THE LOCAL GOVERNMENT ACT

SECTION 64-THE LOCAL ADMINISTRATION (TRADE EFFLUENT) REGULATIONS

Regulations by the Minister

CAP. 281

Statutory Instrument 161 of 1985
Act 13 of 1994

1. These Regulations may be cited as the Local Administration (Trade Effluent) Regulations.* Title

*These Regulations are continued in operation by virtue of section 15 of the Interpretation and General Provisions Act Cap. 2.

2. In these Regulations, unless the context otherwise requires- Interpretation

"area" means the area under the jurisdiction of the Council;

"average sewage strength" means all sewage, domestic and trade effluent received at the Council's sewage purification works;

"chemical parameters" means the group of substances listed in items 7 to 53 of the First Schedule;

"Council" means any council to which these Regulations have been applied in accordance with section sixty-five of the Act;

"operating day" means the period of twenty-four hours commencing at midnight and ending the following mid-night;

"physical parameters" means the physical characteristics listed in items 1 to 6 of the First Schedule;

"public sewer" means a sewer belonging to the Council;

"trade effluent" means water or any other liquid which has been used for medical, trade or industrial purposes and as a result of such use has been polluted within or beyond the legally enforceable limiting values with respect to physical, chemical and microbiological characteristics and so requires treatment before discharge into the environment.

3. (1) No person shall, without the written permission of the Council, discharge any trade effluent in any water course or on any land in the area. Consent to discharge trade effluent

(2) In granting permission under sub-regulation (1), the Council may impose such conditions as it considers necessary, and may at any time vary such conditions or revoke such permission.

(3) The point at or through which trade effluent is to be discharged shall be subject to the prior written permission of the Council; and where appropriate, such discharge shall be made through such approved connection to the sewer as is maintained by the Council.

*These Regulations are continued in operation by virtue of section 15 of the Interpretation and General Provisions Act Cap. 2.

Conditions and standards for trade effluent and public sewage discharge

4. (1) Any discharge of trade effluent into a public sewer shall conform to the conditions and standards for chemical and physical parameters set out in column 2 of the First Schedule.

(2) Any discharge from any sewage works or any discharge other than as provided for in sub-regulation (1) shall conform to the conditions and standards for chemical and physical parameters set out in column 3 of the First Schedule.

Regulating discharge of trade effluent

5. The Council may prescribe-

(*a*) the hours during which trade effluent may be discharged into a sewer;

(*b*) the maximum hourly rate at which trade effluent may be discharged into a sewer; and

(*c*) the total volume of trade effluent which may be discharged into a sewer during an operating day.

Methods and frequency of sampling and analysis

6. (1) A composite sample shall be obtained by collecting effluent discharged from a plant during an operating day either-

(*a*) continually during a sampling period of twenty-four hours at a rate in proportion to the flow rate of the effluent discharged; or

(*b*) in such manner that equal volumes of effluent are delivered into a receptacle at equal intervals of not longer than one hour during a sampling method of twenty-four hours.

(2) The frequency of sampling and analysis of the composite samples shall be done on a regular basis to be determined by the Council.

(3) The concentration in milligrammes per litre of any substance described in any item of the First Schedule in each composite sample shall be determined by the method set out therein.

(4) The procedures pertaining to sampling, preservation, storage and

analysis of samples as outlined in the publication Standard Methods for the Examination of Water and Waste Water, (15th Edition, 1980) or any other method approved in writing by the Minister, shall be adhered to.

Measuring devices and inspection chambers

7. (1) The occupier of any trade premises from which any trade effluent is proposed to be discharged shall provide and maintain at his own expense on such premises and to the satisfaction of the Council-

(*a*) an inspection chamber or manhole in a position and of dimensions to be approved by the Council on each pipe or channel through which trade effluent is proposed to be discharged; and

(*b*) at such inspection chamber or manhole, either a notch gauge and continuous recorder, or similar apparatus suitable and adequate for measuring and adequately recording or calculating the volume of trade effluent proposed to be discharged;

(*c*) such other apparatus as may be reasonably necessary for obtaining samples and for measuring and controlling the volume and rate of flow:

Provided that if the Council is satisfied in the case of any premises that the occupier has some other means available to the Council for measuring, recording, sampling, controlling, calculating or otherwise determining the volume of trade effluent proposed to be discharged into a sewer, it may, in writing exempt such trade premises from all or any provisions of this regulation.

(2) Any duly authorised officer of the Council shall at all times have a right of access to any trade premises from which any trade effluent is discharged into a sewer to inspect, examine and test any inspection chamber or manhole or apparatus for measuring and recording or calculating or otherwise determining the volume of trade effluent discharged, and to take samples of such trade effluent for determining its nature and composition and for the taking of official samples.

Sampling of trade effluent

8. The Council or its authorised officer may take samples of trade effluent at any time and at any trade premises from which any trade effluent is discharged.

Alteration and cessation of trade

9. The occupier of any trade premises from which trade effluent is discharged shall notify the Council forthwith of-

(*a*) any change in the process of manufacture, or in the raw materials used, or of any other circumstances which are likely to alter the

nature or composition of such trade effluent; and

(*b*) any circumstances which may result in the permanent cessation of such discharge.

Accuracy in data recording and measuring devices

10. If at any time the apparatus provided for the purpose of measuring and recording or calculating or otherwise determining the volume of trade effluent discharged ceases properly to measure, record, calculate, or otherwise determine, or is suspected by the Council of not properly measuring, recording, calculating, or otherwise determining, then the volume of the trade effluent discharged into a sewer during the period from the date when the apparatus was last accepted by the Council as being correct up to the date when the apparatus is again accepted by the Council as being correct shall be pro rated according to the volume when the apparatus was last accepted by the Council as being correct.

Charges for disposal of trade effluent

11. Any person who discharges trade effluent into the public sewer shall pay to the Council a trade effluent charge which shall be calculated in accordance with the formula set out in the Second Schedule:

Provided that the minimum charge for the disposal of any trade effluent, not exceeding one cubic metre per day, shall be one hundred and twenty-five thousand fee units per calendar year.

(*As amended by* Act No. 13 *of* 1994)

Appeals from decisions of Councils

12. Any person aggrieved or adversely affected by any decision of a Council may appeal to the Minister.

Offences and penalties

13. (1) Any person who contravenes any provision of these Regulations shall be guilty of an offence and shall be liable, upon conviction-

(*a*) in the case of a first offence, to a fine not exceeding seven hundred and fifty penalty units; and

(*b*) in the case of a second or subsequent offence to a fine not exceeding one thousand five hundred penalty units or to imprisonment for a period not exceeding six months, or to both.

(2) In addition to or in substitution for the penalty prescribed in sub-regulation (1), the court may order that any expenses incurred by the Council in consequence of such contravention be paid by the convicted person.

(*As amended by* Act No. 13 *of* 1994)

14. (1) In any order made under section sixty-five of the Act applying these Regulations to any area, a period of not less than twelve months shall be specified during which undertakings situated in the area are required to start complying with these Regulations, and if no such period is specified, a period of twelve months shall be deemed to have been specified. Period for compliance

(2) No person shall be convicted of an offence under regulation 13 if such offence was committed during the period specified under sub-regulation (1).

FIRST SCHEDULE

(*Regulation* 4)

TABLE OF STANDARDS FOR TRADE AND OTHER EFFLUENTS

Column 1 SUBSTANCE	Column 2 TRADE EFFLUENT INTO PUBLIC SEWER	Column 3 SEWAGE AND OTHER EFFLUENT
A. PHYSICAL		
1.Temperature	60°C. After mixing of the waters, the temperature should not exceed 40°C	40°C at the point of entry
(Thermometer)		
2.Colour Hazen (Spectrophotometer)	The treatment plant ensure discolouration dyestuffs in the waste water	Must not cause any colouration of the receiving water
3.Odour and Taste (Threshold odour Number)	The odour must not cause any nuisance	Must not cause any deterioration in taste or odour as compared with the natural state
4.Total suspended solids (Gravimetric method)	1,200 mg/L (Avoid blockage of sewer, effect free flow)	50 mg/L. Must not cause formation of sludge or scum in receiving waters
5.Settleable matter sedimentation ml/L (Imhoff funnel)	1.0 ml/L in 2 hours (Avoid blockage of sewer, effect free flow)	0.5 ml/L in 2 hours. Must not cause formation of sludge in receiving water
6.Salinity/Residue mg/L (Evaporation and Gravimetric method)	7,500 mg/L. The salinity must not affect the discharge and treatment or	3,000 mg/L. The salinity of waste water must not adversely affect surface

	installations or their functioning	water
B. CHEMICAL		
7.pH (0-14 scale) (Electrometric method)	6-10	6-9
8.Dissolved Oxygen mg oxygen/L (Modified Winkler method and Membrane-electrode method)	No requirements	After complete mixing, the oxygen content must not be less than 5 mg/L. Extreme temperature may result in lower values
9.Chemical Oxygen Demand (COD) (Dichromate method)	1,800 mg/L	COD based on the limiting values for organic carbon 60-90 mg 0 2 /L average for 24 hours
10.Biochemical Oxygen Demand (BOD) (Modified Winkler method and Membrane Electrode method)	1,200 mg/L	50 mg 0 2 /L (mean value over a 24 hours period). According to circumstances in relation to the self-cleaning capacity of the waters
11.Nitrates (NO 3 as introgen (Spectrophotometric method and Electrometric method)	80 mg/L	The nitrates burden must be reduced as far as possible according to circumstances: Watercourses <50 mg/L; Lakes <20 mg/L
12.Nitrite (NO 2 as nitrogen/L) (Spectrophotometric sulfanilamide)	10.0 mg NO 2 as N/L	1.0 mg NO 2 as N/L
Column 1 SUBSTANCE	Column 2 TRADE EFFLUENT INTO PUBLIC SEWER	Column 3 SEWAGE AND OTHER EFFLUENT
C. METALS		
13.Organic Nitrogen (Spectrophotometric method N-Kjeldhal) (*the % of nutrient elements for degradation of BOD should be 0.4-1% for phosphorous (different for processes using algae))	300 mg N/L*	5.0 mg/L mean*
14.Ammonia and Ammonium (Total) (NH 3	50 mg/L	The burden of ammonium salts must be reduced as far

as N/L) Nesslerization method and Electrometric method)		as 10 mg/L (depending upon temperature, pH and salinity)
15.Cyanides (Spectrophotometric method)	0.5 mg/L	0.1 mg/L
16.Phosphorous (Total) (PO4 as P/L) (Colorimetric method)	45 mg/L	Treatment installation located in the catchment area of lakes: 1 mg/L; located outside the catchment area: reduce the load of P as low as possible (PO4<6 mg/L)
17.Sulphates (Turbidimetric method)	500 mg/L	The sulphate burden must be reduced as low as possible
18.Sulfite (Iodometric method	10 mg/L	1 mg/L (presence of oxygen changes SO3 to SO4)
19.Sulphide (Iodometric and Electrometric method)	1 mg/L	0.1 mg/L (depending on temperature, pH and dissolved 02)
20.Chlorides Cl/L (Silver nitrate and Mercuric nitrate)	1,000 mg/L	Chloride levels must be as low as possible as < (800 mg/L)
21.Active chloride Cl2/L (Iodometric method)	(0.5-3.0 mg/L)	0.5 mg/L
22.Active Bromine (Br2/L) (Iodometric method)	(0.5-3.0 mg/L)	0.1 mg/L
23.Fluorides F/L (Electrometric method and Colorimetric method with distillation)	(<30 mg/L)	10 mg/L
24.Aluminium compounds (Atomic Absorption method)	<20 mg/L	<10 mg/L
25.Antimony (Atomic Absorption method)	0.5 mg/L (inhibition of oxidation)	0.5 mg/L
26.Arsenic compounds (Atomic Absorption method)	1.0 mg/L	1.0 mg/L
27.Barium compounds (water soluble concentration) (Atomic Absorption method)	1.0 mg/L	0.5 mg/L

28.Beryllium salts and compounds (Atomic Absorption method)	0.5 mg/L (inhibition of oxidation)	0.1-0.5 mg/L (according to circumstances)

Column 1 SUBSTANCE	Column 2 TRADE EFFLUENT INTO PUBLIC SEWER	Column 3 SEWAGE AND OTHER EFFLUENT
29.Boron compounds (Spectrophotometric method-Curcumin method)	<50 mg/L	<10 mg/L
30.Cadmium compounds (Atomic Absorption method)	1.5 mg/L	0.5 mg/L
31.Chromium Hexavalent Trivalent (Atomic Absorption method)	5.0 mg/L	0.1 mg/L
32.Cobalt compounds (Atomic Absorption method)	0.5 mg/L	0.5 mg/L
33.Copper compounds (Atomic Absorption method)	3.0 mg/L	1.0 mg/L
34.Iron compounds (Atomic Absorption method)	15.0 mg/L	<2 mg/L
35.Lead compounds (Atomic Absorption method)	1.5 mg/L	1.5 mg/L
36.Magnesium (Atomic Absorption method and Flame photometric method)	<1,000 mg/L	<500.0 mg/L
37.Manganese (Atomic Absorption method)	10.0 mg/L	<3.0 mg/L
38.Mercury (Atomic Absorption method)	0.01 mg/L	0.001 mg/L
39.Molybdenum (Atomic Absorption method)	5.0 mg/L	0.5-5.0 mg/L
40.Nickel (Atomic Absorption method)	2.0 mg/L	2.0 mg/L
41.Selenium (Atomic Absorption method)	<1.0 mg/L	<0.05 mg/L

42.Silver (Atomic Absorption method)	0.1 (inhibition of oxidation)	0.1 mg/L
43.Thallium mg (Atomic Absorption method)	1.0 mg/L	<0.5 mg/L
44.Tin compounds (Atomic Absorption method)	2.0 mg/L	2.0 mg/L
45.Vanadium compounds (Atomic Absorption method)	1.0 mg/L	1.0 mg/L
46.Zinc compounds (Atomic Absorption method)	25.0 mg/L	10.0 mg/L
D. ORGANICS		
47.Total hydrocarbons (Chromatographic method)	10.0 mg/L	20.0 mg/L
48.Oils (Mineral and Crude) (Chromatographic method and Gravimetric method)	100.0 mg/L (after installation of oil separators) 20.0 mg/L (after installation of demulsifier)	1-2 mg/L
49.Phenols (steam distillable) (Non-steam distilled) (Colorimetric method)	5.0 mg/L 1.0 mg/L	0.2 mg/L 0.05 mg/L
Column 1 SUBSTANCE	Column 2 TRADE EFFLUENT INTO PUBLIC SEWER	Column 3 SEWAGE AND OTHER EFFLUENT
50.Fats and saponifiable oils (Gravimetric method and Chromatographic method)	No requirement but installation of oil and fat separators	20.0 mg/L
51.Detergents (Anionic) (Atomic Absorption Spectrophotometric)	10.0 mg/L Alkybenzene sulfonate not permitted	2.0 mg/L (Detergents should contain at least biodegradable compounds)
52.*Pesticides and PCBs (Total) (Chromatographic method)	1.0 mg/L	0.5 mg/L (Reduce to a minimum)
53.Trihaloforms (Chromatographic method)	1.0 mg/L	0.5 mg/L (Reduce to a minimum)
E. RADIOACTIVE MATERIALS		

54.Radioactive materials as specified by IAEA | No discharge accepted | Not permitted

* There are approximately 4,000 pesticides, herbicides and PCBs. The normal practices as per the works of reference hereinafter mentioned shall be used in respect thereof.

References:

1. Environmental Protection Agency-Code of Federal Regulations-Protection of Environment Parts 1 to 399. US Government Printing Office, Washington USA (1979).
2. Environment Canada-Environmental Protection Service (EPS-1) Water Pollution Control Directorate Regulations, Codes and Protocols.
3. Kratel, R., Draft Water Pollution Control Act, Lusaka, Zambia (1981).
4. Lund, H. F., "Industrial Pollution Control Handbook" McGraw-Hill Book Company (1971).
5. APHA, AWWA, WPCF, "Standard Methods for the Examination of Water and Wastewater 15th Edition (1980)"

SECOND SCHEDULE

(*Regulation* 11)

CHARGE FOR THE DISPOSAL OF TRADE EFFLUENTS

The formula for working out the charges shall be as follows:

$$C = V \left(\frac{X}{W} + \frac{Y}{20} + \frac{Z}{7} \right) B + \left(\frac{Q}{R} \right) S +$$

Where,

C = the charge, in fee units per 1,000 litres for the disposal of trade effluent;

V = the volume charge in fee units per 1,000 litres for conveyance, reception and preliminary treatment of average sewage received at the works;

X = the COD in milligram per litre of the trade effluent;

Y = the concentration in milligram per litre of total toxic metals in the trade effluent;

Z = the concentration in milligram per litre of cyanogen compounds (as CN-), which on acidification liberate HCN, in the trade effluent;

W = the COD in milligram per litre of settled sewage;

B = the cost in fee units per 1,000 litres of biological purification of settled average sewage;

Q = the suspended solids in milligram per litre of the trade effluent;

R = the suspended solids in milligram per litre of average sewage treated at the works;

S = the cost of sludge disposal expressed in ngwee per 1,000 litres of average sewage received at the works.

Explanatory Notes on Formula

(i) The cost in fee units per 1,000 litres for V, B and S are to be determined by the Council at the commencement of each financial year and are to be based on the annual costs ascertained for the purpose of the rate levy for sewers and sewage disposal for that year.

(ii) The values of X, Y, Z and Q are the means of the results from the analysis of samples taken during the preceding financial year.

(iii) The values for W and R are the means from the analysis of hourly samples taken over a series of 24-hour periods during the previous financial year.

(iv) The factors of 20 and 7 in relation to Y and Z arise from the limits of toxic materials which may be discharged under the conditions of the consent.

(v) COD means the chemical oxygen demand of a sample of trade effluent measured in accordance with the methods used at the Water Pollution Research Laboratory, Stevenage (WPL Procedure No. 17, February, 1969).

(vi) Suspended solids means those solids retained on a Whatman GF/C glass fibre filter paper when a shaken sample is filtered.

(vii) The determination of chromium compounds is done by using Atomic Absorption Spectrophotometer.

(viii) Cyanogen compound is determined by distillation and titrimetric method using Rhodamine as indicator as described in "American Standard Methods for the Examination of Water and Waste Water 14th edition".

(ix) The toxic metals, copper, cadmium, nickel, zinc and tin are determined by using Atomic Absorption Spectrophotometer.

(x) The volume of effluent discharged shall be based on figures obtained during the year from meters or flow recording apparatus as assessed and certified by a Council officer authorised by the Council for the purpose or as otherwise agreed, assessed and certified by the said Council officer. In assessing the volume of trade effluent discharged, records of the water consumed at the premises shall be taken into account and due allowance made for use for domestic and other purposes not related to trade effluent.

The minimum quarterly charge for the disposal of any trade effluent shall be fifty fee units.