

**SULTANATE OF OMAN**  
**MINISTRY OF REGIONAL MUNICIPALITIES AND ENVIRONMENT**  
**MINISTERIAL DECISION 145/93 DATED 13 JUNE 1993**  
**REGULATIONS FOR WASTEWATER RE-USE**  
**AND DISCHARGE**

In compliance with the law on the Conservation of the Environment and Prevention of Pollution issued by Royal Decree 10/82 and its amendments, and in order to provide the greatest possible health and social welfare for the Nation and citizens and to protect the land and water resources, these Regulations concerning wastewater re-use and discharge have been effected.

**Article –1**

The terms used in these Regulations shall be as defined in Royal Decree No. 10/82 and its amendments, with definitions as follows :

1. **Discharge :**  
The emission of any wastewater or sludge to places or areas as determined by the Ministry.
2. **Wastewater :**  
Any liquid containing environmental pollutants discharged from any source.
3. **Sludge :**  
Any semi-liquid, semi-solid or solid arising from any wastewater treatment.
4. **Sacrificial Discharge :**  
The discharge of wastewater or sludge in such a way that no direct benefit results.
5. **Re -Use :**  
The utilization of wastewater or sludge.
6. **Sanitary Landfill :**  
A site used for the disposal of solid wastes licensed by the Ministry.
7. **Wastewater Treatment Plant :**  
A single unit or an integrated combination of units for the treatment of wastewater.
8. **Septic Tank :**  
Any structure designed to treat wastewater by integrated settlement and anaerobic biological degradation.
9. **Radioactive Matter :**  
Any matter having a specific radioactivity in excess of 70 Bq/g.
10. **Irrigation :**  
The approved application of wastewater to land by aerial spraying, complete or partial flooding, drip-feeding, or any other means, as in table (3).
11. **Aquifer :**  
Any geological unit capable of yielding usable quantities of ground water to wells, springs or aflaj.

**Article -2**

The discharge to the environment of any waste water or sludge in whatever form or condition is prohibited without a Permit to Discharge issued by the Ministry .The Permit to Discharge may be amended by the Ministry at any time after giving reasonable notice of any change to the owner .

**Article -3**

Details of wastewater and sludge re-use practices shall be in accordance with Tables (2) and (3), and, in any case, shall be approved by the Ministry and shall be defined under the terms of any Permit to Discharge that may be issued by the Ministry.

**Article -4**

The final point(s) of discharge of wastewater to the environment shall only be at the point(s) marked on the drawing(s) listed in the Permit to Discharge.

**Article -5**

Wastewater quality shall at all times be within the limits that are set out in Table (1) as they relate to the permitted method of discharge or as may be modified and supplemented by any other limits that might be included in any specific Permit to Discharge.

**Article -6**

The soil on which sludge may be applied shall be tested by the owner for the metals listed in Table (2), and for pH value, prior to any initial application; and the sludge quality and application constraints shall at all times be within the limits that are set out in Table (2) as they relate to the permitted method of sludge re-use, or as may be modified and supplemented by any other limits that might be included in any specific Permit to Discharge.

**Article -7**

Any sludge having concentrations of metals greater than the limits prescribed in Table (2) shall be disposed of in sanitary landfills or to other facilities but only with the prior approval of the Ministry .

**Article -8**

Facilities and equipment shall be provided and maintained by the owner to the requirements and satisfaction of the Ministry for sampling, measuring and recording the quantity and rate of discharge of the wastewater and for determining its characteristics.

**Article -9**

Samples and readings shall be taken by the owner at intervals stated in the Permit to Discharge, or as required by the Ministry. All data shall be recorded and submitted at the end of each month to the Ministry in an approved format.

**Article- 10**

Wastewater or sludge shall not be discharged sacrificially except in an exceptional circumstance where no form of wastewater re-use is possible.

**Article -11**

No wastewater or sludge shall be transported from the site of its origin without the prior approval of the Ministry. Approval shall be subject to conditions that will include the obligation for all transport movements to be recorded in a manner defined in the approval.

**Article- 12**

The Ministry shall have the absolute right to inspect and/or monitor any wastewater treatment plant and to take samples of any wastewater, sludge or soil at any time and place.

**Article -13**

These Regulations shall not apply to discharges from septic tanks or to discharges of wastewater to the marine environment, or discharges of wastewater or sludge which contain radioactive matter, which are subject to separate legislation.

**TABLE 1. WASTEWATER -MAXIMUM QUALITY LIMITS(mg/L except where otherwise stated)**

PARAMETER	STANDARDS (See Table 3)	
	A	B
Biochemical Oxygen Demand (BOD) (5d@20°C)	15	20
Chemical Oxygen Demand (COD)	150	200
Suspended Solids (SS)	15	30
Total Dissolved Solids (TDS)	1500	2000
Electrical Conductivity (E C) (micro S. / cm)	2000	2700
Sodium Absorption Ratio (SAR) <i>(The effect of Sodium on soil absorption)</i>	10	10
pH (within range)	6-9	6-9
Aluminum (as Al)	5	5
Arsenic (as As)	0.100	0.100
Barium (as Ba)	1	2
Beryllium (as Be)	0.100	0.300
Boron (as B)	0.500	1
Cadmium (as Cd)	0.010	0.010
Chloride (as Cl)	650	650
Chromium (total as Cr)	0.050	0.050
Cobalt (as Co)	0.050	0.050
Copper (as Cu)	0.500	1
Cyanide (total as CN)	0.050	0.100
Fluoride (as F)	1	2
Iron (total as Fe)	1	5
Lead (as Pb)	0.100	0.200
Lithium (as Li)	0.070	0.070
Magnesium (as Mg)	150	150
Manganese (as Mn)	0.100	0.500
Mercury (as Hg)	0.001	0.001
Molybdenum (as Mo)	0.010	0.050
Nickel (as Ni)	0.100	0.100
Nitrogen: Ammoniacal (as N)	5	10
: Nitrate (as NO <sub>3</sub> )	50	50
: Organic (Kjeldahl) (as N)	5	10
Oil and Grease (total extractable)	0500	0.500
Phenols (total)	0.001	0.002
Phosphorus (total as P)	30	30
Selenium (as Se)	0.020	0.020
Silver (as Ag)	0.010	0.010
Sodium (as Na)	200	300
Sulfate (as SO <sub>4</sub> )	400	400
Sulfide (total as S)	0.100	0.100
Vanadium (as V)	0.100	0.100
Zinc (as Zn)	5	5
Fecal Coliform Bacteria (per 100ml)	200	1000
Viable Nematode Ova (per litre)	<1	<1

**TABLE 2 : RE-USE OF SLUDGE IN AGRICULTURE -CONDITIONS FOR APPLICATION TO LAND**

METAL	Maximum Concentration (mg/kg of dry Solids)	Maximum Application Rate (kg/ha/yr)*	Maximum Permitted Concentration In Soil (mg/kg of dry solids)
Cadmium	20	0.150	3
Chromium			
Copper	1000	10	400
Lead			
Mercury	1000	10	150
Molybdenum	1000	15	30
Nickel	10	0.100	1
Selenium	20	0.100	3
Zinc	300	3	75
	50	0.150	5
	3000	15	300

After the spreading of sludge there must be a minimum period of three weeks before grazing or harvesting of forage crops.

Sludge use is prohibited:-on soils whilst fruit or vegetable crops, other than fruit trees, are growing or being harvested.  
 -for six months preceding the harvesting of fruit or vegetables which grow in contact with the soil and which are normally eaten raw.  
 -on soils with a pH < 7.0.

\* Based on a 10 -year average and a soil pH > 7.0.

**TABLE 3 : WASTEWATER RE-USE -AREAS OF APPLICATION OF STANDARDS A AND B (TABLE 1 )**

	A	B
	( See Table 1 )	
CROPS	Vegetables likely to be eaten raw. Fruit likely to be eaten raw and within 2 weeks of any irrigation.	Vegetables to be cooked or processed Fruit if no irrigation within 2 weeks of cropping Fodder, cereal and seed crops
GRASS and ORNAMENTAL AREAS	Public parks, Hotel Lawns Recreational areas.  Areas with public access. Lakes with public contact. (except places which may be used for praying and hand washing)	Pastures.  Areas with no public access.
AQUIFER RECHARGE	All controlled aquifer recharge	
METHOD OF IRRIGATION	Spray or any other method of aerial irrigation not permitted in areas with public access unless with timing control	
ANY OTHER RE-USE APPLICATIONS	Subject to the approval of the Ministry	