

SULTANATE OF OMAN
COUNCIL FOR CONSERVATION OF ENVIRONMENT and PREVENTION
of POLLUTION

REGULATIONS CONCERNING THE DISPOSAL OF LIQUID
EFFLUENTS TO MARINE ENVIRONMENT

OBJECTIVE:

In compliance with the Law on the Protection of the Environment and the Prevention of Pollution issued by Royal Decree No.10/82 and in order to protect land and marine life and to provide greatest possible health and social welfare for the nation and citizens these regulations concerning the discharge of liquid effluents to the marine environment have been effected.

DEFINITIONS

Shall be as stated in Section II of Royal Decree 10/82 with the following additions:

"Liquid effluent" - any aqueous or non-aqueous liquid which will enter marine waters.

"Marine environment" - the area of the coast extending from the line of the highest high tide seaward to the territorial limits of Oman.

"Benthic marine life" - any marine plants or animals attached to or living on the sea bed.

REGULATIONS

- 1) The disposal (*discharge*) of any liquid effluent to the marine environment, either directly or indirectly, is prohibited without prior application to the Council for approval and a "Consent to Discharge" permit.
- 2) All applications for disposal of liquid effluent to the marine environment shall comply with the requirements of Articles 13 and 14 of Royal Decree 10/82.
- 3) No application will be accepted by the Council which does not first consider regulations governing re-use of wastewater effluents (see "Regulations and Standards for Wastewater Treatment and Disposal on Land") .
- 4) All applications for disposal of liquid effluent to the marine environment must be accompanied by full details of the proposed location and method of disposal and a complete physical and chemical characterization of the effluent.
- 5) Liquid effluents proposed for disposal to the marine environment must meet or be pre-treated to comply with the "Standards for Disposal of Liquid Effluents to the Marine Environment" as required by the Council (Appendix A attached) .
- 6) Disposal to the marine environment of any liquid effluent containing any of the following compounds or materials is strictly prohibited:-
 - a) Pesticides, herbicides, or insecticides;
 - b) Radioactive elements;
 - c) All materials produced for biological or chemical warfare.
 - d) Any other materials or compounds which the Council determines to be deleterious to the marine environment.
- 7) In addition to the above regulations, any liquid effluent proposed for disposal to the marine environment shall not result in:
 - a) Visible floating particulate, grease or oil,
 - b) Esthetically undesirable discoloration of the sea surface,

- c) Visible evidence of disposal in water or on beaches, rocks, or structures,
 - d) Reduction of natural light transmittance more than 10% of ambient values at point of disposal;
 - e) Alteration of marine sediments which lead to degradation of benthic marine life.
 - f) Alteration of organic matter in adjacent sediments deleterious to marine life;
 - g) objectionable aquatic growth which degrades indigenous biota;
 - h) Objectionable odors to emanate from receiving waters at point of disposal;
 - i) Alteration of the natural quality of fish, shellfish or other marine resources used for human consumption.
- 8) The discharge end of any effluent discharge pipe must be sited a minimum of 1 meter below the Lowest Low Tide Level at the proposed discharge site. A 300 meter radius from the point of effluent discharge is set as the initial zone of dilution at which point the disposed effluent shall not result in:
- a) Increase in ambient water temperature more than 10 °C (weekly average);
 - b) Depression of dissolved oxygen values more than 10% of ambient values;
 - c) Changes in ambient pH more than 0.2 units;
 - d) Increased or decreased salinity of receiving water greater than 2 parts per thousand from ambient values.
- 9) In special cases, the Council may require an applicant to provide additional information concerning the physical, chemical and/or biological characteristics of a proposed disposal site. The applicant may be required to conduct or commission a field survey to determine the seasonal(at least 13 months) variation of all or some of the following parameters as determined by the Council.

9.1 PHYSICAL:

- a) Tidal Cycles: determine the maximum and minimum tidal height during each month.
- b) Water Currents: determine the average speed and direction of water currents at the surface, midwater and bottom depths. Measurements should be made hourly for 25 hours once a month during maximum tidal height fluctuation.
- c) Wind Conditions: Determine the monthly average wind speed direction at point of proposed effluent disposal;
- d) Salinity, Temperature, and Turbidity: These parameters should be measured hourly for 25 hours once a month during the maximum tidal height fluctuation at surface, mid water and bottom depths.
- e) Bottom topography, depth contours, and Geological Characterization: Information on these features of the proposed disposal site may be required.

9.2 CHEMICAL

- a) Dissolved oxygen and pH: These parameters should be measured hourly for 25 hours once a month during the maximum tidal height fluctuation at surface, mid water and bottom depths.
- b) Nutrients: The one day average concentrations of phosphate, nitrogen compounds, and silicate should be determined from surface water samples collected every 3 hours for 25 hours once a month during the period of maximum tidal height fluctuation.
- c) Heavy metals: The concentrations of various heavy metals in surface sediments adjacent to the proposed disposal site may be required. Measurements should be made 2 times during the 13 month period.

9.3 BIOLOGICAL

- a) Plankton: The abundance of dominant Zoo and phytoplankton species should be determined monthly at the proposed disposal site. Fish eggs and larvae should also be included in counts.

- b) Benthic Macrofaunal and Macroflora: A survey of the abundance and distribution of the dominant benthic invertebrates and algae adjacent to the proposed disposal site should be conducted once every four months.
- c) Primary productivity: Determinations of the primary productivity of receiving waters in the proposed disposal site should be made in conjunction with monthly plankton surveys.

APPENDIX - A

COUNCIL FOR CONSERVATION OF ENVIRONMENT AND PREVENTION OF POLLUTION

LIQUID EFFLUENT STANDARDS FOR DISPOSAL TO MARINE ENVIRONMENT

PARAMETER	UNIT	STANDARD NOT GREATER THAN
Ammoniacal Nitrogen (as N)	mg/L	40.0
Arsenic (As)	mg/L	0.05
BOD-5 day	mg/L	30
Cadmium (Cd)	mg/L	0.05
Chlorine total (not less than)	mg/L	2.5
Chromium (Cr)	mg/L	0.50
Copper (Cu)	mg/L	0.50
Cyanide (CN)	mg/L	0.10
Fecal Coliforms	MPN/100ml	100 (80% samples)
Fecal Streptococci	MPN/100ml	100
Salmonella	MPN/1 litter	Non detectable
Grease and oil	mg/L	5.0
Iron (Fe)	mg/L	2.0
Lead (Pb)	mg/L	0.10
Mercury (Hg)	mg/L	0.001
Nickel (Ni)	mg/L	0.10
pH	Between	6-9
Phenols	mg/L	0.10
Phosphates	mg/L	0.10
Selenium (Se)	mg/L	0.02
Silver (As)	mg/L	0.005
Sulfide	mg/L	0.10
Suspended solids	mg/L	30
Turbidity	JTU	75
Zinc	mg/L	0.10