

EN1A: Set standards for quality of effluent discharges arising from wastewater services

REGULATORY FUNCTION: ENVIRONMENT		EN1A																																				
OBJECTIVE EN1 Regulatory requirements for water abstraction and management of faecal sludge, effluent or wastewater are in place	ACTION CARD EN1A <h2 style="margin: 0;">SET STANDARDS FOR QUALITY OF EFFLUENT DISCHARGES ARISING FROM WASTEWATER SERVICES</h2>																																					
COST: Medium FREQUENCY: Regular TARGET GROUPS: Regulators, service operators, environmental authorities, civil society organizations, industrial and agricultural consumers																																						
DESCRIPTION Environment regulators translate national environmental standards and norms into established regulatory frameworks for water and sanitation services within their mandate. They therefore transpose national environmental directives into policies, guidelines, and frameworks, with the objective of protecting the environment from noxious substances discharged through wastewater services. Most commonly, regulators outline a list of substances, along with permissible limits, allowed for municipal, industrial, or agricultural wastewater disposal.																																						
EXPECTED OUTCOMES <ul style="list-style-type: none"> • Environmental norms are properly integrated within water and sanitation sectors. • Service operators' contracts adequately reflect their environmental duties. • Environmental protection is ensured through clearly defined effluent quality standards. 																																						
EXAMPLE 1: TANZANIA In Tanzania , wastewater effluent quality discharges should comply with the latest national standard (TZS 860:2006) on limits for municipal and industrial wastewaters. The standard prescribes permissible limits for municipal and industrial effluents discharged directly into water bodies, and its use promotes a consistent approach towards prevention of water pollution.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Table 2a: Physical Components</th> </tr> <tr> <th style="text-align: center;">Parameter</th> <th style="text-align: center;">Limit</th> <th style="text-align: center;">Test Method</th> </tr> </thead> <tbody> <tr> <td>BOD₅ at 20 °C</td> <td style="text-align: center;">30 mg/L</td> <td>EMDC1 1173: Part 3 ± Five-day BOD Method</td> </tr> <tr> <td>COD</td> <td style="text-align: center;">60 mg/L</td> <td>EMDC1 1173: Part 4 ± Dichromate Digestion Method</td> </tr> <tr> <td>Color</td> <td style="text-align: center;">300 TCU</td> <td>ISO 7887: 1994, Water quality ± Examination and determination of color ± Section 3: Determination of true color using optical instruments</td> </tr> <tr> <td>pH range</td> <td style="text-align: center;">6.5-8.5</td> <td>EMDC1 1173: Part 2 ± Electrometric Method</td> </tr> <tr> <td>Temperature range</td> <td style="text-align: center;">20-35°C</td> <td>See Annex A</td> </tr> <tr> <td>Total Suspended Solids</td> <td style="text-align: center;">100 mg/L</td> <td>EMDC1 1173: Part 1 ± Gravimetric Method</td> </tr> <tr> <td>Turbidity</td> <td style="text-align: center;">300 NTU</td> <td>APHA Standard Methods:2130 B. Nephelometric Method</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Table 2d: Microbiological Components</th> </tr> <tr> <th style="text-align: center;">Parameter</th> <th style="text-align: center;">Limit</th> <th style="text-align: center;">Test Method</th> </tr> </thead> <tbody> <tr> <td>Total Coliform Organisms</td> <td style="text-align: center;">10,000counts/100mL</td> <td>ISO 6222:1999, Microbiological methods</td> </tr> </tbody> </table> <p style="text-align: center; font-size: small;">Sample of permissible limits for municipal and industrial wastewaters (TZS 860:2006).</p>		Table 2a: Physical Components			Parameter	Limit	Test Method	BOD ₅ at 20 °C	30 mg/L	EMDC1 1173: Part 3 ± Five-day BOD Method	COD	60 mg/L	EMDC1 1173: Part 4 ± Dichromate Digestion Method	Color	300 TCU	ISO 7887: 1994, Water quality ± Examination and determination of color ± Section 3: Determination of true color using optical instruments	pH range	6.5-8.5	EMDC1 1173: Part 2 ± Electrometric Method	Temperature range	20-35°C	See Annex A	Total Suspended Solids	100 mg/L	EMDC1 1173: Part 1 ± Gravimetric Method	Turbidity	300 NTU	APHA Standard Methods:2130 B. Nephelometric Method	Table 2d: Microbiological Components			Parameter	Limit	Test Method	Total Coliform Organisms	10,000counts/100mL	ISO 6222:1999, Microbiological methods
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EXAMPLE 2: UNITED KINGDOM

In the **UK**, the EU Urban Wastewater Treatment Directive was transposed in 1991 into UK law through the Urban Wastewater Treatment Regulations (1994). They detail the following standards for discharges from wastewater treatment plants.

- Discharges from urban wastewater treatment plants subject to treatment in accordance with regulation 5(1) and (2) shall, subject to paragraphs 4 and 5 of Part II of this Schedule, meet the requirements shown in Table 1.
- Discharges from urban wastewater treatment plants to those sensitive areas which are subject to eutrophication as identified in sub-paragraph (a) of Part I of Schedule 1 shall, subject to paragraphs 4 and 5 of Part II of this Schedule, also meet the requirements in Table 2.

TABLE 1

REQUIREMENTS FOR DISCHARGES FROM URBAN WASTE WATER TREATMENT PLANTS SUBJECT TO REGULATION 5(1) AND (2)

The values for concentration or for the percentage of reduction shall apply.

Parameters	Concentration	Minimum percentage of reduction ¹	Reference method of measurement
Biochemical oxygen demand (BOD5 at 20°C without nitrification ²)	25 mg/l O ₂	70—90	Homogenized, unfiltered, undecanted sample. Determination of dissolved oxygen before and after five-day incubation at 20° ±1°C, in complete darkness. Addition of a nitrification inhibitor
Chemical oxygen demand (COD)	125 mg/l O ₂	75	Homogenized, unfiltered, undecanted sample Potassium dichromate

¹ Reduction in relation to the load of the influent.

² The parameter can be replaced by another parameter: total organic carbon (TOC) or total oxygen demand (TOD) if a relationship can be established between BOD5 and the substitute parameter.

TABLE 2

REQUIREMENTS FOR DISCHARGES FROM URBAN WASTE WATER TREATMENT PLANTS TO SENSITIVE AREAS WHICH ARE SUBJECT TO EUTROPHICATION AS IDENTIFIED IN SUB-PARAGRAPH (a) OF PART I OF SCHEDULE 1

One or both parameters may be applied depending on the local situation. The values for concentration or for the percentage of reduction shall apply.

Parameters	Concentration	Minimum percentage of reduction ¹	Reference method of measurement
Total phosphorus	2 mg/l P (10,000—100,000 p.e.) 1 mg/l P (more than 100,000 p.e.)	80	Molecular absorption spectrophotometry
Total nitrogen ²	15 mg/l N (10,000—100,000 p.e.) 10 mg/l N (more than 100,000 p.e.)	70—80	Molecular absorption spectrophotometry

¹ Reduction in relation to the load of the influent.

² Total nitrogen means: the sum of total Kjeldahl-nitrogen (organic N + NH₃), nitrate (NO₃)-nitrogen and nitrite (NO₂)-nitrogen.

EXAMPLE 3: COLOMBIA

In Colombia, Resolution No. 0631 of 2015 stipulates the maximum permissible parameters and limits in the dumping of wastewater into surface water bodies and public sewerage systems. This regulation changed a set of very limited parameters that had been established in 1984 and set forth the maximum permissible parameters.

The regulation also establishes parameters for active ingredients in pesticides in Toxicity Classes I-a, I-b and II, and the maximum permissible limits when dumping non-domestic wastewater (ARND) into the public sewerage system.

CAPÍTULO V.

PARÁMETROS FÍSICOQUÍMICOS Y SUS VALORES LÍMITES MÁXIMOS PERMISIBLES EN LOS VERTIMIENTOS PUNTALES DE AGUAS RESIDUALES DOMÉSTICAS, (ARD) Y DE LAS AGUAS RESIDUALES (ARD – ARND) DE LOS PRESTADORES DEL SERVICIO PÚBLICO DE ALCANTARILLADO A CUERPOS DE AGUAS SUPERFICIALES.

♦ **ARTÍCULO 8o. PARÁMETROS FÍSICOQUÍMICOS Y SUS VALORES LÍMITES MÁXIMOS PERMISIBLES EN LOS VERTIMIENTOS PUNTALES DE AGUAS RESIDUALES DOMÉSTICAS, (ARD) DE LAS ACTIVIDADES INDUSTRIALES, COMERCIALES O DE SERVICIOS; Y DE LAS AGUAS RESIDUALES (ARD Y ARND) DE LOS PRESTADORES DEL SERVICIO PÚBLICO DE ALCANTARILLADO A CUERPOS DE AGUAS SUPERFICIALES.** Los parámetros físicoquímicos y sus valores límites máximos permisibles en los vertimientos puntuales de Aguas Residuales Domésticas, (ARD) y de las Aguas Residuales no Domésticas (ARND), de los prestadores del servicio público de alcantarillado a cumplir, serán los siguientes:

PARÁMETRO	UNIDADES	AGUAS RESIDUALES DOMÉSTICAS (ARD) DE LAS SOLUCIONES INDIVIDUALES DE SANEAMIENTO DE VIVIENDAS UNIFAMILIARES O BIFAMILIARES	AGUAS RESIDUALES DOMÉSTICAS (ARD), Y DE LAS AGUAS RESIDUALES (ARD – ARND) DE LOS PRESTADORES DEL SERVICIO PÚBLICO DE ALCANTARILLADO A CUERPOS DE AGUAS SUPERFICIALES, CON UNA CARGA MENOR O IGUAL A 625,00 kg/DÍA DBOS
Generales			
pH	Unidades de pH	6,00 a 9,00	6,00 a 9,00
Demanda Química de Oxígeno (DQO)	mg/L O ₂	200,00	180,00
Demanda Bioquímica de Oxígeno (DBO ₅)	mg/L O ₂		90,00
Sólidos Suspendidos Totales (SST)	mg/L	100,00	90,00
Sólidos Sedimentables (SSED)	ml/L	5,00	5,00
Grasas y Aceites	mg/L	20,00	20,00
Sustancias Activas al Azul de Metileno (SAAM)	mg/L		Análisis y Reporte
Hidrocarburos			
Hidrocarburos Totales (HTP)	mg/L		Análisis y Reporte
Compuestos de Fósforo			
Ortofosfatos (P-PO ₄ -3-)	mg/L		Análisis y Reporte
Fósforo Total (P)	mg/L		Análisis y Reporte
Compuestos de Nitrógeno			
Nitratos (N-NO ₃ -)	mg/L		Análisis y Reporte
Nitritos (N-NO ₂ -)	mg/L		Análisis y Reporte
Nitrógeno Amónico (N-NH ₃)	mg/L		Análisis y Reporte
Nitrógeno Total (N)	mg/L		Análisis y Reporte

EXAMPLE 4: MEXICO

In Mexico, Official Mexican Regulation NOM-002-ECOL-1996 establishes the maximum permissible contaminant limits allowed in wastewater discharged into the urban or municipal sewerage systems. The regulation establishes the maximum permissible contaminant limits allowed in wastewater discharged into the urban or municipal sewerage systems with the aim of preventing and controlling the contamination of water bodies and national resources as well as protecting the infrastructure of such systems, and requires mandatory compliance from entities conducting such discharges.

Pursuant to the regulation, the maximum permissible contaminant limits in wastewater discharged into the urban or municipal sewerage systems should not exceed those indicated in the following table. In the case of grease and oils, it is the weighted average according to flow, on the basis of results from analyses carried out on each of the individual samples.

PARAMETERS (Milligrams per liter, unless otherwise specified)	MAXIMUM PERMISSIBLE LIMITS		
	Monthly Average	Daily Average	Instantaneous
Grease and Oils	50	75	100
Sediments solids	0.5	0.75	10
Total cadmium	0.5	0.75	1
Total cyanide	1	1.5	2
Total copper	10	15	20
Hexavalent chromium	0.5	0.75	1
Total mercury	0.01	0.015	0.02
Total nickel	4	6	8
Total lead	1	1.5	2
Total zinc	6	9	12

The maximum permissible limits are only reference values; in the event that a value exceeds the reference value in the table, the entity responsible for the discharge is obliged to provide the competent authority with the daily and monthly averages, as well as the laboratory results of the corresponding analyses, in a timely manner and as required by local legal codes.

LINKS

Tanzania: <http://www.ewura.go.tz/wp-content/uploads/2015/03/Water-and-Wastewater-Quality-Monitoring-Guidelines-for-WSSAs-DAWASCO-and-DAWASA.pdf>

UK: <https://www.legislation.gov.uk/uksi/1994/2841/schedule/3/made>

Colombia: Maximum permissible limits in dumping

<https://www.minambiente.gov.co/wp-content/uploads/2021/11/resolucion-631-de-2015.pdf>

Mexico: Maximum permissible limits

<https://www.profepa.gob.mx/innovaportal/file/3295/1/nom-002-semarnat-1996.pdf>

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INTERNAL CAPACITIES NEEDED AND THE ROLE OF PARTNERS

Establishing wastewater effluent quality standards requires a blend of technical and legal expertise, including an understanding of the current level of wastewater treatment, laboratory testing capacity, and the ambient water quality status of receiving water bodies and their relative ecological vulnerability. Development partners and environmental civil society groups are well placed to provide technical support governments and regulators through capacity and knowledge building workshops, and could potentially help support a national review and mapping of existing evidence of ambient water quality and ecological status, upon which regulators could designate ecologically sensitive receiving water bodies and plan further ecological surveys if needed.