



HAZARDOUS WASTE (MANAGEMENT , HANDLING AND TRANSBOUNDARY MOVEMENT) RULES 2008 AMENDMENTS MADE THERE OF



DEFINITION OF HAZARDOUS WASTES-ITS APPLICABILITY

Waste substance is solid, semi-solid or non -aqueous liquid which because of its quantity, concentration or characteristics in terms of physical, chemical, infectious quality :

- (a) Can cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitate reversible illness, or
- (b) Pose a substantial present or potential hazard to humans or the Environment when it is improperly treated, stored, transported, disposed of or otherwise managed.



Any waste is hazardous if it exhibits whether alone or when in contact with other wastes or substances, any of the identified characteristics below :

- (1) Corrosivity
- (2) Reactivity
- (3) Ignitability
- (4) Acute toxicity
- (5) Infectious property.

CORROSIVITY

A waste exhibits the characteristics of corrosivity if a representative sample of the waste has either of the following properties :

- (a) Any liquid which has a pH less or equal to 4 or greater than or equal to 12.5 as determined by the standard test procedure ; or
- (b) A waste, which can corrode steel at a rate greater than 6.35 mm per year at a temperature of 55 C as determined by the standard test procedure

- **Reactivity**

- Unstable and undergoes violent change without detonation
- Violent reaction with water
- Potential explosive mixture with water
- Toxic gases, vapors or fumes generation of CN or S⁻ wastes
- Explosive

- **Ignitability**

- Waste with flash point <60°C

- **Toxicity**

- A solid waste exhibit the characteristics of toxicity if the leachate from the representative sample by TCLP test method (as followed by USEPA vide no. SW-846)

- **ACUTE TOXIC**

Wastes generated in the manufacturing process of :

- Halogenated Phenols & other halogenated compounds
- Pesticides or pesticide derivatives
- Halogenated Benzene under alkaline conditions
- Off-specification or discarded products from the above processes



HAZARDOUS WASTES (MANAGEMENT & HANDLING AND TRANSBOUNDARY MOVEMENT) RULES 2008

- Schedule-1
115 Hazardous waste streams in 36 industrial processes
- Schedule-2 (Class A to E)
List of wastes constituents with concentration limits
- Schedule-3 (Part A & B)
Part A: List of wastes applicable for Import and Export
Part B: List of Hazardous characteristics
- Schedule-4 (Class A to E)
List of Non-Ferrous metal wastes applicable for registration of recyclers



Responsibilities of the generator for handling of hazardous waste

- Shall be responsible for **safe and environmentally sound** handling of hazardous waste generated
- The Haz. Wastes generated shall **be sent or sold to recycler/re-user** or an authorized disposal facility
- Should give information to Haz. Waste treated and disposed of by the operator of a treatment, storage and disposal facility as determined by SPCB
- **contain contaminants and prevent accidents** and limit their consequences on human beings and the environment.
- Provide persons working **on the site with training** , equipment and the information necessary to ensure their safety



Grant of authorization for handling hazardous wastes

- Every industry who is engaged in generation, of hazardous waste shall require to obtain an authorization
- The haz. Waste shall be collected, treated, stored or disposed of only in such facilities as may be authorized by the SPCB
- Every industry who is engaged in generation, of hazardous waste or occupier of the facility shall make an application in

Form-1 to the SPCB for Authorization with in a period of sixty days from the date of commencement.



FORM-1

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FORM 1

[See rules 5(3) and (7)]

APPLICATION FOR OBTAINING AUTHORISATION FOR COLLECTION/RECEPTION/TREATMENT/TRANSPORT/STORAGE/DISPOSAL OF HAZARDOUS WASTE*

From:

To: **The Member Secretary,**
Pollution Control Board/.....Pollution Control Committee.

Sir,

I / We hereby apply for authorisation/renewal of authorisation under sub-rule (3) of Rule 5 of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 for collection/reception/treatment/ transport/storage/disposal of hazardous wastes.

For Office Use Only

- 5. Code No. :
- 6. Whether the unit is situated in a critically polluted area as identified by Ministry of Environment and Forests;

To be filled in by Applicant

Part A: General

- 3. (a) Name and address of the unit and location of activity :
- (b) Authorisation required for (Please tick mark appropriate activity / activities :
 - (i) collection
 - (ii) reception
 - (iii) treatment
 - (iv) transport
 - (v) storage
 - (vi) disposal
- (c) In case of renewal of authorisation previous authorisation number and date
* delete whichever is not applicable

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- 4. (a) Whether the unit is generating hazardous waste as defined in these Rules:
(b) If so the type and quantity of wastes (in Tonnes/KL.)
- 5. (a) Total capital invested on the project (in Rupees)
(b) Year of commencement of production
(c) Whether the industry works general/ 2 shifts/ round the clock
- 6. (a) List and quantum of products and by-products (in Tonnes/KL.)
(b) List and quantum of raw material used (in Tonnes/KL.)
- 7. Furnish a flow diagram of manufacturing process showing input and output in terms of products, waste generated including for captive power generation and demineralised water.

Part B: Hazardous Waste

- 8. Hazardous Wastes:
 - (a) Type of hazardous wastes generated as defined under these Rules
 - (b) Quantum of hazardous waste generated (Also
 - (c) Sources and waste characteristics
 - (d) Mode of storage within the plant, method of disposal and capacity: (provide details).
- 9. Hazardous Wastes generated as per these Rules from storage of hazardous chemicals as defined under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989

Part C: Treatment, Storage and Disposal Facility

- 10. Detailed proposal of the facility (to be attached) to include
 - (i) Location of site (provide map)
 - (ii) Name of waste processing technology
 - (iii) Details of processing technology
 - (iv) Type and Quantity of waste to be processed per day
 - (v) Site clearance (from local authority, if any)
 - (vi) Utilization programme for waste processed (Product Utilization)
 - (vii) Method of disposal (details in brief be given)
 - (viii) Quantity of waste to be disposed per day
 - (ix) Nature and composition of waste
 - (x) Methodology and operational details of land filling/ incineration
 - (xi) Measures to be taken for prevention and control of environmental pollution including treatment of leachate
 - (xii) Investment on Project and expected returns
 - (xiii) Measures to be taken for safety of workers working in the plant

Place : Signature :
Date : Designation :



Grant of Authorization for handling hazardous wastes

- On receipt of application complete in all respects for the authorization the SPCB may, after such inquiry on being satisfied to handle haz. Waste safely, **grant within a period of 120 days an authorization in form 2** to the applicant which shall be valid for a period of five years.
- Every industry authorized under these rules shall maintain a record of haz. Waste handled by him in **Form 3** and prepare and submit to the SPCB, an annual return containing the details specified in **Form 4** on or before the 30th day of June following to the financial year to which that return relates.
- An application for the renewal of an authorization shall be made in **Form 1**, **60 days** before its expiry to the SPCB.



FORM-3

FORM 3
[See rule 5 (6), and 22 (1)]

FORMAT FOR MAINTAINING RECORDS OF HAZARDOUS WASTES BY THE OCCUPIER OR OPERATOR OF A FACILITY

- Name and address of the occupier or operator of a facility
- Date of issuance of authorisation and its reference number
- Description of hazardous waste

Physical form with description	Chemical form	Total volume (m ³) and weight (in kg.)

- Description of storage and treatment of hazardous waste

Date	Method of storage of hazardous wastes	Date	Method of treatment of hazardous wastes

- Details of transportation of hazardous waste

Name and address of the consignee of package	Mode of packing of the waste for transportation	Mode of transportation to site of disposal	Date of transportation

- Details of disposal of hazardous waste

Date of disposal	Concentration of hazardous constituents in the final waste form	Site Of disposal (identify the location on the relevant layout drawing for reference)	Method of disposal	Persons involved in disposal

- Data on environmental surveillance

Date of measurement	Analysis of ground water			Analysis of soil samples			Analysis of air samples		Analysis of any other samples (give details)
	Location of sampling	Depth of sampling	Data	Location of sampling	Depth of sampling	Data	Location of sampling	Data	

- Details of hazardous waste sold/auctioned to the recyclers or reprocessors or re-users:

- Details of hazardous waste reused or recycled

Date	Total Quantity of Hazardous Wastes generated	Details of hazardous waste minimization activity	Materials received	Final Quantity of waste generated	Net reduction in waste generation quantity and percentage

Date: _____ Name and signature of the Head of facility

Place: _____



FORM-4

FORM 4
[See rules 5(6) and 22 (2)]

**FORM FOR FILING ANNUAL RETURNS
BY THE OCCUPIER OR OPERATOR OF FACILITY**

[To be submitted by occupier/operator of disposal facility to State Pollution Control Board/
Pollution Control Committee by 30th June of every year for the preceding period April to
March]

1.	Name and address of the generator/ operator of facility	:				
2.	Name of the authorised person and full address with telephone and fax number	:				
3.	Description of hazardous waste	:	Physical description	form with	Chemical form	
4.	Quantity of hazardous wastes (in MTA)	:	Type of hazardous waste		Quantity (in Tonnes /KL)	
			(a)			
			(b)			
			(c)			
5.	Description of Storage	:				
6.	Description of Treatment	:				
7.	Details of transportation	:	Name & address of consignee	Mode of packing	Mode of transportation	Date of transportation
8.	Details of disposal of hazardous waste	:	Name & address of consignee	Mode of packing	Mode of transportation	Date of transportation
9.	Quantity of useful materials sent back to the manufacturers* and others#	:	Name and type of material sent back to		Quantity in Tonnes/KL	
			Manufacturers			
			Others#			

* delete whichever is not applicable
enclose list of other agencies.

Date :
Place :

Signature :
Designation :

Storage of Hazardous waste

- The occupier , re-cyclers, re-processors, and re-users may store the hazardous waste for a period **not exceeding ninety days** and shall maintain a **record of sale, transfer, storage, recycling** and reprocessing of such wastes and keep these records available for inspection.
- Provide that the **SPCB may extend** the said period in the following cases namely:
 - I. Small generators up **to 10 tones** per annum
 - II. Recyclers, re-processors and facility operators up to six months of their annual capacity
 - III. Generators who don't have access to any Treatment, storage, Disposal Facility in the concerned state
 - IV. The wastes **which needs to be specifically stored for development of a its recycling, reuse.**

Packing and Labeling

- The generator shall ensure that the hazardous waste are packed based on the composition in manner suitable for safe handling, storage and transport as per guidelines issued by CPCB time to time.
- The labeling and packaging shall be easily visible and be able to withstand physical conditions and climatic factors.

Transport of Hazardous waste

- The transport of the hazardous wastes shall comply to Motor Vehicles Act. 1988 .
- The occupier shall provide the transporter with the relevant information in **Form 11 (TREM CARD)**, regarding the hazardous nature of the wastes and measures to be taken in case of an emergency and shall mark the hazardous wastes containers as per **Form 12 (Marking of Hazardous waste container)**.

FORM-11 (TREM CARD)



TAMILNADU WASTE MANAGEMENT LIMITED

Form 11

Truck No.

TRANSPORT EMERGENCY (TREM) CARD

(Use one per Waste)

1. Characteristics of waste :

Type of Waste	Physical Properties	Chemical Composition	Exposure Hazards	First Aid Requirements

1. Procedure to be followed in case of fire
2. Procedure to be followed in case of spillage / accidents / explosion :
3. For Expert Services, please contact :
 - (i) Name and Address :
 - (ii) Telephone No. :

(Name and Signature of Waste Generator with Stamp)



FORM-12

(MARKING OF HAZ. WASTE)

FORM -12
[see rule 20(2)]

HAZARDOUS WASTE

Handle with care



Waste category No.....	Compatible Group No.....
Total Quantity	Date of Storage
Contents and state of the waste :	
Sender's Name and Address:	Receiver's Name and Address: TAMILNADU WASTE MANAGEMENT LTD. Plot No. 5-15, 28-33, SIPCOT Industrial complex. Gummidipoondi - 601 201., Tiruvallur Dist. Tamilnadu.
Phone :	Phone : 044-2792 3310
E-mail :	E-mail : tnwml@ramky.com
Tel. & Fax No. :	Tel. & Fax No. : 044-2668 1180
Contact Person :	Contact Person : SAMBANDAM GT - GM (Operations)
In case of emergency please contact :	Contact No : 99406 36300
Manifest No. :	U.N. Classification No :
Waste Identification :-	
STATE OF THE WASTE	
Aqueous	Organic liquid
Solid	Tarry



FILLED FORM-12

(MARKING OF HAZ. WASTE CONTAINER)

FORM -12

[see rule 20(2)]

HAZARDOUS WASTE

Handle with care



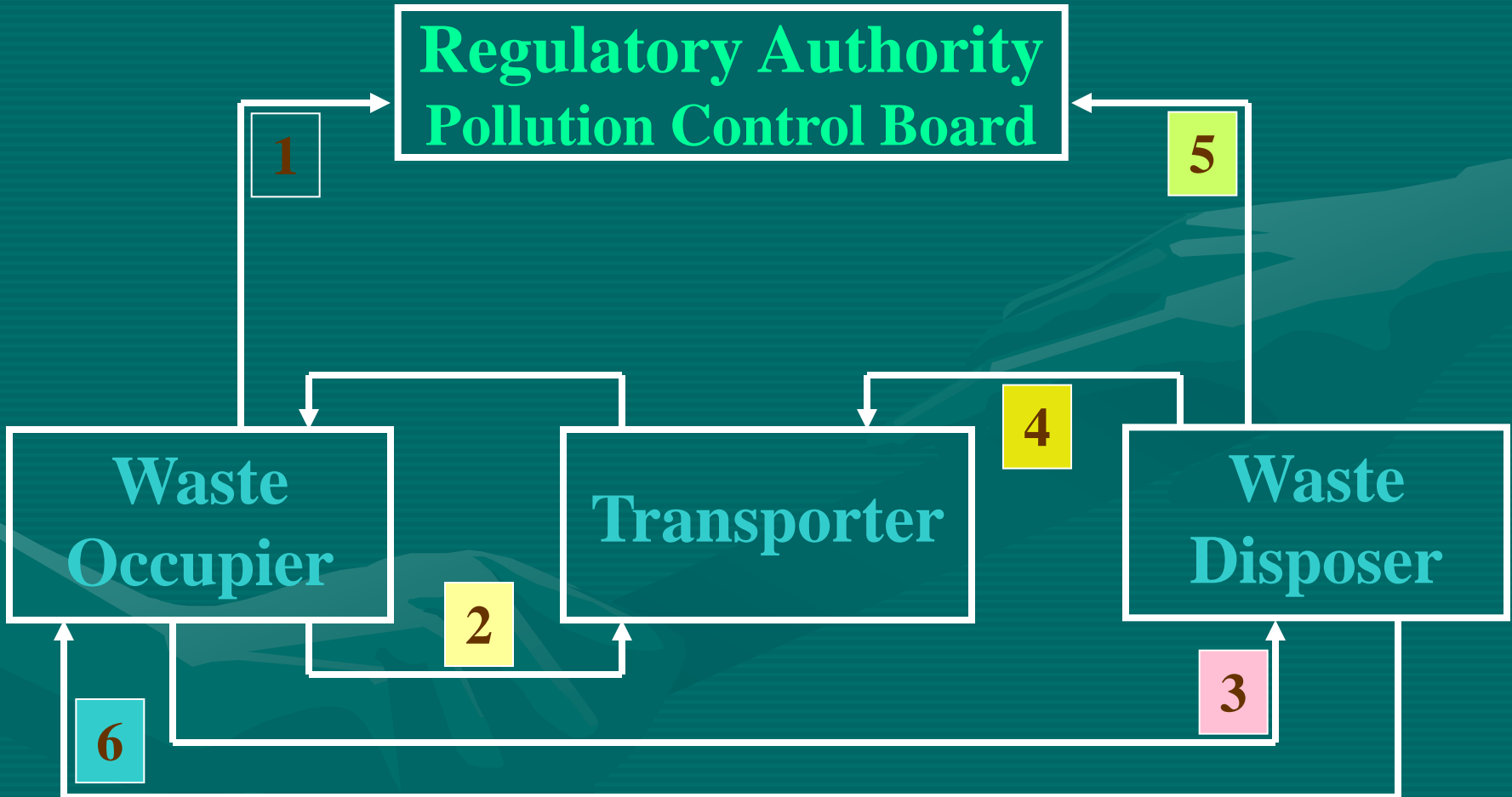
Waste category No..... <i>34.3</i>	Compatible Group No.....
Total Quantity <i>27.48</i>	Date of Storage <i>06.09.2012</i>
Contents and state of the waste : <i>Sledge from waste water treatment</i>	
Sender's Name and Address:	Receiver's Name and Address: TAMILNADU WASTE MANAGEMENT LTD. Plot No. 5-15, 28-33, SIPCOT Industrial complex. Gummidipoondi - 601 201., Tiruvallur Dist. Tamilnadu.
Phone : <i>04344253509</i>	Phone : 044-2792 3310
E-mail :	E-mail : <i>tnwml@ramky.com</i>
Tel. & Fax No. :	Tel. & Fax No. : 044-2668 1180
Contact Person : <i>Thirumercigan</i>	Contact Person : SAMBANDAM GT - GM (Operations)
In case of emergency please contact : <i>04344253509</i>	Contact No : 99406 36300
Manifest No. : <i>15551</i>	U.N. Classification No :
Waste Identification :- <i>Sledge from waste water treatment</i>	
STATE OF THE WASTE	
Aqueous	Organic liquid
Solid <input checked="" type="checkbox"/>	Tarry

Manifest System

(HW Movement Document)

- ❖ The occupier shall prepare six copies of manifest in **Form-13 (Color coded)**

Manifest System (Movement Document)





FILLED FORM-13 (MANIFEST DOCUMENT)

FORM - 13
[See Rule 21(1)]
HAZARDOUS WASTE MANIFEST
(Information of Hazardous Waste For Disposal)

1. Generator's Name & Address : [Redacted]		2. Occupier's Registration No. KG 175	
3. Manifest Documents No. 15551		4. Transporter's Name & Address : TNWML	
5. Type Of Vehicle : <input checked="" type="checkbox"/> Truck <input type="checkbox"/> Tanker <input type="checkbox"/> Special Vehicle		6. Transporter's Authorization No. :	
7. Vehicle Registration No. : TN15 J 3369		8. Designated Facility Name & Site Address: Tamil Nadu Waste Management Limited, Plot No. 5-16, 28-33, EPIP Building, SIPCOT Industrial Complex, Gummidipoondi - 601201.	
9. TSDF Authorization No. : 3086 Dt 19.10.07		10. TSDF Phone No. 044 - 27923310	
11. Waste Description : SLUDGE FROM WASTE WATER TREATMENT		12. Total Quantity of Waste m ³ : 27.48 Tons :	
13. Consistency <input checked="" type="checkbox"/> Solid : <input type="checkbox"/> Oily : <input type="checkbox"/> Semi Solid : <input type="checkbox"/> Tarry : <input type="checkbox"/> Sludge : <input type="checkbox"/> Slurry :		14. Transport Description of Waste ETP SLUDGE	
15. Containers : No. Type		16. Total Quantity 27.48	
<input checked="" type="checkbox"/> Corrosive <input type="checkbox"/> Reactive <input type="checkbox"/> Ignitable <input type="checkbox"/> Toxic		17. Unit Weight Wt./Vol kg	
18. Waste Category No. as per Schedule 1 3A Schedule 2 3		19. Special Handling Instruction & Additional information : USE PPE WHILE HANDLING	
20. Generator's/Occupier's Certificate : I hereby declare that the contents of the consignment are fully and accurately described above proper shipping name and are categorized, packed, marked, and labeled and are in the respects in proper conditions for transport by road according to applicable national government regulations.			
Occupier's Name & Stamp BERIGAI 635 105		Signature [Signature]	
21. Transporter's Acknowledgement of Receipt of Materials		Month Day Year 09 06 2012	
Transporter's Name & Stamp TAMIL NADU WASTE MANAGEMENT LIMITED		Signature [Signature]	
22. Discrepancy Note Space :		Month Day Year 09 06 2012	
23. Facility Owner / Operator's Certification of Receipt of Hazardous Waste		Month Day Year [] [] 17 SEP 2012	
Operator's Name & Stamp TAMIL NADU WASTE MANAGEMENT LIMITED		Signature [Signature]	

NOTE : Please attach Comprehensive Analysis Report Photocopy.

COPY 3 of 6
To be retained by the operator of a facility

Pink Copy

அகம் தராயமை வராயமைககு! புறம் தராயமை வாழவுககு!



CRITERIA FOR ACCEPTANCE OF HAZARDOUS WASTES TO TSDF SITE

- **Generators should provide information on**

Through inputs and process that generates the waste with quantities

Physical and chemical Characteristics of waste

Analytical procedures and interpretation of results

Hazardous waste codes as per schedule 1 & 2

IWMA Membership

TNWML Agreement Finalization

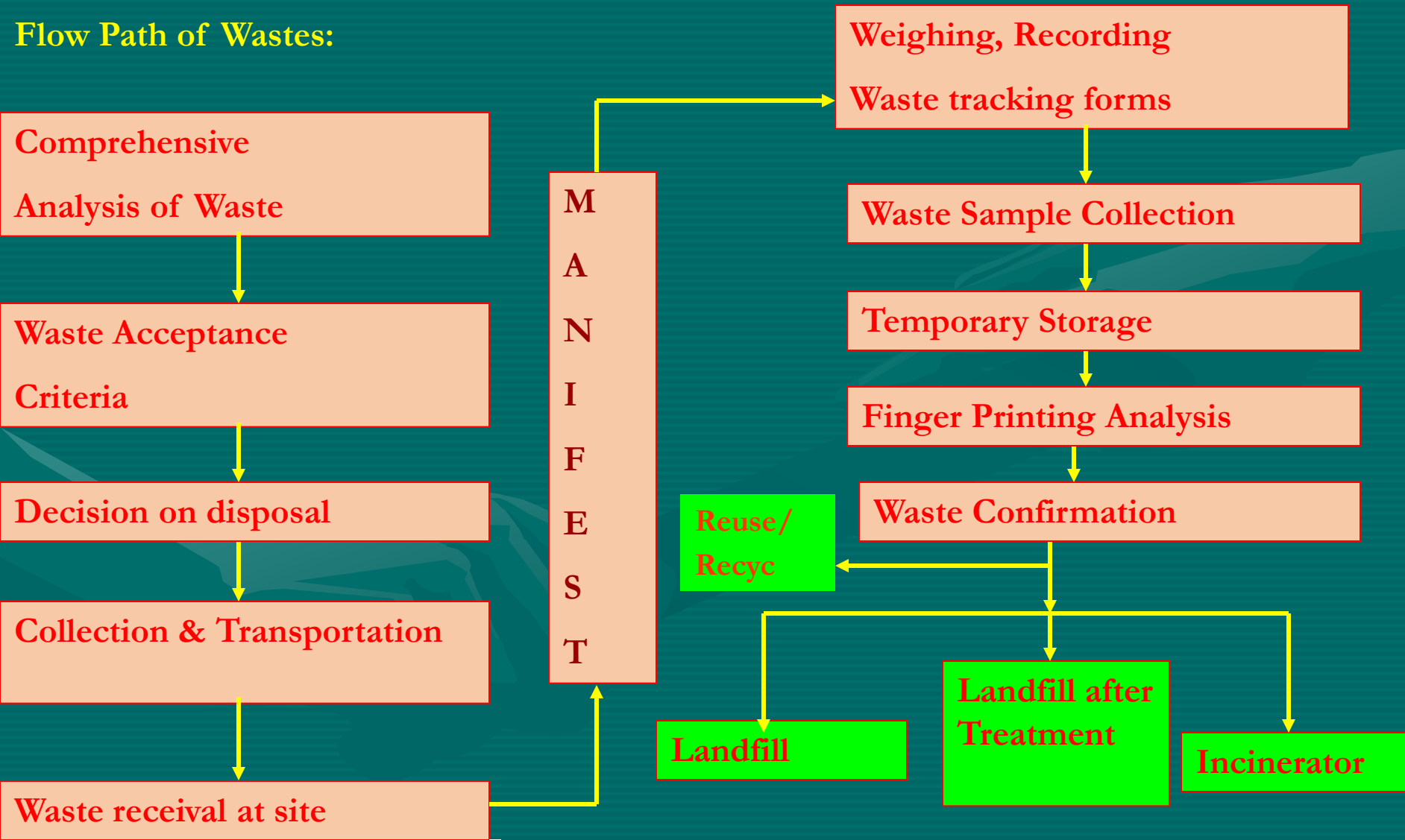
Waste Characterization / CA generation

TNPCB Authorization

Essential For Transportation

Following the regulations / Carrying Documents

Flow Pathway of wastes



Comprehensive Analysis

Physical	Physical state, Color and Texture, Flash point, LOD at 105°C, LOI at 550°C, Calorific Value, Paint filter liquid test, Liquid release test
Chemical	pH, reactive cyanide, reactive sulphide, Sulphur (elemental) Concentration of Inorganics as per schedule-2
Others	Extractable organic fraction, C,H,N,S Individual Organics as per schedule-2
	TCLP characteristics (Organics & Inorganics)

Finger Print Analysis

- Finger print analysis shall be performed by operator at TSDF:

Physical state

Colour and Texture

pH

Loss on Drying at 105°C

Loss on Ignition at 550°C

Flash point

Calorific value

Paint filter liquid test

Reactive Sulphide

Reactive Cyanide

Chemical compatibility

Other parameters on merit

CRITERIA FOR ACCEPTANCE OF HAZARDOUS WASTES FOR DIRECT DISPOSAL TO SECURED LANDFILL

(as per CPCB –MoEF Guidelines)

Leachate Quality *	Concentration		
pH	4 to 12	Water soluble compounds except salts	< 10%
Total Phenols	< 100 mg/l	Calorific value	<2500K.Cal/Kg
Arsenic	< 1 mg/l	Strength	
Lead	< 2 mg/l	Transversal strength (Vane Testing)	> 25 KN/m ²
Cadmium	< 0.2 mg/l	Unconfined Compression test	> 50 KN/m ²
Chromium-VI	< 0.5 mg/l	Axial Deformation	> 20%
Copper	< 10 mg/l	Degree of Mineralization or Content of Organic Materials (Original Sample)	
Nickel	< 3 mg/l	Annealing loss of the dry residue at 550°C	<20%byweight (for non-biodegradable waste) <5%byweight (for biodegradable waste)
Mercury	< 0.1 mg/l	Extractable Lipophilic contents (Oil & Grease)	<4%byweight
Zinc	< 10 mg/l		
Fluoride	< 50 mg/l		
Ammonia	< 1,000 mg/l		
Cyanide	< 2 mg/l		
Nitrate	< 30 mg/l		
Adsorbable organic bound Chlorine	< 3 mg/l		

* Leachate quality is based on Water Leach Test

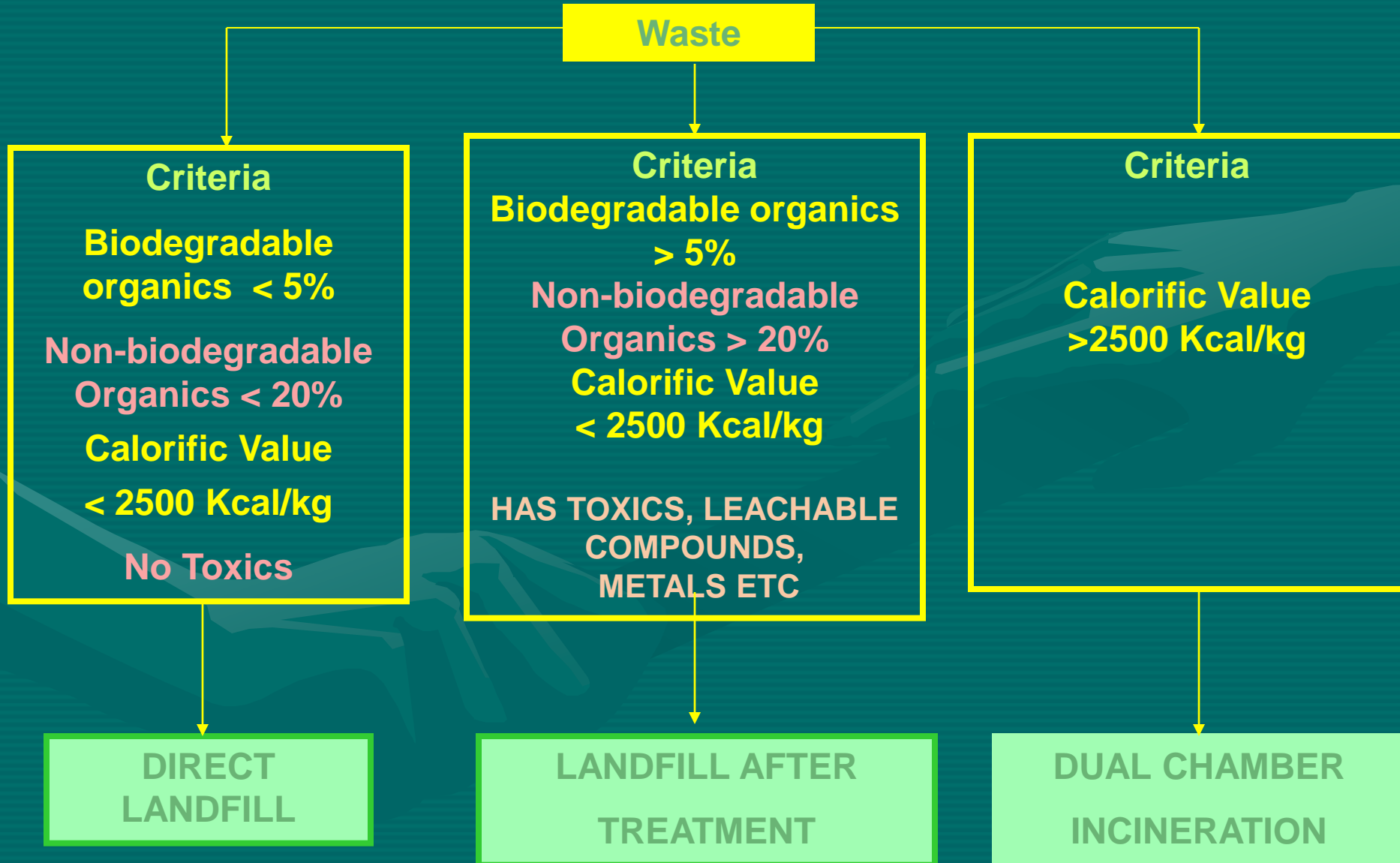


WASTE DISPOSAL OPTIONS

Waste at TSDF could be handled in different ways

- Direct disposal in to landfill
- Treatment/stabilization of waste and then disposal into landfill
- Direct incineration
- Pre- treatment and Incineration
- Pre- treatment, incineration and disposal of ash in to landfill
- Others

Disposal Pathways



THE INGREDIENTS FOR STABILIZATION



INGREDIENTS FOR STABILISATION

Sodium Silicate

Bentonite

Fly Ash

Alkaline chlorination
for cyanides

Sodium sulphide for
Mercury bearing
wastes

WASTE TREATMENT/ STABILISATION

Treatment/ Stabilization operations are carried out for all wastes identified for the purpose so as to minimize their contaminant leaching potential.

Stabilisation could involve – immobilization of leachable material by

- Fixation as non-reactive solids
- Reduction of volume
- Reducing contaminant level of org/inorg

WASTE TREATMENT/ STABILISATION

- Immobilization/Chemical fixation
- chemical binding of contaminants within a cementing structure to reduce the mobility of leachability of the waste constituents
- Encapsulation
- Entrapment of contaminant particles within a solid matrix
- Solidification
- The conversion of slurries that do not readily dewater into solids by addition of solidification and adsorption agents

LIABILITY OF OCCUPIER, TRANSPORTER AND OPERATOR OF A FACILITY

- The **occupier, transporter and operator of a facility** shall be **liable for all damages caused to the environment** or third party due to improper handling of the hazardous waste or disposal of the hazardous waste.
- Shall be **liable to pay financial penalties as levied for any violation** of the provisions under these rules by TNPCB with the prior approval of the CPCB.



THANK YOU