

# **QUESTIONNAIRE FOR ENVIRONMENTAL APPRAISAL**

## ***(THERMAL POWER SECTOR PROJECTS)***

Note 1 : All information given in the form of annexures should be part of this file itself. Annexures as separate files will not be accepted.

Note2 : Please enter x in appropriate box where answer is Yes/No

### **I. General Information**

A. Name of the Project

1. Existing project/proposed project/  
expansion project/modernization project :
2. If Existing/expansion/  
modernization project, whether  
environmental clearance  
has been obtained :

B. Generation Capacity (MW)

C. Location

Village	Tehsil	District	State

D. Geographical Information

1. Latitude

2. Longitude

3. Elevation above Mean  
Sea Level (metres)

4. Total Area envisaged for setting up  
of project (in ha.)

- 5. Nature of terrain (hilly, valley, plains, Coastal plains etc.)
- 6. Nature of Soil (sandy, clayey, silty loam etc. with permeability in cm/sec)
- 7. Permeability (cm/sec)

E. Alternate sites considered

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_

F. Reasons for selecting the proposed site on comparative evaluation on environmental consideration.

**II. Current land usage of the proposed project site Area (in hectares) .**

- A. Notified Industrial Area/Estate
- B. Agricultural
  - 1. Irrigated
  - 2. Unirrigated
- C. Homestead
- D. Forest
- E. Grazing
- F. Fallow
- G. Mangroves
- H. Marshes
- I. Others (Please specify)
- Total

**III. Is the proposed site located in a low-lying area ?**

Yes  No

If yes,

A. Level before filling (above MSL, in. metres) \_\_\_\_\_

B. Level after filling (above MSL in metres) \_\_\_\_\_

Quantity of Fill Material required (in cum.)	Source

C. Does the project involve land preparation/reclamation ?

Yes  No

If yes provide details

**IV. Please indicate area earmarked for each of the following (in ha.)**

A. Plant Facilities

B. Ash Disposal

C. Storage (Fuel)

D. Storage (Water)

E. Storage (Hazardous Waste)

F.	Storage (Hazardous Chemicals)	
G.	Storage (Others)	<input type="text"/>
H.	Approach Road(s)	<input type="text"/>
I.	Township	<input type="text"/>
J.	Green Belt	<input type="text"/>
K.	Others (Please specify)	<input type="text"/>
	Total	<input type="text"/>

**V. Proximity to sea/water bodies :**

	Sea	Other Water bodies like River/creek/lake etc. (Please specify)
Distance of site* boundary (in m)		
Distance of plant facilities (in m)		

\* From highest flood line/high tide line

**VI. Whether any of the following exist within 7 km. of the periphery of the project site. If so, please indicate aerial distance and the name of the eco-system as given under the Table.**

S.No		Name	Area falling within 7 km periphery of project (ha.)	Aerial Distance (in km.)
1	National Park/Wildlife Sanctuary			
2	Tiger Reserve/Elephant Reserve/Turtle Nesting ground			

3	Core Zone of Biosphere Reserve			
4	Habitat for migratory birds			
5	Lakes/Reservoir/Dams			
6	Stream/Rivers			
7	Estuary/Sea			
8	Mangroves			
9	Mountains/Hills			
10	Notified Archaeological sites			
11	Any other Archaeological sites			
12	Industries/Thermal Power Plants			
13	Defence Installation			
14	Airports			

If located within limits of municipal bodies, please confirm.

From National/ State Highways and railway lines, distance of 0.5 km should be maintained.

If located in the landing funnel of the airport, clearance from Airports Authority of India should be obtained.

**VII. Description of the flora/vegetation within 7 km under following headings.**

A. Agricultural crops : \_\_\_\_\_

B. Commercial crops : \_\_\_\_\_

C. Plantation : \_\_\_\_\_

D. Natural Vegetation/Forest Type : \_\_\_\_\_

E. Grass Lands : \_\_\_\_\_

- F. Endangered species : \_\_\_\_\_
- G. Endemic species : \_\_\_\_\_
- H. Others (Please Specify) : \_\_\_\_\_

**VIII. Description of fauna (non-domesticated) within 7 km under the following headings**

- A. Total listing of faunal elements
- B. Endemic fauna species
- C. Endangered species
- D. Migratory species
- E. Route of migratory species of birds and mammals
- F. Details of aquatic fauna (if applicable)

**IX. Meteorological Parameters**

- A. Seasonal – Monitoring Data (continuous monitoring for one full season except monsoon should be carried out)
  - 1. Temperature (in <sup>0</sup>C)
    - (a) Maximum\_\_\_\_\_ (b) Minimum\_\_\_\_\_ (c) Mean\_\_\_\_\_
  - 2. Rain fall (in mm) \_\_\_\_\_
    - (a) Maximum\_\_\_\_\_ (b) Minimum\_\_\_\_\_ (c) Mean\_\_\_\_\_
  - 3. Mean value of humidity (in %)
  - 4. Inversion occurrence
    - (a) in percentage                      (b) Height in meters
  - 5. Seasonal Wind-rose pattern (16 points on compass scale)

- B. Hourly Mean Meteorological data (based on one full season data collected at site required as input for air quality modelling)

Hour	Low/Medium Cloud amount (in OCTAS)	Wind Speed in (Kmph)	Predominant wind direction	Ambient air temperature (in deg K)	Hourly stability	Mixing depth (in m)
1.						
2.						
3.						
.....						
.....						
23.						
24.						

Attach additional sheet as required.

#### X. Ambient Air Quality Data

[Frequency of Monitoring should be as per guidelines of CPCB and monitoring should cover one full season (excluding monsoon)]

- A. Season and period for which monitoring has been carried out
- B. Frequency of sampling

C. Number of samples collected at each side

Date, Time & Location	Wind direction & Speed	24 hourly Concentration as monitored (in $\mu\text{g}/\text{m}^3$ .)  SPM, RPM, SO <sub>2</sub> ,NO <sub>x</sub> .CO	Permissible Standard(As per EPA/SPCB consent)	Remarks (Name of the instrument and sensitivity)

D. 24 hourly concentrations (in  $\mu\text{g}/\text{m}^3$ )

Pollutant(s)	Maximum	Minimum	Mean	98%
SPM				
RPM				
SO <sub>2</sub>				
NO <sub>x</sub>				
CO				

E. Specific air pollution issues in the project area.

**XI. Water Requirements (cum/day)**

Purpose	Avg. Demand	Peak Demand	Source	Type Treated / untreated/Fresh /Recycled	Remarks
A. Project 1. Process 2. Cooling water					



3. DM water					
4. Dust suppression					
5. Drinking					
6. Green Belt					
7. Fire Service					
8. Others (pl. specify)					
<b>B. Township</b>					
1. Green Belt					
2. Drinking					
3. Others (pl. specify)					
<b>C. Total</b>					

**XII. Source of Raw Water Supply**

S.No	Source	Cu.m./hr	Cu.m./day
1	Sea		
2	River		
3	Groundwater		
4	Other surface water bodies (Please specify)		

**XIII. Lean Season flow in case of surface water source (cusecs/cumecs)**

**XIV. Groundwater**

A. Recharge Rate

B. Withdrawal rate

C. Ground water level (metres)

1. Premonsoon

2. Postmonsoon

**XV. Competing Users of the Water Source :**

S.No	Usage	Present Consumption (cu.m./day)		Addition Proposed as per local plan (cu.m./day)		Total (cu.m./day)	
		Surface	Ground	Surface	Ground	Surface	Ground
1	Irrigation						
2	Industry						
3	Drinking						
4	Others (Please specify)						
Total							

**XVI. Physico chemical analysis of Raw Water at intake point**

**XVII. Physico chemical analysis of treated water to be used in project/township.**

**XVIII. Waste Water Management**

- A. Description of waste water treatment plan with flow chart
1. Coal storage
  2. Other than coal storage

B. Composition/characteristics of discharge stream(s) before and after treatment

S.No	Item	Characteristics	
		Before treatment	After treatment
1			
2			
3			
4			

C. Daily discharge (cu.m./day) from different sources

- |    |                     |                      |
|----|---------------------|----------------------|
| 1. | Cooling             | <input type="text"/> |
| 2. | Processing          | <input type="text"/> |
| 3. | D.M. Plant effluent | <input type="text"/> |
| 4. | Domestic            | <input type="text"/> |
| 5. | Others ( specify )  | <input type="text"/> |
| 6. | Total               | <input type="text"/> |

D. Quantity of water recycled

- |    |               |                      |
|----|---------------|----------------------|
| 1. | (in %)        | <input type="text"/> |
| 2. | (in cu.m/day) | <input type="text"/> |

E. Details of recycling mechanism

F. Mode of final discharge/disposal of treated effluent :

S.No	Mode	Length (in m.)	Quantity(in cu.m/day)
1	Open Channel		
2	Pipeline		
3	Others (Please specify)		
Total			

G. Point of final discharge:

S.No	Final Point	Quantity (in cu.m/day)
1	Green belt within the plant/township	
2	Agricultural land	
3	Fallow Land	
4	Forest Land	
5	River/Stream	
6	Lake	
7	Estuary	
8	Sea	
Total		

I. Lean season flow rate in case of discharge in a river/stream (cusecs/cumecs)

1. Human
2. Irrigation
3. Industry
4. Others (pl. specify)

- K. Analysis of river water 100 metres upstream of discharge point and 100 metres downstream of discharge point (except in rainy/monsoon season) along with details of aquatic life.
- L. What is the predicted impact on water quality of the receiving body due to discharge ? (Briefly state the prediction tool adopted)

**XIX. Quantity of fly ash/residue produced per day (tonnes)**

	Dry	Wet
A. Fly Ash	<input type="text"/>	<input type="text"/>
B. Bottom Ash	<input type="text"/>	<input type="text"/>
C. Others, pl. specify	<input type="text"/>	<input type="text"/>
<b>Total :</b>	<input type="text"/>	<input type="text"/>

**XX. Solid Waste Management**

A. Details

	Source	Qty(TPM)	Form
1. Raw water treatment Plant	<input type="text"/>	<input type="text"/>	<input type="text"/>
2. ETP	<input type="text"/>	<input type="text"/>	<input type="text"/>
3. Process	<input type="text"/>	<input type="text"/>	<input type="text"/>
4. Others (pl. specify)	<input type="text"/>	<input type="text"/>	<input type="text"/>

- B. If waste(s) contain any hazardous/toxic substance/radioactive materials or heavy metals, provide data and proposed precautionary measures.
- C. What are the possibilities of recovery and recycling of wastes?
- D. Possible users of Solid Waste (s).

**XXI. Method of disposal of solid waste (s)**

	Method	Qty(TPM)
A.	Landfill	<input type="text"/>
B.	Incineration	<input type="text"/>
C.	Recovery	<input type="text"/>
D.	Downstream users	<input type="text"/>

**XXII. Please indicate the methods used for handling ash**

A.	Collection	<input type="text"/>
B.	Transport	<input type="text"/>
C.	Disposal	<input type="text"/>

**XXIII. Utilisation of ash (tonnes per day)**

A.	Proposed use	
1.	Bricks	<input type="text"/>
2.	Cement	<input type="text"/>
3.	Road construction	<input type="text"/>
4.	Landfill	<input type="text"/>
5.	Soil amendment	<input type="text"/>
6.	Others (Pl. specify)	<input type="text"/>

B.	In case of landfill		
1.	Is solid amenable for landfill? Yes	<input type="text"/>	No <input type="text"/>
2.	Dimensions of landfill		
3.	Life of landfill (Years)	<input type="text"/>	

4. Proposed precautionary and mitigation measures along with design Features.

C. Indicate the phased programme for utilisation of fly ash. (Number of years for full utilisation, area etc.)

**XXIV. Noise Pollution Control and Management**

A. Source

B. Level at Source (dB)

C. Level at project boundary (dB)

D. Abatement measures (give source-wise details)

**XXV. Fuel Requirements**

A. Details of Fuel used

S.No	Fuel	Daily Consumption (TPD)		Calorific value (Kcals/kg)	% Ash	% Sulphur
		Existing	Proposed			
1	Gas					
2	Naphtha					
3	HSD					
4	Fuel Oil					
5	Coal					
6	Lignite					
7	Other (please specify)					

B. Source of Fuel (Distance in km)

- |                           |                      |
|---------------------------|----------------------|
| 1. Port                   | <input type="text"/> |
| 2. Mine                   | <input type="text"/> |
| 3. Refinery               | <input type="text"/> |
| 4. Storage depot/Terminal | <input type="text"/> |

C. Mode of Transportation of fuel to site

- |                                 |                      |
|---------------------------------|----------------------|
| 1. Trucks (numbers/day)         | <input type="text"/> |
| 2. Pipeline(length in km.)      | <input type="text"/> |
| 3. Railway Wagons (numbers/day) | <input type="text"/> |

**XXVI. Coal handling and dust suppression**

**Give details of dust suppression/collection equipment for reducing pollution from coal fines and other fugitive emissions from coal handling**

- A. Wagon tipping
- B. Conveyer transfer points
- C. Storage
- D. Crushing mills
- E. Bunker filling
- F. Other (pl. specify)

**XXVII. Emissions and Stack details**

A. Flue gas characteristics(SPM, SO<sub>2</sub>, NO<sub>x</sub>)

S.No	Pollutant	Source of Emission	Emission rate kg/hr	Concentration in flue gas (g/m <sup>3</sup> )
1	SPM			
2	RPM			
3	SO <sub>2</sub>			
4	Nox			



B. Size distribution of SPM at the top of the stack

S.No	Range	% by weight
1	Micron	
2	1-10 Micron	
3	10-20 Micron	
4	<20 Micron	

C. Stack emission details

- Frequency of stack emission monitoring as per CPCB guidelines
- Emission rate for each pollutant (kg/hr)

S. No.	Stack Attached to	Stack Height (m)	Stack Internal diameter (m)	Temp. of exhaust gases (deg K)	Exit Velocity (m/sec)	SPM	SO2	NOX	Heat emission rate (in k.cal/hour)

Equipment used for stack monitoring should be indicated.

**XXVIII. Predicted impact on air quality (as per CPCB Guidelines for conducting the air quality modelling)**

**XXIX. Storage of chemicals (inflammable/explosive/hazardous/toxic substances)**

S.No	Name	Number of Storages	Capacity (TPD)	Physical and Chemical Composition	Consumption (in TPD)	Maximum Quantity of storage at any point of time	Source of Supply	Means of transportation

**XXX. Occupational Health and Industrial Hygiene.**

- A. What are the major occupational health and safety hazards anticipated. (Explain briefly).
- B. What provisions have been made/propose to be made to conform to health/safety requirements. (Explain briefly).
- C. Details of personal protective equipment provided/to be provided to the workers.
- D. Details of proposed measures for control of fugitive emission/odour nuisance from different sources.
- E. Details of fire protection and safety measures envisaged to take care of fire and explosion hazards.

**XXXI. Green Belt Plan**

- A. Total area of project / township (in ha.)
- B. Area already afforested (for existing projects), in ha.
- C. Area proposed to be afforested (in ha.)
- D. Plant species proposed
  - 1. Indigenous
  - 2. Exotic

- E. Width of green belt (minimum, in metres)
- |  |                      |
|--|----------------------|
| 1. Along plant boundary  | <input type="text"/> |
| 2. Roads and avenues within the plant                              | <input type="text"/> |
| 3. Ash Dike  | <input type="text"/> |
| 4. Township  | <input type="text"/> |
| 5. Other-ornamental, garden spaces,<br>Commercial plantations etc. | <input type="text"/> |

F. Trees planted & proposed

- |                               | Nos.                 | Survival rate        |
|-------------------------------|----------------------|----------------------|
| 1. Planted                    | <input type="text"/> | <input type="text"/> |
| 2. Proposed                   | <input type="text"/> |                      |
| 3. List of species<br>planted |                      |                      |

**XXXII. Construction Phase**

- A. Estimated duration of construction in months
- B. Number of persons to be employed for construction
- |            |                      |
|------------|----------------------|
| 1. Peak    | <input type="text"/> |
| 2. Average | <input type="text"/> |
- C. What provision has been made for the sewage treatment for the construction workers?
- D. How the fuel (kerosene/wood, etc.) requirement of labour force will be met to avoid cutting of trees from the adjoining areas
- E. Proposed Health care Measures with emphasis on protection from endemic diseases.
- F. Educational and other social welfare measures proposed.

### XXXIII. Human Settlement

	Aerial distance from the periphery of the site		
	Upto 500m from periphery	500m to 3000 m from the periphery	3000m to 7000m from the periphery
Population			
Number of Houses			
Present Occupational Pattern			

### XXXIV. Rehabilitation & Resettlement Plan (Wherever applicable)

#### A. Village(s) affected by the project:

S. No.	Village (Tribal/Others)	Population	Occupation	Average Income per annum

#### B. Population to be displaced

S.No	Name of Village	Population		
		Land oustees only	Homestead Ousteers only	Land and Homestead ousteers
1				
2				
3				

#### C. Salient features of Rehabilitation Plan for oustees

1. Site where the people are proposed to be resettled
2. Facilities proposed at the resettlement site
3. Compensation package
4. Agency/Authority responsible for their resettlement.

### XXXV. Pollution Control Aspects

A. Details of Pollution Control Systems :

S.No	Control system for	Existing	Proposed to be installed
1	Air		
2	Water		
3	Noise		
4	Solid Waste		

B. Efficiency of each pollution control equipment/system installed for the existing units

S.No	Name of the System/ Equipment	Design Efficiency %	Present Working efficiency %
1			
2			
3			

### XXXVI. Expenditure on Environmental Measures

A. Capital cost of the project (as proposed to approved by the funding agency/financial institutions

(Rs. Lakhs)

B. Cost of environmental protection measures (Rs. Lakhs)

S.No		Recurring Cost per annum	Capital Cost
1	Air Pollution Control		
2	Water Pollution Control		
3	Noise Pollution Control		
4	Environment Monitoring and Management		
5	Reclamation borrow/mined area		
6	Occupational Health		
7	Green Belt		
8	Others ( Pl. Specify)		

- C. Details of organizational set up/cell for environmental management and monitoring.
- D. Details of community welfare/peripheral development programmes envisaged/being undertaken by the project proponent :

**XXXVII. Public Hearing details :**

- A. Date of Advertisement
- B. Newspapers in which the advertisement appeared (with copies)
- C. Date of Hearing
- D. Panel Present
- E. List of public project along with address and occupation
- F. Summary/details of public hearing report

S.No	Issues raised	Recommendation of panel	Response of Project Proponents
1			
2			
3			

The data and information given in this Performa are true to the best of my knowledge and belief

**Date:**

Signature of the Applicant with full name & address.

**Place:**

Given under the seal of organisation on behalf of whom the applicant is signing.

## LIST OF DOCUMENTS TO BE ATTACHED WITH THE QUESTIONNAIRE

### **Thermal Power Sector**

S.No	Documents to be attached
1	Topographic map of the site indicating contours (1:2500 scale).
2	Topographic map covering 7kms radius from the periphery of the site indicating main features.
3	Wind rose diagram of the site (Seasonal)
4	Wind rose diagram of the site (Artificial)
5	Site map indicating the positions of the ambient air quality monitoring stations vis-à-vis wind direction.
6	Flow sheet of the process adopting indicating mass input/output brief description of the process including technological and engineering details.
7	Alternative technologies considered along with details of criteria used for selecting the technology and result of evaluation.
8	Approval of ground water board/irrigation departments/Municipality etc for supply of water.
9	Mass balance for water used by project in a flow chart.
10	Flow chart for waste water treatment with mass balance.
11	Site map indicating solid waste disposal facilities.
12	Lay out of the plant showing the position of stack for deciding the inter stack distance.
13	Site map indicating the storage facilities.
14	Approval of the controller of explosives for lay out and storage of hazardous substances.
15	Lay out green belt indicating width on all sides, trees, lawns and bushes.
16	Copy of advertisements issued in respect of public hearing.
17	No objection certificate from the pollution control board.

18	Incase of proposals for expansion copies of renewals of consent from SPCB/PCC.
19	Copy of the application submitted to the state Government for forest clearance in case diversion of forestland is involved.
20	Comments/Observation/Recommendation of chief wildlife warden in case wildlife habitat/migration path exists within 25 kilometres of the project site.
21	Hydro-geological report in case ground water is to be used and/or the area is drought prone or the wastewater is likely to be discharged on land.
22	Environmental audit report for the previous two years in case of expansion of the existing undertaking.
23	In case the proposal involves installations in coastal zone, copy of the application forwarded by the State Government.