to leave the site or surface water run-off from entering the site.
- (vii) separate compartments shall be provided for different groups of incompatible wastes.
- (viii) appropriate sidewall and roof shall be provided to protect the containers from weather.
- (ix) the place to load and unload containers shall be designed so that any spill could be contained.
- (x) the site shall be fenced and designated as a restricted area.
- (xi) at the entrance to the storage site, a warning signboard shall be set up.
- (xii) access to the storage site shall be limited to the employees who have been instructed, trained and supervised in respect of normal and emergency procedures.
- (xiii) in case of on-site storage, there shall be a properly designated area in the waste generator's premises, away from

the manufacturing/processing area and area of employees' activities.

- (xiv) the storage area shall not be subjected to flooding.
- (xv) off-site storage area shall preferably be within an industrial area.
- (xvi) off-site storage area shall be away from residential area (preferably not less than 250m), downstream of water intake points, compatible with surrounding landuse, provided with good access road and other infrastructural facilities, for fire fighting and emergency procedures.
- (xvii) the store, warehouse or any other premises shall be of such design, construction and layout as to prevent spillage or leakage of hazardous waste to the environment.
- (xviii) the storage area shall be under cover, fenced-up, under lock and key; provided with kerb/hump all round the storage area; provided with fire protection and safety facilities; installed with leak detection and warning devices and emergency scrubbing systems if toxic gases are being stored.
- (xix) the storage area shall normally be roofed to protect wastes from the elements. For outdoor storage, the following precautions are recommended:
 - Drums must be closed and lids or bung hole caps must be securely fastened.
 - No drums shall be closer than 10 metres from buildings or pipes and 4 metres from storm drains.
 - Clean open drums without lids shall be stored in such a position so as to prevent collection of rainwater.
 - Wastes in non-waterproof containers (e.g. in bags) must be stored under a roof at all times.
- (xx) ample aisle space shall be allowed between groups of containers for
 - Free movement of the fork lift and other equipment and machinery
 - Emergency fire fighting purpose
 - Emergency escape route

- Ease of inspection of containers for leaks or spillages
Moreover the containers must not obstruct any exits. There must be sufficient space to allow the unobstructed movement of personnel during inspection.
- (xxi) waste containers shall not rest on the floor but must be elevated i.e. placed on pallets to prevent contact with spilled waste or water.
- (xxii) pallets shall be undamaged. Pallets with one broken or damaged board are unsuitable.
- (xxiii) all containers to be whole, with no leaks or bulging.
- (xxiv) for safety and accessibility, the containers shall be stacked not more than:
- 2 tiers high for drum storage
 - a maximum of 4 drums per standard pallet
 - 3 tiers for crate storage
 - in rows two pallets wide
- (xxv) drums shall be stacked vertically and not horizontally for stability.
- (xxvi) containers shall be stored in an orderly "First-in first-out" manner so that older wastes can be attended first.
- (xxvii) types and characteristics of wastes have to be determined before assigning the types of containers to be used.
- (xxviii) the containers and storage areas to be routinely inspected for leaks and corrective actions initiated, if required.
- (xxix) if solvents and other liquid wastes received in bulk are to be stored at the storage site, an adequate number of tanks with an appropriate piping and pumping system shall be installed. Fire prevention regulations shall be observed.
- (xxx) special tanks for spent oil and lubricants shall be provided, and designed to allow for settling and discharge of water and sludge.

- (xxxix) a roofed ramp shall be built for receiving any intermediate storage of wastes packed in drums or other containers. It is advisable that very toxic packaged wastes and pharmaceutical wastes, including discarded drugs shall be separated from other wastes and stored at a special fenced-in roofed ramp.
- (xxxix) records of stock increments of the hazardous substances and wastes must be kept. Record shall be maintained to indicate the date, type and quantity of wastes brought into or removed from the storage site.
- (xxxix) an emergency action plan for dealing with any accidental release of waste must be established with necessary stock of emergency equipment such as neutralising agent, absorbents, oversized drums, protective gears, etc.
- (xxxix) provision of a warning system (such as an alarm) to alert the neighbourhood in case of emergency shall be put up.
- (xxxix) emergency procedures shall be limited to the employees who have been instructed in respect of normal and emergency procedures
- (xxxix) implementation of a safety audit procedure .
- (xxxix) records of stock increments of the hazardous substances and wastes must be kept. Record should be maintained to indicate the date, type and quantity of wastes brought into or removed from the storage site.
- (xxxix) an emergency action plan for dealing with any accidental release of waste must be put up; with the necessary stock of emergency equipment such as neutralising agent, absorbents, oversized drums, protective gears should be kept on standby.

3.8 REPORTING

- (i) The hazardous waste generator is advised to register with the enforcing agency.
- (ii) An inventory of the quantity of hazardous waste generated, stored and disposed shall be made in accordance with the Sixth Schedule of the Regulations. A model copy of an inventory sheet at *Annex II*.
- (iii) The inventory sheet shall be filled in by the waste generator quarterly, (every 3 months).
- (iv) Column 2 (Name of waste) the name of the hazardous waste, its chemical composition, its characteristics (e.g. toxics, etc...) should be mentioned.
- (v) Column 3 (Quantity generated) the amount of hazardous waste generated in kg or m³ over an interval of time should be specified. The time interval could be hourly, daily, weekly, monthly or more depending on the rate of generation of the waste.
- (vi) Any backlog of hazardous waste should also be indicated together with their storage place and storage time.
- (vii) Column 5 (Quantity disposed of and place of disposal) - Should any amount of hazardous waste been disposed of by the waste generator, he should write down the exact quantity that has been disposed and the place where these were disposed.

3.9 TRANSPORT

- (i) International codes of practices such as the UN Regulations for transport of dangerous goods and the Basel convention could be followed.
- (ii) Consignment notes in accordance to the Seventh Schedule shall be filled in.
- (iii) A hazardous waste shall not be exported without the written approval of the Enforcing Agency.
- (iv) No import of hazardous waste shall be allowed.
- (v) The containers and tankers must be designed, manufactured and tested in accordance to internationally acceptable standards.

The containers and vehicles shall be properly labelled.

For tankers, the drivers must be trained in handling an accidental spill.

It is recommended that an adequate emergency action plan is put up to deal with any accidental release of the hazardous waste; with adequate stock of emergency equipment carried on the vehicles.

The consignor is advised to prepare a set of instructions for the carrier or transport company containing the following:

information on the hazards of the hazardous substance and safety precautions for its safe handling.

restrictions in the mode of transport and any necessary routing instructions.

special operational requirements for loading, unloading and transport or a statement that none is needed

emergency action plan, contact persons & details.

- (xi) Transport shall be in accordance with the Regulations made under the Road Traffic Act.

4.0 LIST OF UNPERMITTED HAZARDOUS WASTES AT MARE CHICOSE LANDFILL SITE.

The following hazardous wastes are generally not accepted for the disposal at the Mare Chicose Landfill site.

- All liquid wastes
- Waste from diagnosis, treatment or prevention of disease and natal care.
- Biocides
- Acid tars, other tars, oils, and acids.
- Halogenated organic solvents.
- Radioactive materials.

Please note this is not an exhaustive list.

Disposal of hazardous wastes requires the prior approval of the enforcing agency.

5.0 REFERENCES:

Please find below a list of references available at the Resource Centre of the Ministry of Environment for consultation.

1. Environment, Health and Safety Guidelines for Use of Hazardous Materials in Small and Medium Scale Industries ; The World Bank.
2. United Nations Environment Programme; IE/PAC: Industry and environment programme activity centre, EETU: Environmental education and training unit; Technical Report series No. 10; Hazardous Waste Policies and strategies, A training Manual.