

**GUIDANCE PACK FOR APPLICATION OF THE EMISSION LICENCE  
FOR STATIONARY SOURCES AS PER AIR QUALITY REGULATIONS,  
2014.**

**Contents**

- (1) Form IV: Application for Initial Emission License**
- (2) Annex 1: Guidelines on Filling the Emission License Application Form**
- (3) Annex 2: Stack Emission Report Format**
- (4) Annex 3: Ambient Air Quality Monitoring Report Format**
- (5) Annex 4: List of laboratories designated by NEMA to carry out air quality measurements**
- (6) Annex 5: Emission License Fees as per the 13<sup>th</sup> Schedule**
- (7) Annex 6: List of Controlled Areas as per 6<sup>th</sup> Schedule**
- (8) Annex 7 : Emission Limits for Controlled and Non-Controlled Facilities 3<sup>rd</sup> Schedule**
- (9) Annex 8: Acceptable Emission Control Technologies 8<sup>th</sup> Schedule**

**NINTH SCHEDULE**  
**EMISSION LICENSES**

r41

**Form IV: Application for Initial Emission License**

1. Name of Company .....
2. Address  
    P.O. Box.....  
    Tel..... Fax..... E-mail.....  
    Name of Contact Person .....
3. Location  
    LR No..... Street..... Area..... Division.....  
    Town.....District..... Province.....
4. Type of Industry.....
5. Name(s) of emitting Equipment.....  
.....  
.....  
.....  
.....
6. Site Plan Layout, (attach sketch)  
    (a) Distance of the equipment to the nearest building.....  
    (b) Height of the above referred building.....  
    (c) Nearest sensitive area or facility.....  
    (d) Immission (fall-out) point.....
7. Operating Emission levels  
    (i) .....
- (ii) .....
- (iii) .....
- (iv) .....
8. Proposed Emission Control Mitigation Measures  
    (v) .....
- (vi) .....
- (vii) .....
- (viii) .....

9. Additional information required .....

10. Start-up, and shut-down of the equipment

- a) Methods.....
- b) Expected Frequency of Occurrence .....
- c) Duration of occurrence.....
- d) Projected emitted Pollutants
  - (i) .....
  - (ii) .....
  - (iii) .....
  - (iv) .....

11. (a).Nature of emissions (gaseous, Particulates)

- (i) .....
- (ii) .....
- (iii) .....
- (iv) .....

(b) Concentration of the emissions

- (i) .....
- (ii) .....
- (iii) .....

Signature of Applicant .....Date.....  
Position .....

FOR OFFICIAL USE

Approved/Not approved.....  
Dated this.....day.....of 20.....

Signature.....  
(Seal)

## ANNEX 1: GUIDELINES ON FILLING THE EMISSION LICENCE APPLICATION FORM

### Form IV: Application for Initial Emission License

r41

1. Name of Company: *(As indicated in the Certificate of Registration)*
2. Address:
  - P.O. Box: *(As indicated in the Letter Head)*
  - Tel: *(As above)*; Fax: *(As above)*; E-mail: *(official email details)*

Name of Contact Person: *(Legal Entity of the company)*

3. Location
  - LR No. *(As indicated in the title deed)*; Street: *(Name of road or street)*; Area: *(Name of the location)*; Division: *(Name of Sub-County)*; Town: *(Name of urban center)*; District: *(Name of County)*; Province: *NA*
4. Type of Industry: *(Indicate production sector)*
5. Name(s) of emitting Equipment:
  - e.g.:*
  - a) *Generators;*
  - b) *Boilers*
  - c) *Incinerators*
  - d) *Production equipment*
6. Site Plan Layout, (attach sketch)
  - (a) *Distance of the equipment to the nearest building (X meters)*
  - (b) *Height of the above referred building(Y meters)*
  - (c) *Nearest sensitive area or facility (As guided under 6<sup>th</sup> Schedule - Annex 6)*
  - (d) *Immission (fall-out) point (Point determined from the dispersion model)*
7. Operating Emission levels: *(Allowable emission limits as indicated in the 3<sup>rd</sup> Schedule –Annex 7)*
  - For instance:*
  - (a) *Parameter: V  $\mu\text{g}/\text{Nm}^3$*
  - (b) *Parameter: X  $\mu\text{g}/\text{Nm}^3$*
  - (c) *Parameter: Y  $\mu\text{g}/\text{Nm}^3$*
  - (d) *Parameter: Z  $\mu\text{g}/\text{Nm}^3$*
8. Proposed Emission Control Mitigation Measures: *(As guided under 7<sup>th</sup> Schedule-Annex 8)*
  - For instance:*
  - (a) *PM – Mechanical Collectors (cyclones)*

- (b) VOC – Adsorption/absorption systems, flares, oxidizers and bio filters**
- (c) SOX – dry or wet scrubbers**
- (d) NOX – Catalytic reduction systems or EGR**

**9. Additional information required: Attach Stack Emission Report and Ambient Air Quality Monitoring Report as per the attached report format – Annex 2 and Annex 3 respectively.**

**NB. Stack Emission and Ambient Air Quality Measurements shall be carried out by a laboratory designated by NEMA for the Air media. (List of designated laboratories indicated under Annex-4)**

10. Start-up, and shut-down of the equipment
- a) Methods. **Emission Reduction measures**
  - b) Expected Frequency of Occurrence: **(Number of times in a day)**
  - c) Duration of occurrence: **(Time in minutes and start time of the occurrence)**
  - d) Projected emitted Pollutants  
**For instance:**
    - (i) Particulate Matter**
    - (ii) Volatile Organic Compounds**
    - (iii) Sulphur Oxides**

11. (a).Nature of emissions (gaseous, Particulates)
- (i) Particulates**
  - (ii) Gaseous**
  - (iii) Odour**

- (b) Concentration of the emissions  
**Emission Results from the stack emission report.**
- (a) Parameter:  $V_1 \mu\text{g}/\text{Nm}^3$**
  - (b) Parameter:  $X_1 \mu\text{g}/\text{Nm}^3$**
  - (c) Parameter:  $Y_1 \mu\text{g}/\text{Nm}^3$**
  - (d) Parameter:  $Z_1 \mu\text{g}/\text{Nm}^3$**

Signature of Applicant .....Date.....  
Position (Designation of the legal entity

FOR OFFICIAL USE

Approved/Not approved.....  
Dated this.....day.....of 20.....  
Signature.....  
(Seal)

***NB. Attach a copy of bank deposit slip for payment of Emission licence and its application fees as guided under Annex 5.***

## **Annex 2: Stack emission Report Format**

The results summary report must be signed by the licensee.

The report must contain at least the:

- a) Name and address of reporting facility
- b) Date of issue of the report
- c) Date, time and place of measurements
- d) Identification of sources tested
- e) The test method used and details of any deviation from that method
- f) Details of source or process operating conditions during sampling and a statement about the representativeness of the sample taken
- g) Location of sampling plane, with respect to the nearest upstream and downstream flow disturbances
- h) Number of sampling points
- i) Period of sampling (start and end times)
- j) Average stack gas velocity in meters per second
- k) Average stack gas temperature in kelvins/centigrades
- l) Air pollutant molecular weight or density in kilograms per cubic meter
- m) Water content of stack gas, expressed as a percentage by volume
- n) Stack gas volumetric flow rate on a dry basis under standard conditions, in cubic meters per second
- o) Concentration of Air pollutant on a dry basis under standard conditions, in grams per cubic Meter
- p) Mass emission rate of Air pollutant on a dry basis under standard conditions, in grams per Second
- q) Details of sample preservation, if applicable
- r) Any factors that may have affected the monitoring results
- s) The precision of the results in accordance to ISO 5725
- t) Details of the most recent calibration of each instrument used to take measurements.

### ***NB.***

- (i) If an Air pollutant cannot be detected, results **must not** be quoted as zero but as less than the method's limit of detection.*
- (ii) All volumes and concentrations are normally reported as dry at a temperature of 0°C and at an absolute pressure of 101.3 kilopascals (kPa).*
- (iii) **Attach a copy of the measuring equipment data-Logger print-out.***

### **Annex 3: Ambient Air Quality Monitoring Report Format**

The results summary report must signed by the licensee

The report must contain at least the:

- a) Name and address of reporting facility
- b) Date of issue of the report
- c) The test method used and details of any deviation from that method
- d) Period of monitoring (start and end dates and percentage of time the instruments were online)
- e) Location of monitoring points (normal address and GPS reference, height above nominal ground level, and a description of the terrain features)
- f) The air pollutants measured, the monitoring instruments used, and a description of the air sampling system
- g) Maximum hourly average concentration, daily average concentration, and appropriate longer-term averages
- h) Appropriate statistical information to describe the variability and range of the concentrations
- i) Any factors that may have affected the monitoring results
- j) The precision of the results in accordance to ISO 5725
- k) Details of the most recent calibration of each instrument used to take measurements.

**NB.**

- (i) *If an Air pollutant cannot be detected, results **must not** be quoted as zero but as less than the method's limit of detection.*
- (ii) ***Attach a copy of the measuring equipment data-Logger print-out.***

**Annex 4: List of laboratories designated by NEMA to carry out air quality measurements**

	<b>Laboratories</b>	<b>Email &amp; Mobile Contact.</b>	<b>Scope Measurement</b>			
			<b>Stack Emission</b>		<b>Ambient Air Quality</b>	<b>Indoor Air Quality</b>
			<i>PM</i>	<i>Gaseous</i>		
1	SGS Kenya Limited P.O.7211-00200, Nbi	<a href="mailto:Sgsinquiries=Kenya@sgs.com">Sgsinquiries=Kenya@sgs.com</a> Tel: 020-2733693	√	√	√	
2	Polucon Services P.O. Box 99344 -80100, Msa	<a href="mailto:Polucon@polucon.com">Polucon@polucon.com</a> Tel: 0722229944	√	√	√	
3	Institute of Nuclear Science & Technology P.O.Box 3097 - 00100, <b>NAIROBI</b>	<a href="mailto:inst@uonbi.ac.ke">inst@uonbi.ac.ke</a> tel: 020-318262			√	
4	Ecoserv Laboratory, P.O.Box 1303 - 00100, <b>NAIROBI</b>	<a href="mailto:gachanja@ecoservkenya.com">gachanja@ecoservkenya.com</a> tel: 0722882879	√			√
5	Labworks P.O.Box 9648 - 00100, <b>NAIROBI</b>	<a href="mailto:info@labworksea.com">info@labworksea.com</a> tel: 0726209641	√	√	√	
6	Kenya Bureau of Standards P.O.Box 54974=00200, <b>NAIROBI</b>	<a href="mailto:Info@kebs.org">Info@kebs.org</a> Tel: 0722203137	√	√		√

*PM: Particulate Matter*



**Annex 5: Emission License Fees as per the 13<sup>th</sup> Schedule**

r85

**THIRTEENTH SCHEDULE**

**FEES**

The fees chargeable under these Regulations shall be as specified hereafter.

- (a) Application for:
  - (i) Emission License for listed emitting facility: - *KShs.5, 000/=*
  - (ii) Emission License for other emitting facility than (i) above: - *KShs.5,000/=*
  - (iii) Variation of emission license: *KShs.3,000/=*
  - (iv) Transfer of emission license: - *KShs.3,000/=*
  
- (b) Annual License fee for Emission into the atmosphere
  - (i) Facility listed in 6<sup>th</sup> schedule under category I :- *KShs.50,000/=*
  - (ii) Facility listed in 6<sup>th</sup> schedule under category II :- *KShs.30,000/=*
  - (iii) Polluting facility not in 6<sup>th</sup> Schedule other than ( i) and (ii) above :- *KShs.20,000/=*
  
- (c) Inspection of emission monitoring records/emission license register: - *KShs.200/=*
  
- (d) Variation of emission License is 10% of the Annual License fee

The above fees are payable to the NEMA Revenue Account:

Details:

Account No. **1102298158**

Bank Name: **KCB,**

Branch: **KICC Branch,**

## **Annex 6: List of Controlled Areas**

### **SIXTH SCHEDULE**

#### **LIST OF CONTROLLED AREAS**

- a) Residential areas, Hospitals,
- b) National Parks,
- c) Reserves and Sanctuaries,
- d) Conservation areas,
- e) Central Business Districts
- f) Any other area declared by the Authority from time to time

# Annex 7 : Emission Limits for Controlled and Non-Controlled Facilities

r16,72

## THIRD SCHEDULE

### EMISSION LIMITS FOR CONTROLLED AND NON-CONTROLLED FACILITIES

Air Pollutant	Industry	Opacity	Particulate (Dust) PM <sub>10</sub> (mg/Nm <sup>3</sup> )		Sulphur oxide (SO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		Nitrogen oxides (NO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		O <sub>2</sub> %	Carbon monoxide	Carbon dioxide	Hydrocarbons (mg/Nm <sup>3</sup> )	Hydrogen Sulphide	Hydrogen Chloride	Hydrogen Fluoride	Lead (mg/Nm <sup>3</sup> )	Dioxins/Furans	
			NDA	DA	NDA	DA	NDA	DA		(mg/Nm <sup>3</sup> )	(mg/Nm <sup>3</sup> )		(mg/Nm <sup>3</sup> )	(mg/Nm <sup>3</sup> )				
			NDA	DA	NDA	DA	NDA	DA										
	Aluminium recycling plants		10 – 30									20		*			*	
	Asphalt mixing batch plants	< 100 t:			2000		460			*	*	20						
		100 to 300 t:																
		300 to 500 t:																
		> 500 t:																
	Boilers	*	50		*		*			*	*	*	*				*	
	Cement plants		50		400		1500			*	500	300					0.5ng/Nm <sup>3</sup>	
	Ceramics manufacture		400				180-250 ppm											
	Coke & coal plants		*		*		*			*	*	*	*	*				
	Dairy		50															
	Fertilizer plant		50		*		500					20	30		50			
	Iron Foundry		50		560					*	*				5			
	Brass bronze Foundry		50		20 - 50													
	Glass Manufacture		20 - 50		Oil fired : 1,800		1000 - 2000							50	5			

Industry		Air Pollutant		Opacity	Particulate (Dust) PM <sub>10</sub> (mg/Nm <sup>3</sup> )	Sulphur oxide (SO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		Nitrogen oxides (NO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		O <sub>2</sub> %	Carbon monoxide (mg/Nm <sup>3</sup> )	Carbon dioxide (mg/Nm <sup>3</sup> )	Hydrocarbons (mg/Nm <sup>3</sup> )	Hydrogen Sulphide (mg/Nm <sup>3</sup> )	Hydrogen Chloride (mg/Nm <sup>3</sup> )	Hydrogen Fluoride (mg/Nm <sup>3</sup> )	Lead (mg/Nm <sup>3</sup> )	Dioxins/Furans			
		NDA	DA			NDA	DA	NDA	DA												
							Gas fired : 700														
	Galvanizing operations	*	50																		
	Incinerators	*	< 10 t: 4g/kg 10 to 30 t: 10g/kg 30 to 50 t: 10g/kg > 50 t: 17.5 g/kg		500		Existing: 130-600 ppm				*		*					2.0 – 80 nTEQ/Nm <sup>3</sup>			
								New: 60-400 ppm											0.1 – 5 nTEQ/Nm <sup>3</sup>		
	Municipal waste		100				300				*	*									
	Medical waste		20 (PM <sub>2.5</sub> )		500		300				*	*	*		*			*			
	Industrial waste	*	50		150		460				*	*	*	*	*			*			
	Kraft pulp mills		100-150		500		600				*	*	20	15	*	*		*			
	Lead Recycling plants		20 (PM <sub>2.5</sub> )		400													50 (B & R Furnace)			

Industry	Air Pollutant	Opacity	Particulate (Dust) PM <sub>10</sub> (mg/Nm <sup>3</sup> )		Sulphur oxide (SO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		Nitrogen oxides (NO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		O <sub>2</sub> %	Carbon monoxide (mg/Nm <sup>3</sup> )	Carbon dioxide (mg/Nm <sup>3</sup> )	Hydrocarbons (mg/Nm <sup>3</sup> )	Hydrogen Sulphide (mg/Nm <sup>3</sup> )	Hydrogen Chloride (mg/Nm <sup>3</sup> )	Hydrogen Fluoride (mg/Nm <sup>3</sup> )	Lead (mg/Nm <sup>3</sup> )	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
																	10 Pot Furnace)
Mineral Processing			50														
Mining & Quarry		20%	400														
Non-ferrous secondary smelters			50		20		*		*	*	*	*	*				
Non-ferrous secondary smelters	*		< 10 t: 7.5 g/kg (PM <sub>2.5</sub> )	800								20	15				*
			10 to 30 t: 22.5 g/kg (PM <sub>2.5</sub> )														
			30 to 50 t: 37.5g/kg (PM <sub>2.5</sub> )														
			> 50 t: 52.5 g/kg (PM <sub>2.5</sub> )														
Paint and varnish manufacturing			50 (PM <sub>2.5</sub> )								20	15	10				
Pesticides formulation			20 (PM <sub>2.5</sub> )								20		5				
Pesticide manufacturing			20								20						

Industry	Air Pollutant	Opacity	Particulate (Dust) PM <sub>10</sub> (mg/Nm <sup>3</sup> )		Sulphur oxide (SO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		Nitrogen oxides (NO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		O <sub>2</sub> %	Carbon monoxide (mg/Nm <sup>3</sup> )	Carbon dioxide (mg/Nm <sup>3</sup> )	Hydrocarbons (mg/Nm <sup>3</sup> )	Hydrogen Sulphide (mg/Nm <sup>3</sup> )	Hydrogen Chloride (mg/Nm <sup>3</sup> )	Hydrogen Fluoride (mg/Nm <sup>3</sup> )	Lead (mg/Nm <sup>3</sup> )	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
Petroleum Refineries			50		Sulphur recovery: 150		460			*		20	152				*
					Combustion units: 500												
Pharmaceuticals manufacturing plants			20									80		10			
Printing industry												20		10			
Steel mills		*	Existing-240 (PM <sub>2.5</sub> )		500		200			*							
			New-120 (PM <sub>2.5</sub> )				180										
Sulphuric acid Plants			50		SO <sub>2</sub> : 2 kg/t acid												
					SO <sub>3</sub> : 0.15 kg/t acid												
					< 100 t: 3.75 g/kg												
					100 to 300 t: 10.5 g/kg												

Air Pollutant	Industry	Opacity	Particulate (Dust) PM <sub>10</sub> (mg/Nm <sup>3</sup> )		Sulphur oxide (SO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		Nitrogen oxides (NO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		O <sub>2</sub> %	Carbon monoxide (mg/Nm <sup>3</sup> )	Carbon dioxide (mg/Nm <sup>3</sup> )	Hydrocarbons (mg/Nm <sup>3</sup> )	Hydrogen Sulphide (mg/Nm <sup>3</sup> )	Hydrogen Chloride (mg/Nm <sup>3</sup> )	Hydrogen Fluoride (mg/Nm <sup>3</sup> )	Lead (mg/Nm <sup>3</sup> )	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
					300 to 500 t: 34.5 g/kg												
					> 500 t: 48 g/kg												
	Sugar Manufacture		(< 8.7 mw input boiler): 150		2000		Liquid fuels: 460 ppm										
			(>8.7 mw input boiler): 100				Solid fuels: 750 ppm										
	Soda ash Manufacture		50											*			
	Tanneries		50		1000		1500					20	15	*			*
	Textiles		50									20					
	Geothermal Power plants				*		*						*				
	Thermal Power Plants																
	Small combustion facilities(3MWth – 50NMWth)Reciprocating internal Combustion Engine (RICE)																
	Engine (Gas)		N/A		N/A		200(SI) 1,600(CI)										

Air Pollutant	Industry	Opacity	Particulate (Dust) PM <sub>10</sub> (mg/Nm <sup>3</sup> )		Sulphur oxide (SO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		Nitrogen oxides (NO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		O <sub>2</sub> %	Carbon monoxide (mg/Nm <sup>3</sup> )	Carbon dioxide (mg/Nm <sup>3</sup> )	Hydrocarbons (mg/Nm <sup>3</sup> )	Hydrogen Sulphide (mg/Nm <sup>3</sup> )	Hydrogen Chloride (mg/Nm <sup>3</sup> )	Hydrogen Fluoride (mg/Nm <sup>3</sup> )	Lead (mg/Nm <sup>3</sup> )	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
Liquid	K S 1 5 1 5	50			Use 1.5% sulphur fuel( SF)*		Boreø <400 mm: 1460 Boreø ≥400 mm: 1,850										
Turbine																	
Natural Gas																	
3MWth to < 15MWth		N/A			N/A		42pp m(Ele ctric Gener ation)( EG) 100pp m(Me chanic al Drive) (MD)										
15MWth to < 50MWth		N/A			N/A		25pp m										
Other fuels																	
3MWth to < 15MWth		N/A			0.5% SF		96pp m(EG ) 150pp m(M D)										
15MWth to < 50MWth		N/A			0.5% SF or lowe r		74pp m										
Boiler																	
Gas		N/A			N/A		320										



Air Pollutant	Industry	Opacity	Particulate (Dust) PM <sub>10</sub> (mg/Nm <sup>3</sup> )		Sulphur oxide (SO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		Nitrogen oxides (NO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		O <sub>2</sub> %	Carbon monoxide (mg/Nm <sup>3</sup> )	Carbon dioxide (mg/Nm <sup>3</sup> )	Hydrocarbons (mg/Nm <sup>3</sup> )	Hydrogen Sulphide (mg/Nm <sup>3</sup> )	Hydrogen Chloride (mg/Nm <sup>3</sup> )	Hydrogen Fluoride (mg/Nm <sup>3</sup> )	Lead (mg/Nm <sup>3</sup> )	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
Liquid			50 150 *	or	2000		460										
Solid			50 150 *	or	2000		650										
Combustion Technology/Fuel																	
RICE																	
Natural Gas			N/A	N/A	N/A	N/A	200(SI) 400(DF)	200(SI) 400(DF/CI)	15%								
Liquid fuels(>=50MWth to < 300MWth)			50	30	1,170 or ≤2% SF	0.5 %S F	1,460(CI, Bore φ<400 mm) 1,850(CI, Bore φ ≥400 mm) 2,000(DF)		15%								
Liquid fuels(plant ≥ 300MWth)			50	30	585 or ≤1%S F	0.2 %S F	740**	400	15%								
Biofuels/Gaseous fuels other than Natural Gas			50	30	N/A	N/A	30% > Natural Gas & Liquid Fuels										
Combustion Turbine																	

Air Pollutant	Industry	Opacity	Particulate (Dust) PM <sub>10</sub> (mg/Nm <sup>3</sup> )		Sulphur oxide (SO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		Nitrogen oxides (NO <sub>x</sub> ) (mg/Nm <sup>3</sup> )		O <sub>2</sub> %	Carbon monoxide (mg/Nm <sup>3</sup> )	Carbon dioxide (mg/Nm <sup>3</sup> )	Hydrocarbons (mg/Nm <sup>3</sup> )	Hydrogen Sulphide (mg/Nm <sup>3</sup> )	Hydrogen Chloride (mg/Nm <sup>3</sup> )	Hydrogen Fluoride (mg/Nm <sup>3</sup> )	Lead (mg/Nm <sup>3</sup> )	Dioxins/Furans
			NDA	DA	NDA	DA	NDA	DA									
Natural Gas (All turbine types of unit > 50MWth)			N/A	N/A	N/A	N/A	51	25									
Fuels other than Natural Gas (unit > 50MWth)			50	30	Use 1% S F	Use 0.5% S F											
Boiler																	
Natural Gas			N/A	N/A	N/A	N/A	240	240	3%								
Other Gaseous fuels			50	30	400	400	240	240	3%								
Liquid Fuels (Plant >=50MWth to < 600MWth)			50	30	900-1500	400	400	200	3%								
Liquid Fuels (>=600MWth)			50	30	200-850	200	400	200	3%								
Solid Fuels >=50MWth to < 600MWth)			50	30	900-1500	400	510	200	6%								
Solid Fuels (>=600MWth)			50	30	200-850	200	1,100 upto volatile matter of fuel < 10%	200	6%								
Waste water treatment plants							NH <sub>3</sub> (100-400)					400 - 2,000	50-200				

And any other parameter as may be prescribed by the Authority from time to time

**Legend**

SF: Sulphur Fuel

\* 1.5-3.0% only justified by project specific considerations i.e. add secondary treatment to meet levels of 1.5% Sulphur

\*\* dependent on water availability for injection

CI: Compression Ignition

SI: Spark Ignition

DF: Dual Fuel

DA: Degraded Area

NDA: Non-degraded Area

The chimney or stack should have a minimum height of 10 metres above ground level and clear the highest of the building by not less than 3 metres for all roofs. The topography and height of adjacent buildings within 50 metres radius should be taken into account.

Toxic Equivalent (TEQ) is the sum of the toxic equivalent factors (TEF) of a mixture congeners contained in a compound. The compound 2,3,7,8-tetrachlorodibenzo-p-dioxin(TCDD) was assigned a TEF of 1 after being identified, by International Association of Radiology and Cancer (IARC) and World Health Organisation (WHO), as the most toxic of all compounds, and as carcinogenic to humans, based mainly on studies of cases involving accidental or occupational heavy exposure. Therefore the TEF is a weighting factor.

*g - gram*

*µg- microgram*

*kg – kilogram (1,000g)*

*mg - milligram*

*µg- microgram*

*m<sup>3</sup> – cubic metre*

*ppm – Parts per million*

*t – tonne*

## Annex 8: Acceptable Emission Control Technologies

### SEVENTH SCHEDULE

#### ACCEPTABLE EMISSION CONTROL TECHNOLOGIES

##### List of Acceptable Emission Control Technologies

	<b>Air Pollutants</b>	<b>Emission Control technologies</b>	<b>Remarks</b>
1.	Particulate Matter	Mechanical collectors ( <a href="#">dust cyclones</a> , multicyclones)	
		<a href="#">Electrostatic precipitators</a>	
		Fabric filters (baghouses)	
		<a href="#">Particulate scrubbers</a>	
2.	Nitrogen Oxides (Nox) *	<a href="#">Low NOx burners</a>	
		<a href="#">Selective catalytic reduction</a> (SCR)	
		<a href="#">Selective non-catalytic reduction</a> (SNCR)	
		<a href="#">NOx scrubbers</a>	
		<a href="#">Exhaust gas recirculation</a>	
		<a href="#">Catalytic converter</a>	
3.	Volatile Organic Compounds (VOC), hydrocarbons	Adsorption systems, such as <a href="#">activated carbon</a>	
		<a href="#">Flares</a>	
		<a href="#">Thermal oxidizers</a>	
		Catalytic oxidizers	
		<a href="#">Biofilters</a>	
		<a href="#">Absorption (scrubbing)</a>	
		Cryogenic condensers	
4.	Sulphur Oxides (SOx)	<a href="#">Wet scrubbers</a>	
		<a href="#">Dry scrubbers</a>	
		<a href="#">Flue gas desulphurization</a>	
5.	Carbon Oxides	<a href="#">Thermal oxidizers</a>	
6.	Hydrogen Sulphides	<a href="#">Absorption (scrubbing)</a>	
7.	Hydrogen Chloride	Dry Scrubbers,	

	<b>Air Pollutants</b>	<b>Emission Control technologies</b>	<b>Remarks</b>
		Adsorption systems, such as <a href="#">activated carbon</a>	
8.	Dioxins & Furans	Cyclone	
		Electrostatic precipitator	
		Bag filter	
		Wet scrubber	
		Quenching & subsequent wet scrubber	
		Catalytic oxidation (selective catalytic reaction)	
		Catalytic bag filter	
		Dry absorption in resins (carbon Particles dispersed in a polymer matrix)	
		Entrained flow reactor with added activated carbon or coke/lime or limestone solutions and subsequent fabric filter	
		Fixed bed or circulating fluidized bed reactor, adsorption with activated carbon or open hearth coke	
9.	Metals (Hg, Pb, )	Sorbent Injection Technology	
		Electro-Catalytic Oxidation (ECO)	
		K-Fuel	
10.	Any other technology approved by the Authority from time to time		

**\* Notes**

Best Available Technology (BAT) for this category of equipment will consist of combustion modification technology including either:

- (a) low NO burner technology with low excess air
- (b) Air if technically feasible; or
- (c) flue gas re-circulation with low excess air.