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CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार.
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA.

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CIRCULAR

CPCB has prepared draft "Guidelines for Handling, Storage, Management Utilisation and Disposal of Reject water and Discarded Element Generated from Domestic and Commercial Reverse Osmosis based Water Purification System (WPS)" and uploaded on CPCB website (i.e., https://cpcb.nic.in/).

Comments/suggestions, if any, on the above draft guidelines are invited and the same may please be provided to CPCB by email to nazim.cpcb@nic.in and vishalgandhi.cpcb@nic.in, so as to finalize the guidelines by 05.02.2026.

20/1/2026

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GUIDELINES FOR HANDLING, STORAGE, MANAGEMENT UTILISATION AND DISPOSAL OF REJECT WATER AND DISCARDED ELEMENT GENERATED FROM DOMESTIC AND COMMERCIAL REVERSE OSMOSIS BASED WATER PURIFICATION SYSTEM (WPS)

WATER QUALITY MANAGEMENT – I DIVISION
Central Pollution Control Board (CPCB)
Ministry of Environment, Forests & Climate Change (MoEF & CC)
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1.0 BACKGROUND

In exercise of the powers conferred by sections 3, 6 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), MoEF&CC notified the "Water Purification System (Regulation of Use) Rules, 2023" vide GSR 833 (E) dated 10.11.2023.

The afore-said Rules define responsibilities of Manufacturer, User, Central Pollution Control Board (CPCB), State Pollution Control Board or Pollution Control Committee and Bureau of Indian Standards (BIS) for Domestic Water Purification System (DWPS) and Commercial Water Purification System (CWPS).

These guidelines for handling, storage, management and utilisation of reject water and discarded element generated from Domestic Water Purification System (DWPS) and Commercial Water Purification System (CWPS) have been prepared as per the responsibility assigned to CPCB in the afore-said Rules.

"Discarded element" means element which is discarded from the domestic water purification system and commercial water purification system due to manufacturing defect, wear, tear, loss of its utility attributes or achieved its end of life;

"Commercial water purification system" means equipment or device, having reverse osmosis based water treatment system that reduces total dissolved solids, chemical contamination to safe level and removes physical particles including microbiological impurities in water to produce water for human consumption and meeting the required specification of IS 10500: 2012.;

2.0 WATER PURIFICATION SYSTEM

Water Treatment System means a system that removes or reduces contaminants from water to produce water that is safe for human consumption.

Water purification systems like Ultra Filtration (UF), Nano Filtration (NF), Reverse Osmosis (RO), Ion Exchange etc. differ in their filtration capabilities, efficiency and the types of impurities they are designed to remove. The general conditions or criteria that determine when and how RO system is suitable for use are given in **Annexure I**.

Use of RO Based Water Purification systems is increasing in households as an additional precaution for removal of harmful substances that may be present in supplied ground water or surface water by the water supply agency.

Reverse Osmosis based water purification system has reject stream. Characteristics of reject water includes high concentration of suspended solids, elevated level of bacteria, viruses and other organics. Hence, proper guidelines are required for management, storage, utilization and disposal of reject stream.

2.1 PROCESS OF REVERSE OSMOSIS BASED WATER PURIFICATION

Reverse osmosis is a process of water purification that uses a synthetic lining i.e. semi-permeable membrane to filter out solutes i.e. salts, bacteria, virus, color, unwanted molecules and large particles such as sediments and dirt from drinking water.

It is employed in various applications viz. desalination, treatment of waste water, reclamation of minerals, concentration of whey and other food products, and purification of water. In recent years, RO has been used increasingly in making processed water for dialysis in hospitals and for certain cosmetics and drugs by pharmaceutical manufacturers.

In India, Reverse osmosis is commonly used in drinking water purification systems in households to treat raw water in urban areas and in areas where water has high concentration and dissolved solids or is contaminated with pathogens. Metal and other ions viz. lead, arsenic, sulphate, calcium, magnesium, sodium, potassium, nitrate, fluoride and phosphorus can also be removed through this process.

As raw feed water flows through the reverse osmosis system, feed water is separated in two streams viz. Permeate water and RO Reject. Permeate is the treated low TDS water used for various domestic and industrial purposes including drinking. While, RO reject, which is high in TDS, contains removed salts, dissolved pollutants, minerals etc., is finally discarded.

2.2 QUANTUM OF RO REJECT

The RO process employs semi-permeable membranes to separate water into two streams: permeate, the purified water that passes through the membrane, and concentrate, the portion that contains salts, heavy metals, minerals, and including microorganisms and therefore needs a suitable and environmentally friendly management option. The characteristics and quantum of the reject or waste stream, also termed as concentrate, retentate or brine, are governed mainly by the quality of the feed water, the quality of the produced water. As per Bureau of Indian Standards IS 16240: 2023, the minimum recovery rate shall be equal to or more than 40 percent.

2.3 RULES FOR RO BASED WATER PURIFICATION SYSTEM

The MoEF&CC issued notification G.S.R. 833(E) dt 10.11.2023 on “Water Purification System (Regulation of Use) Rules, 2023” for the Domestic Water Purification system (DWPS), with a capacity of up to 25 lt/hr, and Commercial Water Purification system (CWPS)

3.0 GUIDELINES FOR HANDLING, STORAGE, MANAGEMENT AND UTILISATION OF RO REJECT WATER

3.1 Utilization of RO Reject Water

Central Public Health and Environmental Engineering Organization (CPHEEO) has published manual on Sewerage and Sewage Treatment Systems in which options for reuse of treated sewage in various activities at the Point of Use are also identified. CPHEEO also recommended the used water quality requirements for specified activities at Point of Use which are attached as **Annexure-II**.

All those options cannot be directly used for utilization in RO reject water in case of high concentration of TDS in RO reject water. It is therefore recommended that the following options can be used for utilization of RO Reject after ensuring water quality requirements of the activity:

1. Floor washing
2. Toilet flushing
3. Vehicle Exterior washing
4. Construction activities (e.g. concrete mixing)
5. Fire fighting

3.2 Storage of RO Reject Water

In order to utilize the reject water, it is important to create adequate storage facility for reject water so that it can be used for options mentioned above.

The manufacturer shall facilitate the optimal storage of RO Reject water as accessory so that user at individual level can use the RO reject as per feasible options. Dedicated container or tank may be provided with proper labelling to hold reject water.

3.3 Disposal of RO Reject Water

In case, RO reject does not meet the water quality requirements of the activity then the unutilized RO reject shall be disposed of into sewerage system leading to terminal STPs for further treatment and safe disposal.

4.0 GUIDELINES FOR HANDLING, STORAGE, MANAGEMENT AND UTILISATION OF DISCARDED ELEMENT

The manufacturers of water purifiers will adopt a policy of maximizing use of raw materials having high recycling rate for manufacturing the water purifiers. Use of halogenated plastics and non-recyclable plastics may be avoided.

The user of water purifier shall ensure that the discarded elements and other components of the end-of-life water purifier are collected and sent for recycling of the materials. The discarded elements of water purification system made of plastics shall be managed as per the provisions of the Plastic Waste Management Rules, 2016, as amended from time to time.

5.0 ROLES AND RESPONSIBILITIES

5.1 Role of Manufacturer

1. The manufacturer shall obtain Standard Mark under a license from the Bureau of Indian Standards as per the Indian Standard IS 16240 (as amended from time to time) under Scheme –I, Schedule- II of Bureau of Indian Standards (Conformity Assessment) Regulations,2018.
2. Manufacturer will facilitate the storage of RO Reject water as mentioned above and shall mention about utilization of RO Reject Water in their Product's manual.
3. The manufacturers of water purifiers will adopt a policy of maximizing use of raw materials having high recycling rate for manufacturing water purifiers. Use of halogenated plastics and non-recyclable plastics shall be avoided.

5.2 Role of User

1. The user of domestic or commercial water purifier shall explore and adopt use of RO reject to the maximum possible extent at the point of use as per options mentioned at Point 3.1. In case, RO reject does not meet the water quality requirements of the activity then the unutilized RO reject shall be disposed of into sewerage system leading to terminal STPs for further treatment and safe disposal.
2. The user of water purifier shall ensure that the discarded elements and other components of the end-of-life water purifier are collected and sent for recycling of the materials. The discarded elements of water purification system made of plastics shall be managed as per the provisions of the Plastic Waste Management Rules, 2016, as amended from time to time.

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Annexure-I

CONDITIONS THAT DETERMINE WHEN AND HOW RO SYSTEM IS SUITABLE FOR USE

Type of treatment	**Purpose**	**Conditions**					
		Particle size removal	**Contaminant**	**Water Quality**	**Pre-treatment**	**Pressure requirements**	**Applications**
Ultra-filtration (UF)	UF is primarily used for removing larger suspended solids, colloids, bacteria, viruses, and some macromolecules from water	Typically removes particles in the range of 0.01 to 0.1 microns.	Effective for reducing bacteria, viruses, suspended solids, and certain organic materials, but not effective for dissolved salts, minerals, or heavy metals.	Suitable for use when the feed water contains high levels of turbidity, particulates, or biological contaminants.	UF may be used as a pre-treatment for RO or other systems, especially in cases where the water has a high fouling potential.	Operates at low pressures (1-10 bar), making it energy efficient but suitable for applications where minimal dissolved impurities need to be removed.	Domestic drinking water purification, wastewater treatment, and industrial applications where only biological and particulate filtration is needed.
Nanofiltration (NF)	NF is used for softening hard water, reducing organic compounds, and removing divalent ions like calcium and magnesium while allowing some monovalent ions like sodium and chloride to pass through.	NF membranes can remove particles down to 0.001 microns.	Removes larger organic molecules, multivalent ions (e.g., calcium, magnesium), and some bacteria and viruses but allows monovalent ions (e.g., sodium, chloride) to pass through.	Suitable for water sources that have high hardness or organic content but do not require complete desalination.	-	Operates at moderate pressures (4-8 bar), requiring more energy than UF but less than RO.	Water softening, partial desalination, and wastewater treatment, especially for reducing hardness and certain organic compounds in water.

Reverse Osmosis (RO)	RO is used for comprehensive water purification, including the removal of dissolved salts, heavy metals, and virtually all types of contaminants.	Removes particles down to 0.0001 microns, which includes almost all dissolved solids, bacteria, viruses, and organic molecules.	Highly effective for removing dissolved salts (desalination), heavy metals (e.g., lead, arsenic), nitrates, fluoride, pharmaceuticals, and other impurities.	Suitable for use when the feed water contains high levels of dissolved salts, heavy metals, or other dissolved contaminants that UF or NF cannot remove.	Requires pre-treatment (such as UF or sediment filtration) to prevent fouling of the RO membrane by suspended solids or biological contaminants.	Requires high pressures (15-70 bar) depending on the system, especially for seawater desalination, which increases energy consumption.	Seawater desalination, wastewater treatment, and production of ultrapure water for industrial or laboratory applications.
Ion Exchange	Ion exchange is used for removing specific ions from water, particularly for water softening (removing calcium and magnesium) and deionization (removing all ions for ultrapure water production).	-	Effective for removing dissolved ions, including hardness ions (calcium, magnesium), heavy metals (e.g., lead, copper), and for demineralization in some cases.	Suitable for use when the primary concern is the removal of specific ions, especially in industrial applications where deionized or softened water is required.	Requires relatively clean feed water, free from particulates and organic matter, to prevent fouling of the resin bed.	-	Water softening in domestic systems, deionization for industrial processes, and heavy metal removal in wastewater treatment

Annexure-II

RECOMMENDED NORMS OF TREATED SEWAGE QUALITY FOR SPECIFIED ACTIVITIES AT POINT OF USE

S. No.	Parameter	Toilet flushing	Fire protection	Vehicle Exterior washing	Non-contact impoundments	Landscaping, Horticulture & Agriculture			
						Horticulture, Golf course	Crops		
							Non edible crops	crops which are eaten	
								Raw	Cooked
1	Turbidity (NTU)	<2	<2	<2	<2	<2	AA	<2	AA
2	SS	nil	nil	nil	nil	nil	30	nil	30
3	TDS	2100							
4	pH	6.5 to 8.3							
5	Temperature °C	Ambient							
6	Oil & Grease	10	nil	nil	nil	10	10	nil	nil
7	Minimum Residual Chlorine	1	1	1	0.5	1	nil	nil	nil
8	Total Kjeldahl Nitrogen as N	10	10	10	10	10	10	10	10
9	BOD	10	10	10	10	10	20	10	20
10	COD	AA	AA	AA	AA	AA	30	AA	30

11	Dissolved Pho sphorous as P	1	1	1	1	2	5	2	5
12	Nitrate Nitrog en as N	10	10	10	5	10	10	10	10
13	Faecal Colifor m in 100 ml	nil	nil	nil	nil	nil	230	nil	230
14	Helminthic Eg gs/ litre	AA	AA	AA	AA	AA	<1	<1	<1
15	Colour	Colourless	Colourless	Colourless	Colourless	Colourless	AA	Colourless	Colourless
16	Odour	Aseptic which means not septic and no foul odour							

Note:

i. *All units in mg/l unless specified; AA-as arising when other parameters are satisfied;*
ii. *A tolerance of plus 5% is allowable when yearly average values are considered.*