

## **Water Governance Benchmarking Criteria**

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Numbers found next to an article or item title correspond to the entire article or item.

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### **A. GOVERNANCE FUNCTIONS**

#### **1. Organizing and building capacity in the water sector**

- 1.1 Creating and modifying an organizational structure
- 1.2 Assigning roles and responsibilities
- 1.3 Setting national water policy [1](#)
- 1.4 Establishing linkages among sub-sectors, levels, and national sub-regions
- 1.5 Establishing linkages with neighboring riparian countries
- 1.6 Building public and political awareness of water sector issues
- 1.7 Securing and allocating funding for the sector
- 1.8 Developing and utilizing well-trained water sector professionals

#### **2. Planning strategically**

- 2.1 Collecting, managing, storing and utilizing water-relevant data [2](#), [3](#)
- 2.2 Projecting future supply and demand for water
- 2.3 Designing strategies for matching expected long-term water supply and demand and dealing with shortfalls (including drought mitigation strategies)
- 2.4 Developing planning and management tools to support decision making

#### **3. Allocating water**

- 3.1 Awarding and recording water rights and corollary responsibilities
- 3.2 Establishing water and water rights transfer mechanisms
- 3.3 Adjudicating disputes
- 3.4 Assessing and managing third party impacts of water and water rights transactions

#### **4. Developing and managing water resources**

- 4.1 Constructing public infrastructure and authorizing private infrastructure development
- 4.2 Forecasting seasonal supply and demand and matching the two
- 4.3 Operating and maintaining public infrastructure according to established plans and strategic priorities
- 4.4 Applying incentives and sanctions to achieve long and short term supply/demand matching (including water pricing) [4](#)
- 4.5 Forecasting and managing floods and flood impacts

#### **5. Regulating water resources and services**

- 5.1 Issuing and monitoring operating concessions to water service providers
- 5.2 Enforcing withdrawal limits associated with water rights
- 5.3 Regulating water quality in waterways, water bodies, and aquifers (including enforcement) [5](#), [6](#), [7](#), [8](#), [9](#)
- 5.4 Protecting aquatic ecosystems [10](#)
- 5.5 Monitoring and enforcing water service standards

## **B. GOVERNANCE PROCESS CHARACTERISTICS**

- 1. Transparency.**
- 2. Participation.**
- 3. Accountability and Integrity.**
- 4. Rule of law.**
- 5. Coherency and Integration.**
- 6. Responsiveness.**

## **C. CROSS CUTTING CATEGORIES**

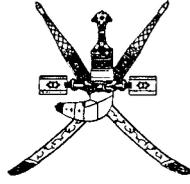
### **1. Water Sources**

- 1.1 Surface water
- 1.2 Groundwater
- 1.3 Derivative water (reclaimed, reused, desalinated) 11

### **2. Water Uses**

- 2.1 Irrigation
- 2.2 Municipal
- 2.3 Industrial
- 2.4 Environmental
- 2.5 Hydropower
- 2.6 Fisheries, navigation, recreation
- 2.7 Other uses (including social, esthetic, and religious uses)

UNOFFICIAL  
TRANSLATION



**SULTANATE OF OMAN  
LAW ON THE CONSERVATION OF THE ENVIRONMENT  
AND PREVENTION OF POLLUTION**

MINISTERIAL DECISION 5/86 DATED 17TH MAY, 1986

**REGULATIONS FOR WASTEWATER  
RE-USE AND DISCHARGE**



**MINISTRY OF ENVIRONMENT AND WATER RESOURCES**  
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# REGULATIONS FOR WASTEWATER RE-USE AND DISCHARGE <sup>11</sup>

## OBJECTIVE

### Article 1

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 waste-water re-use and discharge have been effected. <sup>1</sup>

## DEFINITIONS

### Article 2

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

#### 1. The Council

Means the Council for Conservation of Environment and Water Resources.

#### 2. The Ministry

Means the Ministry of Environment and Water Resources.

#### 3. The Law

Means the Law on the Conservation of the Environment and Prevention of Pollution issued by Royal Decree No. 10/82 and its amendments.

#### 4. Aquifer

Means a porous, water bearing geological formation which consists of sand, gravel, sandstone and fractured or cavernous limestone, from which water can be drawn by wells in usable quantities for drinking, irrigation or other purpose.

#### 5. Irrigation

Means the use of wastewater for the watering of plants.

#### 6. Treated Effluent

Means the wastewater after treatment in a wastewater treatment plant.

**7. Wastewater**

Means any polluted liquid discharged from any premises, trade or industrial or scientific premises.

**8. Wastewater Treatment Plant**

Means a single unit or several different units or an integrated unit for treating wastewater, using physical or chemical or biological or other methods in an open or partially closed system.

**9. Sludge**

Means a semi liquid waste with a solid concentration in excess of 2500 parts per million obtained from the treatment of wastewater.

**10. Treated Sludge**

Means sludge which has been suitably conditioned for re-use or disposal in accordance with these Regulations.

**11. User**

Means the person who uses the sludge produced from wastewater treatment plants by disposing of it to land owned or leased by him.

**12. Contractor**

Means anyone transporting sludge for users or supplying it for reuse or disposal.

**13. Utilisation of Treated Sludge means :**

- a. Its application as a fertilizer.
- b. Its processing for fertilizer (dry sludge compost) .. etc.

**Article 3**

The discharge to the environment of any wastewater or sludge in whatever form or condition is prohibited without a Permit from the Ministry or any other authorities approved by the Ministry. **5, 10**

**Article 4**

Owners of current sources or areas of work which discharge wastewater or sludge to the environment must apply to the Ministry for a Permit to Discharge in a prescribed form within 4 months of the date upon which these Regulations come into force. **6**

## **DISCHARGE AND RE-USE OF WASTEWATER**

### **Article 5**

Wastewater must meet all the conditions shown in Table 1 which include the maximum limits permitted for its re-use. **7**

### **Article 6**

The alternative methods for re-use of such wastewater shall be:

- (a) In a buried drip feed system for the irrigation of ornamental trees and shrubs in areas where there should not be public exposure.
- (b) In approved groundwater recharge system in areas where there should not be public exposure. These areas may include open land or wadis.
- (c) Re-use of treated effluent for industrial processes within a closed circuit system where there will not be any dangers to the workers. Full details of such re-use is to be submitted when making application for Permit to Discharge.
- (d) The re-use of treated effluent for flood, hosepipe, sprinkler or spray irrigation shall not be permitted without the prior consent of the Ministry.

### **Article 7**

The alternative methods for discharge of such wastewater shall be:

- (a) By controlled discharge to approved areas such as open land, wadis or water courses.
- (b) By discharge to sea conforming to the requirements of the Regulations concerning the disposal of Liquid Effluents to the Marine Environment issued by the Council Decision No. 7/84.
- (c) The discharge of wastewaters by deep well injection shall not be permitted.

## **WASTEWATER QUALITY REQUIREMENTS**

### **Article 8**

Wastewater quality requirements for re-use and discharge must be as given in Table 1. **8**

## **UTILISATION AND DISPOSAL OF SLUDGE**

### **Article 9**

All sludge must be treated for disposal to the limits given in Table 2.

#### Article 10

Owners of wastewater treatment plants shall not deliver sludge to contractors or users unless the latter have obtained prior approval from the Ministry or other authorities approved by the Ministry for the proper disposal of such sludge.

#### Article 11 2

Owners of wastewater treatment plants delivering sludge to contractors or users shall keep records specifying at least:

- (a) Date of Delivery.
- (b) Name and address of the Contractor or the User of Sludge.
- (c) The quantity delivered.

#### Article 12

Sludge which is not being delivered to contractors or users shall either be utilised in a approved manner or be disposed of by the owners in an approved manner such as landfill or incineration.

### Monitoring Requirements

#### Article 13

If wastewater, treated effluent or sludge being re-used or discharged are found to be outside the stated limits and represent a risk to public health then the Ministry or such authorities approved by the Ministry reserve the right to inspect, record and request samples and tests in accordance with Article 23 of the Royal Decree No. 10/82. 3

### Septic Tanks and Holding Tanks:

#### Article 14

These Regulations shall not apply to the owners of septic tanks and holding tanks which shall be subjected to separate Regulations.

### Radioactive Material :

#### Article 15 9

- 1 – The re-use of wastewater or sludge containing radio-active material shall not be permitted.
- 2 – The discharge of wastewater or sludge containing radio-active material shall in addition to these Regulations be subject to Regulations laid down by the

International Atomic Energy Agency or such other Regulations that may be issued by the Ministry.

## **PENALTIES**

### **Article 16**

Any owner or person violating these Regulations will be punished by the Penalties stated in Section V of the Royal Decree No. 10/82. **4**

**TABLE 1 – TABLE OF PARAMETERS FOR REUSE AND DISCHARGE OF WASTEWATER**

All Units are mg/ltr unless otherwise stated		
Parameter	Limits (not greater than)	
	Maximum	Monthly average over any four consecutive weeks
<b><u>PHYSICAL</u></b>		
Total Dissolved Solids	1500	1000
Total Suspended Solids	15	10
Turbidity (N.T.U.)	5	2
<b><u>CHEMICAL</u></b>		
Aluminium	5	1
Ammoniacal Nitrogen (as N)	5	1
Arsenic	0.2	0.05
Barium	2	1
Beryllium	0.3	0.1
Biochemical Oxygen Demand (5 days)	15	10
Boron	2	1
Cadmium	0.03	0.01
Chemical Oxygen Demand	100	50
Chloride	350	250
Chlorine, Free Residual (After 60 min. contact time)	0.5 (min)	0.5 (min)
Chromium	0.5	0.1
Cobalt	0.5	0.1
Copper	0.3	0.2
Cyanide	0.1	0.05
Dissolved Oxygen	2.0 (min)	2.0 (min)
Fluoride	2	1
Iron	5	1
Lead	0.5	0.1
Lithium	10	2.5
Magnesium	150	30
Manganese	1	0.2
Mercury	0.005	0.001
Molybdenum	0.05	0.01
Nickel	0.5	0.2
Oil and Grease	5	2

All Units are mg/ltr unless otherwise stated		
Parameter	Limits (not greater than)	
	Maximum	Monthly average over any four consecutive weeks
pH (pH units)	6 – 9	6 – 9
Phenols	1	0.1
Phosphorus (total as P)	30	20
Selenium	0.05	0.02
Sodium	200	70
Sulphate	400	200
Sulphide	0.1	0.05
Organic Nitrogen (Kjeldahl)	10	5
Total Nitrogen	50	30
Total Organic Carbon	50	20
Vanadium	1	0.1
Zinc	5	2
<b><u>BACTERIOLOGICAL</u></b>		
Total Coliforms (MPN/100 ml)	23 (Not to be exceeded in any sample)	2.2 (Determined over last 7 days of completed analyses)
Viable Pathogenic Ova and Cysts	None detectable	None detectable

Note : Only those parameters specified in the Permit to Discharge need to be analysed.

**TABLE 2 – LIMITS FOR DISPOSAL OF SLUDGE**

All units are grammes per ton of dry matter	
Parameter	Limits (not greater than)
Cadmium	30
Chromium	1000
Cobalt	100
Copper	1000
Lead	1000
Molybdenum	20
Nickel	200
Zinc	1000