

Jordanian Standard 202/1991
Requirements for Discharges of Industrial Effluents

Content:

1. Scope
2. Definitions
3. General conditions
4. Standard conditions
5. Scientific references
6. Parties involved in the modification of this standard

1. Scope

This Jordanian standard is concerned with the conditions and parameters required for industrial wastewater generated from all industries and need to be discharged into the surface water or which feeds naturally into the ground water or which is intended to use for irrigation purposes.

2. Definitions

Wastewater generated from industries is that water which is discharged or produced from use of water in some or all the phases of production processes, cleaning, cooling, or others; whether treated or untreated.

3. General Conditions

The following conditions should be met:

- 1.1 The discharged industrial wastewater should not have any negative impact on the environment for the protection of human health and safety; also it should not have a negative impact on the economic and social development in the area or the water basin that maybe affected by this pollution.
- 1.2 The uses of this wastewater are set by the guidelines and standards presented in Table 1 while maintaining the environmental balance of the area.
- 1.3 The discharged industrial wastewater should not have any negative impact on the quality of the surrounding groundwater or the area water basin.

- 1.4 The discharged industrial wastewater should not have any negative impact on the recipient surface water, and should not have any negative effect on the aquatic life.
- 1.5 In the case where the discharged industrial wastewater should be reused in any stage of the production processes (cleaning, cooling...etc.) or for irrigation purposes, it should have no negative impact on the health and safety of both the plant workers and consumers.
- 1.6 In the case where the discharged industrial wastewater is to be reused for irrigation purposes it is required to take into consideration the guidelines set by the Food and Agriculture Organization (FAO) and the instruction for wastewater and the recommendations set by it if it were mixed with the sewage of the industry.
- 1.7 In the case where the industrial wastewater is discharged into the sewerage network of the Water Authority, then it should meet the requirements for connection to the sanitary sewerage network and any modifications hereafter.

4. Sampling & Measurement Conditions

The following standards are required to be met for industrial wastewater discharge. These parameters are measured as follows:

- 1.1 The sample should be comprehensive and representative and according to the rate of flow over the period of the operation of the factory (number of working hours), and the number of samples should be not less than one per week, in order to test and analyze the water.
- 1.2 If the above condition is not met then random sampling is carried out according to the quality and continuity of discharge on an average of 3 samples per week if not more preferably.
- 1.3 The sampling, storage and analysis procedures should be according to the Standard Methods for Testing Water & Wastewater book published by the American Public Health Society and the American Society for Pollution Control of the American federal Waters, 1989, and its approved modifications or any other accepted analysis methods not indicated in the above mentioned reference.
- 1.4 The general conditions should be followed along with the comprehensive environmental impact assessment to identify the quality of the discharged industrial wastewater especially for the parameters and characteristics that have not been mentioned or set in the following table.

| Parameter | Maximum Allowable Limit, (mg/1) ⁺ | | | |
|-------------------------|--|---------|----------------------|-------------------------|
| | Disposal To | | Groundwater Recharge | Reuse for irrigation ** |
| | Wadis & Rivers | Sea | | |
| BOD₅ | 50 (M) | - | 50 (M) | - |
| COD | 150 (M) | 200 | 150 (M) | - |
| DO | 1* | 5* | 1* | 1* |
| TDS | 3000 (1) | - | 1500 (1) | 2000 (2) |
| TSS | 50 | - | - | 100 (3) |
| PH (SU) | 6.5-9.0 | 5.5-9.0 | 6.5-9.0 | 6.5-8.4 |
| Color (Unit) | 15 | 75 | 15 | - |
| TC | - | 4 | - | - |
| FOG | 5 | 10 | Absent | 5 |
| Phenol | 0.002 | 1 | 0.002 | 0.002 |
| MBAS | 25 | - | 15 | - |
| NO₃-N | 12 (4) | - | 12 (4) | 30 |
| NH₃ | 5 | 12 | 5 | 5 |
| Total-N | - | 125 | - | 50 |
| PO₄-P | 15 | - | - | - |
| Cl- | 500 | - | 500 | 350(3) |
| SO₄ | 500 | - | 500 | 400 |
| F | 1.5 | - | 1.5 | - |
| HCO₃ | - | - | - | 500 |
| Na | - | - | 400 | - |
| Mg | - | - | - | - |
| Ca | - | - | - | - |
| SAR | - | - | - | 9 |
| Al | 5 | - | 0.3 | 5 |
| As | 0.05 | 0.1 | 0.05 | 0.1 |
| B | 1 | - | 1 | 1(5) |
| Cr | 0.1 | 0.3 | 0.05 | 0.1 |
| Cu | 2 | 0.1 | 2 | 0.2 |
| Fe | 1 | 2 | 1 | 5 |
| Mn | 0.2 | 0.2 | 0.2 | 0.2 |
| Ni | 0.2 | 0.02 | 0.1 | 0.2 |
| Pb | 0.1 | 0.1 | 0.1 | 1 |
| Se | 0.02 | 0.02 | 0.05 | 0.02 |
| Cd | 0.01 | 0.07 | 0.02 | 0.01 |
| Zn | 15 | - | 15 | 15 |
| Sn | 0.1 | 1 | 0.1 | 0.1 |
| Hg | 0.001 | 0.001 | 0.001 | 0.001 |
| TCC | | | | |
| MPN\100 ml | | 5000 | - | - |
| TFSS | | | | |
| MPN\100 ml | 1000(6) | - | 1000(6) | 1000(6) |
| Nematodes | <1 | - | - | <1 |

⁺ All units are in mg/1 except where noted.

* Minimum value for dissolved oxygen

** Depends upon, type and quantity of crops, irrigation methods, soil type, climate & groundwater in the area concerned.

- Undetermined, and is dependent on the general and standard conditions

M: monthly average.

Notes:

1. The quantity allowed is dependent on TDS concentration in the water resource supplying the industry and the water basin affected.
2. The quantity allowed is dependent on the degree of restriction: no restriction, slight to moderate restriction, or highly restricted.
3. The quantity allowed is dependent on the method of irrigation: spraying, surface irrigation, or droplets)
4. The quantity allowed is dependent on the nitrate level of concentration allowed in the affected water basin.
5. Could reach 3mg/l.
6. The Geometric mean is used for calculations.

5. Scientific References

- Water Reuse and recycling Technology.
- Water Quality Criteria for discharge to the Arabian Gulf / Codes of Practice and Environmental Guidelines – Kuwait.
- FAO Guidelines for Agriculture
- The Jordanian Standard No. 286/1988 for Drinking Water
- Regulation for Wastewater Reuse and Discharge – Sultanate of Oman, Ministry of Environmental and Water Resources.
- Recommended Water Quality for Reuse, KISR – Kuwait.
- Reuse of Effluents, Methods of Wastewater Treatment and Health safe Guards (WHO).

6. Parties Involved in the Modification of the Standard

- Ministry of Health
- Ministry of Water and Irrigation
- Ministry of Planning
- Ministry of Rural Affairs and Environment
- Ministry of Agriculture
- Greater Amman Municipality
- Royal Scientific Society
- Jordan University
- Industrial Estate Corporation / Sahab
- Amman Chamber of Trade
 - Intaj Company
 - Jordan Petroleum Refinery Company
 - Arab Company for Aluminum Manufacturing
 - Yeast Industries Company