

Serial No. 23

BEFORE THE NATIONAL GREEN TRIBUNAL
 EASTERN ZONAL BENCH, KOLKATA, WEST BENGAL
 FINANCE CENTRE, 3RD FLOOR, NEW TOWN

MEMORANDUM OF APPLICATION

[Under Section 18 (1) read with sections 14, of the National Green
 Tribunal Act, 2010]

Original Application No. 188 of 2023

Rajkumar Das

..... Applicant

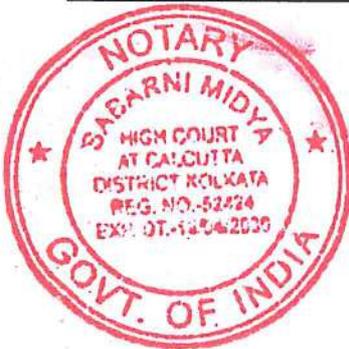
AND

MOEF & ORS.

.....Respondent

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Paushali Banerjee

Paushali Banerjee
 Advocate

10 DEC 2025

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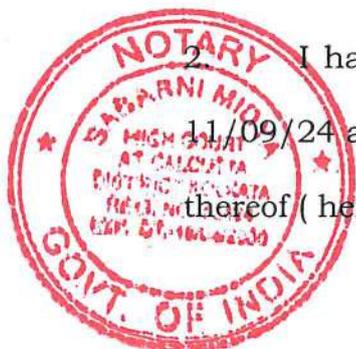
REJOINDER TO THE COUNTER AFFIDAVIT OF RESPONDENT

NO. 1.

I, Rajkumar Das, Son of Swapan Kumar Das, aged about 45 years residing at Malancha Chandpur, Khargapur, Paschim Midnapore-721301, by occupation Service, do hereby solemnly affirm and say as follows:

1. I am the Applicant in this herein and as such I am fully conversant with the fact and circumstances of the case, as such I am competent to affirm this affidavit in this instant matter.

2. I have perused the Affidavits affirmed by Respondent no.1 on 11/09/24 and on 10/07/25 and understood the contents and purport thereof (hereinafter referred collectively to as the said Affidavit).



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3. I have been advised to traverse and/or to deal with only those statements and/or allegations contained in the instant OA and to refer to such facts as may be material and/or relevant for the disposal of the same.

4. As such, save what would be borne out by the admitted records or what may be specifically admitted by me hereinafter, all statements and/or allegations contained in the said Affidavit should be deemed to have been denied and disputed by me as if each one has been set out hereunder and denied in seriatim.

5. I say that before dealing with the Affidavit, the Applicant seek liberty to place on record certain preliminary objections that are crucial for a holistic adjudication of the present matter.

6. I say that in the said Affidavit in Annexure R1/11 (page-908) it is clearly stated by R1 that the construction activity on the proposed area of sinter plant and pellet plant was found to be suspended during the last inspection held on 2/11/23.

7. I say that in the said Affidavit in Annexure R1/12 (pg 919) that is the personal hearing of the project held on 11/07/24, the latest of observation of RO based on monitoring conducted on 2/11/23 it is reiterated that construction activity is suspended.



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Therefore it is an admitted fact that illegal construction activities were carried out that was stopped after respondent no.1 issued show cause notice.

8. I say that it is very strange that even though the inspection on 2/11/23 states that the construction activities were suspended, the conclusion portion of the personal hearing held on 11/07/24 say that illegal construction reported at sinter plant and pellet plant appears to be unsubstantiated.

9. It is submitted by the Applicant that that in accordance with the specific conditions of the Environmental Clearance total requirement of water should not exceed 660 cubic meter per day and that requirement should be met from Khargapur Municipality and no ground water can be used by the project proponent. In the said Affidavit at Annexure R1/12 (pg 919), being the personal hearing of the project held on 11/07/24, it was stated by the private respondent that borewell water is used for drinking purpose only. It is submitted that respondent no.4 have twelve borewells within the factory premises in Khargapur and the affidavit of respondent no.3 clarifies that only three borewells have the required permission.

10. It is pertinent to mention here that water from twelve borewells are not required for drinking purpose, the entire factory is illegally



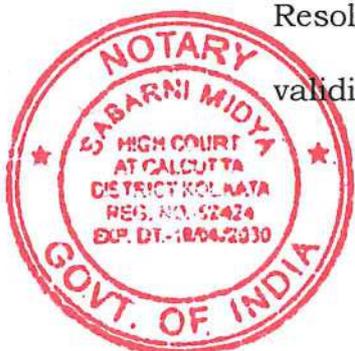
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extracting groundwater. The only source of water is the municipality and the agreement executed by and between Khargapur municipality and respondent no.4 during February, 2024 wherein it was agreed by the Khargapur Municipality 2 MGD water per day. It is not possible for the private respondent to meet the requirement of water if 2 MGD water per day is supplied by the municipality, therefore the respondent no.4 is illegally extracting ground water.

11. I say that respondent no.1 in the said Affidavit in Annexure R1/12 (pg. 919) that is the personal hearing of the project held on 11/07/24 accepted the word of the respondent no.4 and failed to reach towards any conclusion regarding extraction of ground water.

12. I say that the respondent no.1 did not at all take into account the fact that the limit of production in the Environmental Clearance is 31,300 TPA and in 2008 the consent was granted for 18360 MT/ M which amounts to 20,238 TPM and 2,42,856 TPA (20,238 X 12)

13. I say that the personal hearing was convened by the Ministry on 11.07.2024 one of the conclusions of the said personal hearing, inter alia, included the following: "with respect to interpretation of the Resolution Plan and the Honl]le Supreme Court order regarding the validity of EC and CTO, views of the Legal Monitoring Cell (1,MC) are



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to be sought.” Subsequently, this Hon’ble Tribunal, vide order dated 28.11.2024, was pleased to direct the Answering Respondent to file a status report on affidavit explaining whether the views of the LMC. The respondent no.1 filed Affidavit dated 10.07.25 and it was stated by the respondent no.1 that “... the matter was examined in detail by the Legal Monitoring Cell (LMC) of the Ministry. The LMC opined that in light of Clauses 15.13 and 15.14 of the Resolution Plan, which has been upheld by the Hon’ble Supreme Court vide order dated 04.05.2021, it is submitted that the EC dated 03.06.2009 with a validity for five years was valid until 02.06.2014. As per the Suspension Certificate, the project was shut down in May 2010, the residual period of validity after shut down was 4 years. Considering Clause 15.14(ii) (c) of the Resolution Plan, the said EC dated 03.06.2009 will be valid for its residual period of 4years as on date of shut down w.e.f. the effective date i.e. 0481 May, 202 1 (date when the Hon’ble Supreme Court upheld the order of the Hon’ble NCLT9 Kolkata Bench)...” “...the EC shall be deemed valid until 03.05.2025...”

14. It is pertinent to mention here that in the context of the opinion of respondent no.1, it is important to understand the interplay of IBC and Environment Impact Assessment Notification, 2006 (“EIA, 2006) under Environment Protection Act, 2006 (“EPA”).



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15. the Insolvency and Bankruptcy Code, 2016 - The “clean slate” doctrine in the Insolvency and Bankruptcy Code, 2016 (IBC) that is sought to be introduced in the present case, essentially provides that once a resolution plan is approved under IBC, The important aspect is in relation to “claims” under IBC that which are taken care of in the Resolution Plan which is submitted by the Resolution Applicant (RA) which is respondent no.4 in the present case. IBC defines “claim”, “creditor”, “corporate person”, “corporate debtor”, “ financial creditor”, “operational creditor” as follows;

“3 (6) "claim" means— (a) a right to payment, whether or not such right is reduced to judgment, fixed, disputed, undisputed, legal, equitable, secured or unsecured; (b) right to remedy for breach of contract under any law for the time being in force, if such breach gives rise to a right to payment, whether or not such right is reduced to judgment, fixed, matured, unmatured, disputed, undisputed, secured or unsecured

(8) "corporate debtor" means a corporate person who owes a debt to any person;

(10) "creditor" means any person to whom a debt is owed and includes a financial creditor, an operational creditor, a secured creditor, an unsecured creditor and a decree holder;



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(11) "debt" means a liability or obligation in respect of a claim which is due from any person and includes a financial debt and operational debt;

5. In this Part, unless the context otherwise requires,—

(7) "financial creditor" means any person to whom a financial debt is owed and includes a person to whom such debt has been legally assigned or transferred to;

(20) "operational creditor" means a person to whom an operational debt is owed and includes any person to whom such debt has been legally assigned or transferred;

(21) "operational debt" means a claim in respect of the provision of goods or services including employment or a debt in respect of the repayment of dues arising under any law for the time being in force and payable to the Central Government, any State Government or any local authority.

It is clear that IBC was enacted to consolidate the laws relating to the reorganization and insolvency resolution of corporate persons in a time-bound manner for maximizing the value of assets and balance the interests of all the stakeholders. Thus, the underlying intention behind initiating



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insolvency is with the intention that the corporate debtor is resolved / rehabilitated through a new management as soon as possible before it becomes unviable with no prospect of any meaningful recovery of its dues in the near future.

16. Environment Protection Act, 1986- The Act was passed by the under the Article 253 of the Constitution , which empowers to union government to enact laws to give effect to international agreements signed by the country. The purpose of the Act is to implement the decisions of the 1972 conference in Stockholm. The Act is related to the right to healthy environment that has been construed as a part of the right to life under article 21 of the Constitution. Environmental Clearance is granted under EIA notification 2006 under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986.

17. EIA Notification 2006- The Environmental Impact Assessment (EIA) Notification, 2006, issued under the Environment (Protection) Act, 1986, aims to ensure sustainable development by assessing and mitigating the potential environmental impacts of new projects or expansion/modernization of existing projects before granting approval. The primary objectives of the EIA Notification, 2006,

include:



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- i. Environmental Protection – To prevent and minimize adverse environmental impacts of projects through scientific evaluation.
- ii. Sustainable Development – To balance economic growth with ecological conservation by ensuring that projects adopt sustainable practices .
- iii. Precautionary Principle – To identify risks and uncertainties in advance and take preventive measures to mitigate environmental damage.
- iv. Polluter Pays Principle – To ensure that project proponents bear the cost of environmental management and restoration.
- v. Public Participation – To incorporate community concerns through public consultations before granting environmental clearance.
- vi. Legal Compliance – To enforce environmental laws and regulations, ensuring that projects comply with national and international environmental standards.
- vii. Post-Clearance Monitoring – To ensure continuous monitoring of projects for compliance with environmental conditions



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18. I say that the process to obtain environmental clearance as stipulated by the EIA, 2006 for projects comprises a maximum of four stages, all of which may not apply depending on the specific case(Category A or B) stipulated under the notification:

- I. Screening: This step is restricted only to Category 'B' projects. This stage entails an examination of whether the proposed project or activity requires further environmental studies for the preparation of an EIA for its appraisal prior to the grant of an EC.
- II. Scoping: At this stage, the EAC formulates detailed and comprehensive Terms of Reference which address all relevant environmental concerns for the preparation of the EIA. This is the basis for preparation of the EIA report. A Summary EIA is prepared in the format given in Appendix IIIA on the basis of the ToR furnished to the applicant.
- III. Public Consultation: A public hearing is conducted at the site or in its close proximity - district-wise to be carried out in the manner prescribed in Appendix IV and through procurement of written responses from concerned persons having a plausible stake in the environmental aspects surrounding the





project to discuss the draft EIA report prepared. SPCB conducts the Public hearing.

- IV. Appraisal: After the public consultation process, the project proponent is duty bound to address all the material environmental concerns expressed during the process and make appropriate changes to the Draft EIA and EMP. This stage involves detailed scrutiny by the EAC of all the documents submitted by the project proponent for the grant of EC.

The appraisal process involves a systematic review by the Expert Appraisal Committee (EAC)

Step 1: Submission of Final EIA Report The project proponent submits the final EIA Report incorporating public concerns and modifications. The report includes: • Project description and objectives • Baseline environmental conditions • Impact prediction and mitigation measures • Environmental Management Plan (EMP) • Risk assessment and disaster management plans • Details of compliance with environmental laws.



Step 2: Review by Expert Appraisal Committee (EAC)

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The Expert Appraisal Committee (EAC) at the Central level undertakes a detailed review of the project proposal. The EAC consists of independent experts from various fields, including environmental science, forestry, hydrology, air quality, and public health. The committee evaluates: 1. Scientific adequacy of the EIA Report – Examining the methodology used for impact prediction and mitigation. 2. Compliance with Terms of Reference (ToR) – Ensuring that the EIA study has covered all aspects mandated in the ToR issued during the scoping stage.

3. Cumulative Environmental Impact – Assessing direct, indirect, and cumulative impacts of the project, including biodiversity, water resources, and air pollution. 4. Effectiveness of Environmental Management Plan (EMP) – Reviewing the proposed mitigation measures and their feasibility. 5. Assessment of Public Concerns – Examining whether issues raised during the public consultation process have been addressed in the revised EIA Report.

Legal and Regulatory Compliance – Checking compliance with 3990 Environment Protection Act, 1986, Forest Conservation Act, 1980, Air and Water Acts, Biodiversity Act, 2002, and other relevant laws.



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Step 3: Deliberation and Recommendations After a detailed review, the EAC deliberates on the project and makes one of the following recommendations:

- Approval with conditions – If the project is found environmentally viable, it is granted clearance with specific conditions, such as: Installation of pollution control technologies , Afforestation or biodiversity conservation commitments, Water and energy conservation measures , Regular environmental monitoring and reporting
- Rejection of Clearance – If the project poses significant environmental risks that cannot be mitigated, the EAC recommends denial of environmental clearance.
- Request for Additional Information (Deferral) – If clarifications or further impact assessments are needed, the proponent is asked to resubmit data or conduct additional studies. The EAC submits its recommendations to the MoEF&CC (for Category A projects) for final decision-making.

Step 4: Final Decision by Regulatory Authority.

The Appraisal process under EIA, 2006, serves as a crucial safeguard in preventing environmentally hazardous projects from being approved without adequate assessment. The Expert Appraisal Committee (EAC) ensures that all projects



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undergo scientific, legal, and public scrutiny before receiving environmental clearance.

19. I say that even after a company undergoes insolvency resolution and new management takes over, the EAC does consider past environmental non-compliance of the project while appraising clearance applications. Environmental regulation follows the “polluter pays” principle and requires that violations be addressed, regardless of changes in ownership. It is evident that the resolution Plan upheld by NCLT is related to claims and disputes and have no relation to the Environmental Clearance dated 3/06/2009. The Annexure 4 of the said Affidavit dated 10/07/25 is letter dated 20/09/24 wherein clause 15.13 of the resolution plan is extracted, the resolution plan proposes retention of all licenses by the Respondent no.4, the resolution plan is upheld by NCLT and Apex Court, so it is concluded by respondent no.1 that the validity of Environmental Clearance dated 3/06/2009(that is valid for 5 years) can be extended till 3/5/25 with a rider that respondent no.4 shall ensure proposing the amendment of all conditions of the EC dated 2006 and 2009 that is now not applicable to the project.



20. I say that Respondent no.4 was granted Environmental Clearance (EC) in 2009, based on the baseline environmental data

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available at that time. Baseline monitoring is the measurement of environmental parameters during the pre project period for the purpose of determining the range of variation of the system and establishing reference points against which changes can be measured. This leads to the assessment of the possible (additional available) assimilative capacity of the environmental components in pre-project period. In December 2024, this EC was transferred to Respondent no.4, It is important to note that baseline environmental data evolves over time. The conditions prevailing in 2009 were significantly different from those in December 2024, consequently, the EC granted in 2009 is rendered ineffective without the evaluation of the present conditions.

The copy of the relevant pages of Technical guidelines manual for metallurgical Industries are annexed herewith and marked as annexure A

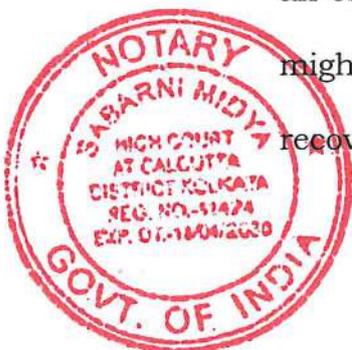
21. It is submitted that the public trust doctrine, for the first time articulated in M C Mehta vs. Kamal Nath (1997) 1 SCC 388 postulates that the State, which is the trustee of the resources has the duty to protect the trust corpus. It emphasizes not only the State's but also of Court's affirmative duty to protect the natural resources and ensure that short term public interest or private interest do not trump long term public interest in such resources. In Fomento Resorts and Hotels



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Ltd. (2009) 3 SCC 571, wherein the Hon'ble Apex Court reiterated that public trust doctrine imposes limits and obligations upon Government Agencies, their Administrators on behalf of all the people and especially future generations. The State and Managers of resources owe a duty to ensure that such resources are not impaired, even if private interests are involved. Public trust doctrine is a tool for exerting long established public rights over short term public rights and private gain. Every person enjoying the natural resources has the obligation to secure for the rest of people the right to use that resource or property for the long term and enjoyment by future generations. Environmental Clearance is also a facet of public trust and cannot be said to exist outside the said trust. Therefore, Environmental Clearance is not a property of the licensee or the Corporate Debtor, it is not an exclusive right granted by respondent no.1 to respondent no.4.

22. I say that Compliance with pollution norms or environmental clearance conditions cannot be viewed as a "claim" but as an ongoing regulatory obligation, which the company/ R-5 must continue to fulfil. Such obligations (e.g. installing pollution control equipment, stopping an ongoing polluting activity, or paying for environmental restoration) might be enforced despite IBC proceedings as they are not debt recovery actions. It is submitted that environmental enforcement is



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part of public trust doctrine and therefore a sovereign function and not equivalent to a money claim by a creditor, and thus outside the ambit of IBC.

23. It is submitted that under Section 5(26) of the I&B Code 'Resolution Plan' is defined as a plan proposed by the Resolution Applicant for insolvency resolution of the CD as a going concern. It is settled that a Resolution Plan is not a sale or auction or recovery or liquidation but a plan for insolvency resolution of CD as a going concern. Taking over a CD with intent to sell it is against the basic object of I&B Code

24. with regards to paragraphs 1,2,3,4,5,6, 7 & 8 of the said Affidavit save and expect what are matters of record I deny and dispute each and every paragraph of the Affidavit of respondent no.3 (herein after referred to as the said Affidavit for the sake of brevity). I specifically say that that the validity of Environmental Clearence dated 3/06/2009(that is valid for 5 years) can not be extended till 3/5/25 as Environmental Clearence is also a facet of public trust and cannot be said to exist outside the said trust. Therefore, Environmental Clearence is not a property of the licensee or the Corporate Debtor, it is not an exclusive right granted by respondent no.1 to respondent no.4. I repeat that the conditions prevailing in



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2009 were significantly different from those in December 2024, consequently, the EC granted in 2009 is rendered ineffective without the evaluation of the present conditions. It is again submitted that environmental enforcement is a part sovereign function and not equivalent to a money claim by a creditor, and thus outside the ambit of IBC. The fundamental right of clean air and environment under Article 21 of the constitution is intrinsically linked to Environmental Clearance and also Articles 48A and 51A(g) add a duty for the State and citizens to protect the environment, reinforcing the constitutional basis for environmental laws like the EIA.

25. I say that Environmental Clearance can not be considered as valid only because the resolution plan under I & B Code have formulated a plan where all the licenses for running of business of the ongoing concern is valid, as Environmental clearance do not fall under the definition of license under I & B Code for reasons stated hereinbefore.



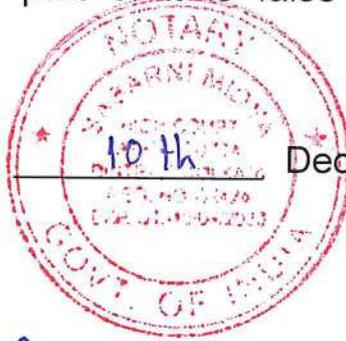
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VERIFICATION



I, the deponent above named do hereby verify that the contents of the above affidavit are true and correct to the best of my knowledge which are derived from the relevant office records. No part of it is false and nothing material has been concealed there from.

Verified at Kolkata on this 10th December, 2025 .



Raj Kumar Das

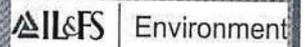
DEPONENT

Sabarni Midya
Advocate

Solemnly Affirmed & Declared
before me on identification

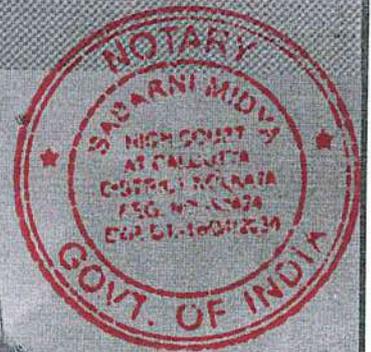
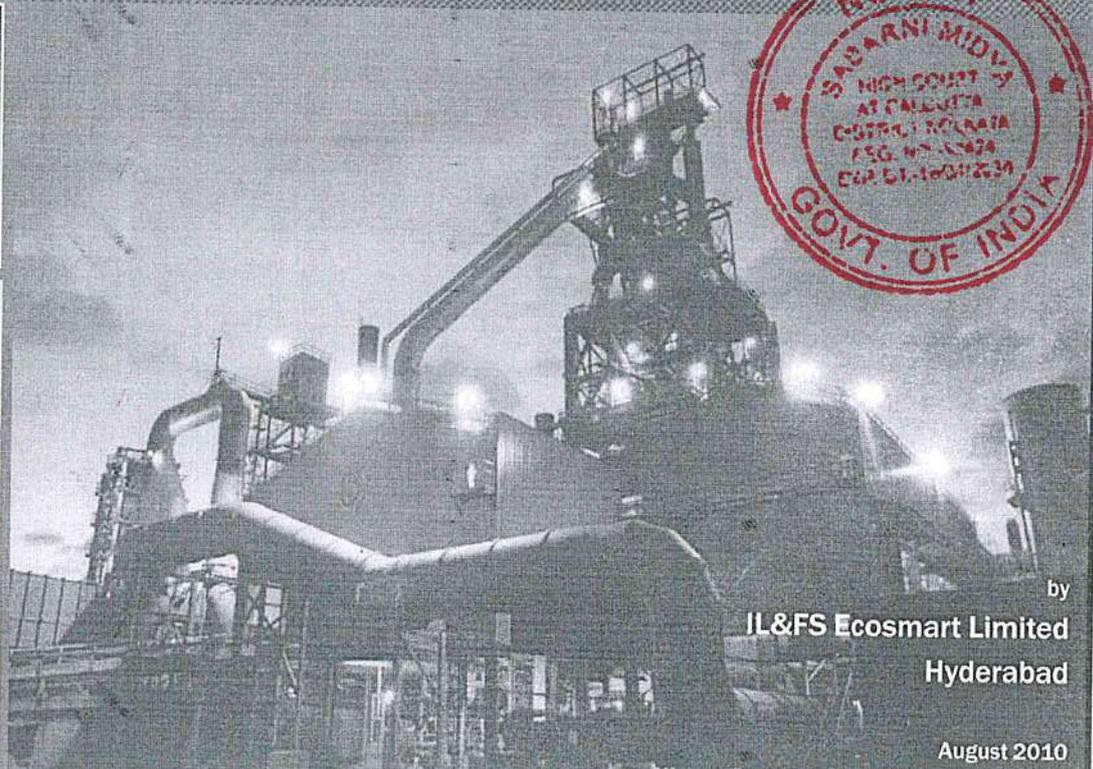
Sabarni Midya
Sabarni Midya, Notary
Reg. No.-52424 Govt. of India
High Court at Calcutta

10 DEC 2025



TECHNICAL EIA GUIDANCE MANUAL FOR METALLURGICAL INDUSTRY

Prepared for
The Ministry of Environment and Forests
Government of India



by
IL&FS Ecosmart Limited
Hyderabad

August 2010

जयराम रमेश
JAIRAM RAMESH

- 24 -



राज्य मंत्री (स्वतंत्र प्रभार)
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ENVIRONMENT & FORESTS
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NEW DELHI - 110 003

22nd December 2010

FOREWORD

The Ministry of Environment & Forests (MOEF) introduced the Environmental Impact Assessment (EIA) Notification 2006 on 14th September 2006, which not only reengineered the entire environment clearance (EC) process specified under the EIA Notification 1994, but also introduced a number of new developmental sectors which would require prior environmental clearance. The EIA Notification 2006 has notified a list of 39 developmental sectors which have been further categorised as A or B based on their capacity and likely environmental impacts. Category B projects have been further categorised as B1 and B2. The EIA Notification 2006 has further introduced a system of screening, scoping and appraisal and for the setting up of Environment Impact Assessment Authority (EIAA) at the Central level and State Level Environment Impact Assessment Authorities (SEIAAs) to grant environmental clearances at the Central and State level respectively. The Ministry of Environment & Forests is the Environment Impact Assessment Authority at the Central level and 25 State Level Environment Impact Assessment Authorities (SEIAAs) have been set up in the various States/UTs. The EIA Notification 2006 also stipulates the constitution of a multi-disciplinary Expert Appraisal Committee (EAC) at the Centre and State level Expert Appraisal Committees (SEACs) at State/UT Level for appraisal of Category A or B projects respectively and to recommend grant/rejection of environmental clearance to each project/activities falling under the various sectors to the EIAA/SEIAAs respectively.

Although the process of obtaining environmental clearance consisting of Screening, Scoping and Appraisal and for undertaking public consultation including the process of conduct of Public Hearing has been elaborated under the EIA Notification 2006, the Notification itself provides for bringing out guidelines from time to time on the EIA Notification 2006 and the EC process with a view to bringing clarity on the EC process for expediting environmental clearance. This need was further reinforced after the constitution of SEIAAs and SEACs in various States, who were assigned the task for the first time and with a need for addressing the concerns of standardization of the quality of appraisal and in reducing inconsistencies between SEACs/SEIAAs in granting ECs for similar projects in different States.

The Technical Guidance Manual of "Metallurgical Industry" sector describes types of process and pollution control technologies, operational aspects of EIA with model TOR of that Sector, technological options with cleaner production and waste minimization techniques,

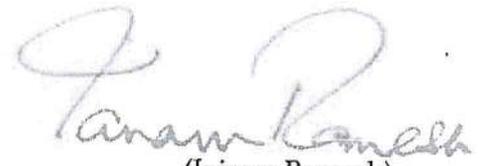


monitoring of environmental quality, post clearance monitoring protocol, related regulations, and procedure of obtaining EC if linked to other clearances for e.g., CRZ, etc.

Metallurgical industries cause great devastation of both terrestrial and aquatic environment on a local and regional scale. The major effects are due to pollution of air, soil, river water, and groundwater with heavy metals. The metallurgical industry has responded in a variety of ways. The steel industry has stopped the use of open hearth furnaces and switched over to cleaner technology. The aluminum industry has switched over from Soderberg to pre-baked electrodes in electrolytic cells. The copper industry has abandoned the reverberatory furnace to a flash smelting technology and introduction of tall stacks has helped dispose of SO₂ emissions. India's industrial competitiveness and environmental future depends on Industries such as Metallurgical Industry adopting energy and resource efficient technologies. Recycling and reuse of materials is critical.

To keep pace with changing technologies and needs of sustainable development, the manual would require regular updating in the future. The manual will be available on the MoEF website and we would appreciate receiving responses from stakeholders for further improvements.

I congratulate the entire team of IL&FS Ecosmart Ltd., experts from the sector who were involved in the preparation of the Manuals, Chairman and members of the Core and Peer Committees of various sectors and various Resource Persons whose inputs were indeed valuable in the preparation and finalization of the Manuals.


(Jairam Ramesh)



5.

STAKEHOLDERS' ROLES AND RESPONSIBILITIES

Prior environmental clearance process involves many stakeholders *i.e.*, Central Government, State Government, SEIAA, EAC at the National Level, SEAC, Public Agency, SPCB, the project proponent, and the public.

- Roles and responsibilities of the organizations involved in different stages of prior environmental clearance are listed in Table 5-1.
- Organization-specific functions are listed in Table 5-2.

In this Chapter, constitution, composition, functions, *etc.*, of the Authorities and the Committees are discussed in detail.

Table 5-1: Roles and Responsibilities of Stakeholders Involved in Prior Environmental Clearance

Stage	MoEF/ SEIAA	EAC/ SEAC	Project Proponent	EIA Consultant	SPCB/ Public Agency	Public and Interest Group
Screening	Receives application and takes advice of EAC/ SEAC	Advises the MoEF/ SEIAA	Submits application (Form 1) and provides necessary information	Advises and assists the proponent by providing technical information		
Scoping	Approves the ToR, communicates the same to the project proponent and places the same in the website	Reviews the ToR, visits the proposed site, if required, and recommends the ToR to the MoEF/ SEIAA	Submits the draft ToR to SEIAA and facilitates the visit of the EAC/SEAC members to the project site	Prepares ToR		
EIA Report & Public Hearing	Reviews and forwards copies of the EIA report to SPCB /public agency for conducting public hearing Places the summary of EIA report in the		Submits detailed EIA report as per the finalized ToR Facilitates the public hearing by arranging presentation on the project, EIA and EMP – takes note of objections and updates the EMP	Prepares the EIA report Presents and appraises the likely impacts and pollution control measures proposed in the public hearing	Reviews EIA report and conducts public hearing in the manner prescribed Submits proceedings and views of SPCB, to the Authority and the	Participates in public hearings and offers comments and observations. Comments can be sent directly to SEIAA through Internet in response to the summary



Stakeholders' Roles and Responsibilities

Stage	MoEF/ SEIAA	EAC/ SEAC	Project Proponent	EIA Consultant	SPCB/ Public Agency	Public and Interest Group
	website Conveys objections to the project proponent for update, if any		accordingly		project proponent as well	placed in the website
Appraisal and Clearance	Receives updated EIA Takes advice of EAC/ SEAC, approves EIA and attaches the terms and conditions	Critically examines the reports, presentation of the proponent and appraises MoEF/ SEIAA (recommendations are forwarded to MoEF/ SEIAA)	Submits updated EIA, EMP reports to MoEF/SEIAA. Presents the overall EIA and EMP including public concerns to EAC/SEAC	Provides technical advise to the project proponent and if necessary presents the proposed measures for mitigation of likely impacts (terms and conditions of clearance)		
Post-clearance Monitoring			Implements environmental protection measures prescribed and submits periodic monitoring results	Conducts periodic monitoring	Incorporates the clearance conditions into appropriate consent conditions and ensures implementation	

Table 5-2: Organization-specific Functions

Organization	Functions
Central Government	<ul style="list-style-type: none"> ▪ Constitutes the EAC ▪ Considering recommendations of the State Government, constitutes the SEIAA & SEAC ▪ Receives application from the project proponent in case of Category A projects or Category B projects attracting general condition ▪ Communicates the ToR finalized by the EAC to the project proponent. ▪ Receives EIA report from the project proponent and soft copy of summary of the report for placing in the website ▪ Summary of EIA report will be placed in website. Forwards the received responses to the project proponent ▪ Engages other public agency for conducting public hearings in cases where the SPCB does not respond within time ▪ Receives updated EIA report from project proponent incorporating the considerations from the proceedings of public hearing and responses received through other media



Stakeholders' Roles and Responsibilities

Organization	Functions
	<ul style="list-style-type: none"> Forwards updated EIA report to the EAC for appraisal Either accepts the recommendations of EAC or asks for reconsideration of specific issues for review by the EAC. Takes the final decision – acceptance/ rejection – of the project proposal and communicates the same to the project proponent
State Government	<ul style="list-style-type: none"> Identifies experts as per the composition specified in the Notification and subsequent guidelines to recommend to the the Central Government. Extends funding support to fulfill the functions of SEIAA/SEAC Engages other public agency for conducting public hearings in cases where the SPCB does not respond within time State Governments will suitably pay the public agency for conducting such activity
EAC	<ul style="list-style-type: none"> Reviews Form 1 and its attachments Visits site(s), if necessary Finalizes ToR and recommends to the Central Government, which in turn communicates the finalized ToR to the project proponent, if not exempted by the Notification Reviews EIA report, proceedings and appraises their views to the Central government If the Central Government has any specific views, then the EAC reviews again for appraisal
SEIAA	<ul style="list-style-type: none"> Receives application from the project proponent Considers SEAC's views for finalization of ToR Communicates the finalized ToR to the project proponent Receives EIA report from project proponent Uploads the summary of EIA report in the website in cases of Category B projects Forwards the responses received to the project proponent Receives updated EIA report from project proponent incorporating the considerations from the proceedings of public hearing and responses received through other media Forwards updated EIA report to SEAC for appraisal Either accepts the recommendations of SEAC or asks for reconsideration of specific issues for review by SEAC. Takes the final decision and communicates the same to the project proponent
SEAC	<ul style="list-style-type: none"> Reviews Form 1 If necessary visits, site(s) for finalizing the ToR Reviews updated EIA - EMP report and Appraises the SEIAA
SPCB	<ul style="list-style-type: none"> Receives request from project proponent and conducts public hearing in the manner prescribed. Conveys proceedings to concerned authority and project proponent
Public Agency	<ul style="list-style-type: none"> Receives request from the respective Governments to conduct public hearing Conducts public hearing in the manner prescribed. Conveys proceedings to the concerned Authority/EAC /Project proponent

5.1 SEIAA

- SEIAA is constituted by the MoEF to take final decision regarding the acceptance/rejection of prior environmental clearance to the project proposal for all Category 'B' projects.
- The state government may decide whether to house them at the Department of Environment or at any other Board for effective operational support.
- State Governments can decide whether the positions are permanent or part-time. The Central Government (MoEF) continues to follow the model of paying fee (TA/DA,



Stakeholders' Roles and Responsibilities

accommodation, sitting fee) to the Chairperson and the members of EAC. As such, the State Government is to fund SEIAA & SEAC and decide the appropriate institutional support for them.

A. Constitution

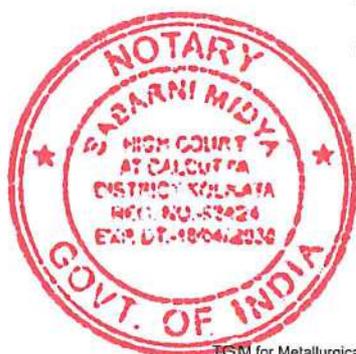
- SEIAA is constituted by the Central Government comprising of three members including a Chairperson and Member–Secretary to be nominated by the State Government or UT Administration concerned.
- The Central Government will notify as and when the nominations (in order) are received from the State Governments, within 30 days from the date of receipt.
- The Chairperson and the non-official member shall have a fixed term of three years, from the date of Notification by the Central Government constituting the Authority.
- The form used by the State Governments to submit nominations for Notification by the Central Government is provided in **Annexure X**.

B. Composition

- Chairperson shall be an expert in the EIA process
- Member–Secretary shall be a serving officer of the concerned State Government/ UT Administration familiar with the environmental laws.
- Member–Secretary may be of a level equivalent to the Director, Dept. of Environment or above – a full time member.
- All the members including the Chairperson shall be the experts as per the criteria set in the Notification.
- The Government servants can only serve as the Member–Secretary to SEIAA and the Secretary to SEAC. All other members including Chairperson of the SEIAA and SEAC shall not be comprised of serving Government Officers; industry representatives; and activists.
- Serving faculty (academicians) is eligible for the membership in the Authority and/or the Committees, if they fulfill the criteria given in Appendix VI to the Notification.
- This is to clarify that the serving Government officers shall not be nominated as professional/expert member of SEIAA/SEAC/EAC.
- Professionals/Experts in the SEIAA and SEAC shall be different.
- Summary regarding the eligibility criteria for Chairperson and Members of the SEIAA is given in Table 5-3.

C. Decision-making process

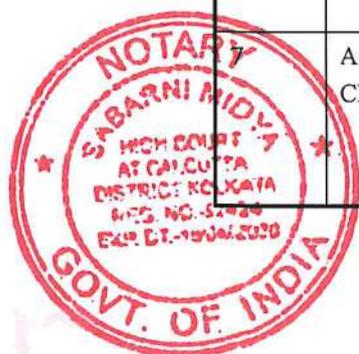
- The decision of the Authority shall be arrived through consensus.
- If there is no consensus, the Authority may either ask SEAC for reconsideration or may reject the approval.
- All decisions of the SEIAA shall be taken in a meeting and shall ordinarily be unanimous, provided that, in case a decision is taken by majority, the details of views, for and against it, shall be clearly recorded in the minutes and a copy thereof sent to MoEF.



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Table 1: Details of Critically Polluted Industrial Areas and Clusters / Potential Impact Zone
(Ref: Office Memorandum No. J-11013/5/2010-IA.II(I) Dated 13.1.2010)

S. No.	Critically Polluted Industrial Area and CEPI	Industrial Clusters/ Potential Impact Zones
1.	Ankeshwar (Gujarat) CEPI-88.50(Ac_Wc_Lc)	<ul style="list-style-type: none"> ▪ GIDC Ankeshwar and GIDC, Panoli
2	Vapi (Gujarat) CEPI-88.09(Ac_Wc_Lc)	<ul style="list-style-type: none"> ▪ GIDC Vapi
3	Ghaziabad (Uttar Pradesh) CEPI-87.37(Ac_Wc_Lc)	<p>Sub-cluster A</p> <ul style="list-style-type: none"> ▪ Mohan nagar industrial area ▪ Rajinder nagar industrial area ▪ Sahibabad industrial area <p>Sub-cluster B</p> <ul style="list-style-type: none"> ▪ Pandav nagar industrial area ▪ Kavi nagar industrial area ▪ Bulandshahar road industrial area ▪ Amrit nagar ▪ Aryanagar industrial area <p>Sub-cluster C</p> <ul style="list-style-type: none"> ▪ Merrut road industrial are <p>Sub-cluster D</p> <ul style="list-style-type: none"> ▪ Loni industrial area ▪ Loni Road industrial area ▪ Roop nagar industrial area <p>Sub-cluster E</p> <ul style="list-style-type: none"> ▪ Hapur Road industrial area ▪ Dasna ▪ Philkura <p>Sub-cluster F (Other scattered industrial areas)</p> <ul style="list-style-type: none"> ▪ South side of GT road ▪ Kavi Nagar ▪ Tronica city ▪ Anand Nagar ▪ Jindal Nagar ▪ Prakash Nagar ▪ Rural industrial estate
4	Chandrapur (Maharashtra) CEPI-83.88 (Ac_Wc_Lc)	<ul style="list-style-type: none"> ▪ Chandrapur (MIDC Chandrapur, Tadali, Ghuggus, Ballapur)
5	Kobra (Chhatisgarh) CEPI-83.00 (Ac_Ws_Lc)	<ul style="list-style-type: none"> ▪ Industrial areas and their townships of NTPC, BALCO, CSEB (East) & CSEB (West) ▪ Korba town
6	Bhiwadi (Rajasthan) CEPI-82.91 (Ac_Wc_Ls)	<ul style="list-style-type: none"> ▪ RIICO industrial areas Phase I to IV ▪ Bhiwadi town ▪ Other surrounding industrial areas: Chopanki, Rampura Mundana, Khuskhera Phase I to III
	Angul Talcer(Orissa) CEPI-82.09 (Ac_Wc_Lc)	<ul style="list-style-type: none"> ▪ MCL Coal mining area, Augul – Talcer region ▪ Industrial area (60 km x 45 km) <p>Following blocks of Angul district:</p> <ul style="list-style-type: none"> ▪ Kohina block ▪ Talcher block

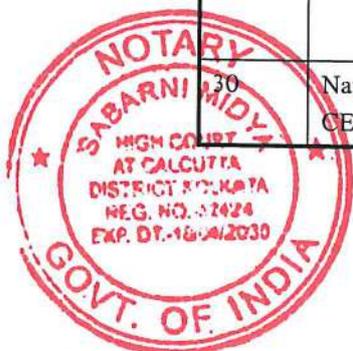


		<ul style="list-style-type: none"> ▪ Angul block ▪ Chhendipada block ▪ Banarpal block ▪ Odapada block of Dhenkamal district
8	Vellore (North Arcot) (Tamil Nadu) CEPI-81.79 (Ac_Wc_Lc)	<ul style="list-style-type: none"> ▪ Ranipet, SIPCOT industrial complex
9	Singrauli (Uttar Pradesh) CEPI-81.73 (Ac_Wc_Ls)	<p>Sonebhadra (UP)</p> <ul style="list-style-type: none"> ▪ Dala-Tola ▪ Obra ▪ Renukoot ▪ Anpara ▪ Renusagar ▪ Kakri ▪ Dudhichuwa ▪ Bina ▪ Khadia ▪ Shakti nagar ▪ Rihand nagar ▪ Bijpur <p>Sigrauli (Madhya Pradesh) Vindhychal nagar and Jaynat, Nigahi, Dudhichua, Amlohri & Jhingurdah townships</p>
10	Ludhiana (Punjab) CEPI-81.66 (Ac_Wc_Ls)	<p>Ludhiana municipal limits covering industrial clusters:</p> <ul style="list-style-type: none"> ▪ Focal point along with NH-I- Total eight phase ▪ Industrial area-B- from sherpur chowk to Gill road & Gill road to Miller Kotla road (left side of road) ▪ Mixed industrial area – right side of Gill road ▪ Industrial area –C (near Juglana village) ▪ Industrial area A & extension: area between old GT road and Ludhiana bypass road ▪ Industrial estate: near Dholwal chowk ▪ Mixes industrial area (MIA) Miller gunj ▪ MIA – bypass road ▪ Bahdur industrial area ▪ Tejpur industrial complex
11	Nazafgarh drain basin, Delhi CEPI-79.54 (As_Wc_Lc)	<ul style="list-style-type: none"> ▪ Industrial areas: Anand Parvat, Naraina, Okhla and Wazirpur
12	Noida (Uttar Pradesh) CEPI-78.90 (Ac_Wc_Lc)	<p>Territorial Jurisdiction of:</p> <ul style="list-style-type: none"> ▪ Noida Phase-1 ▪ Noida Phase-2 ▪ Noida Phase-3 ▪ Surajpur industrial area ▪ Greater Noida industrial area ▪ Village- Chhapparaula
13	Dhanbad (Jharkhand) CEPI-78.63 (Ac_Ws_Lc)	<p>Four blocks of Dhanbad district:</p> <ul style="list-style-type: none"> ▪ Sadar (Dhanbad Municipality) ▪ Jharia (Jharia Municipality, Sindri industrial area) ▪ Govindpur (Govindpur industrial estate) ▪ Nirsa
14	Dombivalli (Maharashtra) CEPI-78.41 (Ac_Wc_Ls)	<ul style="list-style-type: none"> ▪ MIDC Phase- I, Phase- II



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15	Kanpur (Uttar Pradesh) CEPI-78.09 (Ac_Wc_Ls)	Industrial areas: <ul style="list-style-type: none"> ▪ Dada nagar ▪ Panki ▪ Fazalganj ▪ Vijay nagar ▪ Jajmau
16	Cuddalore (Tamil Nadu) CEPI-77.45 (As_Wc_Lc)	<ul style="list-style-type: none"> ▪ SIPCOT industrial complex, Phase I & II
17	Aurangabad (Maharashtra) CEPI-77.44 (Ac_Wc_Ls)	<ul style="list-style-type: none"> ▪ MIDC Chikhalthana, MIDC Waluj, MIDC Shendra, and Paithan road industrial area
18	Faridabad (Haryana) CEPI-77.07 (Ac_Ws_Lc)	<ul style="list-style-type: none"> ▪ Sector 27-A, B, C, D ▪ DLF phase- 1, sector 31,32 ▪ DLF phase- 2, sector 35 ▪ Sector 4, 6, 24, 27, 31, 59 ▪ Industrial area Hatin ▪ Industrial model township
19	Agra (Uttar Pradesh) CEPI-76.48 (As_Wc_Ls)	<ul style="list-style-type: none"> ▪ Nunihai industrial estate, Rambag nagar, UPSIDC industrial area, and Runukata industrial area
20	Manali (Tamil Nadu) CEPI-76.32 (Ac_Ws_Ls)	<ul style="list-style-type: none"> ▪ Manali industrial area
21	Haldia (West Bengal) CEPI-75.43 (As_Wc_Ls)	<ul style="list-style-type: none"> ▪ 5 km wide strip (17.4 x 5.0 km) of industrial area on the southern side of the confluence point of Rivers Hugli and Rupnarayan, covering ▪ Haldia municipal area & Sutahata block – I and II
22	Ahmedabad (Gujarat) CEPI-75.28 (Ac_Ws_Ls)	<ul style="list-style-type: none"> ▪ GIDC Odhav ▪ GIDC Naroda
23	Jodhpur (Rajasthan) CEPI-75.19 (As_Wc_Ls)	<ul style="list-style-type: none"> ▪ Industrial areas including Basni areas (phase-I & II), industrial estate, light & heavy industrial areas, industrial areas behind new power house, Mandore, Bornada, Sangariya and village Tanwada & Salawas. ▪ Jodhpur city
24	Greater Cochin (Kerala) CEPI-75.08 (As_Wc_Ls)	<ul style="list-style-type: none"> ▪ Eloor-Edayar industrial belt, ▪ Ambala Mogal industrial areas
25	Mandi Gobind Garh (Punjab) CEPI-75.08 (Ac_Ws_Lc)	<ul style="list-style-type: none"> ▪ Mandi Govindgarh municipal limit and khanna area
26	Howrah (West Bengal) CEPI-74.84 (As_Ws_Lc)	<ul style="list-style-type: none"> ▪ Liluah-Bamangachhi region, Howrah ▪ Jalan industrial complex-1, Howrah
27	Vatva (Gujarat) CEPI-74.77 (Ac_Wc_Ls)	<ul style="list-style-type: none"> ▪ GIDC Vatva, Narol industrial area (Villages Piplaj, Shahwadi, Narol)
28	Ib Valley (Orissa) CEPI-74.00 (Ac_Ws_Ls)	<ul style="list-style-type: none"> ▪ Ib Valley of Jharsuguda (Industrial and mining area)
29	Varansi-Mirzapur (Uttar Pradesh) CEPI-73.79 (As_Wc_Ls)	<ul style="list-style-type: none"> ▪ Industrial estate, Mirzapur ▪ Chunar ▪ Industrial estate, Chandpur, Varansi ▪ UPSIC, industrial estate, Phoolpur ▪ Industrial area, Ramnagar, Chandauli
30	Navi Mumbai (Maharashtra) CEPI-73.77 (Ac_Ws_Ls)	<ul style="list-style-type: none"> ▪ TTC industrial area, MIDC, Navi Mumbai (including Bocks-D, C, EL, A, R, General, Kalva)



31	Pali (Rajasthan) CEPI-73.73 (As_Wc_Ls)	<ul style="list-style-type: none"> ▪ Existing industrial areas: Mandia road, Puniyata road, Sumerpur ▪ Pali town
32	Mangalore (Karnataka) CEPI-73.68 (Ac_Ws_Ls)	<ul style="list-style-type: none"> ▪ Baikampady industrial area
33	Jharsuguda (Orissa) CEPI-73.34 (Ac_Ws_Ls)	<ul style="list-style-type: none"> ▪ Ib valley of Jharsuguda (Industrial and mining area)
34	Coimbatore (Tamil Nadu) CEPI-72.38 (Ac_Ws_Ln)	<ul style="list-style-type: none"> ▪ SIDCO, Kurichi industrial Clusters
35	Bhadravati (Karnataka) CEPI-72.33 (Ac_Ws_Ln)	<ul style="list-style-type: none"> ▪ KSSIDC Industrial area, Mysore paper mill & VISL township complex
36	Tarapur (Maharashtra) CEPI-72.01 (Ac_Ws_Ls)	<ul style="list-style-type: none"> ▪ MIDC Tarapur
37	Panipat (Haryana) CEPI-71.91 (As_Ws_Ls)	<ul style="list-style-type: none"> ▪ Panipat municipal limit and its industrial clusters
38	Indore (Madhya Pradesh) CEPI-71.26 (As_Ws_Ls)	<p>Following 09 industrial area:</p> <ul style="list-style-type: none"> ▪ Sanwer road ▪ Shivaji nagar ▪ Pologround ▪ Laxmibai nagar ▪ Scheme no.71 ▪ Navlakha ▪ Pipliya ▪ Palda ▪ Rau <p>Indore city</p> <p>Other surrounding industrial areas: Manglia, Rajoda, Asrawad, Tejpur Gadwadi</p>
39	Bhavnagar (Gujarat) CEPI-70.99 (As_Ws_Ls)	<ul style="list-style-type: none"> ▪ GIDI Chitra, Bhavnagar
40	Vishakhapatnam (Andhra Pradesh) CEPI-70.82 (As_Ws_Ls)	<ul style="list-style-type: none"> ▪ Bowl area (the area between Yarada hill range in the south to Simhachalam hill range in the north and sea on the east and the present NH-5 in the west direction)
41	Junagarh (Gujarat) CEPI-70.82 (As_Ws_Ls)	<p>Industrial areas:</p> <ul style="list-style-type: none"> ▪ Sabalpur ▪ Jay Bhavani ▪ Jay Bhuvneshwari ▪ GIDC Junagarh (I&II)
42	Asansole (West Bengal) CEPI-70.20 (As_Ws_Ls)	<ul style="list-style-type: none"> ▪ Bumpur area surrounding IISCO
43	Patancheru - Bollaram (Andhra Pradesh) CEPI-70.07 (As_Ws_Ls)	<p>Industrial area:</p> <ul style="list-style-type: none"> ▪ Patancheru ▪ Bollaram

Note:

Names of identified industrial clusters/potential impact zones are approximate location based on rapid survey and assessment and may alter partially subject to the detailed field study and monitoring. Detailed mapping will be made available showing spatial boundaries of the identified industrial clusters including zone of influence/ buffer zone, after in depth field study.



TYPES OF MONITORING AND NETWORK DESIGN CONSIDERATIONS

A. Types of Monitoring

Monitoring refers to the collection of data using a series of repetitive measurements of environmental parameters (or, more generally, to a process of systematic observation). The environmental quality monitoring programme design will be dependent upon the monitoring objectives specified for the selected area of interest. The main types of EIA monitoring activities are:

- Baseline monitoring is the measurement of environmental parameters during the pre-project period for the purpose of determining the range of variation of the system and establishing reference points against which changes can be measured. This leads to the assessment of the possible (additional available) assimilative capacity of the environmental components in pre-project period w.r.t. the standard or target level.
- Effects monitoring is the measurement of environmental parameters during project construction and implementation to detect changes which are attributable to the project to provide the necessary information to:
 - verify the accuracy of EIA predictions; and
 - determine the effectiveness of measures to mitigate adverse effects of projects on the environment.
 - Feedback from environmental effect monitoring programs may be used to improve the predictive capability of EIAs and also determine whether more or less stringent mitigation measures are needed
- Compliance monitoring is the periodic sampling or continuous measurement of environmental parameters to ensure that regulatory requirements and standards are being met.

Compliance and effects monitoring occurs during the project construction, operation, and abandonment stages. The resources and institutional set-up should be available for the monitoring at these stages. All large-scale construction projects will require some construction stage monitoring. To control the environmental hazards of construction as specified in the EIA, a monitoring program should be established to ensure that each mitigation measure is effectively implemented. There are numerous potential areas for monitoring during operations.

It is meaningful to perform baseline monitoring at those stations where the effects monitoring is to be performed so that the change from baseline due to the project as predicted by models can be validated and rectification can be performed even after the project starts functioning. It is therefore necessary to select the base line stations at those places where the predicted effects will be maximum. The scope of monitoring topics discussed in this chapter is limited to Baseline and Effects monitoring. In addition, this chapter will also discuss the Compliance monitoring during the construction phase. Post-project monitoring requirements are discussed in the EMP.

Before any field monitoring tasks are undertaken there are many institutional, scientific, and fiscal issues that must be addressed in the implementation of an environmental monitoring program. Careful consideration of these issues in the design and planning stages will help avoid many of the pitfalls associated with environmental monitoring programs. Although these issues are important but the discussions here are confined to the monitoring network design component.



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B. Network Design

Analysis of Significant Environmental Issues

At the outset of planning for an environmental monitoring network, the EIA manager may not know exactly what should be monitored, when monitoring should begin, where it should monitor, which techniques should be employed, and who should take responsibility for its conduct. Because there are usually a number of objective decisions associated with network design to be made, it is important to start with an analysis of environmental issues. The scoping phase of an EIA is designed to identify and focus on the major issues. Scoping should provide a valuable source of information on the concerns that need to be addressed by the monitoring network design. These are project specific as well as specific to the environmental setting of the location where the project is proposed to be located

Hence, the network designs are associated with questions like:

- What are the expected outputs of the monitoring activity?
- Which problems do we need to address to? *etc.*

Defining the output will influence the design of the network and optimize the resources used for monitoring. It will also ensure that the network is specially designed to optimize the information on the problems at hand

What to Monitor?

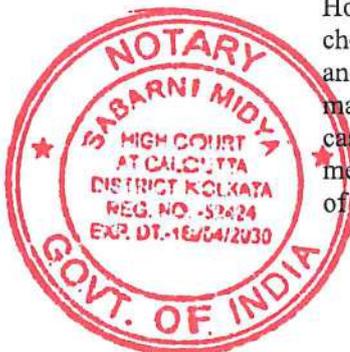
The question of what to monitor is associated with the identification of VECs.

VECs are generally defined as environmental attributes or components of the environment that are valued by society as identified during the scoping stage of the project. They are determined on the basis of perceived public concerns. For example, changes to water quality and quantity could have implications on fish by affecting habitat, food supply, oxygen, and contaminant uptake. Similarly, employment and business, and economies are both VECs that serve as pathways.

The choice of VECs is also related to the perceived significant impact of the project implementation on important environmental components. In general, the significance or importance of environmental components is judged based on:

- legal protection provided (for example, rare and endangered species)
- political or public concerns (for example, resource use conflicts and sustainable development)
- scientific judgment (for example, ecological importance); or
- commercial or economic importance

However, in addition to their economic, social, political or ecological significance, the chosen VEC should also have unambiguous operational ease, be accessible to prediction and measurement; and be susceptible to hazard. Once the VECs are defined, the VECs may be directly measured (for example, extent of habitat for an endangered species). In cases where it is impossible or impractical to directly measure the VECs, the chosen measurement endpoints or environmental indicators must correspond to, or be predictive of assessment endpoints.



The chosen environmental indicators must be: 1) measurable; 2) appropriate to the scale of disturbance/ contamination; 3) appropriate to the impact mechanism; 4) appropriate and proportional to temporal dynamics; 5) diagnostic; and 6) standardized; as well as have: 1) a low natural variability; 2) a broad applicability; and 3) an existing data series.

C. Site Selection

This normally means that for designing a monitoring programme in an (study) area which might have an impact, several monitoring stations are needed for characterizing the baseline conditions of the impacted area. When considering the location of individual samplers, it is essential that the data collected are representative for the location and type of area without the undue influence from the immediate surroundings. In any measurement point in the study area the total ambient concentration is the representative of:

- natural background concentration
- regional background
- impact of existing large regional sources such as Industrial emissions

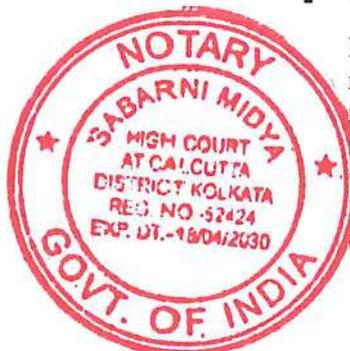
To obtain the information about the importance of these different contributions it is therefore necessary to locate monitoring stations so that they are representative for different impacts. In addition to the ambient pollution data, one would often need other data governing the variations such as meteorological data for air pollution, to identify and quantify the sources contributing to the measurements. When considering the location of individual samplers, it is essential that the data collected are representative for the location and type of area without undue influence from the immediate surroundings. For example, for measuring natural background concentration, if a dust sampler is located adjacent to a dusty road at road level, this will read occasional traffic pollution rather than the general background dust level of the area. As such a proper QA/QC must be followed to locate stations. USEPA guidelines are available for this.

Where, How and How Many Times to Monitor?

These are the other components of Monitoring Network Design. These questions are best answered based on local field conditions, capacity and resources available, prevailing legal and regulatory priorities, *etc.* For this screening or reconnaissance Surveys of the study area also necessary. This may also include some simple inexpensive measurements and assimilative/dispersion modeling. The data will give some information on the prevailing spatial and temporal variations, and the general background air pollution in the area. The number of monitoring stations and the indicators to be measured at each station in the final permanent network may then be decided upon based on the results of the screening study as well as on the knowledge of the sources of the proposed development and prevailing local environmental/meteorological conditions. The best possible definition of the air pollution problem, together with the analysis of the resources: personnel, budget and equipment available, represent the basis for the decision on the following questions:

- What spatial density (number) of sampling stations is required?

It is evident that the more is the number of stations selected in the study area, the more representative is the data and the more is the cost of monitoring. Therefore this needs optimization. For example, for optimum results as per the present practice, for metallurgical industry, the study area is a circle of 10 km radius from the plant centre; the number of AAQ stations are at least 10; the number of meteorological station may be 1 in case the study area falls in a single air shed having similar meteorological conditions and more in case the study area falls in more than one air sheds; the



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number of surface water quality stations will depend on the number of surface water bodies present in the study area and likely to get polluted; the number of ground water stations may be at least 6 to 8; the number of noise monitoring stations will depend upon the number of residential, commercial and sensitive areas likely to get affected due to the noise from the plant operation and its services facilities like transport; the number of soil monitoring stations will be those agricultural lands where the dust fall from the plant is likely to be high; the number of ecological monitoring stations will depend upon the number of ecologically sensitive spots etc. Qualitative and quantitative models may be used to defend the decision. However, these optimum figures are not statutory requirements and may change from time to time as more scientific and credible information becomes available. For details refer Annexure A4

- How many samples are needed and during what period (sampling (averaging) time and frequency)?

These are mostly governed by statutory stipulations made in the E(P) Act/ EIA Notification/ EIA questionnaire. These must be presented in the ToR before costly monitoring exercise is started to save repetitions. Generally, the sampling averaging time must be compatible with the norms e.g., 24 hrs average for AAQ for SPM/RPM/SO₂/NO_x/HC/Pb and 1/8 hrs for CO; twice a week for at least one full season of 3 months except monsoon equally spaced. Met data should be hourly to be compatible with dispersion models. Water samples should be grab or composite for flowing water collected over the sampling period of one full season and ground water for pre and post monsoon to give more representative data. LEQ noise should be collected on limited days over 24 hours to obtain night time and day time values. Dust fall should be collected monthly for 3 months of monitoring period. As work zone, stack, ecological and socio economic monitoring are not much season oriented, they may be collected at the earliest. For details refer Annexure A4

- Where should the stations be located?

As described, the location should be the worst affected areas due to plant operation. As such for AAQ monitoring, a qualitative or quantitative screening model may be used to identify inhabited localities/ sensitive locations/ areas under surveillance with limited met and emission data where GLC due to plant operation will be maximum; for surface water monitoring all static water bodies, upstream and down stream of flowing water bodies from locations of probable discharges; all upstream and downstream ground water bodies from probable locations of leaching possibilities (for this ground water contours of the area should be pre determined); all ecologically sensitive areas; residential/commercial/sensitive locations for noise monitoring; prime agricultural lands for dust fall monitoring etc. In general, there must be a scientific basis for selecting locations. For details refer Annexure A4

- What kind of equipment and methods should be used?

The CPCB guidelines describe such equipment and methods in details. In addition, standard literatures/ handbooks like USEPA/APHA handbooks may be referred. For details refer Annexure A4

- What additional background information is needed?

- Published meteorological data from IMD's nearest station
- Topography from Survey of India/ satellite imageries



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- population density from latest government publications
 - emission sources and emission rates of plant proper/ other nearby plants affecting study area
 - effects and impacts
 - ground water contours
 - data on forest and ecology from forest deptment
 - upper air data
 - any other secondary information
- How will the data be made available/communicated?

All raw data must be preserved. Adequate QA/QC may be followed. Summary data may be included in the EIA.



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ANNEXURE VII
Guidance for Assessment of Baseline Components and Attributes



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GUIDANCE FOR ASSESSMENT OF BASELINE COMPONENTS AND ATTRIBUTES*

Attributes	Sampling		Measurement Method	Remarks
	Network	Frequency		
A. Air				
<ul style="list-style-type: none"> ▪ Meteorological ▪ Wind speed ▪ Wind direction ▪ Dry bulb temperature ▪ Wet bulb temperature ▪ Relative humidity ▪ Rainfall ▪ Solar radiation ▪ Cloud cover 	<p>Minimum 1 site in the project impact area requirements</p> <p>Other additional site(s) are required depending upon the model applied or site sensitivities</p>	<p>Min: 1 hrly observations from continuous records</p>	<p>Mechanical / automatic weather station</p> <p>Rain gauge</p> <p>As per IMD</p> <p>As per IMD</p>	<p>IS 5182 Part 1-20 Sit-specific primary data is essential</p> <p>Secondary data from IMD, New Delhi for the nearest IMD station</p>
<p>Pollutants</p> <ul style="list-style-type: none"> ▪ SPM ▪ RPM ▪ SO₂ ▪ NO₂ ▪ CO ▪ H₂S* ▪ NH₃* ▪ HC* ▪ Fluoride* ▪ Pb* ▪ VOC-PAH* ▪ Mercury* <p>(parameters to be proposed by the proponent, in draft ToR, which will be reviewed and approved by EAC/SEAC)</p>	<p>10 to 15 locations in the project impact area</p>	<p>24 hrly twice a week</p> <p>8 hrly twice a week</p> <p>24 hrly twice a week</p>	<ul style="list-style-type: none"> ▪ Gravimetric (High – Volume) ▪ Gravimetric (High – Volume with Cyclone) ▪ EPA Modified West & Gaeke method ▪ Arsenite Modified Jacob & Hochheiser ▪ NDIR technique ▪ Methylene-blue ▪ Nessler's Method ▪ Infra Red analyzer ▪ Specific Ion meter 	<p>Monitoring Network</p> <ul style="list-style-type: none"> ▪ Minimum 2 locations in upwind side, more sites in downwind side / impact zone ▪ All the sensitive receptors need to be covered <p>Measurement Methods</p> <p>As per CPCB standards for NAQM, 1994</p>
B. Noise				
Hourly equivalent noise levels	Same as for Air Pollution	At least one day continuous in	Instrument : Sensitive Noise	Min: IS: 4954- 1968 as adopted

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Attributes	Sampling		Measurement Method	Remarks
	Network	Frequency		
	along with others Identified in study area	each season on a working and non-working day	level meter (preferably recording type)	by CPCB
Hourly equivalent noise levels	Inplant (1.5 m from machinery or high emission processes)	Same as above for day and night	Instrument : Noise level metre	CPCB / OSHA
Hourly equivalent noise levels	Highways (within 500 metres from the road edge)	Same as above for day and night	Instrument : Noise level meter	CPCB / IS : 4954-1968
Peak particle velocity	150- 200m from blast site	Based on hourly observations	PPV meter	
C. Water				
Parameters for water quality <ul style="list-style-type: none"> ▪ Ph, temp, turbidity, magnesium hardness, total alkalinity, chloride, sulphate, nitrate, fluoride, sodium, potassium salinity ▪ Total nitrogen, total phosphorus, DO, BOD, COD, Phenol ▪ Heavy metals ▪ Total coliforms, faecal coliforms ▪ Phyto plankton ▪ Zooplankton ▪ Fish & other aquatic flora & fauna (parameters are given in ToR for EIA studies based on nature of project, raw material & process technology, location-nature/activities within of air basin)	Set of grab samples during pre and post-monsoon for ground and surface water for the whole study zone. For lab. Analysis the samples should be preserved for transport safe	Diurnal and season-wise	Samples for water quality should be collected and analyzed as per: IS: 2488 (Part 1-5) methods for sampling and testing of industrial effluents Standard methods for examination of water and waste water analysis published by American Public Health Association. International standard practices for benthos and aquatic flora & fauna	
For Surface Water Bodies				
<ul style="list-style-type: none"> ▪ Total Carbon ▪ PH ▪ Dissolved Oxygen 	Monitoring locations should include up-stream, on site, down stream of	Yield & impact on water sources to be measured during critical	Samples for water quality should be collected and	Historical data should be collected from relevant offices such as central water

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Attributes	Sampling		Measurement Method	Remarks
	Network	Frequency		
<ul style="list-style-type: none"> ▪ Biological Oxygen Demand ▪ Free NH₄ ▪ Boron ▪ Sodium Absorption ratio ▪ Electrical Conductivity 	<p>proposed discharge point. Besides sampling should cover width of the river in case water quality modeling is proposed.</p> <p>Standard methodology for collection of surface water (BIS standards)</p> <p>At least one grab sample per location per season</p>	<p>season</p> <p>River Stretch within project area be divided in grids (say 1 km length and 1/3 width) and samples should be from each grid at a time when the wastewater discharged by other sources of pollution is expected to be maximum</p>	<p>analyzed as per:</p> <p>IS: 2488 (Part 1-5) methods for sampling and testing of industrial effluents</p> <p>Standard methods for examination of water and wastewater analysis published by American Public Health Association.</p>	<p>commission, state and central ground water board, Irrigation dept.</p>
Parameters for wastewater characterization				
<ul style="list-style-type: none"> ▪ Temp, colour, odour, turbidity, TSS, TDS ▪ PH, alkalinity as CaCO₃, p value, M value, total hardness as CaCO₃, chloride as cl, sulphate as SO₄, Nitrate as NO₃, Floride as F, Phosphate as P₀₄, Chromium as Cr (Hexavalent, total) Ammonical Nitrogen as N, TKN, % sodium, BOD at 20 C, COD, DO, total residual chlorine as Cl₂, oil and grease, sulphide, phenolic compound 	<p>Implant Source depending upon the different waste streams the parameters can be optimized</p> <p>Grab and composite sampling representing avg of different process operations as well as worst emission scenario should be represented</p>	<p>Different operational cycles as well as raw material variations should be reflected in the analysis</p>	<p>Samples for water quality should be collected and analyzed as per:</p> <p>IS: 2488 (Part 1-5) methods for sampling and testing of industrial effluents</p> <p>Standard methods for examination of water and wastewater analysis published by American Public Health Association.</p>	<p>All plant sources categorized as:</p> <ul style="list-style-type: none"> ▪ Different Process waste streams as well as run-off conditions ▪ ETP wastewater ▪ Domestic/ sanitary wastewater
D. Land Environment				
<ul style="list-style-type: none"> ▪ Soil ▪ Particle size distribution ▪ Texture ▪ pH ▪ Electrical conductivity ▪ Caution exchange capacity 	<p>One surface sample from each landfill and/or hazardous waste site (if applicable) and prime villages, (soil samples be collected as per BIS</p>	<p>Season-wise</p>	<p>Collected and analyzed as per soil analysis reference book, M.I.Jackson and soil analysis reference book by C.A. Black</p>	<p>The purpose of impact assessment on soil (land environment) is to assess the significant impacts due to leaching of wastes or accidental releases and contaminating</p>

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Attributes	Sampling		Measurement Method	Remarks
	Network	Frequency		
<ul style="list-style-type: none"> ▪ Alkali metals ▪ Sodium Absorption Ratio (SAR) ▪ Permeability ▪ Porosity 	specifications) in the study area			
Landuse / Landscape				
<ul style="list-style-type: none"> ▪ Location code ▪ Total project area ▪ Topography ▪ Drainage (natural) ▪ Cultivated, forest plantations, water bodies, roads and settlements 	At least 20 points along with plant boundary and general major land use categories in the study area.	Drainage once in the study period and land use categories from secondary data (local maps) and satellite imageries	<ul style="list-style-type: none"> ▪ Global positioning system ▪ Topo-sheets ▪ Satellite Imageries (1:25,000) ▪ Satellite Imageries (1:25,000) 	<p>Drainage within the plant area and surrounding is very important for storm water impacts.</p> <p>From land use maps sensitive receptors (forests, parks, mangroves etc.) can be identified</p>
E. Hazardous Waste				
<ul style="list-style-type: none"> ▪ Permeability and porosity ▪ Moisture pH ▪ Electrical conductivity ▪ Loss on ignition ▪ Phosphorous ▪ Total nitrogen ▪ Cation exchange capacity ▪ Particle size distribution ▪ Heavy metal ▪ Ansonia ▪ Fluoride 	Grab and Composite samples. Recyclable components have to analyzed for the recycling requirements	Process wise or activity wise for respective raw material used.	Analysis IS 9334 : 1979 IS 9235 : 1979 IS 10158 : 1982	Impacts of hazardous waste should be performed critically depending on the waste characteristics and place of discharge. For land disposal the guidelines should be followed and impacts of accidental releases should be assessed
F. Biological Environment Aquatic				
<ul style="list-style-type: none"> ▪ Primary productivity ▪ Aquatic weeds ▪ Enumeration of phytoplankton, zooplankton and benthos 	Considering probable impact, sampling points and number of samples to be decided on established guidelines on ecological	Season changes are very important	Standards techniques (APHA et. Al. 1995, Rau and Wooten 1980) to be followed for sampling and measurement	<p>Seasonal sampling for aquatic biota</p> <p>One season for terrestrial biota, in addition to vegetation studies during monsoon season</p>

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Attributes	Sampling		Measurement Method	Remarks
	Network	Frequency		
<ul style="list-style-type: none"> ▪ Fisheries ▪ Diversity indices ▪ Trophic levels ▪ Rare and endangered species ▪ Sanctuaries / closed areas / Coastal regulation zone (CRZ) ▪ Terrestrial ▪ Vegetation – species, list, economic importance, forest produce, medicinal value ▪ Importance value index (IVI) of trees ▪ Wild animals 	<p>studies based on site eco-environment setting within 10/25 km radius from the proposed site</p> <p>Samples to collect from upstream and downstream of discharge point, nearby tributaries at down stream, and also from dug wells close to activity site</p>			<p>Preliminary assessment</p> <p>Microscopic analysis of plankton and meiobenthos, studies of macrofauna, aquatic vegetation and application of indices, viz. Shannon, similarity, dominance IVI etc</p> <p>Point quarter plot-less method (random sampling) for terrestrial vegetation survey.</p>
<p>Avifauna</p> <ul style="list-style-type: none"> ▪ Rare and endangered species ▪ Sanctuaries / National park / Biosphere reserve 	<p>For forest studies, chronic as well as short-term impacts should be analyzed warranting data on micro climate conditions</p>			<p>Secondary data to collect from Government offices, NGOs, published literature</p> <p>Plankton net</p> <p>Sediment dredge</p> <p>Depth sampler</p> <p>Microscope</p> <p>Field binocular</p>
G. Socio Economic				
<ul style="list-style-type: none"> ▪ Demographic structure ▪ Infrastructure resource base ▪ Economic resource base ▪ Health status: Morbidity pattern ▪ Cultural and aesthetic attributes 	<p>Socio-economic survey is based on proportionate, stratified and random sampling method</p>	<p>Different impacts occurs during construction and operational phases of the project</p>	<p>Primary data collection through R&R surveys (if require) or community survey are based on personal interviews and questionnaire</p>	<p>Secondary data from census records, statistical hard books, toposheets, health records and relevant official records available with Govt. agencies</p>

* Project Specific concerned parameters needs to be identified by the project proponent and shall be incorporated in the draft ToR, to be submitted to the Authority for the consideration and approval by the EAC/SEAC.

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