GUIDELINES FOR THE MANAGEMENT OF SCHEDULED WASTE IN SRI LANKA

In accordance to the
National Environmental (Protection & Quality) Regulation
No. 01 of 2008



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CENTRAL ENVIRONMENTAL AUTHORITY
Ministry of Environment & Natural Resources
Battaramulla

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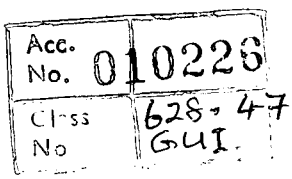
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MESSAGE OF CHAIRMAN

Hazardous waste generated from various commercial, industrial and other institutional sources causes an immense environmental problem in Sri Lanka affecting health and quality of life of people, particularly the residents in urban and sub urban areas.

At present the most of the hazardous waste generated is disposed in a haphazard manner in unsuitable locations while some are disposed together with the municipal solid wastes. Dumping of such waste may lead to serious health and environmental problems.

Being a signatory of the Basel Convention of the Trans-boundary Movement of the Hazardous waste, Sri Lanka has taken some vital actions as per the obligations of the convention that all signatory countries should develop and implement which includes necessary legal provisions for proper management of hazardous waste in the country.

In order to streamline and enhance the effectiveness of the regulatory mechanism for hazardous waste management in the country, the Government of Sri Lanka has framed regulations for the Management of Hazardous Waste in 1996 as an amendment to the National Environmental (Protection & Quality) Regulation No 1 of 1990. This was done by publishing Part II in the Gazette Extra ordinary No 924/13 dated 23 May 1996 as an extension of the Environmental Protection Licensing procedure. An amendment to this regulation was published by the Gazette Extra Ordinary No 1534/18 dated 01 February, 2008.

In an endeavour to fulfil proper management of hazardous wastes the CEA has developed these guidelines in line with the new amendment of the above mentioned regulation.

I am grateful to Technical Expert Committee for their active contribution by providing technical expertise and inputs in reviewing the Guidelines for Hazardous Waste Management.

I am confident that the industries, relevant institutions and all the other stakeholders will make use of these guidelines to prepare themselves for proper management of hazardous wastes. Through this means it is hoped make a substantial contribution in minimizing the adverse impacts of hazardous waste to our environment.

Dr W Abeyewickreme
Chairman
Central Environmental Authority

MESSAGE OF DIRECTOR GENERAL

Regulations with respect to Hazardous Waste Management were gazetted on 23rd of May 1996 by the extra ordinary gazette No 924/13. Nevertheless, these regulations were not fully implemented yet due to a number of practical problems especially lack of facility for identification and classification of waste and more importantly the absence of environmentally sound final disposal facility in the country. Having identified the difficulties and draw backs of the previous regulations an amendment had come into force in the form of a prescribed list of waste to facilitate the easy implementation by the extra ordinary gazette No. No 1534/18 dated 01 February, 2008.

The CEA had developed Guidelines on Hazardous Waste Management (HWM) in order to facilitate the implementation of Regulations on HWM in 1999. But the content of this guideline is not compatible with the amendment to the existing regulation and with the new technologies and administrative procedures. Therefore these guidelines have prepared in accordance with the new regulations with the assistance of the Technical Expert Committee appointed in this regard.

The objective of these guidelines is to ensure the public protection and to minimize the cumulative impact on the environment and the CEA look forward the cooperation of all respective parties to achieve this goal through adherence to these guidelines.

Finally on behalf of the CEA I wish to acknowledge the members of Technical Expert Committee and the stakeholders who gave their cooperation and technical support in developing these guidelines.

Pasan Gunasena
Director General
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Experts and representatives of the stakeholder institutions participated in the stakeholder consultation workshop held on 09 September 2008 on finalizing these guidelines.

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ABBREVIATIONS AND ACRONYMS

BOI	-	Board of Investment
CEA	-	Central Environmental Authority
EIA	-	Environment Impact Assessment
EPL	-	Environmental Protection License
NEA	-	National Environmental Act
PAA	-	Project Approving Agency
PBB	-	Poly Bromineted Biphenyl
PCB	-	Poly Chlorinated Biphenyl
PH	-	Measure of the acidity or alkalinity of a solution
PP	-	Project Proponent
PPE	-	Personal Protective Equipment
PCT	-	Polychlorinated Teryphenyls
POHC	-	Polycyclic Organic Hydrocarbon
SWML	-	Scheduled Waste Management License
SSI	-	Site Sensitivity Index
TLV	-	Threshold Limit Value
TOC	-	Total Organic Carbon

PREAMBLE

According to some particular studies and estimations it was revealed that, about 50,000 MT of hazardous waste (HW) is annually generated in Sri Lanka quantity wise. Most of these hazardous waste are disposed in hap hazard manner in unsuitable locations mostly with general municipal solid waste. These malpractices lead to create severe environmental and health impacts.

Being a signatory of the Basel Convention of the trans-boundary movement of the hazardous waste, Sri Lanka has taken some vital actions as per the obligations of the convention that all signatory countries should develop and implement including necessary legal provisions to a proper management of hazardous waste in the country.

In order to streamline and enhance the effectiveness of the regulatory mechanism for hazardous waste management in the country, the Government of Sri Lanka has framed regulations for the Management of Hazardous Waste in 1996 as an amendment to the National Environmental (Protection & Quality) Refulation No 1 of 1990. This was done by publishing Part II in the Gazette Extra ordinary No 924/13 dated 23 May, 1996 as an extension of the Environmental Protection Licencing procedure.

Having identified the importance of a comprehensive guidance document for the general public for the Hazardous waste Management in order to facilitate the implementation of the regulations, a set of guidelines were prepared and published by the CEA in 1999 with the assistance of Government of Norway through NORAD.

However, these regulations were not fully implemented yet due to a number of practical problems; especially lack of laboratory facility for identification and classification of waste in Sri Lanka and more significantly the absence of an environmentally sound final disposal facility in the country.

In order to overcome the identified difficulties and draw backs of the current regulations, this regulation was further amended as National Environmental (Protection & Quality) regulation No. 01 of 2008 by the gazette notification No 1534/18 with a prescribed list of waste which refers as scheduled waste to facilitate the easy identification of Waste types which should follow this regulation with out undergoing expensive analytical methods. Subsequently the guideline has to be updated in order to facilitate the implementation of amended regulation.

As a prelude to the effective implementation of these regulations, the need for set and updating of guidelines for the proper management of scheduled waste was realized. This need has also been recognized in the Regulations, specifically Regulation 26(1) and (2) states;

(1) The Authority (CEA) shall have power to specify guidelines from time to time, for-

a) the establishment of Scheduled Waste disposal sites;

b) safety measures to be adopted during generation, collection, transportation, storage, recovery, recycling or disposal of waste;

c) operations regarding recycling or recovery of waste.

(2) The guidelines as specified under paragraph (1) shall wherever possible be published in the gazette and other wise be made available to the public.

The task to update the existing guidelines was entrusted to a multidisciplinary committee comprising of all the stakeholders by the Central Environmental Authority.

Subsequently, a Working Group consisting representatives from Central Environmental Authority, Industry Technology Institute, Board of Investment, Ministry of Health, National Cleaner production Centre National Chambers of Industries was appointed to execute the task under the supervision of the main committee.

These guidelines are intended to meet the needs of a wide range of government officials, industry managers and environment protection associations, by providing information on the management of scheduled waste.

NB: It should be noted that these guidelines are indicative and are only meant for guidance and any information, in full as parts thereof contained in this document should not be used for any legal purpose. Application of any appropriate environmentally sound technology regardless of the technologies suggested is promoted as long as it could meet the relevant regulatory requirements and the standards stipulated by the CEA.

SECTION 01
LEGAL REQUIREMENT

1.1. GENERAL

1.1.1 As per the Part II of the National Environmental (Protection and Quality) Regulations No.1 of 2008 a Scheduled Waste Management Licence (SWML) should be obtained from the Central Environmental Authority for the Management (Generate, Collect, Transport, Store, Recover, Recycle or Dispose waste or establish any site or facility for the disposal) of waste specified in the Schedule VIII of the regulation.

1.1.2 License and compliance - please refer the Part 11 of the National Environmental (Protection & Quality) Regulation No. 1 of 2008, as amended by the gazette notification No. 1534/18 dated 01.02.2008. (Annex 02)

1.1.3 Industries /facilities who generate scheduled waste (Annex. 01 - Possible Generators of scheduled waste with hazardous characteristics) should obtained SWML as generator other then the Environmental Protection Licence (EPL) should be get for the activities set out in the Schedule in Gazette (Extra Ordinary) No. 1533/16 dated 25th January 2008.

1.1.4 The noise levels shall be maintained at the boundaries of the site as stipulated in the Gazette (Extra Ordinary) No. 924/12 dated 23rd May 1996.

1.1.5 Effluents or leachate quality should be monitored and treated to conform to the standards / tolerance limits as mentioned in the Part III of National Environmental (Protection and Quality) Regulations No.1 of 2008 - Gazette (Extra Ordinary) No. 1534/18 dated 01st February 2008.

1.1.6 Prior approval for the building plan (Construction Plans) needs to be obtained from the relevant Local Authority as same as approvals should be taken in other relevant Authorities or Agencies.

1.1.7 BOI projects should apply through the BOI.

1.1.8 Industries or any person willing to export their waste listed in the list A of the Basel Convention (BC) (the list available in the web page, www.basel.int) should submit their request with the duly filled Basel Notification Document (Annexure 03) to the CEA in order to obtain the concent of the importing country and the transiting countries if any as per the stipulated procedures of the BC.

1.1.9 An environmental recommendation should be obtained from the Central Environmental Authority prior to initiate any Scheduled Waste Management activity.

1.1.10 If any of the Scheduled Waste Management facilities or any Industrial Projects mentioned in the scheduled hereinafter meets the requirement of the Gazette (Extra Ordinary) No. 772/22 of 24th June 1993 and the subsequent amendments, then it shall follow the Environmental Impact Assessment Process in order to obtain the environmental clearance.

1.1.11 In case of the absence of any local standerds, Industrialis are advised to comply with the International standerds recommended by the CEA.

1.2 SITE APPROVAL PROCEDURE/ REGULATORY APPROVALS/ ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

1.2.1 The National Environmental Act No. 47 of 1980 (NEA) is the basic National Charter for Protection and management of the environment in Sri Lanka.

1.2.2 The NEA was amended by Act No. 56 of 1988 to include a provisions relating to Environmental Impact Assessment contained in Part IV C of the statute specifying "Approval of Projects".

1.2.3 Under the provisions of section 23Z of the NEA the EIA process applies only to "Prescribed Projects" (PP) which have been specified in Gazette Extra-Ordinary No. 772/22 of 22.06.93 and implemented throughout designated Project Approving Agencies(PAA)

1.2.4 Construction of waste waster treatment plants treating toxic or hazardous waste is a prescribed project as per the section 23Z of the NEA and it requires approval under the provisions of Part IV C of NEA.

1.2.5 The project proponent of a proposed hazardous waste treatment and disposal facility should commence the EIA process as close as possible to the time that it develops the proposal.

1.2.6 For projects directly undertaken by public entities, the EIA should be prepared at the feasibility or pre-feasibility stage. The EIA may be supplemented at a later stage if necessary.

1.2.7 For applications by private proponents to the PAA, appropriate environmental assessments should be commenced immediately after application and preliminary information are received as early in the planning stage as possible.

1.2.8 EIA serves as a valuable tool for identification, prediction and evaluation of impacts arising out of proposed hazardous waste treatment disposal facility.

1.2.9 The major steps in the EIA process are described below;

Step I- Preliminary Information

A project proponent is required to give the PAA preliminary information on the proposed prescribed project as early as possible. It should include a description of the nature, scope and location of the proposed project accompanied by location maps and any other details as may be required by the PAA. The preliminary information submitted should be comprehensive and may even suffice to be considered as an IEE.

Step II- Environmental Scoping

Environmental scoping is the process of identifying the important issues which must be addressed in detail in the IEE/EIA. Environmental issues involve national, regional and local government agencies and cover a broad range of responsibilities (wild life, health, water, land use, tourism etc). Thus co-ordination among government agencies and the public is crucial.

This is best achieved through Inter-Agency scoping meetings to identify issues, types of analyses and mitigatory measures to be considered.

Step III- Public Participation

The involvement of the public is one of the most crucial aspects of the EIA process. The provision for public participation is contained in the NEA. The notice of availability of the IEE/EIA Report for public review must be inserted in one newspaper each in the Sinhala, Tamil and English languages and in the gazette. 30 days are allowed for public review.

Once the public comment period is over the PAA must decide whether the case warrants a public hearing. The public comments received during the 30 day period must be sent back to the project proponent for review and response.

The project proponent must respond to comments by making every effort to modify alternatives including the proposed action, develop and evaluate alternatives not provided, give serious consideration to providing supplementary information in the document and make factual corrections. All substantive comments received on the draft should be attached to the final statement.

Step IV- Decision making

According to the regulations, the PAA shall grant approval for the project subject to specified conditions or refuse approval for the implementation of the project with reasons for doing so.

A project proponent who is aggrieved by a refusal can appeal to the Secretary of the Minister in charge of the subject of environment. A member of the public aggrieved by a decision to grant approval for a project would have to seek recourse in courts.

Step V- Monitoring

The success of the EIA process would be totally negated if the conditions imposed by the PAA are not effectively monitored. The regulations state that the PAA should forward to the CEA a report which contains a plan to monitor the implementation of every approved project within 30 days of granting such approval.

Monitoring by the PAA would involve compliance with conditions and the effectiveness of the mitigatory measures.

SECTION 02
GENERATION & ON-SITE STORAGE OF SCHEDULED WASTE

2.1 APPLICABILITY

These guidelines shall apply to the Generator of Scheduled Waste specified in schedule VIII of Part 11 of the National Environmental (Protection & Quality) Regulation No. 1 of 2008, as amended by the gazette notification No. 1534/18 dated 01.02.2008.(Annex 02)

The waste generator who generates and stores scheduled waste needs to have a system to safely store waste until it can be transferred for further storage, treatment or disposal.

2.2 HAZARDOUS WASTE IDENTIFICATION

A Generator, who generates hazardous waste, should first ascertain whether the waste is listed as scheduled waste and identify their characteristics (See Annexure 1- Possible Generators of scheduled waste with hazardous characteristics)

2.3 RESPONSIBILITIES OF THE GENERATOR

2.3.1 Generator of hazardous waste should obtain a license for Scheduled Waste Management from the CEA & should apply as per the form A of the regulation (Annex 2).

2.3.1 The generator who produces waste or is in possession or control of waste, shall inform the Authority

a) On or before the 31st day of July and the 31st day of January each year, the quantity and characteristics of waste generated or produced or in possession or control of or exported as the case may be, in the previous six months and estimate the quantity and composition of waste that might be so generated or produced or in possession or control of or be exported as the case may be for the ensuing year, including information on process modifications and changes in chemical usage and

b) Of the measures adopted to apply technologies for the reduction or elimination of the generation or production or the possession or control of waste including method adopted for treatment and final disposal of such waste.

2.3.3 The following procedure should be followed in managing the scheduled waste

a) Identification of quantity and characteristics of scheduled waste

b) Proper labeling and marking of containers used to store, transport or dispose of scheduled waste

c) Use of appropriate containers for storage

d) Use secure place for storage

e) Furnishing of information regarding the waste to persons who store, transport, treat & dispose of this waste

f) Use of a declaration system/chain of custody document

g) Training of personnel for handling and proper storage of scheduled waste

h) Provide safety measures for handling of scheduled waste

i) Possessing a public liability insurance cover adequately covering the risk or damage that may be caused to the public as a result of generation/storage of scheduled waste

j) An obligation to deliver the scheduled waste to collectors, transporter or treatment/ disposal facilities that have obtained the licence issued by the CEA as per the regulations.

2.4 ON SITE STORAGE REQUIREMENTS

2.4.1 General Requirements

a) A generator who is generating scheduled waste may store his waste on-site for a maximum period of 90 days or a maximum quantity of 10,000 Kilograms, if permitted by the CEA for on-site storage. An extension in the storage time may be allowed by the CEA on a case-by-case basis.

b) A generator should not store his scheduled waste in the open ground. It must be stored in closed containers or in a contained area. This shall be in accordance with storage requirements for hazardous waste (Refer Section 4.4)

c) The generator should mark each container holding scheduled waste with appropriate labeling (Refer Section 2.5.2)

d) The storage system should provide for orderly stacking and shelving with sufficiently wide gangways in order to minimize the risk of mechanical damage from handling the waste container.

e) Floor space including gangways between stacks and shelves should be kept clear and uncluttered for easy inspection and good ventilation.

f) Stacking heights must be limited to the maximum tolerable without causing damage to the lower packs, the use of pallet racks of shelves is recommended.

g) The storage area should be fenced properly and a sign of "Danger and Limited Access" should be placed at the storage site.

h) The generator should have and use the required safety devices like safety mask, goggles, hand gloves, gumboots, etc., for handling the scheduled waste.

2.4.2 Requirements for semi-solid and solid scheduled hazardous waste

The waste should be placed in closed containers or in a contained area. The containers, holding scheduled waste, should be in condition and made of material, which can withstand the physical and environmental conditions during storage and transportation. If the generator is in doubt of suitability of the container for storage of waste, he should consult the Authority to check the integrity of the container.

2.4.3 Requirements for sludge

It is recommended to dewater the sludge prior to storage and subsequent operations by an appropriate dewatering system and handled like semi-solid and/or solid scheduled waste.

2.4.4 Requirements for liquid hazardous waste

Secondary containment system should be designed and installed so that no waste is released to the surrounding in case of tank failure. refer section 4.4.2

2.4.5 Compatibility of waste with containers

The generator should use a container made of or lined with materials, which will not react with, and are otherwise compatible with the scheduled waste to be stored, so that the integrity of the container to contain the waste is not impaired. Guidance for selection of container types for different types of Scheduled waste are given in table 2.1

Waste	Container	Bulk Tank
Inorganic Waste		
Conc., Sulphuric Acid dil. Sulphuric Acid	Mild steel polypropylene	Mild steel, Polypropylene*, Stainless steel, Epoxy coated mild steel
Hydrochloric Acid	polypropylene	Polypropylene*, Epoxy coated mild steel
Chromic Acid	polypropylene	Polypropylene*, Epoxy coated mild steel
Other halogen acids	Teflon, hastelloy	hastelloy, Epoxy coated mild steel
Inorganic alkalis Heavy metal solutions	Polypropylene Polypropylene	Mild steel, Polypropylene*, Epoxy coated mild steel
Heavy metal sludge	mild steel, epoxy coated mild steel	Mild steel Epoxy coated mild steel
Solid waste contaminated with inorganic materials	Depends upon contaminants	Depends upon contaminant(s)
"Empty" containers	Polypropylene/ mild steel bins	Concrete storage areas coated concrete areas
Oil waste	Mild steel, stainless steel	mild steel, stainless steel
Solvent waste	Stainless steel, coated mild steel, plastics	Stainless steel, coated mild steel
Paints, varnishes etc.	Mild steel, stainless steel, polypropylene	mild steel, stainless steel
Agrochemicals ** Pharmaceuticals ** Wood preservative waste	)mild steel)stainless steel)coated mild steel	)mild steel)stainless steel)coated mild steel
PCB s, PBBs, PCTs	Coated mild steel Stainless steel	Coated mild steel Stainless steel
Other Waste		
Asbestos	Polyethylene sacks mild steel drums	
Plastic resin waste	Polypropylene *** mild steel	
Sludge	Above ground concreted pit with impervious liner	

* often g.r.p.(fibre) glass reinforced plastic.
**generally dependant upon the base material (water, solvent etc.)
*** provided waste is not hot

Table 2.1 Guidance for selection of container types for different types of Scheduled waste

2.4.6 Management of containers

It is recommended to keep the containers next to the waste generating process (satellite collection points) until full, then moved to a waste storage area awaiting further transfer.

Containers for temporary storage should be designed to hold the waste for the period between collection events.

It is necessary to ensure that the waste generation area is not overloaded with the containers and the actions shall be taken to remove them to the temporary storage site on time.

A container holding scheduled waste should always be closed during storage, except when it is necessary to add or remove waste.

Only properly cleaned containers and transport vehicle should be used for storage and transport of scheduled waste. Empty containers, which had contained raw material, may be suitable for storing waste, depending on the compatibility of waste with the container and with any residue, which may be left in the container.

A generator transporting scheduled waste in containers shall ensure that they are provided with adequate closing system and, when necessary provided with sufficient cushioning and absorption material. All cushioning and absorbent material used in containers must be compatible with the scheduled waste.

A generator transporting scheduled waste in containers shall also ensure that its contents are so limited, that under conditions normally incident to transportation:

a) there will be no significant release of the hazardous materials to the environment by leakage or otherwise;

b) the effectiveness of the packaging will not be substantially reduced: and

c) there will be no mixture of gases or vapours in the package which could through any credible spontaneous increase of heat or pressure, or through an explosion, significantly reduce the effectiveness of the packaging.

Usages of tanks are recommended for accumulating waste that is easily handled by bulk materials handling systems such as pipelines, chutes or belt conveyers.

2.4.7 Special requirement for flammable or reactive waste

Containers holding flammable or reactive waste should be stored at least 15 metres (50 feet) away form the plant operational area and any human settlement. "No Smoking" and "Flammable" signs should be placed conspicuously wherever ignitable or reactive waste is stored.

Containers holding the waste other than ignitable or reactive should be stored at least 6 metres (20 feet) away from the plant operational area.

2.4.8 Special requirements for non-compatible waste

Non - compatible waste and material should not be mixed in the same transportation or storage container. Table 2.2 - Compatibility of Selected scheduled Waste summarizes the undesirable reactions which can occur when incompatible waste containing hazardous components are mixed together. This is intended as a guide to generators and operators of storage, treatment and /or disposal facilities and to the regulatory authorities to indicate the need for special precautions when managing these potentially non-compatible waste materials or components.

Scheduled waste should not be placed in unwashed containers that previously held any chemical material or non-compatible waste.

A storage container holding scheduled waste that is non-compatible with any waste or other materials stored nearby in other containers, piles open tanks, or surface impoundments should be separated from other materials or protected from them by means of a dike, wall or other suitable device.

E	-	Explosive
F	-	Fire
GF	-	Flammable Gas
GT	-	Toxic Gas
H	-	Heat Generation
S	-	Solubilisation of Toxins

1	Oxidising Mineral Acids	1										
2	Caustics	H	2									
3	Aromatic Hydrocarbon	H F		3								
4	Halogenated Organics	H F GT	H GF		4							
5	Metals	GF H F			H F	5						
6	Toxic Metals	S	S				6					
7	Sat. Aliphatic Hydrocarbon	H F						7				
8	Phenols and Cresols	H F							8			
9	Strong Oxidising Agents		H	H F		H F		H		9		
10	Strong reducing Agents	H F GT			H GF				GT H	H F E	10	
11	Water and mixtures containing waste	H			H E		S				GF GT	11
12	Water Reactive Substances	←			Extremely reactive, do not mix with chemical or waste material					→		12

Table 2.2- Compatibility of Selected scheduled Waste

2.5 PRE-TRANSPORT REQUIREMENTS

Whenever any scheduled waste is offered for transportation certain measures should be taken to ensure that the scheduled waste is properly packaged and the potential risks are adequately communicated to all who may come in contact with the waste in the course of transport. The generator shall follow the following provisions/ requirements with respect to packaging, labeling and marking, before transporting his waste.

2.5.1 General Packaging Requirements

Packaging materials and contents shall be such that there will be no significant chemical or galvanic reaction among any of the materials in the package.

The closing system shall be adequate enough to prevent inadvertent leakage of the contents under normal conditions incident to transportation.

Polyethylene materials used in packaging must be of a type compatible with the waste and may not be permeable to an extent that a hazardous condition occurs during transportation and handling.

Each package must be with its filling holes up and the pack should be marked **"THIS SIDE UP"** or **"THIS END UP"** to indicate the upward position of closures.

The packaging should be secure enough to prevent leaks, spills, and vaporization during transportation. Following are the suggested packaging for hazardous waste;

- Waste oils and solvents: 200 litre steel tight head drums or steel tankers
- Solid or semi-solid organic waste : 200 litre steel clamp-lid drums
- Inorganic liquid waste:30lt., 45lt. or 200 litres plastic cans or polyethylene tanks and
- Inorganic solid and sludge: 200liter steel or plastic clamp-lid drums.
- Stainless steel tanks for bulk liquids
- Pallets for drums

2.5.2 Marking and labeling of containers

A generator who transports or offers for transportation of scheduled waste must mark the containers with the words **"HAZARDOUS WASTE"** in bold letters in Sinhala, Tamil and English in addition to the information given in **Figure 2.1.**

HAZARDOUS WASTE

HANDLE WITH CARE

Waste Code:

Waste Content:

Total Volume: Kg/Litre

Waste origin	Waste destination
Organization Name & Address:	Organization Name & Address:
Tel No.:	Tel No.:
Telefax:	Telefax:
Contact Person:	Contact Person:

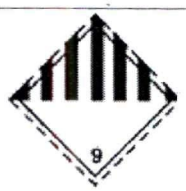
Figure 2.1 -Schematic format of a Label

1. The background colour of the label should be yellow fluorescent
2. Size of the label should be 6"X6"
3. The words **"HAZARDOUS WASTE"** and **"HANDLE WITH CARE"** should be prominent and written in red colour
4. The label should be of non-washable material

The generator should ensure that all the containers are clearly labeled with the type of waste and their hazard characteristics such as explosive, flammable, corrosive, reactive etc.

Figure 2.2 - Hazard waning symbols

Hazard Characteristic	Symbol	Description
Class 1 Explosive		Symbol (Exploding Bomb): Black Background: Light orange
Class 3 Flammable Liquid		Symbol (Flame): Black or white Background: Red
Class 4.1 Flammable Solid		Symbol (Flame): Black Background: White with vertical red stripes
Class 4.2 Self-igniting Compounds		Substances liable to spontaneous combustion Symbol(Flame): Black Background: Upper half white; lower half red
Class 5.1 Oxidising Compounds		Symbol (Flame over Circle): Black Background: Yellow
Class 6.1 Toxic Compounds		Poisonous (toxic) substances Symbol(Skull and crossbones): Black Background: White
Class 6.2 Infectious and Disgusting Acting Compounds		Symbol (Three Crescents Superimposed on a circle): Black Background: White

Class 8 Corrosives		Symbol (Liquids, Spilling from two glass vessels and attacking a hand and a metal bar): Black Background: Upper half white; lower half black
Class 9 Mixtures of Miscellaneous, Dangerous Compounds		Symbol (nil); Background: white with upper half vertical black stripes

Types of Waste	**Hazard Class**
Cyanide Waste	Toxic
Heavy Metal bearing waste	Toxic, Corrosives Oxidizing substance
Non-halogenated Hydrocarbon Including solvents	Combustible, Toxic Flammable Liquid Corrosives
Halogenated hydrocarbon including solvents	Combustible, Toxic Flammable Liquid
Waste from paint pigment, glue varnish & Printing inks	Flammable Solids Combustibles
Waste from Dyes & Dye intermediate ontaining inorganic chemical compounds	Toxic, Flammable Solids, Corrosive
Waste from Dyes & Dye intermediate containing organic chemical compounds	Toxic, flammable Solids, Dangerous when wet
Waste oil & oil emulsions	Flammable Liquid
Tarry waste from refining & tar residues form distillation or pyrolytic treatment	Flammable solids/ Liquid, Combustible

Sludge from waste water treatment, incineration ash	Toxic, Dangerous when wet
Phenols	Toxic
Asbestos	Toxic
Waste from pesticide & herbicide manufacturing and residues form formulation units	Flammable Solids/ Liquid, Toxic, Combustible
Acid/alkaline/slurry waste	Corrosive, Oxidizing substance
Off-specification & discarded products	Toxic
Discarded containers & liner of hazardous & toxic chemicals & waste	Dangerous

Table 2.3 A broad classification of Hazard class for different Waste Categories Sources: Hazard Class Label, Motor Vehicle Act, 1988, Govt. of India.

2.5.4 Reuse of containers

a) Containers used more than once (refilled and reshipped after having previously emptied) must be in such condition, that they comply in all respects with the prescribed requirements for those containers as mentioned in paragraphs 2.5.1 and 2.5.2 of this part.

b) Containers previously used for any hazardous material having old markings and labels must be thoroughly removed or obliterated before being reused for scheduled waste.

c) The containers specified for single trip containers and non - reusable containers from which contents have been removed must not be used for the transportation of scheduled waste and must be disposed off properly.

d) Cylinders and/or containers used in anhydrous hydrofluoric acid must not be used in any other service.

e) Each container must be inspected for deterioration or defects. All closing devices and parts must be removed (if possible), inspected for defects and replaced if necessary.

2.6 DECLARATION, RECORD KEEPING AND REPORTING

2.6.1 Declaration

Activities generation hazardous waste are obliged to deliver the waste to an approved scheduled waste collector/transporter. All deliveries shall be accompanied by a declaration.

The declaration form consists of different fields which are to be completed by the various parties. (Annex - 3)

The waste generator shall complete the 1st part of the form with information about the company and the waste and if necessary, enclose other information such as product date sheets.

All scheduled waste collectors/transporters subsequently handling the waste shall complete the 2nd part of the form.

The declaration form consists of 5 copies and the waste generator receives a copy of the copy no. 5 (blue copy) in receipt of delivery of waste.

Before signing the form as acknowledgement of receipt, the scheduled waste collector shall check that the waste generator has filled in the form sufficiently and that the packaging is marked according to the relevant rules.

2.6.2 Record Keeping

A generator shall keep a copy of each declaration signed until he receives a signed copy from the designated facility which received the waste. The generator should keep the signed copy as a record for at least three years from the date the waste was accepted by the waste disposer.

A generator shall keep records of any test result, waste analysis, or other determination made for at least three years from the date that waste was last sent to on-site or off-site treatment, storage or disposal.

The generator shall maintain a daily record of his waste generated. The record should contain:

- Date, quantity and source of generation
- Physical state/ consistency of waste
- Type of waste category as per schedule VIII of part II of the Environmental (Protection & Quality) Regulation No.01 of 2008 as amended by the gazette notification dated 01.02.2008.

2.7 OCCUPATIONAL HEALTH AND SAFETY CONSIDERATION

The key preventive action from the health and safety stand point is to avoid exposure to the waste. This can be achieved by a combination of:

- well-designed operating procedures
- personal protective equipment
- pre-operational training
- constant supervision
- working procedure review

A list of personal protective equipment appropriate for a stock handling and disposal exercise is given below:

- nitrile or PVC aprons
- nitrile or neoprene gloves (particularly if solvents are involved)
- rubber boots(steel toed if drum moving is involved)
- cotton coveralls
- PVC one-piece chemical protection suits
- face shields
- dust masks
- goggles
- half-face respirators with organic vapour cartridges
- spare cartridges and inlet / exhaust valves for respirators towels

Medical monitoring and treatment equipment are depending on the products concerned by could include:

- comprehensive first aid kit
- eye wash
- appropriate antidotes and therapeutic drugs
- biomedical monitoring equipment

2.8 FIRE PRECAUTIONS

All electrical equipment including wiring should be maintained in safe condition and checked regularly.

Adequate fire fighting equipment must be provided and strategically located. They must be regularly tested to check their condition.

Material necessary for firefighting, spill control and decontamination should always be on hand. Sufficient water must be available constantly. Buckets of sand are also useful.

Arrangements should be made with the local fire brigade to provide immediate assistance in the case of a major fire. The brigade must be informed beforehand of the nature of chemicals stored.

Easy access to fire brigade and other emergency services should be provided within the site.

2.9 EMERGENCY PREPAREDNESS PLAN

A generator who is generating scheduled waste specified in schedule I of Part II of the regulation should draw an emergency preparedness plan for on-site storage and transportation of this waste.

The emergency plan should be so designed that it minimizes hazards to human health or the environment from fire, explosions or any unplanned sudden or non-sudden release of scheduled waste or scheduled waste constituents to air, soil or surface water.

The provisions of the plan must be carried out immediately when ever there is a fire, explosion or release of scheduled waste or scheduled waste constituents which could threaten human health or the environment.

In case, a generator is already having an emergency preparedness plan for his unit then appropriate provisions should be made in that plan in order to meet any emergency situation from scheduled waste.

2.9.1 Contents of Emergency Preparedness Plan

The emergency preparedness plan must describe the actions that personnel must take in response to fires, explosions, or any unplanned sudden or release of scheduled waste and toxic waste or its constituents to the environment.

The plan must describe arrangements in accordance with the concerned authorities such as Police, Fire Service, CEA etc., Drills and tests need to be conducted at regularly scheduled intervals to test the plan and to ensure employee preparedness.

The plan must list names, addresses, and phone numbers (office and home) of all persons responsible for acting as emergency coordinator and this list must be kept up to date.

The plan must include a list of all emergency equipment such as, fire extinguishing systems, spill control equipment, communications, and alarm systems, and decontamination equipments which are required and available.

2.9.2 Emergency Procedure in Case of Accident

A generator who is transporting or offering for transportation of scheduled waste must inform the transporter about the emergency procedure to be followed in case of accident. The information should include:

a) The kind of hazard that may occur.

b) Precautionary measures to be taken in case of emergency.

c) The follow-up actions to be taken as described under Section 03 - of Guidelines for Collection and Transportation of scheduled waste.

2.10 ADMINISTRATIVE GUIDELINES

In order to have a proper control over scheduled waste management the authority should specify the generator of scheduled waste:

I. To keep a complete record of the types, quantities, and characteristics of scheduled waste.

II. To segregate scheduled waste at source from non- scheduled waste.

III. To transport scheduled waste only through the specified and licensed transporters.

IV. To fulfill the pre-transport requirements before transporting scheduled waste.

V. To dispose of scheduled waste only at the notified disposal facilities.

VI. The authority may allow the generator to store his scheduled waste on-site a maximum quantity of 10,000 kilo grams for a maximum period of 90 days.

VII. If generator generates less than 1,000 kilograms of scheduled waste in a calendar month, he may be considered as a small quantity generator. Such type or generators may be allowed to store their waste on-site for a maximum period of 180 days. In any case, the quantity of waste should not exceed 6,000 kilograms at any given point of time.

VIII. The authority may provide an extension in the storage period to the generator, on case-by case basis.

IX. In case of any unforeseen, temporary, and uncontrollable circumstances, the authority may grant an extension to 90-day or 180-day or 270-day (which ever the case may be) in the on-site storage period after receiving written application form the generator.

X. A generator who generates less than 1,000 kilograms of scheduled waste in a calendar month and who stores scheduled waste more than 10,000 kilograms or store hazardous waste more than 90-days, or 180-days or 270-days, as the case may be, should be considered as an operator of a storage facility, unless an extension has been provided by the CEA. Under these circumstances, the guidelines for the Operator of Hazardous Waste Storage, Treatment and Disposal Facility, described in part-3 of this document should be applicable.

XI. A generator may be allowed to store not more than one day's quantity of semi-solid scheduled waste at a time in containers at or near the source/point of generation, which is under the control of the operator of the process generating the waste. In any case, the container should have marking of the words **"HAZARDOUS WASTE"** in Sinhala, Tamil and English.

XII. At all times there must be at least one employee either on the premises or on call (i.e. available to respond to an emergency within a short period of time) with the responsibilities for coordinating all emergency response measures specified in paragraph 2.9 of this part.

XIII. In order to track the scheduled waste from the source of generation to the final disposal points, the authority should introduce the waste declaration system. This system would not only help the regulatory authorities in tracking the scheduled waste but also would ensure safe disposal of the waste. The declaration system would serve as a "chain of custody document".

SECTION 03
COLLECTION AND TRANSPORTATION OF SCHEDULED WASTE

3.1 APPLICABILITY

These guidelines shall apply to the persons collecting and/or transporting scheduled waste within the Democratic Socialist Republic of Sri Lanka by road.

It shall apply to the person collecting and /or transporting scheduled waste from the point of generation to off-site storage, treatment and /or disposal facility.

Collector and transporter of scheduled waste should follow the Part 11 of the National Environmental (Protection & Quality) Regulation No. 1 of 2008.

These guidelines will not be applicable to on-site transportation of scheduled waste by the generator and operator/owner of permitted scheduled waste management facility.

It shall also apply to the importer/exporter of scheduled waste.

3.2 RESPONSIBILITIES OF COLLECTOR AND/OR TRANSPORTER

3.2.1 A person collecting and /or transporting scheduled waste should obtain a license for scheduled waste management (pl refer Section 01)

3.2.2 A person collecting and /or transporting scheduled waste from the source of generation to off-site facility should bear the following responsibilities:

a) To check proper labeling and marking on the containers before loading onto the vehicle.

b) To check the conditions of the containers for the suitability of transportation.

c) To ensure that flammable, reactive, or non-compatible waste are not being transported along with the other waste.

d) To provide adequate training to the drivers and helpers regarding handling and transportation requirements of scheduled waste.

e) To provide necessary equipment for any emergency situation and also training of drivers and helpers regarding handle the emergency situation and use of equipment.

f) To provide special lining, cushioning, shock absorbers etc. to the vehicles engaged in transporting scheduled waste.

g) To deliver the scheduled waste to the designated facility mentioned in the declaration form.

h) To keep record of transported scheduled waste.

i) To transport and deliver the waste to the designated facility without any undue delay.

3.3 THE DECLARATION SYSTEM

3.3.2 Declaration

Activities generating scheduled waste are obliged to deliver the waste to an approved scheduled waste collector/ transporter. All deliveries shall be accompanied by a declaration.

The declaration form (Annex IV) consists of different fields which are to be completed by the various parties. The waste generator shall complete the main field of the form with information about the company and the waste. All scheduled waste collectors/ transporters subsequently handling the scheduled waste, shall complete their respective spaces on the form.

The 2nd part (cage 18-23) of all 05 copies has to be filled by the transporter and hand over White & pink (1st & 2nd) copies to the generator & keep rest of the 03 copies (green, yellow & blue) to be handed over to the disposal facility or the destination facility at the delivery of waste.

The 3rd part (cage 24-32) of all 03 copies has to be filled by the facility destination /disposer and hand over the green copy to the transporter.

Before signing the form as acknowledgement of receipt, the scheduled waste transporter/collector shall check that the waste generator has filled in the form sufficiently and that the packaging is marked according to the requirements.

3.3.3 Compliance with the declaration

The transporter must deliver the entire quantity of scheduled waste which he has accepted from the generator to the designated facility listed on the declaration.

If the scheduled waste cannot be delivered to the designated facility because of any emergency that prevents delivery, the transporter must contact the generator for further directions and must act only as per the directions of generator.

A transporter should not accept scheduled waste from a generator unless it is accompanied by a declaration, signed by the generator or importer.

Before transporting scheduled waste, the transporter should sign and date in the declaration acknowledging acceptance of the scheduled waste from the generator. The transporter should return a signed copy (copy no. 05) of the declaration to the generator before leaving the generator's premises.

A transporter who delivers a scheduled waste to the designated facility should;

a) Obtain the date of the delivery and the signature including company's stamp of the operator of the designated facility on the declaration.

b) Retain one copy of the declaration for his record

c) Give the remaining copies of the declaration to the * designated facility.

* Facility which store or recover or recycle or treat and dispose of Hazardous Waste

3.4 SAFETY REQUIREMENTS FOR VEHICLES

a) The vehicles should be of high standard of design and construction. In the case of vehicles carrying packaged scheduled waste, the flatbed or van body should be constructed to enable containers to be effectively secured on and prevent their movement during transportation. Open top vehicles shall never be used for transportation.

b) With respect to bulk solid/semi-solid waste, the vehicles (or bulk containers) should be designed to prevent spillage of waste during transportation. If bulk solid containers are carried on vehicles then the vehicles must have an effective means of securing those containers to prevent movement during transportation.

c) With respect to bulk liquid transportation, the containment tank must be designed to effectively contain the material being carried. The tank material must be resistant to attack from the materials being carried. All valves, pumps and other equipment must be located in positions that minimize risk of damage and be protected from crash damage.

d) If bulk liquid containers are carried on vehicles then the vehicles must have an effective means of securing those containers to prevent movement during transportation.

e) All vehicles carrying dangerous goods should carry signs indicating the general nature of the material carried, the principal hazards, risk phrases and contact information in the case of emergency.

f) In addition to any other signs or symbols required under any other law, the following statement should be displayed as plainly visible notice in Sinhala, Tamil and English on the vehicle used for transportation. " Warning, contains waste, dangerous to human health and the environment "

g) Vehicles should be equipped with personal protective equipment (PPE) commensurate with the nature of the waste being carried. This will include portable fire extinguisher, safety goggles, gas mask, respirators, gum boots, hand gloves, splash suits, eye-wash bottle and first aid kit.

3.5 SPECIAL REQUIREMENTS FOR DRIVER

a) A transporter should provide special training to the drivers of the vehicle for handling and transporting scheduled waste e.g the use of declaration system, etc.

b) The drivers should be adequately trained in using the emergency equipments such as fire extinguisher, gas mask, first aid kit, etc.

c) A driver who transports scheduled waste should be well acquainted about the procedure to be followed in case of an emergency during transit.

d) A driver who delivers scheduled waste to the designated facility should be instructed by the transporter about thorough cleaning /washing of the vehicle before leaving the facility premises.

3.6 ACCIDENTAL SPILLAGE OF SCHEDULED WASTE DURING TRANSIT

3.6.1 Immediate action

If there is a transport accident resulting in leakage or spillage of the scheduled Waste, two distinct actions are required, i.e.,

01. Emergency action must be taken to contain the spilled material and
02. To prevent further uncontrolled spillage or leakage.

These emergency actions are normally initiated by the driver (depending on the scale of incident without compromising the personal safety) of the vehicle and executed by emergency services personnel with adequate training.

The driver of the vehicle should take following actions to minimize the adverse effects on environment:

- Immediately switch off the engine of the vehicle
- Put up warning signals on both sides of the road
- If any liquid waste is involved, observe the flow direction
- Escape from the hazard area and walk against the wind direction
- In case of fire, try to extinguish, if possible
- immediately notify the local emergency services of the incident (nearest fire brigade / Police station) clearly stating:

==> the location

==> the nature of the load being carried

==> the status at the site of the accident itself, i.e., whether further leakage is still taking place, whether the vehicle or the load is on fire and what the traffic situation is.

- Bystanders must, under all circumstances, be kept away from the vehicle and its load.

3.6.2 Spillage clean up

The transporter is responsible for taking appropriate steps to clean up spillage which may occur during transit. The remedial action will depend on the nature and properties of the waste material, on the physical environment in which it has been spilled and on the severity of the spillage. In some instances washing away of residues with water may prove adequate but in other instances chemical treatment of the residue or even digging up of soil and removal thereof to a disposal site may be required.

The major objective of the clean-up procedure must be to minimize the risk of contaminating the environment and in particular the water sources at a later stage.

Such remedial action may be undertaken by the Generator himself or by a waste disposal contractor appointed by either the Generator or transporter with the consent of regulatory authority (CEA). If required expertise should be sought from the relevant experts / institutions

Ref: Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste USEPA

3.6.3 Accident Reporting

Every transporter of waste shall forthwith report to the authority of any accident that may have occurred during or as a result of collection or transportation of waste in the form set out in Schedule VII of Part II of the National Environmental (Protection & Quality) regulations No. 1 of 2008 (Annex - 02).

SECTION 04
OFF SITE STORAGE OF SCHEDULED WASTE

4.1 APPLICABILITY

These guidelines shall apply to the operators of all facilities which store and/or preprocessing of scheduled waste specified in the Scheduled Waste Management Regulations of 2008.

These guidelines do not apply to the generator who is permitted to store his waste on-site.

4.2 RESPONSIBILITY OF OPERATORS OF A FACILITY

The responsibilities of scheduled waste storage, and preprocessing facility should be as follows:

4.2.1 Preparation of an appropriate site plan for safe storage of scheduled waste.

4.2.2 Operating the facility with minimum impact on environment and human health including site closure and reclamation.

4.2.3 Keeping and maintaining records for the scheduled waste management and provide accurate and sufficient information to the regulatory authorities.

4.2.4 Providing necessary trainings for plant personnel on scheduled waste management and emergency preparedness.

4.2.5 Preparation of proper contingency plans and procedures for emergency situations.

4.3 WASTE ANALYSIS REQUIREMENTS

The operator of off site storage facility must inspect and analyze representative samples of each scheduled waste movement received at the facility to determine whether it matches the identity of the waste specified on the accompanying manifest. This analysis must contain all the information which must be known to decide the storage, recovery, recycling treatment and/ or disposal methodology.

The facility may decide upon a test that will easily and readily identify each waste the facility agrees to accept. The tests might be for example, PH, flashpoint, Chloride, Sulphate, TOC, calorific value, Cyanide, heavy metals, etc.

An analysis plan should be maintained and the facility should prescribe analytical procedures, equipment, calibration methods and quality assurance/ control procedures.

Sampling and analysis procedures should satisfy the following three goals;

a) Identify the inherent hazard of the waste

b) Characterize the waste effectively enough to manage it and

c) Find a characteristic to easily identify load of waste delivered

4.4 STORAGE REQUIREMENTS

In order to ensure safe storage of the scheduled waste, the operator of a facility should adopt the following safety procedures;

4.4.1 Storage Area

a) The storage area of the facility should be kept under a specifically designed shelter and the floor area should be concreted or paved with any other suitable material specifically acceptable to the Authority.

b) Proper ventilation, aeration and temperature control system should be operated within the storage area according to the waste type.

c) Storage areas should be specifically segregated for flammable, reactive, and non-compatible scheduled waste and containers of such type of waste should not be stored along with other waste.

d) The scheduled waste containing volatile solvents or other low vapour pressure chemicals should be stored separately with adequate protection from direct exposure to sunlight.

e) The waste which contain highly soluble contaminants should be protected from rain or any other contamination with water.

f) The operator of a facility must regularly inspect areas where containers are stored in order to check any leakages due to deterioration of containers.

g) Any damaged containers should be removed immediately and the contents of the containers should be transferred into compatible containers before treatment.

h) The perimeter of the facility could be fenced with minimum of 2M high chain link fencing and the single non-emergency access to the facility with a gatehouse having 24 hour security cover.

4.4.2. Containment system

The storage facility should have containment system and it should be designed and operated as follows:

a) The base of the containment should be constructed in such a way that it is free of cracks or gaps and is sufficiently impervious to contain leakages, spillages, and accumulated precipitation until the collected material is detected and removed. Construction material should possess the ability to withstand the reactivity of the stored scheduled waste.

b) It should be designed and operated to drain and remove liquids which may result from leak and spills

c) The containment system should have sufficient capacity to contain 10% of the volume of containers or the largest container, whichever is greater. This is applicable to containers which contain free liquids.

d) Run-off in to the containment system should be prevented unless the collection system has sufficient excess capacity in addition to that mentioned in paragraph (c) of this section to contain any run-off which might enter the system.

e) The containment system should have sump or collection area to collect any leak, spill or precipitation.

f) Clear access pathway should be available for the containment system

4.4.3. Management of Packaging and Containers

a) Packaging and containers should be in a good condition. The container materials should be compatible with the waste type containing and endure the physical and environmental conditions during storage.

b) Lockable containers or seal type containers should be used for scheduled waste to prevent any spillages or leakages.

c) Container containing scheduled waste must always be kept closed during storage, except when it is necessary to remove waste.

d) A container containing scheduled waste must not be opened. Handled, or stored in a manner which may rupture the container or cause it to leak

e) The stored waste should be inspected regularly.

f) If a container containing scheduled waste is not in good condition (e.g. severe rusting, apparent structural defects) or if it begins to leak, the contents should be transferred to another compatible container that is in good condition immediately or any other acceptable option could be applied.

4.5 REQUIREMENTS FOR FLAMMABLE, REACTIVE, OR NON-COMPATIBLE WASTE

The operator of an off site storage facility must take precautions to prevent accidental ignition of ignitable or reactive waste. Such type of waste must be separated and protection from sources of ignition or reaction including but not limited to open flames, smoke, hot surfaces, friction heat sparks and radiant heat. " No smoking" and "Flammable" signs should be placed conspicuously wherever there is a hazard form ignitable or reactive waste.

The operator of an off site storage facility that handles, or mixes non-compatible waste or waste materials, should take precautions to prevent reaction which:

a) Generate extreme heat, fire, explosions or violent reactions.

b) Produce uncontrolled toxic fumes, mists, dusts, or gases in sufficient quantities which can threaten the human health or the environment.

c) Produce uncontrolled flames or gasses in sufficient quantities to pose a risk of fire or explosions

d) Damage the structural integrity of the device or facility

e) Any other means which may threaten human health or the environment

4.6 DECLARATION SYSTEM, RECORD KEEPING & REPORTING

4.6.1 Use of declaration form

When a off site storage facility receives scheduled waste accompanied by a declaration, the operator must:

a) Sign and date each copy of the declaration to certify that the scheduled waste mentioned in the declaration form was received

b) Note discrepancies, if any, on each copy of the declaration.

c) Hand over the signed copy No 03 (Green copy) to the transporter upon the receipt and confirmation of the Waste.

d) Retain copy no. 4 (Yellow Copy) of the declaration at the facility for his records.

e) Within a week from the receipt of the waste/ rejection of the waste, copy no 5 - Blue copy of the declaration form should be sent to the CEA.

f) And copy of the Blue copy of the declaration form should be sent to the Generator of waste for his records.

4.6.2 Discrepancies in the declaration

Discrepancies are difference between the quantity or type of scheduled waste designated on the declaration, and the quantity or type of scheduled waste, a facility actually receives.

Significant discrepancies are;

a) For bulk waste, variations greater than 1% weight

b) For batch waste, any variation in piece count, such as a discrepancy of one drum in truckload.

Significant discrepancies in type are differences which can be discovered by inspection or waste analysis.

Upon discovering a significant discrepancy, the operator should immediately resolve the discrepancy with the waste generator or transporter. If the discrepancy is not resolved, the operator of a facility should return the waste to the waste generator, with clear description of the discrepancy in the declaration.

4.6.3 Record keeping

The operator of off site storage facility should keep daily operating records. The facility's operating records should document entire operational activities and reflect the present status of the facility.

The following information should be recorded and maintained in the operating record until closure of the facility:

a) A description and quantity of each scheduled waste received /dispatched and methods and dates of the storage, at the facility

b) The location of each scheduled waste, within the facility and the quantity at each location for disposal must be recorded on a map or diagram of each cell or disposal area.

c) Cross- references to specific declaration document numbers, should be provided.

d) Records and results of waste analysis performed at the facility.

e) An environmental monitoring data.

The operator of a facility should preserve all the records for the entire period of operation and these records should be submitted to the regulatory authorities.

In case of transfer of facility and /or change of operator, all the records should be passed on to the new operator with joint written declaration.

4.6.4 Reporting

The operator of a scheduled off site waste storage facility must submit reports to the Central Environmental Authority as per the Part II of the National Environmental (Protection and Quality) Regulations No.1 of 2008

SECTION 05
RECOVERY/ CO PROCESSING AND RECYCLING OF SCHEDULED WASTE

5.1 APPLICABILITY

5.1.1 The guideline in this section on recycling activities pertain to scheduled waste and for materials recovery as well as for energy recovery.

The term "recycling" encompasses both re-use and recovery activities.

5.1.2 Recycling is characterized by three major practices:

a) Direct use or re-use of a waste in a process

b) Recovery of a secondary material for a separate end use such as the recovery of a metal from a sludge

c) Removal of impurities from a waste to obtain a relatively pure re-usable substance.

5.1.3 Material Recovery

The proportion of waste that is recycled is specific to both industry and waste. Factors influencing the industries to recycle its waste are:

a) The type of waste generation process used

b) The volume, composition and uniformity of waste

c) Whether uses and re-uses of the waste identified and

d) Availability and price of virgin materials relative to the costs of recycling and storing the waste.

The term "Co-processing" may be used instead of "recovery" for the use of waste material in industrial processes such as cement, lime or steel production and power stations or any other large combustion plants. Co-processing means the substitution of primary fuel and raw material by waste. It is a recovery of energy and material from waste while achieving thermal destruction of the waste.

5.1.4 Generally, dilute waste streams containing reusable constituents could be recycled in large scale applications by the generator him self.

Eg.

a) Spent acids and alkaline solutions in the chemical and allied products sector.

b) Waste water treatment sludge from electroplating process

c) Spent pickle liqueur in the primary metals industry.

d) Chromium solutions can be reused/ recovered in tanning industry.

e) Solvents could be recovered in larger proportion than other waste due to the fact that there is and existing technology to allow recovery and a market exists for the recycled solvent.

The technology (e.g. distillation) available is relatively inexpensive to operative and can attain high purity levels (95%)

5.2. CONTROLS REQUIRED FOR RECOVERY/ CO PROCESSING AND RECYCLING OF SCHEDULED WASTE

5.2.1 Waste pre-qualification control

Waste pre-qualification needs to be done to pre-determine the suitability of a waste material to be Recovered/ co processed and recycled in the facilities, by analyzing a sample received by the waste generating industry.

The generator is required to submit the following information for the facility operator's record keeping.

- The generator's name, EPL number, facility address, technical contact,
- Specific data about the process generating the WASTE.
- Physical and chemical characteristics of the waste already identified
- Information as to whether the waste belongs to the negative list (e.g., infectious, explosive, radioactive waste) or has similar constituents is present in the waste stream.
- Information as to whether certain reactive characteristics are present.
- Hazardous material shipping information.
- Known or expected CEA waste codes associated with the waste.
- Other hazardous characteristics

5.2.2 Evaluation of the stream

Upon receipt of the above information and analytical test results, the acceptability of the material for Recovery/ co processing and recycling needs to be evaluated.

In the initial pre-qualification process, the following information needs to be used as inputs in the determination process.

- Information and analytical results supplied by the generator
- The components and properties identified by the analytical testing

To authorize acceptance of a material, Recovery/ co processing and recycling operators should have the waste code representing the sample of waste material should be in accepted list of waste for which the Recovery/ co processing and recycling facility is granted approval, by the relevant Regulatory Authority for waste Recovery/ co processing and recycling.

Waste code determinations are made based on information supplied by the generator and review of the laboratory analysis, by a technical representative of the facility.

Representatives of the facility may audit the facility that generates the candidate stream to verify the information provided.

If it is determined that the waste material / stream can be utilized in the Recovery/ co processing and recycling plant and all waste codes of the stream are in the list of acceptable waste codes, the generator is provided pre-qualification approval to ship the waste material / stream.

Copies of the pre-qualification analysis and evaluation are maintained on-site at the waste management facility.

5.2.3 Waste material acceptance control

The Recovery/ co processing and recycling operator may enter into an agreement with the waste generator and specify the range of characteristic values of waste material acceptable by the co-processing facility.

The Recovery/ co processing and recycling operator may use acceptance control of the waste materials received at the Recovery/ co processing and recycling plant by performing inspections for conformity and the Recovery/ co processing and recycling operator's reserves the right to reject the material if the characteristics of the bulk waste material received does not comply with the characteristic values of waste material acceptable by the Recovery/ co processing and recycling facility.

5.2.4 Conditions for co-processing

Co-processing operator shall achieve the minimum conditions given under section 6.3 for the thermal destruction of the waste

5.2.4 Emissions monitoring

The Recovery/ co processing and recycling operator must employ continuous emissions monitoring of the combustion products and spot emissions monitoring on a regular basis according to the requirements of the regulatory authority.

The records must be made available at the Recovery/ co processing and recycling operator's site for scrutiny at any given time.

The Recovery/ co processing and recycling facility should adhere to emissions monitoring standards and keep their emission below permissible limits set out by the regulatory authorities for

1. The primary manufacturing operation of the Recovery/ co processing and recycling facility or
2. The waste Recovery/ co processing and recycling operations

5.2.5 Document control and record keeping

The Recovery/ co processing and recycling operator should have the following minimum record keeping requirements

- Records on accepted materials
- Records on emissions monitoring
- Records on the use of waste manifest system and filing of records as required by the manifest system

5. 3 RECYCLING TECHNOLOGY

5.3.1 Waste that has higher constituent concentrations are usually selected for recovery and recycling. To consider waste as eligible for the recycling process, threshold levels must be reached.

a) Halogenated solvent and non-solvent waste must be in the range of 35-40% before recovery or recycle technologies are practical.

b) For non-halogenated solvents and corrosives, the threshold levels are lower for recovery or recycle practices.

c) To be economically and technically viable for recycling waste stream should be uniform (i.e. it must not contain more than one contaminant).

5.3.2. Other factors that must be met in order for recycling to be successful are:

a) A market for the recycled material must exist within an economically viable distance and

b) The recycled waste must meet purity requirements for manufacturing process.

5.3.4 Because recyclable waste must be economically competitive with the virgin materials they are replacing, the waste must be processed prior to re-use.

5.3.5 Recovery processes include physical, chemical and electrochemical separation, Major technologies involved in recovery process are;

a) Distillation of solvent waste

b) Dechlorination of halogenated, not-solvent waste and

c) Metal concentrating techniques such as leaching, solvent extraction, ion exchange, precipitation, crystallization and evaporation to treat dilute metal-bearing waste streams.

5.3.6 Centralized recovery facilities could accept scheduled waste from generation only for treatment and could return the removed product to the same generator for re-use.

5.3.7 The re-cycler can charge a fee to the generator for recovery of the reclaimed material.

5.3.8 Small volume scheduled waste generators could pool their resources and operate centralized facilities, thereby reducing their capital and operating costs.

5.4 WASTE EXCHANGE

Certain waste that are not useful to a generator may be desired by another industry as a raw material.

5.4.1 Waste exchanges are often helpful in facilitating the transfer and recycling of these waste. Some of the waste that could be recycled through waste exchange are acids, alkalis, solvents, metal waste etc.

5.4.2 Operations which lead to resource recovery, recycling are;

1. Use as a fuel (other than in direct incineration) or other means to generate energy

2. Solvent recovery/ regeneration

3. Recycling recovery or organic substances which are not used as solvent
4. Recycling / recovery of metals and metal compounds
5. Recycling/recovery of other inorganic materials
6. Regeneration of acids or alkalis
7. Recovery of components used for pollution abatement
8. Recovery of components form catalysts
9. Used oil re-refining or other reuses of previously used oil
10. Land treatment resulting a benefit to agriculture or ecological improvement
11. Uses of residual materials obtained form any of the operations numbered 1-10

Exchange of waste for submission to any of the operation numbered 1-11

SECTION 06
TREATMENT AND DISPOSAL OF SCHEDULED WASTE

Evaluation of options for scheduled Waste Treatment and disposal involves decisions with respect to the following key issues:

- Selection of on - site or off-site methods
- Degree of treatment before disposal
- Selection of treatment/disposal technology

6.1 TREATMENT & DISPOSAL METHODS

Many different scheduled waste treatment technologies are available prior to ultimate disposal. The choice of the best practicable way of treating the waste depends on the availability and suitability of treatment or disposal facilities, discharge standards and cost effectiveness.

6.1.1 The design and operation of such a plant must incorporate safeguards against all forms of environmental effects which could result from such an operation. Specific safeguards need consideration are:

6.1.1.1 Aqueous effluent derived from process operations must conform to the relevant discharge specifications as per the National Environmental (Protection and Quality) Regulations No.1 of 2008; (Annextune - 02)

6.1.1.2 Emission from process operations must conform to stipulated emissions standards.

6.1.1.3 Solid residues resulting from the processes operations must be sufficiently inert, and must confirm to acceptable disposal standards;

6.1.1.4 Within the treatment plant including pre-operational area, all possible pre-containment measures should be taken to prevent, minimize and manage the possible of ground contamination due to waste transfer operations, pipe and tank fracture, site flooding etc and must ensure safe working practices and systems of treatment;

6.1.1.5 Measures should be adopted for the adequate treatment of spillages, and emergency plans should be formulated in anticipation of an incident such as fire, explosion etc.

6.1.2 The operator of a scheduled waste management facility should have a sufficient knowledge of waste characteristics expected in treatment technology required so as to decide the best technology for the waste.

6.1.3 A comprehensive list of treatment and disposal methodologies, based on waste categories, is presented in **Table 6.1** for reference.

6.1.4 The detailed design of the treatment facility including the technologies to be used shall be submitted to the Central Environmental Authority for the approval.

6.1.5 Processing of scheduled waste in a centralized facility depends upon the types of waste received. However any centralized facility should have minimum facilities for waste storage, treatment and disposal. The main sections of a centralized treatment/disposal facility are;

a. Waste reception section
b. Waste exchange following the 3R concept
c. Tank farm
d. Waste oil recovery plant
e. Chemical treatment plant for inorganic waste
f. Incineration plant for organic waste
g. Landfill

6.1.6 Strict process/quality control measures at all stages of process operation should be maintained by on site of laboratory for monitoring waste characteristics, process scheduling and environmental control to meets all stipulated sets of standards imposed by the Central Environmental Authority and other regulatory authority

6.2 GENERAL PRECAUTIONARY MEASURES REQUIRED

6.2.1 Odor Control

Drum opening area associated with material handling operations should be equipped with air extraction systems to collect and control fumes.

6.2.2 Site Drainage and spillage control

Facility should be surrounded by a spillage catchment drain, which is linked to catchment sump for collection. In the event of any spillage, the area can be cleaned washed down and the combined spillage and wash liquors will be collected for processing in the correct manner.

Type of Waste	Treatment	Disposal
Cyanide Waste	Detoxification /Biological	Sludge for Landfill
Heavy Metal bearing waste	Sludge conditioning and dewatering Metal Recovery	Landfill
Non-halogenated hydrocarbon including solvents	Thermal treat. After solvent recover	Ash for Landfill
Halogenated hydrocarbon including solvents	Thermal treat. After solvent recovery	-do-
Waste from paint pigment, glue, varnish & printing links	Thermal/ Biological	-do-
Waste from Dyes & Dye intermediate containing inorganic chemical compounds	Vary form the type of the waste	Landfill
Waste from Dyes & Dye intermediate containing organic chemical compounds	Thermal	Ash for Landfill
Waste Oil and Oil emulsions	Physico-chemical & Biological for oil separation and sludge for thermal treatment	-do-
Tarry waste form refining & tar residues form distillation or pyrolytic treatment	Thermal	-do-
Sludges form waste water treatment incl. incineration ash	Sludge conditioning and Dewatering	Landfill
Phenols	Detoxification	Sludge for landfill
asbestos		Landfill
Waste form pesticides & herbicides manufacturing and residues form formulation units	Biological or thermal Thermal treatment & Solidification	landfill
Acid /Alkaline/ Slurry Slurry Waste	Physico-chem treatment and sludge for conditioning & dewatering	Sludge for Landfill
Off -specification & discarded products	Physico-chem., Biological or Thermal	Ash & Sludge
Discarded containers & liners of hazardous & toxic chemicals & waste	Liners for Thermal	Containers for Landfill

Table 6.1 Treatment and Disposal Options for Waste Categories

6.2.3 Site Safety

The health and safety of the plant employees and the public is of prime importance in scheduled waste management. The following items are considered to be essential for the safe operation of the facility:

i) Plant Safety and Training Officer

The role of a safety and training officer is to perform regular safety audits, bring to the attention of plant management deficiencies in operating procedures that might result in a dangerous occurrence of injury and ensure that operators are properly trained and have adequate personal protection equipments.

ii) Operating procedures and Systems of Work

These are manuals containing detailed information of specific plant activities, such as maintenance procedures, transfer and pumping of waste and processing of waste. The manual contains, for each item, a summary of the potential hazards associates with the activity, safety precautions such as clothing, decontamination , contingency & emergency procedures, and a detailed system of work. It is the responsibility of the Managers to ensure that operators adhere to these procedures, and to regularly update them in the light of the best available information.

iii) Trained Operators

Operators should be trained to perform plant functions in a reliable and responsible manner, adhering at all times to a Standard Operating Procedures and safe work practices.

iv) Housekeeping and Maintenance

Good housekeeping is essential to prevent the dispersion of hazardous chemicals. Immediate clean-up of spills using established procedures, the prevention of fire, the diversion of storm water from storage and processing areas, are all operations that require constant vigilance. Lack of maintenance can result in a fractured pipe, leaking pump seals etc., possibly leading to a dangerous occurrence. Therefore a regular maintenance programme should be introduced.

Therefore it is advisable to develop & practice on relevant Standard Operating Procedures (SOP) for house keeping, maintain and develop a culture to Total Productive Maintenance (TPM).

v) Emergency Procedures

Procedures for the evacuation of the site in the event of an incident should be drawn up and rehearsed. The site should maintain adequate fire fighting equipment, hydrants, emergency showers, protective clothing and breathing apparatus.

6.2.4 Measures to be taken in case of unintentional exposure to Scheduled Waste

It is important that in any case where potential exposure is discovered from scheduled waste the authorities and the public are informed swiftly and adequately about the source of exposure and the potential risks involved. An information communication system should be set up to ensure that the progress of ongoing investigations is being reported adequately and all necessary precautions to protect the public are implemented. Such information is necessary in order to prevent public over-reaction due to fears and concern.

Measures should be taken to limit or eliminate exposure and to confine the waste to controlled area or site.

6.2.5 Health and Safety of Personnel Handling Scheduled Waste

Individuals at most risk form exposure to scheduled waste are those who are involved in handling the waste during collection. Transportation, storage, treatment or disposal. To prevent exposure of these workers to hazardous agents through inhalation, ingestion or absorption through skin contact (through injuries or through splashes into the eyes) safety procedures should in place as part of a general safety programme.

Such a programme should incorporate the following aspects;

i. Information

All personnel should be given detailed information regarding risks involved with different types of waste, together with possible routes of exposure, methods of avoidance and measures to be taken should exposure occur. Personnel should be made fully aware of the consequences if they do not follow the prescribed safety procedures. Any change in the composition of waste or process conditions, working procedures should be adequately and effectively brought to the attention of all workers before changes are implemented.

ii. Training

All persons handling scheduled waste should be given training in the handling procedures by experienced personnel. They should also be given written instructions about normal procedures, safety precautions and about actions to be taken if complications arise. When procedures are changed, special training courses should be organized for personnel involved.

iii. Work organization

a) **Standardized Operating Procedures:** An important way to reduce the possibility of harm to personnel is to work out standardized operating procedures. Such procedures should be based on the best available knowledge, operational principles and technical guidance. The initial procedures should be properly tested, reviewed

and revised form time to time by competent safety professional. The procedures should be practical and applicable without sacrificing the level of safety. They should be described in understandable instructions and made available to all relevant personnel.

b) **Plant Layout:** the workplace should be properly organized. Appropriate work areas should be established and identify the areas where access is forbidden, where entry is restricted, where support services and equipment should be located and where decontamination can be carried out. Where appropriate, a decontamination procedure should be established for workers prior to leaving the plant site. When appropriate, wind indicators should also be set out to provide indications for upwind escape in case of an emergency.

c) Mixing different waste of unknown compositions should as a rule not be permitted unless tests and chemical expertise have shown or adjudged that this can be performed without any hazard.

d) When wearing self-contained breathing apparatus or fully encapsulated suites, or when operating in confined spaces, personnel in the scheduled waste area should work in pairs at all times. Pairs should pre-arrange hand signals for communication, if available establish radio contact. Communication between all members must be maintained at all times. It is important to emphasize that the number of personnel and the amount of equipment in the hazardous area should be minimized.

e) Safety plans for all potentially dangerous incidents should be developed, regularly updated and made available to all personnel.

iv. Personal protection equipment

Personnel may be protected from inhalation of hazardous dust and gases, by the use of breathing apparatus. Protection of eyes and skin can be achieved with protective glasses and clothing. If splashing is a possibility, eye wash station and sometimes shower facilities for full body wash should be made available at suitable locations. Depending on the types of scheduled waste and on the level of protection required various combinations of such equipment may be required.

v. Respiratory Equipment

The choice of respirator is determined by the type and extent of the hazard. A demand type Self-contained Breathing Apparatus (SCBA) should never be used in an atmosphere considered to be immediately dangerous to life or health. In this case a pressure-demand SCBA must be used.

vi. Protective clothing

The hazardous properties of chemical substances necessitate the use of protective clothing. The degree of protection required is depending on the inherent physical, chemical or toxic property of the material.

The most important factor when considered in the selection of clothing is the safety of the individual. The level of protection assigned must be in accordance with the severity of the hazard. It is also very important that the individual is well trained in the use of protective apparel and is familiar with the necessary standard operating procedures for site activities. Other factors include cost, availability, compatibility with other equipment, suitability and most important, performance.

Protective clothing ranges from safety glasses, helmet, and safety shoes to a fully encapsulating suit with a breathing supply.

vii. Medical Surveillance and Safety Programme

Personnel working with scheduled waste should be kept under constant medical surveillance. A proper immunization programme should be administered where appropriate and a programme out. Necessary first aid equipment and relevant antidotes to toxic substances should always be close at hand. Special personnel, including staff safety representative of regular medical monitoring relevant to the type of exposures should also be carried and safety officers should be assigned to ensure compliance with proposed safety measures.

viii. Environmental Monitoring

When certain scheduled waste are handled, it will be desirable to monitor the environment of the workplace to ensure that dangerously high levels of contamination are not reached. Monitoring may be carried out by either personnel or static sampling; and by the use of techniques ranging form relatively simple ones using detector tubes and hand-held pumps to highly sophisticated operators which requires professionally qualified personnel to both operate and interpret.

6.3 THERMAL DESTRUCTION (INCINERATION)

6.3.1 Applicability

This part of the guidelines will be applicable to the operations of the following facilities that incinerate Scheduled Waste.

i. suitably adapted existing high temperature process plants/industrial boilers/ furnaces such as cement kilns (co processing)

ii. dedicated, purposes built facilities which destroy scheduled waste by thermal process.

6.3.2 Fundamentals of Incineration-Ref : USEPA -RCRA

Incineration is the controlled burning of substances in an enclosed area. Typical incinerators include rotary kilns, liquid injectors, controlled air incinerators, and fluidized bed incinerators. During a burn, waste are fed into the incinerator's combustion chamber. As waste get heated, they are converted from solids and liquids into vapours. These vapours pass through the flame and are heated further.

Eventually, the vapour become so hot that the organic compounds present within vapours break down into their constituent atoms. These atoms combine with oxygen and form stable gases that are released to the atmosphere after passing through Air Pollution Control Devices (APCDs).

For incineration to be an effective method for destroying waste' hazardous properties, combustion must be completed.

Three critical factors(3Ts) ensure the completeness of combustion in an incinerator:

i. the temperature in the combustion chamber(Temperature)

ii. the length of time waste are maintained at high temperatures (Time)

iii. the turbulence, or degree of mixing, of the waste and the air(Turbulance)

The stable emissions produced by incineration are primarily carbon dioxide and water. Depending on waste composition, however, small quantities of carbon monoxide, nitrogen oxides, HCl, and other gases may form. Also, if combustion is not complete compounds known as product of incomplete combustion (PICs) may be emitted.

Another by-product of the combustion process is ash. Ash is an inert solid material composed primarily of carbon, salts, and metals. During combustion, most ash collects at the bottom of the combustion chamber (bottom ash). When this ash is removed from the combustion chamber, it is considered as hazardous waste and thus is a scheduled waste in itself.

As a hazardous waste management practice, incineration has several unique attributes. First, if properly conducted, it permanently destroys toxic organic compounds contained in hazardous waste by breaking their chemical bonds and reverting them to their constituent elements, thereby reducing or removing their toxicity. Second, incineration reduces the volume of hazardous waste by converting solids and liquids to ash. Land disposal of ash, as opposed to untreated hazardous waste, is both safer and more efficient. Incineration, however, will not destroy inorganic compounds, such as metals, present in hazardous waste. Residue ash from incinerators is subject to applicable CEA standards and may need to be treated for metals or other non-organic constituents prior to land disposal. No general disposal on land is acceptable.

6.3.3 PERFORMANCE STANDARDS

6.3.3.1 Designing Criteria

i) Minimum Incineration Temperature and Residence Time

Hazardous waste incineration facilities for the incineration of non-halogenated or non Polynuclear Aromatic Hydrocarbons waste must be designed for a minimum temperature at the outlet of the secondary chamber of 1200 0C and must operate at or above 1000 0C . For halogenated or Polynuclear Aromatic Hydrocarbons waste, minimum designed temperature shall be 1300 0C and minimum operating temperature shall be 1200 0C.

The incineration gases must remain at or above the minimum operating temperature for at least 2 seconds (residence time within the high temperature zone)

The residence time is to be calculated from the point where most of the combustion has been completed and the incineration temperature fully developed.

In multi-chamber incinerators the residence time is calculated from the secondary burner(s) flame front or final secondary air injection point(s).

In an incinerator where the furnace is one continuous space, such as in spreader stoker and single chamber mass burning equipment, the location of the complete combustion and fully developed temperature shall be determined by an overall design review.

ii) Primary Air

The incinerator shall be designed to ensure that an adequate quantity of primary combustion air is distributed properly inside the initial combustion zone to promote good contact between the waste and the air. The design features shall also include the capability to control and adjust both the air flow rate and its distribution to minimize quenching of the combustion reaction and entrainment of particles, as well as to compensate for irregular waste loading on the grate.

(iii) Secondary Air

The incinerator shall be designed for adequate air supply through properly located injection ports to provide sufficient turbulence and mixing of the reactants in the final combustion zone. The location and design of the air injection ports shall ensure good penetration and coverage of furnace cross-section under all flow conditions.

(iv) Auxiliary Burner(s)

The incinerator shall be equipped with auxiliary burner(s) of adequate heat capacity to be used during start-up, shutdown, upset conditions, when burning marginally combustible waste, and at any other time as necessary to maintain the minimum incineration temperature. The auxiliary burner(s) shall be designed to provide 100% of the primary and secondary heat capacity of the

incinerator and can be maintained for at least 15 minutes without any waste feeding to the unit. The firing of the auxiliary burner(s) and the supply of combustion air shall be modulated automatically to maintain the required minimum combustion zone temperature.

(v) Oxygen Level in Flue Gas

To maintain adequate availability of combustion air in the incinerator, the combustion air supply system shall be designed to maintain the oxygen content in the flue gas leaving the unit within the prescribed range.

(vi) Turndown Restrictions

The incinerator shall be designed to meet the minimum requirements of temperature, residence time, combustion air supply, and oxygen level in the flue gas over the recommended range of the waste feed load.

(vii) Maximum Carbon Monoxide Level in Flue Gas

The recommended maximum CO concentration of 55 mg/m3 corrected to 11% 02 (4-h rolling average) in the incinerator flue gas shall be used as the operating target. Any excursion of CO concentration to twice the above specified level shall require adjustment of operating parameters until the normal combustion conditions are restored.

(viii) Combustion Efficiency (CE)

A combustion efficiency of at least 99.99% to 99.9999% must be maintained depending on the substance to be destructed during normal operation of the incinerator. The combustion efficiency (CE) is to be calculated as follows:

$CE = 100 \times (CO2) / [(CO2) + (CO)]$

where:

(CO2) = concentration of carbon dioxide in the exhaust emissions; and
(CO) = concentration of carbon monoxide in the exhaust emissions.

The above CE must be maintained on a 8-hour rolling average basis.

(ix) Emission Control Systems

The temperature of the flue gas at the outlet of the emission control equipment used for simultaneous removal of acid gases and particulates, or at the inlet of a separate particulates control device, shall not exceed 140°C.

The height of the stack of the incinerator should not be less than 30 ft (>9.m) from the ground level and should be at least 10 ft (>3 m) above the roof of tallest building located within the 100 ft (>30 m) radius from the centre of the incinerator

6.3.3.2 Operating parameters and guidelines

Operating parameter	Operating guidelines
Minimum incinerator operating temperature for non-halogenated or non- polynuclear aromatic hydrocarbons	1000 0C at fully mixed height
Minimum incinerator operating temperature for halogenated or polynuclear aromatic hydrocarbons	1200 0C at fully mixed height
Minimum Residence time	2 sends after final secondary air injection
Primary air	Utilize multi port injection to minimize waste distribution
Secondary Air	Up to 80% of the total air required
Auxiliary Burner Capacity	Secondary burner 100% of total rated heat capacity and that required to meet start up and part load temperature
Minimum Oxygen Concentration at secondary chamber outlet (dry basis)	6%
Turn down restrictions	80 % 110% of designed capacity
Minimum CO levels (10minute averages)	55 mg/Nm3 at 11% oxygen concentration.
Minimum destruction and removal efficiency for non halogenated Hazardous Materials	99.99%
Minimum destruction and removal efficiency for halogenated hazardous materials	99.999%
Minimum destruction and removal efficiency for dioxin bearing waste	99.9999%
N means the values are expressed at normal conditions 0 0C temperature 1 bar (760mmHg) pressure dry (zero moisture)	

6.3.3.3 Monitoring requirements

Continuous in-stack monitoring must be provided for opacity, hydrogen chloride, total hydrocarbon, temperature, oxygen , carbon dioxide and carbon monoxide to check the operating efficiency of the incinerator

(A) Air Pollution control Systems

Sufficient air pollution control systems shall be incorporated into the incinerator to avoid air pollution due to Stack emissions

Air pollution control systems should designed according to the following guidelines

Parameter	Operating guidelines
Inlet temperature to particulate control device	<140 0C > lowest acid dew point
Particulate matter concentration in stack	Shall not exceed the national emission standards
HCl concentration in stack	Shall not excess the national stack emission standards
Sulfur dioxide concentration in stack	Shall not excess the national stack emission standards
HCl removal efficiency	Shall be of >99%

(B) Emission standards

Stack emissions from hazardous waste incinerators must meet the National Source Emission Standards stipulated by Central Environmental Authority (Available at www.cea.lk).

ORGANICS

The principle measure of incinerator performance is its Destruction and Removal Efficiency (DRE). A 99.99 percent DRE means that one molecule of an organic compound is released to the air for every 10,000 molecules entering the incinerator. A 99.9999 percent DRE means that one molecule of an organic compound is released to the air for every one million molecules entering the incinerator.

The performance standards require a minimum DRE of 99.99% for POHCs minimum DRE of 99.999% for halogenated hazardous materials and a minimum DRE of 99.9999% for dioxin-bearing waste.

DRE is determined for each POHC from the following equation:

$$DRS = \frac{(W_{in} - W_{out})}{W_{in}} \times 100\%$$

where:

W_{in}=mass feed rate of one principal organic hazardous constituent (POHC) in the waste stream feeding the incinerator

and

W_{out}=mass emission rate of the same POHC present in exhaust emissions prior to release to the atmosphere.

HYDROGEN CHLORIDE (HCL)

HCl is an acidic gas that forms when chlorinated organic compounds in hazardous waste are burned. An incinerator burning hazardous waste shall meet the National source specific emission standards. (available at www.cea.lk)

PARTICULATE MATTER

PM is tiny particles of ash that are carried along with the combustion gases to the incinerator's stack. The incinerator regulations control metal emissions through the performance standard for particulates, since metals are often contained in or attached to the particulate matter. An incinerator burning hazardous waste shall meet the National source specific emission standards.(available at www.cea.lk)

A typical hazardous waste incinerator, consists of a rotary kiln (primary combustion chamber), an afterburner (secondary combustion chamber), connected to an air pollution control system, all of which are controlled and monitored.

Rotary kilns Both solid and liquid waste are introduced into the rotary kiln, in which the temperature is typically above 1800°F. Temperature is maintained at this level by using the heat content of the liquid waste or by introducing supplemental fuels into the chamber, such as natural gas.

The flame and high temperature in the kiln cause the organic and some of the metal waste to be converted from solids or liquids into hot gases. These hot gases pass into the afterburner. Any inorganic materials (metals, such as zinc or lead) that have not been subsequently continue as temperature drops out as ash at the end of the kiln, into a container, for further management.

Afterburner Atomized liquid waste and/or supplemental fuel are injected into the afterburner, where temperatures are typically maintained at 2200°F. or higher. These atomized liquids and the hot gases entering the afterburner from the kiln are mixed with air and passed through the hot flame in the afterburner. The heat and flame break down the chemical bonds of the gaseous and

atomized organic compounds into atoms. These atoms recombine with oxygen from the air in the chamber to form stable compounds primarily composed of non-hazardous chemicals such as carbon dioxide and water (i.e., steam).

Air Pollution Control System (APCS) Gases and vapours exiting the secondary chamber are cooled and cleaned in the APCS. The APCS removes particulates (small solid matter) and the remaining hazardous constituents-such as metals which were not destroyed by the incineration process-down to levels established as safe by the regulations and the facility's Environmental Protection Licence (EPL) etc.

Controls and monitoring Operation within the key parameters of the combustion process are assured by maintaining units and computer controls. These systems make automatic adjustments to key functions as necessary. For example, if temperatures begin to drop below desired levels, supplemental waste fuels are automatically injected. Conversely, if temperatures rise above the desired range, waste feeds are reduced.

All regulated incinerators have waste feed cut-offs (WFCOs) to assure protective operations. WFCOs automatically stop the feeding of waste into the incinerator if any of the key parameters even momentarily falls outside the narrow range of operating requirements.

There is also continuous monitoring and recording of key indicators, so that a permanent record is maintained, verifying operation of the incinerator within these parameters. Frequently, as many as twenty separate parameters are monitored and recorded. Automatic control systems are a must with incineration technologies.

Residue management The rotary kiln discharges an inorganic ash into a large container. The ash, and any residue from the APCS, is analyzed to assure that it does not contain any hazardous organic constituents above concentration levels specified in EPA's regulations as safe for land disposal. These concentration levels are almost always less than one part per million for any organic hazardous constituent.

This inorganic residue is further treated by mixing it with chemical stabilizers to chemically bind the constituents. The chemically stabilized inorganic residue is analyzed to assure that the metals cannot leach out of the residue. The facility retains the results of its analyses.

6.3.4 Selection of Waste

Incineration of waste has to be chosen if the waste

- is recalcitrant and persistence in the environment
- is resistant to biodegradation and persistent in the environment
- is volatile
- has a flash point below 400C

- cannot be safely disposed of in a landfill site
- contain organically bound halogens, lead, mercury, cadmium, zinc, nitrogen, phosphorus or sulphur

In general, the following types of waste could be incinerated

- solvent waste
- waste oils, oil emulsions & oil mixtures
- pesticide waste
- pharmaceutical waste
- refinery waste consisting acid tar and spent clay
- phenolic waste
- grease and wax waste
- organic waste containing halogens, sulphur, phosphorous or nitrogen compounds.
- solid materials contaminated with hazardous chemicals (eg. Soil containing oil, capacitors containing PCB's)

6.3.5 Waste Analysis

During operation, the owner/operator of an incinerator must conduct sufficient waste analyses to verify that the waste feed is within the physical and chemical composition limits specified for the combustion unit. This analysis may include a determination of a waste's calorific value, viscosity, and content of hazardous constituents, including POHCs. CEA stresses the importance of proper waste analysis to ensure compliance with emission limits.

The operator of an incinerator should first ascertain the waste for the combustible characteristics before incinerating the waste. Throughout normal operation, the operator should conduct sufficient waste analysis and decide about the physical and chemical composition required for burning the waste

6.3.6 Optimum Conditions for Incineration

During incineration, the product gases generated consist primarily of carbon dioxide, water and excess air along with noxious halogen acids, sulphur, nitrogen and phosphorous oxides, vaporized metal oxides and traces of un burnt waste and organic by-products.

The material left behind on the hearth of the incinerator comprises ash, metals, oxides and non-combustibles. The hearth solids can be safely land filled if analysis proves that these are sufficiently sterile.

If the incineration conditions are not maintained properly, traces of unburnt waste or new organic compounds may also be released in the gas stream.

Greater care must be taken to reduce the formation of these new compounds, because they can be more hazardous than the parent compound. Eg. When incinerating PCB's, below about 900°C, chlorinated dioxin and dibenzofurans are formed as trace by-products.

6.3.7 Optimum Conditions for Incineration

When the waste is incinerated, the following four conditions should be observed for optimum incineration:

- high temperature
- sufficient (gas) residence time in the incinerator
- good turbulence
- an excess of oxygen

When considering incineration of Hazardous waste, the following empirical parameters could be used as a guide;

- Temperature of 900°C - 1100°C for hydrocarbon waste, 1100°C - 1200°C for waste containing halogens.
- Minimum gas phase residence time of 2 seconds. Residence time for hearth solids is measured in hours.
- Combustion air 100% in excess of stoichiometric requirements.

6.3.8 Principles of Incinerator design

In any design of incinerators the following design principles are important;

i. Volume of the combustion chamber should be adequate enough to receive the physical bulk of the waste, and provide adequate gas residence time.

ii. High temperature should be maintained

iii. Combustion air requirements must be met and in excess of the stoichiometric quantity.

iv. Maximum turbulence and mixing should be achieved in the combustion chambers by proper siting of burners and fans.

v. Proper design of feed system as well as the as well as the emission exhaust system in link with recommended controls

6.3.9 Modifications required to the existing high temperature furnaces and kilns

- installation of separate feed system for waste
- installation of automatic temperature control systems to regulate fuel feed with rising or falling temperatures
- installation of CO monitoring system at kiln exit
- provision of stack gas sampling points
- installation of waste feed cut-off and interlock to prevent feeding of waste to the kiln if;
- the kiln temperature drops below a configurable pre-set value
- the CO level at kiln exit drops below a configurable pre-set value
- the feed of raw materials into the kiln stops,
- malfunction of fuel feed system

6.3.10 Requirement for Gas Cleaning

Purpose of gas cleaning will be to remove particulate and non- combustible, contaminants such as fly ash and metal oxides and acid gases.

The level of sophistication of a gas cleaning system has to be determined based on the Environmental emission quality standards coupled with the type of waste burnt.

6.3.11 Control of Waste Input and emission

The amount of combustion products released to the environment is controlled by the amount and type of waste that is fed into the incinerator and also by the manner in which it is fed.

Therefore it is important to characterize a waste as fully as possible by laboratory analysis in order to control its impact.

The following waste characterization may be considered

i) **Physical form of the waste**

- Liquid or solid
- Whether pumpable
- If liquid, what is its viscosity?

ii) **Composition of waste**

- Contents of metal, halogens, sulphur, nitrogen or phosphours, if so, how much.

iii) **Heat content /calorific value:**

- amount of heat generated
- whether high temperature can be maintained with waste alone or support fuel is required.

iv) **Ash content:**

- Amount of ash production expected (more ash content means more particulate emissions).

v) **Special type of waste:**

- Waste require special precautions when handling due to toxicity/Non compatibility with other waste.

The laboratories which conduct these tests should be properly equipped with validated procedures and should be staffed with competent people

6.3.12 Emergency Preparedness Plan

The emergency plan should be so designed that it minimizes hazards to human health or the environment from fire, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water.

The provisions of the plan must be carried out immediately whenever there is a fire, explosion or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.

Contents of Emergency Preparedness Plan

The emergency preparedness plan must describe the actions that personnel must take in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous and toxic waste or its constituents to the environment.

The plan must list names, addresses, and phone numbers (office and home) of all persons responsible for acting as emergency coordinator and this list must be kept up to date.

The plan must include a list of emergency equipment such as, fire extinguishing systems, spill control equipment, communications, and alarm systems, and decontamination equipments which are required and available.

6.3.13 Other areas which require particular attention include the following;

1) Waste Reception

Transport of waste to an incineration facility can be by road or rail. They may be in bulk tankers, containers or in drums.

It should be ensured that weight and volumes on recorded, waste are transferred from the vehicle to appropriate reception tanks or drummed waste reception areas, labeled and safely stored.

2) Laboratory Control

Function of the laboratory is to analyze incoming waste for the composition, check the compatibility with the process and other waste management activities and measure emissions/discharges and record.

3) Waste Storage and Blending

In general, the facility should have a tank farm for storage and blending of liquid waste, separate storage area for drums and containers, and a secured area for storage and handling of waste containing PCB's.

4) Records

Each stage of the operation, from waste reception to incineration, should include incineration, should be supervised and records detailing its fate must be maintained. These records should include incinerator parameters such as temperature, logging of waste inputs and monitoring of gas emissions for particulate, un- burnt organics and acids.

5) Malfunctions and Fugitive emissions

Malfunctions on a scheduled waste incinerator can occur for a variety of reasons: blockage in burners, instrument & equipment failure, leakage in pipelines fugitive emission etc.

A safety system should be incorporated with the incinerator in order to automatically cut off waste feed to the incinerator when operating conditions deviate.

The main factor in prevention of malfunctions, spillages and other plant problems is the formulation of a comprehensive system of work, clear delegation of responsibility to operators and supervisory staff and a regular and routine plant maintenance programme.

6) Monitoring, Inspection and Record keeping

The operator of a facility should conduct the following monitoring while incinerating scheduled waste:

a) Combustion temperature and carbon monoxide should be monitored and recorded on a continuous basis.

b) The flu gases from incinerator should be monitored and recorded on a continuous basis for the air pollutants prior to release to the atmosphere as specified by the regulations in force.

c) The incinerator and allied equipment (pumps, valves, conveyers, pipes etc) should be subjected to thorough visual inspection, at least daily for leaks, spills, fugitive, emissions and signs of tempering.

d) The emergency waste feed cut off system and associated alarms should be tested daily to verify operatability

e) The owner or operator of a facility should keep daily records of monitoring and inspections in the operation records

6.4 LANDFILL

The operator of a secure landfill facility should follow the design and operating criteria described below;

6.4.1 Liners

A secure landfill for scheduled waste should have a liner that is designed, constructed and installed to prevent penetration of water or by-products out of the landfill to adjacent subsurface soil, ground water or surface water at any time during the life span (Closure and post-closure period) of the land fill.

The liner should be constructed of materials that have chemical properties and sufficient strength and thickness to prevent failure due to

i. Physical contact with the waste or leachate

ii. Pressure gradients

iii. Climatic conditions

iv. Stress of installation and daily operation

v. Animal activities and natural degradation

Liner should be installed to cover all surrounding earth likely to be in contact with the waste or leachate.

A scheduled waste landfill should be designed with two liners, a leak detection system, and a leachate collection and treatment system. The leak detection system is required for the detection of any migration of liquid into the space between the liners.

Liners for scheduled waste landfills are recommended to have a permeability of about 1x 10-7 cm/sec or less.

6.4.2 Analysis of Incoming waste

Inspection and analysis of incoming waste is necessary to verify the waste generators and the description of the waste, to ensure

a) Compliance with disposal science requirement

b) Health and safely of personnel handling the waste and

c) To conform that the waste is suitable for the method of disposal chosen

Regular monitoring and sampling of waste received should be carried out and if necessary, samples sent for more detailed analysis to an accredited Laboratory registered in the CEA.

Analytical facilities required at a landfill site accepting scheduled waste will depend on the nature and quantity of incoming waste.

The following basic tests for the incoming waste are suggested;

- appearance
- odour
- pH
- flammability and
- Specific gravity

Equipments other than the General equipments for a Laboratory serving a landfill site is suggested in **Table 3.2**

	Equipment	Parameter
1.	Sampling devices for liquid/sludge waste	
2.	pH papers, or pH meter	pH
3.	Titration equipment	Acid/alkali strength
4.	Absorbent paper and matches	flammability
5.	Glassware	appearance
6.	Dropper bottles of selected reagents	reactivity
7.	Bellows and selection of gas detection tubes	Volatility and gas type
8.	Filtration equipment	
9.	Hydrometer	Specific gravity

Table 3.2- Site Laboratory Equipment

6.4.3 Health and Safety

Major consideration when running a scheduled waste landfill site is the protection of site workers and delivery personnel from risks to their health and safety. Safety of visitors and the general public who may live near the site are also considered to be important.

The standards of safety training and supervision should commensurate with the risks involved and should be monitored regularly to ensure that they are effective.

The operator of a secure landfill facility should recognize and deal with the hazards which include;

a) The hazard which may result form consignors failing to describe the true and precise nature of a consignment of waste.

b) The hazards which may result from the mixing of incompatible waste

6.4.4 First Aid Arrangements

Equipments such as eye wash bottles or other means to treat irritating the eyes should be provided. A safety shower or drenching facilities with a continuous supply of clean water should be provided near the working area.

Extreme caution should be exercised during fill placing, spreading, compaction and covering operations to prevent harm to the operator or equipment through exposure to toxic solids, liquids, dusts, fumes and gases.

6.4.5 Leachate Collection, Removal and Treatment

A leachate collection and removal system must be installed as an essential component of the secure landfill and managed in a manner that will allow the system to be used for all of its projected life.

A leachate collection and removal system must be;

a) compatible with the characteristics of the leachate which is collected

b) of sufficient strength to resist collapsing by pressure exerted by equipment used at the site and by the accumulated waste and cover materials, and

c) capable of withstanding the hydrostatic pressure

The collected leachate should be managed in accordance with the applicable effluent quality standards in the regulation No 01 of 2008.

6.4.6 Leachate Monitoring

An effective leachate monitoring plan must be drawn up and monitoring carried out regularly to confirm that the landfill behaves in the ways predicted and licensed and provides information needed for management decisions. Monitoring data also provide the means of assessing the general behaviors of a landfill.

Leachate monitoring should not be confined to the landfill itself, but also take place outside the landfill boundary to ascertain ground water contamination.

The monitoring scheme must provide detailed information on the development of leachate within, and beyond a landfill. The scheme should be drawn up at the site investigation stage and pre-operational background readings are vital as without such readings, it is difficult to judge what effect a landfill has on the environment.

6.4.7 Landfill Gas Management

Landfill gas is one of the major routes through which land filing may create impact on the environment and the local community. Land fill Gas migration should be considered when planning a land fill operation or any development adjacent to a landfill site.

Following 3 types of systems may be used to prevent lateral migration of landfill gas;

i. impermeable barriers
ii. passive venting and
iii. gas pumping

6.4.8 Record Keeping

The operator of a secure landfill facility should maintain in the operating record the following items:

i. On a map, the exact location and dimensions, including depth of each cell
ii. The contents of each cell and the approximate location of each type of scheduled waste within each cell
iii. The quantities and types of waste being treated and disposed of should be recorded in the daily log book.
iv. The daily analytical data of the effluent from leachate treatment system should be recorded. The parameters to be analyzed must be in accordance with the respective discharge standards in the regulation No 01 of 2008.

SECTION 07
IMPORTANT FACTORS FOR ESTABLISHMENT OF SCHEDULED WASTE DISPOSAL FACILITY

7.1 SCOPE

These Guidelines are designed to provide a framework for the development of procedure to protect the community and the environment in setting up of new facilities for (treatment and) disposal of hazardous waste in environmentally compatible sites in accordance with the environmental regulations in force (see the section 01).

These guidelines are primarily for the setting up of independent scheduled waste (treatment and) disposal facilities located away (off-site) from the premises of scheduled waste generator.

7.2 SITING OF SCHEDULED WASTE TREATMENT & DISPOSAL FACILITY

7.2.1 The goals of site selection should be to

i. Minimize health risks

ii. Minimize environmental impacts

iii. Maximize public acceptability

iv. Minimize costs

Risks to human health, environmental impacts and public acceptability are important factors to be considered in the site selection process.

7.2.2 To meet the siting goals, two basic tasks must be undertaken;

i. the definition of factors and criteria for sites selection and

ii. the establishing of methods to apply the criteria in a rational way.

7.2.3 Siting factors

A general listing of various factors to be considered for siting of hazardous waste disposal facilities is presented in **Table 7.1**

Physical Constraints

- Surface soils
- Subsurface geology and aquifers
- Topography
- Surface water and streams, flooding
- Seismic stability
- Land stability
- Wind direction

Ecological Constraints

- Flora and fauna
- Conservation value
- Habitat value

Human Values

- Landscape
- Recreation value
- Historical/ archaeological/ cultural
- Population density
- Employment opportunities

Land Use

- Agricultural value
- Extractive industry/mining
- Water supply(surface and subsurface)
- Development potential
- Transportation corridor or utility use
- Land use designation (residential/industrial, etc)

Waste Disposal Suitability

- Proximity to users
- Transport access
- Availability to utilities and services
- Adjacent land use; zoning
- Site modifications

Table 7.1 Siting Factors
Source: Environmental Protection Authority of Victoria, 1985.

The factors presented here are points for consideration. Not all the factors listed are equally applicable to each type of scheduled waste treatment and disposal facility.

7.3 LAND FILL SITE SELECTION

For landfills and evaporation ponds, the physical characteristics of the site should be more important than for other types of facilities where the waste do not remain on the site and do not normally come into contact with the soil. Special attention should be given to the hydro geological suitability of the site (i.e subsurface geology, aquifers and permeability of soils).

7.3.1 Landfill site selection criteria

a) Engineering

Physical Site Should be large enough to accommodate waste for life of production facility.

Proximity Locate as close as possible to production facility to minimize handling and reduce transport cost. Locate away from water supply (suggested minimum 500fet) and property line (suggested minimum 200 feet).

Access Should be all -weather, have adequate width and loan capacity, with minimum traffic congestion.

Topography Should minimize earth-moving, take advantage of natural conditions. Avoid natural depression and valleys where water contamination is likely.

Geology Avoid areas with earthquakes, slides, faults, underlying mines, sinkholes, and solution cavities.

Soils Should have natural clay liner or clay available for liner and final cover material available.

b) Environmental

Surface Water Locate outside 100-year floodplain. No direct contact with navigable water. Avoid wetlands.

Ground water No contact with groundwater. Base of fill must be above high ground water table. Avoid sole-source aquifer, avoid areas of groundwater recharge.

Air Locate to minimize fugitive emissions and odour impacts.

Terrestrial and aquatic ecology Avoid unique habitat area (important to propagation of rare and endangered species) and wetlands.

Noise Minimize truck traffic and equipment operation noise.

Land use Avoid populated areas and areas of conflicting land use such as parks and scenic areas.

Cultural resources Avoid areas of unique archaeological, historical and paleontological interest.

Legal/ regulatory Consider national, regional and local requirements for permits.

Public/political Gain local acceptance from elected officials and local interest groups.

7.3.2 Site characteristics that are unacceptable for Hazardous waste land disposal site

Geology

- Bedrock Outcrops
- Irregularities such as fissures or faults overlying groundwater

Hydrology

- Aquifer recharge zone
- Flood prone areas
- Wetlands
- Seasonally high water tables
- Near private or community water supply wells or reservoirs

Climate

- Extremely wet or cold conditions

Topography

- Overly steep slopes
- Broken terrain

Soils

- Thin soil above groundwater
- Highly permeable soils above shallow ground water
- Soils with extreme erosion potential

Land Use

- Areas formerly used for Landfills
- Areas contaminated with persistent residues form past chemical spills or waste treatment processing.

Source : Ryan J.R., and R.C. Loehr, 1891. Site selection methodology for the land treatment of waste water, Hanover, New Hampshire.

The strategy recommended here is to select sites with a high degree of natural containment. Careful attention to the hydrologic conditions can reduce the site preparation cost and can increase the safety of these facilities.

7.4 SITING OF INCINERATORS

7.4.1 In the case of incineration facility, special physical constraints also apply. Consideration should be given to the prevailing wind direction and air dispersion characteristics of the site especially from the view point of possible environmental damage resulting from stack emission.

7.4.2 Areas prone to atmospheric inversion condition or upwind and close proximity residential settlements should be avoided.

7.4.3 Air dispersion model can be used to determine ambient concentrations of pollutants at specific receptors closer to the selected location

7.4.4 The transportation of scheduled waste to the facility is another potential source of risk to the surrounding community. An analysis of spillage scenarios should be performed taking into account the quantity, type, physical form and the method of containment of the waste, and emergency measures formulated in anticipation of an incident.

7.4.5 Decisions on siting should be supported by comprehensive environmental quality and safety legislation in order to gain the confidence of the general public.

7.4.6 Water supply catchments and future development zones are best avoided to eliminate, any potential conflicts and to give assurance of long term environmental security.

7.5 A PHASED APPROACH TO SITE SELECTION

A site selection process for scheduled waste treatment - disposal should be a step-by step procedure involving the evaluation of alternatives.

7.5.1 Definition of Waste Management Problem

The first step in the development process is to define the nature and size of the scheduled waste problem to be managed by the proposed facility. This task is undertaken through surveys of waste generation, handling and management practices and options available. An outline of engineering, planning and environmental issues to be considered in the later phases is also to be prepared.

7.5.2 Selection of Generic Technologies

Based on the information on the quantities and physical and chemical characteristics of the waste, the possible treatment and disposal technologies are to be identified.

7.5.3 Selection of Candidate Region

The first step in the search for suitable site is to select a geographic region. The principal consideration should be given to (a) geological and hydrogeological conditions likely to result in natural containment of scheduled waste, (b) atmospheric and water dispersion characteristics that will protect terrestrial and aquatic ecosystems and (c) proximity to the principal areas of scheduled waste generation in the region.

7.5.4 Selection of Candidate Areas

In this step, importance is assigned to siting factors based on environmental, transportation and land use considerations. This exercise narrows the search to a finite number of candidate areas. Concurrently, other issues related to facility design and operation such as buffer zones, facility arrangements and site size should be addressed.

7.5.5 Selection of Candidate Sites

This phase is very crucial in the siting process and can be carried out through a multi -level screening process.

Level 1 - constraint Mapping

Constraint mapping eliminates environmentally unsuitable sites and narrows down the number of sites for further consideration. Certain features termed as "exclusionary factors" are identified and the occurrence of these features in the candidate areas will be mapped using maps of approximately 1: 250,000 scale.

A list of exclusionary factors used for constraint mapping is given below;

- Seismic risk zones
- National parks/Wildlife sanctuaries
- Surface and subsurface mining areas
- Coastal flood hazard areas
- Coastal wetlands
- Watersheds for public water supply
- Critical recharge areas and sole source aquifers
- Areas of high well yield

These factors should be imposed along with the requirements to eliminate environmentally unsuitable sites from further analysis;

- Ecologically and/ of otherwise sensitive areas: at least 25kms. The requisite distance may be increased depending on the geo-climate conditions.
- Coastal Areas: at least 1/2km , from high tide line
- Flood Plains of the Riverine Systems: at least 1/2km form flood plain or modified flood plain affected by dam in the upstream or by flood control systems.
- Transport /communication systems: at least ½ km from highway and railway
- Major Settlements (3,00,000 population): distance from settlements is difficult to maintain because of urban sprawl. At the time of siting of the industry if any notified limit of any major settlement is within 50 km the spatial direction of growth of the settlement for at least a decade must be assessed and the industry shall be sited at least 25 km from the projected growth boundary of the settlement.

Source: Environmental Guidelines for Siting Industry, Ministry of Environment & Forests, Government of India, New Delhi, August 1985

Level II - Potential Site Selection

The level II factors include land use and infrastructure facilities (major Highway access, sites of existing/former waste disposal facilities and land designated for industrial use) which provide the basis for highlighting promising sites within the candidate areas remaining after level I analysis.

Level III - Community and environmental impacts

The sites selected in level II are further scrutinized to eliminate areas which fail to meet additional socio-economic and environmental concerns as well as additional geological and hydro geological factors such as:

- Existing zones of development
- Agricultural land reserves
- Areas of mineral development
- Wetlands
- Visual corridors of scenic rivers
- Riverine and dam-related flood hazard areas.

7.5.6 Ranking of Sites Alternatives

The next stage of site selection involves comparison of candidate sites based on evaluation of each site for more detailed environmental social and community impacts. The methodology for ranking of site alternatives comprises the following steps:

- Selected attributes for evaluation of site alternatives
- Apportion a total score of 1000 between the assessment attributes based on their importance through ranked pair wise comparison technique.
- Develop site Sensitivity Index (SSI s) using Delphi Techniques
- Estimate scores for each attribute for various candidate site alternatives using SSI s.
- Add the scores for individual site alternatives, to rank the alternatives based on total score.

ANNEXURE

ANNEXURE - 01

SCHEDULE VIII

List of Scheduled Waste with the type of industry according to the Gazette No:1534/18 - 2008.02.01

List of Scheduled Waste with the type of indu stry according to the Gazette No:1534/18 - 2008.02.01

Waste Code	Scheduled Waste	Typical Industries	Symbols for the Characteristics Scheduled Waste
PART I - SCHEDULED WASTE FROM NON-SPECIFIC SOURCES			
1. Mineral Oil and Oil-Contaminated Waste			
N011	Spent oil or grease used for lubricating industrial machines	Any industry using lubricating oil	Toxic, Flammable
N012	Spent hydraulic oil from machines, including plastic injection moulding machines, turbines and die-casting machines	Any industry using Hydraulic oil	
N013	Spent oil-water emulsion used as coolants	Any industry using coolents	
N014	Oil tanker sludges	A3, B2 Waste accepting facilities operating at ports and harbours	
N015	Oil-water mixture such as ballast water		
N016	Sludge from oil storage tank		
2. Waste containing polychlorinated biphenyls (PCBs) or polychlorinated triphenyls (PCTs)			
N021	Spent oil contaminated with PCBs and/or PCTs		Toxic
N022	Electrical equipment or parts containing or contaminated with PCBs and/or PCTs	A73	
N023	Retrofilled transformer contaminated with PCBs and/or PCTs	Including capacitors	
N024	Containers and all waste materials contaminated with PCBs and/or PCTs		
3. Spent organic solvents containing halogen or sulphur, including methylene chloride, 1,1,1-trichloroethane, perchloroethylene and dimethyl sulphide			
N031	Spent halogenated solvents from cleaning and degreasing processes	Metal finishing, laundry operations, garment industry, Electronic product manufactures, Laboratories	Toxic,

4. Spent aromatic organic solvents not containing compounds of organic halogen or sulphur, including toluene, xylene, turpentine and kerosene			
N041	Spent aromatic organic solvents from washing, cleaning, or degreasing processes	Metal Cleaning, Petroleum Products storing & Distribution	Flamable /Toxic
5. Spent non-aromatic organic solvents without containing compounds of organic halogen or sulphur, including acetone, ketones, alcohols, cleaning-benzene, and dimethyl formamide			
N051	Spent non-aromatic organic solvents from washing, cleaning or degreasing processes	B8,A34,B16, laboratories	Toxic, Flammable
6. Residues from recovery of halogenated solvents, may contain oil, fat and solvents			
N061	Residues from recovery of halogenated solvents	Metal Finishing, Any industry /facility on recovery /recycling of solvents	Toxic, Flammable
7. Residues from recovery of non-halogenated solvents, may contain oil, fat and solvents			
N071	Residues from recovery of non-halogenated solvents	A34,B16 Any industry /facility on recovery /recycling of solvents	Toxic Flammable
8. Spent organometallic compounds may be mixed with benzene excluding mercury compounds			
N081	Residues of organometallic compounds, including tetraethyl lead, tetramethyl lead and organotin compounds from mixing process of anti-knock compound with gasoline	Antifouling paints	Toxic, Flammable
9. Flux wastes, may contain mixture of organic acids, solvents or compounds of ammonium chloride			
N091	Flux wastes from fluxing bath of metal treatment processes	Metal finishing Industries including galvanizing	Toxic, Reactive, Corrosive
10. Spent aqueous alkaline solutions not containing cyanide, may contain heavy metals			
N101	Spent aqueous alkaline solutions from treatment process of metal or plastic surfaces	Metal finishing Industries including galvanizing	Toxic, Reactive, Corrosive
N102	Spent aqueous alkaline solutions from bleaching process of textile materials	Textile garment Industry	
11. Spent aqueous alkaline solutions containing cyanide, may contain heavy metals			
N111	Spent aqueous alkaline solution containing cyanide from treatment process of metal or plastic surfaces	Metal finishing Industries	Toxic, Reactive
12. Spent aqueous chromic acid solutions			
N121	Spent aqueous chromic acid solutions from treatment process of metal or plastic surfaces	Metal finishing Industries, laboratories, Cooling towers using Chromium additives	Toxic, Reactive, Corrosive, Oxidizing
N122	Spent aqueous chromic acid solution from leather tannery processes	A25, A26	Toxic

13. Spent aqueous inorganic acid solutions other than spent chromic acid solutions, may contain heavy metals			
N131	Spent aqueous acid solutions from treatment process of metal or plastic surfaces	Metal finishing Industries	Toxic Corrosive,
N132	Spent aqueous inorganic acid solutions from industrial equipment cleaning		
14. Spent aqueous or discarded photographic waste from film processing or plates mixing			
N141	Spent aqueous or discarded photographic waste from film processing or plate making	Studios & Photo printing & processing facilities	Toxic
15. Metal hydroxide sludges containing one or several metals, including chromium, copper, nickel, zinc, lead, cadmium, aluminium and tin			
N151	Metal hydroxide sludges from wastewater treatment system	A43 this includes sludges containing above metal in other forms	Toxic
16. Plating bath sludges containing cyanide			
N161	Plating bath sludges containing cyanide from metal finishing processes	A43	Toxic, Reactive
17. Spent salt containing cyanide			
N171	Spent salt containing cyanide from heat treating process		Toxic, Reactive
18. Sludges of inks, paints, dyes, pigments, lacquer with or without organic solvent			
N181	Paint sludges from solvent recovery of solvent-based paint waste	A11, A24, A23, A28, B7, A61	(depends on the constituents)
N182	Ink sludges from solvent recovery of solvent-based ink waste		
N183	Lacquer sludges from solvent recovery of solvent-based lacquer waste		
N184	Paint sludges from paint wastewater treatment system		
N185	Ink sludges from ink wastewater treatment system		
N186	Pigment sludges from pigment wastewater treatment system		
N187	Dye sludges from dye wastewater treatment system		
19. Wastes from the production, formulation and use of printing ink, paint, pigment, lacquer or varnish containing organic solvents			
N191	Discarded or off-specification ink, pigment and paint products	A11, A24, A23, A28, B7, A61	(depends on the constituent)

20. Sludges, dust, slag, dross and ashes, may contain oxides or sulphate or one of several metals, including lead, cadmium, copper, zinc, chromium, nickel, iron, vanadium, and aluminium			
N201	Dross, slag, ash, dust from metal smelting process or dust emission control system	A45, A46	Toxic, Reactive, Corrosive
N202	Dross from soldering process	Electrical & Electronic Industry	
N203	Residues from recovery of acid pickling liquor	Metal finishing industry	Corrosive
N204	Hydroxide or sulphate sludges from wastewater treatment system		Corrosive
21. Spent or discarded strong acids or alkalis			
N211	Spent or discarded acid of pH less or equal to 2	Acid & Alkali producing industries	Toxic, Corrosive
N212	Spent or discarded alkali of pH greater or equal to 12.5		
22. Spent oxidizing agents			
N221	Spent oxidizing agent	Industries/Laboratories using oxidising agents such as chlorine, Manganese based oxidizers, Ethylene Oxides .	Oxidizing,
23. Contaminated soil, water, debris or matter resulting from clean-up of a spill or chemical or scheduled waste			
N231	Contaminated soil, water debris or matter resulting from cleanup of a spill or chemical or scheduled waste		(depends on the constituents)
24. Immobilized scheduled wastes, including chemically fixed or encapsulated sludges			
N241	Immobilized scheduled wastes		(Based on the original waste used)
25. Discarded drugs except living vaccines and euphoric compounds			
N251	Discarded drugs except living vaccines and euphoric compounds	Any heath care facility	Toxic
26. Pathogenic and clinical wastes and quarantined materials			
N261	Pathogenic and clinical wastes and quarantined materials		Infectious
27. Containers and bags containing hazardous residues and material			
N271	Used containers or bags contaminated with scheduled waste and residues.		(depending on the composition)
28. Mixtures of scheduled wastes			
N281	A mixture of scheduled wastes	A57	(depending on the composition)
N282	A mixture of scheduled and non-scheduled wastes		
29. Mercury wastes containing metallic mercury, organic and inorganic mercury compounds			
N291	Discarded, Used, fused, broken and off specified fluorescent lamps/bulbs	A61,	Toxic

30. Waste Electrical and Electronic Equipments			
N301	Discarded Computers and accessories	Training schools, Institutions, repair shops	Toxic
N302	Discarded Mobile phones	Repair shops	

PART II - SCHEDULEDD WASTES FROM SPECIFIC SOURCES			
1. Mineral Oil and Oil-Contaminated Wastes			
S011	Waste oil or oily sludge from waste water treatment plant of oil refinery or crude oil terminal	A10	Toxic, Flammable
S012	Oily residue from automotive workshop or service station oil grease interceptor	A70, A71, B30, B32, A15	
S013	Oil contaminated earth from re - refining of used lubricating oil		
S014	Oil or sludge from oil refinery maintenance operation.	A10	
2. Tar or tarry residues from oil refinery or petrochemical plant			
S021	Tar or tarry residues from oil refinery or petrochemical plant	A10, A13, A15	Toxic, Flammable
3. Waste of printing inks, paints, dyes, pigments, lacquer, varnish or wood preservative containing organic solvents			
S031	Ink waste from washing of reaction tank or container of ink manufacturing plant.	A12	(depending on the constituents)
S032	Paint waste from washing of reaction tank or container of paint manufacturing plant.	A12	
S033	Dyes waste from washing of reaction tank or container of dyes manufacturing plant.	A11	
S034	Pigment waste from washing of reaction tank or container of pigment manufacturing plant.	A12	
S035	Lacquer or varnish Pigment waste from washing of reaction tank or container of lacquer or varnish manufacturing plant.	A12	
4. Clinker, slag and ashes from scheduled wastes incinerator			
S041	Clinker, slag and ashes from scheduled wastes incinerator	A58, A62, A63, A68, A77	Toxic
5. Waste of printing inks, paints, dyes, pigments, lacquer without containing solvents			
S051	Water based Paint waste from the washing of reaction tank or container of paint manufacturing plant.	A12	Toxic
S052	Water based Ink waste from the washing of reaction tank or container of ink manufacturing plant.	A12	

S053	Water based dye and pigment waste from the washing of reaction tank or container of dye and pigment manufacturing plant.	A11, A12	
S054	Ink waste from the washing of cleaning of printing machine of printing works.	A24, A74,	
S055	Pigment waste from brick and tile works		
S056	Paint waste from the paint spraying or dipping process of metal works, motor vehicle assembly plant or electrical appliances manufacturing plant	A47, A69, B22, B30	
6. Spent tars or anti-corrosion oils			
S061	Anti-corrosion oils or tar residues from the sealing or spraying or casting processes of motor vehicle assembly plant or automotive workshop.	A69	Toxic
7. Spent ethylene glycol			
S071	Contaminated ethylene glycol from gas processing plant.	A14	Toxic
S072	Unhardened ethylene glycol from polyester manufacturing plant	A16	
8. Waste containing phenol or formaldehyde			
S081	Phenol or formaldehyde waste from the washing or reaction or mixing tank of adhesive or glue or resin manufacturing plant	A16, A21	Corrosive, Toxic, Flammable?
S082	Sludges containing phenol or formaldehyde waste from the Waste water treatment system of adhesive or glue or resin manufacturing plant	A16, A21	
9. Residues of isocyanate compounds, excluding solid polymeric materials			
S091	Residues of isocyanate compounds from foam manufacturing process.	A5, A16, A17	Reactive, Toxic, Flammable
10. Adhesive or glue waste may contain organic solvents, excluding solid polymeric materials			
S101	Off-specification adhesive or glue products from adhesive or glue manufacturing plant	A16, A21	Flammable
S102	Effluent from the washing of the reaction or processing tank of adhesive or glue manufacturing plant.	A16, A21	
11. Uncured resin waste, may contain organic solvents or heavy metals including epoxy resin, phenolic resin.			
S111	Uncured resin residues form electronic or semiconductor, electrical appliances, fibreglass manufacturing plants and metal works.	A4, A16, A47, B3, B22	Reactive, Toxic Flammable
S112	Effluents from washing of reactor of resin manufacturing plant	A16	
S113	Resin sludge from waste water treatment system of resin manufacturing plant	A16	

12. Latex effluent, rubber or latex sludges containing organic solvents or heavy metals			
S121	Rubber or latex sludges containing heavy metals from the waste water treatment system of rubber products manufacturing plant.	A5	Toxic
S122	Rubber or latex sludges containing organic solvents from rubber products manufacturing plant.		Toxic, Flammable
S123	Latex effluent from rubber products manufacturing plant.		Toxic
13. Sludges from the re-refining of used oil products including oily sludges containing acid or lead compounds			
S131	Acid sludge from the re-refining of used lubricating oil.	A10	Corrosive, Toxic
14. Sludges containing fluoride			
S141	Sludges containing fluoride from the waste water treatment system of electronic or semiconductor manufacturing plant.	A47, B22	Toxic
15. Mineral sludges, including calcium hydroxide sludges, phosphating sludges, calcium sulphite sludges and carbonate sludges			
S151	Sludges from phosphating process of motor vehicle assembly, air conditioning, electrical appliances and electronic or semiconductor plants.	A43, A47, A69, B22	Toxic
S152	Sludges from the waste water treatment system of plant producing ceramic or tiles, industrial gas and bleaching earth containing heavy metals.	A52,	Toxic
16. Asbestos waste			
S161	Asbestos sludges from the waste water treatment system of Asbestos/ cement products manufacturing plant.	A19	Toxic
S162	Asbestos dust or loose asbestos fibre wastes from asbestos / cement products manufacturing plant.		
S163	Empty bags or sack containing loose asbestos fibres from asbestos / cement products manufacturing plant.		
S164	Waste arising from repairing/renovation processes and demolition/construction debris containing asbestos.		
17. Waste from the production, formulation, repacking, and trade of pesticides; including herbicides, Insecticides, rodenticides, and fungicides			
S171	Dust from air emission control equipment, or exhaust systems of pesticides production, formulation and repacking plants.	A9	Toxic
S172	Sludges from wastewater treatment systems of pesticides production, formulation and repacking plants.	A9	Toxic
S173	Residues from filtering process of intermediate products at pesticides production and formulation plants.	A9	Toxic

S174	Waste from washing of reaction tank or mixing tank and spillages at pesticide production and formulation plants and spillages at pesticides repacking plants	A9	Toxic
S175	Solid residues resulting from stamping process of mosquito coil production plant.	A9	Toxic
S176	Off-specification and out dated products and contaminated containers from pesticides formulation and repacking plants and trade of pesticides	A9	Toxic
18. Press cake from pre-treatment of glycerol soap lye			
S181	Press cake from pre-treatment of glycerol soap lye from detergent or soap or toiletries plants.	A2, B1	Toxic
19. Wastes containing dye			
S191	Waste water containing dye from textile manufacturing plant.	A23, A24, A28, B7,	Toxic
20. Waste from wood preserving operations using inorganic salts containing copper, chromium as well as arsenic of fluoride compounds or using compound containing chlorinated phenol or creosote			
S201	Waste from wood preserving operations using inorganic salts containing copper, chromium as well as arsenic of fluoride compounds or using compound containing chlorinated phenol or creosote	A64	Toxic, Corrosive
21. Mercury wastes containing metallic mercury, organic and inorganic mercury compounds			
S211	Mercury wastes containing metallic mercury form manufacturing of fluorescent lamps	Not available in Sri Lanka and not encouraged	
S212	Activated carbon waste containing mercury from hydrogen gas purification process.	A14	Toxic
S213	Mercury bearing sludges from brine treatment and Mercury bearing brine purification muds from chlorine production plant.	Not available in Sri Lanka and not encouraged Toxic	
22. Spent catalysts			
S221	Spent industrial catalysts from chemical plant manufacturing detergent or soap or toiletries plants.	A2, B1	Toxic
S222	Spent industrial catalysts from petroleum and petro-chemical processes	A10, A13	
S223	Spent industrial catalysts from sulphuric acid and other inorganic acid manufacturing process	A1	
23. Leachate from scheduled waste landfills.			
S231	Leachate from scheduled waste landfills.	A63	Toxic, Corrosive

24. Rags, papers plastics or filters contaminated with organic solvents			
S241	Rags, papers plastics or filters contaminated with paint or ink or organic solvent from motor vehicle assembly plants, metal works, electronic or semiconductor plants and printing or packaging plants	A16, A47, A69, A74, B30	Toxic, Flammable
25. Containers and bags containing hazardous residues			
S251	Used containers or bags contaminated with residues of raw materials and products of pesticide formulation plant	A9	Toxic
26. Discarded or off specification batteries containing lead, mercury, nickel, cadmium, lithium and Electrolyte from batteries and accumulators.			
S261	Discarded or off specification batteries from battery manufacturing plant.	A18	Corrosive, Toxic
S262	Used or off specified batteries and accumulators	A18, C24	Corrosive, Toxic
27. Pharmaceutical waste			
S271	Waste water from washing of reaction vessels and floors of Pharmaceutical products manufacturing plant.	A7, A20, B6	Toxic
S272	Sludges containing pharmaceutical material from waste water treatment plants of pharmaceutical manufacturing/formulation plants	A7, A20, B6	Corrosive, Toxic, Reactive
28. Bio Medical & Health Care Waste from Health Care Institutions including Medical Laboratories and Research Centres.			
S281	Infectious health care waste including laboratory cultures; waste from isolation wards; tissues (swabs), materials or equipment that have been in contact with infected patients; Human tissues or fluids	A68	Infectious
S282	Sharps including needles and scalpels	A68	Infectious
S283	Biological and Anatomical waste including tissues, organs, body parts, human fetuses and animal carcasses, blood, and body fluids	A68	Infectious
S284	Outdated and discarded drugs including cytotoxic drugs and chemical reagents	A7, A20, B6	Infectious ,Toxic
S285	Materials and containers contaminated with the above specified waste	A7, A20, B6	Toxic, Infectious

THE ACTIVITIES FOR WHICH AN ENVIRONMENTAL PROTECTION LICENSE IS REQUIRED

Prescribed Industry List

PART A

1. Chemicals manufacturing or formulating or repacking industries.
2. Soaps, detergents, softener or any other cleansing preparations manufacturing industries having a production capacity of 1,000 kilograms per day or more.
3. Bulk petroleum Liquid or liquefied petroleum gas storage or filling facilities having a total capacity of 150 or more metric tons excluding vehicle fuel filling stations.
4. Industries involved in the use of fibreglass as a raw material where 10 or more workers are employed.
5. Synthetic rubber, natural rubber manufacturing or processing or rubber based industries excluding industries which manufacture less than 100 kilograms of ribbed smoke rubber sheets per day
6. Activated carbon or carbon black manufacturing industries or charcoal manufacturing industries having a production capacity one or more metric ton per batch.
7. Industries involved in manufacturing, extracting or formulating Ayurvedic, Indigenous medicinal products where 25 or more workers are employed.
8. Chemical fertilizer manufacturing, formulating, processing or repacking Industries.
9. Pesticides, insecticides, fungicides and herbicides manufacturing, formulating or repacking industries.
10. Oil (mineral oil or petroleum) refineries.
11. Dye and dye intermediate manufacturing or formulating industries
12. Paints (emulsion or enamel), inks, pigments, varnish, polish manufacturing or formulating industries.
13. Petrochemical (basic or intermediates) manufacturing or formulating industries.
14. Industrial gas manufacturing, processing or refilling industries.
15. Asphalt processing plants
16. Industries involved in the manufacture of polymers or polymer based products (i.e. polyethylene, polyvinyl chloride (PVC), polyurethane, polypropylene, polyester, nylon, polystyrene, resins, fibreglass or other man made fibres etc.) or polymer or polymer based products recycling industries.
17. All types of tyres, tubes manufacturing or tyre retreading industries.
18. Industries involved in manufacturing or reconditioning of batteries.
19. Any industry involved in the use of asbestos fibres as a raw material.

20. Industries involved in manufacturing, extracting or formulating pharmaceuticals or cosmetic products including intermediates.
21. Adhesives manufacturing industries excluding natural gums.
22. Match sticks manufacturing industries and explosives manufacturing or formulating industries.
23. Batik industries where 10 or more workers are employed.
24. Textile processing (i.e. bleaching, dyeing, printing) industries or garment washing industries or textile sand blasting industries or commercial laundries where 10 or more workers are employed.
25. Tanneries
26. Leather finishing industries having effluent generating operations.
27. Jute processing industries.
28. Industries involved in bleaching or dyeing of natural fibre or natural fibre based industries where 25 or more workers are employed.
29. Power looms having 25 or more machines or power looms with sizing activities
30. Sugar manufacturing industries or sugar refineries.
31. Fermentation industries (Distilleries, Breweries) or alcoholic beverages bottling plants or bottling plants having bottle washing operations.
32. Food manufacturing and processing industries including bakery products and confectioneries where 25 or more workers are employed
33. Abattoirs.
34. Coconut oil or cinnamon oil extraction industries where 25 or more workers are employed.
35. Plants or animal oil/fats extraction industries having production capacity of 10 litres or more per day excluding coconut oil and cinnamon oil extraction industries.
36. Instant tea or coffee processing industries
37. Non-alcoholic beverages manufacturing industries where 25 or more workers are employed.
38. Desiccated coconut mills or coconut processing industries where 10 or more workers are employed.
39. Rice mills having wet process and having a production capacity of 5,000 kilograms or more per day.
40. All hatcheries or poultry farms having 2,500 or more birds or piggery, cattle, goats farms having animals 50 or more or having rating* for mixed farming 2,500 or more.

    *Rating for Mixed Farming = No. of Birds + 50 x (No. of Pigs + No. of Cattle + No. of Goats)

41. Animal feed manufacturing industries having a capacity of 25 or more metric tons per day.
42. Cigarettes or other tobacco products manufacturing industries where 50 or more workers are employed.
43. Industries involved in Surface treatment of metal or plastic including electroplating, galvanizing and powder coating industries.
44. Iron and steel mills.
45. Foundries with any type of furnaces.
46. Non-ferrous metal processing industries including secondary process, smelting and recovery of metals.
47. Metal fabricating industries or machinery, machinery parts or hardware items or electrical and electronic goods and equipment manufacturing or assembling industries where 24 or more workers are employed. (including lathe workshops, welding shops, spray painting industries).
48. Cement industries (clinker grinding, manufacturing or repacking)
49. Concrete batching plants having a production capacity of 50 or more cubic meters per day.
50. Glass or glass based product manufacturing industries.
51. Lime kilns having a production capacity of 20 or more metric tons per day.
52. Ceramic industries where more than 25 or more workers are employed.
53. Mechanized mining activities with multi bore hole blasting or single bore hole blasting activities with production capacity having 600 or more cubic meters per month.
54. Crushing or processing of non-metallic minerals (i.e. limestone, dolomite, apatite, rock phosphate, sand stone, feldspar, quartz, ilmenite, rutile, zircon, mica, graphite, kaolin, etc.) excluding lime shell and granite crushing activities.
55. Granite boulders, making or processing industries (extracting, blasting, slicing, polishing).
56. Granite crushing (Metal crushing) industries having a total production capacity of 25 or more cubic meters per day.
57. Common wastewater (Industrial or sewage) treatment plants.
58. Incinerators having a feeding capacity of 5 or more metric tons per day.
59. Water treatment plants having a treatment capacity of 10,000 or more cubic meters per day.
60. Municipal solid waste and other solid waste composting plants having a capacity of 10 or more metric tons per day.
61. Solid waste recovery/recycling or processing plants having a capacity of 10 or more metric tons per day.
62. Solid waste disposal facility having a disposal capacity of 10 or more metric tons per day.

63. All toxic and hazardous waste treatment facility or disposal facilities or recycling /recovering or storage facilities.

64. Industries involved in chemical or oil treatment and preservation of wood excluding Boron treatment.

65. Saw mills having a milling capacity of 50 or more cubic meters per day or wood based industries where 25 or more workers are employed.

66. Hotels, guest houses, rest houses having 20 or more rooms.

67. Hostels and similar dwelling places where occupancy level is exceeding 200 or more.

68. Health care service centres generating infectious waste, including medical laboratories and research centres.

69. Automobile or bicycle manufacturing or assembling industries.

70. Vehicle service stations or container yards having vehicle service activities excluding three wheeler and motor cycles services and interior cleaning.

71. Railway workshops or all bus depots having vehicle servicing activities.

72. All vehicle emission testing centres.

73. Electrical power generating utilities excluding standby generators or hydro or solar or wind power generation.

74. Printing presses with lead smelting or newspaper printing or printing process which generates wastewater or colour photographs processing centres.

75. Paper and Pulp Industries or corrugated cartons manufacturing industries.

76. Any industry where 200 or more workers per shift are employed.

77. Industrial Estates approved under the part IVC of the National Environmental Act including Katunayake and Biyagama Export Processing Zone.

78. Zoological gardens.

79. Transmission towers providing facilities for telecommunication and broadcasting.

80. Any industry not included above which discharges 10 or more cubic meters of wastewater per day or using toxic chemicals in its process.

PART B

1. Soaps, detergents, softener or any other cleansing preparations manufacturing industries having a production capacity less than 1,000 kilogram per day.
2. Bulk petroleum liquid storage facilities excluding filling stations or liquefied petroleum gas (LP gas) storage or filling facilities having a total capacity less than 150 metric tons.
3. Industries involved in the use of fibre glass as a raw material where less than 10 workers are employed.
4. Ribbed smoke rubber sheets manufacturing industries having a production capacity of more than 50 kilograms per day and less than 100 kilograms per day.
5. Activated carbon or carbon black manufacturing industries or charcoal manufacturing industries having a production capacity less than one metric ton per batch.
6. Industries involved in manufacturing, extracting or formulating Ayurvedic Indigenous medicinal products where more than 10 workers and less than 25 workers are employed.
7. Batik industries where less than 10 workers are employed.
8. Commercial laundries where less than 10 workers are employed.
9. Leather finishing industries having dry process operations.
10. Natural fibre based industries where less than 25 workers are employed excluding industries involved in bleaching or dyeing of natural fibre.
11. Power looms having less than 25 machines.
12. Hand looms or knitting or embroidery industry having more than 10 looms.
13. Garment industries where 25 or more workers and less than 200 workers per shift are employed.
14. Sugar cane based industries excluding sugar factories or sugar refineries
15. Food manufacturing and processing industries including bakery products and confectioneries where 5 or more workers and less than 25 workers are employed.
16. Cinnamon oil extracting industry where less than 25 workers are employed.
17. Rice mills having wet process with a production capacity of less than 5,000 kilograms per day.
18. Grinding mills having production capacity of more than 1000 kilograms per month.
19. Poultry farms having 250 or more and less than 2,500 birds or piggery, cattle, goats farms having animals 5 or more and less than 50 or having rating* for mixed farming 250 and less than 2,500.

    * Rating for Mixed Farming = No. of Birds + 50 x (No. of Pigs + No. of Cattle + No. Goats)

20. Animal feed manufacturing industries, having a capacity of less than 25 metric tons per day.

21. All ice manufacturing industries.

22. Metal fabricating industries or machinery, machinery parts or hardware items or electrical and electronic goods and equipment manufacturing or assembling industries where less than 25 workers are employed. (including lathe workshops, welding shops, spray painting industries).

23. Concrete batching plants having a capacity less than 50 cubic meters per day.

24. Single borehole blasting with industrial mining activities using explosives, having a production capacity of less than 600 cubic meters per month.

25. Granite crushing (Metal crushing) industries having a total production capacity of less than 25 cubic meters per day excluding manual crushing operations using hand tools

26. Municipal solid waste and other solid waste composting plants (excluding household composting) having a capacity of less than 10 metric tons per day.

27. Solid waste recovery/recycling or processing plants having a capacity of less than 10 metric tons per day.

28. Solid waste disposal facility having a disposal capacity of less than 10 metric tons per day.

29. Hostels and similar dwelling places where occupancy level of 25 or more boarders and less than 200 borders.

30. Vehicle repairing and maintaining garages including spray painting or mobile air-conditioning activities.

31. Recycling or recovering centres of refrigerants from air-conditioners or refrigerators.

32. Three wheeler or motor cycle servicing activities or vehicle interior cleaning activities.

33. Any Industry not included above which discharges 3 or more and less than 10 cubic meters of industrial processing wastewater per day.

ANNEXURE - 02

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The Gazette of the Democratic Socialist Republic of Sri Lanka
EXTRAORDINARY

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No. 1534/18 - FRIDAY, FEBRUARY 01, 2008

(Published by Authority)

PART I : SECTION (I) — GENERAL

Government Notifications

L.D.B. 4/81.

NATIONAL ENVIRONMENTAL ACT, No. 47 OF 1980

REGULATIONS made by the Minister under Section 32 read with Section 23A and 23 B of the National Environmental Act, No. 47 of 1980.

PATALI CHAMPIKA RANAWAKA,
Minister of
Environment and Natural Resources.

Colombo,
14th January, 2008.

Regulations

1. These Regulations may be cited as the National Environmental (Protection and Quality) Regulations, No. 1 of 2008.

PART I

ISSUE OF ENVIRONMENTAL PROTECTION LICENSE FOR EMISSION OR DISPOSAL OF WASTE

2. No person shall, discharge, deposit or emit waste into the environment or carry on any prescribed activity determined by an Order made under Section 23A of the National Environmental Act, No. 47 of 1980 in circumstances which cause or are likely to cause pollution, or noise pollution, otherwise than –

(a) under the Authority of a license issued by the Central Environmental Authority (hereinafter referred to as "the Authority") ; and

(b) in accordance with the such standards and criteria specified in Schedule I hereto, in respect of the specified industries.

3. Notwithstanding anything contained in regulation 2, the Authority may, by a direction issued under regulation 12, impose more stringent standards and criteria than those specified in Schedule I hereto in respect of any prescribed activity, having regard to the need to protect the receiving environment.

4. Where an activity in respect of which an application for a license is made, is not covered by the standards and criteria specified in Schedule I hereto, the Authority shall examine such application on its merits and grant such application specifying the standards and criteria which shall be applicable. The applicant shall comply with all such directions as may be issued to him by the Authority for the protection of the environment.

5. (1) An application for the license shall be –

(a) made separately, in respect of prescribed activity regarding which the Acts authorized by the regulations are being carrie out ;

(b) made substantially in Form A in Schedule II and Schedule IV hereto ;

(c) made at least thirty days prior to the commencement of the activity.

(2) Every applicant shall furnish all such particulars as may be required to be stated in the aforesaid Form A in Schedule II and Schedule IV and any other information that may be called for by the Authority for the purpose of determining whether or not to grant the license.

(3) Every applicant shall make payment of the license fee specified in Schedule III hereto on intimation by the Authority.

6. Every license issued by the Authority shall be :-

(a) made substantially in Form B of Schedule II hereto ;

(b) valid for such period not exceeding three years as specified in the license subject to any suspension or cancellation of the license under Section 23 D of the Act ; and

(c) renewable.

7. The Authority shall issue the license only if it is satisfied that :-

(a) the license will not be used to contravene the provisions of the Act or any regulation made there under ;

(b) no irreversible damage or hazard to any person, environment or any nuisance will result from the acts authorized by the license ;

(c) the applicant has taken adequate steps for the protection of the environment in accordance with the requirements of the Law.

8. (1) An application for a renewal of a license shall be –

(a) made at least three months before the date of expiry of the license or one month before effecting any changes, alterations, or extensions to the premises at which the acts authorized by the license are carried out, as the case may be ;

(b) made substantially in Form C of Schedule II hereto ;

(2) Every applicant for a renewal of the license shall furnish all such particulars as may be required to be stated in the aforesaid Form A in Schedule II and Schedule IV and any other information that may be called for by the Authority for the purpose of determining whether or not the license should be renewed.

(3) Every applicant shall make payment of the license fee specified in the Schedule III hereto for renewal of a license within the period specified by the Authority on receipt of intimation by the Authority.

9. The Authority may, before issuing an order suspending or canceling a license under Section 23 D of the Act, give the holder of the license an opportunity to show cause why such order should not be issued :

Provided that, where, since the issue of the license, the receiving environment has been altered or changed due to natural factors or otherwise or where continued discharge, deposition or emission of waste into the environment under the license affects any beneficial use adversely, the Authority shall forthwith make an order suspending the license for a period to be specified in the order or cancel such license.

10. (1) Any applicant for a license who is aggrieved by the refusal of the Authority to grant a license, or, any holder of a license who is aggrieved by the suspension or cancellation of a license or the refusal to renew a license may, within thirty days after the date of notification of such decision to him, appeal in writing against such refusal, suspension, cancellation or refusal to renew, to the Secretary to the Ministry of the Minister in-charge of the subject of Environment.

(2) Such applicant shall be given an opportunity of making representations in person or by authorized representative in connection with his appeal.

(3) The Secretary may set aside, vary or confirm the decision appealed from, and the Authority shall give effect to the Secretary's decision.

(4) The decision of the Secretary shall be final and conclusive.

11. The holder of a license shall forthwith notify the Authority of –

(a) any changes made or proposal to be made in the particulars furnished in connection with his application for a license ;

(b) any decision to terminate any activity to which the license relates,

and shall comply with any directions that may be issued by the Authority to prevent or mitigate environmental pollution and hazards.

12. Every applicant and every holder of a license shall comply with any direction given by or on behalf of the Authority for the purpose of protecting the environment.

13. Every person who acts in contravention of any regulations commits an offence punishable under Section 31 of the Act.

14. Any person who operates a prescribed activity shall obtain a license from the Authority prior to the commencement of such activity.

PART II

ISSUE OF LICENSE FOR THE MANAGEMENT OF WASTE

15. No person shall generate collect, transport, store, recover, recycle or dispose waste or establish any site or facility for the disposal of any waste specified in the Schedule VIII (herein after referred to as "scheduled waste") except under the authority of a license issued by the Authority and in accordance with such standards and other criteria as may be specified by the Authority.

16. Every application for a license under regulation 15 shall be substantially in Form A as set out in Schedule IV of these regulations, and be accompanied by –

(a) a valid certificate of insurance or any other form of financial security acceptable to the Authority, of such sum as is sufficient to cover the risk or damage that may be caused to the public as a result of any activity referred to in regulation 15 being carried on by the applicant ; and

(b) such other additional information explanatory of the matters set out in Form A of Schedule IV of this regulation, as the Authority may consider necessary in the interest of the protection of the Environment.

17. Every application for a license under regulation 15 shall be accompanied by a fee calculated on the following basis :-

Generator	Rs. 1000
Collector	Rs. 1000

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PART I : SEC. (I) - GAZETTE EXTRAORDINARY OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA - 01.02.2008

Storer	Rs.	10,000
Transporter	Rs.	2,000
Recycler	Rs.	5,000
Recoverer	Rs.	5,000
Disposer	Rs.	1,00,000

18. On receipt of an application for a license under regulation 16 and after such risk assessment as the Authority shall deem appropriate, the Authority may issue a license to the applicant.

19. Every license issued by the Authority under regulation 18 shall –

(a) be substantially in such from as set out in Form B of Schedule IV of this Regulation ;

(b) be subject to such terms, conditions and standards as may be stipulated in the license in addition to what is specified in the Schedule I hereto ;

(c) be valid for such period as shall be specified in the license ; and

(d) on application being made there fore be renewable subject to regulation 25, by the Authority.

20. No person shall continuously engage in the management of scheduled waste with the same physical and chemical characteristics or any aspects thereof, except under a separate license for multiple scheduled waste management operations of the same kind, issued by the Authority in accordance with the provisions of regulation 17 for multiple scheduled waste management operations of the same kind. Such license shall be for a specified period and for a specified quantity of scheduled waste as shall be specified in the license.

21. A license issued under regulation 18, 19 or 20 shall not authorize the mixing of waste, with scheduled waste within the meaning of this Part of these regulations and specified in Part I of these regulations, unless the generator, collector, storer, transporter or person disposing proves to the satisfaction of the Authority that such mixing may reduce the load of pollutants.

22. A license issued under this Part of these regulations shall not be transferable and any transfer made in contravention of these regulations shall render the license issued null and void.

23. A license issued under these regulations to any person shall not be used for the benefit of any other person.

24. Where a person to whom a license has been issued under this Part of these regulations, acts in violation of any of the terms, standards and conditions of the license, the Authority may be order suspend the operation of such license for a period specified in such order, or cancel such license, after granting to the licensee an opportunity to show cause and after recording reasons therefore :

Provided however the Authority shall have power to temporarily suspend the license pending the conclusion of an inquiry under this regulation, where it considers such action urgently required in the public interest.

25. The Authority shall have the power to monitor and inspect activities conducted by a licensee pursuant to any license granted to such person under this part of the regulations.

26. (1) The Authority shall have the power to specify guidelines from time to time, for –

(a) the establishment of scheduled waste disposal sites ;

(b) safety measures to be adopted during generation collection, transportation, storage, recovery, recycling or disposal of scheduled wastes ;

(c) operations regarding recycling or recovery of scheduled waste.

(2) The guideline specified under paragraph (1) shall wherever possible be published in the *Gazette* or shall otherwise be made available to the public.

27. It shall be the duty of every licensee to –

(*a*) maintain records substantially in the form set out in the Schedule V of these regulations in respect of collection, transportation, storage, recovery, recycling or disposal of Scheduled waste ;

(*b*) send an annual return to the Authority substantially in the form set out in the Schedule VI of these regulations regarding the disposal of Scheduled waste, duly certified by any person authorized for such purposes by the Authority ;

(*c*) provide the Authority annually with such information as may be required by the Authority ; and

(*d*) record in a register to be maintained by the licensee the quantity, type, quality and origin of Scheduled waste, collected, stored, transported, recovered, recycled and disposed of by him.

28. The register to be maintained under regulation 27 shall be made available by the licensee for inspection at any time by the Authority and it shall be the duty of a licensee to issue a certified copy of any extract of the register so maintained at the request of any member of the public, on the payment of a fee.

29. Any authorized officer of the Authority or a police officer may, for the purpose of ascertaining whether the provisions of these regulations are being complied with-

(*a*) enter and inspect any facility or site of generation collection storage, recover, recycling or disposal of scheduled waste ;

(*b*) stop and inspect any vehicle in transit, suspected to contain scheduled waste ;

(*c*) examine any records maintained under these regulations and take copies of such records ;

(*d*) take samples of scheduled waste generated transported, stored, collected, recovered, recycled or disposed of.

30. The Authority shall maintain a record of licences granted under these regulations.

31. Every person involved with the management of scheduled waste shall, in addition to any other signs or symbols required under any other law, display a plainly visible notice in Sinhala, Tamil and English, on the—

(*a*) site of generation or storage ;

(*b*) vehicle used for transportation ;

(*c*) containers or tanks used for collection and storage ; and

(*d*) disposal sites whether approved or not,

the following statement and visual sign — "Warning, contains waste, Dangerous to human, health and the environment"

32. The licnece issued under these regulations or a certified copy thereof shall be carried on the vehicle transporting schedule waste, and shall be produced by the driver of the vehicle for inspection by any police officer or other officer authorized by the Authority.

33. Every generator collector, storer, transporter recycler, recovery and disposer of scheduled waste shall —

(*a*) ensure that all its employees are adequately trained in handling scheduled waste and shall report to the authority on a bi-annual basis the steps taken to ensure that its employees are so trained ;

(*b*) have a regularly updated emergency action plan approved by the authority ;

(*c*) ensure that all employees handling scheduled wastes shall be protected by appropriate clothing and other precautions from the adverse effects of the scheduled waste ; and

(*d*) ensure that immediate and adequate medical care is available for employees and the public at all times, including emergency situations.

34. Every generator collector, storer, transporter, recycler, recoverer or disposer, of scheduled waste shall forthwith report to the Authority of any accident that may have occured during or as a result of the generation, collection, storage, trsnsportation, recycling recovery or disposal of waste substantially in the form set out in Schedule VII hereto.

35. Every person who carries on any activity which generates or produces waste or is in possession or control of scheduled waste or is an importer of waste into Sri Lanka, shall inform the Authority-

(*a*) on or before the July 31 and January 31, respectively of each year, the quantity and characteristics of scheduled waste generated or produced or in possession or control of or imported as the case may be, in the previous six months and estimate of the quantity and composition of scheduled waste that might be so generated or produced, or be in possession or control of or be imported as the case may be for the ensuring year, including information of process, modifications and changes in chemical usage ; and

(*b*) of the measures adopted to apply technologies for the reduction or elimination of the generation or production or the possession or control of scheduled waste, including method adopted for treatment and final disposal of such waste.

PART III

GENERAL

36. The National Environmental (Protection and Quality) Regulation No. 1 of 1990 published in *Gazette Extraordinary* No. 595/16 of February, 1990 as amended from time to time, are hereby rescinded.

37. (1) Notwithstanding the rescinding of the aforesaid regulation, any act or omission done or made under the said regulation shall be effective and has a force of law unless its is contrary to this regulation.

(2) Every licence issued for the purposes of the aforesaid regulation, after 16th February, 1990 shall be valid and continued as effectual as if issued here under for the purposes of enforcement of the rights and obligations to which such licence applies.

38. For the purpose of this Part of these regulations-

"Act" means the National environmental Act, No. 47 of 1980 ;

"Authority" means the Central Environmental Authority established by the National Environmental Act, No. 47 of 1980 ;

"collection" means the collection including storage for the time being of scheduled waste including those generated in small quantities ;

"disposal" includes any operation which leads to the emission, discharge or deposit of scheduled waste into or upon the environment and further includes other operations such as recycling and recovery ;

"facility" means any location wherein the processes incidental to the generation, collection, storage, recycling, recovery and disposal of scheduled wastes are carried out ;

"generation" means the productions, manufacturing, or creation of scheduled waste from any activity ;

"heavy metals" means the group of elements between and including copper and mercury in the periodic table of the elements having atomic weights between and including 63.546 and 200.590 ;

"management" means the generation collection, storage, transport, recycling, recovery and disposal of scheduled waste, including these generated in small quantities ;

"schedule waste" means any waste specified in Schedule VIII hereto ;

"storage" includes the storing of waste for a minimum reasonable period under conditions which will prevent their release to the environment ;

"transport" means the movement of scheduled waste from the site of generation, importation or storage to any other side including a facility for disposal ;

"waste" means waste as defined in the Act and specified in Scheduled VIII hereto.

SCHEDULE I

TOLERANCE LIMITS FOR THE DISCHARGE OF INDUSTRIAL WASTE IN TO INLAND SURFACE WATERS

No.	*Parameter*	*Unit type of limit*	*Tolerance Limit values*
01.	Total suspended solids	mg/l, max.	50
02.	Particle siz of the total suspended solids	µm, less than	850
03.	pH at ambient temperature	-	6.0 - 8.5
04.	Biochemical oxygen demand (BOD_5 in five days at 20°c or BOD_3 in three days at 27°c)	mg/l, max.	30
05.	Temperature of discharge	°C, max.	Shall no exceed 40° C in any section of the stream within 15 m down stream from the effluent outlet.
06.	Oils and greases	mg/l, max.	10
07.	Phenolic compounds (as C_6H_5OH)	mg/l, max.	1
08.	Chemical oxygen demand (COD)	mg/l, max.	250
09.	Colour	Wavelength Range	Maximum spectral absorption coefficient
		436 nm (Yellow range)	$7m^{-1}$
		525 nm (Red range)	$5m^{-1}$
		620 nm (Blue range)	$3m^{-1}$
10.	Dissolved phosphates (as P)	mg/l, max.	5
11.	Total Kjeldahl nitrogen (as N)	mg/l, max.	150
12.	Ammoniacal nitrogen (as N)	mg/l, max.	50
13.	Cyanide (as CN)	mg/l, max.	0.2
14.	Total residual chlorine	mg/l, max.	1.0
15.	Flourides (as F)	mg/l, max.	2.0
16.	Sulphide (as S)	mg/l, max.	2.0
17.	Arsenic (as As)	mg/l, max.	0.2
18.	Cadmium (as Cd)	mg/l, max.	0.1
19.	Chromium, total (as Cr)	mg/l, max.	0.5
20.	Chromium, Hexavalent (as Cr^{6+})	mg/l, max.	0.1
21.	Copper (as Cu)	mg/l, max.	3.0
22.	Iron (as Fe)	mg/l, max.	3.0
23.	Lead (as Pb)	mg/l, max.	0.1
24.	Mercury (as Hg)	mg/l, max.	0.0005
25.	Nickel (as Ni)	mg/l, max.	3.0
26.	Selenium (as Se)	mg/l, max.	0.05

SCHEDULE I *(Contd.)*

TOLERANCE LIMITS FOR THE DISCHARGE OF INDUSTRIAL WASTE IN TO INLAND SURFACE WATERS

No.	*Parameter*	*Unit type of limit*	*Tolerance Limit values*
27.	Zinc (as Zn)	mg/l, max.	2.0
28.	Pesticides	mg/l, max.	0.005
29.	Detergents/surfactants	mg/l, max.	5
30.	Faecal Coliform	MPN/100 ml, max	40
	Radio Active Material :		
31.	(*a*) Alpha emitters	micro curie/ml, max	10^{-8}
	(*b*) Beta emitters	micro curie/ml, max	10^{-7}

Note 1 : All efforts should be made to remove unpleasant odour as far as possible.

Note 2 : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by the 1/8 of the actual dilution.

Note 3 : The above mentioned general standards shall cease to apply with regard to a particular industry when industry specific standards are notified for that industry.

Note 4 : Pesticides as per World Health Organization (WHO) and Food and Agriculture Organization (FAO) requirements.

LIST II

TOLERANCE LIMITS FOR INDUSTRIAL WASTE DISCHARGED ON LAND FOR IRRIGATION PURPOSE

No.	*Parameter*	*Unit type of limit*	*Tolerance Limit value*
1.	Total dissolved solids	mg/l, max.	2100
2.	pH at ambient temperature	-	5.5 - 9.0
3.	Biochemical oxygen demand (BOD_5 in five days at 20^0 C or BOD_3 in three days at 27^0c)	mg/l, max.	250 30
4.	Oils and greases	mg/l, max.	10
5.	Chemical Oxygen Demand (COD)	mg/l, max.	400
6.	Chlorides (as C1)	mg/l, max.	600
7.	Sulphates (as SO_4)	mg/l, max.	1000
8.	Boron (as B)	mg/l, max.	2.0
9.	Arsenic (as As)	mg/l, max.	0.2
10.	Cadmium (as Cd)	mg/l, max.	2.0
11.	Chromium , total (as Cr)	mg/l, max.	1.0
12.	Lead (as Pb)	mg/l, max.	1.0
13.	Mercury (as Hg)	mg/l, max.	0.01
14.	Sodium adsorption ratio (SAR)	-	10 - 15
15.	Residual sodium carbonate (RSC)	mol/l, max.	2.5

LIST II *(Contd).*

TOLERANCE LIMITS FOR INDUSTRIAL WASTE DISCHARGED ON LAND FOR IRRIGATION PURPOSE

No.	*Parameter*	*Unit Type of limit*	*Tolerance Limit Values*
16.	Electrical conductivity	µS/cm. max.	2250
17.	Faecal coliform	MPN/100ml, max.	40
18.	Copper (as Cu)	mg/l, max.	1.0
19.	Cyanide (as CN)	mg/l, max.	0.2
20.	Radio Active Material :		
	(a) Alpha emitters	Micro curie./ml, max.	10^{-9}
	(b) Beta emitters	Micro curie/ml, max.	10^{-8}

Hydraulic Loading Applicable for Different Soils :

Soil Texture Class	Recommended dosage of settled Industrial Effluents (m^3/hectare, day)
1. Sandy	225 - 280
2. Sandy laom	170 - 225
3. loam	110 - 170
4. Clay loam	55 - 110
5. Clay	35 - 55

LIST III

TOLERANCE LIMITS FOR INDUSTRIAL AND DOMESTIC WASTE DISCHARGED INTO MARINE COASTAL AREAS

No.	*Parameter*	*Unit Type of limit*	*Tolerance Limit Values*
1.	Total suspended solids	mg/l, max.	150
2.	Particle size of -		
	(*a*) Floatable solids	mm, max.	3
	(*b*) Settlabe solids	µm, max	850
3.	pH at ambient temperature	-	5.5 - 9.0
4.	Biochemical oxygen demand (BOD_5 in five days at 20 °C or BOD_3 in three days at 27 °C)	mg/l, max.	100
5.	Temperature	°C, max	45°C at the point of discharge
6.	Oils and greases	mg/l, max.	20

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LIST III *(Contd.,)*

TOLERANCE LIMITS FOR INDUSTRIAL AND DOMESTIC WASTE DISCHARGED INTO MARINE COASTAL AREAS

No.	*Parameter*	*Unit Type of limit*	*Tolerance Limit Values*
7.	Phenolic compunds (as Phenolic OH)	mg/l, max.	5
8.	Chemical oxygen demand (COD)	mg/l, max.	250
9.	Total residual chlorine	mg/l, max.	1.0
10.	Ammoniacal Nitrogen (as N)	mg/l, max.	50
11.	Cyanide (as CN)	mg/l, max.	0.2
12.	Sulphides (as S)	mg/l, max.	5.0
13.	Fluorides (as F)	mg/l, max.	15
14.	Arsenic (as As)	mg/l, max.	0.2
15.	Cadmium (as Cd)	mg/l, max.	2.0
16.	Chromium, total (as Cr)	mg/l, max.	2.0
17.	Chromium, Hexavalent (as Cr^{6+})	mg/l, max.	1.0
18.	Copper (as Cu)	mg/l, max.	3.0
19.	Lead (as Pb)	mg/l, max.	1.0
20.	Mercury (as Hg)	mg/l, max.	0.01
21.	Nickel (as Ni)	mg/l, max.	5.0
22.	Selenium (as Se)	mg/l, max.	0.1
23.	Zinc (as Zn)	mg/l, max.	5.0
24.	Pesticides	mg/l, max.	0.005
25.	Organo-Phosphorus compounds	mg/l, max.	1.0
26.	Chlorinated hydrocarbons (as C1)	mg/l, max.	0.02
27.	Faecal coliform	MPN/100ml, max.	60
28.	Radio Active Material :		
	(c) Alpha emitters	micro curie/ml, max	10^{-8}
	(d) Beta emitters	micro curie/ml, max	10^{-7}

Note 1 : All efforts should be made to remove unplesant odour and colour as far as practicable.

Note 2 : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. if the dilution is below 8 times, the permissible limits are muiltiplied by the 1/8 of the actual dilution.

LIST IV

TOLERANCE LIMITS FOR WASTE FROM RUBBER FACTORIES BEING DISCHARGED INTO INLAND SURFACE WATERS

	Parameters	Units	Tolerance Limit Value	
		Type of limit	Type I* Factories	Type II** Factories
1	pH value at ambient temperature	-	6.5 to 8.5	6.5 to 8.5
2	Total suspended solids	mg/l, max.	100	100
3	Total Solids	mg/l, max.	1500	1000
4	Biochemical Oxygen Demand, BOD_5 in five days at 20°C or BOD_3 in three days at 27°C	mg/l, max.	60	50
5	Chemical Oxygen Demand (COD)	mg/l, max.	400	400
6	Total Nitrogen (as N)	mg/l, max.	300	60
7	Ammonical Nitrogen (as N)	mg/l, max.	300	40
8	Sulphides (as S)	mg/l, max.	2.0	2.0

* *Type I Factories* – Latex Concentrate

** *Type II Factories* – Standard Lanka Rubber ;
Crepe Rubber and Ribbed Smoked Sheets

Note 1 : All efforts should be made to remove unplesant odour and colour as far as practicable.

Note 2 : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by the 1/8 of the actual dilution.

LIST V

TOLERANCE LIMITS FOR WASTE FROM TEXTILE INDUSTRY BEING DISCHARGED INTO INLAND SURFACE WATERS

No.	*Parameter*	*Unit type of limit*	*Tolerance Limit values*
01.	pH at ambient temperature		6.5 to 8.5
02.	Temperature	°C, max.	40 measured at site of sampling
03	Total suspended solids	mg/l, max.	50
04	Biochemical Oxygen Demand BOD_5 in five days at 20°c or BOD_3 in a three days at 27°c	mg/l, max.	60
05	Colour	**Wavelength Range**	**Maximum spectral Absorption coefficient**
		436 nm (Yellow range)	$7m^{-1}$
		525 nm (Red range)	$5m^{-1}$
		620 nm (Blue range)	$3m^{-1}$
06.	Oils and grease	mg/l, max.	10
07.	Phenolic compounds (as Phenolic OH)	mg/l, max.	1.0
08.	Chemical Oxygen Demand (COD)	mg/l, max.	250
09.	Sulphides (as S)	mg/l, max.	2.0

LIST V *(Contd).,*

TOLERANCE LIMITS FOR WASTE FROM TEXTILE INDUSTRY BEING DISCHARGED INTO INLAND SURFACE WATERS

No.	*Parameter*	*Unit type of limit*	*Tolerance Limit values*
10.	Chromium total (as Cr)	mg/l, max.	2.0
11.	Hexavalent Chromium (as Cr^{+6})	mg/l, max.	0.5
12.	Copper, total (as Cu)	mg/l, max.	3.0
13.	Zinc, total (as Zn)	mg/l, max.	5.0
14.	Ammoniacal nitrogen (as N)	mg/l, max.	60
15.	Chloride (as Cl)	mg/l, max.	70

Note 1 : All efforts should be made to remove unplesant odour and colour as far as practicable.

Note 2 : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by the 1/8 of the actual dilution.

LIST VI

TOLERANCE LIMITS FOR WASTE FROM BEING DISCHARGED FROM TANNING INDUSTRIES

No.	*Parameter*	*Unit Type of Limit*	*Tolerance Limit Values for Effluents Discgharged into Inland Surface Waters*	*Tolerance Limit Values for Effluents Discharged into Marine Coastal Areas*
01	pH value at ambient temperature	°C	5.5 - 9.0	5.5 - 9.0
02	Total suspended solids	mg/l, max.	100	150
03	Biochemical Oxygen Demand (BOD_5 in five days at 20°C or BOD_3 in three days at 27°C)	mg/l, max.	60	100
04	Chemical Oxygen Demand (COD)	mg/l, max.	250	300
05	Colour	**Wavelength Range**	**Maximum Absorption coefficient**	
		436 nm (Yellow range)	$7m^{-1}$	-
		525 nm (Red range)	$5m^{-1}$	-
		620 nm (Blue range)	$3m^{-1}$	-
06	Alkalinity (as $CaCO_3$)	mg/l, max.	750	-
07	Chloride (as Cl)	mg/l, max.	1000	-
08	Hexavalent Chromium (as Cr^{+6})	mg/l, max.	0.5	0.5
09	Chromium total (as Cr)	mg/l, max.	2.0	2.0
10	Oils and Grease	mg/l, max.	10	20
11	Phenolic Compounds (as phenolic OH)	mg/l, max.	1.0	5.0
12	Sulphides (as S)	mg/l, max.	2.0	5.0

Note 1 : All efforts should be made to remove unplesant odour and colour as far as practicable.

Note 2 : These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by the 1/8 of the actual dilution.

LIST VII

TOLERANCE LIMITS FOR DISCHARGE OF EFFLUENTS INTO PUBLIC SEWERS WITH CENTRAL TREATMENT PLANTS

No.	*Parameter*	*Unit type of limit*	*Tolerance Limit values*
1.	Total suspended solids	mg/l, max.	500
2.	pH at ambient temperature	-	5.5 - 10.0
3.	Temperature	°C, max.	45
4.	Biochemical oxygen demand (BOD_5 in five days at 20°C or BOD_3 in three days at 27°C)	mg/l, max.	350
5.	Chemical Oxygen Demand (COD)	mg/l, max.	850
6.	Total Kjeldahl nitrogen (as N)	mg/l, max.	500
7.	Free ammonia (as N)	mg/l, max.	50
8.	Ammoniacal nitrogen (as N)	mg/l, max.	50
9.	Cyanide (as CN)	mg/l, max.	2
10.	Total residual chlorine	mg/l, max.	3.0
11.	Chlorides (as Cl)	mg/l, max.	900
12.	Flourides (as F)	mg/l, max.	20
13.	Sulphide (as S)	mg/l, max.	5.0
14.	Sulphates (as SO_4)	mg/l, max.	1000
15.	Arsenic (as As)	mg/l, max.	0.2
16.	Cadmium (as Cd)	mg/l, max.	1.0
17.	Chromium , total (as Cr)	mg/l, max.	2.0
18.	Copper (as Cu)	mg/l, max.	3.0
19.	Lead (as Pb)	mg/l, max.	1.0
20.	Mercury (as Hg)	mg/l, max.	0.005
21.	Nickel (as Ni)	mg/l, max.	3.0
22.	Selenium (as Se)	mg/l, max.	0.05
23.	Zinc (as Zn)	mg/l, max.	5.0
24.	Pesticides	mg/l, max.	0.2
25.	Detergents/surfactants	mg/l, max.	50
26.	Phenolic compounds (as phenolic OH)	mg/l, max.	5
27.	Oil And Grease	mg/l, max.	30
28.	Radio Active Material :		
	(*e*) Alpha emitters	micro curie/ml, max	10^{-8}
	(*f*) Beta emitters	micro curie/ml, max	10^{-7}

Notes : The following conditions should be met :

* discharge of high viscous material should be prohibited.
* Calcium Carbide sludge should not be discharged.
* substances producing inflammable vapours should be absent.

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SCHEDULE II

APPLICATION FOR A LICENCE FOR THE EMISSION OF WASTE

Form A

(Regulation 5)

National Environmental Act, No. 47 of 1980 (Section 23 A)

FORM OF APPLICATION FOR AN ENVIRONMENTAL PROTECTION LICENCE FOR EMISSION AND DISPOSAL OF WASTE

Application No. : .....
Date : .....

Sector : .....
Category : .....

Name of Industry :

Type of Industry : Manufacture/Assembly/Formulation/Repacking/Processing/other (specify)

Name of Applicant :

Postal Address :
Telephone No. :

1.General Description of Industry

1.1 Nature of Industry :

1.2 Location of Industry :

(Location map and a clear route sketch with landmarks to the site to be annexed.)

Address :

1.3 Name of local authority :

1.4 Is the site within an approved Industrial Zone ?

1.5 Amount of Capital Investment :

Local :
Foreign :

1.6 Date of commencement of operation :

1.7 No. of Shifts/Day and Times :

1.8 No. of Workers in Each Shift :

1.9 A List of permits obtained from Local or State Authorities permitting the Establishment and Operation of the Industry.

(Please attach photocopies) :

	Name	*Date of Issue*	*Date of Expiry*
(*a*)	.....	.....	.....
(*b*)	.....	.....	.....
(*c*)	.....	.....	.....
(*d*)	.....	.....	.....
(*e*)	.....	.....	.....

1.10 Land use of the area within 5 km radius - Residential / Commercial / Agricultural / Open Space / Public area / Marshy lands / salt Marshy Land / Mangrove / Natural Reserve / Other (specify) :

1.11 List of existing industries / institutions / Agricultural land within 2 km radius :

1.12 Land available for treatment plant :

2. Manufacturing Process

2.1 List of main manufactured products and capacities :

2.2 List of by-products :

2.3 Process Details :

2.3.1. A brief description of the processes used (attach process flow diagram) :

2.3.2. Raw materials used :

(State item wise quantity per day at all stages of manufacture)

2.3.3. Chemical used :

Chemical Name Trade Name Quantity / Day / (in kg)

2.3.4. Precautionary measures adopted in the transport and handling of any hazardous / toxic / flammable / explosive materials :

2.3.5. Storage facilities for hazardous / toxic / flammable / explosive materials :

2.3.6. Do you have adequate fire fighting equipment ?

2.3.7. If so, details of such equipment :

3. Water

3.1 Water - Requirement

Processing : m^3 / day
Cooling : m^3 / day
Washing : m^3 / day
Domestic : m^3 / day

3.2 Source of Water

1. Public Supply
2. Ground Water (Wells , springs)
3. *Surface water (Stream, river)*

3.3 Total daily discharge : m^3 / day :

3.4 Method of discharge : Open Channel / Pipeline / Covered Drains / Other :

3.5 Final point of discharge of waste water : Agricultural land / Marshy land / Sewer / Lake / River / Ela / Estuary / Sea / Other

3.6 What other specific toxic substances are discharged" (specify nature and concentration -eg., Inorganics and organics including pesticide, Organic Chlorine Compounds, Heavy Metals etc).,

3.7 Methods of treatment of Waste Water (Diagrams of Treatment Process to be included);

3.8 Methods adopted for recording characteristics of waste water before and after treatment ;

3.9 Give details of reuse of water or water recycling, if any ;

4. Solid Waste

4.1 Type and Nature of Solid Wastes :

4.2 Total quantity of solid waste - kg/day :

4.3 Methods of disposal of solid wastes - Municipal collection system/Land Fill/ Incineration/Composting/Sold/ Recycle :

5. Atmospheric Emissions

Is there emission to the atmosphere : Yes/No - if "Yes" complete the following :

5.1 Possible emissions :

(a) Oxides of Nitrogen —
(b) Oxides of Sulphur—
(c) Dust and Soot—
(d) Any Other—

5.2 No. of Stacks/Chimneys :
Height :

6. Does your industry cause odour problem.
Source :
Method of Abatement :

7. Noise Pollution

7.1 does your industry cause noise pollution : Yes/No
7.2 if "Yes", source :
Method of abatement :

8. Energy Requirements

8.1 Total Energy Consumption :
(a) In-plant generation :
(b) public supply :

8.2 Details of Machinery used in the industry and their Horse Power Ratings :

8.3 Types of Fuel Used :
(*a*) Purpose :
(*b*) Daily consumption :

9. Recycling/Reuse

9.1 Possible salvage of any waste material for reuse :
Specify :

10. Expansion of Industry

Describe your plans for future expansion of the industry, State whether proposed expansion will alter the manufacturing process, raw material, usage and finished products.

I hereby certify that the particulars furnished by me in this application are true and correct. I am aware that if any particulars herein are found to be false or incorrect, my application will be refused and the licence, if issued, will be cancelled.

.....
Signature of Applicant.

Date.

Additional Information required from Chemical industries

Details information on the following has to be provided :

1. A site map extending half a mile beyond the boundaries of the property depicting the facility, the discharge points for effluents, wells, springs and other surface water bodies and drinking water wells.
2. A description of the procedures, structures and equipment used at the facility in relation to (I) and (II) to :
   (i) Prevent hazards in transport and unloading operations of chemicals :
   (ii) Prevent undure exposure of personnel to chemicals (protective clothing etc.,)
3. A description of the following –
   (i) precautions to prevent accidental fires resulting from storage of chemicals ;
   (ii) available fire fighting equipment ;
   (iii) training of personnel in fire fighting.
4. A description of storage system for bulk chemicals prior to use in the industrial process.
5. A description of recovery methods of use chemicals , if any.

For Official Use Only

Licence Application No.:.....
Sector ( )
Category ( )

1. Date of receipt of application :.....
2. Reference Plans, Reports and other documents received :
3. If any additional information was requested, details of such requests :.....
4. If the observation of any other Agency was requested, details of such requests :.....
5. Whether a Licence is granted : Yes/No.
6. If a Licence is granted :
   (*a*) No. of the Licence :.....
   (*b*) Date of Licence :.....
   (*c*) Validity period :.....
   (*d*) Date of expiry :.....
   (*e*) Conditions attached (if any) :.....
7. Reasons for refusal, if licence is refused :

.....
Designation and Signature of
the authorized officer.

Date.

18A I කොටස : (I) ඡේදය - ශ්‍රී ලංකා ප්‍රජාතාන්ත්‍රික සමාජවාදී ජනරජයේ අති විශෙෂ ගැසට් පත්‍රය - 2008.02.01
PART I : SEC. (I) - GAZETTE EXTRAORDINARY OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA - 01.02.2008

NATIONAL ENVIRONMENTAL ACT, No. 47 OF 1980

FORM B

(Regulation 6)

AN ENVIRONMENTAL PROTECTION LICENCE FOR EMISSION AND DISPOSAL OF WASTE ISSUED UNDER SECTION 23 B

M/s.....of.....situated within the area of authority of the Pradeshiya Sabha/Municipal Council/Urban Council of.....is/are hereby authorized to discharge/deposit waste and/or emit noise/vibrations/air emissions which may arise as a result of the operation of the said industry/process, in accordance with the standards and criteria prescribed by the National Enviornmental (Protection and Quality) Regulations No. 1 of 2008 and the National Environmental (Noise control) Regulation No. 01 of.....

This licence shall be in force form.....to.....unless it is earlier cancelled or suspended.

This licence is subject to the general terms and conditions stated overleaf AND to the additional terms and conditoins stated below.

1.
2.
3.
4.

Chairman/Director General/Authorized Officer,
Central Environmental Authority.

Date :.....

General Terms and Conditions

1. The licence shall be valid for such period as may be specified in the license, provided it shall **not** be for more than a period of three years from the date of issue. An application for renewal of the license shall be made at least three months prior to the date of expiry of the license.
2. The holders of the Licence shall permit the Director General or any other officer duly authorized in writing by him at any time to enter the premises in respect of which the Licence is issued to examine and inspect any equipment or industrial plant ; and
   (*a*) to take samples of any pollutants that are emitted, discharged or deposited from or by such equipment or industrial plant ;
   (*b*) to examine books, records or documents relating to the performance or use of such equipment or industrial plant or relating to the emission, discharge or deposition from such industrial plant ;
   (*c*) to take photographs of such equipment or industrial plants as he considers necessary or make copies of any books, records or documents seen in the course of such examination; and
   (*d*) to take samples of any fuel, substance or material used, in such trade, industry or process carried on in or on such premises.
3. The holder of the Licence shall comply with any requirement communicated from time to time by the Authority as regards :
   (*a*) the use of any techniques or installations in the production/process, handling and storage of goods, material, fuel and waste products with a view to minimizing environmental pollution and hazards ; and
   (*b*) any additional technical measures for preventing or mitigating environmental pollution and hazards.

4. The holder of the Licence shall ensure that monitoring of environmental pollution or other acts that the authority considers neceesary to protect the environment, including the following are done:

   (*a*) measurements, calculation, registration of samples to determine actual level of pollution and risk of exposure ;

   (*b*) recording and sorting of data and reporting to the Authority ;

   (*c*) issuing written instructions to persons employed with regard to handling of hazardous material and installations to protect the environment ;

   (*d*) assigning duties and responsiblities to management and staff with regard to protection of the environment ; and

   (*e*) ensuring that persons referred to in (c)above, and charged with duties and responsibilities referred to in (d) above are properly qualified persons.

5. This Licence is avlid only for the type and nature of the industry/process/operation as stated in the preliminary application and to the information submitted by the Licencee.

6. Any alteration or extension made to the industry, process or operation should be indicated forthwith to the Authority.

Chairman/Director General/Authorized Officer,
Central Environmental Authority.

Date :.....

Form C

(Regulation 6)

APPLICAITON FOR RENEWAL OF ENVIRONMENTAL PROTECTION LICENCE FOR EMMISION AND DISPOSAL OF WASTE

Application No. : .....
Date : .....

Sector : .....
Category : .....

1. Name and location of Industry :
2. Name and address of applicant :
3. Previous Licence No :
   3.1 Issued on .....
   3.2 Valid until.....
4. Any changes/alterations/expansions of the industry since last licence was issued –
   (give details) :
5. State if manufacturing process/raw material usage/finished products have been altered in any way.
6. Details of monitoring reports submitted to the Central Environmental Authority during the year :
7. Any other additional information :

I hereby certify that the particulars furnished by me in this application are true and correct. I am aware that if any particulars herein are found to be false or incorrect, my application will be refused and the licence if issued will be cancelled.

.....
Signature of Applicant.

Date :.....

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1. Was licence renewed – Yes/No
2. If renewed
   - No. of licence .....
   - Date of licence .....
   - Validity period .....
   - Date of expiry .....

   Conditions attached (if any)
3. If renewal of licence is refused reasons for refusal :

.....
Signture and Designation of
Athorized Officer.

Date :.....

SCHEDULE III

LICENSING FEE

The Licence fee and the Renewal fee for each of the activities specified in Part "A" of the Order made under Section 23 and published in *Gazette* No. 1533/16 dated 25th January, 2008, shall be levied by the authority on the following basis :-

One year or less — Rs. 7,500/-

The Licence Fee and the renewal fee for each of the actitivies specified in the Part "B" of the order made under Section 23 and published in *Gazette* No. 1533/16 dated 25th January, 2008, shall be levied by the authority on the following basis :-

For three years or less — Rs. 6,000/-

The Licence Fee and the renewal fee for each of the actitivies specified in the Part "C" of the order made under Section 23 and published in *Gazette* No. 1533/16 dated 25th January, 2008, shall be levied by the authority on the following basis :-

For three yeas or less — Rs. 4,000/-

SCHEDULE IV

Form A

(Registration 16(b)

National Environmental Act, No. 47 of 1980 (Section 23A)

FORM OF APPLICATION FOR A LICENCE FOR SCHEDULED WASTE MANAGEMENT

Application No.:.....
Date:.....

Sector : ——————————
Category : ——————————

01. Name of the faciity/activity :
02. Location/address :
03. Telephone No. :
04. Local Authority area :
05. District :
06. Province :
07. Name of the Officer to be contacted in an emergency:
08. Contact details:
    Mobile phone :
    Tel.:
    Fax :
    E-mail :
    Address :
09. Authorization required for (Please tick appropriate activity/activities)
    (a) generation ( )
    (b) Collection ( )
    (c) Transportation ( )
    (d) Storage ( )
    (e) Recovery ( )
    (f) Recycling ( )
    (g) Disposal ( )

( ) Permit for one operation ( ) Permit for multiple operations .....
10. Full Name of the Applicant/Industry :
11. Contact details
    Address :
    Tel. No. :
    Fax No.:
12. In case of renewal of licence, previous licence number and date :.....
    .....
    .....
    .....
13. Qualifications to engage in the activity covered by the permit: .....
    .....
    .....
14. Insurance cover details: .....
    .....
    .....
15. Arrangements for security and emergency procedures : .....
    .....
16. Information on accidents as a result of the management of waste : .....
    .....
17. Health and safety measures adopted for the workers and the public: .....
    .....
18. Important Environmental features of the surrounding areas of the site (Please attach a map of the area 2.5km. radius with the site at the centre indicating there in water bodies and important human activities sensitive features): .....
    .....

19. Waste category/categories identified as per the Scheduled VII : .....
.....

20. Quality and quantity waste handled: .....
.....

21. Details of the operation system for carrying out the activity/activities: .....
.....

22. If application is for the establishment of a disposal site, location description and other details: .....
.....

To be filled by Collector

23. Site/s of Collection (Names and address/es): .....
.....

24. Proposed dates or frequency of collection : .....
.....

25. Estimated quantity to be collected: .....
.....

26. Type of packaging envisaged (Eg. bulk, drummed, tanker etc.) and method of collection): .....
.....

To be filled by transpoter

27. Mode of transportation to be used : .....
.....
Class/Type of vehicle : .....
.....
Registered number/s: .....
.....
Number of vehicles : .....
.....

28. Details of Routes (include road maps) times and dates : .....
.....

29. What are the emergency measures adopted (including notice of warming to the public) and what are the precautions taken to prevent accidents: : .....
.....

To be filled by Storer

30. Location and extent of the storage site : .....
.....

31. Type of packaging envisaged (bulk, drummed, tanker, concrete blocks etc.) for storing: .....
.....

32. Period of time waste will be stored : .....
.....

33. Information relating to recyling/recovery of final disposal of the waste: .....
.....

34. What are the emergency measures adopted (including posting of warning to public and what are the precautions taken to prevent accidents: .....
.....

To be filled by recycler/recoverer:

35. Location of the recycling/recovery facility : .....
.....
36. Method used in the recycling/recovery process : .....
.....
37. Purpose of recycling/recovery and the market availability for the end product : .....
.....
38. Emergency measures adopted in the event of an accident : .....
.....

To be filled by Disposer :

39. Location of the site for Disposal : .....
.....
40. Method of Disposal : .....
.....
41. Description of the treatment process : .....
.....
42. Emergency measures adopted at the site in the even of an accident : .....
.....
43. Information on the after care of the disposal site : .....
.....

.....,
Signature of the Applicant.

Date :——

FORM B

Form of Licence

(Regulation 19(a)

National Environmental Act No. 47 of 1980

LICENCE FOR OPERATING A FACILITY FOR SCHEDULED WASTE MANAGEMENT

Licence Number : .....
Date of issue : .....

M/s ..... of.....is hereby authorized to operate a facility for generation, collection, storage, recovery, recycle or disposal of the waste more fully described in the Schedule hereto, on the premises situated at .....and/or to transport the same from ..... to ..... along the route, time and date set out in the Schedule.

This licence shall be in force from .....to ..... unless it is earlier cancelled or suspended.

This licence is subject to the general terms and conditions stated overleaf and to the terms conditions stated below and to such terms as may be specified in the regulations or guidelines for the time being in force under the National Environmental Act, No. 47 of 1980 as amended by Act No. 56 of 1988.

Other Terms and Conditions:

1.
2.
3.
4.

.....,
Chairman/Director General,
Central Environmental Authority.

Date :——

(DESCRIPTION OF THE QUANTITY AND TYPES, ETC., OF WASTE)

General Terms and Conditions:

1. Licence shall be in accordance with the provisions of National Environment Act, No. 47 of 1980.
2. The licence or its renewal shall be produced for inspection at the request of an officer authorized by the Central Environmental Authority or any delegate. The Licence shall be displayed in a place accessible to public.
3. The license shall not rent, lend sell, transfer or otherwise transport the waste without obtaining prior permission of the Central Environmental Authority.
4. Any unauthorized change in personnel, equipment, process and working conditions as mentioned in the application by the licencee shall constitute breach of this authorization.
5. It is the duty of the authorized person to take prior permission of the Central Environmental Authority to close down the facility.
6. An application for the renewal of a licence shall be made as laid down in regulation 16 of the National Environmental (Protection and Quantity) regulation No.1 of 1990.
7. This licence shall not be transferred unless under the authorization of the Central Environmental Authority.
8. Any accident which occurs during the management of wastes must be immediately reported to the Central Environmental Authority by the Licensee.

Other terms and Contitions:

1.
2.
3.
4.

.....,
Chairman/Director General,
Central Environmental Authority.

Date:————.

SCHEDULE V

[Regulation 27]

(Format for maintaining records of waste at the facility)

1. Name and address of the accupier or operator at the facility :
2. Date of issuance of licence and its reference number :
3. Description of waste :
   Physical form with description Chemical form Total volume and weight (in kg):
4. Description of Storage and treatment of waste:

Date	*Waste Code*	*Amount*	*Method of Storage of waste*	*Date*	*Amount*	*Method of treatment of waste*

5. Details of transportation of waste:

Waste Code	*Amount*	*Name & Address of the consignee of the package*	*Mode of packing of the waste for transportation and amount*	*Mode and route of transportation to site disposal*	*Date and Time of transportation*

6. Details of disposal of Waste :

Waste Code	*Date of Disposal*	*Quantity*	*Site of disposal (identify the location on the relevant layout drawing for reference)*	*Method of disposal*	*Concentration of material in the final waste form*	*Persons involved in disposal*

7. Details on environmental surveillance:

Date of Measurement	*Analysis of Ground water*			*Analysis of soil samples*			*Analysis of air sampling*		*Analysis of any other samples (give details)*
	Location of sampling	*depth of sampling*	*Data sampling*	*Location of sampling*	*Depth of* sampling	*Data*	*Location*	*Data*	

Name and Signature of the Head of facility.

SCHEDULE VI

[Regulation 27(b)]

(Format for the sub mission of returns, regarding disposal of scheduled waste)

1. Name and Address of the institution:
2. Details of waste disposal operations:

S no.	*Date of issuance of the licence*	*Description of Waste*			*Mode of transportation to the site of disposal*	*Site of disposal (attach a sketch showing the location of disposal)*	*Brief description of the method of disposal*	*Date of disposal*
		Physical Form & contents	*Chemical Form*	*Total volume of the waste disposal with No. of packages*				

3. Detail of environmental surveillance :

Date of Measurement	*Analysis of Ground Water*			*Analysis of soil Samples*			*Analysis of air sampling*		*Analysis of any Other samples*
	Location of sampling	*Depth of Sampling*	*Data*	*Location of Sampling*	*Depth of Sampling*	*Data*	*Location of sampling*	*Data*	

Name and address of the Head of facility.

Certificate by authorized person

This is to certify that I have examined the above return, and have satisfied myself of the accuracy of the facts stated there in by physical examination and scientific tests as are necessary for such purpose.

.....,
Authorized Person.

Date :————————.

SCHEDULE VII

[Regulation 36]

(Form for reporting accidents)

1. The date and time of the accident :
2. Location :
3. Sequence of events leading to accident :
4. The waste involved in the facility :
5. The data for assessing the effects of the accidents on health or the environment:
6. The emergency measures taken :
7. The steps taken to alleveiate the effects of accident :
8. The steps taken to prevent the recurrence of such an accident :
9. Names, address and next of kin of persons affected by the accident :
10. Step taken to pay compensation to victims of the accident together with insurance claiming and settlements:

SCHEDULE VIII

List of Scheduled Wastes

Waste Code	Scheduled Waste
PART I - SCHEDULED WASTES FROM NON-SPECIFIC SOURCES	
1. Mineral Oil and Oil-Contaminated Wastes	
N011	Spent oil or grease used for lubricating industrial machines
N012	Spent hydraulic oil from machines, including plastic injection moulding machines, turbines and die-casting machines.
N013	Spent oil-water emulsion used as coolants
N014	Oil tanker sludges
N015	Oil-water mixture such as ballast water
N016	Sludge from oil storage tank
2. Waste containing polychlorinated biphenyls (PCBs) or polychlorinated triphenyls (PCTs)	
N021	Spent oil contaminated with PCB and/or PCTs
N022	Electrical equipment or parts containing or contaminated with PCBs and/or PCTs
N023	Retrofilled transformer contaminated with PCBs and/or PCTs
N024	Containers and all waste materials contaminated with PCBs and/or PCTs
3. Spent organic solvents containing halogen or sulphur, including methylene chloride, 1, 1, 1,-trichloroethane, perchloroethylene and dimethyl sulphide	
N031	Spent halogenated solvents from cleaning and degreasing processes

4. Spent aromatic organic solvents not containing compounds of organic halogen or sulphur, including toluene, xylene, turpentine and kerosene.
   - N041 Spent aromatic organic solvents from washing, cleaning, or degreasing processes

5. Spent non-aromatic organic solvents without containing compounds of organic halogen or sulphur, including acetone, ketones, alcohols, cleaning-benzene, and dimethyl formamide
   - N051 Spent non-aromatic organic solvents from washing, cleaning or degreasing processes

6. Residues from recovery of halogenated solvents, may contain oil, fat and solvents
   - N061 Residues from recovery of halogenated solvents

7. Residues from recovery of non-halogenated solvents, may contain oil, fat and solvents
   - N071 Residues from recovery of non-halogenated solvents

8. Spent organometallic compounds may be mixed with benzene excluding mercury compounds
   - N081 Residues of organometallic compounds, including tetraethyl lead, tetramethyl lead and organotin compounds from mixing process of anti-knock compound with gasoline

9. Flux wastes, may contain mixture of organic acids, solvents of compounds of ammonium chloride
   - N091 Flux wastes from fluxing bath of metal treatment processes

10. Spent aqueous alkaline solutions not containing cyanide, may contain heavy metals
    - N101 Spent aqueous alkaline solutions from treatment process of metal or plastic surfaces
    - N102 Spent aqueous alkaline solutions from bleaching process of textile materials

11. Spent aqueous alkaline solutions containing cyanide, may contain heavy metals
    - N111 Spent aqueous alkaline solution containing cyanide from treatment process of metal or plastic surfaces

12. Spent aqueous chromic acid solutions
    - N121 Spent aqueous chromic acid solutions from treatment process of metal or plastic surfaces
    - N122 Spent aqueous chromic acid solution from leather tannery processes

13. Spent aqueous inorganic acid solutions other than spent chromic acid solutions, may contain heavy metals
    - N131 Spent aqueous acid solutions from treatment process of metal or plastic sufaces
    - N132 Spent aqueous inorganic acid solutions from industrial equipment cleaning

14. Spent aqueous or discarded photographic waste from film processing or plates making
    - N141 Spent aqueous or discarded photographic waste from film processing or plate making

15. Metal hydroxide sludges containing one or several metals, including chromium, copper, nickel, zinc, lead, cadmium, aluminium and tin
    - N151 Metal hydroxide sludges from wastewater treatment system

16. Plating bath sludges containing cyanide
    - N161 Plating bath sludges containing cyanide from metal finishing processes

17. Spent salt containing cyanide
    - N171 Spent salt containing cyanide from heat treating process

18. Sludges of inks, paints, dyes, pigments, lacquer with or without orgnic solvent
    - N181 Paint sludges from solvent recovery of solvent-based paint waste
    - N182 Ink sludges from solvent recovery of solvent-based ink waste
    - N183 Lacquer sludges from solvent recovery of solvent-based lacquer waste

N 184 Paint sludges from paint wastewater treatment system
N 185 Ink sludges from ink wasterwater treatment system
N 186 Pigment sludges from pigment wastewater treatment system
N 187 Dye sludges from dye wastewater treatment system

19. Wastes from the production, formulation and use of printing ink, paint, pigment, lacquer or varnish containing organic solvents
N 191 Discarded or off-specification ink, pigment and paint products

20. sludges, dust, slag, dross and ashes, may contain oxides or sulphate or one of several metals, including lead, cadmium, copper zinc, chromium, nickel, iron, vanadium, and aluminium
N 201 Dross, slag, ash, dust from metal smelting process or dust emission control system
N 202 Dross from soldering process
N 203 Residues from recovery of acid pickling liquor
N 204 Hydroxide or sulphate sludges from wastewater treatment system

21. spent or discarded strong acids or akalis
N 211 Spent or discarded acid of pH less or equal to 2
N 212 Spent or discarded alkali of pH greater or equal to 12.5

22. Spent oxidizing agents
N 221 Spent oxidizing agent

23. Contaminated soil. water, debris or matter resulting from clean-up of a spill or chemical or scheduled waste
N 231 Contaminated soil, water debris or matter resulting from cleanup of a spill or chemical or scheduled waste

24. Immobilized scheduled wastes, including chemically fixed or encapsulated sludges
N 241 Immobilized scheduled wastes

25. Discarded drugs except living vaccines and euphoric compounds
N 251 Discarded drugs except living vaccines and euphoric compounds

26. Pathogenic and clinical wastes and quarantined materials
N 261 Pathogenic and clinical wastes and quarantined materials

27. Containers and bags containing hazardous residues and material
N 271 Used containers or bags contaminated with scheduled waste and residues.

28. Mixtures of scheduled wastes
N 281 A mixture of scheduled wastes
N 282 A mixture of scheduled and non-scheduled wastes

29. Mercury wastes containing metallic mercury, organic and inorganic mercury compounds
N 291 Discarded, Used, fused, broken and off specified fluorescent lamps/bulbs

30. Waste Electrical and Electronic Equipments
N 301 Discarded Computers and accessories
N 302 Discarded Mobile phones.

PART II - SCHEDULED WASTES FROM SPECIFIC SOURCES

1. Mineral Oil and Oil-Contaminated Wastes

S011	Waste oil or oily sludge from waste water treatment plant of oil refinery or crude oil terminal
S012	Oily residue from automotive workshop or service station oil grease interceptor
S013	Oil contaminated earth from re-refining of used lubricating oil
S014	Oil or sludge from oil refinery maintenance operation.

2.Tar or tarry residues from oil refinery petrochemical plant

S021	Tar or tarry residues from oil refinery or petrochemical plant

3. Waste of printing inks, paints, dyes, pigments, lacquer, varnish or wood preservative containing organic solvents

S031	Ink waste from washing of reaction tank or container of ink manufacturing plant.
S032	Paint waste from washing of reaction tank or container of paint manufacturing plant
S033	Dyes waste from washing or reaction tank or container of dyes manufacturing plant
S034	Pigment waste from washing of reaction tank or container of pigment manufacturing plant.
S035	lacquer or vanish Pigment waste from washing of reaction tank or container of lacquer or varnish manufacturing plant.

4. Clinker, slag and ashes from scheduled wastes incinerator

S041	Clinker, slag and ashes from scheduled wastes incinerator

5. Waste or printing inks, paints, dyes, pigments, lacquer without containing solvents

S051	Water based Paint waste from the washing of reaction tank or container of paint manufacturing plant.
S052	Water based Ink waste from the washing of reaction tank or container of ink manufacturing plant.
S053	Water based dye and pigment waste from the washing of reaction tank or container of dye and pigment manufacturing plant.
S054	Ink waste from the washing of cleaning of printing machine of printing works.
S055	Pigment waste from brick and tile works
S056	Paint waste from the paint spraying of dipping process of metal works, motor vehicle assembly plant or electrical appliances manufacturing plant.

6. Spent tars or anti-corrosion oils

S061	Anti-corrosion oils or tar residues from the sealing or spraying or casting processes of motor vehicle assembly plant or automotive workshop.

7. Spent ethylene glycol

S071	Contaminated ethylene glycol from gas processing plant.
S072	Unhardened ethylene glycol from polyester manufacturing plant

8. Waste containing phenol or formaldehyde

S081	Phenol or formaldehyde waste from the washing or reaction or mixing tank of adhesive or glue or resin manufacturing plant
S082	Sludges containing phenol or formaldehyde waste from the Waste water treatment system of adhesive or glue or resin manufacturing plant

9. Residues of isocyanate compounds, excluding solid polymeric materials.

S091	Residues of isocyanate compounds from foam manufacturing process.

10. Adhesive or glue waste may contain organic solvents, excluding solid polymeric materials
- S 101 Off-specification adhesive or glue products from adhesive or glue manufacturing plant
- S 102 Effluent from the washing of the reaction or processing tank of adhesive or glue manufacturing plant.

11. Uncured resin waste, may contain organic solvents or heavy metals including epoxy resin phenolic resin
- S 111 Uncured resin residues form electronic or semiconductor, electrical appliances, fibreglass manufacturing plants and metal works.
- S 112 Effluents from washing of reactor of resin manufacturing plant
- S 113 Resin sludge from waste water treatment system of resin manufacturing plant

12. Latex effluent, rubber or latex Sludges containing organic solvents or heavy metals
- S 121 Rubber or latex sludges containing heavy metals from the waste water treatment system of rubber products manufacturing plant.
- S 122 Rubber or latex sludges containing organic solvent from rubber products manufacturing plant.
- S 123 Latex effluent from rubber products manufacturing plant.

13. Sludges from the re-refining of used oil products including oily sludges containing acid or lead compounds.
- S 131 Acid sludge from the re-refining of used lubricating oil.

14. Sludges containing fluoride
- S 141 Sludges containing fluoride from the waste water treatment system of electronic or semiconductor manufacturing plant.

15. Mineral sludges, including calcium hydroxide sludges, phosphating sludges, calcium sulphite sludges and carbonate sludges.
- S 151 Sludges from phosphating process of motor vehicle assembly, air conditioning, electrical appliances and electronic or semiconductor plants.
- S 512 Sludges from the waste water treatment system of plant producing ceramic or tiles, industrial gas and bleaching earth containing heavy metals.

16. Asbestos waste

- S 1611 Asbestos sludges from the waste water treatment system of Asbestors/cement products manufacturing plant.
- S 162 Asbestos dust or loose asbestos fibre wasts from asbestos/cement products manufacturing plant.
- S 163 Empty bags or sack containing loose asbestos fibres from asbestos/cement products manufacturing plant.
- S 164 Waste arising from repairing/renovation processes and demolition/construction debris containing asbestos.

17. Waste from the production, formulation, repacking, and trade of pesticides ; including herbicides, Insecticide, rodenticides, and fungicides.
- S 171 Dust from air emission control equipment, or exhaust systems of pesticides production, formulation and repacking plants.
- S 172 Sludges from wastewater treatment systems of pesticides production, formulation and repacking plants.
- S 173 Residues from filtering process of intermediate products at pesticides production and formulation plants.
- S 174 Waste from washing of reaction tank or mixing tank and spillages at pesticide production and formulation plants and spillages at pesticides repacking plants.
- S 175 Solid residues resulting from stamping process of mosquito coil production plant.
- S 176 Off-specification and out dated products and contaminated containers from pesticides formulation and repacking plants and trade of pesticides

18. Press cake from pre-treatment of glycerol soap lye
S 181 Press cake from pre-treatment of glycerol soap lye from detergent or soap or toiletries plants

19. Wastes containing dye
S 191 Waste water containing dye from textile manufacturing plant.

20. Waste from wood preserving operations using inorganic salts containing copper, chromium as well as arsenic of fluoride compounds or using compound containing chlorinated phenol or creosote

S201 Waste from wood preserving operations using inorganic salts containing copper, chromium as well as arisenic of fluoride compounds or using compound containing chlorinated phenol or creosote

21. Mercury wastes containing metallic mercury, organic and inorganic mercury compounds
S 211 Mercury wastes containing metallic mercury from manufacturing of fluorescent lamps
S 212 Activated carbon waste containing mercury from hydrogen gas purification process.
S 213 Mercury bearing sludges from brine treatment and Mercury bearing brine purification muds from chlorine production plant.

22. Spent catalysts
S 221 Spent industrial catalysts from chemical plant manufacturing detergent or soap or toileries plants.
S222 Spent industrial catalysts from petroleum and petro-chemical processes
S 223 Spent industrial catalysts from sulphuric acid and other inorganic acid manufacturing process

23. Leachate from scheduled waste landfills.
S 231 Leachate from scheduled waste landfills.

24. Rags, papers plastics or filters contaminated with organic solvents
S 241 Rags, papers plasties or filters contaminated with paint or ink or organic solvent from motor vehicle assembly plants, metal works, electronic or semiconductor plants and printing or packaging plants.

25. Containers and bags containing hazardous residues
S251 Used containers or bags contaminated with residues of raw materials and products of pesticide formulation plant

26. Discarded or off specification batteries containing lead, mercury, nickel, cadmium, lithium and Electrolyte from batteries and accumulators.
S 261 Discarded or off specification batteries from battery manufacturing plant
S 262 Used or off specified batteries and accumulators

27. Pharmaceutical waste
S271 Waste water from washing of reaction vessels and floors of Pharmaceutical products manufacturing plant.
S 272 Sludges containing pharmaceutical material from waste water treatment plants of pharmaceutical manufacturing/ formulation plants

28. Bio Medical and Health Care Waste from Health Care Institution including Medical Laboratories and Research Centres.
S 281 Infectious health care waste including laboratory cultures; waste from isolation wards ; tissues (swabs), materials or equipment that have been in contact with infected patients ; Human tissues or fluids
S 282 Sharps including needles and scalpels
S 283 Biological and Anatomical waste including tissues, organs, body parts, human fetuses and animal carcasses, blood, and body fluids.
S 284 Outdated and discarded drugs including cytotoxic drugs and chemical reagents
S 285 Materials and containers contaminated with the above specified waste

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ANNEXURE - 03

TRANSBOUNDARY MOVEMENT OF WASTE - Notification BASEL CONVENTION

1. Exporter (name, address):

Contact person: Tel:
Fax/Telex:
Reason for export:

2. Importer (name, address):

Contact person: Tel:
Fax/Telex:

3. Notification concerning (1):

A (i) Single Movement ☐ B (i) Disposal (no recovery) ☐
(ii) General notification ☐ (ii) Recovery operation ☐
(multiple movements)

C Pre-authorised recovery facility (1) Yes ☐ No ☐
Facility Registration Number (if Yes)
(To be completed for a recovery facility located in an OECD State)

4. Total intended number of shipments

5. Estimated quantity (3)
kg
litres

6. Intended date(s) or period of time for shipment(s)

7. Intended carrier(s)* (name, address) (2):

Contact person: Tel:
Fax/Telex:

8. Disposer (name, address)

Contact person: Tel:
Actual site of disposal: Fax/Telex:

10. Waste generator(s) (name, address) (2):

Contact person: Tel:
Fax/Telex:
Site of generation & process:

9. Method(s) of disposal:
D code / R code (4):
Technology employed (Attach details if necessary):

11. Mode(s) of transport (4):

12. Packaging Type(s) (4):

13. (i) Designation and chemical composition of the waste

(ii) Special handling requirements

14. Physical characteristics

15. Waste identification code
in country of export: IWIC:
in country of import: EWC:
Customs Code H.S: Other (specify):

17. Y-number (4):

18. H-number (4):

16. OECD classification (1):
amber ☐ red ☐ and number:
other ☐ (attach details)

19. (i) UN identification:
UN Shipping name:

(ii) UN class (4):

20. Concerned states, code number of Component authorities, and specific points of entry and exit:

State of export	States of transit			State of Import

21. Customs offices of entry and/or departure (European-Community):
Entry
Departure:

22. Number of annexes attached

23. Exporter's/Generators declaration:
I certify that the above information is complete and correct to my best knowledge. I also certify that legally-enforceable written contractual obligations have been entered into and that any applicable insurance or other financial guarantees are or shall be in force covering the transboundary movement.

Name: Signature:
Date:

FOR USE BY COMPETENT AUTHORITIES

24. To be completed by - **Import (EEC, OECD)** - **transit (Basel)**
Notification received on:
Acknowledgment sent on:
Name of competent authority,
stamp and/or signature:

25. Consent to the movement provided by the competent authority of (country):
Consent given on: Consent expires on:
Specific conditions (1): ☐ Yes. See block 26 overleaf/annex ☐ No.
Name of competent authority,
stamp and/or signature:

(1) Enter X in appropriate box (2) Attach a list if more than one (3) Attach a list if multiple shipment (4) See codes on the reverse

List of abbreviations used in the notification form

DISPOSAL (NO RECOVERY) (Block 9)

D1	Deposit into or onto Land, (e.g., Landfill, etc.)
D2	Land treatment, (e.g., biodegradation of liquid or sludgy discards in soils, etc...)
D3	Deep Injection, (e.g., injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.)
D4	Surface impoundment, (e.g., placement of liquid or sludge discards into pits, ponds or lagoons, etc...)
D5	Specially engineered landfill, (e.g., placement onto lined discrete cells which are capped and isolated from one another and the environment, etc...)
D6	Release into water body except seas/oceans
D7	Release into seas/oceans including sea-bed insertion
D8	Biological treatment not specified elsewhere in this list which results in final compounds or mixtures which are discarded by means of any operations number D1 to D12
D9	Physico-chemical treatment not specified elsewhere in this list which results in final compounds or mixtures which are discarded by means of any operations numbered D1 to D12, (e.g., evaporation, drying, calcination etc.)
D10	Incineration on land
D11	Incineration at sea
D12	Permanent Storage, (e.g., emplacement in containers in a mine, etc.)
D13	Blending or mixing prior to submission to any of the operations numbered D1 to D12
D14	Repackaging prior to submission to any of the operations number D1 to D12.
D15	Storage pending any of the operations D1 to D12.

RECOVERY OPERATIONS (Block 9)

R1	Use as a fuel (other than in direct incineration) or other means to generate energy
R2	Solvent reclamation/regeneration
R3	Recycling/reclamation of organic substances which are not used as solvents
R4	Recycling/reclamation of metal compounds
R5	Recycling/reclamation of other inorganic materials
R6	Regeneration of acid or bases
R7	Recovery of components from used for pollution abatement
R8	Recovery of components from catalysts
R9	Used oil re-refining or other reuses of previously used oil
R10	Land treatment resulting in benefit to agricultural or ecological improvement
R11	Uses of residual material obtained from any of the operations numbered R 1 to R10
R12	Exchange of wastes for submission to any of the operations numbered R1 to R11
R13	Accumulation of material intended for any operations numbered R1 to R12

MODES OF TRANSPORT (Block 11)

R	Road
T	Train/Rail
S	Sea
A	Air
W	Inland Waterways

PACKAGING TYPES (Block 12)

1	Drum
2	Wooden Barrel
3	Jerrican
4	Box
5	Bag
6	Composite Packaging
7	Pressure receptacle
8	Bulk
9	Other (Specify

PHYSICAL CHARACTERISTICS (Block 14)

1	Powdery/powder
2	Solid
3	Viscous/paste
4	Sludgy
5	Liquid
6	Gaseous
7	Other (specify)

H NUMBER (Block 18) AND UN CLASS (Block 19)

UN	Class	H number
1	H1	Explosive
3	H3	Inflammable liquids
4.1	H4.1	Inflammable solids
4.2	H4.2	Substances or wastes liable to spontaneous combustion
4.3	H4.3	Substances or waste which, in contact with water, emit inflammable gases
5.1	H5.1	Oxidizing
5.2	H5.2	Organic peroxides
6.1	H6.1	Poisonous (acute)
6.2	H6.2	Infectious substances
8	H8	Corrosives
9	H10	Liberation of toxic gases in contact with air or water
9	H11	Toxic (delayed or chronic)
9	H12	Ecotoxic
9	H13	Capable, after disposal, of yielding another material, e.g. leachate, which possesses any of the characteristics listed above

Y numbers (block 17) refer to categories of waste listed in Annex I and II of the Basel Convention. These codes, as well as more detailed information can be found in an instruction manual available from the Secretariat of the Basel Convention.

26. SPECIFIC CONDITIONS ON CONSENTING TO THE MOVEMENT

ANNEXURE - 04

Hazardous Waste Declaration Form

CENTRAL ENVIRONMENTAL AUTHORITY
104, Denzil Kobbekaduwa Mw,
Battaramulla, Sri Lanka
Tel: +94 11 2872409 Fax: +94 11 2872605

No:

Tracking document for collection, Transportation, Storage and treatment/ disposal of Hazardous Waste

Genarator

1. Generators name		2. CPL No	
3. Mailing Address			
4. Tel. No.		5. Fax No	
6. Waste Name		7. Waste Code	
8. Waste Description		9. Hazard Class	
10. Physical Characteristics	Liquid ☐ Solid ☐ Sludge ☐ Other ☐ Specify _____		
11. Type of Packing	Bulk ☐ Drum ☐ Can ☐ Other ☐ Specify _____		
12. No of Packages		13. Total Quantity of Waste	Kg/Litters
14. Special Handing Instructions			
15. Name of Transporters			
16. Name of Facility of final destination			
17. Generators Certification: I here by declare that the contents of this consignment are accurately described above. It has been packed, labeled and are in proper condition for transport according to regulations.			
Name:	Signature	Designation	Date

Transporter

18. Name fo Transportation Company		19. Emergency Number	
20. Address			
21. Name of Driver		22. Vehicle type & Registered Number	
23. Transporters certification: I hereby declare that I have received the type & quantity of the waste described in cage 13 to send to the facility as described in cage 16.			
Name:	Signature	Designation	Date

Disposer/ facility

24. Name fo Facility		25. EPL number	
26. Address			
27. Facility certification of arrival:	I hereby declare that I have received the type & quantity of the waste described above.		
Name:	Signature	Designation	Date
28. Action taken	Accepted ☐ Partially accepted ☐ Return to Generator ☐ Other ☐ Specify _____		
29. Reason for rejection/ partially rejection			
30. Quantity		31. Type	
32. Facility certification: I hereby declare that the waste has been accepted and will be processed according to regulations/ regulations/ rejected and handed over to the transporter to return to generator.			
Name:	Signature	Designation	Date

Rejection

33. Transporters certification: I hereby declare that I have received the type & quantity of the waste to send back to the generator as described in cage 30&31			
Name:	Signature	Designation	Date
34. Generator's certification I hereby declare that I have received back the quantity and type of waste described in cage 30&31			
Name:	Signature	Designation	Date

For office use only

See the reverse side for filling instructions

GENERAL INSTRUCTIONS

1. Use separate sheet where as the given space is not adequate.
2. Hazardous waste declaration form is issued by the Central Environmental Authority.
3. The declaration form consist of 5 copies:

   Page 1 (White copy): Copy to be submitted to the CEA by the Generator

   Page 2 (Pink copy): Copy to be kept with the generator

   Page 3 (Green copy): Copy to be kept with the Transporter

   Page 4 (Yellow copy): Copy to be kept with the Designated facility

   Page 5 (Blue copy): Copy to be submitted to the CEA by the Disposer or the facility destination
4. On completion of the 1st part (cage 1-17) the generator should hand over all 05 copies to the transporter.
5. The 2nd part (cage 18-23) of all 05 copies has to be filled by the transporter and hand over white & pink copies to the generator & keep rest of the 03 copies (green, yellow & blue) to be handed over to the disposal facility or the destination facility at the delivery of waste.
6. The 3rd part (cage 24-32) of all 03 copies has to be filled by the facility destination/ disposer and hand over the green copy to the transporter and send the blue copy to the CEA on acceptance of the consignment . Keep the yellow copy with him.
7. The 4th part should be filled only when the rejection or partially rejection of waste occurs.
8. On rejection or partially rejection the disposal or the destination facility should fill the cage29-32 & hand over the waste back to the transporter with 03 copies (green, yellow & blue) and obtain his declaration in all 03 copies at cage 33 and send a endorsed copy of the copy of the yellow page to the CEA and hand over the 02 copies (green and blue) to the transporter back.
9. The transporter hand over the waste being rejected to the generator back and get the declaration at cage 34 from the generator and keep the green copy with him.
10. The generator should keep the photocopy of the blue copy and should send the blue copy to the Central Environmental Authority

Specific Instructions

11. Cage 07 - should be filled according to the prevailing regulations of hazardous waste.
12. Cage 09 - Refer to the Guidelines for the Implementation of Hazardous Waste Management regulations for details

ANNEXURE - 05

HAZARDOUS CHARACTERISTICS

Hazardous Characteristics of different types of waste and substances listed by the secretariat of the Basel Convention on the Control of the Transboundary Movements of Hazardous Waste and their Disposal are described below;

UN Class	Code	Characteristics
1	H1	Explosive An explosive substance or waste is a solid or liquid substance or waste(or mixture of substances or waste) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and as such speed as to cause damage to the surroundings.
3	H3	Flammable Liquids The word "flammable" has the same meaning as "inflammable". Flammable liquids are liquids or mixtures of liquids or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers etc., but not including substances or waste 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. (Since these results of open-cup tests and of closed-cup tests are not strictly comparable and even individual results by the same test are often variable, regulations varying from the above figures to make allowance for such differences would be within the spirit of this definition).
4.1	H 4.1	Flammable Solids Solids or waste solids other than those classed as explosives, which under conditions encountered in transport are readily combustible or may cause or contribute to fire through friction.

4.2	H 4.2	Substances or waste liable to spontaneous combustion. Substances or waste, which are liable to spontaneous heating under normal conditions, encountered in transport or to heating up on contact with air and being then liable to catch fire.
4.3	H 4.3	Substances or waste, which in contact with water, emit flammable gases. Substances or waste, which by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.
5.1	H 5.1	Oxidizing Substances or waste which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause or contribute to, he combustion of other materials.
5.2	H 5.2	Organic peroxides Organic substances or waste, which contain the bivalent -o-o- structure, are thermally unstable substances, which may undergo exothermic self-accelerating decomposition.
6.1	H 6.1	Poisonous(Acute) Substances or waste liable either to cause death or serious injury or harm health if swallowed or inhaled or inhaled or by skin contact.
6.2	H 6.2	Infectious substances Substances or waste liable either to cause death or serious injury or harm health if swallowed or inhaled or inhaled or by skin contact.
8	H 8	Corrosive Substances or waste which, by chemical action, 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.
9	H 10	Liberation of toxic gases in contact with air or water Substances or waste which, by interaction with air or water are liable to give off toxic gases in dangerous quantities.

9	H11	Toxic(Delayed or chronic) Substances or waste which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity.
9	H12	Ecotoxic Substances or waste which if released present or may present immediate or delayed adverse impacts to the environment by means of bioaccumulation and/or toxic effects upon biotic systems.
9	H13	Capable, by any means, after disposal, of yielding another material, e.g., leachate that possesses any of the characteristics listed above.

ANNEXURE - 06

Definitions

Agrochemicals	:	Is a generic term for the various chemical products used in agriculture.
Aquifers	:	Is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, silt, or clay) from which the groundwater can be usefully extracted using a water well
Antidotes	:	Is a substance which can counteract a poison and neutralizes It's effects.
Authority	:	means the Central Environmental Authority established by the National Environmental Act, No. 47 of 1980.
Breathing apparatus	:	Is a device worn by rescue workers, firefighters, and others to provide breathable air in a hostile environment.
Calorific value	:	Quantity of heat liberated on the complete combustion of a unit weight or unit. Usually expressed in Jules per Kilogram
Declaration/Manifest	:	Formal document specifying plaintiff's cause of action, including the facts necessary to sustain a proper cause of action, and to advise the defendant of the grounds upon which he is being sued.
Discrepancy	:	An incompatibility between two propositions that cannot both be true.
Emergency showers	:	An apparatus that provides a means to remove gross chemical contamination from the body or to extinguish a fire on the body.
Explosive	:	Material that causes a sudden, almost instantaneous, release of gas, heat, and pressure, accompanied by loud noise when subjected to a certain amount of shock, pressure, or temperature

Flammable gas	:	Is the gas ease with which a substance will ignite, causing fire or combustion.
Flu gas	:	Is gas that exits to the atmosphere via a flue, which is a pipe or channel for conveying exhaust gases from a fireplace, oven, furnace, boiler or steam generator.
Fly ash	:	Ash drawn from the burning fuel and carried by the gas flow through the kiln chamber or flues.
Friction heat sparks	:	heated particles thrown from relative motion of two surfaces in contact.
Galvanic reaction	:	Is an electrochemical process in which one metal corrodes preferentially when in electrical contact with a different type of metal and both metals are immersed in an electrolyte. Conversely, a galvanic reaction is exploited in primary batteries to generate a voltage.
Generation	:	means the productions, manufacturing, or creation of scheduled waste
Halogens	:	Are a series of nonmetal elements from of the periodic table, comprising fluorine, F; chlorine, Cl; bromine, Br; iodine, I; and astatine, At. The undiscovered element 117, temporarily named ununseptium, may also be a halogen.
Hazardous waste	:	A waste will fall under the scope of the Convention if it is within the category of waste listed in Annex I of the Basel Convention and it does exhibit one of the hazardous characteristics contained in Annex III In other words it must both be listed and contain a characteristic such as being explosive, flammable, toxic, or corrosive. The other way that a waste may fall under the scope of the Basel Convention is if it is defined as or considered to be a hazardous waste under the laws of either the exporting country, the importing country, or and of the countries of transit.
Heavy metal	:	A chemical element within the upper range of atomic weights.
Hydrants	:	An upright pipe with a nozzle or spout for drawing water from a water main.
Hydrostatic pressure	:	Is the pressure exerted by a fluid due to its weight.
Impermeable barriers	:	Not permitting passage (as of a fluid) through its substance
Incineration	:	A waste treatment technology that involves the combustion of Waste by controlled burning at high temperatures

Infectious substance	:	Waste that contains pathogens or consists of tissues, organs, body parts, blood and body fluids that are removed during surgery or other medical procedures.
Inorganic liquid waste	:	Any liquid waste not containing carbon atoms.
Leachate	:	Liquid that has percolated through solid waste and has extracted dissolved or suspended materials from it.
Medical surveillance	:	The purpose of medical surveillance is for the early identification of systematic health data collection.
Non compatible waste	:	there is no capability of two or more components of waste material to exist in the same system or environment without mutual interference.
Non halogenated hydrocarbon	:	chemical compounds, without consisting halogens
On site storage	:	Is the storage within the boundaries of the premises. This includes movement of waste within buildings and between buildings.
Oxidizing substance	:	Material which combine with oxygen; make into an oxide.
Pharmaceuticals	:	"Chemical substances used in the treatment, cure, prevention, or diagnosis of disease or used to otherwise enhance physical or mental well-being."
Pyrolytic treatment	:	The decomposition of a material or compound due to heat in the absence of oxygen or any other reagents.
Radiant heat	:	Is electromagnetic radiation emitted from the surface of an object which is due to the object's temperature.
Reactive waste	:	waste generally capable of having a reaction.
Residence time	:	It is the average time a substance spends within a specified region of space.
Safety audits	:	Study of an organization's, operations and real and personnel property to discover existing and potential hazards and the actions needed to vendor these hazards harmless.
Safety goggles	:	protective eyewear that usually enclose or protect the eye area in order to prevent particulates.

Scheduled waste	:	means any waste specified in scheduled VIII hereto.
Sinkholes	:	Is a natural depression or hole in the surface topography caused by the removal of soil or bedrock
Sludge filter cake	:	Is a sludge formed by the substances that are retained in or on a filter.
Sludge	:	means residual semi-solid material left from industrial waste water treatment facility.
Solid residues	:	Particulate material remaining after a distillation or an evaporation.
Specific gravity	:	is a ratio of the mass of a material to the mass of an equal volume of water at 4 o C (39 o F).
Spent acids	:	acids that have been used and must be processed before using.
Spill control equipment	:	A tool is an entity used to manage the release of a liquid petroleum hydrocarbon or any other liqiud into the environment due to human activity,
Static sampling	:	not acting or changing of sampling
Stoichiometric quantity	:	The amount of substance, n, of a sample or system is a physical quantity which is proportional to the number of elementary entities present.
Storage	:	include the storing of waste for a minimum reasonable period.
Therapeutic drug	:	Is a substance that has healing or preventive properties in relation to certain diseases, or is administered to enable a medical diagnosis.
Toxic gas	:	Is the gas a measure of the degree to which something is toxic.
Transport	:	means the movement of scheduled waste from the site of treatment, or wastewater treatment processes.
Volatile	:	evaporating at a relatively low temperature