

ANNEXURE-II
APPLICABLE ENVIRONMENTAL STANDARDS

1.0 Ambient Air Quality Standards

National Ambient Air Quality Standards for ambient air has been prescribed by the Environment (Protection) Seventh Amendment Rules, 2009 dated 16th November 2009. The prescribed Standards are given below in **Table-1**.

TABLE-1
NATIONAL AMBIENT AIR QUALITY STANDARDS

Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur dioxide (SO ₂), µg/m ³	Annual*	50	20	-Improved West and Gaeke -ultraviolet fluorescence
		24 Hours**	80	80	
2	Nitrogen Dioxide (NO ₂), µg/m ³	Annual*	40	30	-Modified Jacob & Hochheiser (Na-Arsenite) -Chemiluminescence
		24 Hours**	80	80	
3	Particulate Matter (Size less than 10µm) or PM ₁₀ µg/m ³	Annual*	60	60	-Gravimetric -TOEM -Beta attenuation
		24 Hours**	100	100	
4	Particulate Matter (Size less than 2.5µm) or PM _{2.5} µg/m ³	Annual*	40	40	-Gravimetric -TOEM -Beta attenuation
		24 Hours**	60	60	
5	Ozone (O ₃) µg/m ³	8 hours **	100	100	-UV photometric -Chemiluminescence -Chemical Method
		1 hour **	180	180	
6	Lead (Pb) µg/m ³	Annual*	0.50	0.50	-AAS /ICP method after sampling on EPM 2000 or equivalent filter paper -ED-XRF using Teflon filter
		24 Hours**	1.0	1.0	
7	Carbon monoxide (CO) mg/m ³	8 Hours	02	02	-Non Dispersive Infra Red (NDIR)
		1 Hour**	04	04	
8	Ammonia (NH ₃) µg/m ³	Annual*	100	100	-Chemiluminescence -Indophenol blue method
		24 Hours**	400	400	
9	Benzene (C ₆ H ₆) µg/m ³	Annual*	05	05	-Gas chromatography based continuous analyzer -Adsorption and Desorption followed by GC analysis
10	Benzo(α) Pyrene (BaP)- particulate phase only ng/m ³	Annual*	01	01	-Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As) ng/m ³	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

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Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
12	Nickel (Ni) ng/m ³	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

Note:

* Annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 8 hourly or, 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

2.0 Noise Limits and Guidelines for Diesel Generators

- Noise from DG set shall be controlled by providing an acoustic enclosure or by treating the room acoustically, at the users end;
- The acoustic enclosure or acoustic treatment of the room shall be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side (if the actual ambient noise is on the higher side, it may not be possible to check the performance of the acoustic enclosure/acoustic treatment. Under such circumstances the performance may be checked for noise reduction upto actual ambient noise level, preferably, in the nighttime). The measurement for Insertion Loss may be done at different points at 0.5 m from the acoustic enclosure/room, and then averaged;
- These limits shall be regulated by the State Pollution Control Boards and the State Pollution Control Committees;
- The manufacturer shall offer to the user a standard acoustic enclosure of 25 dB (A) insertion loss and also a suitable exhaust muffler with insertion loss of 25 dB (A);
- The user shall make efforts to bring down the noise levels due to the DG set, outside his premises, within the ambient noise requirements by proper siting and control measures;
- Installation of a DG set must be strictly in compliance with the recommendations of the DG set manufacturer; and
- A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacturer which would help prevent noise levels of the DG set from deteriorating with use.

3.0 Ambient Noise Standards

Ambient standards with respect to noise have been notified by the Ministry of Environment and Forests vide gazette notification dated 26th December 1989 (amended in February, 2000). It is based on the 'A' weighted equivalent noise level (L_{eq}). The ambient noise standards are presented in **Table-2**.

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TABLE-2
AMBIENT NOISE STANDARDS

Area Code	Category of Area	Noise Levels dB(A) Leq	
		Day time*	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone**	50	40

Note:

* Daytime is from 6 am to 10 pm.

** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones.

4.0 Noise Standards for Occupational Exposure

Noise standards in the work environment are specified by Occupational Safety and Health Administration (OSHA-USA) which in-turn are being enforced by Government of India through model rules framed under Factories Act. These are given in **Table-3**.

TABLE-3
STANDARDS FOR OCCUPATIONAL EXPOSURE

Total Time of Exposure per Day in Hours (Continuous or Short term Exposure)	Sound Pressure Level in dB(A)
8	90
6	92
4	95
3	97
2	100
3/2	102
1	105
3/4	107
1/2	110
1/4	115
Never	>115

Note:

- No exposure in excess of 115 dB(A) is to be permitted.
- For any period of exposure falling in between any figure and the next higher or lower figure as indicated in column (1), the permissible level is to be determined by extrapolation on a proportionate scale.

5.0 Wastewater Discharge Standards

The wastewater discharge standards as per EPA Notification (GSR 176 (E), April 1996) are given in **Table-4**.

TABLE-4
WASTE WATER DISCHARGE STANDARDS

Sr. No.	List of Parameters	Units	Standard (On land Irrigation)	Standard (Surface Waters)
1	Colour and Odour	--	All efforts should be made to remove colour and unpleasant odour as far as practicable.	All efforts should be made to remove colour and unpleasant odour as far as practicable.
2	Suspended Solids	mg/l	200.0	100.0
3	Particle size of	--	Shall pass 850 micron IS	Shall pass 850 micron IS

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Sr. No.	List of Parameters	Units	Standard (On land Irrigation)	Standard (Surface Waters)
	Suspended Solids		Sieve	Sieve
4	pH value	--	5.5 to 9.0	5.5 to 9.0
5	Temperature	--	Not Specified	Shall not exceed 5 °C above the receiving water temperature.
6	Oil and grease, Max.	mg/l	10.0	10.0
7	Total residual chlorine, Max.	mg/l	Not Specified	1.0
8	Ammonical nitrogen (as N), Max.	mg/l	Not Specified	50
9	Total Kjeldhal nitrogen (as N),Max	mg/l	Not Specified	100
10	Free ammonia (as NH ₃), Max.	mg/l	Not Specified	5
11	Biochemical oxygen demand (3 days at 27°C), Max.	mg/l	100.0	30.0
12	Chemical oxygen demand, Max.	mg/l	Not Specified	250
13	Arsenic (as As), Max.	mg/l	0.2	0.2
14	Mercury (as Hg), Max.	mg/l	Not Specified	0.01
15	Lead (as Pb), Max.	mg/l	Not Specified	0.1
16	Cadmium (as Cd), Max.	mg/l	Not Specified	2.0
17	Hexavalent chromium (as Cr ⁺⁶), Max.	mg/l	Not Specified	0.1
18	Total chromium (as Cr), Max.	mg/l	Not Specified	2.0
19	Copper (as Cu), Max.	mg/l	Not Specified	3.0
20	Zinc (as Zn), Max.	mg/l	Not Specified	5.0
21	Selenium (as Se), Max.	mg/l	Not Specified	0.05
22	Nickel (as Ni), Max.	mg/l	Not Specified	3.0
23	Cyanide (as CN), Max.	mg/l	0.2	0.2
24	Fluorides as F	mg/l	Not Specified	2.0
25	Dissolved phosphates (as P),Max	mg/l	Not Specified	5.0
26	Sulphides as (S), Max.	mg/l	Not Specified	2.0
27	Phenolic compounds (as C ₂ H ₅ OH),	mg/l	Not Specified	1.0
28	Radioactive Materials			
A]	Alpha Emitters, Max.	µC/ml	10 ⁻⁷	10 ⁻⁷
B]	Beta Emitters, Max.	µC/ml	10 ⁻⁷	10 ⁻⁶
29	Bio-assay test	--	90% survival of fish after 96 hours in 100% effluent.	90% survival of fish after 96 hours in 100% effluent.
30	Manganese (as Mn)	mg/l	Not Specified	2.0
31	Iron (as Fe)	mg/l	Not Specified	3.0
32	Vanadium (as V)	mg/l	Not Specified	0.2
33	Nitrate nitrogen	mg/l	Not Specified	10.0

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6.0 Guidelines for Disposal of Solid Waste, Drill Cutting and Drilling Fluids for Offshore and Onshore Drilling Operation as per Ministry of Environment and Forests vide gazette notification dated 30th August 2005.

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

- 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 LC₅₀ > 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.