

DRAFT TANZANIA STANDARD

Draft for comments only

CDC6(5017)P3

Receiving waters - Specification

TANZANIA BUREAU OF STANDARDS

0 FOREWORD

This Draft Tanzania Standard is being prepared by the Water Quality Technical Committee, under the supervision of Chemicals Divisional Standards Committee and it is in accordance with the procedures of the Bureau.

The quality of receiving waters varies from one water body to another. This Draft Tanzania Standard is being prepared to guide authorities for processing various uses of receiving waters.

For the purpose of deciding whether a particular requirement of this Draft Tanzania Standard is complied with, the final value observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with TZS 4.

In the preparation of this Draft Tanzania Standard assistance was drawn from the following:

Inputs for receiving waters quality standards established by Ministry of Water and Irrigation of Tanzania, 2015.

United Republic of Tanzania, Ministry of Water and Irrigation (2008). WSDP Implementation Manual. Vol 5: Environmental and Social Management Framework.

1.0 Scope

This Draft Tanzania Standard specifies the requirements, sampling and methods of test for receiving waters.

Field of application

This Draft Tanzania Standard apply to the following categories:

Category 1: Water that can be processed for drinking water supplies, swimming pools, food and beverage manufacturing industries, pharmaceuticals manufacturing industries or industries requiring a water source of similar quality.

Category 2: Water that can be processed for use in feeding domestic animals; in fisheries, shellfish cultures, recreation and water contact sports.

Category 3: Water that can be processed for irrigation and other industrial activities requiring water of standards lower than those of water in category 1 and 2.

2.0 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- 2.1 ISO 5667-6: Water quality -Sampling - Part 6: Guidance on sampling of rivers and streams.
- 2.2 ISO 5667-11: Water quality - Sampling - Part 11: Guidance on sampling of ground waters.
- 2.3 ISO 5667-18: Water quality - Sampling - Part 18: Guidance on sampling of groundwater at contaminated sites
- 2.4 ISO 5667-9: Water quality - Sampling - Part 9: Guidance on sampling from marine waters.
- 2.5 ISO 5667-4: Water quality -Sampling -Part 4: Guidance on sampling from lakes, natural and man-made
- 2.6 ISO 5667-10: Water quality - Sampling -Part 10: Guidance on sampling of waste waters
- 2.7 ISO 19458: Water quality -Sampling for microbiological analysis
- 2.8 FTZS 1850:2016/ISO 12846, Water quality -- Determination of mercury -- Method using atomic absorption spectrometry (AAS) with and without enrichment.
- 2.9 TZS 1130(Part 1): Water Quality - Determination of dissolved anions by liquid chromatography of ions- Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite phosphate and sulfate.
- 2.10 ASTM D888: Standard Test Methods for Dissolved Oxygen in Water.
- 2.11 ASTM D6764: Standard Guide for Collection of Water Temperature, Dissolved-Oxygen Concentrations, Specific Electrical Conductance, and pH Data from Open Channels.
- 2.12 TZS 861 (Part 1)(1st Ed) ISO 11923: Water quality – Determination of suspended solids by filtration through glass-fibre filters.
- 2.13 TZS 729(1st Ed)/ISO 4832: Microbiology of food and animal feeding stuffs –Horizontal method for the enumeration of coliforms – Colony count technique
- 2.14 TZS 1261(1st Ed)/ISO 7887: Water quality - Examination and determination of colour
- 2.15 FTZS 1844: Water quality -- Determination of pH.
- 2.16 ASTM D 5907: Standard test methods for filterable matter (total dissolved solids) and non-filterable matter (total suspended solids) in water.
- 2.17 FTZS 1849: Water quality -- Determination of aluminium — Atomic absorption spectrometric methods.
- 2.18 FTZS 1848: Water quality -- Determination of arsenic -- Atomic absorption spectrometric method (hydride technique).
- 2.19 FTZS 1847 6: Water quality -- Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES).
- 2.20 FTZS 1839: Water quality -- Determination of manganese -- Formaldoxime spectrometric method.
- 2.21 ISO 11885: Water quality -- Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES).
- 2.22 FTZS 1841/ISO 6703: Water quality -- Determination of cyanide.
- 2.23 ISO 5815-2: Water quality -- Determination of biochemical oxygen demand after n days (BOD_n) – part 2: method for undiluted samples.
- 2.24 FTZS 1861 /ISO 8165: Water quality -- Determination of selected monovalent phenols.
- 2.25 FTZS 1863 /ISO 8288: Water quality -- Determination of cobalt, nickel, copper, zinc, cadmium and lead -- Flame atomic absorption spectrometric methods.
- 2.26 TZS 861-2: Water quality – Determination of highly volatile halogenated hydrocarbons – Gas chromatographic methods

- 2.27 FTZS 1864 /ISO 9174: Water quality -- Determination of chromium -- Atomic absorption spectrometric methods.
- 2.28 ISO 6468: Water quality -- Determination of certain organochlorine insecticides, polychlorinated biphenyls and chlorobenzenes -- Gas chromatographic method after liquid-liquid extraction
- 2.29 ISO 7875-1: Water quality -- Determination of surfactants -- Part 1: Determination of anionic surfactants by measurement of the methylene blue index (MBAS)
- 2.30 FTZS 1853:2016: Water quality -- Guidelines for selective immunoassays for the determination of plant treatment and pesticide agents.
- 2.31 FTZS 1840:2016/ISO 6332: Water quality -- Determination of iron – spectrometric method using 1, 10-phenanthroline.

3.0 Terms and definitions

For the purposes of this Draft Tanzania Standard, the following terms and definitions apply;

3.1

Effluents

flowing-out or fluid material, including wastewaters (treated or untreated) discharged from domestic or industrial wastes systems.

3.2

Receiving waters

water bodies into which any effluent or runoff are being or can be discharged.

4.0 Requirements

4.1 The receiving water shall have a concentration of nitrates as low as is required to prevent eutrophication or excessive weed growth if nitrogen is a limiting nutrient.

4.2 The receiving water shall have a concentration of phosphates as low as is required to prevent eutrophication or excessive weed growth if phosphorous is a limiting nutrient

4.3 The receiving waters shall also comply with the requirements given in tables 1, 2, 3 and 4.

Table 1: Physical Requirements for Receiving Waters

Parameters		Permissible Level			Test method
		Category 1	Category 2	Category 3	
1	pH	6.5 - 8.5	6.5 - 8.5	6.5 - 9.0	FTZS 1844
2	Total Dissolved Solids (TDS), mg/l, max	2,000	2,000	-	ASTM D 5907

Table 2 Inorganic Substances Requirements for Receiving Waters

Parameters		Maximum permissible concentration			Test method
		Category 1	Category 2	Category 3	
1	Aluminum (Al), mg/l	0.3	0.3	0.3	FTZS 1849
2	Arsenic (As), mg/l	0.05	0.1	0.1	FTZS 1848
3	Barium (Ba), mg/l	1.0	1.0	1.5	ISO 11885
4	Boron (B), mg/l	1.15	1.5	1.5	FTZS 1847
5	Cadmium (Cd)	0.03	0.1	0.2	FTZS 1863
6	Chromium III (Cr ³⁺), mg/l	0.1	0.3	0.5	
7	Chromium VI (Cr ⁶⁺), mg/l	0.05	0.1	0.1	
8	Cobalt (Co), mg/l	0.1	0.1	0.5	FTZS 1863
9	Copper (Cu) mg/l	3.0	3.0	4.0	FTZS 1863
10	Iron (Fe), mg/l	1.0	1.2	1.5	FTZS 1840
11	Lead (Pb), mg/l	0.1	0.1	0.2	FTZS 1863
12	Manganese (Mn), mg/l	0.5	0.8	0.8	FTZS 1839
13	Mercury (Hg), mg/l	0.001	0.001	0.005	FTZS 1850
14	Nickel (Ni), mg/l	0.05	0.05	0.1	FTZS 1863
15	Selenium (Se), mg/l	0.05	0.05	0.5	ISO 11885
16	Silver (Ag), mg/l	0.05	0.05	0.05	ISO 11885
17	Tin (Sn), mg/l	0.5	0.5	0.1	ISO 11885
18	Vanadium (V), mg/l	0.005	0.005	0.01	ISO 11885
19	Zinc (Zn), mg/l	0.2	0.2	1.0	FTZS 1863
20	Ammonia + Ammonium (NH ₃ + NH ₄ ⁺), mg/l	0.5	0.5	2.0	-
21	Chlorides (Cl ⁻), mg/l	200	200	400	TZS 1130-1
22	Fluorides (F ⁻), mg/l	8.0	8.0	8.0	TZS 1130-1
23	Cyanides (Cn), mg/l	0.05	0.05	0.1	FTZS 1841:2016
24	Nitrates (NO ₃ ⁻), mg/l	50	50	100	TZS 1130-1
25	Dissolved oxygen, mg/l min	6	5	3	ASTM D 888
26	Oxygen Saturation, % min	80	60	40	-
27	Sulphates (SO ₄ ²⁻), mg/l	600	600	600	TZS 1130-1
28	Sulphides (S ²⁻), mg/l	0.01	0.01	0.1	-

Table 3 Organic Substances Requirements for Receiving Waters

Parameters (mg/l)		Maximum permissible concentration			Test method
		Category 1	Category 2	Category 3	
1	Alkyl benzene Sulphonates (ABS)	0.5	1.0	1.0	ISO 7875
2	Aromatic and aliphatic hydrocarbons	0.05	0.05	1.0	-
3	Aromatic nitrogen containing compounds (e.g. aromatic amines)	0.01	0.01	0.1	-
4	Chloroform extract (CE)	0.5	0.5	1.0	-
5	Formaldehyde	0.2	0.2	0.5	-
6	Grease & Oils (petroleum ether extract)	0.5	1.0	5.0	-
7	Non-volatile chlorinated compounds	0.005	0.005	0.10	-
8	Volatile chlorinated Hydrocarbons (as Cl ⁻)	0.005	0.005	0.01	TZS 861-2
9	Organochlorine Pesticides (as Cl)	0.0005	0.0005	0.001	ISO 6468
10	Other Pesticides	0.001	0.001	0.005	FTZS 1853:2016
11	Phenols	0.002	0.002	0.1	FTZS 1861:2016
12	Resins or tar .	0.1	0.1	0.5	-
13	BOD – 5days, 20°C	5	5	10	ISO 5815-2
14	BOD-5 days, 25 °C	6	6	12	ISO 5815-2
15	BOD-5 days, 30 °C	6	6	12	ISO 5815-2
16	BOD-5 days, 35 °C	7	7	13	ISO 5815-2
17	Permanganate Value	20	20	30	-

NOTE: BOD Biological Oxygen Demand

Table 4- Microbiological requirements for receiving waters

Parameter	Maximum permissible value			Test method
	Category 1	Category 2	Category 3	
Total coliform organisms, (Cfu/100ml)	5000	25000	100,000	TZS 729

5.0 Sampling

The sample of water taken for testing shall represent the receiving water body. Sampling procedure shall be as per ISO 5667-4, ISO 5667-6, ISO 5667-9, ISO 5667-10, ISO 5667-11, ISO 5667-18 and ISO 19458.