Guidelines for Collection, Handling, Storage, and Transportation of Waste Batteries

CENTRAL POLLUTION CONTROL BOARD

(Ministry of Environment, Forest and Climate Change)

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1.0 Introduction

Ministry of Environment, Forest and Climate Change (MoEF&CC), GOI notified Battery Waste Management (BWM) Rules on 22nd August, 2022 and amendments thereof. These regulations apply to producers, dealers, consumers, and entities involved in the collection, segregation, transportation, refurbishment, and recycling of all types of waste batteries, regardless of their chemistry, shape, volume, weight, material composition, or use. Battery types covered include portable, automotive, industrial, and EV batteries, encompassing various chemistries such as lead-acid, lithium-ion, nickel-cadmium, zinc-based batteries etc.

Under the said BWM Rules, 2022, the Central Pollution Control Board (CPCB) is mandated to develop guidelines for environmentally sound procedures related to the collection, storage, transportation, refurbishment, and recycling of waste batteries. Entities engaged in these activities should ensure that their facilities comply with the standards or guidelines prescribed by the CPCB. Furthermore, they are required to conduct all activities in accordance with the guidelines provided by the CPCB.

In view of above and considering the hazardous nature of waste batteries as defined in the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Guidelines for Collection, Handling, Storage, and Transportation of Waste Batteries have been prepared and given in following sections.

2.0 Applicability of these Guidelines

These guidelines are applicable to:

- **Recyclers:** These guidelines apply to companies or facilities engaged in the recycling of waste battery. Recyclers are responsible for processing and recovering key battery materials from used batteries in compliance with the BWM Rules, 2022.

- **Collection Centres:** These guidelines are relevant to establishments designated as collection centres for used batteries. Collection centres collect and aggregate waste battery from consumers, businesses, producers, etc. before it is transported to recyclers for processing.

- **Refurbishers:** Companies or entities involved in the refurbishment or reconditioning of used batteries fall under the scope of these guidelines. Refurbishers may restore used batteries to a functional state for reuse or resale, following appropriate safety and environmental protocols.

- **Producers:** means an entity who engages in:

(i) manufacture and sale of Battery including refurbished Battery, including in equipment, under its own brand; or

(ii) sale of Battery including refurbished Battery, including in equipment, under its own brand produced by other manufacturers or suppliers;

(iii) import of Battery or equipment containing Battery; or

(iv) manufacture or assembling of Battery or refurbished Battery including in equipment for sale to the Producer mentioned in sub-clause (ii) without its own brand name.

- **Entities Involved in Transportation:** Refers to the diverse range of organizations, service providers, and logistics entities engaged in the transportation of waste batteries across different units or interstate transfers within the country.

Note: Definition of various stakeholders and terminologies are provided in the Battery Waste Management Rules, 2022 and will be applicable as per the Rules.

3.0 Collection of Waste Batteries

As per Rule 4 (10) of the BWM Rules, 2022, in order to develop a mechanism for collection of waste battery for fulfilling Extended Producer Responsibility obligations, the producer, may operate schemes such as deposit refund system or buy back or any other model.

The producers may device a collection mechanism which may include take-back through dealers, collection centres or any other entity engaged in collection of waste battery. Producer may manage a system directly for collection of Waste Battery by involving relevant stakeholders such as consumer, bulk consumer, resident associations, retailers and dealers, etc. Producers may also have an arrangement of collection of waste battery from individual consumers and bulk consumers as well. The producers may publicize their collection system which may include details of their drop points linked to collection centres, take-back system, deposit refund scheme, retailers/dealers etc. for making collection system effective and workable. If take - back system is being provided, then it should be accessible to any citizen located anywhere in the country and may be provided through retailers/dealers. The producers may provide consumer/bulk consumer following details of take-back system:

- Link of their website where information pertaining to take-back system is available. In case where a website is not available, producers may provide a contact email or phone number where consumers can inquire about battery drop points.
- Helpline No./Toll free number to be available during working hours for consumers' / bulk consumers.

- Details of the dealers, retailers, drop points linked to collection centres for depositing of waste battery by the consumer/bulk consumers if they are part of the take-back system
- Details of any incentive scheme for consumers' / bulk consumers for returning of Waste Battery
- Details of authorised refurbishers/recyclers who can take-back waste battery on behalf of the producer if recyclers/refurbishers are part of take-back system

4.0 Collection Centres

As per Rule 4 (2) of the BWM Rules, 2022, producer shall meet the collection and recycling and/or refurbishment targets as mentioned in Schedule II for battery made available in the market.

A collection centre for waste battery management is a facility dedicated to the collection, sorting, and temporary storage of waste batteries before they are transported to recycling facilities.

Producer / Recycler / Refurbisher may set-up collection centres, which are part of waste battery channelization. Collection centre may collect and store waste battery and transfer the same to authorised recyclers / refurbishers. Collection centres may setup drop points (locations where individuals or businesses can safely and conveniently drop used or expired batteries) at designated places where waste battery can be collected from residential areas, office complexes, commercial complexes, retail outlets, customer care stores, educational and research institutions, resident welfare associations (RWAs). Waste battery from collection centres should be sent only to the authorised refurbishers and recyclers.

4.1 Procedure for establishment of Collection Centres

Setting up collection centres for waste battery management involves consideration of factors such as location, space requirements, accessibility, proper infrastructure for safe handling and storage of used batteries, and certifications from SPCB/PCCs. This section outlines the above requirements in detail.

4.1.1 Grant of Registration to Collection Centres by SPCBs/PCCs

- Collection centres shall obtain CTE / CTO / Authorization under Hazardous Waste from respective SPCBs/PCCs under Green Category as applicable. (as per the Classification of Sectors into Red, Orange, Green, White and Blue Categories issued by CPCB.)

- The site plan of the collection facility should be submitted to the SPCB / PCC to assess and approve the facility's storage capacity.

- Only recyclers, refurbishers, or producers shall be allowed to set up collection centres to prevent mishandling, illegal operations and ensure safe handling of these batteries.

- Collection centres should submit Annual Returns to the concerned SPCBs / PCCs of the previous FY by 30th June of every year as per FORM 4 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

4.1.2 Location and Accessibility of Collection Centres

- **Procedure for selection of location of Collection Centres:** Specific and /or General conditions related to establishing a new industrial unit/collection centres at a location along with the appropriate environment safeguards and/ or mitigation measures, in view of site condition on the ground shall be imposed by the concerned SPCB / PCC as per the paragraph 9 of the Control of Water Pollution (Grant, Refusal or Cancellation of Consent) Amendment Guidelines, 2026 and the Control of Air Pollution (Grant, Refusal or Cancellation of Consent) Amendment Guidelines, 2026

- Proper signage may be placed on Collection centre and collected waste battery storage location.

  If waste batteries are stored within a manufacturing, recycling, or refurbishing unit, it will not be considered a collection centre

- **Drop Points for Portable / Household / Dry Cell Batteries:**

- Collection centres may set up drop points in various locations within the community to facilitate convenient disposal of dry cells and portable batteries. These drop points may be installed in public buildings, such as libraries, RWAs, community centres, or government offices, as well as in commercial areas like shopping malls or supermarkets. Following points are also to be considered:
  - Ensure that drop points are located in areas that are not directly exposed to sunlight, rain, or adverse weather conditions to prevent damage to batteries and minimize potential risks to individuals and the environment.
  - Install drop points in secure and well-monitored locations to prevent unauthorized access and minimize the risk of vandalism or tampering.
  - Consider placing drop points away from areas frequented by children or pets to reduce the risk of accidental exposure to waste battery and or hazardous material.
  - Provide adequate signage and instructions at drop points to guide users on proper battery disposal procedures and safety precautions.
  - Containers used for collecting used batteries must be resistant to battery electrolytes.
  - The bins or boxes should be placed in well-ventilated, dry areas that are sheltered from the weather.

- The area allocated for each drop point shall be proportionate to the anticipated volume of batteries handled, ensuring adequate space for safe movement and handling operations.
- The quantity of batteries stored at any drop point shall be restricted to a modest volume to avoid over-accumulation, and shall be supported through periodic and timely collection arrangements.
- Drop point should be adequate ventilation and fire protection system to prevent any fire hazard.

- Each drop point should be clearly marked and equipped with secure containers for the collection of batteries. (Refer section 5.1 for storage of different types of batteries)

- Regular pickup schedules to collect batteries from drop points and transport them to the collection centre.

- Transportation of waste batteries from drop points to collection centres should be carried out as per guidelines provided in section 6.0 of this document.

- No acid draining / dismantling / seal removal of waste batteries shall be permitted at drop points.

4.1.3 Facilities at Collection Centres

- Collection centre should have weighing equipment for weighing each delivery received by it and maintain a record in this regard. Collection centre should also maintain the records of kind of waste battery collected i.e., Lead Acid, Lithium-ion, Zn-based, etc. The records shall be maintained as per Rule (20) of the Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016. (As per format attached in **Annexure – I)**

- The storage capacity of any collection centre should be commensurate with volume of operations (weight and numbers) and types of waste battery.

- Collection centre should provide separate spacing for storing different types (Portable, Automotive, Industrial, EV) and kind (Lead acid, Lithium-ion, Zinc-based, Nickel-Cadmium, etc.) of waste battery.

- Fire-rated partitioning and an adequate physical gap between battery stacks shall be maintained to reduce fire-spread risk. Further, collection centres with relatively large storage capacities shall be equipped with CO_2 or other inert-gas–based fire-suppression systems to ensure enhanced safety.

- All personnel must wear appropriate PPE, including gloves, eyewear, an apron, and shoes, while collecting or handling damaged and defective batteries.

- When an accident occurs at the facility of the occupier while handling hazardous or other wastes and operator of the disposal facility or during transportation, the occupier or the operator or the transporter shall immediately intimate the SPCB / PCC through telephone or e-mail about the accident. Report of the accident shall be sent as per Rule (22) of the Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 (as per format attached in **Annexure –II)**

- Collection centres may display type and kind of waste batteries they store on-site.

- No dismantling / shredding / processing activities shall be carried out at the collection centres.

- Collection centres should be equipped with a discharge facility (primarily for lithium-ion batteries with dry discharge system). Portable batteries may not require discharge.

- Collection systems may be designed in close co-ordination with OEMs, service networks, and logistics partners to enable efficient reverse logistics for these battery types.

- Waste Batteries collected should be given only to registered recyclers, either directly or on instructions of the producer.

- No collection centre shall sell waste batteries to traders or dealers; sales shall be made only to authorized recycling units.

- Storage area should be provided with flameproof electrical fittings and it should be strictly adhered to.

- Automatic smoke, heat detection system should be provided in the sheds. Adequate firefighting systems should be provided for the storage area, along with the areas in the facility.

- Loading and unloading of wastes in storage sheds should only be done under the supervision of the well trained and experienced staff.

- The storage and handling should have at least two routes to escape in the event of any fire in the area. Doors and approaches of the storage area should be of suitable sizes for entry of fork lift and firefighting equipment;

- Measures should be taken to prevent entry of runoff into the storage area. The Storage area shall be designed in such a way that the floor level is at least 150 mm above the maximum flood level.

- The storage area floor should be provided with secondary containment such as proper slopes as well as collection pit so as to collect the leakages/spills etc.

- All the storage yards should be provided with proper peripheral drainage system connected with the sump so as to collect any accidental spills in roads or within the storage yards as well as accidental flow due to fire fighting.

- Smoking shall be prohibited in and around the storage areas.

- Good housekeeping need to be maintained around the storage areas.

- Signboards showing precautionary measures to be taken, in case of normal and emergency situations should be displayed at appropriate locations.

- To the extent possible, manual operations within storage area are to be avoided. In case of manual operation, proper precautions need to be taken, particularly during loading / unloading of liquid hazardous waste in drums.

- A system for inspection of storage area to check the conditions of the batteries, spillages, leakages etc. should be established and proper records should be maintained.

- The wastes should be adequately protected from direct exposure to sunlight and adequate ventilation should be provided.

- Storage sites should have adequate & prompt emergency response equipment systems for the waste stored on-site. This should include firefighting arrangement based on the risk assessment, spill management, evacuation and first aid.

- Only persons authorized to enter and trained in hazardous waste handling procedures should have access to the storage site.

- Mock drill for onsite emergency should be conducted regularly and records maintained.

5. Guidelines for Storage of Waste Battery

- Every producer, collection centre, recycler, and refurbisher may store waste batteries for a period not exceeding 90 days and shall maintain records of the collection, sale, transfer, and storage of

waste batteries, making these records available for inspection. The standard storage period may be extended by the SPCBs/PCCs as per Rule (8) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

- Storage of end of life battery or waste battery may be done in a manner which does not damage the battery terminals and should be safe for workers handling such products. Ensure storage area is free of sharp objects and tools which can puncture battery outer casing.

- Loading, transportation, unloading and storage of waste battery/end of life battery should be carried out in such a way that its end use such as re-use after refurbishing or recycling or recovery is unaffected.

- Use a surface made of concrete, ceramic, metal, or any other non-flammable material to store waste batteries.

- The storage area should have fire protection system in place such as fire detector, CO_2 fire extinguisher, emergency kits, protective eyewear, gloves, and a fireproof safety bag or container.

- Waste batteries should be stored in a cool and dry area, out of direct sunlight and not in areas where batteries could overheat.

- Facility should store waste battery type-wise (Portable, Automotive, Industrial, EV) and kind-wise (Lead acid, Lithium-ion, Zinc-based, Nickel-Cadmium, etc.)

- Leaking or damaged batteries should be separated from other waste battery and individually protected. Immediately contain the leaked material to prevent it from spreading further. Use absorbent materials like saw dust to soak up the leaked electrolyte. While handling these batteries, wear the appropriate personal protective equipment (PPEs). Ensure portable spill containment and clean-up equipment on site and provide relevant trainings for the equipment deployment. Once the leakage is contained, carefully clean up the spilled material. Dispose of the contaminated materials according to regulations for hazardous waste disposal.

- Used absorbents should be collected and sent to TSDF for proper treatment and disposal, in accordance with hazardous waste rule, so that sawdust containing acidic spills cannot pollute/harm the surrounding and environment.

- Storage area should be provided with proper peripheral drainage system connected with the sump so as to collect any accidental spills in or within the storage area.

- Standard Operating Procedures (SoP) should be established by the unit for the storage and movement of batteries within their facility and handling of batteries in the premises. Trained personnel (HAZMAT training) should be designated to execute these procedures.

- The quantity of waste batteries stored at a Collection Centre or drop points shall not exceed the quantity specified in the approved CTO / Authorization issued under the Hazardous Waste Rules by the respective SPCBs/PCCs.

- Lithium-ion batteries may be stored at ~30% of their rated capacity at an optimal storage temperature (at or below 35°C).

- Protect battery terminals or loose wires using non-conductive tape.

- Ensure that battery packs are not placed near a heat source or extreme temperatures.

- Metal containers with non-conductive linings may be used for storage of damaged batteries to contain fire risks, ensuring no metal contact.

- Use containers with adequate ventilation (e.g. venting cap, container is not air tight). Details of storage containers for each type of battery is given in below section.

- Incorporate electrically non-conductive and non-combustible cushioning material, such as vermiculite, to occupy any voids between cells or batteries within the packaging.

- The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and packaging design shall be chosen so as to prevent the development of unintentional electrical contact, short-circuit, shifting and corrosion of the terminals, and afford some protection from the environment.

- When utilizing metal storage containers, it is advisable to line or fit them with an electrically non-conductive lining material, such as a plastic bag. This precaution serves to prevent direct contact between the batteries and the metal container, thus reducing the risk of electrical conduction and potential short circuits.

5.1 Battery types, hazards, chemistry, and specific storage requirements

This section outlines the recommended storage containers for different types of batteries. Below is a table summarizing the type of container suitable for each battery type:

Battery Type	Battery Chemistry	Reference Photos	Storage Containers
Portable Battery, except those used in consumer electronics which are rechargeable	Alkaline batteries		Plastic drums / boxes Avoid stacking too high to prevent collapse or damage.
	Button Batteries		Plastic drums / boxes Avoid stacking too high to prevent collapse or damage.
Portable Battery used in Consumer Electronics which are rechargeable	Lithium and Lithium-ion (small)	 	Plastic drums / boxes Avoid stacking of big plastic drums / boxes.
	Nickel Metal Hydride		Plastic drums / boxes Avoid stacking too high to prevent collapse or damage.
	Nickel-Cadmium		Plastic drums / boxes Avoid stacking too high to prevent collapse or damage.

Mixed Batteries (e.g. containers with alkaline, lithium and others)	Varies depending on batteries in mixed load		Plastic drums / boxes Avoid stacking too high to prevent collapse or damage.
Industrial and Automotive Batteries	Used Lead Acid		Store upright on a pallet. Secure with non-conductive strapping for transport.
EV battery – two, three, and four wheelers	Large Lithium-ion battery		Store upright on a pallet (no stacking of batteries). Secure with non-conductive strapping for transport. These batteries may require storage and packaging on wrapped pallets due to their size and weight.

Table 1: Different types of batteries with their storage containers

6.0 Guidelines for Transportation of Waste Batteries

- The sender of waste battery (that may be a producer, recycler, refurbisher, or collection centre) should identify transporter or make arrangements for a transporting waste battery in such a manner that environmental consequences of hazards associated with its transport could be kept at minimum.

- The transport of the Waste Battery shall be in accordance with the provisions of these rules and the rules made by the Central Government under the Motor Vehicles Act, 1988.

- The transportation of Waste Battery should adhere strictly to the regulations outlined in Rule 18 of the Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.

- The producers, recyclers and refurbishers while transporting waste generated from manufacturing, recycling and refurbishment process destined for final disposal to a treatment, storage and disposal

facility will follow the provisions under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

- Waste Batteries be transported using containers and packaging specified in sections 5.1 of this document. Avoid mixing waste batteries with other materials during transportation.

- Avoid transporting waste batteries in unlined metal boxes, and ensure that battery terminals are taped to prevent exposure and short-circuiting. Lithium-ion batteries must be packaged in a manner that prevents short circuits during transportation. However, if metal boxes are properly lined with plastic, rubber, or foam—and the battery terminals are securely taped—such metal boxes may be preferred as they are fire-resistant, provide protection against crushing, impacts, and punctures, and can be sealed against moisture, dust, and mechanical wear.

- Lithium-ion waste battery packs may have State of Charge (SoC) less than 30% of their rated capacity while being transported.

- The waste batteries must be packaged in a way that prevents contact with other devices, conductive materials, or fluids such as acid or water, and ensures protection against weather conditions, such as rain.

- When transporting lithium-ion waste battery packs, it is important to ensure that they are kept away from heat sources or extreme temperatures.

- The base of the waste cabin shall be leak proof to avoid pilferage of liquid during transportation.

- Precautions must be taken to avoid the dropping of waste batteries during transport.

- In case of transportation of waste battery for recycling, the sender shall intimate the State Pollution Control Boards before handing over the waste to the transporter. The intimation shall be given as per Rule 19 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

- The vehicles used for transportation of the used lead acid batteries should be leak proof. The flooring of the containers should be having wood sawdust. Used lead acid batteries scrap must be transported inside shock resistant and acid resistant sealed container in upright position due to the risk of leakage.

- The containers must be well packed to the transport vehicle and should not be allowed to move while being transported. The containers have to be bound, shrink wrapped or stacked properly to avoid movement;

- In case of transportation of waste battery, the responsibility of safe transport shall be either of the sender or the receiver whosoever arranges the transport and has the necessary authorisation for transport from the concerned SPCB / PCC. This responsibility should be clearly indicated in the manifest (Rule 19 of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016).

- In case of transit of waste battery for recycling through a State other than the States of origin and destination, the sender shall give prior intimation to the concerned SPCB / PCC of the States of transit before handing over the wastes to the transporter and also shall obtain 'No Objection Certificate' from the SPCB / PCC of both the States. This has to be carried out in accordance with the provision of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

- The authorisation for transport shall be obtained either by the sender or the receiver on whose behalf the transport is being arranged.

- Appropriate fire-fighting equipment, such as a regular fire extinguisher, should be kept in the vehicle in case a battery catches fire during transportation.

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Annexure - I

FORMAT FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES

1. Name and address of the facility:

2. Date of issuance of authorisation and its reference number:

3. Description of hazardous and other wastes handled (Generated or Received)

Date	Type and Kind of Waste Battery	Total Quantity (in kg)	Method of Storage	Destined to and/or received from

4. Date wise description of management of hazardous and other wastes including products sent and to whom in case of recyclers or pre-processor or utiliser:

Signature of occupier

Date…….

Place……

Annexure – II

FORMAT FOR REPORTING ACCIDENT

[To be submitted by the facility or sender or receiver or transporter to the State Pollution Control Board]

1. The date and time of the accident:
2. Sequence of events leading to accident:
3. Details of hazardous and other wastes involved in accident:
4. The date for assessing the effects of the accident on health or the environment:
5. The emergency measures taken:
6. The steps taken to alleviate the effects of accidents:
7. The steps taken to prevent the recurrence of such an accident:

Date: Signature:

Place: Designation: