

- (vi) In no circumstances, the liquid effluent shall be discharged without conforming to the minimal national standards or stored in a holding arrangement which is likely to cause pollution.
- (vii) The sludge from the solar evaporation pans shall be incinerated or disposed as per the guidelines for management and handling of hazardous waste, published by the Ministry of Environment & Forests, Government of India, after obtaining authorization from the State Pollution Control Board under the hazardous Waste (Handling and Management) Rules, 1989.
- (viii) The facility shall be protected from flood and storm to prevent embankments from erosion or any other damage which may render any portion inoperable.
- (ix) Facilities shall be protective enclosure to keep wildlife, domestic animals, unauthorized persons, etc. away.

72. OIL DRILLING AND GAS EXTRACTION INDUSTRY

A. STANDARDS FOR LIQUID EFFLUENT

1.0 On-Shore facilities (For Marine Disposal)

pH	5.5—9.0
Oil & Grease	10 mg/l
Suspended solids	100 mg/l
BOD(3 days at 27°C)	30 mg/l

Note :

- (i) For on-shore discharge of effluents, in addition to the standards prescribed above, proper marine outfall has to be provided to achieve the individual pollutant concentration level in sea water below their toxicity limits as given below, within a distance of 50 metre from the discharge point, in order to protect the marine aquatic life :

Parameter	Toxicity limit,mg/l
Chromium as Cr	0.1
Copper, as Cu	0.05
Cyanide, as CN	0.005
Fluoride, as F	1.5
Lead, as Pb	0.05
Mercury, as Hg	0.01
Nickel, as Ni	0.1
Zinc, as Zn	0.1

- (ii) Oil and gas drilling and processing facilities, situated on land and away from saline water sink, may opt either for disposal of treated water by on-shore disposal or by re-injection in abandoned well, which is allowed only below a depth of 1000 metres from the ground level. In case of re-injection in abandoned well the effluent have to comply only with respect to suspended solids and oil and grease 100 mg/l and 10 mg/l, respectively. For on-shore disposal, the permissible limits are given below.

S.No.	Parameter	On-shore discharge standards (Not to exceed)
1.	2.	3.
1.	pH	5.5—9.0
2.	Temperature	40°C
3.	Suspended Solids	100 mg/l
4.	Zinc	2 mg/l
5.	BOD	30 mg/l
6.	COD	100mg/l
7.	Chlorides	600 mg/l
8.	Sulphates	1000 mg/l
9.	TDS	2100 mg/l
10.	%Sodium	60 mg/l
11.	Oil and Grease	10 mg/l
12.	Phenolics	1.2 mg/l
13.	Cyanides	0.2 mg/l
14.	Fluorides	1.5 mg/l
15.	Sulphides	2.0 mg/l
16.	Chromium(Cr+6)	0.1 mg/l
17.	Chromium (Total)	1.0 mg/l
18.	Copper	0.2 mg/l
19.	Lead	0.1 mg/l
20.	Mercury	0.01 mg/l
21.	Nickel	3.0 mg/l

2.0 Off-shore facilities :

For off-shore discharge of effluents, the oil content of the treated effluent without dilution shall not exceed 40 mg/l for 95% of the observation and shall never exceed 100 mg/l. Three 8-hourly grab samples are required to be collected daily and the average value of oil and grease content of the three samples shall comply with these standards.

B. GUIDELINES FOR DISCHARGE OF GASEOUS EMISSION :

- 1.0 DG Sets
- 1.1 DG Sets at drill site as well as production station shall conform with the norm notified under the Environment (Protection) Act, 1986.
- 2.0 Elevated/ground flares
- 2.1 Cold Venting of gases shall never be resorted to and all the gaseous emissions are to be flared.
- 2.2 All flaring shall be done by elevated flares except where there is any effect on crop production in adjoining areas due to the flaring. In such cases, one may adopt ground flaring.
- 2.3 In case of ground flare, to minimize the effects of flaring, the flare pit at Group Gathering Station(GGS)/Oil Collecting Station(OCS) and Group Collection Station(GCS) shall be made of RCC surrounded by a permanent wall (made of refractory brick) of minimum 5m height, to reduce the radiation and glaring effects in the adjoining areas.
- 2.4 A green belt of 100 m width may be developed around the flare after the refractory wall in case of ground flaring.
- 2.5 If the ground flaring with provision of green belt is not feasible, enclosed ground flare system shall be adopted, and be designed with proper enclosure height, to meet the ground level concentration(GLC) requirement.
- 2.6 In case of elevated flaring, the minimum stack height shall be 30m. Height of the stack shall be such that the max. GLC never exceeds the prescribed ambient air quality limit.
- 3.0 Burning of effluent in the pits shall not be carried out at any stage.

¹[C. GUIDELINES FOR DISPOSAL OF SOLID WASTE, DRILL CUTTING AND DRILLING FLUIDS FOR OFFSHORE AND ONSHORE DRILLING OPERATION-

1. Disposal of Drill Cutting and Drilling Fluids for On-shore Installations:

¹ Substituted "paragraph C", for "paragraph C relating to Guidelines For Disposal of Solid Waste" by Rule 2(iii) of the Environment (Protection) Third Amendments Rules, 2005 notified vide Notification No.G.S.R.546(E), dated 30.8.2005.

- (a) Drill Cuttings (DC) originating from on-shore or locations close to shore line and separated from Water Base Mud (WBM) should be properly washed and unusable drilling fluids (DF) such as WBM, Oil Base Mud (OBM), Synthetic Base Mud (SBM) should be disposed off in a well designed pit lined with impervious liner located off-site or on-site. The disposal pit should be provided additionally with leachate collection system.

Design aspects of the impervious waste disposal pit; capping of disposal pit should be informed by the oil industry to State Pollution Control Board (SPCB) at the time of obtaining consent.

- (b) Use of diesel base mud is prohibited. Only WBM should be used for on-shore oil drilling operations.
- (c) In case of any problem due to geological formation for drilling, low toxicity OBM having aromatic content < 1% should be used. If the operators intend to use such OBM to mitigate specific whole problem/ SBM it should be intimated to Ministry of Environment and Forests/State Pollution Control Board.
- (d) The chemical additives used for the preparation of DF should have low toxicity i.e. 96 hr $LC_{50} > 30,000$ mg/l as per mysid toxicity or toxicity test conducted on locally available sensitive sea species. The chemicals used (mainly organic constituents) should be biodegradable.
- (e) DC separated from OBM after washing should have oil content at < 10 gm/kg for disposal into disposal pit.
- (f) The waste pit after it is filled up shall be covered with impervious liner, over which, a thick layer of native soil with proper top slope is provided.
- (g) Low toxicity OBM should be made available at installation during drilling operation.
- (h) Drilling wastewater including DC wash water should be collected in the disposal pit evaporated or treated and should comply with the notified standards for on-shore disposal.
- (i) Barite used in preparation of DF shall not contain Hg > 1 mg/kg & Cd > 3mg/kg.

- (j) Total material acquired for preparation of drill site must be restored after completion of drilling operation leaving no waste material at site. SPCB should be informed about the restoration work.
- (k) In case, environmentally acceptable methods for disposal of drill waste such as (a) injection to a formation through casing annulars, if conditions allow (b) land farming at suitable location (c) bio-remediation (d) incineration or (e) solidification can be considered, in such cases oil industry is required to submit proposal to Ministry of Environment and Forests/State Pollution Control Board (MoEF/SPCB) for approval.

2. Disposal of Drill Cutting and Drilling Fluids for Off-shore Installations:

- (a) Use of diesel base mud is prohibited. Only WBM is permitted for offshore drilling. If the operator intend to use low toxicity OBM or SBM to mitigate specific hole problems in the formation, it should be intimated to MoEF/SPCB. The low toxicity OBM should have aromatic content < 1%.
- (b) The toxicity of chemical additives used in the DF (WBM or OBM or SBM) should be biodegradable (mainly organic constituents) and should have toxicity of 96 hr LC₅₀ Value > 30,000 mg /l as per mysid toxicity or toxicity test conducted on locally available sensitive sea species.
- (c) Hexavalent chromium compound should not be used in DF. Alternative chemical in place of chrome lignosulfonate should be used in DF. In case, chrome compound is used, the DF/ DC should not be disposed offshore.
- (d) Bulk discharge of DF in offshore is prohibited except in emergency situations.
- (e) WBM/OBM /SBM should be recycled to a maximum extent. Unusable portion of OBM should not be discharged into sea and shall be brought to on-shore for treatment & disposal in an impervious waste disposal pit.
- (f) Thoroughly washed DC separated from WBM/SBM & unusable portion of WBM/SBM having toxicity of 96 hr LC₅₀ > 30,000 mg/l shall be discharged off-shore into sea intermittently, at an average rate of 50 bbl/hr/well from a platform so as to have proper dilution & dispersion without any adverse impact on marine environment.

- (g) Drill cutting of any composition should not be discharged in sensitive areas notified by the Ministry of Environment and Forests.
- (h) In case of specific hole problem, use of OBM will be restricted with zero discharge of DC. Zero discharge would include re-injection of the DC into a suitable formation or to bring to shore for proper disposal. In such a case, use of OBM for re-injection should be recorded and made available to the regulatory agency. Such low toxic OBM having aromatic content < 1% should be made available at the installation.
- (i) In case, DC is associated with high oil content from hydrocarbon bearing formation, then disposal of DC should not have oil content > 10 gm/kg.
- (j) The DC wash water should be treated to confirm limits notified under EPA, before disposal into Sea. The treated effluent should be monitored regularly.
- (k) Discharge of DC from the installation located within 5 km away from shore should ensure that there is no adverse impact on marine Eco-system and on the shore. If, adverse impact is observed, then the industries have to bring the DC on-shore for disposal in an impervious waste disposal pit.
- (l) If any, environmental friendly technology emerges for substitution of DF and disposal technology, it may be brought to the notice of MoEF and regulatory agencies. If the operator desires to adopt such environment friendly technology a prior approval from Ministry of Environment and Forests is required.
- (m) Barite used in preparation of DF shall not contain Hg > 1 mg/kg & Cd > 3 mg/kg.
- (n) Oil drilling operators are required to record daily discharge of DC & DF to offshore and also to monitor daily the effluent quality, and submit the compliance report once in every six-month to Ministry of Environment and Forests.]