

WATER RESOURCES ACT

(reg.80)

(Cap.72:03)

 WATER RESOURCES REGULATIONS, 2018 **FORM I**

STANDARDS AND GUIDELINES FOR WATER QUALITY AND EFFLUENT DISCHARGE

(1) **Standards for domestic/sewage effluents discharged into inland surface waters**

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| --- | --- |
| **Parameter** | **Max Allowable (Limits)** |
| Arsenic as As (mg/1) | 0.1 |
| Biochemical Oxygen Demand (BOD 5 days at 20 °C) (mg/1) | 20 |
| Cadmium as Cd (mg/1) | 1.0 |
| Chemical Oxygen Demand (COD (mg/1) | 60 |
| Chromium as Cr (mg/1) | Less than 0.01 |
| Lead as Pb (mg/1) | Less than 0.01 |
| Oil and grease (mg/l) | 2.5 |
| pH (Hydrogen ion activity) | 5.0-9.0 |
| Phenols, total (mg/1) | 0.05 |
| Sulphide as S (mg/1) | 2.0 |
| Total Suspended Solids, (mg/1) | 30 |
| Temperature (in degrees Celsius) based on ambient temperature | ± 5 |
| Cyanides as CN (mg/1) | Less than 0.2 |
| Nickel as Ni (mg/1) | Less than 2.0 |
| Detergents (ABS) (mg/1) | Less than 5.0 |
| Mercury as Hg (mg/1) | Less than 0.01 |
| Total Phosphorus as P (mg/1) | 2.0 |
| Total Nitrogen as N (mg/l) | 10 |
| Total pesticide residues | Absent |

(2) **Standards for Industrial effluents discharged into inland surface waters**

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| Parameter | Max Allowable (Limits) |
| Total Suspended Solids, mg/l | 30 |
| Particle size of Total Suspended Solids, mg/l | Shall not pass 850 micron |
| Total Dissolved Solids, mg/l | 500 |
| Total Residual Chlorine, mg/l | 1.0 |
| pH value | 6.5-9.0 |
| Temperature (in any section of the receiving water body within 15 metres downstream from the effluent outlet) 0C | 40 |
| Biochemical Oxygen Demand for 5 days (BOD5) at 20 0C, mg/l | 20 |
| Chemical Oxygen Demand (COD), mg/l | 60 |
| Oils and grease and other liquids immiscible with water, mg/l | 2.5 |
| Colour, TCU | 25 |
| Turbidity, NTU | 25 |
| Effluent volume/day, m3 | 5.0 |
| **Radioactivie materials** (Bq/l): Alpha emitters, Beta emitters | 3.7 Bq/l37 Bq/l |
| **Insectcides**Organochloride, mg/lOrganophosphates, mg/l | 0.100.20 |
| Carbonates, mg/l | 0.50 |
| Ammonia Nitrogen, mg/l | 10 |
| Sulphates, mg/l | 800 |
| Nitrates, mg/l | 50 |
| Nitrites, mg/l | 1.0 |
| Cyanides (as CN), mg/l | 0.05 |
| Sulphides (as S), mg/l | 2.0 |
| Fluorides, mg/l | 2.0 |
| Arsenic, mg/l | 0.05 |
| Cadmium, mg/l | 0.01 |
| Total Chromium, mg/l | 0.05 |
| Bromides, mg/l | 8.0 |
| Copper, mg/l | 2.0 |
| Lead, mg/l | 0.05 |
| Mercury, mg/l | Nil |
| Nickel, mg/l | 0.01 |
| Selenium, mg/l |  Nil |
| Zinc, mg/l | 5.0 |
| Phosphates, mg/l |  0.15 |
| Inorganic compounds, mg/l | 0.01 |

**(3) Standards for Drinking Water Delivered from Boreholes and Protected Shallow Wells**

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| Parameter | Max Allowable (Limits) |
| **Chemical requirements** |
| Aluminium as Al, mg/l | 0.50 |
| Arsenic as AS, mg/l | 0.05 |
| Barium as Ba, mg/l | 0.70 |
| Cadmium as Cd, mg/l | 0.01 |
| Chromium as Cr, mg/l | 0.01 |
| Cyanide as Cn, mg/l | 0.07 |
| Copper as Cu, mg/l | 2.0 |
| Fluoride as F, mg/l | 6.0 |
| Iron as Fe, mg/l | 3.0 |
| Lead as Pb, mg/l | 0.05 |
| Manganese as Mn, mg/l | 1.5 |
| Nitrate, NO3, mg/l | 45 |
| Sulphate as SO42, mg/l | 800 |
| Zinc as Zn, mg/l | 15 |
| Uranium, mg/l | 0.03 |
| **Physical and Micro Constituent Characteristics** |
| Colour, TCU | 50 |
| Turbidity, NTU | 25 |
| Electrical Conductivity, µs/cm at 200C | 3,500 |
| pH Value | 6.0-9.5 |
| Calcium, mg/l | 250 |
| Total Hardness as CaCO3, mg/l | 800 |
| Chloride, mg/l | 750 |
| Magnesium, mg/l | 200 |
| Sodium, mg/l | 500 |
| Total Dissolved Solids, mg/l | 2000 |
| **Microbiological Characteristics** |
| Total coliform, count/100ml | 50 |
| Faecal (Thermotolerant) coliforms, count/100ml | 50 |
| Faecal streptococci, Count/100ml | 0 |
| Colony counts, Count/ml at 220C | 100 |

**(4a) Standards for Treated Drinking Water**

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| --- | --- |
| Parameter | Max Allowable (Limits) |
| **Physical and organoleptic requirements** |
| Colour, mg/l | 5-10 |
| Electrical Conductivity at 250C, ms/m | 70-150 |
| Total Dissolved Solids, mg/l | 450-1000 |
| Odour, TON | 1-5 or (odourless) |
| pH value at 250C | 5.0-9.5 |
| Turbidity, NTU | 0.10-1.0 |
| **Chemical requirements of micro-determinants** |
| Ammonia as N, mg/l | 0.20-1.0 |
| Calcium as Ca, mg/l | 80-150 |
| Chloride as Cl, mg/l | 100-200 |
| Fluoride as F, mg/l | 0.70-1.0 |
| Magnesiun as Mg, mg/l | 30-70 |
| Potassium as K, mg/l | 25-50 |
| Sodium as Na, mg/l | 100-200 |
| Sulphate as SO42-, mg/l | 200-400 |
| Zinc as Zn, mg/l | 3.0-5.0 |
| **Chemical requirements of micro-determinants** |
| Aluminium as Al, µg/l | 150-300 |
| Arsenic as As, µg/l | 10-50 |
| Cadmiun as Cd, µg/l | 3-5 |
| Chromium as Cr, µg/l | 50-100 |
| Cobalt as Co, µg/l | 250-500 |
| Copper as Cu, µg/l | 500-1000 |
| Cyanide as CN, µg/l | 30-50 |
| Iron as Fe, µg/l | 10-200 |
| Lead as Pb, µg/l | 10-50 |
| Manganese as Mn, µg/l | 50-100 |
| Mercury as Hg, µg/l | 1-2 |
| Selenium as Se, µg/l | 10-20 |
| Uranium, mg/l | 0.03 |
| **Chemical requirements- organic determinants** |
| Total Trihalomethanes, µg/l\* | 100-200 |
| Phenols, µg/l | 5-10 |
| 1. The limits given are based on aesthetic aspects
2. No primary health effect – low pH values can result in structural problems in the distribution

\* This is a suggested value because trihalomethanes have not been proven to have any effect on human health |

**(4b) Standards for Treated Drinking Water- Microbiological requirements**

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| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
|  |  | Allowable compliance contribution |
| Determinants | Units | 95% of sample min | 4% of sample max | 1% of sample max |
|  |  | Upper limits |
| Total coliform  | Count/100ml | Not detected | 10 | 100 |
| *Faecal coliform*b | Count/100ml | Not detected | 1 | 10 |
| *E.coli*b | Count/100ml | Not detected | Not detected | 1 |
| 1. The allowable compliance contribution shall be at least 95% to the limits indicated in column 3 with a maximum of 4% and 1%, respectively, to the limits indicated in column 4 and column 5. The objective of disinfection should, nevertheless, be to attain 100% compliance to the limits indicated in column 3.
2. In most instances it will not be necessary to conduct both these tests; one or the other will normally suffice as the required indicator
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**(4c) Standards for Treated Drinking Water- Minimum frequency of sampling-Microbiological Test**

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| **Population Served** | **Frequency min** |
| More than 1,000,000 | 10 every month |
| 25,001-1,1,000,000 | 10 every month |
| 10,001-25,000 | 3 every month |
| 2,500-10,000 | 2 every month |
| Less than 2,500 | 1 every month |

(**4d) Guidelines for Irrigation Water**

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| --- | --- | --- | --- | --- |
| **Water Class** | **SAR** | **EC** (µS/cm) | **TDS**(Gravimetric ppm) | **Boron,** mg/l |
| **Sensitive Crops** | **Semitolerant Crops**  | **Tolerant Crops** |
| Class 1, Excellent | 1-10 | <250 | 175 | <0.33 | <0.67 | <1.00 |
| Class 2, Good | 10-18 | 250-750 | 175-525 | 0.33-0.67 | 0.67-1.33 | 1.00-2.00 |
| Class 3, Permissible | 18-26 | 750-2000 | 525-1400 | 0.67-1.00 | 1.33-2.00 | 2.00-3.00 |
| Class 4, Doubtful | >26 | 2000-3000 | 1400-2001 | 1.00-1.25 | 2.00-2.50 | 3.00-3.75 |
| Class 5, Unsuitable |  >26 | >3000 | >2001 | >1.25 | >2.50 | >3.75 |

**(4e) Guidelines for Recreational Water Quality -**

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| **Parameter** | **Guideline** |
| Total coliform bacteria  | **<**500/100 ml |
| Escherichia coliform | <200/100 ml |
| Enterococci | <35/ 100 ml |
| pH | 5.0 - 9.0 |
| Arsenic | 0.05mg/L |
| Cadmium | 0.01mg/L |
| Chromium | 0.1mg/L |
| Radiation, Total | 0.37Bq/L |
| Turbidity | 50 NTU |
| Clarity (light penetration) | Secchi disc visible at a depth of 1.2M |
| Colour  | 100 (true colour units |
| Oil/grease | 5.0 mg/L |
| Odour (Threshold Odour Number ) | 16 |