BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH AT NEW DELHI

Appeal No. 62 of 2025

IN THE MATTER OF:

Rajpal Saini and Anr. …Appellants

Versus

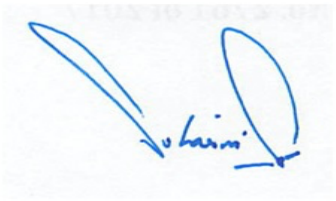
Union of India and Ors. …Respondents

NDOH: 04.02.2026

INDEX

S. No.	Particulars	Page No.
	Counter Affidavit on behalf of Respondent No. 1: Ministry of Environment, Forest and Climate Change, Government of India.	1-18
	Annexure No. R1-1 – Copy of Terms of Reference letter dated 10.01.2024	19-37
	Annexure No. R1-2 – Copy of the Minutes of the EAC meeting dated 27.05.2025	38-169
	Annexure No. R1-3 – Copy of the Environmental Clearance Letter dated 18.06.2025	170-193
	Annexure No. R1-4 – Copy of CPCB's direction dated 12.02.2025	194-302
	Annexure No. R1-5 – Copy of the Epidemiological Study on morbidity patterns in the Bawana region	303-417

THROUGH



SUHASINI SEN
(COUNSEL FOR MOEF&CC)
Mob No. : +91-96500 96066
Email Id: suhasini.sen@gmail.com

New Delhi
Date: 30.01.2026

BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH AT NEW DELHI

APPEAL NO. 62 OF 2025

IN THE MATTER OF:

RAJPAL SAINI &ANR. **....APPELLANTS**

VERSUS

UNION OF INDIA & ORS. **....RESPONDENTS**

COUNTER AFFIDAVIT ON BEHALF OF RESPONDENT NO. 1, MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

I, Sundar Ramanthan, son of Shri Late Shri Ramanathan aged 43 years, presently employed as Scientist 'F' at the Ministry of Environment, Forest, and Climate Change (MoEF&CC), Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003, solemnly affirm and declare the following:

1. That I, the above-named Deponent, am authorized and well conversant with the facts and circumstances of the present case and thus competent to swear the present Affidavit.
2. That I have read and understood the contents of the present Affidavit. The contents thereof are true and no part of it is false and no material has been concealed therefrom.

NOTARY
R.V. SINGH
Advocate
Regn.No.2282
Commission
Expire on
24-10-2027
Area-Delhi
GOVT. OF INDIA

3. That without prejudice to the above and as an alternative submission, the deponent craves liberty to raise further required contentions during the course of the proceedings if sought by this Hon'ble Tribunal.

A. APPEAL NO. 62 OF 2025

4. That it is most respectfully submitted that the present Appeal has been preferred under Section 16(h) of the National Green Tribunal Act, 2010 ("NGT Act"), challenging the Environmental Clearance (EC) dated 18.06.2025 granted by this Respondent to M/s Jindal Urban Waste Management (Bawana) Limited, for establishment of a 30 MW Waste-to-Energy Thermal Power Project at DSIIDC Industrial Area, Sector–5, Village Bawana, Sub-District Narela, District North Delhi.
5. That it is most respectfully submitted that the Appellant, in the instant Appeal, has inter –alia raised the following grounds to challenge the Environmental Clearance (EC):

- Violation of Fundamental Rights: That the proposed Waste to Energy (WtE) plant allegedly infringes upon the residents' fundamental right to breathe pollution-free air under Article 21 of the Constitution.
- Non-Compliance with Siting Norms: That the project location violates the CPCB Guidelines for Buffer Zones and fails to account for the site's proximity to Bawana, an identified pollution hotspot.

NOTARY R.V. SINGH Advocate Regn.No.2262 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

- Procedural Failures by the EAC: That the Expert Appraisal Committee (EAC) recommended the EC without due application of mind, specifically by overlooking its own prior objections and failing to scrutinize the outcomes of the Public Consultation process.
- Environmental Clearance ignores the adverse environmental and health impacts of Waste to Energy plants: That the EIA Report concealed material data and the impugned EC ignored the comprehensive environmental and health risks associated with WtE facilities.

6. That it is most respectfully submitted that in the instant appeal, the appellants prays before the Hon'ble Tribunal for the following:

a. Set aside the Environmental Clearance dated 18.06.2025 pertaining to Proposal No. IA/DL/THE/536932/2025 granted by the Ministry of Environment Forest and Climate Change to M/s Jindal Urban Waste Management for the proposed Waste to Energy Thermal Power Project of capacity 30 MW located at DSIIDC Industrial Area, Sector 5, Village Bawana, Sub-District Narela, District North Delhi;

b. Pass any order deemed fit by this Hon'ble Tribunal in the interest of justice, equity and good conscience.

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

7. That, it is most respectfully submitted I have read and understood the contents of the appeal filed therein. Save and except what is expressly

admitted herein, all the averments, allegations and contentions raised by the Appellants are denied.

8. That it is most respectfully submitted that without prejudice to the following submissions, this Respondent reserves the right to make further submissions, if so directed by this Hon'ble Tribunal.

B. PRELIMINARY SUBMISSIONS

9. At the outset, it is most respectfully submitted that the present appeal is misconceived, devoid of merit and liable to be dismissed. The Environmental Clearance dated 18.06.2025 has been granted strictly in accordance with the provisions of the Environment (Protection) Act, 1986 read with the EIA Notification, 2006, after due appraisal by the Expert Appraisal Committee (EAC) and compliance with all procedural safeguards.

10. That, it is respectfully submitted that the scope of jurisdiction of the Answering Respondent is confined to the appraisal and grant of Environmental Clearance in accordance with the provisions of the Environment (Protection) Act, 1986 read with the EIA Notification, 2006. Issues relating to land allotment, municipal planning, waste collection, or transportation fall outside the statutory mandate of the Answering Respondent. In this regard, it is respectfully submitted that the project site and land for the project are duly earmarked for Solid Waste Management

NOTARY R.V. SINGH Advocate Regn.No. Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

facilities under the Delhi Development Authority (DDA) Zonal Development Plan. The project forms part of the Municipal Corporation of Delhi's plan for achieving 100% scientific processing of municipal solid waste. The land allotment was carried out by the Municipal Corporation of Delhi (MCD).

C. STATUTORY FRAMEWORK

11. That, it is most respectfully submitted that, the Answering Respondent has notified Environment Impact Assessment (EIA) Notification, 2006 under the provisions of the Environment (Protection) Act, 1986 which deals with the process to grant prior Environment Clearance (EC) for the new projects and activities listed in the Schedule of this notification, for expansion and modernization of the existing projects and for any change in product-mix in an existing manufacturing units.

12. That, it is most respectfully submitted that, EIA involves assessing the potential environmental effects of a proposed project, encompassing interconnected socio-economic, cultural, and human-health impacts—both positive and negative. Furthermore, it's crucial to note that the granting of EC to a project isn't a singular step; it follows a prescribed process outlined in the EIA Notification, 2006, which includes:

Stage (1) – Screening(Category B only)

NOTARY
R.V. SINGH
Advocate
Regn.No.2282
Commission
Expire on
24-10-2027
Area-Delhi
GOVT. OF INDIA

- Stage (2) - Scoping – i.e. prescribing Terms of Reference (TOR) or undertaking detailed Environment Impact assessment studies.
- Stage (3) - Public Consultation – to be conducted by the respective State Pollution Control Board/UT Pollution Control Committee.
- Stage (4) - Appraisal – by Expert Appraisal Committee (EAC).

13. That, it is most respectfully submitted that as per the extant provisions of EIA Notification, 2006, the Waste to Energy plants is listed under item 1(d) to the schedule of EIA, 2006.

14. That, it is most respectfully submitted that the process involving grant of EC is transparent & is placed in public domain including the application for grant of EC, submissions and supporting documents filed by the project proponent, the minutes of meeting of the EAC/SEAC and the EC issued by the MoEF&CC/SEIAA.

D. PROJECT BACKGROUND AND PROCEDURAL COMPLIANCE

15. That it is most respectfully submitted that M/s Jindal Urban Waste Management (Bawana) Limited vide their online application bearing Proposal No. IA/DL/THE/435160/2023 and its subsequent submission requested the answering respondent for grant of Terms of Reference (ToR) for undertaking EIA/EMP study for establishment of a 30 MW Waste-to-Energy Thermal Power Project at DSIIDC Industrial Area, Sector-5,

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

Bawana. The said proposal was duly examined by the Expert Appraisal Committee (Thermal) in accordance with the provisions of the EIA Notification, 2006. Upon detailed appraisal, the EAC recommended and Ministry accorded the Terms of Reference vide letter dated 10.01.2024 for undertaking EIA/EMP study. The ToR inter-alia includes following site specific studies:

a. Cumulative Environmental Impact Assessment study,
b. Monitoring of dioxins and furans and other heavy metals as per the Municipal Solid Waste Rules, 2016,
c. Epidemiological study within 5 km range,
d. Zero Liquid Discharge plan,
e. Action plan for development of green belt (40% of total project cover area) all along the periphery of the site,
f. Recommendations of the Commission for Air Quality Management in National Capital Region and Adjoining Areas.

Copy of the ToR letter dated 10.01.2024 is annexed herewith as **Annexure No. R1-1.**

16. That it is most respectfully submitted that, pursuant to the grant of ToR, the Delhi Pollution Control Committee (DPCC), under the Chairmanship of the Additional District Magistrate (North District), Government of NCT

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

of Delhi, conducted the public consultation on 27.12.2024, after due advertisement in widely circulated newspapers, strictly in compliance with the provisions of the EIA Notification, 2006. As per the minutes of the public hearing, approximately 300 persons attended the proceedings, of whom about 40 persons signed the attendance register. A total of 685 representations were received from the public prior to the hearing (677 through e-mail and 3 by post), and 5 representations were received during the public hearing. The issues raised primarily pertained to air pollution, public health, employment, and waste handling and management. All concerns and suggestions raised during the public consultation were duly examined and addressed by the Project Proponent through a detailed and comprehensive action plan.

17. That it is most respectfully submitted that thereafter, the Project Proponent submitted an online application bearing Proposal No. IA/DL/THE/536932/2025 on the PARIVESH portal, along with the EIA/EMP report and Common Application Form (CAF), seeking for grant of Environmental Clearance. The said proposal was considered by the Expert Appraisal Committee (Thermal) in its 25th meeting held on 27.05.2025. During the appraisal, the Committee examined, inter alia, selection of technology, air and water pollution control measures, ash handling and disposal, odour management, greenbelt development, compliance with CAQM directions, proceedings of the public consultation

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

and the action plan for issues raised therein, as well as the findings of the epidemiological health study. After detailed deliberations, the EAC recommended the project for grant of Environmental Clearance, subject to stringent specific and general conditions. Copy of the Minutes of the EAC meeting dated 27.05.2025 is annexed herewith as **Annexure No. R1-2**.

18. That it is most respectfully submitted that the Ministry of Environment, Forest and Climate Change (MoEF&CC), after examining the proposal in accordance with the EIA Notification, 2006, as amended from time to time, and based on the recommendations of the Expert Appraisal Committee, granted Environmental Clearance to M/s Jindal Urban Waste Management (Bawana) Limited vide letter dated 18.06.2025 for the 30 MW Waste-to-Energy Thermal Power Project located at DSIIDC Industrial Area, Sector-5, village Bawana, North Delhi, subject to compliance with all general and specific environmental conditions stipulated therein. Copy of the Environmental Clearance letter dated 18.06.2025 is annexed herewith as **Annexure No. R1-3**.

E. SPECIFIC REPLIES TO THE ALLEGATIONS OF THE APPELLANTS

19. That it is most respectfully submitted that the allegation of violation of Article 21 of the Constitution is wholly misconceived. The project incorporates state-of-the-art pollution control systems and complies with

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

emission standards prescribed under the Solid Waste Management Rules, 2016. The project has also received recommendations from the Commission for Air Quality Management, a specialized statutory body for the NCR.

20. That it is most respectfully submitted that the contention regarding any violation of CPCB siting norms is denied, as the project site has been duly allotted by the Municipal Corporation of Delhi in accordance with applicable land use norms. Further it is submitted that the Waste-to-Energy plants are recognized as essential environmental services and falls under Blue category as provided in direction of CPCB dated 12.02.2025 under the relevant provision of the Water (Prevention & Control of Pollution) Act, 1974, and the Air (Prevention & Control of Pollution) Act, 1981. Copy of the CPCB's direction dated 12.02.2025 is annexed herewith as **Annexure No. R1-4**.

21. The allegation that the Expert Appraisal Committee (EAC) granted Environmental Clearance (EC) without due application of mind, by ignoring its prior objections and not examining the Public Consultation outcomes, is without merit and unsustainable. The EAC, while considering the project, thoroughly examined all aspects of the proposal, including the compliance of Terms of Reference (ToR) letter dated 10.01.2024, and meticulously reviewed the public hearing proceedings, recording and

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

addressing each representation. In recommending the EC, the EAC imposed the following conditions:

- *"The budget proposed for PH is Rs. 6.60 Crores. The budget proposed shall be kept in a separate account and audited annually. Project proponent shall implement the action plan to address the issues raised during public hearing within a time frame of 5 years from the date of grant of EC. In addition to this, PP shall provide medical camps in the study area for better public health, strengthen existing roads, provide RO for drinking water, develop skills of local people, etc. as committed. Compliance status in this regard shall be submitted along with the six monthly compliance to the concerned Regional Office of MoEF&CC.*
- *...The establishment of a robust public grievance redressal mechanism to address concerns and complaints from local communities regarding the power plant's operations, environmental impacts, or social issues shall be developed. A Senior Officer shall review the functioning of the mechanism twice in a month...."*

22. That the allegation that the Environmental Clearance disregards the adverse environmental and health impacts of Waste-to-Energy plants is wholly misconceived and devoid of merit. The appellant has raised bald and unsubstantiated assertions without placing any material on record. It is submitted that the Expert Appraisal Committee, prior to recommending the

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

project for grant of Environmental Clearance, comprehensively examined all relevant aspects, including potential environmental and public health impacts. Further, an Epidemiological Study on morbidity patterns in the Bawana region, North-West District of Delhi, conducted by the International Institute of Health Management Research (IIHMR), Dwarka, New Delhi, was duly undertaken and considered. (Copy of the Epidemiological Study on morbidity patterns in the Bawana region is annexed herewith as **Annexure No. R1-5**). Consequently, detailed and enforceable safeguard conditions addressing air quality, emissions, waste handling, and health concerns have been expressly incorporated in the Environmental Clearance.

i. Conditions stipulated in the Environmental Clearance letter dated 18.06.2025 addressing adverse environmental impacts:

- *Waste shall be transported in covered vehicles and the wheel-washing facility shall be provided at the entry and exit of the plant.*
- *PP shall transport fly ash / bottom ash / inerts in properly covered vehicles and ensure that no fugitive emission occurs in the air during loading, unloading and transportation.*

Air quality monitoring and Management:

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

- *Project proponent shall manage the foul odour emerging as a result of waste processing as per CPCB guidelines issued from time to time.*
- *Negative Pressure shall be maintained in the Waste Storage Pit from the waste pit. Pressure monitoring system showing the atmospheric pressure and pressure inside the waste pit shall be installed and the data shall be transferred to CPCB and DPCC through server.*
- *Selective Non-Catalytic Reduction (SNCR) system or Low NOx combustion system shall be installed to achieve NOx emission standard as prescribed in Solid Waste Management Rules, 2016 or by DPCC whichever is stringent.*
- *Hydrated lime and activated carbon injection system shall be installed for controlling SO2 and HCl emissions in flue gas. Bag Filter House made of PTFE (Polytetrafluoroethylene) with 130% design efficiency for controlling Particulate matter emissions shall be installed to ensure that particulate matter (PM) emission meet the stipulated standards of 30 mg/Nm3.*
- *One common stack with a height of 60 meters shall be provided with continuous online monitoring instruments for SO2, NOx and Particulate Matter as per extant rules.*
- *Exit velocity of flue gases shall not be less than 20-25 m/s. Project proponent shall ensure that all the parameters including TOCs in stack*

NOTARY R.V. SINGH Advocate Regn.No.2262 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

emissions to meet the standards as prescribed in Solid Waste Management Rules, 2016 or by DPCC whichever are stringent.

- *Continuous Ambient Air Quality monitoring system shall be set up to monitor common/criteria pollutants from the flue gases such as PM10, PM2.5, SO2, NOX within the plant area at one location. The monitoring of other locations (at least three locations outside the plant area covering upwind and downwind directions at an angle of 120° each) shall be carried out manually.*
- *Adequate dust extraction/suppression system shall be installed in waste handling, ash handling areas and material transfer points to control fugitive emissions.*
- *Appropriate Air Pollution Control measures shall be provided at all the dust generating sources including sufficient water sprinkling arrangements at various locations viz., roads, excavation sites, crusher plants, transfer points, loading and unloading areas, etc.*

Noise pollution and its control measures:

- *The Ambient Noise levels shall meet the standards prescribed as per the Noise Pollution (Regulation and Control) Rules, 2000.*
- *Persons exposed to high noise generating equipment shall be provided with Personal Protective Equipment (PPE) like earplugs/ear muffs, etc.*

NOTARY
R.V. SINGH
Advocate
Regn.No.2282
Commission
Expire on
24-10-2027
Area-Delhi
GOVT. OF INDIA

- *Periodical medical examination on hearing loss shall be carried out for all the workers and maintain audiometric record and for treatment of any hearing loss including rotating to non-noisy/less noisy areas.*

Water quality monitoring and Management:

- *Proponent shall achieve specific water consumption of the WTE below 3.0 m3/MWhr.*
- *Regular (at least once in six months) monitoring of groundwater quality in and around the proposed waste to energy plant including presence of heavy metals (Hg, Cr, As, Pb, etc.) shall be carried out as per CPCB guidelines. Surface water quality monitoring shall be undertaken for major surface water bodies as per the EMP. The data so obtained should be compared with the baseline data so as to ensure that the groundwater and surface water quality is not adversely impacted due to the project & its activities.*
- *The treated effluents emanating from the different processes such as RO & DM plant, boiler blow down, sewage, etc. conforming to the prescribed standards shall be recycled and reused. Sludge/ rejects will be disposed in accordance with the Hazardous Waste Management Rules.*
- *Wastewater generation of 274 KLD (191 KLD from RO & DM Plant + 57 KLD Cooling Tower water blowdown + 26 KLD from boiler blowdown) shall be sent to CMB and 108 KLD shall be recycled to raw water tank.*

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

- *Leachate of 357 KLD and sewage of 3 KLD making the quantum as 360 KLD shall be treated collectively in Leachate Treatment Plant to meet the standards as laid down in Solid Waste Management Rules, 2016. Treated leachate shall be recycled and utilized in the process and for quenching ash within the premises of the proposed WTE plant.*
- *Project proponent shall use the sludge obtained from the Leachate Treatment Plant as fuel into incinerator after dewatering by screw press technique.*

Greenbelt and Biodiversity conservation:

- *Greenbelt of at least 5-50 metres thickness and densified @ 2500 trees per hectare, shall be developed in an area of 40% of the total plant area with indigenous plant species in accordance with CPCB guidelines. The greenbelt shall inter-alia cover an entire periphery of the plant.*
- *In-situ/ex-situ Conservation Plan for the flora and fauna in the vicinity of the proposed site should be prepared and implemented.*

ii. Conditions stipulated in the Environmental Clearance letter dated 18.06.2025 addressing adverse health impacts:

- *All the recommendations of the epidemiological study report by IIHMR Delhi shall be complied upon by the project proponent in a time bound manner and compliance status in this regard shall submitted along with*

NOTARY
R.V. SINGH
Advocate
Regn.No.2282
Commission
Expire on
24-10-2027
Area-Delhi
GOVT. OF INDIA

the six monthly compliance report. In addition to this, proponent shall carry out a Root Cause Analysis (RCA) study to assess the prevalence of water borne diseases in the areas adjacent to the proposed project. The study report along with the recommendations shall be submitted to the Regional Office of the Ministry along with the six monthly compliance report.

23. That in view of the foregoing facts and submissions, it is most respectfully submitted that the Environmental Clearance dated 18.06.2025 has been granted strictly in accordance with the provisions of the Environment (Protection) Act, 1986 and the EIA Notification, 2006, after a transparent, comprehensive and multi-stage appraisal process involving scoping, detailed impact assessment, public consultation, expert scrutiny by the EAC, and consideration of specialized inputs including those of the Commission for Air Quality Management and an independent epidemiological health study. The allegations raised by the Appellants are vague, unsubstantiated and based on conjectures, and fail to demonstrate any procedural illegality, arbitrariness or violation of statutory norms in the grant of the impugned Environmental Clearance. The project, being an essential environmental service aimed at scientific management of municipal solid waste, is subject to stringent environmental, health and social safeguard conditions, continuous monitoring and regulatory

NOTARY R.V. SINGH Advocate Regn.No.2282 Commission Expire on 24-10-2027 Area-Delhi GOVT. OF INDIA

oversight. Accordingly, the present Appeal is devoid of merit and is liable to be dismissed.

PRAYER:

In view of the facts and circumstances stated hereinabove, it is most respectfully prayed that this Hon'ble Tribunal may be pleased to:

a. Dismiss Appeal No. 62 of 2025 as being misconceived, devoid of merit and unsustainable in law; and

b. Pass such other or further orders as this Hon'ble Tribunal may deem fit and proper in the facts and circumstances of the case, in the interest of justice.

DEPONENT

I Identified the deponent/executant who has signed in my presence
27/10/2018

SUNDAR RAMANATHAN
वैज्ञानिक 'एफ'/Scientist 'F'
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Min.of Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

VERIFICATION:

Verified at New Delhi on 29th day of January, 2026 that the contents of this affidavit are true and correct to my knowledge and as per official records maintained in the routine course of business. No part of the above affidavit is false and nothing material has been concealed there from.

DEPONENT

NOTARY
R.V. SINGH
Advocate
Regn.No.2282
Commission
Expire on
24-10-2027
Area-Delhi
GOVT. OF INDIA

SUNDAR RAMANATHAN
वैज्ञानिक 'एफ'/Scientist 'F'
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Min.of Environment,Forest and Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

Solemnly affirmed before me, read over & explained to the deponent.

Notary Public, DELHI

29 JAN 2026

सत्यमेव जयते

File No: J-13012/04/2023-IA.I (T)
Government of India
Ministry of Environment, Forest and Climate Change
IA Division
***

Dated **10/01/2024**

To,

M/s JINDAL URBAN WASTE MANAGEMENT (BAWANA) LIMITED
U-1, UPSIDC INDUSTRIAL AREA, NANDGAON, CHHATA, Koshi Kalan, MATHURA, UTTAR PRADESH, 281403
Info.Juwmbl@jindalecopolis.com

Subject: **Waste to Energy Thermal Power Project of capacity 30 MW at villages Badli, Sub-district Alipur, District North Delhi, Delhi by M/s Jindal Urban Waste Management (Bawana) Limited - Reconsideration for Terms of References (ToR) – reg.**

Sir/Madam,

This is in reference to your application vide proposal number IA/DL/THE/435160/2023 dated 11/08/2023 for grant of Terms of Reference to the project for Waste to Energy Thermal Power Project of capacity 30 MW at villages Badli, Sub-district Alipur, District North Delhi, Delhi by M/s Jindal Urban Waste Management (Bawana) Limited, under the provision of the EIA Notification 2006.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO23A0603DL5223800N
(ii) File No.	J-13012/04/2023-IA.I (T)
(iii) Clearance Type	TOR
(iv) Category	A
(v) Project/Activity Included Schedule No.	1(d) Thermal Power Plants
(vi) Sector	Thermal Projects
(vii) Name of Project	Proposed Waste to Energy Project 50 MW, DSIIDC Industrial Area, sector-5, Bawana, Delhi-110039 by M/s Jindal Urban Waste Management (Bawana) Limited.
(viii) Name of Company/Organization	JINDAL URBAN WASTE MANAGEMENT (BAWANA) LIMITED
(ix) Location of Project (District, State)	NORTH WEST, DELHI
(x) Issuing Authority	MoEF&CC
(xii) Applicability of General Conditions	yes

(xiii) Applicability of Specific Conditions no

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the Ministry for an appraisal by the Expert Appraisal Committee (EAC) in the Ministry under the provision of EIA notification 2006 and its subsequent amendments.

4. The above-mentioned proposal has been considered by Expert Appraisal Committee of EAC in the meeting held on 31/10/2023. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A and Part B] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

5. The brief about configuration of plant/equipment, products and byproducts and salient features of the project along with environment settings, as submitted by the Project proponent during EAC meeting are annexed.

6. The EAC, in its meeting held on 31/10/2023, based on information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference, under the provision of EIA Notification, 2006 and as amended thereof subject to stipulation of specific and general conditions as detailed in Annexure (1).

7. The details of the project is at Annexure (2).

8. The MoEF&CC has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the Expert Appraisal Committee hereby decided to grant Terms of Reference for Waste to Energy Thermal Power Project of capacity 30 MW at villages Badli, Sub-district Alipur, District North Delhi, Delhi by M/s Jindal Urban Waste Management (Bawana) Limited, under the provisions of EIA Notification, 2006 and as amended thereof.

9. The Ministry reserves the right to stipulate additional conditions, if found necessary.

10. The Terms of Reference to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

11. This issues with the approval of the Competent Authority.

Copy To

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, NewDelhi - 110 001.
2. The Chairman, Central Electricity Authority, SewaBhawan, R. K. Puram,New Delhi - 110 066.
3. The Chairman, Central Pollution Control Board, Parivesh Bhawan, EastArjun Nagar, Delhi - 110 032.
4. The Deputy Inspector General of Forests,, Ministry of Environment, Forest and Climate Change, Integrated Regional Office, Jaipur, A-209&218, Aranya Bhawan, Mahatma Gandhi Road, Jhalana Institutional Area, Jaipur – 304002, Rajasthan
5. The Chairman, Delhi Pollution Control Committee, 6th floor, C wing, Delhi Secretariat, I P Estate, Delhi-110002.
6. Guard file/Monitoring file
7. Website of MoEF&CC.

Annexure 1

Specific Terms of Reference for (Thermal Power Plants)

1. Socio-economic Study

S. No	Terms of Reference
1.1	1. Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace. 2. All the tasks includingconducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter. 3. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017-IA.III dated 30th September, 2020 shall be submitted. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation &Resettlement plan shall be prepared. 4. Details of settlement in 10 km area shall be submitted. 5. Harnessing solar power within the premises of the plant particularly at available roof tops and other available areas shall be formulated and for expansion projects, status of implementation shall also be submitted.

2. Environmental Management And Biodiversity Conservation

S. No	Terms of Reference
2.1	1. Cumulative Environmental Impact Assessment study of all the existing and proposed projects in the 15-km radius of the proposed project shall be conducted. 2. Details of characterization of Municipal solid waste, its segregation process and disposal of waste management plan shall be submitted along with EIA. 3. A plan shall be submitted to minimize the least use of hard plastic getting burn into the incinerators. 4. A study shall be carried out that commissioning of the project can decrease air emission level in the surrounding area as compare to current situation. 5. Proximate and ultimate analysis, Calorific value of municipal waste proposed to be brought from nearby MSW shall be carried out for design purpose of boilers. Mass balance of waste in the process shall be submitted. 6. Toxicity Characteristic Leachate Procedure (TCLP) test shall be conducted for Characterization of leachate, any potential of leaching heavy metals into the surrounding areas as well as into the groundwater. TCLP analysis of heavy metals, texture, bulk density, Cation Exchange Capacity of Heavy metals in the flyash and bottom ash shall be conducted for existing nearby plant. 7. The remedial measures for arresting dust generation on roads and atmosphere, Air pollution control measures including NOx control measure, treatment of leachate and stabilizing the slopes shall be taken up. Implementation plan along with timelines and financial allocations for Scientific and engineered closure of existing landfill shall be submitted.

S. No	Terms of Reference
	8. Detailed Geo-hydrological study shall be conducted w. r. t hydraulic gradient, porosity and infiltration around 2 km of the landfill site. 9. Aquifer characteristics shall be clearly mapped by conducting in-situ studies. 10. Treatment and disposal of leachate shall be submitted. No water from the plant is allowed to enter into canal/ nallah/ stream. 11. Details regarding Flue gas treatment, ash generation and its disposal/utilization method shall be submitted. 12. Monitoring of dioxins and furans and other heavy metals shall also be carried out in the stack emissions as per the Municipal Solid Waste Rules, 2016 for one season of the existing nearby waste to energy plant. 13. Impact of existing integrated facility on natural environment be studied and a comparative statement clearly mentioning the impacts on existing water bodies, and other ecologically sensitive areas within 10 km radius of project be submitted. 14. A comparative chart shall be prepared with changes observed from previous baseline study (existing nearby Waste to Energy Plant) and present baseline study. 15. An epidemiological study shall be carried out within 5 km range of the existing integrated facility. 16. Detailed action plan shall be prepared for maintenance of air pollution control equipment. 17. Pond and ground water quality (10 locations within 2 km radius of the plant boundary) shall be studied and report be submitted along with EIA/EMP. Action plan for Ground water monitoring stations on all hotspots like schools/hospitals within 2 km radius of the plant boundary be submitted. 18. Baseline Study for Heavy metals in Ground water, Surface water and soil to be carried out and incorporated in EIA/EMP report. 19. Details pertaining to water source, treatment and discharge should be provided. 20. Zero Liquid Discharge plan shall be submitted. 21. Action plan for development of green belt (40% of total project cover area) along the periphery plantation with 90% survival rate and detailed plan for thick plantation in the surrounding Nallah/stream shall be submitted. 22. PP shall submit action plan for using treated Sewage/Domestic wastewater for its operations. 23. Project Proponent to conduct Environmental Cost Benefit Analysis for the project in EIA/EMP Report. 24. An action plan shall be prepared for Water shed development within 10 km radius of the plant boundary in consultation with reputed government institution. 25. A detailed plan need to be submitted for undertaking extensive green plantation within 10 km radius of the plant focusing on water reservoir, school, hospital and other institutional area and same need to be incorporated in EIA/EMP report. 26. Recommendations of the Commission for Air Quality Management in National Capital Region and Adjoining Areas shall be submitted.

3. Disaster Management

S. No	Terms of Reference
3.1	1. Disaster Management Plan shall be prepared and incorporated in EIA/EMP report.

4. Miscellaneous:

S. No	Terms of Reference
4.1	1. PP shall submit details of court cases and its status for the project. 2. A letter shall be submitted certified that the JSW is the current bidder and it has valid consent. 3. The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples. 4. Aerial view video of project site shall be recorded through drone and be submitted.

Standard Terms of Reference for (Thermal Power Plants)

1. Statutory Compliance

S. No	Terms of Reference
1.1	The proposed project shall be given a unique name in consonance with the name submitted to other Government Departments etc. for its better identification and reference.
1.2	Vision document specifying prospective long term plan of the project shall be formulated and submitted.
1.3	Latest compliance report duly certified by the Regional Office of MoEF&CC for the conditions stipulated in the environmental and CRZ clearances of the previous phase(s) for the expansion projects shall be submitted.

2. Details Of The Project And Site

S. No	Terms of Reference
2.1	The project proponent needs to identify minimum three potential sites based on environmental, ecological and economic considerations, and choose one appropriate site having minimum impacts on ecology and environment. A detailed comparison of the sites in this regard shall be submitted.
2.2	Executive summary of the project indicating relevant details along with recent photographs of the proposed site (s) shall be provided. Response to the issues raised during Public Hearing and the written representations (if any), along with a time bound Action Plan and budgetary allocations to

S. No	Terms of Reference
	address the same, shall be provided in a tabular form, against each action proposed.
2.3	Harnessing solar power within the premises of the plant particularly at available roof tops and other available areas shall be formulated and for expansion projects, status of implementation shall also be submitted.
2.4	The geographical coordinates (WGS 84) of the proposed site (plant boundary), including location of ash pond along with topo sheet (1:50,000 scale) and IRS satellite map of the area, shall be submitted. Elevation of plant site and ash pond with respect to HFL of water body/nallah/River and high tide level from the sea shall be specified, if the site is located in proximity to them.
2.5	Layout plan indicating break-up of plant area, ash pond, green belt, infrastructure, roads etc. shall be provided.
2.6	Land requirement for the project shall be optimized and in any case not more than what has been specified by CEA from time to time. Item wise break up of land requirement shall be provided.
2.7	Present land use (including land class/kism) as per the revenue records and State Govt. records of the proposed site shall be furnished. Information on land to be acquired including coal transportation system, laying of pipeline, ROW, transmission lines etc. shall be specifically submitted. Status of land acquisition and litigation, if any, should be provided.
2.8	If the project involves forest land, details of application, including date of application, area applied for, and application registration number, for diversion under FCA and its status should be provided along with copies of relevant documents.
2.9	The land acquisition and R&R scheme with a time bound Action Plan should be formulated and addressed in the EIA report.
2.10	Satellite imagery and authenticated topo sheet indicating drainage, cropping pattern, water bodies (wetland, river system, stream, nallahs, ponds etc.), location of nearest habitations (villages), creeks, mangroves, rivers, reservoirs etc. in the study area shall be provided.
2.11	Topography of the study area supported by toposheet on 1:50,000 scale of Survey of India, along with a large scale map preferably of 1:25,000 scale and the specific information whether the site requires any filling shall be provided. In that case, details of filling, quantity of required fill material; its source, transportation etc. shall be submitted.

3. Ecology Biodiversity And Environment

S. No	Terms of Reference
3.1	A detailed study on land use pattern in the study area shall be carried out including identification of common property resources (such as grazing and community land, water resources etc.) available and Action Plan for its protection and management shall be formulated. If acquisition of grazing land is involved, it shall be ensured that an equal area of grazing land be acquired and developed and detailed plan submitted.
3.2	Location of any National Park, Sanctuary, Elephant/Tiger Reserve (existing as well as proposed),

S. No	Terms of Reference
	migratory routes / wildlife corridor, if any, within 10 km of the project site shall be specified and marked on the map duly authenticated by the Chief Wildlife Warden of the State or an officer authorized by him.
3.3	A mineralogical map of the proposed site (including soil type) and information (if available) that the site is not located on potentially mineable mineral deposit shall be submitted.
3.4	The water requirement shall be optimized (by adopting measures such as dry fly ash and dry bottom ash disposal system, air cooled condenser, concept of zero discharge) and in any case not more than that stipulated by CEA from time to time, to be submitted along with details of source of water and water balance diagram. Details of water balance calculated shall take into account reuse and re-circulation of effluents.
3.5	Water body/Nallah (if any) passing across the site should not be disturbed as far as possible. In case any Nallah / drain is proposed to be diverted, it shall be ensured that the diversion does not disturb the natural drainage pattern of the area. Details of proposed diversion shall be furnished duly approved by the concerned Department of the State.
3.6	It shall also be ensured that a minimum of 500 m distance of plant boundary is kept from the HFL of river system / streams etc. and the boundary of site should also be located 500 m away from railway track and National Highways.
3.7	Hydro-geological study of the area shall be carried out through an institute/ organization of repute to assess the impact on ground and surface water regimes. Specific mitigation measures shall be spelt out and time bound Action Plan for its implementation shall be submitted
3.8	Detailed Studies on the impacts of the ecology including fisheries of the River/Estuary/Sea due to the proposed withdrawal of water / discharge of treated wastewater into the River/Sea etc shall be carried out and submitted along with the EIA Report. In case of requirement of marine impact assessment study, the location of intake and outfall shall be clearly specified along with depth of water drawl and discharge into open sea.
3.9	Source of water and its sustainability even in lean season shall be provided along with details of ecological impacts arising out of withdrawal of water and taking into account inter-state shares (if any). Information on other competing sources downstream of the proposed project and commitment regarding availability of requisite quantity of water from the Competent Authority shall be provided along with letter / document stating firm allocation of water.
3.10	Detailed plan for rainwater harvesting and its proposed utilization in the plant shall be furnished.In addition, wherever ground water is drawn, PP shall submit detailed plan of Water charging activity to be undertaken.
3.11	Feasibility of near zero discharge concept shall be critically examined and its details submitted.
3.12	Optimization of Cycles of Concentration (COC) along with other water conservation measures in the project shall be specified.
3.13	Plan for recirculation of ash pond water and its implementation shall be submitted.
3.14	Detailed plan for conducting monitoring of water quality regularly with proper maintenance of

S. No	Terms of Reference
	records shall be formulated. Detail of methodology and identification of monitoring points (between the plant and drainage in the direction of flow of surface / ground water) shall be submitted. It shall be ensured that parameter to be monitored also include heavy metals. A provision for long-term monitoring of ground water table using Piezometer shall be incorporated in EIA, particularly from the study area.
3.15	Hazards Characterization: Past incidents of hazard events within 10km radius of project area with detailed analysis of causes and probability of reoccurrence

4. Environmental Baseline Study And Mitigation Measures

S. No	Terms of Reference
4.1	One complete season (critical season) site specific meteorological and AAQ data (except monsoon season) as per latest MoEF&CC Notification shall be collected along with past three year's meteorological data for that particular season for wins speed analysisand the dates of monitoring shall be recorded. The parameters to be covered for AAQ shall include PM10, PM2.5, SO2, NOx, CO and Hg. The location of the monitoring stations should be so decided so as to take into consideration the upwind direction, pre-dominant downwind direction, other dominant directions, habitation and sensitive receptors. There should be at least one monitoring station each in the upwind and in the pre - dominant downwind direction at a location where maximum ground level concentration is likely to occur.
4.2	In case of expansion project, air quality monitoring data of 104 observations a year for relevant parameters at air quality monitoring stations as identified/stipulated shall be submitted to assess for compliance of AAQ Standards (annual average as well as 24 hrs).
4.3	A list of industries existing and proposed in the study area shall be furnished.
4.4	Cumulative impacts of all sources of emissions including handling and transportation of existing and proposed projects on the environment of the area shall be assessed in detail. Details of the Model used and the input data used for modelling shall also be provided. The air quality contours should be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any. The windrose and isopleths should also be shown on the location map. The cumulative study should also include impacts on water, soil and socio-economics.
4.5	Radio activity and heavy metal contents of coal to be sourced shall be examined and submitted along with laboratory reports.
4.6	Fuel analysis shall be provided. Details of auxiliary fuel, if any, including its quantity, quality, storage etc should also be furnished.
4.7	Quantity of fuel required, its source and characteristics and documentary evidence to substantiate confirmed fuel linkage shall be furnished. The Ministry's Notification dated 02.01.2014 regarding ash content in coal shall be complied. For the expansion projects, the compliance of the existing units to the said Notification shall also be submitted
4.8	Details of transportation of fuel from the source (including port handling) to the proposed plant and its impact on ambient AAQ shall be suitably assessed and submitted. If transportation entails a long

S. No	Terms of Reference
	distance it shall be ensured that rail transportation to the site shall be first assessed. Wagon loading at source shall preferably be through silo/conveyor belt.
4.9	For proposals based on imported coal, inland transportation and port handling and rail movement shall be examined and details furnished. The approval of the Port and Rail Authorities shall be submitted.
4.10	Details regarding infrastructure facilities such as sanitation, fuel, restrooms, medical facilities, safety during construction phase etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase should be adequately catered for and details furnished.

5. Environmental Management Plan

S. No	Terms of Reference
5.1	EMP to mitigate the adverse impacts due to the project along with item - wise cost of its implementation in a time bound manner shall be specified.
5.2	A Disaster Management Plan (DMP) along with risk assessment study including fire and explosion issues due to storage and use of fuel should be prepared. It should take into account the maximum inventory of storage at site at any point of time. The risk contours should be plotted on the plant layout map clearly showing which of the proposed activities would be affected in case of an accident taking place. Based on the same, proposed safeguard measures should be provided. Measures to guard against fire hazards should also be invariably provided. Provision for mock drills shall be suitably incorporated to check the efficiency of the plans drawn.
5.3	The DMP so formulated shall include measures against likely Fires/Tsunami/Cyclones/Storm Surges/ Earthquakes etc, as applicable. It shall be ensured that DMP consists of both On-site and Off-site plans, complete with details of containing likely disaster and shall specifically mention personnel identified for the task. Smaller version of the plan for different possible disasters shall be prepared both in English and local languages and circulated widely.
5.4	Details of fly ash utilization plan as per the latest fly ash Utilization Notification of GOI along with firm agreements / MoU with contracting parties including other usages etc. shall be submitted. The plan shall also include disposal method / mechanism of bottom ash along with monitoring mechanism.

6. Green Belt Development

S. No	Terms of Reference
6.1	Detailed scheme for raising green belt of native species of appropriate width (50 to 100 m) and consisting of at least 3 tiers around plant boundary not less than 2000 tree per ha with survival rate of more than 85%shall be submitted. Photographic evidence must be created and submitted periodically including NRSA reports in case of expansion projects. A shrub layer beneath tree layer would serve as an effective sieve for dust and sink for CO2 and other gaseous pollutants and hence a stratified green belt should be developed.

S. No	Terms of Reference
6.2	Over and above the green belt, as carbon sink, plan for additional plantation shall be drawn by identifying blocks of degraded forests, in close consultation with the District Forests Department. In pursuance to this the project proponent shall formulate time bound Action Plans along with financial allocation and shall submit status of implementation to the Ministry every six months

7. Socio-economic Activities

S. No	Terms of Reference
7.1	Socio-economic study of the study area comprising of 10 km from the plant site shall be carried out through a reputed institute / agency which shall consist of detail assessment of the impact on livelihood of the local communities.
7.2	Action Plan for identification of local employable youth for training in skills, relevant to the project, for eventual employment in the project itself shall be formulated and numbers specified during construction & operation phases of the Project.
7.3	If the area has tribal population, it shall be ensured that the rights of tribals are well protected. The project proponent shall accordingly identify tribal issues under various provisions of the law of the land.
7.4	A detailed CER plan along with activities wise break up of financial commitment shall be prepared in terms of the provisions OM No. 22-65/2017-IA.III dated 30.09.2020.CER component shall be identified considering need based assessment study and Public Hearing issues. Sustainable income generating measures which can help in upliftment of affected section of society, which is consistent with the traditional skills of the people shall be identified.
7.5	While formulating CER schemes it shall be ensured that an in-built monitoring mechanism for the schemes identified are in place and mechanism for conducting annual social audit from the nearest government institute of repute in the region shall be prepared. The project proponent shall also provide Action Plan for the status of implementation of the scheme from time to time and dovetail the same with any Govt. scheme(s). CERdetails done in the past should be clearly spelt out in case of expansion projects.
7.6	R&R plan, as applicable, shall be formulated wherein mechanism for protecting the rights and livelihood of the people in the region who are likely to be impacted, is taken into consideration. R&R plan shall be formulated after a detailed census of population based on socio economic surveys who were dependant on land falling in the project, as well as, population who were dependant on land not owned by them.
7.7	Assessment of occupational health and endemic diseases of environmental origin in the study area shall be carried out and Action Plan to mitigate the same shall be prepared.
7.8	Occupational health and safety measures for the workers including identification of work related health hazards shall be formulated. The company shall engage full time qualified doctors who are trained in occupational health. Health monitoring of the workers shall be conducted at periodic intervals and health records maintained. Awareness programme for workers due to likely adverse impact on their health due to working in non-conducive environment shall be carried out and precautionary measures like use of personal equipments etc. shall be provided. Review of impact of various health measures undertaken at intervals of two to three years shall be conducted with an

S. No	Terms of Reference
	excellent follow up plan of action wherever required.

8. Corporate Environment Policy

S. No	Terms of Reference
8.1	Does the company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
8.2	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.
8.3	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions. Details of this system may be given.
8.4	Does the company has compliance management system in place wherein compliance status along with compliances / violations of environmental norms are reported to the CMD and the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA report.

9. Miscellaneous

S. No	Terms of Reference
9.1	All the above details should be adequately brought out in the EIA report and in the presentation to the Committee.
9.2	Details of litigation pending or otherwise with respect to project in any Court, Tribunal etc. shall invariably be furnished.
9.3	In case any dismantling of old plants are envisaged, the planned land use & land reclamation of dismantled area to be furnished.

10. Additional Tor For Coastal Based Thermal Power Plants Projects (Tpps)

S. No	Terms of Reference
10.1	Low lying areas fulfilling the definition wetland as per Ramsar Convention shall be identified and clearly demarcated w.r.t the proposed site.
10.2	If the site includes or is located close to marshy areas and backwaters, these areas must be excluded from the site and the project boundary should be away from the CRZ line. Authenticated CRZ map from any of the authorized agencies shall be submitted.
10.3	The soil levelling should be minimum with no or minimal disturbance to the natural drainage of the area. If the minor canals (if any) have to be diverted, the design for diversion should be such that the

S. No	Terms of Reference
	diverted canals not only drains the plant area but also collect the volume of flood water from the surrounding areas and discharge into marshy areas/major canals that enter into creek. Major canals should not be altered but their embankments should be strengthened and desilted.
10.4	Additional soil required for levelling of the sites should as far as possible be generated within the site itself in such a manner that the natural drainage system of the area is protected and improved.
10.5	Marshy areas which hold large quantities of flood water to be identified and shall not be disturbed.
10.6	No waste should be discharged into Creek, Canal systems, Backwaters, Marshy areas and seas without appropriate treatment. Wherever feasible, the outfall should be first treated in a Guard Pond and then only discharged into deep sea (10 to 15 m depth). Similarly, the Intake should be from deep sea to avoid aggregation of fish and in no case shall be from the estuarine zone. The brine that comes out from Desalinization Plants (if any) should not be discharged into sea without adequate dilution.
10.7	Mangrove conservation and regeneration plan shall be formulated and Action Plan with details of time bound implementation shall be specified, if mangroves are present in Study Area.
10.8	A common Green Endowment Fund should be created by the project proponents out of EMP budgets. The interest earned out of it should be used for the development and management of green cover of the area.
10.9	Impact on fisheries at various socio economic level shall be assessed.
10.10	An endowment Fishermen Welfare Fund should be created out of CER grants not only to enhance their quality of life by creation of facilities for Fish Landing Platforms / Fishing Harbour / cold storage, but also to provide relief in case of emergency situations such as missing of fishermen on duty due to rough seas, tropical cyclones and storms etc.
10.11	Tsunami Emergency Management Plan shall be prepared wherever applicable and Plan submitted prior to the commencement of construction work.
10.12	There should not be any contamination of soil, ground and surface waters (canals & village pond) with sea water in and around the project sites. In other words necessary preventive measures for spillage from pipelines, such as lining of Guard Pond used for the treatment of outfall before discharging into the sea and surface RCC channels along the pipelines of outfall and intake should be adopted. This is just because the areas around the projects boundaries could be fertile agricultural land used for paddy cultivation.

Additional Terms of Reference

N/A

Annexure 2

Details of Products & By-products

Name of the product /By-product	Product / By-product	Quantity	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Electricity	Electricity	50	Mega Watt (MW)	Through Underground Cable.	NA

Annexure (2)

The details of the project:-

The details of the project submitted by project proponent and ascertained from the document submitted are mentioned below:

i. The proposal was earlier considered by the EAC in its 46th meeting held on 4th September, 2023 wherein the proposal was deferred while observing the following:

"....The EAC noted that another 24 MW Waste to Energy Plant by M/s Delhi MSW Solutions Ltd. is already under operation just adjacent to the boundary of proposed power plant. It was also noted that a proposal (proposal no IA/DL/THE/430833/2023) for expansion of the same operating power plant has also been submitted to the Ministry for adding capacity of 60 MW. From the. kml file the committee observed that the proposed location of instant proposal is in notified industrial area as well as very close to civil colonies.

The proposed project layout also indicates diversion of Natural stream/Nallah. Operation of 110MW waste to energy power plants in the area may invite undesirable environmental consequences. The EAC suggested the PP to re-visit the proposal in terms of its capacity and project site location....."

ii. In view of the observations raised by the EAC the project proponent vide letter dated 17.10.2023 submitted the following:

1. Project capacity is revised to 30 MW.
2. In view of existing Natural Stream/ Nallah, which is crossing through the backside of the proposed project site shall not be disturbed and no change will be made in existing drainage pattern. The revised layout plan of proposed project has been submitted.

It is pertinent to mention that the proposed project site has been earmarked for Solid Waste Management facility by DDA in Zonal Development Plan of Zone "P1" Narela

The Municipal Corporation of Delhi (MCD), in order to meet the target of 100% solid waste processing and scientific disposal of unprocessed quantities of MSW, has planned to develop this Waste Energy (WtE) Project.

iii. **Analysis of Alternate Site: -**

Three alternate sites were analysed to decide the most environmentally and techno-economically suitable site for establishing the proposed Waste to Energy Project. The Bawana site has been found most suitable due to availability of adequate authorized land with the MCD in DSIIDC, Industrial Area, Nearness to water source from PPCL and no fresh water will be drawn up for industrial use except drinking water, and no existence of Ecologically sensitive areas.

iv. The Salient features of the project are as under:

1. **Project details:**

Name of the Proposal	Proposed Waste to Energy Project 30 MW located at DSIIDC Industrial Area, Sector-5, Bawana, Delhi-110039 by M/s Jindal Urban Waste Management (Bawana) Limited.
Proposal No.	IA/DL/THE/435160/2023
Location	DSIIDC Industrial Area, Sector-5, Bawana, Delhi-110039.
Company's Name	M/s Jindal Urban Waste Management (Bawana) Limited.
Accredited Consultant and certificate no.	**Consultant Name:** Mantec Consultants Pvt. Ltd. **Certificate No.:** NABET/EIA/2326/RA 0305 valid up to 20-04-2026.
Inter- state issue involved	Delhi-Haryana State Boundary
Seismic zone	Zone-IV (As per IS 1893:2002)

2. **Category details:**

Category of the project	Category - A
Capacity	30 MW (3000 TPD of MSW)
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	NA

3. **Project Details:**

If expansion, the details of ECs (including amendments and extension of validity) of existing Units etc.	Not Applicable.
Amendments granted, if Yes details	Not Applicable.
Expansion / Green Field (new): (IPP / Merchant / Captive):	Green Field (New)
If expansion, the date of latest monitoring done by the Regional Office (R.O) of MoEF&CC for compliance of the conditions stipulated in the environmental and CRZ clearances of the previous phases. A certified copy of the latest	Not Applicable.

R.O. monitoring report shall also be submitted.	
Specific webpage address where all EC related documents (including monitoring and compliance related reports/documents) of the specific project under consideration are/will be available. Also contact details of PP's officer responsible for updating this webpage/information.	Specific website of the project will be developed.
Co-ordinates of all four corners of TPP Site:	A 28°47'41.49"N 77°3'42.51"E B 28°47'46.08"N 77°3'36.54"E C 28°47'53.53"N 77°3'43.80"E D 28°47'49.56"N 77°3'48.06"E E 28°47'47.84"N 77°3'47.27"E F 28°47'47.12"N 77°3'47.43"E G 28°47'46.70"N 77°3'47.84"E
Average height of: (a) TPP site, (b) ash pond site etc. above MSL	(a) TPP Site: ~240 m (b) Ash Pond site etc.: Not Applicable
Whether the project is in the Critically Polluted Area (CPA) or within 10 km of CPA. If so, the details thereof:	No
CRZ Clearance	Not Applicable.
Cost of the Project (As per EC and revised): Cost of the proposed activity in the amendment:	Estimated Cost of the Project Rs 660.00 Crore.
Employment Potential for entire project/plant and employment potential for the proposed amendment (specify number of persons and quantitative information).	Employment potential: • **<u>During the construction phase</u>** Employment (Contract): 570 Nos On Roll:60 Nos **Total (On Roll + Contract): 630 Nos.** • **<u>During the operational phase</u>** Contract: 156 Nos On Roll: 86 Nos **Total (On Roll + Contract): 242 Nos.**
Benefits of the project (specify quantitative information)	• Handling of 3000 TPD of MSW through an environmentally and scientific approach. • Generation of 30 MW of Green Energy from MSW • Avoidance of sanitary landfills site due to utilization of MSW, thus saving land resource.

4. Electricity generation capacity:

Capacity & Unit Configurations:	30 MW (One TG Set with Two Steam Generators/Boilers)
Generation of Electricity Annually	262800 MWh

5. Details of fuel and Ash disposal

Fuel to be used:	Municipal Solid Waste (MSW)
Quantity of Fuel required per Annum:	10,95,000 MTPA
Coal Linkage / Coal Block: (If Block allotted, status of EC & FC of the Block)	Not Applicable
Details of mode of transportation of coal from coal source to the plant premises along with distances	MSW will be transported to the site through covered trucks/closed compactor by MCD.
Fly Ash Disposal System Proposed	Fly ash will be sent to the secured landfills site designated by MCD.
Ash Pond/ Dyke (Area, Location & Co-ordinates) Average height of area above MSL(m)	Not Applicable. .
Quantity of a. Fly Ash to be generated. b. Bottom Ash to be generated:	a. Fly Ash- <3% (Approx.) of Feed. b. Bottom Ash- <17% (Approx.) of Feed
Fly Ash utilization (details)	Fly ash will be sent to the secured landfills site designated by MCD.
Stack Height (m) & Type of Flue	60 meters & Single flue type.

6. Water Requirement:

Source of Water:	• Process water will be met from PPCL /Treated sewage from DJB. • Drinking water will be supplied by DJB
Quantity of water requirement:	• During construction phase: 40 KLD • Domestic water: 10 KLD • During operation: 625 KLD (Industrial Purpose) • Domestic water: 5 KLD

Distance of source of water from Plant:	Approx 1 Km from PPCL
Mode of Conveyance of water	Through Pipeline
(If source is Sea water) Desalination Plant Capacity	Not Applicable
Mode/Management of Brine:	Not Applicable
Cooling System	ACC (Air Cooled Condenser)

7. Land Area Breakup:

Land Requirement: a) TPP Site b) Ash Pond c) Township d) Railway Siding & Others e) Raw Water Reservoir f) Green Belt g) others Total (if expansion state additional land requirement) Status of Land Acquisition:	15.0 Acres 7.84 Acres NA NA NA NA 4.96 Acres 2.2 Acres 15.0 Acres (Note: This is Greenfield project; hence no additional land is required). Land will be given by MCD.
Status of the project: If under construction phase: please specify the reasons for delay, works completed till date and balance works along with expected date of completion. If under operation phase, date of commissioning (COD) of each unit. Whether the plant was under shutdown since commissioning, details and reasons. Break-Up of land-use of TPP site: a. Total land required for project. components.	Green Field (New) NA

b. Private land	15.0 Acres
c. Government land	Nil
d. Forest Land	15.0 Acres
	Nil

8. **Presence of Environmentally Sensitive areas in the study area**

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate/ letter/ Remarks
Reserve Forest/Protected Forest Land	Yes	❖ Ghoga RF: 3.12 Km in North direction ❖ Bawana RF: 1.70 km in North direction. ❖ Sultanpur RF: 4.29 km in SW direction ❖ There is no National Park, Wildlife Sanctuary etc. in 10 km radius.
National Park	No	
Wildlife Sanctuary	No	
Archaeological sites monuments/historical temples etc	No	
Names & distance of National parks, Wildlife sanctuaries, Biosphere reserves, Heritage sites Rivers, Tanks, Reserve Forests etc. Located within 10 Km from the plant boundary:	No	
Additional information (if any)	NA	-

Availability of Schedule-I species in study area: It will be included in the EIA report.

9. **Court case details:**

Any litigation/ Court Case pertaining to the project	No
Is the proposal under any investigation? If so, details thereof.	No
Any violation case pertaining to the project:	No
Additional information (if any)	NA

***

Signature invalid

Digitally Signed by Amit Vashishtha
Member Secretary, MoEFCC (EC)

Date: 10/01/2024

सत्यमेव जयते

Government of India
Ministry of Environment, Forest and Climate Change
IA Division
(Thermal Projects)
***

Minutes of AGENDA FOR 25th MEETING OF EXPERT APPRAISAL COMMIT TEE (THERMAL SECTOR), SCHEDULED TO BE HELD DURING 27TH MAY, 2025 THROUGH PHYSICAL MODE. meeting Thermal Projects held from 27/05/2025 to 27/05/2025 **Date:** 03/06/2025

MoM ID: EC/MOM/EAC/828412/5/2025

Agenda ID: EC/AGENDA/EAC/828412/5/2025

Meeting Venue: Narmada Hall, MOEF&CC, New Delhi

Meeting Mode: Physical

Date & Time:

27/05/2025	10:34 AM	05:30 PM

1. Opening remarks

At the outset, Shri. Inder Pal Singh Matharu (I.F.S Retd.), Chairman, Expert Appraisal Committee (Thermal Power & Coal Mining) welcomed the Expert members & other participants and requested to start the proceeding as per the agenda listed for this meeting. The list of members who participated in the meeting is at **Annexure – I**. The Standard/Generic ToR conditions shall be system generated through the PARIVESH Portal.

[The main PDF of MoM is enclosed at Page no. 110 - 169]

2. Confirmation of the minutes of previous meeting

Confirmation of the Minutes of the 24th Meeting of the EAC (Thermal): The minutes of the 24th meeting of the EAC (Thermal) held on 29/04/2025 has been confirmed by the EAC as uploaded on Parivesh.

3. Details of proposals considered by the committee

Day 1 -27/05/2025

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Proposed Waste to Energy Project 50 MW, DSIIDC Industrial Area, sector-5, Bawana, Delhi-110039 by M/s Jin dal Urban Waste Management (Bawana) Limited. by **JINDAL URBAN WASTE MANAGEMENT (BAWANA) LIMITED** located at **NORTH WEST,DELHI**	
Proposal For	Fresh EC

Proposal No	File No	Submission Date	Activity (Schedule Item)
IA/DL/THE/536932/2025	J-13012/04/2023-IA.I (T)	12/05/2025	Thermal Power Plants (1(d))

3.1.2. Project Salient Features

Agenda No 25.1

25.1 Proposed Waste to Energy Thermal Power Project of capacity 30 MW by **M/s Jindal Urban Waste Management (Bawana) Limited** located at DSIIDC Industrial Area, Sector 5, village Bawana, Sub-district Narela, **District North Delhi, Delhi – Environment Clearance – regarding.**

[Proposal No. IA/DL/THE/536932/2025; F. No. J-13012/04/2023-IA.I (T)]

25.1.1: M/s Jindal Urban Waste Management (Bawana) Limited has made an online application vide proposal number IA/DL/THE/536932/2025 dated 12/05/2025 along with copy of EIA/EMP report, CAF (Part A, B & C) and sought for Environment Clearance (EC) under the provisions of the EIA Notification, 2006 for the project mentioned above. The proposed project/activity is listed at item no. 1(d) Thermal Power Plants of the schedule of the EIA Notification, 2006 and falls under Category 'A'. Further, the proposed project/activity also attracts the general condition of the EIA Notification, 2006 as the project site is located at a distance of 4.48 KM from Delhi-Haryana State boundary in NNW direction.

Name of the EIA Consultant: M/s Mantec Consultants Pvt. Ltd [S. No. 144, List of ACOs with their Certificate / Extension Letter no NABET/EIA/23-26/RA 0305_Rev.01 Valid up to April 20, 2026].

Details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meeting, are given as under:

25.1.2: The instant proposal of M/s Jindal Urban Waste Management (Bawana) Limited is for setting up of Waste to Energy (WTE) Thermal Power Project with a capacity 30 MW at Delhi State Industrial and Infrastructure Development Corporation Limited (DSIIDC) Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi.

25.1.3: The details of the Terms of Reference (ToR) obtained for the above project for prearation of EIA/EMP report is furnished as below:

Proposal No with Date	Consideration	Details	Date of accord	ToR Validity
IA/DL/THE/435160/2023dated 11/08/2023	2nd meeting of EAC– Thermal held on 31/10/2023	Terms of Reference	10/01/2024	4 years

25.1.4: Environmental site settings:

S. No.	Particulars	Details	Remarks
1.	Total Land	15.0 Acres (or) 6.07 Ha – Government Land	Land Use: Industrial Purpose Locate

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>d at DSIIDC Industrial Area, Sector-5, Bawana, Delhi</td></tr>
<tr><td>2.</td><td>Land Use breakup</td><td>
<table>
<tr><th>Details</th><th>Area Breakup (Acres)</th><th>Percentage (%)</th></tr>
<tr><td>TPP Site</td><td>7.84</td><td>52.27</td></tr>
<tr><td>Admin Office & Canteen</td><td>0.3</td><td>2.0</td></tr>
<tr><td>Greenbelt Area</td><td>6.0</td><td>40.0</td></tr>
<tr><td>Ot</td><td>0</td><td>5.7</td></tr>
</table>
</td><td>Land Use: Industrial Purpose. At DSIIDC Industrial Area, Sector-5, Bawana, Delhi-110039.</td></tr>
</table>

S. No.	Particulars	Details	Remarks
		hers .86 3 Total 15 acres (or) 6.07 Ha 100%	
3.	Land acquisition details as per MoEF&CC O.M. dated 7/10/2014 & 20/02/2025	The land requirement for the project is 6.07 Ha (or) 15 acres which is a Government land.	The land has been provided by Municipal Corporation of Delhi (MCD) to M/s. Jindal Urban Waste Management (Bawana) Limited vide concession agreement dated 27/02/2025.

S. No.	Particulars	Details	Remarks
4.	Existence of habitation & involvement of R&R, if any.	**Study Area:** Habitation — Distance JJ Colony — Within 1 Km Iradat Nagar alias Naya Bans — Within 05 Km Holambi Khurd Holambi Kalan Sanoth Ghoga Khera Khurd	The project is within the DSIIDC Industrial Area, Bawana The land for the project is allocated by the MCD. It does not involve R&R issue.
5.	Lat	Plant Site:	-

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th><th>Remarks</th></tr>
<tr><td></td><td>itude and Longitude of all corners of the project site.</td><td>
<table>
<tr><th>Point</th><th>Lat.</th><th>Long.</th></tr>
<tr><td></td><td>28°47‘41.49"N</td><td>77°31'42.51"E</td></tr>
<tr><td></td><td>28°47’46.08"N</td><td>77°31'36.54"E</td></tr>
<tr><td></td><td>28°47’53.53"N</td><td>77°31'43.80"E</td></tr>
<tr><td></td><td>28°47’49.56"N</td><td>77°31'48.06"E</td></tr>
<tr><td></td><td>28°47’47.84"N</td><td>77°31'47.27"E</td></tr>
<tr><td></td><td>28°47’47.12"N</td><td>77°31'47.43"E</td></tr>
<tr><td></td><td>28°47’46.70"N,</td><td>77°31'47.84"E</td></tr>
</table>
</td><td></td></tr>
<tr><td>6.</td><td>Elevation of the project site</td><td>The project site elevation varies from 248 m to 236 m above mean sea level (msl)</td><td>-</td></tr>
<tr><td>7.</td><td>Involvement of Forest land if any</td><td>No</td><td>-</td></tr>
<tr><td>8.</td><td>Water body (Rivers, Lake</td><td>A natural nallah is passing through the project site.

Western Yamuna Canal is located at approx. 32 meters from the proje</td><td>No perennial river passing, only regulated canal passing by nea</td></tr>
</table>

S. No.	Particulars	Details	Remarks
	s, Pond, Nala, Natural Drainage, Canal etc.) exists within the project site as well as study area	ct site in South-West direction. **<u>Protection measures:</u>** MSW will be stored in a closed pit to prevent cross-contamination Fly ash and bottom ash securely stored in closed silos Fuel oil tanks equipped with dykes and spill collection pits Nallah passing through the site will not be diverted Development of a green belt along the surrounding nallah/stream Stormwater from open storage areas will be routed through pits for effective silt collection	r to the project site.
9.	Existence of ESZ/ ES	There is no National Park, Wildlife Sanctuary etc. within study area.	-

S. No.	Particulars	Details	Remarks
	A/ national park/ wildlife sanctuary/ biosphere reserve/ tiger reserve/ elephant reserve etc. if any within the study area		
10.	Archaeological sites, monume	None	-

S. No.	Particulars	Details	Remarks
	nts/ historical temples, etc.		
11.	Involvement of Critically Polluted Area/ Severely Polluted area as per 2018 CEPI score	No	-

25.1.5: The salient features of the proposed WTE project is given as below:
The technology proposed to be employed for this WTE project is RDF combustion based reciprocating forward feed grate technology. The power plant constitutes Material Recovery Facility (Pre-sorting), RDF fuel Pit, Incinerators, Boilers, and Steam Turbine Generators with power generation total capacity of 30 MW±6MW. Air cooled condensers (ACC) are to be used in lieu of water-cooled condenser (WCC). The rejects/generated bottom ash will be processed in the bottom ash processing plant. After the processing materials which are not recyclable for further processing will be sent to Sanitary Landfill. Fly ash will be sent to the secured landfills site designated by MCD. The air pollution control system will consist of Flue Gas Treatment System which includes Adsorption of acidic components and other pollutants by lime and Activated carbon in turbo reactors and filtration of dust particles through bag

filters. Wastewater & leachate generated from the WTE plant will be treated in the Leachate Treatment Plant. The treated wastewater will be recycled to DM plant and rejected water for quenching of bottom ash. The green belt area will be developed in an area of 6 acres all along the periphery of the project site.

- Total MSW feed : 3000 TPD
- Power Plant capacity : 30 MW ± 6 MW
- RDF Processing Capacity : 700 TPD per unit (2x700 TPD for two units)
- Auxiliary power consumption : 10 to 15% of total power generation
- Saleable Power to Grid : 85 to 90%
- Calorific Value of Fuel : 1600 kcal/kg and above based on RDF quality
- Export grid voltage : 66 kV
- Grid Interconnection : DTL Bawana Substation (220/66 kV)
- Furnace and boiler type
  - Upward grate system
  - 99.9% Combustion rate (less than 10 ppm of CO)
  - Low NOX generation design – secondary air control
  - Flue gas Cooling system
  - Hydrated lime dosing system for SO_2 control
  - Stack of 60 meter height

The description of process involved in the generation of electricity from municipal waste is given below:

MSW receiving

Pre Segregation and preparation of RDF

Heat Recovery & Steam Generation in the boiler

Power Generation & exporting to grid

Flue Gas Cleaning System

Leachate Treatment

Overall mass balance

Description	Quantity (Tons Per Day)	% fraction
Total Waste for processing	3000 ton	100 %
Green Waste by bio-methanation process	600 ton	20 %
Total MSW Processed for RDF	2,400 ton	80 %
Total RDF to storage	1,400 ton	58 %
Inerts removal in processing	295 ton	12%
Leachate recovered	357 ton	15 %
Moisture	343 ton	14 %
Compost	4 ton	0.17 %
Recyclables	2 ton	0.08 %

Note: 20 to 25 percentage variations on the MSW feed quality are envisaged.

25.1.6: Fuel requirement: The details of the municipal solid waste requirement for the proposed project along with its source and mode of transportation is given as below:

Details	Fuel requirement (TPD)	Source	Distance from site (Kms)	Mode of Transportation	Linkage document
1.	3000 Municipal Solid Waste	Municipal Corporation of Delhi	Approx. 12 Kms	Road	Concession Agreement with MCD

25.1.7: Water requirement: The water requirement for the proposed project during operation phase is estimated as 625 m^3 /day and approx. 7 m^3/day of fresh water will be required for domestic purposes which will be met by the DJB. Requirement of water for industrial usage will be met from the blowdown reject water from the Pragati Power Corporation Limited (PPCL) or treated sewage from STP, DJB. There will be no use of ground water in the process or for domestic use for the proposed project.

Operation Phase:

Fresh water – 7 m^3/day

Blowdown reject water from the PPCL/Treated sewage from STP, DJB – 625 m^3/day

Treated Leachate water – 357 m^3/day

25.1.8: Power requirement: The power requirement during construcytion shall be met from the nearest construction power source i.e., Tata Power Delhi Distribution Limited (TPDDL). During operation phase, power consumption shall be 10–15 % of the generated power. A 750 kVA DG set is envisaged which will be used in case of grid failure.

25.1.9: Baseline Environmental Studies with proposed mitigation measures

Period	March, 2023 to May, 2023	Additional Study (if any)
AAQ parameters at 8 Locations (min and max)	$PM_{2.5}$ = 46.0 To 228.0 µg/m^3 PM_{10} = 77.0 To 380.0 µg/m^3 SO_2 = 5.0 to 18.0 µg/m^3 NO_x = 14.0 To 32.0 µg/m^3 CO = 0.52 To 0.84 mg/m^3	-
Incremental GLC lev	PM = 1.604 µg/m^3 (Level at 0.96.km in South Direction) SO2 = 6.418 µg/m^3 (Level at 0.96.km in South Direction) NO_x = 12.83	-

Period	March, 2023 to May, 2023	Additional Study (if any)
el	7 µg/m^3 (Level at 0.96.km in South Direction) **Proposed mitigation measures** • Presence of PVC waste is significant, hence the release of HCl, Dioxins and furans will be less significant (below 0.1 ng TEQ/Nm^3) • Hydrated lime and activated carbon injection in the post-	

Period	March, 2023 to May, 2023	Additional Study (if any)
	combustion stage to control SO_2 and HCl • 130% design capacity of PTFE Bag Filter House, • PM, SO_2, and NOX emissions will be maintained within the levels of 50 mg/Nm^3, 200 mg/Nm^3, and 400 mg/Nm^3, respectively, as	

Period	March, 2023 to May, 2023	Additional Study (if any)
	per SWM Rules, 2016 norms • Continuous Emission Monitoring System (CEMS) will be installed on the stack • CAAQMS will be installed at the site • Provision for Selective Non-catalytic Reduction for Nox Control	

Period	March, 2023 to May, 2023	Additional Study (if any)
	Odour control measures Negative Pressure Ventilation in the MSW collection pit Ventilation air from MSW pit will be fired in the boiler Fogging unit/mist system & herbal solution spray Odour assessment will be undertaken during the operational phase as per EN 16841-1 standards	
Ground water quality at	pH: 7.11 to 7.58, Temperature- 19 degree C to 22 degree C, Turbidity- 1.0 to 1.6 NTU, TDS-232.0 to 698.0 mg/l, Alkalinity as CaCO3-188 to 232.0 mg/l, Total Hardness. 13	-

Period	March, 2023 to May, 2023	Additional Study (if any)
8 locations	4 to 250 mg/l, Mercury-< 0.0005 mg/l, Selenium-< 0.002 mg/l, Zinc-<0.01 mg/l, Chlorides: 62.00 to 84.00 mg/l, Fluoride: 0.57 to 0.81 mg/l, Sulphate-44.0 to 58.00 mg/l, Nitrate-10.20 to 13.80 mg/l, Cyanide-<0.01 mg/l, Free Residual Chlorine- <0.1 mg/l, Phenolics-<0.001 mg/l, Calcium-56.20 to 72.0 mg/l, Aluminium-<0.03 mg/l, Total Arsenic-<0.002 mg/l, Cadmium-<0.001 mg/l, Boron-<0.05 mg/l, Total Chromium-<0.002 mg/l, Iron - 0.0 to 0.01 mg/l, Copper-<0.002 mg/l, Lead-<0.002 mg/l, Manganese-<0.02	

Period	March, 2023 to May, 2023	Additional Study (if any)
	mg/l, Faecal Coliform-<2 MPN/100 ml.	
Surface water quality at 8 locations	pH-7.02 to 7.34,-TDS-233.0 to 311.0 mg/L, BOD-10.0 to 20.0 mg/L. DO-5.50 to 6.40 mg/L, Total Hardness as CaCO3 130.0 to 196.0 mg/L. Temperature – 19.0 degree C to 21.0 degree C TSS-2.0 to 6.0 mg/l, Chloride-28.0 to 60.0 mg/l, Fluoride-0.33 to 0.67 mg/l, Sulphate- 26.0 to 46.0 mg/l, Nitrate- 7.20 to11.50 mg/l, Cyanide-<0.01 mg/l, Phenolic Compounds-<0.001 mg/l, Total Arsenic-<0.002 mg/l, Calcium-102.0 mg/l to 142.0 mg/l, Magnesium-28.0 to 56.0 mg/l, Cadmium-<0.001 mg/l, Total Chromium-<0.002 mg/l, Iron- 0.01 to 0.01 mg/l, Copper-	

Period	March, 2023 to May, 2023	Additional Study (if any)
	<0.002 mg/l, Lead-<0.002 mg/l, Manganese-<0.02 mg/l, Mercury-<0.0005 mg/l, Selenium-<0.002 mg/l, Zinc-<0.01 mg/l, Total Coliform- 490.0 to 1770.0 MPN/100 ml	-
Effluent generation and details treatment	Effluent sent to CMB – 382 m^3/day Leachate (357 m^3/day & sewage generation 3m^3/day) – 360 m^3/day 1. Leachate 2. Cooling Tower Blow down 3. Boiler Blowdown 4. Other industrial effluents Mode of treatment 1. Leachate Treatment Plant through RO 2. Central Monitoring Basin (CMB) Mode of reuse 1. 100% reuse of treated effluent & leachate	-

Period	March, 2023 to May, 2023	Additional Study (if any)
	2. Treated water for FGCS & gas cooling, dust suppression and ash quenching 3. Green belt development 4. Domestic wastewater will be used as seed for LTP Zero liquid discharge will be adopted.	
Noise levels Leq (Day and Night)	42.6 dB (A) to 54.8 dB (A) for the day time and 36.8 dB (A) to 42.6 dB (A) for the Night time. Control measures: • Acoustic walls for the control room, office rooms, and canteen will be provided	

PARIVESH
CPC GREEN
e-Payments
e-Processing

Period	March, 2023 to May, 2023	Additional Study (if any)
	• A mandatory PPE policy will be adopted in high-noise zones such as TG rooms • Audiometric tests for all persons working at high noise zones	
Traffic assessment study	The traffic study was performed on NH-344 M which is connected to project site and traffic load NH-344 M was found to be moderate as per the respective road classification. The	-

Period	March, 2023 to May, 2023	Additional Study (if any)
findings	condition of the existing road is good.	
Soil Quality at 8 Locations	Bulk density: 1.49 to 1.72 gm/cm^3; pH: 6.22 to 7.66; Electrical conductivity (EC); 238 to 324 µmhos/cm; Calcium content: 2.59 to 3.34 mg/100 gm; Sodium: 3.7 to 6.1 mg/100 gm; Potassium: 191.74 to 231.62 kg/ha; Nitrogen: 311.58 to 366.46 kg/ha; Phosphorous: 13.89 to 19.94 kg/ha; Cation Exchange Capacity (CEC): 6.64 to 10.72 meq/100gm; Organic Matter: 1.23% to 1.74%	-
F	61 Flora and	-

Period	March, 2023 to May, 2023	Additional Study (if any)
lora and fauna	56 Fauna were found in the study area. As per the Wildlife Protection Act 2022, **Three Schedule-I**, species *Pavo cristatus, Herpestes javanicus* and *Accipiter badius* are found in the study area and Wildlife Conservation Plan has been prepared and submitted to DFO for their approval. **Rs 54 Lakhs** has been allocated for the Conservation Plan.	
Hydrogeology st	Bawana's aquifer systems predominantly consist of shallow alluvial aquifers. The hydrogeological setup includes unconfined to semi-confined aq	M/s Mantec Consultants Pvt.

Period	March, 2023 to May, 2023	Additional Study (if any)
udy	uifers, primarily composed of sand, silty sand, and kankar horizons. The depth of water level during Pre-Monsoon ranges from 1.25 mbgl to 66.01 m bgl. The depth of water level during Post Monsoon ranges from 0.62 mbgl to 66.75 mbgl. The source of water is reject blowdown water from the M/s Pragati Power Corporation Limited No groundwater will be withdrawn from any natural water bodies. Hence, there will be no impact on ground water regime. A total of 5,085.3 m^3 per ann	Ltd., Noida

Period	March, 2023 to May, 2023	Additional Study (if any)
	um will be harvested and supporting sustainable water management. Rain water havesting Total Built-up Area: 7,539 m^2 Annual rainfall: 674.5 mm/year Annual rainfall: 0.67745 m Roof yield per annum: 5,085.3 m^3/year	
Impact study	The project is based on ZLD concept and there will be no effluent discharge from the plant. Since, there is n	M/s Mantec Consultant

Period	March, 2023 to May, 2023	Additional Study (if any)
onbiodiversity and aquatic ecology	o major aquatic system in the area, the chances of impact on aquatic ecology would be insignificant. Minimum 40% greenbelt / green cover of the total project area will be developed as per CPCB guidelines. Plantation will be done in consultation with the local Forest Department. The excavated soil from the project site should be kept separately and can be used to boost restoration and green plantation activity. Planting fruit bearing tree for avifauna and other faunal species. Western Yamuna Canal is flo	s Pvt. Ltd., Noida

Period	March, 2023 to May, 2023	Additional Study (if any)
	wing adjacent to the project site. Utmost precaution should be taken to ensure no leakage or discharge of effluent takes place. All vehicles inside the project site should maintain speed limit and will not blow horn unless it is required. Awareness will be given to workers about the importance and conservation of terrestrial ecology and bio diversity. Extensive plantation should be undertaken in an around the project site.	
Risk ase	Only flammable material is diesel/LDO for operations for 25 KL whi	M/s Mantec

Period	March, 2023 to May, 2023	Additional Study (if any)
ssment study	ch will be provided with dykes and firefighting systems. Fire water pumps shall be installed along with adequate water storage capacity. Ensure Inspection and Maintenance of Pipelines of Boiler and other related equipments/instruments/connections like safety device, water level indicator, flanges etc. to avoid boiler explosion. Special precautions like SOP will be considered during start-up and shut down failure of which may lead to fire box explosion/boiler explosion. Periodical inspection and calibration of v	Consultants Pvt. Ltd., Noida

Period	March, 2023 to May, 2023	Additional Study (if any)
	arious types of electronic instruments shall be followed. Ensure effective monitoring of the power plant safety. Effective house keeping to be maintained in the plant. MSDS of the chemicals should be present at strategic locations and workers should be well trained to handle that chemical with appropriate PPE. Gas monitoring equipments to be connected to the alarm (flammable oil). Periodic Inspection and Maintenance of Fire Alarm & Fire Detection System to ensure its working when in need.	

PARIVESH
CPC GREEN
e-Payments
e-Processing

Period	March, 2023 to May, 2023	Additional Study (if any)
	Periodic rehearsal of mock drill to ensure readiness to handle any emergency situation. All safety precautions (SOP etc.) to be followed in any type of operation in the plant to avoid accidental situations. Special precautions like no use of match boxes, cigarette lighters etc. also be followed to avoid fire in LDO storage area, loading/unloading of LDO tanker area. SOP to be followed during loading/unloading of LDO to storage tank. LDO Tankers to be fitted with flame arrestors. Earthing/bonding during l	

Period	March, 2023 to May, 2023	Additional Study (if any)
	oading/unloading to be considered to avoid any static charge generation. As per NFPA-85E, it is believed that improved instrumentation, safety interlocks and protective devices, proper operating sequences and a clearer understanding of the problem by both designers and operators can greatly reduce the risks and actual incidence of furnace/boiler explosions.	
Epidemiological Stu	Recommendations **Health Interventions:** Strengthenpr	International Institute of Health

Period	March, 2023 to May, 2023	Additional Study (if any)
dy	imary health care services and disease surveillance in the Bawanaar	Management Research (IIHMR), New Delhi

Period	March, 2023 to May, 2023	Additional Study (if any)
	e a. Focus on prevention and early diagnosis of both communicable a	

Period	March, 2023 to May, 2023	Additional Study (if any)
	ndnon-communicable diseases. **Nutritional Support**: Implementnutritioneducationa	

Period	March, 2023 to May, 2023	Additional Study (if any)
	nd supplementation programs targeting deficiencies. **Awareness Programs:** Promote heal	

Period	March, 2023 to May, 2023	Additional Study (if any)
	thy lifestyle practices to reduce to bacco and alcohol use, especially	

Period	March, 2023 to May, 2023	Additional Study (if any)
	among youth. **Community Engagement**: Involve the community in health education, sanitatio	

Period	March, 2023 to May, 2023	Additional Study (if any)
	improvement, and participatory health planning. **Action plan: Within the facility operations** • Annual medical tests for the workers who are	

Period	March, 2023 to May, 2023	Additional Study (if any)
	directly exposed to MSW handling • Tie-ups with local hospitals for annual health checkups for all persons working in high-hazard areas • Masks and hand sanitation program for persons working in the MSW handling area • Health insurance coverage for all employees and workers working at the facility • Strict implementation of ESI policy for the contract workers **Within a 5**	

Period	March, 2023 to May, 2023	Additional Study (if any)
	Km radius • Ambient air quality monitoring at three locations • Collaborating with other WtE operators in the area to conduct periodic epidemiological studies in association with local authorities • Conducting awareness programs on the health and hygiene aspects JUIL allocated Rs. 55 Lakhs towards various community healthcare support initiatives	

25.1.10: The details of solid and hazardous waste generation along with its mode of treatment/disposal is furnished as below:

724

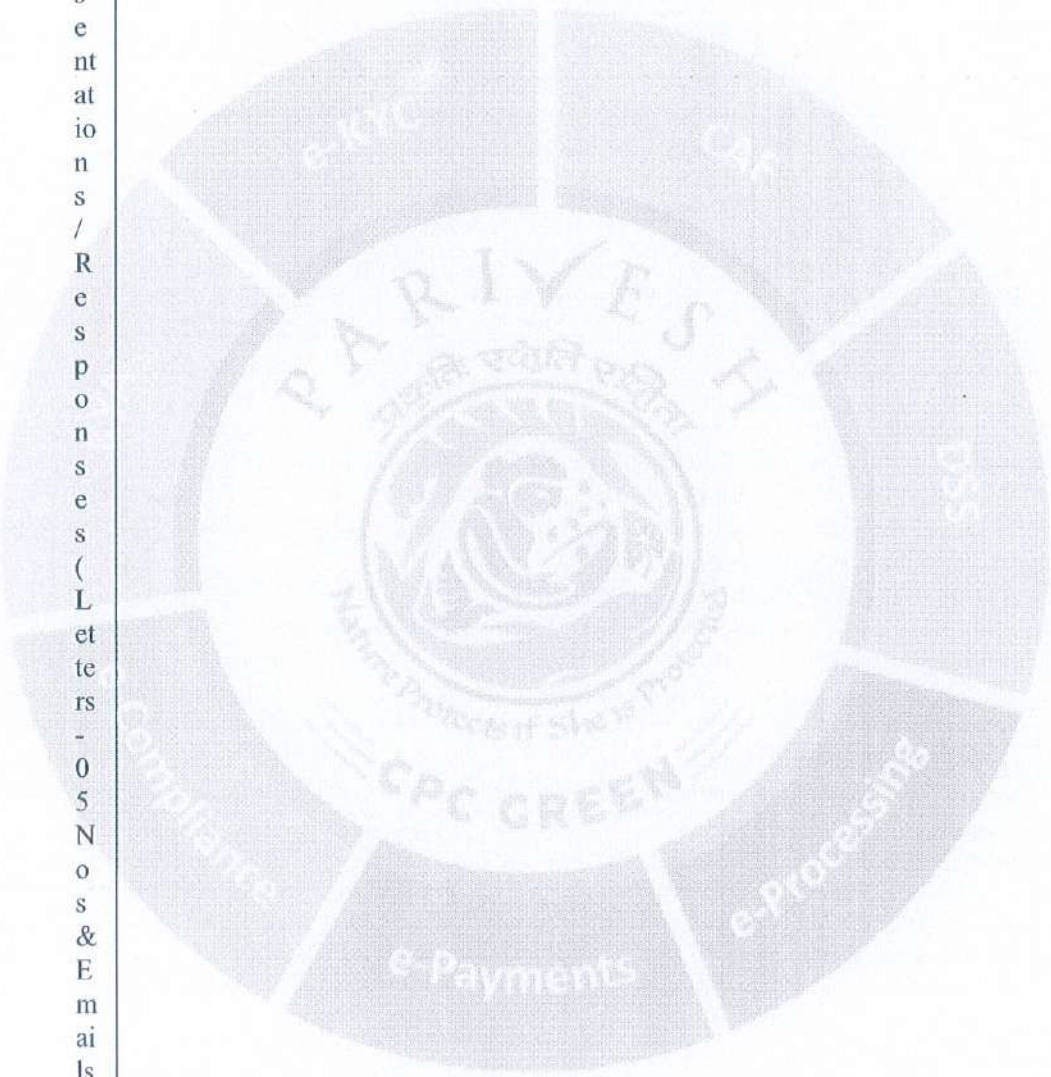
Type of Waste	Source	Quantity (Daily) Metric Tons (MT)	Mode of Transportation	Disposal Method	Remarks
Recyclable	Process	2 MT	Road	Will be sold to registered recyclers	-
Manure (from composting)	Process	4 MT	Road	Used as compost/soil conditioner	Agreement with local farmers and horticulture departments will be made
Bottom Ash & Inert		408 MT	Road	Used for road construction and any unutilized material will be sent to ESLF	-
Fly Ash	Process	72 MT	Road	Supplied to cement industries/ash brick manufacturers and unutilized material will be sent to ESLF	-
Used Oil	Machineries	4 MT	Road	Wil be sold to registered recyclers	-

25.1.11: Public Consultation:

Details of advertisement given	Nav Bharat Times, Delhi (Hindi) - 26.11.2024 & Times of India (English) -26.11.2024
Date	27.12.2024 at 11:00 A.

of public consultation	M. to 1: 00 P.M
Venue	Proposed Waste to Energy Project (30 MW), adjacent to TSDF for Hazardous Waste, Sector-5 Bawana, Delhi-110039.
Presiding Officer	Additional District Magistrate (North District), Govt. of NCT of Delhi.
Major issues raised	Air Pollution, Health, Employment, Waste Handling and Management etc.

No. of people attended	• 34 No. of Representations/Responses (Letters - 05 Nos & Emails - 29 Nos) rec ei



	ved from the Public after 26.12.2024

S.N	Name	Response
1	People's Alliance for Waste Accountability (PAWA) peoplesallianceforwasteacc@gmail.com	Oppose
2	vkdn51284@gmail.com	Oppose
3	PUNEET VERMA puneetverma3may@gmail.com	Oppose
4	Ajay Sardana (8860380911) ajaysardana7@gmail.com	Oppose
5	BK Singla (9810886322) baldevksingla@gmail.com	Oppose
6	PAWAN BATRA pawan07batra@yahoo.co.in	Oppose
7	PAWAN BATRA pawan07batra@yahoo.co.in	Oppose
8	shahbazsaifi254@gmail.com	Oppose
9	Ravinder Kumar H.N.145 Village Sanoth, Delhi. ravindermahura@gmail.com	Oppose
10	Tarsem Singh (9810012402)	Support

S.N	Name	Response
	kwality.tarsem@gmail.com	
11	sahilseh009@gmail.com	Oppose
12	samarseh0405@gmail.com	Oppose
13	Hardik Dhochak hardikdhochak3813@gmail.com	Oppose
14	mkchahal111@gmail.com	Oppose
15	mkchahal111@gmail.com	Oppose
16	vinudelhi006@gmail.com	Oppose
17	surendersingh09899@gmail.com	Oppose
18	Bablu nirwal99999@gmail.com	Oppose
19	Surender Singh Dabas surendersingh3193520m@gmail.com	Oppose
20	vkdn51284@gmail.com	Oppose
21	amitkumar15774439@gmail.com	Oppose
22	alexmercy112233@gmail.com	Oppose
23	sharawat.sunil@gmail.com	Oppose
24	Yogesh Chahal(Village Sanoth) yogeshchahal08@gmail.com	Oppose
25	Rajpal singh rajpalsaini01081957@gmail.com	Oppose
26	rk025214@gmail.com	Oppose
27	vickykajla624@gmail.com	Oppose
28	shivkumar101110@gmail.com	Oppose
29	chanderkala95964@gmail.com	Oppose
30	sahilparjapati9990@gmail.com	Oppose
31	devsehrawat935@gmail.com	Oppose
32	rahulparjapati938@gmail.com	Oppose

S.N	Name	Response
33	ashokkhatri.ak@gmail.com	Oppose
34	Jai prakash (9717319552) Village khera kalan Delhi 110082 jai.rana005@gmail.com	Oppose
35	dabasp84@gmail.com	Oppose
36	haribhura9@gmail.com	Oppose
37	bhuraraja89@gmail.com	Oppose
38	jk45447@gmail.com	Oppose
39	ahmedanish526@gmail.com	Oppose
40	rajabhura656@gmail.com	Oppose
41	nirwalvirat029@gmail.com	Oppose
42	baldevatal27@gmail.com	Oppose
43	mk8324090@gmail.com	Oppose
44	sj2536894@gmail.com	Oppose
45	deepsaini001.ds@gmail.com	Oppose
46	deepsaini0001.ds@gmail.com	Oppose
47	panditjionln@gmail.com	Oppose
48	Abhishek Vats anjuabhivats@gmail.com	Oppose
49	ramphalvats2@gmail.com	Oppose
50	av4743377@gmail.com	Oppose
51	preranavats89@gmail.com	Oppose
52	ssaini0764@gmail.com	Oppose
53	ahmedanish526@gmail.com	Oppose
54	bhurahari@gmail.com	Oppose
55	meenalalitkumar1987@gmail.com	Oppose
56	sheleshraghav2008@gmail.com	Oppose

S.N	Name	Response
57	yashvats098@gmail.com	Oppose
58	ee.hce14011002005@gmail.com	Oppose
59	gkb1473@gmail.com	Oppose
60	Sandeep sn.icfai@gmail.com	Support
61	saini00pankaj@gmail.com	Oppose
62	tanishthakran163@gmail.com	Oppose
63	Shekhar luckymanwall@gmail.com	Support
64	Ravi Kant Singh parthkrsh136@gmail.com	Support
65	Sambit sambitsaswat87@gmail.com	Support
66	Gaurav Singh gauravvsingh710@gmail.com	Support
67	Simran Walia simranwalia356@gmail.com	Support
68	chandswam7@gmail.com	Oppose
69	P.S.Bisht - Resident of Narela prn_bisht@rediffmail.com	Support
70	Ramu Goyal ramugoyal@outlook.com	Support
71	d.nirwal@yahoo.com	Oppose
72	Nirakar nira.sahu.321@gmail.com	Support
73	souravbarkandaj3@gmail.com	Oppose
74	souravbarkandaj3@gmail.com	Oppose
75	Manoj Agarwal manoj130575@gmail.com	Support
76	krishanmalik148@gmail.com	Oppose
77	Megha meghashastri25@gmail.com	Support

S.N	Name	Response
78	yogicame92@gmail.com	Oppose
79	Vinod Yadav (9873989036) vinodyadav564@gmail.com	Oppose
80	Ramesh ramesh1055@gmail.com	Support
81	Sachin Dhingra sachindhingra@gmail.com	Support
82	akashswami56@gmail.com	Oppose
83	ashoknirwal528@gmail.com	Oppose
84	nirwalvarun19@gmail.com	Oppose
85	bhupendernohwal08@gmail.com	Oppose
86	mukeshattri42@gmail.com	Oppose
87	rathicablenetwork14@gmail.com	Oppose
88	rathicablenetwork14@gmail.com	Oppose
89	rathicablenetwork14@gmail.com	Oppose
90	vatsavinash1994@gmail.com	Oppose
91	tridevroadlines9312@gmail.com	Oppose
92	vvats0887@gmail.com	Oppose
93	rakesh391973@gmail.com	Oppose
94	attripandit@gmail.com	Oppose
95	heenasaini1698@gmail.com	Oppose
96	surendersingh09899@gmail.com	Oppose
97	vatsboy6490@gmail.com	Oppose
98	manjeetkajla5627@gmail.com	Oppose
99	sainiuma266@gmail.com	Oppose
100	jyotipanchal26061998@gmail.com	Oppose
101	jyotipanchal26061998@gmail.com	Oppose

S.N	Name	Response
102	rockchahal0695@gmail.com	Oppose
103	akashnimesh9873@gmail.com	Oppose
104	pashu7204@gmail.com	Oppose
105	psaini.advocate@gmail.com	Oppose
106	inspiringm98@gmail.com	Oppose
107	saritasaini151979@gmail.com	Oppose
108	factorymotivation92@gmail.com	Oppose
109	Sonam sonamsharam0769@gmail.com	Oppose
110	Sonam sonamsharam0769@gmail.com	Oppose
111	Sonam sonamsharam0769@gmail.com	Oppose
112	atulvats087@gmail.com	Oppose
113	attrivansh3@gmail.com	Oppose
114	sanjaykumar9121976@gmail.com	Oppose
115	paramjeetsinghsaab33@gmail.com	Oppose
116	dheerajgautam58@gmail.com	Oppose
117	ksaurabh4234@gmail.com	Oppose
118	ksaurabh4234@gmail.com	Oppose
119	ksaurabh4234@gmail.com	Oppose
120	vikasnarwal52661@gmail.com	Oppose
121	manish27aug@gmail.com	Oppose
122	mannuv4719@gmail.com	Oppose
123	vaibhav.gautam90@gmail.com	Support
124	lalitatalpl@gmail.com	Oppose
125	Mohit verma mohitverma1mv4@gmail.com	Support

733

S.N	Name	Response
126	himsain1201@gmail.com	Oppose
127	bhardwaj2002ankit@gmail.com	Oppose
128	Ashish ashish08saini@gmail.com	Oppose
129	himsain1201@gmail.com	Oppose
130	poojasaini3855@gmail.com	Oppose
131	kkchahal51019@gmail.com	Oppose
132	ashishnirwal0710@gmail.com	Oppose
133	dineshnirwal4949@gmail.com	Oppose
134	rajpalsaini01081957@gmail.com	Oppose
135	amitatal71@gmail.com	Oppose
136	n7701906373@gmail.com	Oppose
137	n7701906373@gmail.com	Oppose
138	honeynarwal142@gmail.com	Oppose
139	kumarvirender77030@gmail.com	Oppose
140	deepaknirmal8891@gmail.com	Oppose
141	sanjay.electricalworks1972@gmail.com	Oppose
142	nikitaagarwal3103@gmail.com	Support
143	sonu1988gir@gmail.com	Oppose
144	rajeshseema1976@gmail.com	Oppose
145	Gopal Gosadan Harevali gosadanharewali@gmail.com	Oppose
146	Gopal Gosadan Harevali gopalgosadanharewali@gmail.com	Oppose
147	mjeetsingh1972@gmail.com	Oppose
148	nikhilesh56@gmail.com	Oppose
149	ntnkhatri6@gmail.com	Oppose
150	jindal.shubham9111@gmail.com	Oppose

S.N	Name	Response
151	chiragbabbariws@gmail.com	Oppose
152	rahulsingh7june2000@gmail.com	Oppose
153	rahulpanchal7june2000@gmail.com	Oppose
154	nikhilgupta330@gmail.com	Oppose
155	Shivam Mangal #9810080568 sammangal1996@gmail.com	Oppose
156	rahulballb040@gmail.com	Oppose
157	nirwal99999@gmail.com	Oppose
158	manishranga9314@gmail.com	Oppose
159	Shubham Mathur mathur.mathur36@gmail.com	Support
160	shaktinarwal@ymail.com	Oppose
161	brajesh1608@gmail.com	Oppose
162	amitswami882@gmail.com	Oppose
163	luckynohwal88@gmail.com	Oppose
164	gauravatal8585@gmail.com	Oppose
165	Jitender yadavjiten9007@gmail.com	Oppose
166	priyankasaini.bemine@gmail.com	Oppose
167	Sumit Rohini, Sector-24, pocket-1, Delhi-110086, cmasumitkumar100@gmail.com	Support
168	bhuraraja89@gmail.com	Oppose
169	jeetsinghkajla3251@gmail.com	Oppose
170	krishannirwal6@gmail.com	Oppose
171	krishannirwal6@gmail.com	Oppose
172	saurabhs659@gmail.com	Oppose
173	Vinod Mann (9654963828) mannvinod26@gmail.com	Oppose

S.N	Name	Response
174	singhgautam793@gmail.com	Oppose
175	tmsvansh5609@gmail.com	Oppose
176	sharmababita3700@gmail.com	Oppose
177	komalmathur1498@gmail.com	Oppose
178	monikamathurabc@gmail.com	Oppose
179	baburamnathiya@gmail.com	Oppose
180	anshunirwal111@gmail.com	Oppose
181	drdeepakspb@gmail.com	Oppose
182	deepaktalksalot@gmail.com	Oppose
183	drdeepakspb1986peter@gmail.com	Oppose
184	drorthodeepak@gmail.com	Oppose
185	Yagesh Nohwal yageshsingh5@gmail.com	Oppose
186	Siya sector-24, Rohoni, Delhi-110086 sumitkadian1992@gmail.com	Support
187	Brijesh Kumar H.No. 74, Village Sanoth Delhi-110040 b.raj.sai@gmail.com	Oppose
188	99raghubirsingh99@gmail.com	Oppose
189	rupeshsharma81@gmail.com	Support
190	yashnirwal018@gmail.com	Oppose
191	Nitish Mishra (9968590635) nitsss008@gmail.com	Support
192	mkchahal111@gmail.com	Oppose
193	kumarlalit26905@gmail.com	Oppose
194	loveneet112@gmail.com	Oppose
195	Anuj Kumar Pandey (Students of Environmental Science) Resident of D-14/181, Pocket 13, Sector 8, Rohini, New Delhi, 11008 5.	Support

S.N	Name	Response
	mr.anujpandey2003@gmail.com	
196	sangamxray@gmail.com	Oppose
197	skardam2003@gmail.com	Oppose
198	jatinnemash27@gmail.com	Oppose
199	Pintu Giri (9560424372) giriofficial14@gmail.com	Support
200	kushalkaryashala@gmail.com (+919671675656)	Support
201	Ramniwas Sehrawat M : 9811353570 ramniwas.sharawat@gmail.com	Oppose
202	anshunirwal111@gmail.com	Oppose
203	jsvats1962@gmail.com	Oppose
204	tmsvansh5609@gmail.com	Oppose
205	Yogeshwar 9891438020 yogesh_natraj@yahoo.com	Support
206	monikamathurabc@gmail.com	Oppose
207	sukhdevdabas@gmail.com	Oppose
208	Mohd Ishrar (student) mohdishrar9773@gmail.com	Oppose
209	rk3247175@gmail.com	Oppose
210	rk3247175@gmail.com	Oppose
211	sushilnohwal8010@gmail.com	Oppose
212	parveennirwal5@gmail.com	Oppose
213	rajeevkumar4483@gmail.com	Oppose
214	Preet Narwal House Number 275 Near Community Hall Sannoth,Delhi-110040 8384048851 narwalpreet2@gmail.com	Oppose

737

S.N	Name	Response
215	tapeshwarshah61@gmail.com	Oppose
216	shilpinirwal97@gmail.com	Oppose
217	rajeshnarwal94@gmail.com	Oppose
218	golushah87342@gmail.com	Oppose
219	shilpinarwal8@gmail.com	Oppose
220	akashali800@gmail.com	Oppose
221	ankit7533098342@gmail.com	Oppose
222	Rinku Resident of Sanoth rinkupanchal25121992@gmail.com	Oppose
223	chintuvats30@gmail.com	Oppose
224	kunalkhatri.19@gmail.com	Oppose
225	pandabhutki9@gmail.com	Oppose
226	anil2291prasad@gmail.com	Oppose
227	anil2291prasad@gmail.com	Oppose
228	honeparam@gmail.com	Oppose
229	parvinderkumar309@gmail.com	Oppose
230	Mohit vats vatsboy6490@gmail.com	Oppose
231	Rajarshi Dev Shukla Professional GIS & Remote Sensing Resident of D-2/135, Pocket 9, Sector 4, Rohini, New Delhi, 110085raj arshidevshukla@gmail.com	Support
232	dinesha.111@gmail.com	Oppose
233	soniknirwal@gmail.com	Oppose
234	Mahender Singh 7082369945 mahendersaini57723@gmail.com	Oppose
235	sucl007@gmail.com	Oppose
236	jaikumarnirwal@gmail.com	Oppose
237	Pawan Pawar	Oppose

738

S.N	Name	Response
	9873003726 pawan.co.pk@gmail.com	
238	Rake Vats 9718300866 tridevroadlines9312@gmail.com	Oppose
239	Jagdish Indora 9213198579 jagdishindora1@gmail.com	Oppose
240	priyanshusainidelhi@gmail.com	Oppose
241	umedsingh121948@gmail.com	Oppose
242	Priyanshu saini Holambi khurd delhi-110082 priyanshusainidelhi@gmail.com	Oppose
243	Ramgopal Mahura 9213234902 ramug5052@gmail.com	Oppose
244	Priyanshu saini Holambi khurd delhi-11008220150367159.priyanshu@doe.delhi.gov.in	Oppose
245	rakeshnarwal8360@gmail.com	Oppose
246	kapildhankher18@gmail.com KAPIL DHANKHER	Oppose
247	anuragvats77@gmail.com	Oppose
248	Ujjwal On behalf of the Residents of Sanoth Village Mail id - its.ujjwalgoel@gmail.com Contact -6026891532	Oppose
249	Ujjwal On behalf of the Residents of Sanoth Village Mail id - ujjwalgoel104@gmail.com Contact -6026891532 ujjwalgoel104@gmail.com	Oppose
250	Isha Resident, Bawana ishasehrawat0027@gmail.com	Oppose
251	Isha Resident, Bawana ishasehrawat0027@gmail.com	Oppose
252	Complainant Mehtab Narwal Resident of Sanoth Village msnarwal7599@gmail.com	Oppose

S.N	Name	Response
253	Dr.Ratna Raman ratnaraman@svc.ac.in Professor, Department of English Sri Venkateswara College New Delhi -110029	Oppose
254	satyawan96710@gmail.com	Support
255	Adv Amar B-1580, Holambi Kalan, Ph-II Delhi-82 Mobile: 9911337071 adv.amardelhi@gmail.com	Oppose
256	luckynohwal88@gmail.com	Oppose
257	sonisonikumar79379@gmail.com	Oppose
258	manavsaini7007@gmail.com	Oppose
259	mr.rajivsaini@gmail.com	Oppose
260	hshoneysing8@gmail.com	Oppose
261	abhinarwal002@gmail.com	Oppose
262	attalv1209@gmail.com	Oppose
263	parvesh10201030@gmail.com	Oppose
264	hshoneysing8@gmail.com	Oppose
265	Alok Kumar Resident of Sannoth Village aloksaini915@gmail.com	Oppose
266	Soniya Resident of Sannoth Village soniyasaini80@gmail.com	Oppose
267	[Asif khan] [Sanoth village] [8130517303, 7990099382] akhan7838@gmail.com	Oppose
268	attalv1209@gmail.com	Oppose
269	shruti saini Resident of Sannoth Village shrutisaini1980@gmail.com	Oppose
270	Ujjwal On behalf of the Residents of Sanoth Village Mail id - ujjwalgoel104@gmail.com	Oppose

S.N	Name	Response
	Contact -6026891532 ujjwalgoel104@gmail.com	
271	Rahul +918929510709 indorarahul05@gmail.com	Oppose
272	aloksaini1974@gmail.com	Oppose
273	gouravchahal026@gmail.com	Oppose
274	atalankush4@gmail.com	Oppose
275	attalv1209@gmail.com	Oppose
276	rajeshcrria@gmail.com	Oppose
277	Boby Rana bobyrana7053@gmail.com	Oppose
278	bobynatrana@gmail.com	Oppose
279	bobyroy312@gmail.com	Oppose
280	gouravnirwal2002@gmail.com	Oppose
281	dk915088355@gmail.com	Oppose
282	vatsavinash1994@gmail.com	Oppose
283	Alok Kumar Resident of Sannoth Village aloksaini915@gmail.com	Oppose
284	tyagiajay027@gmail.com	Support
285	nitinpapnai135@gmail.com	Support
286	meeradeviwifi@gmail.com	Oppose
287	885397at@gmail.com	Support
288	ambujtiwari400@gmail.com	Support
289	ambujtiwari400@gmail.com	Support
290	ambujtiwari400@gmail.com	Support
291	Ranjeet Shukla sundarshukla68@gmail.com	Support
292	s96936215@gmail.com	Support

S.N	Name	Response
293	techunlimited06@gmail.com	Support
294	Poornima poornima.gauravgautam@gmail.com	Support
295	Gaurav gauravgautam121018@gmail.com	Support
296	Ravi Kumar Singh rk27121992@gmail.com	Support
297	Sumit Shukla shuklasumit08918@gmail.com	Support
298	Rohan Kumar irohanhere07@gmail.com	Support
299	kartik.saini5184@gmail.com	Oppose
300	Sourabh anand saurabhanand1104@gmail.com	Support
301	amit243334@gmail.com	Support
302	sandeep90.saini@gmail.com	Support
303	Shah Alam ch.shahalam05@gmail.com	Support
304	Ramesh Kumar Ram J.P. Enterprises J-236, sector 1, Bawana rameshkumar0705@gmail.com	Support
305	tdhiraj892.com@gmail.com	Support
306	ajayktrust@gmail.com	Oppose
307	krtarsingh@gmail.com	Support
308	krtarsingh@gmail.com	Support
309	Vijay Bhardwaj M.8506972747 vijayksharma9873@gmail.com	Oppose
310	Mona singh B- 610 Holambi Kalan, Ph-II, Delhi-82 Mobile- 8743064655 monaguatam1234@gmail.com	Oppose
311	shuklaramashankar439@gmail.com	Support
312	bansalankit406@gmail.com	Oppose

742

S.N	Name	Response
313	Ashish ashishpaul192@gmail.com	Support
314	Rohit tiwari ramrohitravi1990@gmail.com	Support
315	Sushrut Kane sushrut.kane4@gmail.com	Support
316	Balkar balkarsingh226@gmail.com	Support
317	ramrohitravi@gmail.com	Support
318	raj793852@gmail.com	Support
319	Chandra Raj Singh 123chandra.raj@gmail.com	Support
320	ramrohitravi@gmail.com	Support
321	hs7190@dseu.ac.in	Support
322	ankit7533098342@gmail.com	Oppose
323	arunabh30@gmail.com	Support
324	akhlakh.re@gmail.com	Support
325	Prakash kumar B-579 Holambi Kalan, Ph-II, Delhi-82 Mobile:9891772839 parkash.cello1973@gmail.com	Oppose
326	kktag40@gmail.com	Oppose
327	amitabh0901@gmail.com	Support
328	bobbynegi1910@gmail.com	Support
329	jitunegi53@gmail.com	Support
330	swastikdutt@gmail.com	Support
331	duttesha9@gmail.com	Support
332	kaustubh.sidharth74@gmail.com	Support
333	upendra233221@gmail.com	Support
334	suryanshsingh0987@gmail.com	Support

S.N	Name	Response
335	gargarpit1980@gmail.com	Oppose
336	qadrizulfikar@gmail.com	Oppose
337	manojbhardwaj1987@gmail.com	Oppose
338	gdeepanshu4@gmail.com	Oppose
339	ankursharmams@gmail.com	Oppose
340	bobyrana7053@gmail.com	Oppose
341	jrajeev06@gmail.com	Oppose
342	Dr.Anjali anjali2111sharma@gmail.com	Oppose
343	Ricky Rohini ricky_bikram@yahoo.co.in	Support
344	singhrinku121985@gmail.com	Support
345	sahil.khatri.8205@gmail.com	Oppose
346	ASHISH SINGH ashishsingh272727@gmail.com	Support
347	parsottam99@gmail.com	Support
348	hp95949@gmail.com	Support
349	sudhirkum0763@gmail.com	Oppose
350	nishantvashisth1020@gmail.com	Oppose
351	vaibhav123rohilla@gmail.com	Support
352	satvirgoutam1993@gmail.com	Support
353	S. Kumar san1970jeev@gmail.com	Support
354	Somendra kumar somender979@gmail.com	Support
355	jagdeesh.raghuvanshi@gmail.com	Support
356	attalv1209@gmail.com	Oppose
357	Dheeraj dpkaushik1980@gmail.com	Support

S.N	Name	Response
358	kumarigungun336@gmail.com	Support
359	ASHOK KUMAR 9289748609 ashokatal06@gmail.com	Oppose
360	Raman Tiwari ramramanrakesh@gmail.com	Support
361	Santosh s.kyadav011975@gmail.com	Support
362	naveennainwal9@gmail.com	Support
363	Arjun arjkumar1993@gmail.com	Support
364	Raj rajdeshwal.meerut@gmail.com	Support
365	poonamjangra819@gmail.com	Support
366	anjuchhikara1807@gmail.com	Support
367	akanksha.3152.singh@gmail.com	Oppose
368	sumitasingh1988@live.com	Support
369	roshnik5139@gmail.com	Support
370	Ujjwal On behalf of the Residents of Sanoth Village Mail id - ujjwalgoel104@gmail.com Contact -6026891532 sahilnarwal223@gmail.com	Oppose
371	gambhirsingh_negi@hotmail.com	Support
372	automobileconsultant@outlook.com	Support
373	amcare.ashwani1733@gmail.com	Support
374	memevaalajoke@gmail.com	Support
375	mahuradipanshu@gmail.com	Oppose
376	Ganga sweets gangasweetssec7@gmail.com	Support
377	rameshwarahirwar39@gmail.com	Support
378	parvinderkumar309@gmail.com	Oppose

S.N	Name	Response
379	Rahul Kumar On behalf of the Residents of Sanoth Village Mail id - raahul1991singh@gmail.com Contact -9999934469 raahul1991singh@gmail.com	Oppose
380	Rishi Arya rishi_3k@yahoo.co.in	Support
381	mr.sharif1983@gmail.com	Support
382	dayashankarshukla1@gmail.com	Support
383	VIJAY KUMAR M9873564772 vijay.bhardwaaj09@gmail.com	Oppose
384	Ujjwal On behalf of the Residents of Sanoth Village Mail id - its.ujjwalgoel@gmail.com Contact -6026891532	Oppose
385	Madhur Chopra madhur22chopra@gmail.com	Support
386	anjali33khurana@gmail.com	Support
387	its.ujjwalgoel@gmail.com	Oppose
388	Amar nishu7999singh@gmail.com	Oppose
389	gouravchahal026@gmail.com	Oppose
390	jagdeesh.raghuvanshi@gmail.com	Support
391	scsssamiti2016@gmail.com	Oppose
392	scsssamiti2016@gmail.com	Oppose
393	sheetal.saroj246511@gmail.com	Oppose
394	Manish Singh m.psingh99990@gmail.com	Support
395	amar260985@gmail.com	Support
396	Jaiman jaimankujur62@gmail.com	Support
397	Sanjeev kumar san70jeev@yahoo.co.in	Support
398	Nishi sharmanishi033@gmail.com	Support

S.N	Name	Response
399	Nishi sharmanishi033@gmail.com	Support
400	Deepak Sachan deepaksachan19@gmail.com	Support
401	Sachin Gupta sachingupta328@gmail.com	Support
402	dalchand01071966@gmail.com	Oppose
403	Jitendra Yadav jitendrajitf@gmail.com	Support
404	Shailendra Mathur smathur.rampur@gmail.com	Support
405	Jagdeesh Raghuvanshi Jagdeesh.Raghuvanshi@jindalecopolis.com	Support
406	kajlarishu@gmail.com	Oppose
407	vipinbansal042@gmail.com	Oppose
408	Sanjeev churia san70jeev@gmail.com	Support
409	Vikram Verma rohilla12cv64@gmail.com	Support
410	rishi1823prasad@gmail.com	Support
411	akasharya465@gmail.com	Support
412	akasharya465@gmail.com	Support
413	akasharya465@gmail.com	Support
414	surendra94mechanical@gmail.com	Support
415	Mohd.Sharif mr.sharif1983@rediffmail.com	Support
416	shivmohangyn@gmail.com	Support
417	Mohd Mahmood Khan mmahmoodkhan846@gmail.com	Support
418	Pawan Pawar On behalf of the Residents of Sanoth Village Mail id - pawan.co.pk@gmail.com Contact -9873003726	Oppose

S.N	Name	Response
419	kumatajay755@gmail.com	Support
420	ankitattal290@gmail.com	Oppose
421	sumitsharma3737@gmail.com	Support
422	Sachchidanand sinha s.singh1729@gmail.com	Support
423	sashitiwari280@gmail.com	Support
424	Kanwar Singh kan46war@gmail.com	Support
425	rajputnanu35@gmail.com	Support
426	Piyush Lavania piyushlavania0@gmail.com	Support
427	Suraj Kashyap B-....1648 .... Holambi Kalan, Ph-II, Delhi-82 Mobile:..7053224907 kashyapsuraj416@gmail.com	Oppose
428	Nikhil Gupta nikhilgupta330@gmail.com	Oppose
429	toonpuri99@gmail.com	Support
430	shinudeni926@gmail.com	Support
431	Pankaj saini, Bawana, Delhi, pankajfzd2002@gmail.com	Support
432	babu.susheel84@gmail.com	Support
433	Ashok yadav ashokyadav30058@gmail.com	Support
434	dakshx766@gmail.com	Support
435	Sandeep singh singhsandeep9238@gmail.com	Support
436	pra95099@gmail.com	Support
437	paramjeet.siwach1@gmail.com	Support
438	praveenmauriya89@gmail.com	Support
439	rahulrawat951281@gmail.com>	Support

S.N	Name	Response
440	rahulrawat951281@gmail.com	Support
441	raniydv8402@gmail.com	Support
442	aryankashyparyan@gmail.com	Support
443	Mahendra Chauhan m4u.chauhan@gmail.com	Support
444	Ajay Kumar Patel ajaywanted100@hotmail.com	Support
445	Rakesh Kumar rakeshsharma81290@gmail.com	Support
446	Bhanu Rawat bhanu.rawat259@gmail.com	Support
447	sejalsingh0815@gmail.com	Support
448	yogitapaal35@gmail.com	Oppose
449	rdravina3@gmail.com	Support
450	rkmaster44@gmail.com	Support
451	Pankaj kumar Bawana,delhi pankajmadhu8127@gmail.com	Support
452	Amarjeet Aharwal amar.aharwal@gmail.com	Support
453	vedprakash12192@gmail.com	Support
454	Radha C- 455 Holambi Kalan, Ph-II, Delhi-82 Mobile:-9319350329 radha61095@gmail.com	Oppose
455	pg2008series1@gmail.com	Support
456	Radha C- 455 Holambi Kalan, Ph-II, Delhi-82 Mobile:-9319350329 radha61095@gmail.com	Oppose
457	sapienlife2004@gmail.com	Support
458	Subham pintugiri2008@live.com	Support

S.N	Name	Response
459	Saurabh saurabh.nsi18@gmail.com	Support
460	M. K. kaushik1981.manish@gmail.com	Support
461	Charvi charvikaushikb@gmail.com	Support
462	Shivam Gupta E-865 Holambi Kalan, Ph-II, Delhi-82 skg463612@gmail.com	Oppose
463	kashyapsuraj416@gmail.com	Oppose
464	pradeepkumar02335@gmail.com	Support
465	vickybartwal04@gmail.com	Support
466	shivambajpai911996@gmail.com	Support
467	Sujeet Kumar 09560068118 sujeet1729@gmail.com	Support
468	jitu.yadav500@gmail.com	Support
469	Kaushal kaushalkuswaha6@gmail.com	Oppose
470	nishugupta4312@gmail.com	Oppose
471	Ajay gaud ajaygaud1998@gmail.com	Support
472	Manish dixit148@gmail.com	Support
473	manojsharmann11995@gmail.com Manoj Kumar	Support
474	dineshdeswar@gmail.com	Support
475	Pooja tiwari pt7642424@gmail.com	Support
476	bawanagramrwa@gmail.com	Oppose
477	rajbhar1004@gmail.com	Support
478	imamuddinansari1196@gmail.com	Support

750

S.N	Name	Response
479	avinashsingh02082003@gmail.com	Support
480	adkhan9990@gmail.com	Support
481	ravider303@gmail.com	Support
482	kumarsatendar54270@gmail.com	Support
483	js2015sonam@gmail.com	Support
484	avinashpsit22@gmail.com	Support
485	anujkumarsharma738@gmail.com	Support
486	ia9936@gmail.com	Support
487	sameerranga363@gmail.com	Support
488	bablibabli1987@gmail.com	Support
489	manidubey1984@gmail.com	Support
490	ak7373720@gmail.com	Support
491	mukeshmishramr@gmail.com	Support
492	adkhan9990@gmail.com	Support
493	samimasamima0024@gmail.com	Support
494	deepukumar1990101@gmail.com	Support
495	pariharavinash0208@gmail.com	Support
496	merebharata@gmail.com	Support
497	mdnurulislam49768@gmail.com	Support
498	sahudk512@gmail.com	Support
499	akasharya465@gmail.com	Support
500	rohit.bkumar765@gmail.com	Support
501	sn432880@gmail.com	Support
502	faiyazmohd1988@gmail.com	Support
503	rk3247175@gmail.com	Oppose
504	pkyadav5720@gmail.com	Support

751

S.N	Name	Response
505	rameshwar.ccil@gmail.com	Support
506	bawanagramrwa@gmail.com	Oppose
507	rohitaastha786@gmail.com	Support
508	dharmendarsharma6676@gmail.com	Support
509	Kuldeep Kumar Jha kuldeepkrjha19@gmail.com	Support
510	ankushgupta150@gmail.com	Support
511	bawanagramrwa@gmail.com	Oppose
512	brajesh1608@gmail.com	Oppose
513	parvindky@gmail.com	Support
514	kuldeepkumarjha01@gmail.com	Support
515	akashnimesh9873@gmail.com	Oppose
516	akashnimesh9873@gmail.com	Oppose
517	ram982144@gmail.com	Support
518	atcinfo9@gmail.com	Support
519	bablu9316@gmail.com	Support
520	spacgrininfo@gmail.com	Support
521	vastravilla09@gmail.com	Support
522	prajapatdeep09@gmail.com	Support
523	sachinvats1610@gmail.com	Support
524	jitu.yadav500@gmail.com	Support
525	manpalsingh15@gmail.com	Support
526	harshnipapabol@gmail.com	Support
527	ashokmnp94@gmail.com	Support
528	manpalsingh15@gmail.com	Support
529	kumarrv93@gmail.com>	Support

752

S.N	Name	Response
530	ajay.boe88@gmail.com	Support
531	ab.pramodkumar@gmail.com	Support
532	rakhikumari80513121@gmail.com	Support
533	dkkukushwah2192@gmail.com	Support
534	mahenderattal1982@gmail.com	Oppose
535	anwesapinky17@gmail.com	Support
536	ak.burnwal@yahoo.com	Support
537	dipaksah9968@gmail.com	Support
538	anishmohanty32@gmail.com	Support
539	nkp0308@gmail.com	Support
540	rahuljain22525.rj@gmail.com>	Support
541	pathak.puja789@gmail.com>	Support
542	soumya.batra@gmail.com	Oppose
543	rahultiwari0120@gmail.com	Support
544	stejpal1985@gmail.com	Support
545	nagendrasingh100889@gmail.com	Support
546	paveeraheja@gmail.com	Support
547	saidabansari29@gmail.com	Support
548	apathak177@gmail.com	Support
549	bhatt1083jk@gmail.com	Support
550	vijay_etc123@rediffmail.com>	Support
551	singh.rana15@gmail.com	Support
552	india.agrade@gmail.com	Oppose
553	ravi2895@gmail.com	Support
554	gaurav.pangtey@gmail.com	Support
555	manjeetshimmar39@gmail.com	Support

S.N	Name	Response
556	bhatt1083jk@gmail.com	Support
557	vermasangeeta0412@gmail.com	Oppose
558	aniketkumar00949@gmail.com	Oppose
559	aniketkumar00949@gmail.com	Oppose
560	rp962589@gmail.com	Support
561	sarikasaini453@gmail.com	Oppose
562	luvshalini3@gmail.com	Oppose
563	r2814290@gmail.com	Support
564	chandan22dec2002@gmail.com	Oppose
565	kuldeepkumarjha01@gmail.com	Support
566	p.palavi2017@gmail.com	Support
567	rahulsinghss954@gmail.com	Support
568	panchalashish2261@gmail.com	Oppose
569	kunard212@gmail.com	Support
570	kumarisumani846@gmail.com	Oppose
571	rakesh15sep@gmail.com	Support
572	ravirksingh468@gmail.com	Support
573	sharmah6664@yahoo.com	Support
574	ibrahim27071972@gmail.com	Support
575	pri.kum28@gmail.com≥	Support
576	sachinkumar901281@gmail.com	Support
577	v13741357@gmail.com	Support
578	smamtasingh048@gmail.com	Support
579	saini.jatinder1971.js@gmail.com	Support
580	ataljitender@gmail.com	Oppose
581	deveshshakya08@gmail.com	Support

754

S.N	Name	Response
582	pawansinghsr00368@gmail.com	Support
583	vinodkverma1952@gmail.com	Support
584	namita.x12@gmail.com	Support
585	neelesh1310@gmail.com	Support
586	rekhasharmabhardwaj1@gmail.com	Support
587	rajatlibra1@gmail.com	Support
588	rajatlibra2545@gmail.com	Support
589	khatrineeldaman@gmail.com	Oppose
590	ramchanderbhardwaj5@gmail.com	Support
591	saumya866@gmail.com	Support
592	anantgupta2309@gmail.com	Support
593	: "deepak sartan"	Support
594	: "deepak sartan"	Support
595	amankumaraap@gmail.com	Oppose
596	"deepak sartan"	Support
597	ravider303@gmail.com	Support
598	ravider303@gmail.com	Support
599	"aman shri24"	Support
600	pg191939@gmail.com	Oppose
601	sahiltiwari9535@gmail.com	Oppose
602	chowdary504@gmail.com	Support
603	: "latif thind"	Support
604	kunard212@gmail.com	Oppose
605	: yogeshkumar190672@gmail.com	Oppose
606	"vashisht 76"	Support
607	: sandeepsingh080783@gmail.com	Support

S.N	Name	Response
608	saralkumar9634@gmail.com	Support
609	ashishsaini2912@gmail.com	Oppose
610	alokkumar9823@gmail.com	Oppose
611	varun987111@yahoo.in	Support
612	ds22598@gmail.com	Oppose
613	deepakindian6402@gmail.com	Oppose
614	kunalnarwaladv@gmail.com	Oppose
615	skakbar.ali4@gmail.com	Oppose
616	kpatel079@googlemail.com	Support
617	kenny.p.patel@gmail.com	Support
618	8375878@gmail.com	Oppose
619	official.himanshu.srivastava@gmail.com	Support
620	gurnoor.bsingh@gmail.com	Support
621	vs2414065@gmail.com	Support
622	gagann2102@gmail.com	Oppose
623	bhavreenkandhari@gmail.com	Oppose
624	sumit1510kumar@gmail.com	Support
625	shailendrapandey445@gmail.com	Support
626	shivkumarengg@gmail.com	Support
627	srao179@yahoo.com	Support
628	; kanhaiyakumar2294@gmail.com	Support
629	sujeet24474@gmail.com	Support
630	prakash2017pandey@gmail.com	Support
631	anurk9368@gmail.com	Support
632	shivambajpai911996@gmail.com	Support
633	tyagirinku984@gmail.com	Support

S.N	Name	Response
634	tkdhiman@hotmail.com	Support
635	004singhis@gmail.com	Support
636	: ak8882487@gmail.com	Support
637	jp1252914@gmail.com	Support
638	pushpendrakumar1975@gmail.com	Support
639	: avnishm795@gmail.com	Support
640	mumtaz4422@gmail.com	Support
641	plastolite@gmail.com	Support
642	"suman orissa"	Support
643	: rajeshkm1967@gmail.com	Support
644	rajeshkm1967@gmail.com	Support
645	mumtazahmad4037@gmail.com	Support
646	rk2988397@gmail.com	Support
647	: "mdarshad ma459"	Support
648	"amit kr8585"	Support
649	sahilsharma124124@gmail.com	Support
650	yadav9939180087@gmail.com	Support
651	gkumar24761@gmail.com	Support
652	sbpandit1978@gmail.com	Oppose
653	sujeet24474@gmail.com	Support
654	sumit1510kumar@gmail.com	Support
655	sksrivastava1988@gmail.com	Support
656	advocatedeepakatwal2016@gmail.com	Oppose
657	vishnurohilla329@gmail.com	Support
658	sujeet24474@gmail.com	Support
659	Man K.	Support

S.N	Name	Response
	mankaushik@rediffmail.com	
660	krohit873@gmail.com	Oppose
661	dilshad95khan01@gmail.com Dilshad khan Narela	Support
662	Manish Kumar Dawarka delhi maniahkumar294@gmail.com	Support
663	Waseem khan Bawana delhi mw866030@gmail.com	Support
664	Deepak Sharma Bawana dipaksharma77357735@gmail.com	Support
665	VEDPRAKASH ARYA Environmental Engineer MM Aqua TechnologiesLtd. MO-09528866280 vedprakasharyavedprakasharya@gmail.com	Support
666	Vikash rana ranav6637@gmail.com Dwarika sec 8	Support
667	Dwarika sec. 10 ranjitrajput935412@gmail.com	Support
668	JAHIRUL Islam Bawana jahirulislam8326@gmail.com	Support
669	MD fakira Narela delhi mohammadfakira86@gmail.com	Support
670	Munna Sharma Bawana sharmamunnakumar93@gmail.com	Support
671	Rahul Kumar rm6765541@gmail.com	Support
672	sangeetasahu486@gmail.com	Support
673	Surybali Rajbhar rajbharsrya@gmail.com	Support

S.N	Name	Response
674	kuhu@jhatkaa.org	Oppose
675	sudeshkumar.skt@gmail.com	Support
676	mustakim123malik@gmail.com	Support
677	reachcycle@gmail.com	Oppose
678	Ekta Residence Welfare Association	Oppose
679	Jan Garib Kalyan Samiti	Oppose
680	Residents of Sanoth Village	Oppose
681	, , -1	Oppose
682	Neeldaman Khatri Ex. MLA, Narela	Oppose
683	Aruna Kumari, Purv Nigam Parshad, Alipur	Oppose
684	Dr Ramniwas Sehrawat, General Secretary, Delhi Gram Sudhar Mahasabha (360)	Oppose
685	Deepak Kumar Advocate, Sannoth Village	Oppose

Summary of issues raised during the public consultation:

Category	Key Concerns Raised	Responses Provided
Air Pollution	Now a days where pollution is on its peak and where we the residents specially those who are living near to Industrial area are already exhausted due to pollution emerging by Industrial units.	Ambient Air quality monitoring system will be installed in plant for tracking pollution levels that ensures compliance with environmental regulations and ensures protection of public health under EHS program of the proposed project.
Medical & Health	There is already a big Landfill is working here, and AQI is also in dangerous zone.	Development of new landfill sites has also not been allowed by Delhi High Court. All emission parameters from the plant shall be within the prescribed limits. Ambient Air quality monitoring system will be installed in plant for tracking pollution levels, ensuring compliance with environmental regulations, and protecting public health.
Employment	Employment Generation	Noted with thanks and Employment will be provided to local people.
Waste Handling and Manag	The collection, transportation, and processing of waste at such a large scale could create health risks for workers and residents, especially	Waste will be received in closed hook loader in the plant. MSW will be stored in an enclosed pit which is maintained under negative pressure, which prevents the escape of any odor. Regular spray inoculum on the waste will be done. Plant will install spray system f

Category	Key Concerns Raised	Responses Provided
ement:	if safety protocols are not strictly f ollowed.	or odor management The WTE plant will not emit odor. Leachate Management System will be put in place.

Action plan as per MoEF&CC O.M. dated 30/09/2020 to address the concerns of public consultation:

S. No	Physical activity and action Plan		Year of implementation (Budget in INR Lakhs)					Total Rs. In Lakhs
			25-26	26-27	27-28	28-29	29-30	
MEDICAL & HEALTH FACILITIES								
1	Providing Medical Camps	Physical Nos	2	5	5	7	7	
		@Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	5	10	10	15	15	55
SOLAR ENERGY DEVELOPMENT/INFRASTRUCTURE DEVELOPMENT								
1	Repair and maintenance of internal roads	Physical Nos	1	1	1	1	1	
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	5	10	20	20	20	75
2	Solar Energy Development	Physical Nos						
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	40	55	75	94	126	390
DRINKING WATER/WATER SHED DEVELOPMENT								
1	Providing of RO plant water	Physical Nos	1	1	1	3	1	
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	

S. No	Physical activity and action Plan		Year of implementation (Budget in INR Lakhs)					Total Rs. In Lakhs
			25-26	26-27	27-28	28-29	29-30	
		Budget, Rs lakhs	2	2	2	6	2	14
GREENBELT DEVELOPMENT								
1	Greenbelt development in villages	Budget, Rs lakhs	3	5	3	3	3	17
EMPLOYMENT/SKILL DEVELOPMENT								
1	Providing skill development training to ITI & diploma passed local youth	Physical Nos	4 students/year	5 students/ year	5 students/year	5 students/year	5 students/ year	
		@Village	Local Youth from 10 km radius					
		Budget, Rs lakhs	1	2	2	2	2	9
SANITATION								
1	Renovation of Toilets & Distribution of dust bins	Budget, Rs lakhs	10	15	20	25	30	100
Total Cost, lakhs			**66**	**99**	**132**	**165**	**198**	**660**

25.1.12: Cost of project: The capital cost of the proposed project is Rs 660.0 Crores and the capital cost for environmental protection measures is proposed as Rs 91.605 Crores. The annual recurring cost towards the environmental protection measures is proposed as Rs 14.155 Crores. The employment generation from the proposed project is 242 (during operation phase). The details of the cost for environmental protection measures are as follows:

Details of Cost Provision for Environmental Measures

S. No.	Particulars	Equipment/Measures Taken-other	Capital Cost (in Crores)	Recurring Cost per annum (in Crores)
1	Air Pollution Control	Flue Gas Cleaning System, SNCR, Anti-Smog Gun etc.	49.505	11.000
2	Water Pollution Control	WTP & LTP installation & Operating cost.	31.400	2.200
3	Noise Pollution Control	Acoustic enclosures & Personal Protective Equipment.	No extra capital investment is required for NPCS to be purchased	0.500

S. No.	Particulars	Equipment/Measures Taken-other	Capital Cost (in Crores)	Recurring Cost per annum (in Crores)
			with noise compliance	
4	Environment Monitoring and Management	OCEMS/CAAQMS installation & Maintenance, Monitoring of Stack emissions.	3.000	0.170
		Manual Environmental and Stack Monitoring	0.14	---
5	Occupational Health	Provision of OHC for working personnel.	0.200	0.150
6	Green Belt	Pursuant to Battery Limit intensifying the greeneries inside and outside of the project site.	0.170	0.051
7	Wildlife Conservation Plan	Activities under biodiversity and habitat conservation	0.540	---
8	Others (Odour control management + Sanitization)	High Pressure Pump, Nozzle and its accessories for fogging unit/mist system & herbal solution spray.	0.050	0.084
9	Public Hearing Commitment	Medical & Health Facilities, Safe Drinking Water, Solar Energy/ Infrastructure Development, Employment/Skill Development	6.60	-
Total			**91.605**	**14.155**

25.1.13: Employment Details: Total manpower during Construction Phase shall be 630 (60 - direct & 570 – Indirect/contractual) and during Operational Phase shall be 242 (86 - direct & 156 – Indirect/contractual).

25.1.14: Green belt development: Proposed greenbelt will be developed in 6.0 acres (2.43 ha) which is about 40 % of the total project area. Thus total of 6.0 acres (2.43 ha) area (40 % of total project area) will be developed as greenbelt. Local and native species will be planted with a density of 2000 trees per hectare. Total no. of 4860 saplings will be planted and nurtured in 6.0 acres (2.43 ha) in 3-5 years. The action plan for green belt development is furnished as below:

- **Greenbelt Area**: 6 Acres (~40% of the total project area)
- **Number of trees**: 4,860 trees to be planted @ 2000 trees/ha
- **Native species** will be selected from the plantation:
  - *Ailanthus excelsa, Alstonia scholaris, Azadirachta indica, Bombax ceiba, Butea monosperma, Calistemon viminalis, Cassia fistula, Dalbergia sissoo, Ficus bengalensis, Ficus religiose, Melia azedarach etc.*

- **Greenbelt layout**: 3-tier plantation around boundaries, roads & open areas
- **Tree spacing**: 2.5m x 2.5m grid for optimal canopy and coverage
- **Width**: Minimum of about 3 to 5 m along the periphery and internal roads

Year	Number of Saplings	Capital cost (INR)	Recurring cost (INR)
2024-2025	1000	350000	10500
2025-2026	1500	525000	15750
2026-2027	2360	826000	24780
Total	**4,860**	**17,01,000**	**51,030**

25.1.15: Ash Management System: The present project falls under Waste to Energy category and accordingly bottom ash, and fly ash utilization plan has been developed as per the current technically viable ash utilization programs

Details	Annual generation (Metric Tons Per Annum – MTPA)	Utilization	% of utilization	Balance quantity (MTPA)	No of storage silos with capacity
Bottom Ash & Inert	1,48,920	Use for road construction and any unutilized material will be sent to ESLF	-	Unutilized material will be sent to ESLF	-
Fly Ash	26,280	Supplied to cement industries/ash brick manufacturers	-	Unutilized material will be sent to ESLF	2 nos. of silos

25.1.16: Summary of court cases: There are no litigations pending against the proposed project.

25.1.17: Written submissions

The proponent submitted the following with respect to the temperature profiling in the boiler:

The boiler is equipped with multistage hydraulic reciprocating grate furnace. It is the state of art forward &/or reverse acting grate technology for typical Indian waste. It is a complete system that efficiently converts municipal solid waste into energy through controlled combustion.The boiler is composed of several auxiliary systems such as feeding equipment, feeding grate, incineration grate, hydraulic system, oil burner system, automatic control system, combustion air system, ash and slag discharging system, etc. It has a unique grate design and optimized air distribution system, to ensure the highest combustion efficiency and eliminate partial combustion, with advanced automatic combustion control system. The waste combustion zone is divided into following sections according to the combustion properties, where the waste is dried, burned, burned out and finally cooled:

1) the drying section,
2) the combustion section and
3) the slag cooling section;

The primary air enters the primary combustion zone of furnace through the chamber arranged under the grate. 1st section specializes in drying the waste to optimum combustion temperature. 2nd section ensures complete combustion above 950 °C temperature. Secondary air enters the secondary combustion zone of furnace through nozzles to enhance the turbulence, along with refractory in the first pass to ensure more than 2 seconds residence time. The continuing design of boiler includes top support, vertical, four pass,

balance draft, single drum and natural circulation, water tube design. Further, the temperature profile of both the combustion zones and boiler passes is as follows:

Particular	1st Pass Furnace		2nd Pass Outlet	3rd Pass Outlet	4th Pass Outlet
	Primary Combustion Zone	Secondary Combustion Zone			
Flue Gas Temperature	1068 °C	1025 °C	661 °C	350 °C	190 °C

The Boiler is designed to maintain the temperature above 950 °C in the secondary combustion zone and ensure a gas residence time of more than 2 seconds in the secondary combustion zone.

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

Observations and deliberation of the EAC

25.1.18: The Committee observed and noted the following:

i. Instant proposal is for setting up of Waste to Energy Thermal Power Project of capacity 30 MW by M/s Jindal Urban Waste Management (Bawana) Limited located at DSIIDC Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi

ii. The EAC took into consideration the KML file on the Google Earth presented by the project proponent along with DSS of the project site on PARIVESH.

iii. ToR for the proposed greenfield project was accorded on 10/01/2024. The site for the proposed project was selected after analysing three alternate sites. The Bawana site was found most suitable due to availability of adequate authorized land with the MCD in DSIIDC, Industrial Area, Nearness to water source from PPCL and no fresh water will be drawn up for industrial use except drinking water and no existence of Ecologically sensitive areas.

iv. Total land required for the proposed project is 6.07 Ha (15.0 Acres), falling within the DSIIDC industrial area, Bawana, Delhi and doesn't involve R&R issues. The land has been provided by Municipal Corporation of Delhi (MCD) to M/s. Jindal Urban Waste Management (Bawana) Limited vide concession agreement dated 27/02/2025.

v. The committee observed that a natural nallah is passing through the project site. Western Yamuna Canal is located at approx. 32 meters from the project site in South-West direction. No nallah diversion involved but the Nalla embankment shall be strengthen and green belt will be developed all along the periphery of the nallah for its conservation. The committee suggested that nallah should be kept intact and no leachate or waste water/solid waste shall be discharged/deposited in to the Nallah.

vi. There is no involvement of forest land. There are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site as ascertained from DSS.

vii. The project site is not located within the Critically Polluted Area (CPA) / Severally Polluted Area (SPA) as per CEPI assessment 2018 of CPCB.

viii. The technology to be employed for this WTE project is RDF combustion based reciprocating

forward feed grate technology. The power generation capacity will be 30 MW. The quantity of MSW requirement for the project will be 3000 TPD.

ix. The water requirement for the proposed project during operation phase is estimated as 625 m^3 /day and approx. 7 m^3/day of fresh water will be required for domestic purposes which will be met by the Delhi Jal Board (DJB). Requirement of water for industrial usage will be met from the blowdown reject water from the Pragati Power Corporation Limited (PPCL) or treated sewage from STP, DJB. No ground water shall be used for the proposed project. Zero Liquid Discharge will be for the proposed project.

x. The requirement of the construction power supply for the project would be met from the Tata Power Delhi Distribution Limited (TPDDL).

xi. The Committee deliberated on the baseline data and incremental GLC due to the proposed project. The committee noted that the proponent is providing hydrated lime injection for SO_2 control, bag filter, Low NO_X combustion system and provision for Selective Non-Catalytic Reduction (SNCR) for NOx control and stack with a height of 60 meters will be provided to control & regulate the air emission from the proposed project.

xii. For odour control, the committee noted that negative Pressure Ventilation in the MSW collection pit, ventilation air from MSW pit will be fired in the boiler and provision of fogging unit/mist system & herbal solution spray.

xiii. The committee noted that with respect to water pollution control, proponent will be using Air cooling system, wastewater from raw water treatment facilities and the boiler section will be used for flue gas conditioning and dust suppression operations and leachate will be collected, treated, and reused in the main plant. Zero liquid discharge will be adopted.

xiv. The rejects/generated bottom ash will be processed in the bottom ash processing plant. After the processing materials which are not recyclable for further processing will be sent to Sanitary Landfill. Fly ash will supplied to cement industries/ash brick manufacturers and unutilized material will be sent to secured land fill.

xv. There are 3 Schedule I Species found in the study area and a Wildlife Conservation & Management Plan (WLCP) has been prepared and submitted to DFO for their approval. Rs 54 Lakhs has been allocated for the Conservation Plan.

xvi. The findings of epidemiological study report have been deliberated and the Committee noted that JUIL has allocated Rs. 55 Lakhs towards various community healthcare support initiatives.

xvii. Proposed greenbelt will be developed in 6.0 acres (2.43 ha) which is about 40 % of the total project area in a time frame of three to five years.

xviii. Public hearing for the project was held on 27.12.2024. The Committee looked into the videography of the public hearing proceedings, deliberated on the public hearing issues and written representations received along with the action plan submitted by the proponent to address the issues raised during the public hearing. The committee advised the PP to implement the PH action plan in a time bound manner.

xix. The capital cost of the proposed project is Rs 660.0 Crores and the capital cost for environmental protection measures is proposed as Rs 91.605 Crores. The annual recurring cost towards the environmental protection measures is proposed as Rs 14.155 Crores. The employment generation from the proposed project is 242 (during operation phase).

xx. The Committee noted that the EIA reports are in compliance of the ToR issued for the project, reflecting the present environmental status and the projected scenario for all the environmental components.

xxi. The Committee also deliberated on the comments received from Commission on Air Quality Management wherein it has been emphasized upon that proposed project shall undertake strict

control measures to control the air pollution arising due to other activities linked to WTE plant construction and operation (e.g., C&D, transportation, road dust, etc) and all the Directions, Advisories and Orders issued by the Commission in this regard from time to time shall be followed strictly. The committee asked the proponent to ensure compliance with the same.

xxii. The EAC also deliberated on the written submission of the project proponent and found it satisfactory.

xxiii. The EAC noted that the Project Proponent has given an undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the EIA/EMP reports. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the project proponent.

Recommendations of the Committee:

25.1.19: In view of the foregoing and after detailed deliberations, the committee ***recommended*** the instant proposal for grant of Environment Clearance under the provisions of EIA Notification, 2006 **subject to submission of the written information on Parivesh portal** and stipulation of the following specific conditions and general conditions based on project specific requirements:

3.1.5. Recommendation of EAC

Recommended (Subject to submission of requisite information/ documents)

3.1.6. Details of Environment Conditions

3.1.6.1. Specific

Environmental Management	
1.	The incoming organic waste of 600 TPD shall be processed at bio-methanation facility and mixed waste of 2400 TPD shall be processed at proposed waste to energy plant as committed. All the waste received shall be kept under a covered storage facility equipped with impermeable base and provision for collection of leachate leading to a leachate treatment and disposal facility.
2.	Project proponent shall take necessary precaution to minimize nuisance of odour, flies, rodents, bird menace and fire hazard in the waste storage pit, around & over windrows and in processing area.
3.	Proponent shall ensure that pre-process and post-process rejects shall be removed from the compost processing facility on regular basis and shall not be allowed to pile at the site. Recyclables shall be sent to authorized recyclers. The non-recyclables having high calorific fraction (>1500 kcal/kg) shall be segregated and sent to waste to energy.
4.	Project Proponent shall ensure that waste to be incinerated shall not be chemically treated with any chlorinated disinfectants and incineration of chlorinated plastics shall not occur. All the facilities in twin chamber incinerators shall be maintained to achieve a minimum temperature of 950°C in secondary combustion chamber and with a gas residence time in secondary combustion chamber not less than 2 seconds. Incinerators shall be operated with such temperature, retention time and turbulence, as to achieve Total Organic Carbon (TOC) content in the slag and bottom ash less than 3%, or the loss on ignition is less than 5% of the dry weight. The CO2 concentration in tail gas shall not be more than 7%.
5.	Project proponent shall ensure that maximum utilization of ash generated in accordance with the ash utilization notification dated 31/12/2021 and its subsequent amendment. No ash pond is permitted within the project site.

Ministry of Environment, Forest and Climate Change
Impact Assessment Division
(Thermal sector)

Date of zero draft MoM sent to Chairman: 01/06/2025
Approval by Chairman: 02/06/2025
Uploading on PARIVESH: 03/06/2025

SUMMARY RECORD OF THE TWENTY FIFTH (25TH) MEETING OF EXPERT APPRAISAL COMMITTEE (EAC) HELD ON 27TH MAY 2025 FOR ENVIRONMENT APPRAISAL OF THERMAL SECTOR PROJECTS THROUGH PHYSICAL MODE.

27TH MAY, 2025 [TUESDAY]

At the outset, Shri. Inder Pal Singh Matharu (I.F.S Retd.), Chairman, Expert Appraisal Committee (Thermal Power & Coal Mining) welcomed the Expert members & other participants and requested to start the proceeding as per the agenda listed for this meeting. The list of members who participated in the meeting is at **Annexure – I**. The Standard/Generic ToR conditions shall be system generated through the PARIVESH Portal.

Confirmation of the Minutes of the 24th Meeting of the EAC (Thermal): The minutes of the 24th meeting of the EAC (Thermal) held on 29/04/2025 has been confirmed by the EAC as uploaded on Parivesh.

Agenda No 25.1

25.1 Proposed Waste to Energy Thermal Power Project of capacity 30 MW by **M/s Jindal Urban Waste Management (Bawana) Limited** located at DSIIDC Industrial Area, Sector 5, village Bawana, Sub-district Narela, **District North Delhi, Delhi – Environment Clearance – regarding.**

[Proposal No. IA/DL/THE/536932/2025; F. No. J-13012/04/2023-IA.I (T)]

25.1.1: M/s Jindal Urban Waste Management (Bawana) Limited has made an online application vide proposal number IA/DL/THE/536932/2025 dated 12/05/2025 along with copy of EIA/EMP report, CAF (Part A, B & C) and sought for Environment Clearance (EC) under the provisions of the EIA Notification, 2006 for the project mentioned above. The proposed project/activity is listed at item no. 1(d) Thermal Power Plants of the schedule of the EIA Notification, 2006 and falls under Category 'A'. Further, the proposed project/activity also attracts the general condition of the EIA Notification, 2006 as the project site is located at a distance of 4.48 KM from Delhi-Haryana State boundary in NNW direction.

Name of the EIA Consultant: M/s Mantec Consultants Pvt. Ltd [S. No. 144, List of ACOs with their Certificate / Extension Letter no NABET/EIA/23-26/RA 0305_Rev.01 Valid up to April 20, 2026].

Details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meeting, are given as under:

25.1.2: The instant proposal of M/s Jindal Urban Waste Management (Bawana) Limited is for setting up of Waste to Energy (WTE) Thermal Power Project with a capacity 30 MW at Delhi State Industrial and Infrastructure Development Corporation Limited (DSIIDC) Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi.

25.1.3: The details of the Terms of Reference (ToR) obtained for the above project for prearation of EIA/EMP report is furnished as below:

Proposal No with Date	Consideration	Details	Date of accord	ToR Validity
IA/DL/THE/435160/2023dated 11/08/2023	2nd meeting of EAC– Thermal held on 31/10/2023	Terms of Reference	10/01/2024	4 years

25.1.4: Environmental site settings:

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th><th>Remarks</th></tr>
<tr><td>1.</td><td>Total Land</td><td>15.0 Acres (or) 6.07 Ha – Government Land</td><td>Land Use: Industrial Purpose
Located at DSIIDC Industrial Area, Sector-5, Bawana, Delhi</td></tr>
<tr><td>2.</td><td>Land Use breakup</td><td>
<table>
<tr><th>Details</th><th>Area Break up (Acres)</th><th>Percentage (%)</th></tr>
<tr><td>TPP Site</td><td>7.84</td><td>52.27</td></tr>
<tr><td>Admin Office & Canteen</td><td>0.3</td><td>2.0</td></tr>
<tr><td>Greenbelt Area</td><td>6.0</td><td>40.0</td></tr>
<tr><td>Others</td><td>0.86</td><td>5.73</td></tr>
<tr><td>Total</td><td>15 acres (or) 6.07 Ha</td><td>100%</td></tr>
</table>
</td><td>• Land Use: Industrial Purpose.
• At DSIIDC Industrial Area, Sector-5, Bawana, Delhi-110039.</td></tr>
<tr><td>3.</td><td>Land acquisition details as per MoEF&CC O.M. dated 7/10/2014 & 20/02/2025</td><td>The land requirement for the project is 6.07 Ha (or) 15 acres which is a Government land.</td><td>The land has been provided by Municipal Corporation of Delhi (MCD) to M/s. Jindal Urban Waste Management</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>(Bawana) Limited vide concession agreement dated 27/02/2025.</td></tr>
<tr><td>4.</td><td>Existence of habitation & involvement of R&R, if any.</td><td><u>Study Area:</u><table><tr><th>Habitation</th><th>Distance</th></tr><tr><td>JJ Colony</td><td>Within 1 Km</td></tr><tr><td>Iradat Nagar alias Naya Bans</td><td>Within 05 Km</td></tr><tr><td>Holambi Khurd</td><td></td></tr><tr><td>Holambi Kalan</td><td></td></tr><tr><td>Sanoth</td><td></td></tr><tr><td>Ghoga</td><td></td></tr><tr><td>Khera Khurd</td><td></td></tr></table></td><td>• The proposed project is within the DSIIDC Industrial Area, Bawana
• The land for the project is allocated by the MCD.
• It does not involve R&R issue.</td></tr>
<tr><td>5.</td><td>Latitude and Longitude of all corners of the project site.</td><td><u>Plant Site:</u><table><tr><th>Point</th><th>Lat.</th><th>Long.</th></tr><tr><td>A.</td><td>28°47'41.49"N</td><td>77°3'42.51"E</td></tr><tr><td>B.</td><td>28°47'46.08"N</td><td>77°3'36.54"E</td></tr><tr><td>C.</td><td>28°47'53.53"N</td><td>77°3'43.80"E</td></tr><tr><td>D.</td><td>28°47'49.56"N</td><td>77°3'48.06"E</td></tr><tr><td>E.</td><td>28°47'47.84"N</td><td>77°3'47.27"E</td></tr><tr><td>F.</td><td>28°47'47.12"N</td><td>77°3'47.43"E</td></tr><tr><td>G.</td><td>28°47'46.70"N,</td><td>77°3'47.84"E</td></tr></table></td><td>-</td></tr>
<tr><td>6.</td><td>Elevation of the project site</td><td>The project site elevation varies from 248 m to 236 m above mean sea level (msl)</td><td>-</td></tr>
<tr><td>7.</td><td>Involvement of Forest land if any</td><td>No</td><td>-</td></tr>
<tr><td>8.</td><td>Water body (Rivers, Lakes, Pond, Nala, Natural Drainage, Canal etc.) exists within the project site as well as study area</td><td>• A natural nallah is passing through the project site.
• Western Yamuna Canal is located at approx. 32 meters from the project site in South-West direction.
<u>Protection measures:</u>
• MSW will be stored in a closed pit to prevent cross-contamination</td><td>No perennial river passing, only regulated canal passing by near to the project site.</td></tr>
</table>

S. No.	Particulars	Details	Remarks
		• Fly ash and bottom ash securely stored in closed silos • Fuel oil tanks equipped with dykes and spill collection pits • Nallah passing through the site will not be diverted • Development of a green belt along the surrounding nallah/stream • Stormwater from open storage areas will be routed through pits for effective silt collection	
9.	Existence of ESZ/ ESA/ national park/ wildlife sanctuary/ biosphere reserve/ tiger reserve/ elephant reserve etc. if any within the study area	There is no National Park, Wildlife Sanctuary etc. within study area.	-
10.	Archaeological sites, monuments/ historical temples, etc.	None	-
11.	Involvement of Critically Polluted Area/ Severely Polluted area as per 2018 CEPI score	No	-

25.1.5: The salient features of the proposed WTE project is given as below:

The technology proposed to be employed for this WTE project is RDF combustion based reciprocating forward feed grate technology. The power plant constitutes Material Recovery Facility (Pre-sorting), RDF fuel Pit, Incinerators, Boilers, and Steam Turbine Generators with power generation total capacity of 30 MW±6MW. Air cooled condensers (ACC) are to be used in lieu of water-cooled condenser (WCC). The rejects/generated bottom ash will be processed in the bottom ash processing plant. After the processing materials which are not recyclable for further processing will be sent to Sanitary Landfill. Fly ash will be sent to the secured landfills site designated by MCD. The air pollution control system will consist of Flue Gas Treatment System which includes Adsorption of acidic components and other pollutants by lime and Activated carbon in turbo reactors and filtration of dust particles through bag filters. Wastewater & leachate

generated from the WTE plant will be treated in the Leachate Treatment Plant. The treated wastewater will be recycled to DM plant and rejected water for quenching of bottom ash. The green belt area will be developed in an area of 6 acres all along the periphery of the project site. .

- Total MSW feed : 3000 TPD
- Power Plant capacity : 30 MW ± 6 MW
- RDF Processing Capacity : 700 TPD per unit (2x700 TPD for two units)
- Auxiliary power consumption : 10 to 15% of total power generation
- Saleable Power to Grid : 85 to 90%
- Calorific Value of Fuel : 1600 kcal/kg and above based on RDF quality
- Export grid voltage : 66 kV
- Grid Interconnection : DTL Bawana Substation (220/66 kV)
- Furnace and boiler type
    - Upward grate system
    - 99.9% Combustion rate (less than 10 ppm of CO)
    - Low NOX generation design – secondary air control
    - Flue gas Cooling system
    - Hydrated lime dosing system for SO_2 control
    - Stack of 60 meter height

The description of process involved in the generation of electricity from municipal waste is given below:

- MSW receiving
- Pre Segregation and preparation of RDF
- Heat Recovery & Steam Generation in the boiler
- Power Generation & exporting to grid
- Flue Gas Cleaning System
- Leachate Treatment

Overall mass balance

Description	Quantity (Tons Per Day)	% fraction
Total Waste for processing	3000 ton	100 %
Green Waste by bio-methanation process	600 ton	20 %
Total MSW Processed for RDF	2,400 ton	80 %
Total RDF to storage	1,400 ton	58 %
Inerts removal in processing	295 ton	12%
Leachate recovered	357 ton	15 %
Moisture	343 ton	14 %
Compost	4 ton	0.17 %
Recyclables	2 ton	0.08 %

Note: 20 to 25 percentage variations on the MSW feed quality are envisaged.

25.1.6: Fuel requirement: The details of the municipal solid waste requirement for the proposed project along with its source and mode of transportation is given as below:

Details	Fuel requirement (TPD)	Source	Distance from site (Kms)	Mode of Transportation	Linkage document
1.	3000 Municipal Solid Waste	Municipal Corporation of Delhi	Approx. 12 Kms	Road	Concession Agreement with MCD

25.1.7: Water requirement: The water requirement for the proposed project during operation phase is estimated as 625 m^3 /day and approx. 7 m^3/day of fresh water will be required for domestic purposes which will be met by the DJB. Requirement of water for industrial usage will be met from the blowdown reject water from the Pragati Power Corporation Limited (PPCL) or treated sewage from STP, DJB. There will be no use of ground water in the process or for domestic use for the proposed project.

Operation Phase:

- Fresh water – 7 m^3/day
- Blowdown reject water from the PPCL/Treated sewage from STP, DJB – 625 m^3/day
- Treated Leachate water – 357 m^3/day

25.1.8: Power requirement: The power requirement during construcytion shall be met from the nearest construction power source i.e., Tata Power Delhi Distribution Limited (TPDDL). During operation phase, power consumption shall be 10–15 % of the generated power. A 750 kVA DG set is envisaged which will be used in case of grid failure.

25.1.9: Baseline Environmental Studies with proposed mitigation measures

Period	March, 2023 to May, 2023	Additional Study (if any)
AAQ parameters at 8 Locations (min and max)	**$PM_{2.5}$** = 46.0 To 228.0 µg/m³ **PM_{10}** = 77.0 To 380.0 µg/m³ **SO_2** = 5.0 to 18.0 µg/m³ **NO_x** = 14.0 To 32.0 µg/m³ **CO** = 0.52 To 0.84 mg/m³	-
Incremental GLC level	**PM** = 1.604 µg/m³ (Level at 0.96.km in South Direction) **SO2** = 6.418 µg/m³ (Level at 0.96.km in South Direction) **NO_x** = 12.837 µg/m³ (Level at 0.96.km in South Direction) **Proposed mitigation measures** • Presence of PVC waste is significant, hence the release of HCl, Dioxins and furans will be less significant (below 0.1 ngTEQ/Nm³) • Hydrated lime and activated carbon injection in the post-combustion stage to control SO_2 and HCl • 130% design capacity of PTFE Bag Filter House, • PM, SO_2, and NOX emissions will be maintained within the levels of 50 mg/Nm³, 200 mg/Nm³, and 400 mg/Nm³, respectively, as per SWM Rules, 2016 norms • Continuous Emission Monitoring System (CEMS) will be installed on the stack • CAAQMS will be installed at the site • Provision for Selective Non-catalytic Reduction for Nox Control **Odour control measures** • Negative Pressure Ventilation in the MSW collection pit • Ventilation air from MSW pit will be fired in the boiler • Fogging unit/mist system & herbal solution spray • Odour assessment will be undertaken during the operational phase as per EN 16841-1 standards	-
Ground water quality at 8 locations	pH: 7.11 to 7.58, Temperature- 19 degree C to 22 degree C, Turbidity- 1.0 to 1.6 NTU, TDS-232.0 to 698.0 mg/l, Alkalinity as CaCO3-188 to 232.0 mg/l, Total Hardness: 134 to 250 mg/l, Mercury-<0.0005 mg/l, Selenium-<0.002 mg/l, Zinc-<0.01 mg/l, Chlorides: 62.00 to 84.00 mg/l, Fluoride: 0.57 to 0.81 mg/l, Sulphate-44.0 to 58.00 mg/l, Nitrate-10.20 to 13.80 mg/l, Cyanide-<0.01 mg/l, Free	-

Period	March, 2023 to May, 2023	Additional Study (if any)
	Residual Chlorine- <0.1 mg/l, Phenolics-<0.001 mg/l, Calcium- 56.20 to 72.0 mg/l, Aluminium-<0.03 mg/l, Total Arsenic-<0.002 mg/l, Cadmium-<0.001 mg/l, Boron-<0.05 mg/l, Total Chromium-<0.002 mg/l, Iron - 0.0 to 0.01 mg/l, Copper-<0.002 mg/l, Lead-<0.002 mg/l, Manganese-<0.02 mg/l, Faecal Coliform-<2 MPN/100 ml.	
Surface water quality at 8 locations	pH-7.02 to 7.34, TDS-233.0 to 311.0 mg/L, BOD-10.0 to 20 mg/L. DO-5.50 to 6.40 mg/L, Total Hardness as CaCO3 130.0 196.0 mg/L. Temperature – 19.0 degree C to 21.0 degree C TSS-2.0 to 6.0 mg/l, Chloride-28.0 to 60.0 mg/l, Fluoride-0. to 0.67 mg/l, Sulphate- 26.0 to 46.0 mg/l, Nitrate- 7.20 to11. mg/l, Cyanide-<0.01 mg/l, Phenolic Compounds-<0.001 mg Total Arsenic-<0.002 mg/l, Calcium-102.0 mg/l to 142.0 mg Magnesium-28.0 to 56.0 mg/l, Cadmium-<0.001 mg/l, To Chromium-<0.002 mg/l, Iron- 0.01 to 0.01 mg/l, Copp <0.002 mg/l, Lead-<0.002 mg/l, Manganese-<0.02 mg Mercury-<0.0005 mg/l, Selenium-<0.002 mg/l, Zinc-<0. mg/l, Total Coliform- 490.0 to 1770.0 MPN/100 ml	-
Effluent generation details and its treatment	Effluent sent to CMB – 382 m^3/day Leachate (357 m^3/day & sewage generation 3m^3/day) – 360 m^3/day 1. Leachate 2. Cooling Tower Blow down 3. Boiler Blowdown 4. Other industrial effluents Mode of treatment 1. Leachate Treatment Plant through **RO** 2. Central Monitoring Basin (CMB) Mode of reuse 1. 100% reuse of treated effluent & leachate 2. Treated water for FGCS & gas cooling, dust suppression and ash quenching 3. Green belt development 4. Domestic wastewater will be used as seed for LTP Zero liquid discharge will be adopted.	-
Noise levels Leq (Day and Night)	42.6 dB (A) to 54.8 dB (A) for the day time and 36.8 dB (A) to 42.6 dB (A) for the Night time. **Control measures:**	

Period	March, 2023 to May, 2023	Additional Study (if any)
	• Acoustic walls for the control room, office rooms, and canteen will be provided • A mandatory PPE policy will be adopted in high-noise zones such as TG rooms • Audiometric tests for all persons working at high noise zones	
Traffic assessment study findings	The traffic study was performed on NH-344 M which is connected to project site and traffic load NH-344 M was found to be moderate as per the respective road classification. The condition of the existing road is good.	-
Soil Quality at 8 Locations	**Bulk density:** 1.49 to 1.72 gm/cm^3; **pH:** 6.22 to 7.66; **Electrical conductivity (EC);** 238 to 324 µmhos/cm; **Calcium content:** 2.59 to 3.34 mg/100 gm; **Sodium:** 3.7 to 6.1 mg/100 gm; **Potassium:** 191.74 to 231.62 kg/ha; **Nitrogen:** 311.58 to 366.46 kg/ha; **Phosphorous:** 13.89 to 19.94 kg/ha; **Cation Exchange Capacity (CEC):** 6.64 to 10.72 meq/100gm; **Organic Matter:** 1.23% to 1.74%	-
Flora and fauna	61 Flora and 56 Fauna were found in the study area. As per the Wildlife Protection Act 2022, **Three Schedule-I,** species • *Pavo cristatus,* • *Herpestes javanicus* and • *Accipiter badius* are found in the study area and Wildlife Conservation Plan has been prepared and submitted to DFO for their approval. **Rs 54 Lakhs** has been allocated for the Conservation Plan.	-
Hydrogeology study	• Bawana's aquifer systems predominantly consist of shallow alluvial aquifers. • The hydrogeological setup includes unconfined to semi-confined aquifers, primarily composed of sand, silty sand, and kankar horizons. • The depth of water level during Pre-Monsoon ranges from 1.25 mbgl to 66.01 mbgl. • The depth of water level during Post Monsoon ranges from 0.62 mbgl to 66.75 mbgl. • The source of water is reject blowdown water from the M/s Pragati Power Corporation Limited • No groundwater will be withdrawn from any natural water bodies. • Hence, there will be no impact on groundwater regime.	M/s Mantec Consultants Pvt. Ltd., Noida

<table>
<tr><th>Period</th><th>March, 2023 to May, 2023</th><th>Additional Study (if any)</th></tr>
<tr><td></td><td>• A total of 5,085.3 m³ per annum will be harvested and supporting sustainable water management.

Rain water haversting
<table><tr><td>Total Built-up Area</td><td>7,539 m²</td></tr><tr><td>Annual rainfall</td><td>674.5 mm/year</td></tr><tr><td>Annual rainfall</td><td>0.6745 m</td></tr><tr><td>Roof yield per annum</td><td>5,085.3 m³/year</td></tr></table></td><td></td></tr>
<tr><td>Impact study on biodiversity and aquatic ecology</td><td>• The project is based on ZLD concept and there will be no effluent discharge from the plant.
• Since, there is no major aquatic system in the area, the chances of impact on aquatic ecology would be insignificant.
• Minimum 40% greenbelt / green cover of the total project area will be developed as per CPCB guidelines. Plantation will be done in consultation with the local Forest Department.
• The excavated soil from the project site should be kept separately and can be used to boost restoration and green plantation activity.
• Planting fruit bearing tree for avifauna and other faunal species.
• Western Yamuna Canal is flowing adjacent to the project site. Utmost precaution should be taken to ensure no leakage or discharge of effluent takes place.
• All vehicles inside the project site should maintain speed limit and will not blow horn unless it is required.
• Awareness will be given to workers about the importance and conservation of terrestrial ecology and biodiversity.
• Extensive plantation should be undertaken in an around the project site.</td><td>M/s Mantec Consultants Pvt. Ltd., Noida</td></tr>
<tr><td>Risk assessment study</td><td>• Only flammable material is diesel/LDO for operations for 25 KL which will be provided with dykes and firefighting systems.
• Fire water pumps shall be installed along with adequate water storage capacity.</td><td>M/s Mantec Consultants Pvt. Ltd., Noida</td></tr>
</table>

Period	March, 2023 to May, 2023	Additional Study (if any)
	• Ensure Inspection and Maintenance of Pipelines of Boiler and other related equipments/instruments/connections like safety device, water level indicator, flanges etc. to avoid boiler explosion. • Special precautions like SOP will be considered during start-up and shut down failure of which may lead to fire box explosion/boiler explosion. • Periodical inspection and calibration of various types of electronic instruments shall be followed. • Ensure effective monitoring of the power plant safety. • Effective housekeeping to be maintained in the plant. • MSDS of the chemicals should be present at strategic locations and workers should be well trained to handle that chemical with appropriate PPE. • Gas monitoring equipments to be connected to the alarm (flammable oil). • Periodic Inspection and Maintenance of Fire Alarm & Fire Detection System to ensure its working when in need. • Periodic rehearsal of mock drill to ensure readiness to handle any emergency situation. • All safety precautions (SOP etc.) to be followed in any type of operation in the plant to avoid accidental situations. • Special precautions like no use of match boxes, cigarette lighters etc. also be followed to avoid fire in LDO storage area, loading/unloading of LDO tanker area. • SOP to be followed during loading/unloading of LDO to storage tank. LDO Tankers to be fitted with flame arrestors. Earthing/bonding during loading/unloading to be considered to avoid any static charge generation. • As per NFPA-85E, it is believed that improved instrumentation, safety interlocks and protective devices, proper operating sequences and a clearer understanding of the problem by both designers and operators can greatly reduce the risks and actual incidence of furnace/boiler explosions.	

Period	March, 2023 to May, 2023	Additional Study (if any)

Epidemiological Study	Recommendations
	• **Health Interventions**:
	  • Strengthen primary healthcare services and disease surveillance in the Bawana area.
	  • Focus on prevention and early diagnosis of both communicable and non-communicable diseases.
	• **Nutritional Support**:
	  • Implement nutrition education and supplementation programs targeting deficiencies.
	• **Awareness Programs**:
	  • Promote healthy lifestyle practices to reduce tobacco and alcohol use, especially among youth.
	• **Community Engagement**:
	  • Involve the community in health education, sanitation improvement, and participatory health planning.
	Action plan:
	Within the facility operations
	• Annual medical tests for the workers who are directly exposed to MSW handling
	• Tie-ups with local hospitals for annual health checkups for all persons working in high-hazard areas
	• Masks and hand sanitation program for persons working in the MSW handling area
	• Health insurance coverage for all employees and workers working at the facility
	• Strict implementation of ESI policy for the contract workers
	Within a 5 Km radius
	• Ambient air quality monitoring at three locations
	• Collaborating with other WtE operators in the area to conduct periodic epidemiological studies in association with local authorities
	• Conducting awareness programs on the health and hygiene aspects
	JUIL allocated Rs. 55 Lakhs towards various community healthcare support initiatives
		International Institute of Health Management Research (IIHMR), New Delhi

25.1.10: The details of solid and hazardous waste generation along with its mode of treatment/disposal is furnished as below:

Type of Waste	Source	Quantity (Daily) Metric Tons (MT)	Mode of Transportation	Disposal Method	Remarks
Recyclable	Process	2 MT	Road	Will be sold to registered recyclers	-
Manure (from composting)	Process	4 MT	Road	Used as compost/soil conditioner	Agreement with local farmers and horticulture departments will be made
Bottom Ash & Inert		408 MT	Road	Used for road construction and any unutilized material will be sent to ESLF	-
Fly Ash	Process	72 MT	Road	Supplied to cement industries/ash brick manufacturers and unutilized material will be sent to ESLF	-
Used Oil	Machineries	4 MT	Road	Wil be sold to registered recyclers	-

25.1.11: Public Consultation:

Details of advertisement given	Nav Bharat Times, Delhi (Hindi) - 26.11.2024 & Times of India (English) -26.11.2024
Date of public consultation	27.12.2024 at 11:00 A.M. to 1:00 P.M
Venue	Proposed Waste to Energy Project (30 MW), adjacent to TSDF for Hazardous Waste, Sector-5 Bawana, Delhi-110039.
Presiding Officer	Additional District Magistrate (North District), Govt. of NCT of Delhi.
Major issues raised	Air Pollution, Health, Employment, Waste Handling and Management etc.
No. of people attended	• About 300 People • 34 No. of Representations / Responses (Letters - 05 Nos & Emails - 29 Nos) received from the Public after 26.12.2024

As per the Public hearing minutes, about 300 nos. of people attended the public hearing and nearly 40 people signed the attendance register. 685 responses (677 through e mail and 3 through post)

were received from the public till 26.12.2024 and 5 representations were received during the public hearing. The abstract of the same is below,

In support: 334 Nos.
Oppose: 351 Nos.

S.N	Name	Response
1	People's Alliance for Waste Accountability (PAWA) peoplesallianceforwasteacc@gmail.com	Oppose
2	vkdn51284@gmail.com	Oppose
3	PUNEET VERMA puneetverma3may@gmail.com	Oppose
4	Ajay Sardana (8860380911) ajaysardana7@gmail.com	Oppose
5	BK Singla (9810886322) baldevksingla@gmail.com	Oppose
6	PAWAN BATRA pawan07batra@yahoo.co.in	Oppose
7	PAWAN BATRA pawan07batra@yahoo.co.in	Oppose
8	shahbazsaifi254@gmail.com	Oppose
9	Ravinder Kumar H.N.145 Village Sanoth, Delhi. ravindermahura@gmail.com	Oppose
10	Tarsem Singh (9810012402) kwality.tarsem@gmail.com	Support
11	sahilseh009@gmail.com	Oppose
12	samarseh0405@gmail.com	Oppose
13	Hardik Dhochak hardikdhochak3813@gmail.com	Oppose
14	mkchahal111@gmail.com	Oppose
15	mkchahal111@gmail.com	Oppose
16	vinudelhi006@gmail.com	Oppose
17	surendersingh09899@gmail.com	Oppose
18	Bablu nirwal99999@gmail.com	Oppose
19	Surender Singh Dabas surendersingh3193520m@gmail.com	Oppose
20	vkdn51284@gmail.com	Oppose
21	amitkumar15774439@gmail.com	Oppose
22	alexmercy112233@gmail.com	Oppose
23	sharawat.sunil@gmail.com	Oppose
24	Yogesh Chahal(Village Sanoth) yogeshchahal08@gmail.com	Oppose
25	Rajpal singh rajpalsaini01081957@gmail.com	Oppose
26	rk025214@gmail.com	Oppose

S.N	Name	Response
27	vickykajla624@gmail.com	Oppose
28	shivkumar101110@gmail.com	Oppose
29	chanderkala95964@gmail.com	Oppose
30	sahilparjapati9990@gmail.com	Oppose
31	devsehrawat935@gmail.com	Oppose
32	rahulparjapati938@gmail.com	Oppose
33	ashokkhatri.ak@gmail.com	Oppose
34	Jai prakash (9717319552) Village khera kalan Delhi 110082 jai.rana005@gmail.com	Oppose
35	dabasp84@gmail.com	Oppose
36	haribhura9@gmail.com	Oppose
37	bhuraraja89@gmail.com	Oppose
38	jk45447@gmail.com	Oppose
39	ahmedanish526@gmail.com	Oppose
40	rajabhura656@gmail.com	Oppose
41	nirwalvirat029@gmail.com	Oppose
42	baldevatal27@gmail.com	Oppose
43	mk8324090@gmail.com	Oppose
44	sj2536894@gmail.com	Oppose
45	deepsaini001.ds@gmail.com	Oppose
46	deepsaini0001.ds@gmail.com	Oppose
47	panditjionln@gmail.com	Oppose
48	Abhishek Vats anjuabhivats@gmail.com	Oppose
49	ramphalvats2@gmail.com	Oppose
50	av4743377@gmail.com	Oppose
51	preranavats89@gmail.com	Oppose
52	ssaini0764@gmail.com	Oppose
53	ahmedanish526@gmail.com	Oppose
54	bhurahari@gmail.com	Oppose
55	meenalalitkumar1987@gmail.com	Oppose
56	sheleshraghav2008@gmail.com	Oppose
57	yashvats098@gmail.com	Oppose
58	ee.hce14011002005@gmail.com	Oppose
59	gkb1473@gmail.com	Oppose
60	Sandeep sn.icfai@gmail.com	Support
61	saini00pankaj@gmail.com	Oppose
62	tanishthakran163@gmail.com	Oppose
63	Shekhar luckymanwall@gmail.com	Support
64	Ravi Kant Singh parthkrsh136@gmail.com	Support

S.N	Name	Response
65	Sambit sambitsaswat87@gmail.com	Support
66	Gaurav Singh gauravvsingh710@gmail.com	Support
67	Simran Walia simranwalia356@gmail.com	Support
68	chandswam7@gmail.com	Oppose
69	P.S.Bisht - Resident of Narela prn_bisht@rediffmail.com	Support
70	Ramu Goyal ramugoyal@outlook.com	Support
71	d.nirwal@yahoo.com	Oppose
72	Nirakar nira.sahu.321@gmail.com	Support
73	souravbarkandaj3@gmail.com	Oppose
74	souravbarkandaj3@gmail.com	Oppose
75	Manoj Agarwal manoj130575@gmail.com	Support
76	krishanmalik148@gmail.com	Oppose
77	Megha meghashastri25@gmail.com	Support
78	yogicame92@gmail.com	Oppose
79	Vinod Yadav (9873989036) vinodyadav564@gmail.com	Oppose
80	Ramesh ramesh1055@gmail.com	Support
81	Sachin Dhingra sachindhingra@gmail.com	Support
82	akashswami56@gmail.com	Oppose
83	ashoknirwal528@gmail.com	Oppose
84	nirwalvarun19@gmail.com	Oppose
85	bhupendernohwal08@gmail.com	Oppose
86	mukeshattri42@gmail.com	Oppose
87	rathicablenetwork14@gmail.com	Oppose
88	rathicablenetwork14@gmail.com	Oppose
89	rathicablenetwork14@gmail.com	Oppose
90	vatsavinash1994@gmail.com	Oppose
91	tridevroadlines9312@gmail.com	Oppose
92	vvats0887@gmail.com	Oppose
93	rakesh391973@gmail.com	Oppose
94	attripandit@gmail.com	Oppose
95	heenasaini1698@gmail.com	Oppose
96	surendersingh09899@gmail.com	Oppose
97	vatsboy6490@gmail.com	Oppose

S.N	Name	Response
98	manjeetkajla5627@gmail.com	Oppose
99	sainiuma266@gmail.com	Oppose
100	jyotipanchal26061998@gmail.com	Oppose
101	jyotipanchal26061998@gmail.com	Oppose
102	rockchahal0695@gmail.com	Oppose
103	akashnimesh9873@gmail.com	Oppose
104	pashu7204@gmail.com	Oppose
105	psaini.advocate@gmail.com	Oppose
106	inspiringm98@gmail.com	Oppose
107	saritasaini151979@gmail.com	Oppose
108	factorymotivation92@gmail.com	Oppose
109	Sonam sonamsharam0769@gmail.com	Oppose
110	Sonam sonamsharam0769@gmail.com	Oppose
111	Sonam sonamsharam0769@gmail.com	Oppose
112	atulvats087@gmail.com	Oppose
113	attrivansh3@gmail.com	Oppose
114	sanjaykumar9121976@gmail.com	Oppose
115	paramjeetsinghsaab33@gmail.com	Oppose
116	dheerajgautam58@gmail.com	Oppose
117	ksaurabh4234@gmail.com	Oppose
118	ksaurabh4234@gmail.com	Oppose
119	ksaurabh4234@gmail.com	Oppose
120	vikasnarwal52661@gmail.com	Oppose
121	manish27aug@gmail.com	Oppose
122	mannuv4719@gmail.com	Oppose
123	vaibhav.gautam90@gmail.com	Support
124	lalitatalpl@gmail.com	Oppose
125	Mohit verma mohitverma1mv4@gmail.com	Support
126	himsain1201@gmail.com	Oppose
127	bhardwaj2002ankit@gmail.com	Oppose
128	Ashish ashish08saini@gmail.com	Oppose
129	himsain1201@gmail.com	Oppose
130	poojasaini3855@gmail.com	Oppose
131	kkchahal51019@gmail.com	Oppose
132	ashishnirwal0710@gmail.com	Oppose
133	dineshnirwal4949@gmail.com	Oppose
134	rajpalsaini01081957@gmail.com	Oppose
135	amitatal71@gmail.com	Oppose
136	n7701906373@gmail.com	Oppose
137	n7701906373@gmail.com	Oppose

S.N	Name	Response
138	honeynarwal142@gmail.com	Oppose
139	kumarvirender77030@gmail.com	Oppose
140	deepaknirmal8891@gmail.com	Oppose
141	sanjay.electricalworks1972@gmail.com	Oppose
142	nikitaagarwal3103@gmail.com	Support
143	sonu1988gir@gmail.com	Oppose
144	rajeshseema1976@gmail.com	Oppose
145	Gopal Gosadan Harevali gosadanharewali@gmail.com	Oppose
146	Gopal Gosadan Harevali gopalgosadanharewali@gmail.com	Oppose
147	rnjeetsingh1972@gmail.com	Oppose
148	nikhilesh56@gmail.com	Oppose
149	ntnkhatri6@gmail.com	Oppose
150	jindal.shubham9111@gmail.com	Oppose
151	chiragbabbariws@gmail.com	Oppose
152	rahulsingh7june2000@gmail.com	Oppose
153	rahulpanchal7june2000@gmail.com	Oppose
154	nikhilgupta330@gmail.com	Oppose
155	Shivam Mangal #9810080568 sammangal1996@gmail.com	Oppose
156	rahulballb040@gmail.com	Oppose
157	nirwal99999@gmail.com	Oppose
158	manishranga9314@gmail.com	Oppose
159	Shubham Mathur mathur.mathur36@gmail.com	Support
160	shaktinarwal@ymail.com	Oppose
161	brajesh1608@gmail.com	Oppose
162	amitswami882@gmail.com	Oppose
163	luckynohwal88@gmail.com	Oppose
164	gauravatal8585@gmail.com	Oppose
165	Jitender yadavjiten9007@gmail.com	Oppose
166	priyankasaini.bemine@gmail.com	Oppose
167	Sumit Rohini, Sector-24, pocket-1, Delhi-110086. cmasumitkumar100@gmail.com	Support
168	bhuraraja89@gmail.com	Oppose
169	jeetsinghkajla3251@gmail.com	Oppose
170	krishannirwal6@gmail.com	Oppose
171	krishannirwal6@gmail.com	Oppose
172	saurabhs659@gmail.com	Oppose
173	Vinod Mann (9654963828) mannvinod26@gmail.com	Oppose
174	singhgautam793@gmail.com	Oppose
175	tmsvansh5609@gmail.com	Oppose
176	sharmababita3700@gmail.com	Oppose

S.N	Name	Response
177	komalmathur1498@gmail.com	Oppose
178	monikamathurabc@gmail.com	Oppose
179	baburamnathiya@gmail.com	Oppose
180	anshunirwal111@gmail.com	Oppose
181	drdeepakspb@gmail.com	Oppose
182	deepaktalksalot@gmail.com	Oppose
183	drdeepakspb1986peter@gmail.com	Oppose
184	drorthodeepak@gmail.com	Oppose
185	Yagesh Nohwal yageshsingh5@gmail.com	Oppose
186	Siya sector-24, Rohoni, Delhi-110086 sumitkadian1992@gmail.com	Support
187	Brijesh Kumar H.No. 74, Village Sanoth Delhi-110040 b.raj.sai@gmail.com	Oppose
188	99raghubirsingh99@gmail.com	Oppose
189	rupeshsharma81@gmail.com	Support
190	yashnirwal018@gmail.com	Oppose
191	Nitish Mishra (9968590635) nitsss008@gmail.com	Support
192	mkchahal111@gmail.com	Oppose
193	kumarlalit26905@gmail.com	Oppose
194	loveneet112@gmail.com	Oppose
195	Anuj Kumar Pandey (Students of Environmental Science) Resident of D-14/181, Pocket 13, Sector 8, Rohini, New Delhi, 110085. mr.anujpandey2003@gmail.com	Support
196	sangamxray@gmail.com	Oppose
197	skardam2003@gmail.com	Oppose
198	jatinnemash27@gmail.com	Oppose
199	Pintu Giri (9560424372) giriofficial14@gmail.com	Support
200	kushalkaryashala@gmail.com (+919671675656)	Support
201	Ramniwas Sehrawat M : 9811353570 ramniwas.sharawat@gmail.com	Oppose
202	anshunirwal111@gmail.com	Oppose
203	jsvats1962@gmail.com	Oppose
204	tmsvansh5609@gmail.com	Oppose
205	Yogeshwar 9891438020 yogesh_natraj@yahoo.com	Support

S.N	Name	Response
206	monikamathurabc@gmail.com	Oppose
207	sukhdevdabas@gmail.com	Oppose
208	Mohd Ishrar (student) mohdishrar9773@gmail.com	Oppose
209	रोहित सहनी पता होलंबी कलां rk3247175@gmail.com	Oppose
210	रोहित सहनी पता होलंबी कलां rk3247175@gmail.com	Oppose
211	sushilnohwal8010@gmail.com	Oppose
212	parveennirwal5@gmail.com	Oppose
213	rajeevkumar4483@gmail.com	Oppose
214	Preet Narwal House Number 275 Near Community Hall Sannoth,Delhi-110040 8384048851 narwalpreet2@gmail.com	Oppose
215	tapeshwarshah61@gmail.com	Oppose
216	shilpinirwal97@gmail.com	Oppose
217	rajeshnarwal94@gmail.com	Oppose
218	golushah87342@gmail.com	Oppose
219	shilpinarwal8@gmail.com	Oppose
220	akashali800@gmail.com	Oppose
221	ankit7533098342@gmail.com	Oppose
222	Rinku Resident of Sanoth rinkupanchal25121992@gmail.com	Oppose
223	chintuvats30@gmail.com	Oppose
224	kunalkhatri.19@gmail.com	Oppose
225	pandabhutki9@gmail.com	Oppose
226	anil2291prasad@gmail.com	Oppose
227	anil2291prasad@gmail.com	Oppose
228	honeparam@gmail.com	Oppose
229	parvinderkumar309@gmail.com	Oppose
230	Mohit vats vatsboy6490@gmail.com	Oppose
231	Rajarshi Dev Shukla Professional GIS & Remote Sensing Resident of D-2/135, Pocket 9, Sector 4, Rohini, New Delhi, 110085rajarshidevshukla@gmail.com	Support
232	dinesha.111@gmail.com	Oppose
233	soniknirwal@gmail.com	Oppose
234	Mahender Singh 7082369945 mahendersaini57723@gmail.com	Oppose
235	sucl007@gmail.com	Oppose
236	jaikumarnirwal@gmail.com	Oppose

S.N	Name	Response
237	Pawan Pawar 9873003726 pawan.co.pk@gmail.com	Oppose
238	Rake Vats 9718300866 tridevroadlines9312@gmail.com	Oppose
239	Jagdish Indora 9213198579 jagdishindora1@gmail.com	Oppose
240	priyanshusainidelhi@gmail.com	Oppose
241	umedsingh121948@gmail.com	Oppose
242	Priyanshu saini Holambi khurd delhi-110082 priyanshusainidelhi@gmail.com	Oppose
243	Ramgopal Mahura 9213234902 ramug5052@gmail.com	Oppose
244	Priyanshu saini Holambi khurd delhi-11008220150367159.priyanshu@doe.delhi.gov.in	Oppose
245	rakeshnarwal8360@gmail.com	Oppose
246	kapildhankher18@gmail.com KAPIL DHANKHER	Oppose
247	anuragvats77@gmail.com	Oppose
248	Ujjwal On behalf of the Residents of Sanoth Village Mail id - its.ujjwalgoel@gmail.com Contact -6026891532	Oppose
249	Ujjwal On behalf of the Residents of Sanoth Village Mail id - ujjwalgoel104@gmail.com Contact -6026891532 ujjwalgoel104@gmail.com	Oppose
250	Isha Resident, Bawana ishasehrawat0027@gmail.com	Oppose
251	Isha Resident, Bawana ishasehrawat0027@gmail.com	Oppose
252	Complainant Mehtab Narwal Resident of Sanoth Village msnarwal7599@gmail.com	Oppose
253	Dr.Ratna Raman ratnaraman@svc.ac.in Professor, Department of English Sri Venkateswara College New Delhi -110029	Oppose
254	satyawan96710@gmail.com	Support
255	Adv Amar B-1580, Holambi Kalan, Ph-II	Oppose

S.N	Name	Response
	Delhi-82 Mobile: 9911337071 adv.amardelhi@gmail.com	
256	luckynohwal88@gmail.com	Oppose
257	sonisonikumar79379@gmail.com	Oppose
258	manavsaini7007@gmail.com	Oppose
259	mr.rajivsaini@gmail.com	Oppose
260	hshoneysing8@gmail.com	Oppose
261	abhinarwal002@gmail.com	Oppose
262	attalv1209@gmail.com	Oppose
263	parvesh10201030@gmail.com	Oppose
264	hshoneysing8@gmail.com	Oppose
265	Alok Kumar Resident of Sannoth Village aloksaini915@gmail.com	Oppose
266	Soniya Resident of Sannoth Village soniyasaini80@gmail.com	Oppose
267	[Asif khan] [Sanoth village] [8130517303, 7990099382] akhan7838@gmail.com	Oppose
268	attalv1209@gmail.com	Oppose
269	shruti saini Resident of Sannoth Village shrutisaini1980@gmail.com	Oppose
270	Ujjwal On behalf of the Residents of Sanoth Village Mail id - ujjwalgoel104@gmail.com Contact -6026891532 ujjwalgoel104@gmail.com	Oppose
271	Rahul +918929510709 indorarahul05@gmail.com	Oppose
272	aloksaini1974@gmail.com	Oppose
273	gouravchahal026@gmail.com	Oppose
274	atalankush4@gmail.com	Oppose
275	attalv1209@gmail.com	Oppose
276	rajeshcrria@gmail.com	Oppose
277	Boby Rana bobyrana7053@gmail.com	Oppose
278	bobynatrana@gmail.com	Oppose
279	bobyroy312@gmail.com	Oppose
280	gouravnirwal2002@gmail.com	Oppose
281	dk915088355@gmail.com	Oppose
282	vatsavinash1994@gmail.com	Oppose

S.N	Name	Response
283	Alok Kumar Resident of Sannoth Village aloksaini915@gmail.com	Oppose
284	tyagiajay027@gmail.com	Support
285	nitinpapnai135@gmail.com	Support
286	meeradeviwifi@gmail.com	Oppose
287	885397at@gmail.com	Support
288	ambujtiwari400@gmail.com	Support
289	ambujtiwari400@gmail.com	Support
290	ambujtiwari400@gmail.com	Support
291	Ranjeet Shukla sundarshukla68@gmail.com	Support
292	s96936215@gmail.com	Support
293	techunlimited06@gmail.com	Support
294	Poornima poornima.gauravgautam@gmail.com	Support
295	Gaurav gauravgautam121018@gmail.com	Support
296	Ravi Kumar Singh rk27121992@gmail.com	Support
297	Sumit Shukla shuklasumit08918@gmail.com	Support
298	Rohan Kumar irohanhere07@gmail.com	Support
299	kartik.saini5184@gmail.com	Oppose
300	Sourabh anand saurabhanand1104@gmail.com	Support
301	amit243334@gmail.com	Support
302	sandeep90.saini@gmail.com	Support
303	Shah Alam ch.shahalam05@gmail.com	Support
304	Ramesh Kumar Ram J.P. Enterprises J-236, sector 1, Bawana rameshkumar0705@gmail.com	Support
305	tdhiraj892.com@gmail.com	Support
306	ajayktrust@gmail.com	Oppose
307	krtarsingh@gmail.com	Support
308	krtarsingh@gmail.com	Support
309	Vijay Bhardwaj M.8506972747 vijayksharma9873@gmail.com	Oppose
310	Mona singh B- 610 Holambi Kalan, Ph-II, Delhi-82 Mobile- 8743064655 monaguatam1234@gmail.com	Oppose

S.N	Name	Response
311	shuklaramashankar439@gmail.com	Support
312	bansalankit406@gmail.com	Oppose
313	Ashish ashishpaul192@gmail.com	Support
314	Rohit tiwari ramrohitravi1990@gmail.com	Support
315	Sushrut Kane sushrut.kane4@gmail.com	Support
316	Balkar balkarsingh226@gmail.com	Support
317	ramrohitravi@gmail.com	Support
318	raj793852@gmail.com	Support
319	Chandra Raj Singh 123chandra.raj@gmail.com	Support
320	ramrohitravi@gmail.com	Support
321	hs7190@dseu.ac.in	Support
322	ankit7533098342@gmail.com	Oppose
323	arunabh30@gmail.com	Support
324	akhlakh.re@gmail.com	Support
325	Prakash kumar B-579 Holambi Kalan, Ph-II, Delhi-82 Mobile:9891772839 parkash.cello1973@gmail.com	Oppose
326	kktag40@gmail.com	Oppose
327	amitabh0901@gmail.com	Support
328	bobbynegi1910@gmail.com	Support
329	jitunegi53@gmail.com	Support
330	swastikdutt@gmail.com	Support
331	duttesha9@gmail.com	Support
332	kaustubh.sidharth74@gmail.com	Support
333	upendra233221@gmail.com	Support
334	suryanshsingh0987@gmail.com	Support
335	gargarpit1980@gmail.com	Oppose
336	qadrizulfikar@gmail.com	Oppose
337	manojbhardwaj1987@gmail.com	Oppose
338	gdeepanshu4@gmail.com	Oppose
339	ankursharmams@gmail.com	Oppose
340	bobyrana7053@gmail.com	Oppose
341	jrajeev06@gmail.com	Oppose
342	Dr.Anjali anjali2111sharma@gmail.com	Oppose
343	Ricky Rohini ricky_bikram@yahoo.co.in	Support

S.N	Name	Response
344	singhrinku121985@gmail.com	Support
345	sahil.khatri.8205@gmail.com	Oppose
346	ASHISH SINGH ashishsingh272727@gmail.com	Support
347	parsottam99@gmail.com	Support
348	hp95949@gmail.com	Support
349	sudhirkum0763@gmail.com	Oppose
350	nishantvashisth1020@gmail.com	Oppose
351	vaibhav123rohilla@gmail.com	Support
352	satvirgoutam1993@gmail.com	Support
353	S. Kumar san1970jeev@gmail.com	Support
354	Somendra kumar somender979@gmail.com	Support
355	jagdeesh.raghuvanshi@gmail.com	Support
356	attalv1209@gmail.com	Oppose
357	Dheeraj dpkaushik1980@gmail.com	Support
358	kumarigungun836@gmail.com	Support
359	ASHOK KUMAR 9289748609 ashokatal06@gmail.com	Oppose
360	Raman Tiwari ramramanrakesh@gmail.com	Support
361	Santosh s.kyadav011975@gmail.com	Support
362	naveennainwal9@gmail.com	Support
363	Arjun arjkumar1993@gmail.com	Support
364	Raj rajdeshwal.meerut@gmail.com	Support
365	poonamjangra819@gmail.com	Support
366	anjuchhikara1807@gmail.com	Support
367	akanksha.3152.singh@gmail.com	Oppose
368	sumitasingh1988@live.com	Support
369	roshnik5139@gmail.com	Support
370	Ujjwal On behalf of the Residents of Sanoth Village Mail id - ujjwalgoel104@gmail.com Contact -6026891532 sahilnarwal223@gmail.com	Oppose
371	gambhirsingh_negi@hotmail.com	Support
372	automobileconsultant@outlook.com	Support
373	amcare.ashwani1733@gmail.com	Support

S.N	Name	Response
374	memevaalajoke@gmail.com	Support
375	mahuradipanshu@gmail.com	Oppose
376	Ganga sweets gangasweetssec7@gmail.com	Support
377	rameshwarahirwar39@gmail.com	Support
378	parvinderkumar309@gmail.com	Oppose
379	Rahul Kumar On behalf of the Residents of Sanoth Village Mail id - raahul1991singh@gmail.com Contact -9999934469 raahul1991singh@gmail.com	Oppose
380	Rishi Arya rishi_3k@yahoo.co.in	Support
381	mr.sharif1983@gmail.com	Support
382	dayashankarshukla1@gmail.com	Support
383	VIJAY KUMAR M9873564772 vijay.bhardwaaj09@gmail.com	Oppose
384	Ujjwal On behalf of the Residents of Sanoth Village Mail id - its.ujjwalgoel@gmail.com Contact -6026891532	Oppose
385	Madhur Chopra madhur22chopra@gmail.com	Support
386	anjali33khurana@gmail.com	Support
387	its.ujjwalgoel@gmail.com	Oppose
388	Amar nishu7999singh@gmail.com	Oppose
389	gouravchahal026@gmail.com	Oppose
390	jagdeesh.raghuvanshi@gmail.com	Support
391	scsssamiti2016@gmail.com	Oppose
392	scsssamiti2016@gmail.com	Oppose
393	sheetal.saroj246511@gmail.com	Oppose
394	Manish Singh m.psingh99990@gmail.com	Support
395	amar260985@gmail.com	Support
396	Jaiman jaimankujur62@gmail.com	Support
397	Sanjeev kumar san70jeev@yahoo.co.in	Support
398	Nishi sharmanishi033@gmail.com	Support
399	Nishi sharmanishi033@gmail.com	Support
400	Deepak Sachan deepaksachan19@gmail.com	Support
401	Sachin Gupta sachingupta328@gmail.com	Support

S.N	Name	Response
402	dalchand01071966@gmail.com	Oppose
403	Jitendra Yadav jitendrajitf@gmail.com	Support
404	Shailendra Mathur smathur.rampur@gmail.com	Support
405	Jagdeesh Raghuvanshi Jagdeesh.Raghuvanshi@jindalecopolis.com	Support
406	kajlarishu@gmail.com	Oppose
407	vipinbansal042@gmail.com	Oppose
408	Sanjeev churia san70jeev@gmail.com	Support
409	Vikram Verma rohilla12cv64@gmail.com	Support
410	rishi1823prasad@gmail.com	Support
411	akasharya465@gmail.com	Support
412	akasharya465@gmail.com	Support
413	akasharya465@gmail.com	Support
414	surendra94mechanical@gmail.com	Support
415	Mohd.Sharif mr.sharif1983@rediffmail.com	Support
416	shivmohangyn@gmail.com	Support
417	Mohd Mahmood Khan mmahmoodkhan846@gmail.com	Support
418	Pawan Pawar On behalf of the Residents of Sanoth Village Mail id - pawan.co.pk@gmail.com Contact -9873003726	Oppose
419	kumatajay755@gmail.com	Support
420	ankitattal290@gmail.com	Oppose
421	sumitsharma3737@gmail.com	Support
422	Sachchidanand sinha s.singh1729@gmail.com	Support
423	sashitiwari280@gmail.com	Support
424	Kanwar Singh kan46war@gmail.com	Support
425	rajputnanu35@gmail.com	Support
426	Piyush Lavania piyushlavania0@gmail.com	Support
427	Suraj Kashyap B-....1648 .... Holambi Kalan, Ph-II, Delhi-82 Mobile:..7053224907 kashyapsuraj416@gmail.com	Oppose
428	Nikhil Gupta nikhilgupta330@gmail.com	Oppose
429	toonpuri99@gmail.com	Support

S.N	Name	Response
430	shinudeni926@gmail.com	Support
431	Pankaj saini, Bawana, Delhi. pankajfzd2002@gmail.com	Support
432	babu.susheel84@gmail.com	Support
433	Ashok yadav ashokyadav30058@gmail.com	Support
434	dakshx766@gmail.com	Support
435	Sandeep singh singhsandeep9238@gmail.com	Support
436	pra95099@gmail.com	Support
437	paramjeet.siwach1@gmail.com	Support
438	praveenmauriya89@gmail.com	Support
439	rahulrawat951281@gmail.com>	Support
440	rahulrawat951281@gmail.com	Support
441	raniydv8402@gmail.com	Support
442	aryankashyparyan@gmail.com	Support
443	Mahendra Chauhan m4u.chauhan@gmail.com	Support
444	Ajay Kumar Patel ajaywanted100@hotmail.com	Support
445	Rakesh Kumar rakeshsharma81290@gmail.com	Support
446	Bhanu Rawat bhanu.rawat259@gmail.com	Support
447	sejalsingh0815@gmail.com	Support
448	yogitapaal35@gmail.com	Oppose
449	rdravina3@gmail.com	Support
450	rkmaster44@gmail.com	Support
451	Pankaj kumar Bawana.delhi pankajmadhu8127@gmail.com	Support
452	Amarjeet Aharwal amar.aharwal@gmail.com	Support
453	vedprakash12192@gmail.com	Support
454	Radha C- 455 Holambi Kalan, Ph-II, Delhi-82 Mobile:-9319350329 radha61095@gmail.com	Oppose
455	pg2008series1@gmail.com	Support
456	Radha C- 455 Holambi Kalan, Ph-II, Delhi-82 Mobile:-9319350329 radha61095@gmail.com	Oppose

S.N	Name	Response
457	sapienlife2004@gmail.com	Support
458	Subham pintugiri2008@live.com	Support
459	Saurabh saurabh.nsi18@gmail.com	Support
460	M. K. kaushik1981.manish@gmail.com	Support
461	Charvi charvikaushikb@gmail.com	Support
462	Shivam Gupta E-865 Holambi Kalan, Ph-II, Delhi-82 skg463612@gmail.com	Oppose
463	kashyapsuraj416@gmail.com	Oppose
464	pradeepkumar02335@gmail.com	Support
465	vickybartwal04@gmail.com	Support
466	shivambajpai911996@gmail.com	Support
467	Sujeet Kumar 09560068118 sujeet1729@gmail.com	Support
468	jitu.yadav500@gmail.com	Support
469	Kaushal kaushalkuswaha6@gmail.com	Oppose
470	nishugupta4312@gmail.com	Oppose
471	Ajay gaud ajaygaud1998@gmail.com	Support
472	Manish dixit148@gmail.com	Support
473	manojsharmann11995@gmail.com Manoj Kumar	Support
474	dineshdeswar@gmail.com	Support
475	Pooja tiwari pt7642424@gmail.com	Support
476	bawanagramrwa@gmail.com	Oppose
477	rajbhar1004@gmail.com	Support
478	imamuddinansari1196@gmail.com	Support
479	avinashsingh02082003@gmail.com	Support
480	adkhan9990@gmail.com	Support
481	ravider303@gmail.com	Support
482	kumarsatendar54270@gmail.com	Support
483	js2015sonam@gmail.com	Support
484	avinashpsit22@gmail.com	Support
485	anujkumarsharma738@gmail.com	Support
486	ia9936@gmail.com	Support
487	sameerranga363@gmail.com	Support

S.N	Name	Response
488	bablibabli1987@gmail.com	Support
489	manidubey1984@gmail.com	Support
490	ak7373720@gmail.com	Support
491	mukeshmishramr@gmail.com	Support
492	adkhan9990@gmail.com	Support
493	samimasamima0024@gmail.com	Support
494	deepukumar1990101@gmail.com	Support
495	pariharavinash0208@gmail.com	Support
496	merebharata@gmail.com	Support
497	mdnurulislam49768@gmail.com	Support
498	sahudk512@gmail.com	Support
499	akasharya465@gmail.com	Support
500	rohit.bkumar765@gmail.com	Support
501	sn432880@gmail.com	Support
502	faiyazmohd1988@gmail.com	Support
503	rk3247175@gmail.com	Oppose
504	pkyadav5720@gmail.com	Support
505	rameshwar.ccil@gmail.com	Support
506	bawanagramrwa@gmail.com	Oppose
507	rohitaastha786@gmail.com	Support
508	dharmendarsharma6676@gmail.com	Support
509	Kuldeep Kumar Jha kuldeepkrjha19@gmail.com	Support
510	ankushgupta150@gmail.com	Support
511	bawanagramrwa@gmail.com	Oppose
512	brajesh1608@gmail.com	Oppose
513	parvindky@gmail.com	Support
514	kuldeepkumarjha01@gmail.com	Support
515	akashnimesh9873@gmail.com	Oppose
516	akashnimesh9873@gmail.com	Oppose
517	ram982144@gmail.com	Support
518	atcinfo9@gmail.com	Support
519	bablu9316@gmail.com	Support
520	spacgrininfo@gmail.com	Support
521	vastravilla09@gmail.com	Support
522	prajapatdeep09@gmail.com	Support
523	sachinvats1610@gmail.com	Support
524	jitu.yadav500@gmail.com	Support
525	manpalsingh15@gmail.com	Support
526	harshnipapabol@gmail.com	Support
527	ashokmnp94@gmail.com	Support
528	manpalsingh15@gmail.com	Support
529	kumarrv93@gmail.com>	Support

S.N	Name	Response
530	ajay.boe88@gmail.com	Support
531	ab.pramodkumar@gmail.com	Support
532	rakhikumari80513121@gmail.com	Support
533	dkkukushwah2192@gmail.com	Support
534	mahenderattal1982@gmail.com	Oppose
535	anwesapinky17@gmail.com	Support
536	ak.burnwal@yahoo.com	Support
537	dipaksah9968@gmail.com	Support
538	anishmohanty32@gmail.com	Support
539	nkp0308@gmail.com	Support
540	rahuljain22525.rj@gmail.com>	Support
541	pathak.puja789@gmail.com>	Support
542	soumya.batra@gmail.com	Oppose
543	rahultiwari0120@gmail.com	Support
544	stejpal1985@gmail.com	Support
545	nagendrasingh100889@gmail.com	Support
546	paveeraheja@gmail.com	Support
547	saidabansari29@gmail.com	Support
548	apathak177@gmail.com	Support
549	bhatt1083jk@gmail.com	Support
550	vijay_etc123@rediffmail.com>	Support
551	singh.rana15@gmail.com	Support
552	india.agrade@gmail.com	Oppose
553	ravi2895@gmail.com	Support
554	gaurav.pangtey@gmail.com	Support
555	manjeetshimmar39@gmail.com	Support
556	bhatt1083jk@gmail.com	Support
557	vermasangeeta0412@gmail.com	Oppose
558	aniketkumar00949@gmail.com	Oppose
559	aniketkumar00949@gmail.com	Oppose
560	rp962589@gmail.com	Support
561	sarikasaini453@gmail.com	Oppose
562	luvshalini3@gmail.com	Oppose
563	r2814290@gmail.com	Support
564	chandan22dec2002@gmail.com	Oppose
565	kuldeepkumarjha01@gmail.com	Support
566	p.palavi2017@gmail.com	Support
567	rahulsinghss954@gmail.com	Support
568	panchalashish2261@gmail.com	Oppose
569	kunard212@gmail.com	Support
570	kumarisumani846@gmail.com	Oppose
571	rakesh15sep@gmail.com	Support
572	ravirksingh468@gmail.com	Support

S.N	Name	Response
573	sharmah6664@yahoo.com	Support
574	ibrahim27071972@gmail.com	Support
575	pri.kum28@gmail.com>	Support
576	sachinkumar901281@gmail.com	Support
577	v13741357@gmail.com	Support
578	smamtasingh048@gmail.com	Support
579	saini.jatinder1971.js@gmail.com	Support
580	ataljitender@gmail.com	Oppose
581	deveshshakya08@gmail.com	Support
582	pawansinghsr00368@gmail.com	Support
583	vinodkverma1952@gmail.com	Support
584	namita.x12@gmail.com	Support
585	neelesh1310@gmail.com	Support
586	rekhasharmabhardwaj1@gmail.com	Support
587	rajatlibra1@gmail.com	Support
588	rajatlibra2545@gmail.com	Support
589	khatrineeldaman@gmail.com	Oppose
590	ramchanderbhardwaj5@gmail.com	Support
591	saumya866@gmail.com	Support
592	anantgupta2309@gmail.com	Support
593	: "deepak sartan" <deepak.sartan@gmail.com>	Support
594	: "deepak sartan" <deepak.sartan@gmail.com>	Support
595	amankumaraap@gmail.com	Oppose
596	"deepak sartan" <deepak.sartan@gmail.com>	Support
597	ravider303@gmail.com	Support
598	ravider303@gmail.com	Support
599	"aman shri24" <aman.shri24@gmail.com>	Support
600	pg191939@gmail.com	Oppose
601	sahiltiwari9535@gmail.com	Oppose
602	chowdary504@gmail.com	Support
603	: "latif thind" <latif.thind@gmail.com>	Support
604	kunard212@gmail.com	Oppose
605	: yogeshkumar190672@gmail.com	Oppose
606	"vashisht 76" <vashisht.76@gmail.com>	Support
607	: sandeepsingh080783@gmail.com	Support
608	saralkumar9634@gmail.com	Support
609	ashishsaini2912@gmail.com	Oppose
610	alokkumar9823@gmail.com	Oppose
611	varun987111@yahoo.in	Support
612	ds22598@gmail.com	Oppose
613	deepakindian6402@gmail.com	Oppose
614	kunalnarwaladv@gmail.com	Oppose
615	skakbar.ali4@gmail.com	Oppose

S.N	Name	Response
616	kpatel079@googlemail.com	Support
617	kenny.p.patel@gmail.com	Support
618	8375878@gmail.com	Oppose
619	official.himanshu.srivastava@gmail.com	Support
620	gurnoor.bsingh@gmail.com	Support
621	vs2414065@gmail.com	Support
622	gagann2102@gmail.com	Oppose
623	bhavreenkandhari@gmail.com	Oppose
624	sumit1510kumar@gmail.com	Support
625	shailendrapandey445@gmail.com	Support
626	shivkumarengg@gmail.com	Support
627	srao179@yahoo.com	Support
628	: kanhaiyakumar2294@gmail.com	Support
629	sujeet24474@gmail.com	Support
630	prakash2017pandey@gmail.com	Support
631	anurk9368@gmail.com	Support
632	shivambajpai911996@gmail.com	Support
633	tyagirinku984@gmail.com	Support
634	tkdhiman@hotmail.com	Support
635	004singhis@gmail.com	Support
636	: ak8882487@gmail.com	Support
637	jp1252914@gmail.com	Support
638	pushpendrakumar1975@gmail.com	Support
639	: avnishm795@gmail.com	Support
640	mumtaz4422@gmail.com	Support
641	plastolite@gmail.com	Support
642	"suman orissa" <suman.orissa@gmail.com>	Support
643	: rajeshkm1967@gmail.com	Support
644	rajeshkm1967@gmail.com	Support
645	mumtazahmad4037@gmail.com	Support
646	rk2988397@gmail.com	Support
647	: "mdarshad ma459" <mdarshad.ma459@gmail.com>	Support
648	"amit kr8585" <amit.kr8585@gmail.com>	Support
649	sahilsharma124124@gmail.com	Support
650	yadav9939180087@gmail.com	Support
651	gkumar24761@gmail.com	Support
652	sbpandit1978@gmail.com	Oppose
653	sujeet24474@gmail.com	Support
654	sumit1510kumar@gmail.com	Support
655	sksrivastava1988@gmail.com	Support
656	advocatedeepakatwal2016@gmail.com	Oppose
657	vishnurohilla329@gmail.com	Support
658	sujeet24474@gmail.com	Support

S.N	Name	Response
659	Man K. mankaushik@rediffmail.com	Support
660	krohit873@gmail.com	Oppose
661	dilshad95khan01@gmail.com Dilshad khan Narela	Support
662	Manish Kumar Dawarka delhi maniahkumar294@gmail.com	Support
663	Waseem khan Bawana delhi mw866030@gmail.com	Support
664	Deepak Sharma Bawana dipaksharma77357735@gmail.com	Support
665	VEDPRAKASH ARYA Environmental Engineer MM Aqua TechnologiesLtd. MO-09528866280 vedprakasharyavedprakasharya@gmail.com	Support
666	Vikash rana ranav6637@gmail.com Dwarika sec 8	Support
667	Dwarika sec. 10 ranjitrajput935412@gmail.com	Support
668	JAHIRUL Islam Bawana jahirulislam8326@gmail.com	Support
669	MD fakira Narela delhi mohammadfakira86@gmail.com	Support
670	Munna Sharma Bawana sharmamunnakumar93@gmail.com	Support
671	Rahul Kumar rm6765541@gmail.com	Support
672	sangeetasahu486@gmail.com	Support
673	Surybali Rajbhar rajbharsrya@gmail.com	Support
674	kuhu@jhatkaa.org	Oppose
675	sudeshkumar.skt@gmail.com	Support
676	mustakim123malik@gmail.com	Support
677	reachcycle@gmail.com	Oppose

S.N	Name	Response
678	Ekta Residence Welfare Association	Oppose
679	Jan Garib Kalyan Samiti	Oppose
680	Residents of Sanoth Village	Oppose
681	केशरानी नीलदमन खत्री, पूर्व निगम पर्षादा, वार्ड-1 नरेला	Oppose
682	Neeldaman Khatri Ex. MLA, Narela	Oppose
683	Aruna Kumari, Purv Nigam Parshad, Alipur	Oppose
684	Dr Ramniwas Sehrawat, General Secretary, Delhi Gram Sudhar Mahasabha (360)	Oppose
685	Deepak Kumar Advocate, Sannoth Village	Oppose

Summary of issues raised during the public consultation:

Category	Key Concerns Raised	Responses Provided
Air Pollution	Now a days where pollution is on its peak and where we the residents specially those who are living near to Industrial area are already exhausted due to pollution emerging by Industrial units.	Ambient Air quality monitoring system will be installed in plant for tracking pollution levels that ensures compliance with environmental regulations and ensures protection of public health under EHS program of the proposed project.
Medical & Health	There is already a big Landfill is working here, and AQI is also in dangerous zone.	Development of new landfill sites has also not been allowed by Delhi High Court. All emission parameters from the plant shall be within the prescribed limits. Ambient Air quality monitoring system will be installed in plant for tracking pollution levels, ensuring compliance with environmental regulations, and protecting public health.
Employment	Employment Generation	Noted with thanks and Employment will be provided to local people.
Waste Handling and Management:	The collection, transportation, and processing of waste at such a large scale could create health risks for workers and residents, especially if safety protocols are not strictly followed.	Waste will be received in closed hook loader in the plant. MSW will be stored in an enclosed pit which is maintained under negative pressure, which prevents the escape of any odor. Regular spray inoculum on the waste will be done. Plant will install spray system for odor management The WTE plant will not emit odor. Leachate Management System will be put in place.

Action plan as per MoEF&CC O.M. dated 30/09/2020 to address the concerns of public consultation:

S. No	Physical activity and action Plan		Year of implementation (Budget in INR Lakhs)					Total Rs. In Lakhs
			25-26	26-27	27-28	28-29	29-30	
MEDICAL & HEALTH FACILITIES								
1	Providing Medical Camps	Physical Nos	2	5	5	7	7	
		@Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	5	10	10	15	15	55
SOLAR ENERGY DEVELOPMENT/INFRASTRUCTURE DEVELOPMENT								
1	Repair and maintenance of internal roads	Physical Nos	1	1	1	1	1	
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	5	10	20	20	20	75
2	Solar Energy Development	Physical Nos						
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	40	55	75	94	126	390
DRINKING WATER/WATER SHED DEVELOPMENT								
1	Providing of RO plant water	Physical Nos	1	1	1	3	1	
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	2	2	2	6	2	14
GREENBELT DEVELOPMENT								
1	Greenbelt development in villages	Budget, Rs lakhs	3	5	3	3	3	17
EMPLOYMENT/SKILL DEVELOPMENT								
1	Providing skill development training to ITI & diploma passed local youth	Physical Nos	4 students/year	5 students/ year	5 students/year	5 students/year	5 students/ year	
		@Village	Local Youth from 10 km radius					
		Budget, Rs lakhs	1	2	2	2	2	9

S. No	Physical activity and action Plan		Year of implementation (Budget in INR Lakhs)					Total Rs. In Lakhs
			25-26	26-27	27-28	28-29	29-30	
SANITATION								
1	Renovation of Toilets & Distribution of dust bins	Budget, Rs lakhs	10	15	20	25	30	100
Total Cost, lakhs			**66**	**99**	**132**	**165**	**198**	**660**

25.1.12: Cost of project: The capital cost of the proposed project is Rs 660.0 Crores and the capital cost for environmental protection measures is proposed as Rs 91.605 Crores. The annual recurring cost towards the environmental protection measures is proposed as Rs 14.155 Crores. The employment generation from the proposed project is 242 (during operation phase). The details of the cost for environmental protection measures are as follows:

Details of Cost Provision for Environmental Measures

S. No.	Particulars	Equipment/Measures Taken-other	Capital Cost (in Crores)	Recurring Cost per annum (in Crores)
1	Air Pollution Control	Flue Gas Cleaning System, SNCR, Anti-Smog Gun etc.	49.505	11.000
2	Water Pollution Control	WTP & LTP installation & Operating cost.	31.400	2.200
3	Noise Pollution Control	Acoustic enclosures &Personal Protective Equipment.	No extra capital investment is required for NPCS to be purchased with noise compliance	0.500
4	Environment Monitoring and Management	OCEMS/CAAQMS installation & Maintenance,Monitoring of Stack emissions.	3.000	0.170
		Manual Environmental and Stack Monitoring	0.14	---
5	Occupational Health	Provision of OHC for working personnel.	0.200	0.150
6	Green Belt	Pursuant to Battery Limit intensifying the greeneries inside and outside of the project site.	0.170	0.051

S. No.	Particulars	Equipment/Measures Taken-other	Capital Cost (in Crores)	Recurring Cost per annum (in Crores)
7	Wildlife Conservation Plan	Activities under biodiversity and habitat conservation	0.540	---
8	Others (Odour control management + Sanitization)	High Pressure Pump, Nozzle and its accessories for fogging unit/mist system & herbal solution spray.	0.050	0.084
9	Public Hearing Commitment	Medical & Health Facilities, Safe Drinking Water, Solar Energy/ Infrastructure Development, Employment/Skill Development	6.60	-
Total			**91.605**	**14.155**

25.1.13: Employment Details: Total manpower during Construction Phase shall be 630 (60 - direct & 570 – Indirect/contractual) and during Operational Phase shall be 242 (86 - direct & 156 – Indirect/contractual).

25.1.14: Green belt development: Proposed greenbelt will be developed in 6.0 acres (2.43 ha) which is about 40 % of the total project area. Thus total of 6.0 acres (2.43 ha) area (40 % of total project area) will be developed as greenbelt. Local and native species will be planted with a density of 2000 trees per hectare. Total no. of 4860 saplings will be planted and nurtured in 6.0 acres (2.43 ha) in 3-5 years. The action plan for green belt development is furnished as below:

- **Greenbelt Area**: 6 Acres (~40% of the total project area)
- **Number of trees**: 4,860 trees to be planted @ 2000 trees/ha
- **Native species** will be selected from the plantation:
    - *Ailanthus excelsa, Alstonia scholaris, Azadirachta indica, Bombax ceiba, Butea monosperma, Calistemon viminalis, Cassia fistula, Dalbergia sissoo, Ficus bengalensis, Ficus religiose, Melia azedarach etc.*
- **Greenbelt layout**: 3-tier plantation around boundaries, roads & open areas
- **Tree spacing**: 2.5m x 2.5m grid for optimal canopy and coverage
- **Width**: Minimum of about 3 to 5 m along the periphery and internal roads

Year	Number of Saplings	Capital cost (INR)	Recurring cost (INR)
2024-2025	1000	350000	10500

Year	Number of Saplings	Capital cost (INR)	Recurring cost (INR)
2025-2026	1500	525000	15750
2026-2027	2360	826000	24780
Total	**4,860**	**17,01,000**	**51,030**

25.1.15: Ash Management System: The present project falls under Waste to Energy category and accordingly bottom ash, and fly ash utilization plan has been developed as per the current technically viable ash utilization programs

Details	Annual generation (Metric Tons Per Annum – MTPA)	Utilization	% of utilization	Balance quantity (MTPA)	No of storage silos with capacity
Bottom Ash & Inert	1,48,920	Use for road construction and any unutilized material will be sent to ESLF	-	Unutilized material will be sent to ESLF	-
Fly Ash	26,280	Supplied to cement industries/ash brick manufacturers	-	Unutilized material will be sent to ESLF	2 nos. of silos

25.1.16: Summary of court cases: There are no litigations pending against the proposed project.

25.1.17: Written submissions

The proponent submitted the following with respect to the temperature profiling in the boiler:
The boiler is equipped with multistage hydraulic reciprocating grate furnace. It is the state of art forward &/or reverse acting grate technology for typical Indian waste. It is a complete system that efficiently converts municipal solid waste into energy through controlled combustion.The boiler is composed of several auxiliary systems such as feeding equipment, feeding grate, incineration grate, hydraulic system, oil burner system, automatic control system, combustion air system, ash and slag discharging system, etc. It has a unique grate design and optimized air distribution system, to ensure the highest combustion efficiency and eliminate partial combustion, with advanced automatic combustion control system. The waste combustion zone is divided into following sections according to the combustion properties, where the waste is dried, burned, burned out and finally cooled:

1) the drying section,
2) the combustion section and
3) the slag cooling section;

The primary air enters the primary combustion zone of furnace through the chamber arranged under the grate. 1st section specializes in drying the waste to optimum combustion temperature. 2nd section ensures complete combustion above 950 °C temperature. Secondary air enters the secondary combustion zone of furnace through nozzles to enhance the turbulence, along with

refractory in the first pass to ensure more than 2 seconds residence time. The continuing design of boiler includes top support, vertical, four pass, balance draft, single drum and natural circulation, water tube design. Further, the temperature profile of both the combustion zones and boiler passes is as follows:

Particular	1st Pass Furnace		2nd Pass Outlet	3rd Pass Outlet	4th Pass Outlet
	Primary Combustion Zone	Secondary Combustion Zone			
Flue Gas Temperature	1068 °C	1025 °C	661 °C	350 °C	190 °C

The Boiler is designed to maintain the temperature above 950 °C in the secondary combustion zone and ensure a gas residence time of more than 2 seconds in the secondary combustion zone.

Observations and deliberation of the EAC

25.1.18: The Committee observed and noted the following:

i. Instant proposal is for setting up of Waste to Energy Thermal Power Project of capacity 30 MW by M/s Jindal Urban Waste Management (Bawana) Limited located at DSIIDC Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi

ii. The EAC took into consideration the KML file on the Google Earth presented by the project proponent along with DSS of the project site on PARIVESH.

iii. ToR for the proposed greenfield project was accorded on 10/01/2024. The site for the proposed project was selected after analysing three alternate sites. The Bawana site was found most suitable due to availability of adequate authorized land with the MCD in DSIIDC, Industrial Area, Nearness to water source from PPCL and no fresh water will be drawn up for industrial use except drinking water and no existence of Ecologically sensitive areas.

iv. Total land required for the proposed project is 6.07 Ha (15.0 Acres), falling within the DSIIDC industrial area, Bawana, Delhi and doesn't involve R&R issues. The land has been provided by Municipal Corporation of Delhi (MCD) to M/s. Jindal Urban Waste Management (Bawana) Limited vide concession agreement dated 27/02/2025.

v. The committee observed that a natural nallah is passing through the project site. Western Yamuna Canal is located at approx. 32 meters from the project site in South-West direction. No nallah diversion involved but the Nalla embankment shall be strengthen and green belt will be developed all along the periphery of the nallah for its conservation. The committee suggested that nallah should be kept intact and no leachate or waste water/solid waste shall be discharged/deposited in to the Nallah.

vi. There is no involvement of forest land. There are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site as ascertained from DSS.

vii. The project site is not located within the Critically Polluted Area (CPA) / Severally Polluted Area (SPA) as per CEPI assessment 2018 of CPCB.

viii. The technology to be employed for this WTE project is RDF combustion based reciprocating forward feed grate technology. The power generation capacity will be 30 MW. The quantity of MSW requirement for the project will be 3000 TPD.

ix. The water requirement for the proposed project during operation phase is estimated as 625 m^3 /day and approx. 7 m^3/day of fresh water will be required for domestic purposes which will be met by the Delhi Jal Board (DJB). Requirement of water for industrial usage will be met from the blowdown reject water from the Pragati Power Corporation Limited (PPCL) or treated sewage from STP, DJB. No ground water shall be used for the proposed project. Zero Liquid Discharge will be for the proposed project.

x. The requirement of the construction power supply for the project would be met from the Tata Power Delhi Distribution Limited (TPDDL).

xi. The Committee deliberated on the baseline data and incremental GLC due to the proposed project. The committee noted that the proponent is providing hydrated lime injection for SO_2 control, bag filter, Low NO_X combustion system and provision for Selective Non-Catalytic Reduction (SNCR) for NOx control and stack with a height of 60 meters will be provided to control & regulate the air emission from the proposed project.

xii. For odour control, the committee noted that negative Pressure Ventilation in the MSW collection pit, ventilation air from MSW pit will be fired in the boiler and provision of fogging unit/mist system & herbal solution spray.

xiii. The committee noted that with respect to water pollution control, proponent will be using Air cooling system, wastewater from raw water treatment facilities and the boiler section will be used for flue gas conditioning and dust suppression operations and leachate will be collected, treated, and reused in the main plant. Zero liquid discharge will be adopted.

xiv. The rejects/generated bottom ash will be processed in the bottom ash processing plant. After the processing materials which are not recyclable for further processing will be sent to Sanitary Landfill. Fly ash will supplied to cement industries/ash brick manufacturers and unutilized material will be sent to secured land fill.

xv. There are 3 Schedule I Species found in the study area and a Wildlife Conservation & Management Plan (WLCP) has been prepared and submitted to DFO for their approval. Rs 54 Lakhs has been allocated for the Conservation Plan.

xvi. The findings of epidemiological study report have been deliberated and the Committee noted that JUIL has allocated Rs. 55 Lakhs towards various community healthcare support initiatives.

xvii. Proposed greenbelt will be developed in 6.0 acres (2.43 ha) which is about 40 % of the total project area in a time frame of three to five years.

xviii. Public hearing for the project was held on 27.12.2024. The Committee looked into the videography of the public hearing proceedings, deliberated on the public hearing issues and written representations received along with the action plan submitted by the proponent to address the issues raised during the public hearing. The committee advised the PP to implement the PH action plan in a time bound manner.

xix. The capital cost of the proposed project is Rs 660.0 Crores and the capital cost for environmental protection measures is proposed as Rs 91.605 Crores. The annual recurring

cost towards the environmental protection measures is proposed as Rs 14.155 Crores. The employment generation from the proposed project is 242 (during operation phase).

xx. The Committee noted that the EIA reports are in compliance of the ToR issued for the project, reflecting the present environmental status and the projected scenario for all the environmental components.

xxi. The Committee also deliberated on the comments received from Commission on Air Quality Management wherein it has been emphasized upon that proposed project shall undertake strict control measures to control the air pollution arising due to other activities linked to WTE plant construction and operation (e.g., C&D, transportation, road dust, etc) and all the Directions, Advisories and Orders issued by the Commission in this regard from time to time shall be followed strictly. The committee asked the proponent to ensure compliance with the same.

xxii. The EAC also deliberated on the written submission of the project proponent and found it satisfactory.

xxiii. The EAC noted that the Project Proponent has given an undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the EIA/EMP reports. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the project proponent.

Recommendations of the Committee:

25.1.19: In view of the foregoing and after detailed deliberations, the committee ***recommended*** the instant proposal for grant of Environment Clearance under the provisions of EIA Notification, 2006 **subject to submission of the written information on Parivesh portal** and stipulation of the following specific conditions and general conditions based on project specific requirements:

A. Specific conditions

[A] Environmental Management

1) The incoming organic waste of 600 TPD shall be processed at bio-methanation facility and mixed waste of 2400 TPD shall be processed at proposed waste to energy plant as committed. All the waste received shall be kept under a covered storage facility equipped with impermeable base and provision for collection of leachate leading to a leachate treatment and disposal facility.

2) Project proponent shall take necessary precaution to minimize nuisance of odour, flies, rodents, bird menace and fire hazard in the waste storage pit, around & over windrows and in processing area.

3) Proponent shall ensure that pre-process and post-process rejects shall be removed from the compost processing facility on regular basis and shall not be allowed to pile at the site. Recyclables shall be sent to authorized recyclers. The non-recyclables having high calorific fraction (≥1500 kcal/kg) shall be segregated and sent to waste to energy.

4) Project Proponent shall ensure that waste to be incinerated shall not be chemically treated with any chlorinated disinfectants and incineration of chlorinated plastics shall not occur. All the facilities in twin chamber incinerators shall be maintained to achieve a minimum temperature of 950°C in secondary combustion chamber and with a gas residence time in secondary combustion chamber not less than 2 seconds. Incinerators shall be operated with such temperature, retention time and turbulence, as to achieve Total Organic Carbon (TOC) content in the slag and bottom ash less than 3%, or the loss on ignition is less than 5% of the dry weight. The CO_2 concentration in tail gas shall not be more than 7%.

5) Project proponent shall ensure that maximum utilization of ash generated in accordance with the ash utilization notification dated 31/12/2021 and its subsequent amendment. No ash pond is permitted within the project site. Any unutilized ash and inerts from processing of municipal solid waste in the proposed Waste to Energy Plant shall be sent to Engineered Sanitary Landfill (ESLF) for its safe disposal. In case the concentration of toxic metals in incineration ash exceeds the limits specified in the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended from time to time, the Project Proponent shall send the ash to the Treatment, Storage and Disposal Facility for Hazardous Waste at Bawana in Delhi.

6) Project proponent shall install one continuous ambient air quality monitoring at suitable locations within the project site in consultation with DPCC as committed. The data from the CAAQMS shall be connected to CPCB server as well as SPCB server. The calibration of CAAQMS installed shall be carried out as per the calibration protocol for CAAQMS system specified by CPCB and records shall be maintained.

7) Online Continuous Stack Emission Monitoring System (OCEMS) shall be done through 24X7 online monitoring system. The emission Standards for Municipal Solid Waste based Thermal Power Plants as per Municipal Solid Waste Rules, 2016 dated 8.4.2016 (S.O. 1357 (E)) shall be complied (Refer Part C of Schedule II of Municipal Solid Waste Rules, 2016 dated 8.4.2016 (S.O. 1357 (E)). OCEMS shall be calibrated properly to ensure that data matches with the actual monitoring results.

8) The total water requirement for the proposed project is estimated as 989 m^3/day, out of which 625 m^3/day shall be met from blowdown reject water of Pragati Power Corporation Limited (PPCL) or treated wastewater from Sewage Treatment Plant (STP) of Delhi Jal Board (DJB) for industrial purposes and 7 m^3/day fresh water shall be met from drinking water supply of DJB for domestic purposes. Air-Cooled Condenser shall be used to reduce fresh water requirement and no ground water abstraction shall be allowed.

9) Natural nallah passing through the project site should be kept intact and no leachate or waste water/solid waste shall be discharged/deposited in to the Nallah. It's embankment shall be strengthened and Green belt shall be developed all along the periphery of the nallah. Western Yamuna Canal located at 32 meters from the project site in South-West direction shall be protected.

10) Project proponent shall harvest rainwater in a storage tank within the plant premises and utilize the same for plantation, recharging water in the pond and domestic utilization as committed. PP shall provide separate garland drains to prevent mixing of leachate with stormwater. A record shall be maintained of water collected through rainwater and its supply system. PP shall get the water audit done every year to optimize the water

requirement.

11) Project proponent shall implement the protective measure proposed in EMP in a time-bound manner. The budget earmarked for the same is Rs. 91.605 Crores (Capital) and Rs. 14.155 crores (recurring) and should be kept in separate accounts and audited annually. The implementation status along with the amount spent with documentary proof shall be submitted to the concerned Regional Office for the activities carried out during the previous year.

12) Project proponent shall take prior permission from the Competent Authority to divert high tension line passing through the project site.

13) Effluent of 360 KLD shall be treated through Leachate Treatment Plant. As committed by the Project proponent, Zero liquid discharge shall be adopted for the proposed plant. No wastewater will be discharged outside the project site. A detailed action plan regarding leachate handling shall be prepared and implemented in consultation with SPCB and the same shall be submitted to the Regional Office of the Ministry. Leachate shall be treated and reused. No treated leachate shall be discharged in any circumstances. Characteristics of Leachate and the treated leachate shall be monitored once in quarter and records shall be maintained.

14) Project proponent shall implement the concurrent plantation plan in a time bound manner. Total area of 2.43Ha. (40% of total plant area of 6.07 Ha.) shall be developed as greenbelt in a time frame of 3-5 years. Three tier green belt all along the periphery of the project site shall be developed as greenbelt and green cover as per CPCB guidelines. The budget earmarked for the greenbelt shall be kept in a separate account and audited annually. PP should annually submit the audited statement of expenditure along with proof of activities viz. photographs (before & after with geolocation date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC and on PARIVESH Portal as the case may be for the activities carried out during previous year.

15) Project proponent shall carry out community plantation with incentive scheme by distributing 50,00 saplings per year for a period of five years. Further, PP shall provide basic facilities to the nearby schools such as drinking water, sanitation facilities and shall also develop greenbelt around the nearby schools. Further, PP shall organize quarterly awareness programs for school students to educate them on the significance and preservation of trees.

16) Wildlife conservation plan as approved by the competent authority shall be implemented. Additional, budget shall be added in the plan, in case additional measures suggested by state wildlife department. The final Wildlife conservation plan duly approved by the CWLW shall be submitted to RO, MoEF&CC within a time frame of three months from the date of grant of EC and the budget approved by the concerned authority shall be deposited in government account.

17) Project proponent shall install LED display of air quality (Continuous AAQ monitoring) and stack emission (Continuous emission monitoring) at prominent locations preferably outside the plant's main entrance for public viewing and in administrative complex and maintenance of devices shall be done regularly.

18) Project proponent shall install adequate number of anti-smog guns at the periphery of the project boundary facing inwardly at a suitable height and explore the possibility for vertical gardens in order to bring down the particulate matter concentration in the area along with carry out Water Sprinkling on roads inside the plant area/ administrative areas on a regular basis to control the air pollution. A logbook shall be maintained for the activity and be in six-monthly compliance report.

19) Project proponent shall deploy mechanical road sweepers for everyday cleaning of the roads in and around plant site.

20) Environment Audit of plant shall be done annually and report shall be submitted to Regional office of the Ministry.

21) Oil and grease recovered from the treatment plant should be disposed only through authorized recyclers.

22) Monitoring of surface water quality and Ground Water quality shall also be regularly conducted in and around the project site and records to be maintained. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall also be undertaken and results/findings submitted along with half yearly monitoring report. The monitored data shall be submitted regularly on PARIVESH portal as part of Half Yearly compliance report

23) For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the latest CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.

24) Project proponent shall ensure that plastic waste generated from the plant except chlorinated plastics shall be used as RDF for the in-house incinerators. The chlorinated plastics waste generated from the plant shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016 (as amended). In pursuant to the Ministry's OM dated 18/07/2022. PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic (SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report submitted by Project proponent.

25) PP is advised to implement the 'Ek Ped Maa Ke Naam' Campaign which was launched on 5th June 2024 on the occasion of the World Environment Day to increase the forest cover across the Country. This plantation drive is other than Greenbelt development. The action in this regard shall be submitted concerned RO in six monthly report.

26) All the Directions, Advisories and Orders of Commission for Air Quality Management in National Capital Region and Adjoining Areas from time to time shall be complied upon by the project proponent.

[B] Socio-economic

1) All the recommendations of the epidemiological study report by IIHMR Delhi shall be complied upon by the project proponent in a time bound manner and compliance status in

this regard shall submitted along with the six monthly compliance report. In addition to this, proponent shall carry out a Root Cause Analysis (RCA) study to assess the prevalence of water borne diseases in the areas adjacent to the proposed project. The study report along with the recommendations shall be submitted to the Regional Office of the Ministry along with the six monthly compliance report.

2) The budget proposed for PH is Rs. 6.60 Crores. The budget proposed shall be kept in a separate account and audited annually. Project proponent shall implement the action plan to address the issues raised during public hearing within a time frame of 5 years from the date of grant of EC. In addition to this, PP shall provide medical camps in the study area for better public health, strengthen existing roads, provide RO for drinking water, develop skills of local people, etc. as committed. Compliance status in this regard shall be submitted along with the six monthly compliance to the concerned Regional Office of MoEF&CC.

3) The establishment of a robust public grievance redressal mechanism to address concerns and complaints from local communities regarding the power plant's operations, environmental impacts, or social issues shall be developed. A Senior Officer shall review the functioning of the mechanism twice in a month.

[C] Miscellaneous

1) An Environmental Cell headed by the Environment Manger with postgraduate qualification in environmental science/environmental engineering, shall be created. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.

2) Consent under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974 and Authorization under Solid Waste Management Rules, 2016 and Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016for the proposed project shall be obtained from the Delhi Pollution Control Committee.

3) All necessary clearance from the concerned Authority, as may be applicable should be obtained prior to commencement of project or activity.

B. General conditions

A. Statutory compliance:

1. Part A, B & C of Schedule II of Solid Waste Management Rules, 2016 which came into force vide S.O. 1357 (E) on 08.04.2016 as amended from time to time shall be complied for standards for composting, treated leachate (generated from waste) and incineration of Municipal Solid Waste.

2. Environmental Guidelines for Compressed Biogas Plant (CBG)/Bio-CNG Plants, 2022 of CPCB shall be followed for biomethanation plant based on municipal solid waste.
3. MoEF&CC Notifications on Ash Utilization S.O. 5481 (E) dated 31/12/2021 as amended from time to time shall be complied.

B. Mode of transportation of municipal solid waste, ash and inerts:

1. Waste shall be transported in covered vehicles and the wheel-washing facility shall be provided at the entry and exit of the plant.
2. PP shall transport fly ash / bottom ash / inerts in properly covered vehicles and ensure that no fugitive emission occurs in the air during loading, unloading and transportation.

C. Air quality monitoring and Management:

1. Project proponent shall manage the foul odour emerging as a result of waste processing as per CPCB guidelines issued from time to time.
2. Negative Pressure shall be maintained in the Waste Storage Pit from the waste pit. Pressure monitoring system showing the atmospheric pressure and pressure inside the waste pit shall be installed and the data shall be transferred to CPCB and DPCC through server.
3. Selective Non-Catalytic Reduction (SNCR) system or Low NOx combustion system shall be installed to achieve NOx emission standard as prescribed in Solid Waste Management Rules, 2016 or by DPCC whichever is stringent.
4. Hydrated lime and activated carbon injection system shall be installed for controlling SO_2 and HCl emissions in flue gas. Bag Filter House made of PTFE (Polytetrafluoroethylene) with 130% design efficiency for controlling Particulate matter emissions shall be installed to ensure that particulate matter (PM) emission meet the stipulated standards of 30 mg/Nm^3.
5. One common stack with a height of 60 meters shall be provided with continuous online monitoring instruments for SO_2, NOx and Particulate Matter as per extant rules.
6. Exit velocity of flue gases shall not be less than 20-25 m/s. Project proponent shall ensure that all the parameters including TOCs in stack emissions to meet the standards as prescribed in Solid Waste Management Rules, 2016 or by DPCC whichever are stringent.
7. Continuous Ambient Air Quality monitoring system shall be set up to monitor common/criteria pollutants from the flue gases such as PM_{10}, $PM_{2.5}$, SO_2, NO_X within the plant area at one location. The monitoring of other locations (at least three locations outside the plant area covering upwind and downwind directions at an angle of 120° each) shall be carried out manually.
8. Adequate dust extraction/suppression system shall be installed in waste handling, ash handling areas and material transfer points to control fugitive emissions.
9. Appropriate Air Pollution Control measures shall be provided at all the dust generating sources including sufficient water sprinkling arrangements at various locations viz., roads, excavation sites, crusher plants, transfer points, loading and unloading areas, etc.

D. Noise pollution and its control measures:

1. The Ambient Noise levels shall meet the standards prescribed as per the Noise Pollution (Regulation and Control) Rules, 2000.
2. Persons exposed to high noise generating equipment shall be provided with Personal Protective Equipment (PPE) like earplugs/ear muffs, etc.
3. Periodical medical examination on hearing loss shall be carried out for all the workers and maintain audiometric record and for treatment of any hearing loss including rotating to non-noisy/less noisy areas.

E. Human Health Environment:

1. Personnels handling municipal solid waste or being present on the tipping floor shall be provided with PPE like shoe covers, gloves, masks, etc.
2. A separate canteen far from the waste management area shall be provided for employees. All the basic sanitation facilities shall also be provided to all the employees.
3. Bi-annual Health check-up of all the workers is to be conducted. The study shall take into account chronic exposure of locals to noise which may lead to adverse effects like increase in heart rate and blood pressure, hypertension and peripheral vasoconstriction and thus increased peripheral vascular resistance. Similarly, the study shall also assess the health impacts due to air polluting agents.
4. The PP should have one Community Health Center in the campus,where the citizens from nearby area can have access to it and get treatment.

F. Water quality monitoring and Management:

1. Proponent shall achieve specific water consumption of the WTE below 3.0 m^3/MWhr.
2. Regular (at least once in six months) monitoring of groundwater quality in and around the proposed waste to energy plant including presence of heavy metals (Hg, Cr, As, Pb, etc.) shall be carried out as per CPCB guidelines. Surface water quality monitoring shall be undertaken for major surface water bodies as per the EMP. The data so obtained should be compared with the baseline data so as to ensure that the groundwater and surface water quality is not adversely impacted due to the project & its activities.
3. The treated effluents emanating from the different processes such as RO & DM plant, boiler blow down, sewage, etc. conforming to the prescribed standards shall be recycled and reused. Sludge/ rejects will be disposed in accordance with the Hazardous Waste Management Rules.
4. Wastewater generation of 274 KLD (191 KLD from RO & DM Plant + 57 KLD Cooling Tower water blowdown + 26 KLD from boiler blowdown) shall be sent to CMB and 108 KLD shall be recycled to raw water tank.
5. Leachate of 357 KLD and sewage of 3 KLD making the quantum as 360 KLD shall be treated collectively in Leachate Treatment Plant to meet the standards as laid down in Solid Waste Management Rules, 2016. Treated leachate shall be recycled and utilized in the process and for quenching ash within the premises of the proposed WTE plant.

6. Project proponent shall use the sludge obtained from the Leachate Treatment Plant as fuel into incinerator after dewatering by screw press technique.

G. Risk Mitigation and Disaster Management:

1. PP shall install radioactive sensors at the entry point of the Waste to Energy plant to detect any radioactive material in the receiving municipal solid waste.
2. Adequate safety measures and environmental safeguards shall be provided in the plant area to control spontaneous fires in coal yard, especially during dry and humid season.
3. Only RDF shall be fed into incinerator for generation of energy and no other kinds of fuel shall be used.
4. Ergonomic working conditions with First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.
5. Safety management plan based on Risk Assessment shall be prepared to limit the risk exposure to the workers within the plant boundary.
6. Regular mock drills for on-site emergency management plan and Integrated Emergency Response System shall be developed for all kind of possible disaster situations.

H. Greenbelt and Biodiversity conservation:

1. Greenbelt of at least 5-50 metres thickness and densified @ 2500 trees per hectare, shall be developed in an area of 40% of the total plant area with indigenous plant species in accordance with CPCB guidelines. The greenbelt shall inter-alia cover an entire periphery of the plant.
2. In-situ/ex-situ Conservation Plan for the flora and fauna in the vicinity of the proposed site should be prepared and implemented.

I. Waste management:

1. Municipal solid waste management should be planned in accordance with extant Solid Waste Management Rules, 2016.
2. Toxicity Characteristic Leachate Procedure (TCLP) test shall be conducted for compost, ash produced or any other substance, potential of leaching heavy metals into the surrounding areas as well as into the groundwater.
3. Ash shall be utilized as per provisions of the Notification issued by the Ministry's gazette notification vide S.O. 5481 dated 31.12.2021, S.O.6169 (E) dated 30.12.2021, S.O.05 (E) dated 01.01.2024 and amendment thereto.
4. Rejects/unutilized ash shall be disposed of in the Engineered Sanitary Landfill (ESLF). In case the concentration of toxic metals in incineration ash exceeds the limits specified in the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended from time to time, the PP shall send the ash to the Treatment, Storage and Disposal Facility for Hazardous Waste at Bawana in Delhi.

J. Monitoring of compliance:

1. Energy Conservation Plan to be implemented as envisaged in the EIA / EMP report. Renewable Energy Purchase Obligation as set by MoP/State Government shall be met

either by establishing renewable energy power plant (such as solar, wind, etc.) or by purchasing Renewable Energy Certificates.

2. The project proponent shall (Post-EC Monitoring):
   a. Send a copy of environmental clearance letter to the heads of Local Bodies, Panchayat, Municipal bodies and relevant offices of the Government;
   b. Upload the clearance letter on the web site of the company as a part of information to the general public.
   c. Inform the public through advertisement within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forest and Climate Change (MoEF&CC) at http://parviesh.nic.in.
   d. Upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same periodically;
   e. Monitor the criteria pollutants level namely; PM (PM_{10} & $PM_{2.5}$ in case of ambient AAQ), SO_2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company;
   f. Submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF&CC, the respective Zonal Office of CPCB and the SPCB;
   g. Submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company;
   h. Inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project and the date of commencement of the land development work.

K. Corporate Environmental Responsibility (CER) activities:

1. Activities under Extended EMP will be carried out as per Ministry's OM F.No.22-65/2017- IA.III dated 30th September, 2020 and 22-65/2017- IA.III dated 25.02.2021 or as proposed by the PP in reference to Public Hearing or as earmarked in the EIA/EMP report along with the detailed scheduled of implementation with appropriate budgeting. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the Extended EMP in compliance of the shall be submitted.

सत्यमेव जयते

File No: J-13012/04/2023-IA.I (T)
Government of India
Ministry of Environment, Forest and Climate Change
IA Division
***

Date **18/06/2025**

To,

Sh. Sandip Dutt
M/s. Jindal Urban Waste Management (Bawana) Limited
U-1, UPSIDC Industrial Area, Nandgaon, Koshi Kalan, Chhata, Mathura, Uttar Pradesh, 281403
E-mail: Info.Juwmbl@jindalecopolis.com

Subject: **Proposed Waste to Energy Thermal Power Project of capacity 30 MW by M/s Jindal Urban Waste Management (Bawana) Limited located at DSIIDC Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi - Environmental Clearance -Regarding**

Sir/Madam,

This is with reference to your proposal number IA/DL/THE/536932/2025 dated 12/05/2025 along with a written submission dated 03.06.2025 seeking for grant of Environmental Clearance (EC) under the provisions of the EIA Notification 2006 and as amended thereof for the project mentioned above.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC25A0603DL5984671N
(ii) File No.	J-13012/04/2023-IA.I (T)
(iii) Clearance Type	Fresh EC
(iv) Category	A
(v) Project/Activity Included Schedule No.	1(d) Thermal Power Plants
(vi) Sector	Thermal Projects
(vii) Name of Project	Proposed Waste to Energy Project 50 MW, DSIIDC Industrial Area, sector-5, Bawana, Delhi-110039 by M/s Jindal Urban Waste Management (Bawana) Limited.
(viii) Name of Company/Organization	M/s. Jindal Urban Waste Management (Bawana) Limited
(ix) Location of Project (District, State)	North West, Delhi
(x) Issuing Authority	MoEF&CC
(xi) Applicability of General Conditions as per EIA Notification, 2006	Yes

3. M/s Jindal Urban Waste Management (Bawana) Limited has made an online application vide proposal number IA/DL/THE/536932/2025 dated 12/05/2025 along with copy of EIA/EMP report, CAF (Part A, B & C) and sought for Environment Clearance (EC) under the provisions of the EIA Notification, 2006 for the project mentioned above.

4. The proposed project/activity is listed at item no. 1(d) Thermal Power Plants of the schedule of the EIA Notification, 2006 and falls under Category 'A'. Further, the proposed project/activity also attracts the general condition of the EIA Notification, 2006 as the project site is located at a distance of 4.48 KM from Delhi-Haryana State boundary in NNW direction.

5. The instant Proposal was considered by the EAC (Thermal) in its 25th meeting held on 27th May, 2025. The PP has submitted the written information on 03.06.2025. The MoM for the same may be seen using the following web link: https://parivesh.nic.in

Details submitted by the project proponent

6. The instant proposal of M/s Jindal Urban Waste Management (Bawana) Limited is for setting up of Waste to Energy (WTE) Thermal Power Project with a capacity 30 MW at Delhi State Industrial and Infrastructure Development Corporation Limited (DSIIDC) Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi.

7. The details of the Terms of Reference (ToR) obtained for the above project for prearation of EIA/EMP report is furnished as below:

Proposal No with Date	Consideration	Details	Date of accord	ToR Validity
IA/DL/THE/435160/2023dated 11/08/2023	2nd meeting of EAC-Thermal held on 31/10/2023	Terms of Reference	10/01/2024	4 years

8. Environmental site settings:

S. No.	Particulars	Details			Remarks
1.	Total Land	15.0 Acres (or) 6.07 Ha – Government Land			Land Use: Industrial Purpose Located at DSIIDC Industrial Area, Sector-5, Bawana, Delhi
2.	Land Use breakup	**Details**	**Area Break up (Acres)**	**Percentage (%)**	· Land Use: Industrial Purpose. · At DSIIDC Industrial Area, Sector-5, Bawana, Delhi-110039.
		TPP Site	7.84	52.27	
		Admin Office & Canteen	0.3	2.0	
		Greenbelt Area	6.0	40.0	
		Others	0.86	5.73	
		Total	15 acres (or) 6.07 Ha	100%	
3.	Land acquisition details as per MoEF&CC O.M. dated 7/10/2014 & 20/02/2025	The land requirement for the project is 6.07 Ha (or) 15 acres which is a Government land.			The land has been provided by Municipal Corporation of Delhi (MCD) to M/s. Jindal Urban Waste Management (Bawana) Limited vide concession agreement dated 27/02/2025.
4.	Existence of habitation & involvement of R&R, if any.	**Study Area:**			· The proposed project is within the DSIIDC Industrial Area, Bawana · The land for the project is allocated by the MCD. · It does not involve R&R issue.
		Habitation	Distance		
		JJ Colony	Within 1 Km		
		Iradat Nagar alias Naya	Within 05 Km		

S. No.	Particulars	Details	Remarks
		Bans Holambi Khurd Holambi Kalan Sanoth Ghoga Khera Khurd	
5.	Latitude and Longitude of all corners of the project site.	Plant Site: Point: Lat. Long. 28°47'41.49"N 77°3'42.51"E 28°47'46.08"N 77°3'36.54"E 28°47'53.53"N 77°3'43.80"E 28°47'49.56"N 77°3'48.06"E 28°47'47.84"N 77°3'47.27"E 28°47'47.12"N 77°3'47.43"E 28°47'46.70"N, 77°3'47.84"E	-
6.	Elevation of the project site	The project site elevation varies from 248 m to 236 m above mean sea level (msl)	-
7.	Involvement of Forest land if any	No	-
8.	Water body (Rivers, Lakes, Pond, Nala, Natural Drainage, Canal etc.) exists within the project site as well as study area	· A natural nallah is passing through the project site. · Western Yamuna Canal is located at approx. 32 meters from the project site in South-West direction. **Protection measures:** · MSW will be stored in a closed pit to prevent cross-contamination · Fly ash and bottom ash securely stored in closed silos · Fuel oil tanks equipped with dykes and spill collection pits · Nallah passing through the site will not be diverted · Development of a green belt along the surrounding nallah/stream · Stormwater from open storage areas will be routed through pits for effective silt collection	No perennial river passing, only regulated canal passing by near to the project site.
9.	Existence of ESZ/ ESA/ national park/ wildlife sanctuary/ biosphere reserve/ tiger reserve/ elephant reserve etc. if any within the study area	There is no National Park, Wildlife Sanctuary etc. within study area.	-
10.	Archaeological sites, monuments/ historical temples, etc.	None	-
11.	Involvement of Critically Polluted Area/ Severely Polluted area as per 2018 CEPI score	No	-

9. **Salient features of the proposed WTE project**: The technology proposed to be employed for this WTE project is RDF combustion based reciprocating forward feed grate technology. The power plant constitutes Material Recovery Facility

(Pre-sorting), RDF fuel Pit, Incinerators, Boilers, and Steam Turbine Generators with power generation total capacity of 30 MW±6MW. Air cooled condensers (ACC) are to be used in lieu of water-cooled condenser (WCC). The rejects/generated bottom ash will be processed in the bottom ash processing plant. After the processing materials which are not recyclable for further processing will be sent to Sanitary Landfill. Fly ash will be sent to the secured landfills site designated by MCD. The air pollution control system will consist of Flue Gas Treatment System which includes Adsorption of acidic components and other pollutants by lime and Activated carbon in turbo reactors and filtration of dust particles through bag filters. Wastewater & leachate generated from the WTE plant will be treated in the Leachate Treatment Plant. The treated wastewater will be recycled to DM plant and rejected water for quenching of bottom ash. The green belt area will be developed in an area of 6 acres all along the periphery of the project site. .

- Total MSW feed : 3000 TPD
- Power Plant capacity : 30 MW ± 6 MW
- RDF Processing Capacity : 700 TPD per unit (2x700 TPD for two units)
- Auxiliary power consumption : 10 to 15% of total power generation
- Saleable Power to Grid : 85 to 90%
- Calorific Value of Fuel : 1600 kcal/kg and above based on RDF quality
- Export grid voltage : 66 kV
- Grid Interconnection : DTL Bawana Substation (220/66 kV)
- Furnace and boiler type
- Upward grate system
- 99.9% Combustion rate (less than 10 ppm of CO)
- Low NOX generation design – secondary air control
- Flue gas Cooling system
- Hydrated lime dosing system for SO2 control
- Stack of 60 meter height

The description of process involved in the generation of electricity from municipal waste is given below:

- MSW receiving
- Pre Segregation and preparation of RDF
- Heat Recovery & Steam Generation in the boiler
- Power Generation & exporting to grid
- Flue Gas Cleaning System
- Leachate Treatment

Overall mass balance

Description	Quantity (Tons Per Day)	% fraction
Total Waste for processing	3000 ton	100 %
Green Waste by bio-methanation process	600 ton	20 %
Total MSW Processed for RDF	2,400 ton	80 %
Total RDF to storage	1,400 ton	58 %
Inerts removal in processing	295 ton	12%
Leachate recovered	357 ton	15 %
Moisture	343 ton	14 %
Compost	4 ton	0.17 %
Recyclables	2 ton	0.08 %

Note: *20 to 25 percentage variations on the MSW feed quality are envisaged.*

10. **Fuel requirement**: The details of the municipal solid waste requirement for the proposed project along with its source and mode of transportation is given as below:

Details	Fuel requirement (TPD)	Source	Distance from site (Kms)	Mode of Transportation	Linkage document
1.	3000 Municipal Solid	Municipal	Approx. 12 Kms	Road	Concession Agreement with

	Waste	Corporation of Delhi			MCD

11. Water requirement: The water requirement for the proposed project during operation phase is estimated as 625 m3 /day and approx. 7 m3/day of fresh water will be required for domestic purposes which will be met by the DJB. Requirement of water for industrial usage will be met from the blowdown reject water from the Pragati Power Corporation Limited (PPCL) or treated sewage from STP, DJB. There will be no use of ground water in the process or for domestic use for the proposed project.

Operation Phase:

- Fresh water – 7 m3/day
- Blowdown reject water from the PPCL/Treated sewage from STP, DJB – 625 m3/day
- Treated Leachate water – 357 m3/day

12. **Power requirement**: The power requirement during construcytion shall be met from the nearest construction power source i.e., Tata Power Delhi Distribution Limited (TPDDL). During operation phase, power consumption shall be 10–15 % of the generated power. A 750 kVA DG set is envisaged which will be used in case of grid failure.

13. **Baseline Environmental Studies with proposed mitigation measures**

Period	March, 2023 to May, 2023	Additional Study (if any)
AAQ parameters at 8 Locations (min and max)	$PM_{2.5}$ = 46.0 To 228.0 µg/m^3 PM_{10} = 77.0 To 380.0 µg/m^3 SO_2 = 5.0 to 18.0 µg/m^3 NO_x = 14.0 To 32.0 µg/m^3 CO = 0.52 To 0.84 mg/m^3	-
Incremental GLC level	PM = 1.604 µg/m^3 (Level at 0.96.km in South Direction) SO2 = 6.418 µg/m^3 (Level at 0.96.km in South Direction) NO_x = 12.837 µg/m^3 (Level at 0.96.km in South Direction) **Proposed mitigation measures** • Presence of PVC waste is significant, hence the release of HCl, Dioxins and furans will be less significant (below 0.1 ngTEQ/Nm^3) • Hydrated lime and activated carbon injection in the post-combustion stage to control SO_2 and HCl • 130% design capacity of PTFE Bag Filter House, • PM, SO_2, and NOX emissions will be maintained within the levels of 50 mg/Nm^3, 200 mg/Nm^3, and 400 mg/Nm^3, respectively, as per SWM Rules, 2016 norms • Continuous Emission Monitoring System (CEMS) will be installed on the stack • CAAQMS will be installed at the site • Provision for Selective Non-catalytic Reduction for Nox Control **Odour control measures** · Negative Pressure Ventilation in the MSW collection pit · Ventilation air from MSW pit will be fired in the boiler · Fogging unit/mist system & herbal solution spray · Odour assessment will be undertaken during the operational phase as per EN 16841-1 standards	-
Ground water quality at 8 locations	pH: 7.11 to 7.58, Temperature- 19 degree C to 22 degree C, Turbidity- 1.0 to 1.6 NTU, TDS-232.0 to 698.0 mg/l, Alkalinity as CaCO3-188 to 232.0 mg/l,	-

Period	March, 2023 to May, 2023	Additional Study (if any)
	Total Hardness: 134 to 250 mg/l, Mercury-<0.0005 mg/l, Selenium-<0.002 mg/l, Zinc-<0.01 mg/l, Chlorides: 62.00 to 84.00 mg/l, Fluoride: 0.57 to 0.81 mg/l, Sulphate-44.0 to 58.00 mg/l, Nitrate-10.20 to 13.80 mg/l, Cyanide-<0.01 mg/l, Free Residual Chlorine- <0.1 mg/l, Phenolics-<0.001 mg/l, Calcium- 56.20 to 72.0 mg/l, Aluminium-<0.03 mg/l, Total Arsenic-<0.002 mg/l, Cadmium-<0.001 mg/l, Boron-<0.05 mg/l, Total Chromium-<0.002 mg/l, Iron - 0.0 to 0.01 mg/l, Copper-<0.002 mg/l, Lead-<0.002 mg/l, Manganese-<0.02 mg/l, Faecal Coliform-<2 MPN/100 ml.	
Surface water quality at 8 locations	pH-7.02 to 7.34, TDS-233.0 to 311.0 mg/L, BOD-10.0 to 20.0 mg/L. DO-5.50 to 6.40 mg/L, Total Hardness as CaCO3 130.0 to 196.0 mg/L. Temperature – 19.0 degree C to 21.0 degree C TSS-2.0 to 6.0 mg/l, Chloride-28.0 to 60.0 mg/l, Fluoride-0.33 to 0.67 mg/l, Sulphate- 26.0 to 46.0 mg/l, Nitrate- 7.20 to11.50 mg/l, Cyanide-<0.01 mg/l, Phenolic Compounds-<0.001 mg/l, Total Arsenic-<0.002 mg/l, Calcium-102.0 mg/l to 142.0 mg/l, Magnesium-28.0 to 56.0 mg/l, Cadmium-<0.001 mg/l, Total Chromium-<0.002 mg/l, Iron- 0.01 to 0.01 mg/l, Copper-<0.002 mg/l, Lead-<0.002 mg/l, Manganese-<0.02 mg/l, Mercury-<0.0005 mg/l, Selenium-<0.002 mg/l, Zinc-<0.01 mg/l, Total Coliform- 490.0 to 1770.0 MPN/100 ml	-
Effluent generation details and its treatment	Effluent sent to CMB – 382 m^3/day Leachate (357 m^3/day & sewage generation 3m^3/day) – 360 m^3/day 1. Leachate 2. Cooling Tower Blow down 3. Boiler Blowdown 4. Other industrial effluents Mode of treatment 1. Leachate Treatment Plant through RO 2. Central Monitoring Basin (CMB) Mode of reuse 1. 100% reuse of treated effluent & leachate 2. Treated water for FGCS & gas cooling, dust suppression and ash quenching 3. Green belt development 4. Domestic wastewater will be used as seed for LTP Zero liquid discharge will be adopted.	-
Noise levels Leq (Day and Night)	42.6 dB (A) to 54.8 dB (A) for the day time and 36.8 dB (A) to 42.6 dB (A) for the Night time. Control measures: • Acoustic walls for the control room, office rooms, and canteen will be provided • A mandatory PPE policy will be adopted in high-noise zones such as TG rooms • Audiometric tests for all persons working at high noise zones	
Traffic assessment study findings	The traffic study was performed on NH-344 M which is connected to project-site and traffic load NH-344 M was found to be moderate as per the respective road classification. The condition of the existing road is good.	-
Soil Quality at 8 Locations	Bulk density: 1.49 to 1.72 gm/cm^3; pH: 6.22 to 7.66; Electrical conductivity (EC); 238 to 324 µmhos/cm; Calcium content: 2.59 to 3.34 mg/100 gm; Sodium: 3.7 to 6.1 mg/100 gm; Potassium: 191.74 to 231.62 kg/ha; Nitrogen: 311.58 to 366.46 kg/ha;	-

<table>
<tr><th>Period</th><th>March, 2023 to May, 2023</th><th>Additional Study (if any)</th></tr>
<tr><td></td><td>Phosphorous: 13.89 to 19.94 kg/ha; Cation Exchange Capacity (CEC): 6.64 to 10.72 meq/100gm;
Organic Matter: 1.23% to 1.74%</td><td></td></tr>
<tr><td>Flora and fauna</td><td>61 Flora and 56 Fauna were found in the study area. As per the Wildlife-Protection Act 2022, Three Schedule-I, species
· Pavo cristatus,
· Herpestes javanicus and
· Accipiter badius
are found in the study area and Wildlife Conservation Plan has been prepared and submitted to DFO for their approval. Rs 54 Lakhs has been allocated for the Conservation Plan.</td><td></td></tr>
<tr><td>Hydrogeology study</td><td>· Bawana's aquifer systems predominantly consist of shallow alluvial aquifers.
· The hydrogeological setup includes unconfined to semi-confined aquifers, primarily composed of sand, silty sand, and kankar horizons.
· The depth of water level during Pre-Monsoon ranges from 1.25 mbgl to 66.01 mbgl.
· The depth of water level during Post Monsoon ranges from 0.62 mbgl to 66.75 mbgl.
· The source of water is reject blowdown water from the M/s Pragati Power Corporation Limited
· No groundwater will be withdrawn from any natural water bodies.
· Hence, there will be no impact on groundwater regime.
· A total of 5,085.3 m³ per annum will be harvested and supporting sustainable water management.
Rain water haversting
<table>
<tr><td>Total Built-up Area</td><td>7,539 m^2</td></tr>
<tr><td>Annual rainfall</td><td>674.5 mm/year</td></tr>
<tr><td>Annual rainfall</td><td>0.6745 m</td></tr>
<tr><td>Roof yield per annum</td><td>5,085.3 m^3/year</td></tr>
</table></td><td>M/s Mantec Consultants Pvt. Ltd., Noida</td></tr>
<tr><td>Impact study on biodiversity and aquatic ecology</td><td>· The project is based on ZLD concept and there will be no effluent discharge from the plant.
· Since, there is no major aquatic system in the area, the chances of impact on aquatic ecology would be insignificant.
· Minimum 40% greenbelt / green cover of the total project area will be developed as per CPCB guidelines. Plantation will be done in consultation with the local Forest Department.
· The excavated soil from the project site should be kept separately and can be used to boost restoration and green plantation activity.
· Planting fruit bearing tree for avifauna and other faunal species.
· Western Yamuna Canal is flowing adjacent to the project site. Utmost precaution should be taken to ensure no leakage or discharge of effluent takes place.
· All vehicles inside the project site should maintain speed limit and will not blow horn unless it is required.
· Awareness will be given to workers about the importance and conservation of terrestrial ecology and biodiversity.
· Extensive plantation should be undertaken in an around the project site.</td><td>M/s Mantec Consultants Pvt. Ltd., Noida</td></tr>
<tr><td>Risk assessment study</td><td>· Only flammable material is diesel/LDO for operations for 25 KL which will be provided with dykes and firefighting systems.
· Fire water pumps shall be installed along with adequate water storage</td><td>M/s Mantec Consultants Pvt. Ltd., Noida</td></tr>
</table>

Period	March, 2023 to May, 2023	Additional Study (if any)
	capacity. · Ensure Inspection and Maintenance of Pipelines of Boiler and other related equipments/instruments/connections like safety device, water level indicator, flanges etc. to avoid boiler explosion. · Special precautions like SOP will be considered during start-up and shut down failure of which may lead to fire box explosion/boiler explosion. · Periodical inspection and calibration of various types of electronic instruments shall be followed. · Ensure effective monitoring of the power plant safety. · Effective housekeeping to be maintained in the plant. · MSDS of the chemicals should be present at strategic locations and workers should be well trained to handle that chemical with appropriate PPE. · Gas monitoring equipments to be connected to the alarm (flammable oil). · Periodic Inspection and Maintenance of Fire Alarm & Fire Detection System to ensure its working when in need. · Periodic rehearsal of mock drill to ensure readiness to handle any emergency situation. · All safety precautions (SOP etc.) to be followed in any type of operation in the plant to avoid accidental situations. · Special precautions like no use of match boxes, cigarette lighters etc. also be followed to avoid fire in LDO storage area, loading/unloading of LDO tanker area. · SOP to be followed during loading/unloading of LDO to storage tank. LDO Tankers to be fitted with flame arrestors. Earthing/bonding during loading/unloading to be considered to avoid any static charge generation. · As per NFPA-85E, it is believed that improved instrumentation, safety interlocks and protective devices, proper operating sequences and a clearer understanding of the problem by both designers and operators can greatly reduce the risks and actual incidence of furnace/boiler explosions.	
Epidemiological Study	Recommendations · **Health Interventions**: · Strengthen primary healthcare services and disease surveillance in the Bawana area. · Focus on prevention and early diagnosis of both communicable and non-communicable diseases. · **Nutritional Support**: · Implement nutrition education and supplementation programs targeting deficiencies. · **Awareness Programs**: · Promote healthy lifestyle practices to reduce tobacco and alcohol use, especially among youth. · **Community Engagement**: · Involve the community in health education, sanitation improvement, and participatory health planning. **<u>Action plan:</u>** **<u>Within the facility operations</u>** • Annual medical tests for the workers who are directly exposed to MSW handling • Tie-ups with local hospitals for annual health checkups for all persons working in high-hazard areas • Masks and hand sanitation program for persons working in the MSW	International Institute of Health Management Research (IIHMR), New Delhi

Period	March, 2023 to May, 2023	Additional Study (if any)
	handling area • Health insurance coverage for all employees and workers working at the facility • Strict implementation of ESI policy for the contract workers **Within a 5 Km radius** • Ambient air quality monitoring at three locations • Collaborating with other WtE operators in the area to conduct periodic epidemiological studies in association with local authorities • Conducting awareness programs on the health and hygiene aspects JUIL allocated Rs. 55 Lakhs towards various community healthcare support initiatives	

14. The details of solid and hazardous waste generation along with its mode of treatment/disposal is furnished as below:

Type of Waste	Source	Quantity (Daily) Metric Tons (MT)	Mode of Transportation	Disposal Method	Remarks
Recyclable	Process	2 MT	Road	Will be sold to registered recyclers	-
Manure (from composting)	Process	4 MT	Road	Used as compost/soil conditioner	Agreement with local farmers and horticulture departments will be made
Bottom Ash & Inert		408 MT	Road	Used for road construction and any unutilized material will be sent to ESLF	-
Fly Ash	Process	72 MT	Road	Supplied to cement industries/ash brick manufacturers and unutilized material will be sent to ESLF	-
Used Oil	Machineries	4 MT	Road	Wil be sold to registered recyclers	-

15. **Public Consultation:**

Details of advertisement given	Nav Bharat Times, Delhi (Hindi) - 26.11.2024 & Times of India (English) -26.11.2024
Date of public consultation	27.12.2024 at 11:00 A.M. to 1:00 P.M
Venue	Proposed Waste to Energy Project (30 MW), adjacent to TSDF for Hazardous Waste, Sector-5 Bawana, Delhi-110039.
Presiding Officer	Additional District Magistrate (North District), Govt. of NCT of Delhi.
Major issues raised	Air Pollution, Health, Employment, Waste Handling and Management etc.
No. of people attended	• 34 No. of Representations / Responses (Letters - 05 Nos & Emails - 29 Nos) received from the Public after 26.12.2024

Summary of issues raised during the public consultation:

Category	Key Concerns Raised	Responses Provided
Air Pollution	Now a days where pollution is on its peak and where we the residents specially those who are living near to Industrial area are already exhausted due to pollution	Ambient Air quality monitoring system will be installed in plant for tracking pollution levels that ensures compliance with environmental regulations and ensures protection of public health under EHS program of the proposed project.

Category	Key Concerns Raised	Responses Provided
	emerging by Industrial units.	
Medical & Health	There is already a big Landfill is working here, and AQI is also in dangerous zone.	Development of new landfill sites has also not been allowed by Delhi High Court. All emission parameters from the plant shall be within the prescribed limits. Ambient Air quality monitoring system will be installed in plant for tracking pollution levels, ensuring compliance with environmental regulations, and protecting public health.
Employment	Employment Generation	Noted with thanks and Employment will be provided to local people.
Waste Handling and Management:	The collection, transportation, and processing of waste at such a large scale could create health risks for workers and residents, especially if safety protocols are not strictly followed.	Waste will be received in closed hook loader in the plant. MSW will be stored in an enclosed pit which is maintained under negative pressure, which prevents the escape of any odor. Regular spray inoculum on the waste will be done. Plant will install spray system for odor management The WTE plant will not emit odor. Leachate Management System will be put in place.

Action plan as per MoEF&CC O.M. dated 30/09/2020 to address the concerns of public consultation:

S. No	Physical activity and action Plan		Year of implementation (Budget in INR Lakhs)					Total Rs. In Lakhs
			25-26	26-27	27-28	28-29	29-30	
MEDICAL & HEALTH FACILITIES								
1	Providing Medical Camps	Physical Nos	2	5	5	7	7	
		@Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	5	10	10	15	15	55
SOLAR ENERGY DEVELOPMENT/INFRASTRUCTURE DEVELOPMENT								
1	Repair and maintenance of internal roads	Physical Nos	1	1	1	1	1	
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	5	10	20	20	20	75
2	Solar Energy Development	Physical Nos						
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	40	55	75	94	126	390
DRINKING WATER/WATER SHED DEVELOPMENT								
1	Providing of RO plant water	Physical Nos	1	1	1	3	1	
		@ Village	Bawana (JJ Colony)	Sanoth	Holambi Kalan	Ghoga	Holambi Khurd	
		Budget, Rs lakhs	2	2	2	6	2	14
GREENBELT DEVELOPMENT								
1	Greenbelt	Budget, Rs	3	5	3	3	3	17

	development in villages	lakhs						
EMPLOYMENT/SKILL DEVELOPMENT								
1	Providing skill development training to ITI & diploma passed local youth	Physical Nos	4 students/year	5 students/ year	5 students/year	5 students/year	5 students/ year	
		@Village	Local Youth from 10 km radius					
		Budget, Rs lakhs	1	2	2	2	2	9
SANITATION								
1	Renovation of Toilets & Distribution of dust bins	Budget, Rs lakhs	10	15	20	25	30	100
Total Cost, lakhs			**66**	**99**	**132**	**165**	**198**	**660**

16. **Cost of project**: The capital cost of the proposed project is Rs 660.0 Crores and the capital cost for environmental protection measures is proposed as Rs 91.605 Crores. The annual recurring cost towards the environmental protection measures is proposed as Rs 14.155 Crores. The employment generation from the proposed project is 242 (during operation phase). The details of the cost for environmental protection measures are as follows:

Details of Cost Provision for Environmental Measures

S. No.	Particulars	Equipment/Measures Taken-other	Capital Cost (in Crores)	Recurring Cost per annum (in Crores)
1	Air Pollution Control	Flue Gas Cleaning System, SNCR, Anti-Smog Gun etc.	49.505	11.000
2	Water Pollution Control	WTP & LTP installation & Operating cost.	31.400	2.200
3	Noise Pollution Control	Acoustic enclosures & Personal Protective Equipment.	No extra capital investment is required for NPCS to be purchased with noise compliance	0.500
4	Environment Monitoring and Management	OCEMS/CAAQMS installation & Maintenance, Monitoring of Stack emissions.	3.000	0.170
		Manual Environmental and Stack Monitoring	0.14	---
5	Occupational Health	Provision of OHC for working personnel.	0.200	0.150
6	Green Belt	Pursuant to Battery Limit intensifying the greeneries inside and outside of the project site.	0.170	0.051
7	Wildlife Conservation Plan	Activities under biodiversity and habitat conservation	0.540	---
8	Others (Odour control management + Sanitization)	High Pressure Pump, Nozzle and its accessories for fogging unit/mist system & herbal solution spray.	0.050	0.084
9	Public Hearing Commitment	Medical & Health Facilities, Safe Drinking Water, Solar Energy/ Infrastructure Development, Employment/Skill Development	6.60	-
Total			**91.605**	**14.155**

17. **Employment Details**: Total manpower during Construction Phase shall be 630 (60 - direct & 570 – Indirect/contractual) and during Operational Phase shall be 242 (86 - direct & 156 – Indirect/contractual).

18. **Green belt development**: Proposed greenbelt will be developed in 6.0 acres (2.43 ha) which is about 40 % of the total project area. Thus total of 6.0 acres (2.43 ha) area (40 % of total project area) will be developed as greenbelt. Local and native species will be planted with a density of 2000 trees per hectare. Total no. of 4860 saplings will be planted and nurtured in 6.0 acres (2.43 ha) in 3-5 years. The action plan for green belt development is furnished as below:

- **Greenbelt Area**: 6 Acres (~40% of the total project area)
- **Number of trees**: 4,860 trees to be planted @ 2000 trees/ha
- **Native species** will be selected from the plantation:
- Ailanthus excelsa, Alstonia scholaris, Azadirachta indica, Bombax ceiba, Butea monosperma, Calistemon viminalis, Cassia fistula, Dalbergia sissoo, Ficus bengalensis, Ficus religiose, Melia azedarach etc.
- **Greenbelt layout**: 3-tier plantation around boundaries, roads & open areas
- **Tree spacing**: 2.5m x 2.5m grid for optimal canopy and coverage
- **Width**: Minimum of about 3 to 5 m along the periphery and internal roads

19. **Ash Management System**: The present project falls under Waste to Energy category and accordingly bottom ash, and fly ash utilization plan has been developed as per the current technically viable ash utilization programs

Details	Annual generation (Metric Tons Per Annum –MTPA)	Utilization	% of utilization	Balance quantity (MTPA)	No of storage silos with capacity
Bottom Ash & Inert	1,48,920	Use for road construction and any unutilized material will be sent to ESLF	-	Unutilized material will be sent to ESLF	-
Fly Ash	26,280	Supplied to cement industries/ash brick manufacturers	-	Unutilized material will be sent to ESLF	2 nos. of silos

20. **Summary of court cases**: There are no litigations pending against the proposed project.

21. **Written submissions**: The proponent submitted the following with respect to the temperature profiling in the boiler:
The boiler is equipped with multistage hydraulic reciprocating grate furnace. It is the state of art forward &/or reverse acting grate technology for typical Indian waste. It is a complete system that efficiently converts municipal solid waste into energy through controlled combustion.The boiler is composed of several auxiliary systems such as feeding equipment, feeding grate, incineration grate, hydraulic system, oil burner system, automatic control system, combustion air system, ash and slag discharging system, etc. It has a unique grate design and optimized air distribution system, to ensure the highest combustion efficiency and eliminate partial combustion, with advanced automatic combustion control system. The waste combustion zone is divided into following sections according to the combustion properties, where the waste is dried, burned, burned out and finally cooled:
1) the drying section,
2) the combustion section and
3) the slag cooling section;
The primary air enters the primary combustion zone of furnace through the chamber arranged under the grate. 1st section specializes in drying the waste to optimum combustion temperature. 2nd section ensures complete combustion above 950 °C temperature. Secondary air enters the secondary combustion zone of furnace through nozzles to enhance the turbulence, along with refractory in the first pass to ensure more than 2 seconds residence time. The continuing design of boiler includes top support, vertical, four pass, balance draft, single drum and natural circulation, water tube design. Further, the temperature profile of both the combustion zones and boiler passes is as follows:

Particular	1st Pass Furnace		2nd Pass Outlet	3rd Pass Outlet	4th Pass Outlet
	Primary Combustion Zone	Secondary Combustion Zone			
Flue Gas Temperature	1068 °C	1025 °C	661 °C	350 °C	190 °C

The Boiler is designed to maintain the temperature above 950 °C in the secondary combustion zone and ensure a gas residence time of more than 2 seconds in the secondary combustion zone.

Observations and deliberation of the EAC

22. The Committee observed and noted the following:

i. Instant proposal is for setting up of Waste to Energy Thermal Power Project of capacity 30 MW by M/s Jindal Urban Waste Management (Bawana) Limited located at DSIIDC Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi.

ii. The EAC took into consideration the KML file on the Google Earth presented by the project proponent along with DSS of the project site on PARIVESH.

iii. ToR for the proposed greenfield project was accorded on 10/01/2024. The site for the proposed project was selected after analysing three alternate sites. The Bawana site was found most suitable due to availability of adequate authorized land with the MCD in DSIIDC, Industrial Area, Nearness to water source from PPCL and no fresh water will be drawn up for industrial use except drinking water and no existence of Ecologically sensitive areas.

iv. Total land required for the proposed project is 6.07 Ha (15.0 Acres), falling within the DSIIDC industrial area, Bawana, Delhi and doesn't involve R&R issues. The land has been provided by Municipal Corporation of Delhi (MCD) to M/s. Jindal Urban Waste Management (Bawana) Limited vide concession agreement dated 27/02/2025.

v. The committee observed that a natural nallah is passing through the project site. Western Yamuna Canal is located at approx. 32 meters from the project site in South-West direction. No nallah diversion involved but the Nalla embankment shall be strengthen and green belt will be developed all along the periphery of the nallah for its conservation. The committee suggested that nallah should be kept intact and no leachate or waste water/solid waste shall be discharged/deposited in to the Nallah.

vi. There is no involvement of forest land. There are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site as ascertained from DSS.

vii. The project site is not located within the Critically Polluted Area (CPA) / Severally Polluted Area (SPA) as per CEPI assessment 2018 of CPCB.

viii. The technology to be employed for this WTE project is RDF combustion based reciprocating forward feed grate technology. The power generation capacity will be 30 MW. The quantity of MSW requirement for the project will be 3000 TPD.

ix. The water requirement for the proposed project during operation phase is estimated as 625 m3 /day and approx. 7 m3/day of fresh water will be required for domestic purposes which will be met by the Delhi Jal Board (DJB). Requirement of water for industrial usage will be met from the blowdown reject water from the Pragati Power Corporation Limited (PPCL) or treated sewage from STP, DJB. No ground water shall be used for the proposed project. Zero Liquid Discharge will be for the proposed project.

x. The requirement of the construction power supply for the project would be met from the Tata Power Delhi Distribution Limited (TPDDL).

xi. The Committee deliberated on the baseline data and incremental GLC due to the proposed project. The committee noted that the proponent is providing hydrated lime injection for SO2 control, bag filter, Low NOX combustion system and provision for Selective Non-Catalytic Reduction (SNCR) for NOx control and stack with a height of 60 meters will be provided to control & regulate the air emission from the proposed project.

xii. For odour control, the committee noted that negative Pressure Ventilation in the MSW collection pit, ventilation air from MSW pit will be fired in the boiler and provision of fogging unit/mist system & herbal solution spray.

xiii. The committee noted that with respect to water pollution control, proponent will be using Air cooling system,

wastewater from raw water treatment facilities and the boiler section will be used for flue gas conditioning and dust suppression operations and leachate will be collected, treated, and reused in the main plant. Zero liquid discharge will be adopted.

xiv. The rejects/generated bottom ash will be processed in the bottom ash processing plant. After the processing materials which are not recyclable for further processing will be sent to Sanitary Landfill. Fly ash will supplied to cement industries/ash brick manufacturers and unutilized material will be sent to secured land fill.

xv. There are 3 Schedule I Species found in the study area and a Wildlife Conservation & Management Plan (WLCP) has been prepared and submitted to DFO for their approval. Rs 54 Lakhs has been allocated for the Conservation Plan.

xvi. The findings of epidemiological study report have been deliberated and the Committee noted that JUIL has allocated Rs. 55 Lakhs towards various community healthcare support initiatives.

xvii. Proposed greenbelt will be developed in 6.0 acres (2.43 ha) which is about 40 % of the total project area in a time frame of three to five years.

xviii. Public hearing for the project was held on 27.12.2024. The Committee looked into the videography of the public hearing proceedings, deliberated on the public hearing issues and written representations received along with the action plan submitted by the proponent to address the issues raised during the public hearing. The committee advised the PP to implement the PH action plan in a time bound manner.

xix. The capital cost of the proposed project is Rs 660.0 Crores and the capital cost for environmental protection measures is proposed as Rs 91.605 Crores. The annual recurring cost towards the environmental protection measures is proposed as Rs 14.155 Crores. The employment generation from the proposed project is 242 (during operation phase).

xx. The Committee noted that the EIA reports are in compliance of the ToR issued for the project, reflecting the present environmental status and the projected scenario for all the environmental components.

xxi. The Committee also deliberated on the comments received from Commission on Air Quality Management wherein it has been emphasized upon that proposed project shall undertake strict control measures to control the air pollution arising due to other activities linked to WTE plant construction and operation (e.g., C&D, transportation, road dust, etc) and all the Directions, Advisories and Orders issued by the Commission in this regard from time to time shall be followed strictly. The committee asked the proponent to ensure compliance with the same.

xxii. The EAC also deliberated on the written submission of the project proponent and found it satisfactory.

xxiii. The EAC noted that the Project Proponent has given an undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the EIA/EMP reports. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the project proponent.

Recommendations of the Committee:

23. The EAC after detailed deliberations on the information submitted and as presented during the meeting recommended for grant of Environmental Clearance to the proposed "*Waste to Energy Thermal Power Project of capacity 30 MW by M/s Jindal Urban Waste Management (Bawana) Limited located at DSIIDC Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi*", under the provisions of EIA Notification, 2006 subject to the stipulation of specific conditions and standard/general conditions (**Annexure 1**).

24. The MoEF&CC has examined the proposal in accordance with the provisions contained in the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and based on the recommendations of the EAC hereby accords Environmental Clearance to **M/s. Jindal Urban Waste Management (Bawana) Limited** for "*Waste to Energy Thermal Power Project of capacity 30 MW located at DSIIDC Industrial Area, Sector 5, village Bawana, Sub-district Narela, District North Delhi, Delhi*" subject to compliance of the Specific/General environmental conditions (

Annexure 1).

25. The proponent shall obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. The Ministry or any other competent authority may stipulate any further condition for environmental protection.

26. The Environmental Clearance to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

27. The PP is under obligation to implement commitments made in the Environment Management Plan, which forms part of this EC.

28. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

29. General Instructions:

(i) The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEF&CC website where it is displayed.

(ii) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn must display the same for 30 days from the date of receipt.

(iii) The project proponent shall have a well laid down environmental policy duly approved by the Board of Directors (in case of Company) or competent authority, duly prescribing standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions.

(iv) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the project proponent (during construction phase) and authorized entity mandated with compliance of conditions (during operational phase) shall be prepared. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Six monthly progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six-Monthly Compliance Report.

(v) Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

(vi) The Regional Office of this MoEF&CC shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

(vii) Validity of EC is as per the provision of EIA Notification, 2006 and its subsequent amendment.

30. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.

31. This issue with an approval of the Competent Authority

Yours faithfully,

(Sundar Ramanathan)
Scientist 'F'
Tel: 011- 20819378
Email- r.sundar@nic.in

Copy To

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.
2. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
3. Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office, Regional Office (CZ), Kendriya Bhawan, 5th Floor, Sector-H, Aliganj, Lucknow - 226020.
4. The Chairman, Central Ground Water Authority, Ministry of Water Resources, Curzon Road Barracks, A-2, W-3 Kasturba Gandhi Marg, New Delhi.
5. The Member Secretary, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, Delhi – 32.
6. The Chairman, Delhi Pollution Control Board, 6th floor, B wing, Delhi Secretariat, I P Estate, Delhi-110 002.
7. The Member Secretary, Delhi Pollution Control Board, 6th floor, C wing, Delhi Secretariat, I P Estate, Delhi-110 002.
9. The District Collector, North Delhi, Delhi.
10. PARIVESH Portal.

Annexure 1

Specific EC Conditions for (Thermal Power Plants)

1. Environmental Management

S. No	EC Conditions
1.1	The incoming organic waste of 600 TPD shall be processed at bio-methanation facility and mixed waste of 2400 TPD shall be processed at proposed waste to energy plant as committed. All the waste received shall be kept under a covered storage facility equipped with impermeable base and provision for collection of leachate leading to a leachate treatment and disposal facility.
1.2	Project proponent shall take necessary precaution to minimize nuisance of odour, flies, rodents, bird menace and fire hazard in the waste storage pit, around & over windrows and in processing area.
1.3	Proponent shall ensure that pre-process and post-process rejects shall be removed from the compost processing facility on regular basis and shall not be allowed to pile at the site. Recyclables shall be sent to authorized recyclers. The non-recyclables having high calorific fraction (>1500 kcal/kg) shall be segregated and sent to waste to energy.
1.4	Project Proponent shall ensure that waste to be incinerated shall not be chemically treated with any chlorinated disinfectants and incineration of chlorinated plastics shall not occur. All the facilities in twin chamber incinerators shall be maintained to achieve a minimum temperature of 950°C in secondary combustion chamber and with a gas residence time in secondary combustion chamber not less than 2 seconds. Incinerators shall be operated with such temperature, retention time and turbulence, as to achieve Total Organic Carbon (TOC) content in the slag and bottom ash less than 3%, or the loss on ignition is less than 5% of the dry weight. The CO2 concentration in tail gas shall

S. No	EC Conditions
	not be more than 7%.
1.5	Project proponent shall ensure that maximum utilization of ash generated in accordance with the ash utilization notification dated 31/12/2021 and its subsequent amendment. No ash pond is permitted within the project site. Any unutilized ash and inerts from processing of municipal solid waste in the proposed Waste to Energy Plant shall be sent to Engineered Sanitary Landfill (ESLF) for its safe disposal. In case the concentration of toxic metals in incineration ash exceeds the limits specified in the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended from time to time, the Project Proponent shall send the ash to the Treatment, Storage and Disposal Facility for Hazardous Waste at Bawana in Delhi.
1.6	Project proponent shall install one continuous ambient air quality monitoring at suitable locations within the project site in consultation with DPCC as committed. The data from the CAAQMS shall be connected to CPCB server as well as SPCB server. The calibration of CAAQMS installed shall be carried out as per the calibration protocol for CAAQMS system specified by CPCB and records shall be maintained.
1.7	Online Continuous Stack Emission Monitoring System (OCEMS) shall be done through 24X7 online monitoring system. The emission Standards for Municipal Solid Waste based Thermal Power Plants as per Municipal Solid Waste Rules, 2016 dated 8.4.2016 (S.O. 1357 (E)) shall be complied (Refer Part C of Schedule II of Municipal Solid Waste Rules, 2016 dated 8.4.2016 (S.O. 1357 (E)). OCEMS shall be calibrated properly to ensure that data matches with the actual monitoring results.
1.8	The total water requirement for the proposed project is estimated as 989 m3/day, out of which 625 m3/day shall be met from blowdown reject water of Pragati Power Corporation Limited (PPCL) or treated wastewater from Sewage Treatment Plant (STP) of Delhi Jal Board (DJB) for industrial purposes and 7 m3/day fresh water shall be met from drinking water supply of DJB for domestic purposes. Air-Cooled Condenser shall be used to reduce fresh water requirement and no ground water abstraction shall be allowed.
1.9	Natural nallah passing through the project site should be kept intact and no leachate or waste water/solid waste shall be discharged/deposited in to the Nallah. It's embankment shall be strengthened and Green belt shall be developed all along the periphery of the nallah. Western Yamuna Canal located at 32 meters from the project site in South-West direction shall be protected.
1.10	Project proponent shall harvest rainwater in a storage tank within the plant premises and utilize the same for plantation, recharging water in the pond and domestic utilization as committed. PP shall provide separate garland drains to prevent mixing of leachate with stormwater. A record shall be maintained of water collected through rainwater and its supply system. PP shall get the water audit done every year to optimize the water requirement.
1.11	Project proponent shall implement the protective measure proposed in EMP in a time-bound manner. The budget earmarked for the same is Rs. 91.605 Crores (Capital) and Rs. 14.155 crores (recurring) and should be kept in separate accounts and audited annually. The implementation status along with the amount spent with documentary proof shall be submitted to the concerned Regional Office for the activities carried out during the previous year.
1.12	Project proponent shall take prior permission from the Competent Authority to divert high tension line passing through the project site.

S. No	EC Conditions
1.13	Effluent of 360 KLD shall be treated through Leachate Treatment Plant. As committed by the Project proponent, Zero liquid discharge shall be adopted for the proposed plant. No wastewater will be discharged outside the project site. A detailed action plan regarding leachate handling shall be prepared and implemented in consultation with SPCB and the same shall be submitted to the Regional Office of the Ministry. Leachate shall be treated and reused. No treated leachate shall be discharged in any circumstances. Characteristics of Leachate and the treated leachate shall be monitored once in quarter and records shall be maintained.
1.14	Project proponent shall implement the concurrent plantation plan in a time bound manner. Total area of 2.43Ha. (40% of total plant area of 6.07 Ha.) shall be developed as greenbelt in a time frame of 3-5 years. Three tier green belt all along the periphery of the project site shall be developed as greenbelt and green cover as per CPCB guidelines. The budget earmarked for the greenbelt shall be kept in a separate account and audited annually. PP should annually submit the audited statement of expenditure along with proof of activities viz. photographs (before & after with geolocation date & time), details of expert agency engaged, details of species planted, number of species planted, survival rate, density of plantation etc. to the Regional Office of MoEF&CC and on PARIVESH Portal as the case may be for the activities carried out during previous year.
1.15	Project proponent shall carry out community plantation with incentive scheme by distributing 5,000 saplings per year for a period of five years. Further, PP shall provide basic facilities to the nearby schools such as drinking water, sanitation facilities and shall also develop greenbelt around the nearby schools. Further, PP shall organize quarterly awareness programs for school students to educate them on the significance and preservation of trees.
1.16	Wildlife conservation plan as approved by the competent authority shall be implemented. Additional, budget shall be added in the plan, in case additional measures suggested by state wildlife department. The final Wildlife conservation plan duly approved by the CWLW shall be submitted to RO, MoEF&CC within a time frame of three months from the date of grant of EC and the budget approved by the concerned authority shall be deposited in government account.
1.17	Project proponent shall install LED display of air quality (Continuous AAQ monitoring) and stack emission (Continuous emission monitoring) at prominent locations preferably outside the plant's main entrance for public viewing and in administrative complex and maintenance of devices shall be done regularly.
1.18	Project proponent shall install adequate number of anti-smog guns at the periphery of the project boundary facing inwardly at a suitable height and explore the possibility for vertical gardens in order to bring down the particulate matter concentration in the area along with carry out Water Sprinkling on roads inside the plant area/ administrative areas on a regular basis to control the air pollution. A logbook shall be maintained for the activity and be in six-monthly compliance report.
1.19	Project proponent shall deploy mechanical road sweepers for everyday cleaning of the roads in and around plant site.
1.20	Environment Audit of plant shall be done annually and report shall be submitted to Regional office of the Ministry.
1.21	Oil and grease recovered from the treatment plant should be disposed only through authorized recyclers.

S. No	EC Conditions
1.22	Monitoring of surface water quality and Ground Water quality shall also be regularly conducted in and around the project site and records to be maintained. Further, monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records maintained. Monitoring for heavy metals in ground water shall also be undertaken and results/findings submitted along with half yearly monitoring report. The monitored data shall be submitted regularly on PARIVESH portal as part of Half Yearly compliance report
1.23	For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the latest CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.
1.24	Project proponent shall ensure that plastic waste generated from the plant except chlorinated plastics shall be used as RDF for the in-house incinerators. The chlorinated plastics waste generated from the plant shall be stored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016 (as amended). In pursuant to the Ministry's OM dated 18/07/2022. PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic (SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six monthly compliance report submitted by Project proponent.
1.25	PP is advised to implement the 'Ek Ped Maa Ke Naam' Campaign which was launched on 5th June 2024 on the occasion of the World Environment Day to increase the forest cover across the Country. This plantation drive is other than Greenbelt development. The action in this regard shall be submitted concerned RO in six monthly report.
1.26	All the Directions, Advisories and Orders of Commission for Air Quality Management in National Capital Region and Adjoining Areas from time to time shall be complied upon by the project proponent.

2. Socio - Economic

S. No	EC Conditions
2.1	All the recommendations of the epidemiological study report by IIHMR Delhi shall be complied upon by the project proponent in a time bound manner and compliance status in this regard shall submitted along with the six monthly compliance report. In addition to this, proponent shall carry out a Root Cause Analysis (RCA) study to assess the prevalence of water borne diseases in the areas adjacent to the proposed project. The study report along with the recommendations shall be submitted to the Regional Office of the Ministry along with the six monthly compliance report.
2.2	The budget proposed for PH is Rs. 6.60 Crores. The budget proposed shall be kept in a separate account and audited annually. Project proponent shall implement the action plan to address the issues raised during public hearing within a time frame of 5 years from the date of grant of EC. In addition to this, PP shall provide medical camps in the study area for better public health, strengthen existing roads, provide RO for drinking water, develop skills of local people, etc. as committed. Compliance status in this regard shall be submitted along with the six monthly compliance to the concerned Regional Office of MoEF&CC.

S. No	EC Conditions
2.3	The establishment of a robust public grievance redressal mechanism to address concerns and complaints from local communities regarding the power plant's operations, environmental impacts, or social issues shall be developed. A Senior Officer shall review the functioning of the mechanism twice in a month.

3. Miscellaneous

S. No	EC Conditions
3.1	An Environmental Cell headed by the Environment Manger with postgraduate qualification in environmental science/environmental engineering, shall be created. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.
3.2	Consent under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974 and Authorization under Solid Waste Management Rules, 2016 and Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016for the proposed project shall be obtained from the Delhi Pollution Control Committee.
3.3	All necessary clearance from the concerned Authority, as may be applicable should be obtained prior to commencement of project or activity.

Standard EC Conditions for (Thermal Power Plants)

1. Statutory Compliance

S. No	EC Conditions
1.1	Part A, B & C of Schedule II of Solid Waste Management Rules, 2016 which came into force vide S.O. 1357 (E) on 08.04.2016 as amended from time to time shall be complied for standards for composting, treated leachate (generated from waste) and incineration of Municipal Solid Waste.
1.2	Environmental Guidelines for Compressed Biogas Plant (CBG)/Bio-CNG Plants, 2022 of CPCB shall be followed for biomethanation plant based on municipal solid waste.
1.3	MoEF&CC Notifications on Ash Utilization S.O. 5481 (E) dated 31/12/2021 as amended from time to time shall be complied.

2. Ash Content/mode Of Transporatation Of Coal

S. No	EC Conditions
2.1	Waste shall be transported in covered vehicles and the wheel-washing facility shall be provided at the entry and exit of the plant.
2.2	PP shall transport fly ash / bottom ash / inerts in properly covered vehicles and ensure that no fugitive emission occurs in the air during loading, unloading and transportation.

3. Air Quality Monitoring And Management

S. No	EC Conditions
3.1	Project proponent shall manage the foul odour emerging as a result of waste processing as per CPCB guidelines issued from time to time.
3.2	Negative Pressure shall be maintained in the Waste Storage Pit from the waste pit. Pressure monitoring system showing the atmospheric pressure and pressure inside the waste pit shall be installed and the data shall be transferred to CPCB and DPCC through server.
3.3	Selective Non-Catalytic Reduction (SNCR) system or Low NOx combustion system shall be installed to achieve NOx emission standard as prescribed in Solid Waste Management Rules, 2016 or by DPCC whichever is stringent.
3.4	Hydrated lime and activated carbon injection system shall be installed for controlling SO2 and HCl emissions in flue gas. Bag Filter House made of PTFE (Polytetrafluoroethylene) with 130% design efficiency for controlling Particulate matter emissions shall be installed to ensure that particulate matter (PM) emission meet the stipulated standards of 30 mg/Nm3.
3.5	One common stack with a height of 60 meters shall be provided with continuous online monitoring instruments for SO2, NOx and Particulate Matter as per extant rules.
3.6	Exit velocity of flue gases shall not be less than 20-25 m/s. Project proponent shall ensure that all the parameters including TOCs in stack emissions to meet the standards as prescribed in Solid Waste Management Rules, 2016 or by DPCC whichever are stringent.
3.7	Continuous Ambient Air Quality monitoring system shall be set up to monitor common/criteria pollutants from the flue gases such as PM10, PM2.5, SO2, NOX within the plant area at one location. The monitoring of other locations (at least three locations outside the plant area covering upwind and downwind directions at an angle of 120° each) shall be carried out manually.
3.8	Adequate dust extraction/suppression system shall be installed in waste handling, ash handling areas and material transfer points to control fugitive emissions.
3.9	Appropriate Air Pollution Control measures shall be provided at all the dust generating sources including sufficient water sprinkling arrangements at various locations viz., roads, excavation sites, crusher plants, transfer points, loading and unloading areas, etc.

4. Noise Pollution And Its Control Measures

S. No	EC Conditions
4.1	The Ambient Noise levels shall meet the standards prescribed as per the Noise Pollution (Regulation and Control) Rules, 2000.
4.2	Persons exposed to high noise generating equipment shall use Personal Protective Equipment (PPE) like earplugs/ear muffs, etc.
4.3	Periodical medical examination on hearing loss shall be carried out for all the workers and maintain audiometric record and for treatment of any hearing loss including rotating to non-noisy/less noisy

S. No	EC Conditions
	areas.

5. Human Health Environment

S. No	EC Conditions
5.1	Personnels handling municipal solid waste or being present on the tipping floor shall be provided with PPE like shoe covers, gloves, masks, etc.
5.2	A separate canteen far from the waste management area shall be provided for employees. All the basic sanitation facilities shall also be provided to all the employees.
5.3	Bi-annual Health check-up of all the workers is to be conducted. The study shall take into account chronic exposure of locals to noise which may lead to adverse effects like increase in heart rate and blood pressure, hypertension and peripheral vasoconstriction and thus increased peripheral vascular resistance. Similarly, the study shall also assess the health impacts due to air polluting agents.
5.4	The PP should have one Community Health Center in the campus,where the citizens from nearby area can have access to it and get treatment.

6. Water Quality Monitoring And Management

S. No	EC Conditions
6.1	Proponent shall achieve specific water consumption of the WTE below 3.0 m3/MWhr.
6.2	Regular (at least once in six months) monitoring of groundwater quality in and around the proposed waste to energy plant including presence of heavy metals (Hg, Cr, As, Pb, etc.) shall be carried out as per CPCB guidelines. Surface water quality monitoring shall be undertaken for major surface water bodies as per the EMP. The data so obtained should be compared with the baseline data so as to ensure that the groundwater and surface water quality is not adversely impacted due to the project & its activities.
6.3	The treated effluents emanating from the different processes such as RO & DM plant, boiler blow down, sewage, etc. conforming to the prescribed standards shall be recycled and reused. Sludge/ rejects will be disposed in accordance with the Hazardous Waste Management Rules.
6.4	Wastewater generation of 274 KLD (191 KLD from RO & DM Plant + 57 KLD Cooling Tower water blowdown + 26 KLD from boiler blowdown) shall be sent to CMB and 108 KLD shall be recycled to raw water tank.
6.5	Leachate of 357 KLD and sewage of 3 KLD making the quantum as 360 KLD shall be treated collectively in Leachate Treatment Plant to meet the standards as laid down in Solid Waste Management Rules, 2016. Treated leachate shall be recycled and utilized in the process and for quenching ash within the premises of the proposed WTE plant.
6.6	Project proponent shall use the sludge obtained from the Leachate Treatment Plant as fuel into incinerator after dewatering by screw press technique.

7. Risk Mitigation And Disaster Management

S. No	EC Conditions
7.1	PP shall install radioactive sensors at the entry point of the Waste to Energy plant to detect any radioactive material in the receiving municipal solid waste.
7.2	Adequate safety measures and environmental safeguards shall be provided in the plant area to control spontaneous fires in coal yard, especially during dry and humid season.
7.3	Only RDF shall be fed into incinerator for generation of energy and no other kinds of fuel shall be used.
7.4	Ergonomic working conditions with First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.
7.5	Safety management plan based on Risk Assessment shall be prepared to limit the risk exposure to the workers within the plant boundary.
7.6	Regular mock drills for on-site emergency management plan and Integrated Emergency Response System shall be developed for all kind of possible disaster situations.

8. Green Belt And Biodiversity Conservation

S. No	EC Conditions
8.1	Greenbelt of at least 5-50 metres thickness and densified @ 2500 trees per hectare, shall be developed in an area of 40% of the total plant area with indigenous plant species in accordance with CPCB guidelines. The greenbelt shall inter-alia cover an entire periphery of the plant.
8.2	In-situ/ex-situ Conservation Plan for the flora and fauna in the vicinity of the proposed site should be prepared and implemented.

9. Waste Management

S. No	EC Conditions
9.1	Municipal solid waste management should be planned in accordance with extant Solid Waste Management Rules, 2016.
9.2	Toxicity Characteristic Leachate Procedure (TCLP) test shall be conducted for compost, ash produced or any other substance, potential of leaching heavy metals into the surrounding areas as well as into the groundwater.
9.3	Ash shall be utilized as per provisions of the Notification issued by the Ministry's gazette notification vide S.O. 5481 dated 31.12.2021, S.O.6169 (E) dated 30.12.2021, S.O.05 (E) dated 01.01.2024 and amendment thereto.
9.4	Rejects/unutilized ash shall be disposed of in the Engineered Sanitary Landfill (ESLF). In case the concentration of toxic metals in incineration ash exceeds the limits specified in the Hazardous and

S. No	EC Conditions
	Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended from time to time, the PP shall send the ash to the Treatment, Storage and Disposal Facility for Hazardous Waste at Bawana in Delhi.

10. Monitoring Of Compliance

S. No	EC Conditions
10.1	Energy Conservation Plan to be implemented as envisaged in the EIA / EMP report. Renewable Energy Purchase Obligation as set by MoP/State Government shall be met either by establishing renewable energy power plant (such as solar, wind, etc.) or by purchasing Renewable Energy Certificates.
10.2	The project proponent shall (Post-EC Monitoring): a. send a copy of environmental clearance letter to the heads of Local Bodies, Panchayat, Municipal bodies and relevant offices of the Government; b. upload the clearance letter on the web site of the company as a part of information to the general public. c. inform the public through advertisement within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forest and Climate Change (MoEF&CC) at http://parviesh.nic.in. d. upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same periodically; e. monitor the criteria pollutants level namely; PM (PM10& PM2.5incase of ambient AAQ), SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company; f. submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF&CC, the respective Zonal Office of CPCB and the SPCB; g. submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company; h. inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project and the date of commencement of the land development work.

11. Corporate Environmental Responsibility (Cer) Activities

S. No	EC Conditions
11.1	Activities under Extended EMP will be carried out as per Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 and 22-65/2017- IA.III dated 25.02.2021 or as proposed by the PP in reference to Public Hearing or as earmarked in the EIA/EMP report along with the detailed scheduled of implementation with appropriate budgeting. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the Extended EMP in compliance of the shall be submitted.

Signed by
Sundar Ramanathan
Date: 18-06-2025 14:46:07
Reason: Verified and signed

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
CENTRAL POLLUTION CONTROL BOARD
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

CP-18/1/2023-IPC-VI-HO-CPCB-HO

Date: 12.02.2025

To

The Chairman
State Pollution Control Board/Pollution Control Committee
(As per the list)

Sub: Directions under section 18(1)(b) of the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act, 1981 regarding harmonization of classification of industrial sectors under Red, Orange, Green, White and Blue categories.

WHEREAS, under section 16 (2)(b) of the Water (Prevention and Control of Pollution) Act, 1974 and under Section 16 (2)(c) of the Air (Prevention & Control of Pollution) Act, 1981, one of the functions of the Central Pollution Control Board (CPCB), constituted under the Water (Prevention and Control of Pollution) Act, 1974, is to coordinate activities of the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs); and

WHEREAS, under section 16 (2)(c) of the Water (Prevention and Control of Pollution) Act, 1974 and under Section 16 (2)(d) of the Air (Prevention & Control of Pollution) Act, 1981, one of the functions of the CPCB is to provide technical assistance and guidance to SPCBs and PCCs; and

WHEREAS, it was brought to the notice of CPCB, that different SPCBs/PCCs were following different criteria for the classification of industrial sectors under different categories. Therefore, in 2012, to have uniformity in classification throughout the country, CPCB vide letter no. B-29012/1/2012/ESS/1526-1563, dated 04.06.2012 issued directions under section 18(1(b) of the Water Act, 1974 and the Air Act, 1981 to SPCBs/PCCs to adopt and implement standardized list of Red, Orange and Green categories of industries; and

WHEREAS, in 2016, the Central Pollution Control Board (CPCB) developed a scoring methodology based on the Pollution Index (PI) to harmonize the criteria for classification of industrial sectors. The PI is determined based on Precautionary Principle- by evaluating potential of water pollution, air pollution, and hazardous waste generation from particular sector. CPCB vide letter no. B-29012//ESS(CPA)/2015-16, dated 07.03.2016 issued directions under section 18(1(b) of the Water Act, 1974 and the Air Act, 1981 to SPCBs/PCCs to adopt and implement revised classification. SPCBs/PCCs were also directed to categorize any new or left over sectors at their level by constituting a Committee and following the methodology prescribed by CPCB; and

'परिवेश-भवन' पूर्वी अर्जुन नगर, दिल्ली-110032
Parivesh Bhawan, East Arjun Nagar, New Delhi - 110032
दूरभाष/Tel: 43102030, 22305792, वेबसाईट/Website : www.cpbc.nic.in

WHEREAS, CPCB vide letter no. B-29016/ROGW/IPC-VI/2020-21, dated 30.04.2020, issued directions under section 18(1)(b) of the Water Act, 1974 and the Air Act, 1981 to SPCBs/PCCs regarding segregated list of non-industrial sectors (activities/ facilities/ infrastructure/ services) such as sewage treatment plants, healthcare facilities, hotels, building and construction projects, airports, highways etc. Further, CPCB also classified few additional sectors from time to time; and

WHEREAS, based on the experience gained over the years in Pollution Index calculation, use of cleaner fuels like PNG/CNG etc., adoption of cleaner technology resulting in reduced emission/wastewater generation, a need was felt to revisit the classification methodology of 2016; and

WHEREAS, during July 2023, CPCB prepared a "Draft Report on Classification of Industrial Sectors into Red, Orange, Green and White Categories: A Tool for Progressive Environmental Management" which was uploaded on CPCB website for seeking comments/suggestions of the stakeholders/public on the same. The draft report was also circulated to SPCBs/PCCs/MoEF&CC for comments; and

WHEREAS, CPCB vide office order dated 26.09.2023 constituted a committee to critically examine and analyse the comments/suggestions and to make recommendations for suitable incorporation in the finalizing the methodology and classification; and

WHEREAS, based on the stakeholders' comments, a need was felt to promote/incentivize units for adopting measures resulting in better environmental performance. Additionally, a requirement was also felt for separate category – Blue Category- for essential environmental services for management of environmental pollution arising from domestic/household activities. Accordingly, CPCB prepared an "Addendum and substitution thereto in Draft Report on Classification of Sectors into Red, Orange, Green, White and Blue Categories", which was shared with SPCBs/PCCs and also uploaded on CPCB website on 11.07.2024 for seeking inputs/comments; and

WHEREAS, the amendment in Section-21 of the Air (Prevention and Control of Pollution) Act, 1981 through the Jan Vishwas (Amendment of Provisions) Act, 2023 and amendment in Section-25 of the Water (Prevention and Control of Pollution) Act, 1974 through the Water (Prevention and Control of Pollution) Amendment Act, 2024, grant exemption to certain categories of industries, as notified by Central Government, for obtaining consent under these Acts; and

WHEREAS, the Ministry of Environment, Forest and Climate Change, Government of India vide notification no. G.S.R. 702(E), dated 12.11.2024 granted exemption of consent under the Water Act, 1974 and the Air Act, 1981 to exemption of Consent to Establish (CTE) and Consent to Operate (CTO) to all industrial plants having pollution index score upto 20 (at present total 39 industrial sectors under white categories as per 2016 methodology) subject to

condition that such plant shall inform in writing to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC); and

WHEREAS, the MoEF&CC vide letter no. Q-15012/2/2022/-CPW-Part (1)/e-240741, dated 14.11.2024 has issued Standard Operating Procedure for implementation of the said Notification dated 12.11.2024. The SOP includes the following provisions for White categories of industries:

i. Industry to intimate to concerned SPCB/PCC about operations and self-declare the compliance with prevalent rules & regulations,
ii. Concerned SPCB/PCC to maintain separate list of such industries/activities, and
iii. Concerned SPCB/PCC to ensure that no activities other than those intimated, are carried out by exempted units.

WHEREAS, the Committee constituted by CPCB evaluated the comments, incorporated the suitable changes and finalized the revised methodology as well as classification of sectors. Final report in this regard titled as "Classification of sectors in to Red, Orange, Green, White and Blue Categories (A tool for progressive environmental management)" was submitted to Ministry of Environment, Forest and Climate Change (MoEF&CC) for concurrence. The MoEF&CC vide letter no. Q-16017-57-2015-CPA, dated 15.01.2025 granted concurrence to the revised classification; and

WHEREAS, as per the revised methodology, the category of the sector is decided based on the following ranges of Pollution Index:

i. Red: $PI \geq 80$,
ii. Orange: $55 \leq PI < 80$,
iii. Green: $25 \leq PI < 55$,
iv. White: $PI < 25$; and

WHEREAS, based on the revised methodology, CPCB has classified a total of 419 sectors and sub-sectors as under:

i. The Red Category: 125
ii. The Orange Category: 137
iii. The Green Category: 94
iv. The White Category: 54
v. The Blue Category: 9; and

WHEREAS, the purpose of classification is to ensure that the industry is established in a manner consistent with the environmental objectives and also to prompt industrial sectors to adopt cleaner technologies, ultimately resulting in the generation of no or minimum pollutants. The revised classification system also defines criteria for incentivizing such industry. The industry may self-assess the PI score as per defined criteria and can submit application to respective SPCBs/PCCs for consideration; and

NOW, THEREFORE, in the exercise of the powers delegated under Section 18(1)(b) of the Water (Prevention & Control of Pollution) Act, 1974 and Section 18(1)(b) of the Air (Prevention & Control of Pollution), Act, 1981 the earlier directions dated 07.03.2016 and subsequent directions/letter in the context of categorization of industries are withdrawn with immediate effect and following **'Directions'** are hereby issued for compliance by all SPCBs and PCCs:

1. That SPCBs and PCCs shall immediately adopt the revised methodology for classification of sectors and list of 419 sectors/sub-sectors classified under Red, Orange, Green, White, and Blue categories as detailed in the **attached** report- "Classification of Sectors into Red, Orange, Green, White and Blue Categories (A tool for progressive environmental management)".
2. That all pending application for consideration of consent (CTE/CTO) and future such application shall be processed as per the revised classification. In case CTE granted before the revised classification, applicability of CTO will be as per revised classification.
3. That the revised sectors/subsectors classified under Red, Orange, Green, White, and Blue category of sectors as given in the attached document shall be used by the SPCBs and PCCs for consent management, inventorization of units under different categories, siting criteria, deciding environmental surveillance frequency, calculation of environmental compensation, etc., as per the guidelines issued from time to time.
4. That SPCBs and PCCs shall prepare the inventory of Red, Orange, Green, White and Blue categories of units operating in their jurisdictions, based on the revised classification. SPCBs and PCCs shall upload the category and sector-wise list of such units on their website. SPCBs and PCCs shall also forward such list to CPCB, latest by 30.06.2025 and thereafter updated list by 30th June every year.
5. That the classification of sectors shall not be linked to sanction of loans/finance of bank proceedings.
6. That any further addition of any new or left-out sector and their classification which is not listed in the revised list of Red, Orange, Green, and White categories, shall be done at the level of concerned SPCB /PCC by constituting a Committee and following revised criteria & guidelines as detailed in the attached report and no concurrence of CPCB shall normally be required. Intimation of same from time to time will suffice. However, addition in Blue Category Sectors-Essential Environmental Services for domestic waste management, will be done at the level of CPCB only. SPCBs/PCCs may forward their proposal, if any, to CPCB in this regard.
7. That SPCBs and PCCs are required to prepare and submit list of additional sector classified under white category to CPCB on annual basis, by 30th of June every year, in the prescribed format (Annexure-V) as given in the attached report, for further notification for exemption from consent as per the provisions of the Jan Vishwas (Amendment of Provisions) Act, 2023, the Water Act, and the Air Act as amended from time to time by MoEF&CC.
8. That SPCBs and PCCs shall constitute a committee as prescribed in the report to evaluate the applications of the units for incentives due to adopting measures resulting in better environmental performance and reduction in PI score. The SPCB/PCC shall

place the separate list of such units on their website and also submit list of such units to CPCB on Annual Basis by 30th June every year.

The SPCBs/PCCs shall acknowledge the receipt of directions and submit the "Action Taken Report" in compliance with these directions to CPCB before 20.02.2025.

Encl. As above.

(Bharat Kumar Sharma)
Member Secretary

Copy to:

1. The Chief Secretary of all the States and UTs
   (As per the list)
2. The Secretary,
   Ministry of Micro, Small and Medium Entrepreneurs
   Udyog Bhawan, Rafi Marg, New Delhi - 110 011
3. The Secretary,
   Ministry of Heavy Industries
   Udyog Bhawan, Rafi Marg, New Delhi - 110 011
4. The Secretary,
   Ministry of New and Renewable Energy
   Block-14, CGO Complex,
   Lodhi Road, New Delhi-110 003
5. The Joint Secretary (CP Division)
   Ministry of Environment, Forests and Climate Change
   Indira Paryavaran Bhawan
   Jor Bagh Road, New Delhi - 110 003
6. All Regional Directorates, CPCB
   (As per the list)

(Bharat Kumar Sharma)
Member Secretary

Address List of The Chief Secretaries of States/UTs			
1.	The Chief Secretary, Government of Andhra Pradesh, 1st Block, A.P Secretariat Office, Velagapudi- 522503 E-mail:- (cs@ap.gov.in)	2.	The Chief Secretary, Government of Arunachal Pradesh, Civil Secretariat, Itanagar-791111 E-mail:- (Cs-arunachal@nic.in)
3	The Chief Secretary, Government of Assam, Block-C,3rd Floor, Assam Sachivalaya, Dispur-781006 E-mail:- (Cs-assam@nic.in)	4	The Chief Secretary, Government of Bihar, Main Secretariat, Patna-800015 E-mail:- (Cs-bihar@nic.in)
5.	The Chief Secretary, Government of Chattisgarh, Mahanadi Bhawan, Mantralaya, Naya Raipur-492002 E-mail:- (Csoffice.cg@gov.in)	6.	The Chief Secretary, Government of Goa, Secretariat, Porvroim, Bardez, Goa-403521 E-mail:- (Cs-goa@nic.in)
7.	The Chief Secretary, Government of Gujarat, 1st Block, 5th Floor, Sachivalaya, Gandhinagar-382010 E-mail:- (chiefsecretary@gujarat.gov.in)	8.	The Chief Secretary, Government of Haryana, 4th Floor, Haryana Civil Secretariat, Sector-1, Chandigarh-160019 E-mail:- (cs@hry.nic.in)
9	The Chief Secretary, Government of Himachal Pradesh, H.P Secretariat, Shimla-171002 E-mail:- (Cs-hp@nic.in)	10	The Chief Secretary, Government of Jammu & Kashmir, R. No. 2/7, 2nd Floor, Main Building, Civil Secretariat, Jammu-180001 E-mail:- (Cs-jandk@nic.in)
11.	The Chief Secretary, Government of Jharkhand, 1st Floor, Project Building, Dhurwa, Ranchi-834004 E-mail:- (Cs-jharkhand@nic.in)	12.	The Chief Secretary, Government of Karnataka, Room No. 320, 3rd Floor, Vidhan Soudha, Bengaluru-560001 E-mail:- (cs@karnataka.gov.in)

13.	The Chief Secretary, Government of Kerala, Secretariat, Thiruvananthapuram-695001 E-mail:- (chiefsecy@kerala.gov.in)	14.	The Chief Secretary, Government of Maharashtra, CS office main building, Mantralaya, 6th Floor, Madame Cama Road, Mumbai-400032 E-mail:- (cs@maharashtra.gov.in)
15	The Chief Secretary, Government of Manipur, South Block, Old Secretariat, Imphal-795001 E-mail:- (Cs-manipur@nic.in)	16	The Chief Secretary, Government of Mizoram, New Secretariat Complex, Aizwal-796001 E-mail:- (Cs_miz@rediffmail.com)
17	The Chief Secretary, Government of Meghalaya, Main Secretariat Building, Room No. 316, Shillong-793001 E-mail:- (Cso-meg@nic.in)	18.	The Chief Secretary, Government of Madhya Pradesh, MP Mantralaya, Vallabh Bhavan, Bhopal-462004 E-mail:- (cs@mp.nic.in)
19.	The Chief Secretary, Government of Nagaland, Civil Secretariat, Kohima-797004 E-mail:- (csngl@nic.in)	20	The Chief Secretary, Government of Odisha, General Administration Department, Odisha Secretariat, Bhubaneswar-751001 E-mail:- (csori@nic.in)
21	The Chief Secretary, Government of Punjab, Chandigarh-160001 E-mail:- (cs@punjab.gov.in)	22	The Chief Secretary, Government of Sikkim, New Secretariat, Gangtok-737101 E-mail:- (Cs-skm@nic.in)
23.	The Chief Secretary, Government of Rajasthan, Secretariat, Jaipur-302005 E-mail:- (csraj@rajasthan.gov.in)	24.	The Chief Secretary, Government of Telangana, Block C, 3rd Floor, Telangana Secretariat, Khairatabad, Hyderabad-500022 E-mail:- (cs@telangana.gov.in)

25	The Chief Secretary, Government of Tripura, New Secretariat Complex, Agartala-799010 E-mail:- (Cs-tripura@nic.in)	26	The Chief Secretary, Government of Tamil Nadu, Secretariat, Chennai-600009 E-mail:- (cs@tn.gov.in)
27.	The Chief Secretary, Government of Uttarakhand, 4 Subash Road, Uttarakhand Secretariat, Dehradun-248001 E-mail:- (Cs-uttarakhand@nic.in)	28.	The Chief Secretary, Government of Uttar Pradesh, 1st Floor, Room No. 110, Lal Bahadur Shastri Bhawan, Uttar Pradesh Secretariat, Lucknow-226001 E-mail:- (csup@nic.in)
29.	The Chief Secretary, Andaman and Nicobar Administration, Secretariat, Port Blair-744101 E-mail:- (Cs-andaman@nic.in)	30	The Advisor to the Administrator, Chandigarh Secretariat, Sector 9, Chandigarh-160009 E-mail:- (adviser-chd@nic.in)
31.	The Chief Secretary, Government of NCT of Delhi, Delhi Secretariat, IP Estate, New Delhi-110002 E-mail:- (csdelhi@nic.in)	32.	The Advisor to Administrator, Daman & Diu and Dadar & Nagar Haveli, Secretariat, Moti, Daman-396220 E-mail:- (Devcom-dd@nic.in)
33.	The advisor to the Administrator, U.T of Lakshadweep, Kavaratti-682555 E-mail:- (lk-advisor@gov.in)	34.	The Chief Secretary, Government of Puducherry, Main Building, Chief Secretariat, Puducherry-605001 E-mail:- (cs@py.gov.in)
35.	The Chief Secretary, Government of West Bengal, Nabanna, 13th Floor, 325 Sarat Chatterjee Road, Mandirtala, Shibpur, Howrah-711102 E-mail:- (Cs-westbengal@nic.in)	36	The Advisor to Hon'ble Lt. Governor of Ladakh, Civil Secretariat, Leh-Ladakh-194101 E-mail:- (Advisor-lg-ladakh@gov.in)

Address List of The Chairman, SPCBs/PCCs			
1.	The Chairman Andhra Pradesh Pollution Control Board D.No. 33-26-14 D/2, Near Sunrise Hospital, Pushpa Hotel Centre, Chalamvari Street, Kasturibaipet, Vijayawada- 520007 (Andhra Pradesh) Email:- (chairman@appcb.gov.in)	2.	The Chairman Arunachal Pradesh State Pollution Control Board Paryavaran Bhawan, Yupia Road, Papu Nalah, Naharlagun – 791110 (Arunachal Pradesh) Email-: (arunachalspcb@gmail.com)
3	The Chairman Assam Pollution Control Board Bamunimaidan, Guwahati – 781021 (Assam) Email:- (chairman@pcbassam.org)	4	The Chairman Bihar State Pollution Control Board PariveshBhawan, Plot No.N-B/2, Patliputra Industrial Area Patna-800010 (Bihar) Email:- (chairmanbspcb-bihar@gov.in)
5.	The Chairman Chhattisgarh Environment Conservation Board ParyavasBhawan, North Block, Sector-19 Atal Nagar, Raipur– 492 002 (Chhattisgarh) Email:- (henv.cg@nic.in)	6.	The Chairman Goa State Pollution Control Board Nr. Pilerne Industrial Estate, Opp. Saligao Seminary, Saligao ,Bardez,- 403511(Goa) Email:- (chairman-gspcb.goa@nic.in)
7.	The Chairman Gujarat Pollution Control Board Paryavaran Bhavan, Sector-10A, Gandhinagar– 382043 (Gujarat) Email:- (chairman-gpcb@gujarat.gov.in)	8.	The Chairman Haryana State Pollution Control Board C-11, Sector 6, Panchkula- 134109 (Haryana) Email:- (hspcbho@gmail.com)
9	The Chairman Himachal Pradesh State Pollution Control Board Paryavaran Bhavan, Phase III, New Shimla – 171009 Email:- (chairmanpcbhp@gmail.com)	10	The Chairman Jammu & Kashmir Pollution Control Committee, Parivesh Bhawan, Forest Complex, Gladni, Narwal, Transport Nagar, Jammu-180004 Email:- (chairman87jkspcb@gmail.com)
11.	The Chairman Jharkhand State Pollution Control Board T.A Building, HEC Campus, P.O. Dhurwa Ranchi – 834004, (Jharkhand) Email:- (ranchijspcb@gmail.com)	12.	The Chairman Karnataka State Pollution Control Board Parisara Bhavan, #49, Church Street, Bengaluru – 560 001, (Karnataka) Email:- (chairman@kspcb.gov.in)

13.	The Chairman Kerala State Pollution Control Board Plamoodu, Pattom P.O Thiruvananthapuram-695004 (Kerala) Email:- (chn.kspcb@gov.in)	14.	The Chairman Maharashtra Pollution Control Board Kalpataru Point, 3rd& 4th floor, Opp. PVR Cinema, Sion Circle (E), Mumbai- 400022 (Maharashtra) Email:- (chairman@mpcb.gov.in)
15	The Chairman Manipur Pollution Control Board Lamphelpat, Imphal West D.C. Office Complex – 795004 (Manipur) Email:- (radhakishore888@gmail.com)	16	The Chairman Mizoram State Pollution Control Board New Secretariat Complex, Khatla, Thlanmual Peng, Aizwal Mizoram- 796001 Email:- (mpcb@mizoram.gov.in)
17	The Chairman Meghalaya State Pollution Control Board Arden, Lumpyngngad, Shillong – 793014 Email:- (megspcb@rediffmail.com)	18.	The Chairman Madhya Pradesh Pollution Control Board ParyavaranParisar, E-5 Arera Colony Bhopal – 462016 Email:- (chairman-mppcb@mp.gov.in)
19.	The Chairman Nagaland State Pollution Control Board Signal Point, Dimapur, Nagaland – 797112 Email: - (npcb2@yahoo.com)	20	The Chairman Odisha State Pollution Control Board Paribesh Bhawan A-118, Nilakanta Nagar, Unit –VIII, Bhubaneshwar – 751012. Email: - (chairman@ospcboard.org)
21	The Chairman Punjab State Pollution Control Board Nabha Road, ITI Rd, Adarsh Nagar, Prem Nagar, Patiala - 147001. Email:- (chairman.ptl.ppcb@punjab.gov.in)	22	The Chairman Sikkim State Pollution Control Board Department of Forest, Environment & Wildlife Management Government of Sikkim, Deorali, Gangtok, -737102 (Sikkim) Email:- (spcbsikkim@gmail.com)
23.	The Chairman Rajasthan State Pollution Control Board A-4 Institutional Area, Jhalane Dungri Jaipur – 302004. (Rajasthan) Email:- (chairperson@rpcb.nic.in)	24.	The Chairman Telangana Pollution Control Board Paryavaran Bhavan A-3, Industrial Estate, Sanath Nagar, Hyderabad – 500 018 (Telangana) Email:- (chief.advisor@telangana.gov.in)

25	The Chairman Tripura State Pollution Control Board Parivesh Bhawan Pt. Nehru Complex, Gorkhabasti P.O., Kunjaban, Agartala, Tripura - 799 006 Email:- (bagarwala00@gmail.com)	26	The Chairman Tamil Nadu Pollution Control Board No. 76, Mount Salai, Guindy, Chennai – 600032 (Tamil Nadu) Email-(chairman@tnpcb.gov.in)
27.	The Chairman Uttarakhand Pollution Control Board Gaura Devi Bhawan, 46 B IT Park Sahastradhara, Dehradun-248001 Uttarakhand Email:- (Secy-for-ua@nic.in)	28.	The Chairman Uttar Pradesh Pollution Control Board Building No. TC-12V VibhutiKhand, Gomti Nagar, Lucknow– 226010, (Uttar Pradesh) Email:- (chairman@uppcb.in)
29.	The Chairman Andaman & Nicobar Islands Pollution Control Committee Department of Science & Technology Dollyganj Van Sadan, Haddo P.O., Port Blair-744102, (Andaman & Nicobar) Email:- (secretaryuddm@gmail.com)	30	The Chairman Chandigarh Pollution Control Committee Paryavaran Bhawan Madhya Marg, Sector - 19 B, Chandigarh – 160019. Chandigarh Email:- (cpcc-chd@nic.in)
31.	The Chairman Delhi Pollution Control Committee 4th& 5th Floor, ISBT Building, Kashmere Gate, Delhi - 110006. Email:- (chdpcc@nic.in)	32.	The Chairman Daman, Diu & Dadra Nagar Haveli Pollution Control Committee 1st Floor, Udhyog Bhavan Bhenslore, Dunetha Nani Daman, Daman – 396210 Email:- (fs-dmn-diu@nic.in)
33.	The Chairman Lakshadweep Pollution Control Committee Lakshadweep Administration Department of Science, Technology & Environment Kavarati – 682555. (Lakshadweep) Email:- (lk-advisor@gov.in)	34.	The Chairman Puducherry Pollution Control Committee Department of Science, Technology & Environment 3rd Floor, Housing Board Complex, Anna Nagar, Nellithope, Puducherry – 605 005 Email:- (secytran@py.gov.in)
35.	The Chairman West Bengal Pollution Control Board Paribesh Bhavan Canteen, 10A, Sector III, Bidhannagar, Kolkata- 700106 West Bengal Email:- (chrmn.wbpcbwb@bangla.gov.in)	36	The Chairman Ladakh Pollution Control Committee Skara Yokma, Near KBR Airport, Leh-194101 UT of Ladakh Email:- (Admsecyutl.hfec@gmail.com)

Address list of The Regional Directors, CPCB			
1.	The Regional Director (Kolkata) Central Pollution Control Board 502, Southend Conclave 1582, Rajdanga Main Road Kolkata-700107 E-mail:- (rdkolkata.cpcb@gov.in)	2.	The Regional Director(Vadodara) Central Pollution Control Board Parivesh Bhawan, Opp. Ward No. 10 VMC Office Subhanpura, Vadodara – 390 023 Gujarat E-mail: - (pcrdvad.cpcb@gov.in)
3.	The Regional Director (Shillong) Central Pollution Control Board BSNL NE- 1, Telecom Circle CTO Building Ground Floor Shillong-793001 E-mail: - (zoshillong.cpcb@nic.in)	4.	The Regional Director (Bhopal) Central Pollution Control Board 3rd Floor, Sahkar Bhawan North T.T Nagar Bhopal- 462003 E-mail: - (cpcb.bhopal@gov.in)
5.	The Regional Director (Lucknow) Central Pollution Control Board Ground Floor, PICUP Bhawan Vibhuti Khand, Gomti Nagar Lucknow- 226020 E-mail: - (zolucknow.cpcb@nic.in)	6.	The Regional Director (Bengaluru) Central Pollution Control Board 1st& 2nd Floors, Nisarga Bhawan A-Block, Thimmaiah Main Road 7th D Cross, Shivanagar Opposite Pushpanjali Theatre Bengaluru-560010 E-mail:- (zobangalore.cpcb@nic.in)
7.	The Regional Director(Chandigarh) Central Pollution Control Board BSNL Exchange, 2nd Floor Sector 49-C, Chandigarh-160047 E-mail: - (rdchandigarh.cpcb@gov.in)	8.	The Regional Director (Chennai) Central Pollution Control Board Regional Directorate - Chennai 2nd Floor, 40-E, BSNL Building TVK Industrial Estate, CIPET Road, Guindy, Chennai – 600032. E-mail: - (rdchennai.cpcb@gov.in)
9.	The Regional Director (Pune) Central Pollution Control Board Row House No. 1, Nisarg Vihar, Near Mitcon International Public School, Balewadi, Pune-411045 E-mail: - (rdpune.cpcb@gov.in)		

852



Classification of Sectors into Red, Orange, Green, White and Blue Categories

(A tool for progressive environmental management)

CPCB

Central Pollution Control Board

"Parivesh Bhawan", East Arjun Nagar

Delhi-110032

(January 2025)

तन्मय कुमार, भा.प्र.से.
अध्यक्ष
Tanmay Kumar, I. A. S.
Chairman

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार
CENTRAL POLLUTION CONTROL BOARD
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE, GOVT. OF INDIA

सत्यमेव जयते

FOREWORD

The concept of classifying industries into different pollution categories originated in 1989 with the Doon Valley (Uttarakhand) Notification issued by Ministry of Environment and Forests. Subsequently the concept of pollution index was developed by Central Pollution Control Board (CPCB) during 2016 to classify the sectors into different category. The 2016 classification helped State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) in streamlining consent management, prioritizing regulatory oversight & environmental monitoring, taking decision related to siting of units, etc. However, necessity felt for refining the concept of calculating Pollution Index to overcome certain limitation and to bifurcate sub-sectors based on pollution load, scale of operation etc.

Accordingly, draft methodology was prepared and widely circulated for inputs/comments/suggestions by placing the same on CPCB website (public domain) as well as by inviting comments from MoEF&CC/SPCBs/PCCs. As of 11.08.2024, i.e. the extended date for receipt of suggestions, CPCB received 170 representations, comprising over 700 comments from PSUs, NGOs, industries, industrial associations, including feedback from SPCBs of Kerala, Nagaland, Tamil Nadu, Mizoram, West Bengal, Punjab and Lakshadweep. The report has been finalised after examining all the comments by a working committee.

The 2025 classification methodology bifurcates sub-sectors based on pollution load, scale of operation, production technology, and type of fuel used into Red, Orange, Green, White and Blue categories. Red indicates the highest pollution potential, requiring stringent regulatory oversight, while White signifies minimal or no pollution, with much reduced compliance burden of merely intimation to the concerned SPCBs/PCCs. **A new Blue Category has also been introduced to distinguish the Essential Environmental Services** required for management of environmental concerns arising from anthropogenic pollution due to domestic/household activities which otherwise will have large littering potential. Additional 2 years validity for consent to operate (as per Pollution Index) is prescribed for the blue category.

This report also outlines the implementation pathway, which includes guidelines for State Pollution Control Boards/Pollution Control Committees to follow and implement the new classification system. Earlier classified 257 sectors have now been bifurcated and classified into 403 sectors (including sub sectors) and additionally, 16 new sectors have been introduced. Thus, the revised classification of 273 key sectors comprising of total 419 sectors/sub-sectors are further classified into Red Category (125 nos.), Orange Category (137 nos.), Green Category (94 nos.), White Category (54 nos.) and Blue Category (9 nos.). Progression between red, orange and green categories for the industrial sectors is also incorporated based on the use of less polluting available processes and technologies.

The report also comprises provisions for individual units to adopt cleaner technologies and practices resulting in reduction of pollution load in any sector. Incentives, such as extended validity for Consent to Operate (CTO) and reduced inspection frequencies, are outlined to encourage continual improvement of environmental performance. The incentive mechanism allowing progression between categories will thereby promote Ease of Doing Business by extended consent validity and enhance duration between inspections, thereby leading to reduced compliance burden.

To sum up, this report aims to create a more transparent, consistent, and incentivized regulatory mechanism for better environment management, promoting sustainable industrial development and better governance. I hope the report will be useful to all concerned in the field of industrial pollution control in the country and would incentivise the industries to switch over to cleaner process and technology leading to reduced air, water and soil pollution and also encourage setting up of blue category industries.

I would like to place on record my sincere appreciation for the hard work and valuable contributions by the CPCB team comprising of Shri Amit R. Thakkar, Add. Director, Shri Saubhagya Dixit, Scientist D, and Dr. Anantha N. S., SSA under the guidance of Shri Bharat Kumar Sharma, Member Secretary. I would also like to extend my thanks to Dr. Prashant Gargava, former Member Secretary, Shri P. K. Gupta, former Director and Shri Ajay Aggarwal, former Director, for their contribution. I would also express gratitude to the Working Committee, CPCB, MoEF&CC, SPCBs/PCCs and others for their contributions in the preparation of this report.

(Tanmay Kumar)

'परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली-110 032, भारत
'Parivesh Bhawan, East Arjun Nagar, Delhi-110 032, India
Tel. +91-11-22307233, Tele Fax : +91-11-22304948, e-mail: ccb.cpcb@nic.in
CPCB

CONTRIBUTORS

Overall Guidance

1. Shri Tanmay Kumar, IAS, Chairman, CPCB
2. Shri Bharat Kumar Sharma, Member Secretary, CPCB

Working Committee

1.	Shri B. Vinod Babu, Scientist 'F' and Div. Head, WM-II & IT, CPCB, Delhi	:	Chairman
2.	Shri V. P. Yadav Scientist 'F' and Div. Head, WM-I, CPCB, Delhi	:	Member
3.	Shri Dinabandhu Gauda, Scientist 'F' and Div. Head, IPC-I, CPCB, Delhi	:	Member
4.	Shri Nazimuddin, Scientist 'F' and Div. Head, IPC-II, CPCB, Delhi	:	Member
5.	Shri Kamlesh Singh, Scientist 'E' and Div. Head, IPC-III, CPCB, Delhi	:	Member
6.	Smt. Anamika Sagar, Scientist 'E' and Div. Head, IPC-IV & V, CPCB, Delhi	:	Member
7.	Shri P. K. Gupta, Scientist 'F' and Div. Head, IPC-VI & VII, CPCB, Delhi	:	Member
8.	Shri Amit Thakkar, Scientist 'E', IPC-VI & VII Division, CPCB, Delhi	:	Member Convenor

Report preparation, finalization and overall coordination

1. Shri P. K. Gupta, Former Scientist 'F', CPCB, Delhi
2. Shri Amit Thakkar, Scientist 'E', and Divisional Head, IPC-VI&VII, CPCB, Delhi
3. Shri Saubhagya Dixit, Scientist 'D', IPC-VI Division, CPCB, Delhi

Development of Online Calculator:

Dr. Anantha N. S., Senior Scientific Assistant, Regional Directorate, Bengaluru

EXECUTIVE SUMMARY

The concept of classification of industrial sectors into red, orange, and green categories based on the size of operations and consumption of resources was first introduced in 1989 for Doon Valley, Uttarakhand. This classification aimed to aid decisions regarding siting of industries. Over the period of time, this concept was extended nationwide to manage consents and establish norms for surveillance and inspection of industry. In 2012, to have uniformity in classification throughout the country, the Central Pollution Control Board (CPCB) issued a standardized list of 244 sectors, classified under red (85 sectors), orange (73 sectors) and green (86 sectors) categories.

In 2016, the Central Pollution Control Board (CPCB) developed a scoring methodology based on the Pollution Index (PI) to harmonize the criteria for categorizing industries. This PI was determined by evaluating water pollution, air pollution, and hazardous waste generation. Using this methodology, CPCB classified 257 industrial sectors into four categories: Red (63 sectors), Orange (91 sectors), Green (65 sectors), and White (38 sectors). The White category was introduced for sectors considered "practically non-polluting" during 2016. Additionally, State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) were authorized to categorize any new or left over sectors according to the CPCB's 2016 methodology.

Further, based on the experience gained over the years, the increased use of cleaner fuels like PNG and bio-CNG, adoption of cleaner technology resulting into reduced wastewater generation, normalisation approach & different formula for calculating PI etc. a need was felt to revisit the classification methodology of 2016 for several such identified areas for improvement. Separate scoring for trade effluent and sewage effluent was also required due to differing characteristics and treatment methods.

Considering the scope of revision, CPCB published a draft report revising the methodology for calculating PI and accordingly classification of sectors into Red, Orange, Green, and White categories based on pollution index range was placed in the public domain for inputs/comments. Around 160 representations comprising more than 700 comments were received. Based on feedback/suggestions and examination of same by the working committee constituted for the purpose, the methodology was finalised. As per the final methodology, the scoring criteria for the following three major pollutant groups are as follows:

i. Water Pollutant Score (PI_W): Assesses the water pollution potential considering the oxygen demand of wastewater, other pollutants in the wastewater and quantity of wastewater generated.
ii. Air Pollutant Score (PI_A): Evaluates the potential air pollution due to process emissions (point source), work zone emissions (fugitive and odour) and type & quantity of fuel used.
iii. Waste Pollutant Score (PI_H): Considering the type and quantity of waste (which are hazardous/toxic/infectious/bulk in nature) generated.

Each pollutant group is scored out of 100, and the Cumulative Pollution Index is calculated. The category of the sector is decided based on the pollution index range, if $PI \geq 80$ the category

of sector is Red, if PI ranges between $55 \leq PI < 80$, the category of sector is orange, similarly for the range of PI between $25 \leq PI < 55$, the category is Green and for $PI < 25$, the category of the sector is white.

Further, based on the stakeholders' comments, a need was felt to introduce a separate "blue category" for Essential Environmental Services (ESS) required for management of waste generated from domestic/household activities and, an incentive mechanism to promote units in a particular sector, taking measures resulting into better environmental performance. An addendum was prepared, shared and presented to all SPCBs/PCCs. The addendum was also placed in the CPCB Website on 11.07.2024 for inputs/comments. 09 representations were received in the addendum. All representations were examined, and classification based on revised methodology is finalised. Based on the revised methodology, CPCB has classified total 419 sectors and sub-sectors under Red (125), Orange (137), Green (94), White (54) and Blue (9) categories.

The report introduced incentive mechanism for the units in any sector that adopt environment friendly practices such as treatment and recovery of 100% wastewater, use of 100% cleaner fuel/renewal energy etc. and ensuring continuous compliance. These incentives are designed to encourage continuous improvement in environmental performance and to reward units that demonstrate proven implementation of sustainable practices and compliances.

Following are the salient features of the revised classification methodology:

- Methodology focusses on "Potential to pollute the environment" by the sector.
- Simplified single formula for Cumulative Pollution Index for all cases.
- Equal weightage to all three pollutant groups- Air, Water, and Waste.
- Cumulative PI based on weighted proportionate scores of pollutant groups.
- Separate scoring criteria for sectors generating sewage (such as Building & construction projects, STPs, Airports, etc.) and bio-medical waste (Health Care Facilities).
- Introduced Blue Category for 9 sectors under Essential Environmental Services required for management of waste generated from domestic/household activities.
- Appropriate weightage to scale of operations by introducing more slabs to bifurcates sub-sectors based on pollution load, scale of operation, production technology and type of fuel used.
- Introduction of sub-categories for sectors based on cleaner technologies, fuel types, integrated/segregated operations etc.
- Motivation to industries for progressive environmental management.
- A tool to assess the Cumulative Pollution Index and category based on revised method.

This report, prepared by the Central Pollution Control Board (CPCB), presents a revised methodology for classifying sectors based on their pollution potential. The classification aims to enhance environmental management and regulatory oversight by classifying sectors into red, orange, green, white, and blue categories. The report covers in detail about the genesis of

classification, need for the revision of 2016 methodology, scoring methodology for calculation of cumulative PI, etc.

The report also outlines guidelines for implementing the classification system. The classification may be used for consent management, inspection frequency, siting criteria, cluster development, pollution control plans, levying environmental compensation, promoting progressive environmental management, etc.

*****

LIST OF ABBREVIATION

CBG: Compressed Biogas

CNG: Compressed Natural Gas

CPI: Cumulative Pollution Index

CPCB: Central Pollution Control Board

CTE: Consent to Establishment

CTO: Consent to Operate

EC: Environment Compensation

ETP: Effluent Treatment Plant

EES: Essential Environmental Services

Gen-Set: Generator Set

HAPs: Hazardous Air Pollutants

HCFs: Health Care Facilities

HW: Hazardous Waste

MoEF&CC: Ministry of Environment, Forest & Climate Change

LNG: Liquefied Natural Gas

LPG: Liquefied Petroleum Gas

NGT: National Green Tribunal

NOC: No Objection Certificate

OCEMS: Online Continuous Effluent/Emission Monitoring System

PCC: Pollution Control Committee

PM: Particulate Matter

PI: Pollution Index

PI_A: Air pollutant score

PI_H: Waste pollutant score

PI_W: Water pollutant score

PNG: Piped Natural Gas

SPCB: State Pollution Control Board

TTZ: Taz Trapezium Zone

VOCs: Volatile Organic Compounds

TABLE OF CONTENT

CHAPTER-1: Genisis and Journey of Classification 1

1.1 Introduction 1

CHAPTER-2: Modified Methodology for Classification 3

2.1 Need and scope for revision of methodology 3

2.2 Modified methodology for classification of industrial sectors 4

2.2.1 Scoring criteria for Water Pollutant "PI_W" 6

2.2.2 Scoring criteria for Air Pollutant "PI_A": 8

2.2.3 Scoring criteria for Industrial Waste Generating Sector "PI_H" 10

2.3 Computation of Cumulative Pollution Index and criteria for deciding category of sector 12

CHAPTER-3: Classification of Sectors as per Revised Methodology 15

3.1 Types of sectors based on their activities 15

3.2. Usage of classification of sectors 17

3.3 Classification of left-out/new sectors 17

CHAPTER-4: Incentives to units in a sector for adopting measures resulting to better environmental performance 19

4.1 Eligibility Criteria 19

4.2. Evaluation Criteria 20

4.3. Re-assessment of Pollution Index (PI) 22

4.4 Incentives to the units for better environmental management 23

CHAPTER-5: Implementation pathway/guidelines 25

REFERENCES 28

ANNEXURE-I: List of Industrial Sectors 30

ANNEXURE-II: List of Essential Environmental Services 76

ANNEXURE-III: List of Service/Infrastructure Development Sectors 799

ANNEXURE-IV: List of Other/Special Category Sectors 85

ANNEXURE-V: Format for submission of information by SPCBs/PCCs regarding sectors classified under white category 877

LIST OF TABLES

Table I: Scoring Criteria for Water Polluting Sector 7
Table II : Scoring criteria for air polluting sectors 9
Table III: Scoring criteria for waste generating Sectors 11
Table IV: Ranges of Cumulative Pollution Index for different categories 12
Table V: Number of sectors classified under different categories 16
Table VI: Structure of Committee to evaluate the request of units adopting measures resulting in better environmental performance 20
Table VII: Checks and balances to assess the adequacy of environment management measures 21
Table VIII: Nomenclature for revised category 23
Table IX: Incentives to units for better environmental performance 23

1

Genesis and Journey of Classification

1.1 Introduction

The notifications issued by the Ministry of Environment and Forest during 1989 for Doon Valley, Uttarakhand introduced the concept of classification of industries as red, orange, and green categories. The purpose of this classification was to facilitate decisions related to location of these industries. The criteria for classification of industries was primarily based on quantity of industrial effluent, quantity of fuel/coal, and the number of employees, and amount of waste generated. The notification included list of 129 sectors, classified under red (45), orange (35), and green (39) categories. The criteria used for Doon Valley Notification, 1989 is summarized in the **Figure I**.

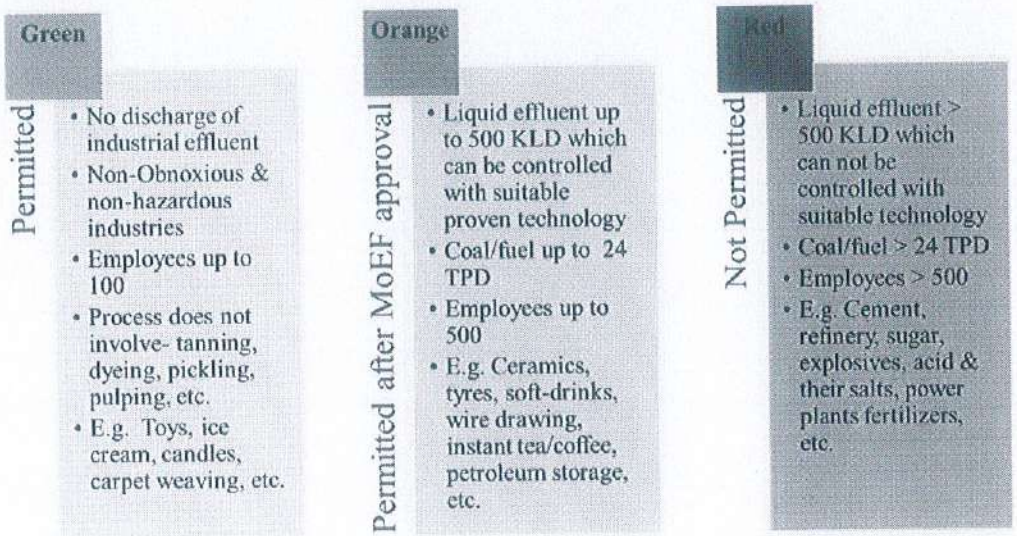


Figure I: Criteria for classification of industries in Doon Valley Notification, 1989

Subsequently, the application of this concept was extended to other parts of the country not only for the purpose of location of industries, but also for the purpose of consent management and formulation of norms related to surveillance/inspection of industries. As the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) were following different

categorization of industries, to maintain the uniformity across the country, during 2012, CPCB issued a list of 244 sectors, classified under red (85), orange (73) and green (86) categories.

In order to harmonize the criteria for categorization, during the year 2016, CPCB developed the scoring methodology to classify the industries based on the Pollution Index (PI) which was a function of water pollution, air pollution and hazardous waste generation. Based on this methodology, CPCB has classified 257 sectors under red (63), orange (91), green (65) and white (38) categories and directed SPCBs/PCCs to adopt the same. During 2016, CPCB introduced white category as a new category for such sectors which are "practically non-polluting". SPCBs/PCCs were also empowered to categorize any new/left-out sector at their own level, following the methodology prescribed by CPCB. Additionally, during 2020, CPCB also segregated the list of non-industrial operations/facilities. The overall journey of classification may be understood with the help of milestone chart shown in **Figure II**.

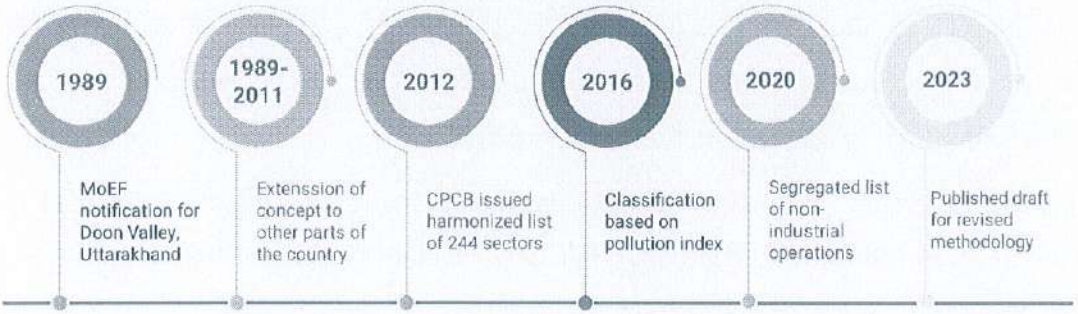


Figure II: Genisis and journey of classification of sectors

The concept of categorization is based on the "Precautionary Principle", which focuses on potential of industries to pollute the environment. The purpose of categorization is to ensure that the industry is established in a manner consistent with the environmental objectives and to prompt industrial sectors to adopt cleaner technologies, ultimately resulting in generation of minimum pollutants.

*****

2

Modified Methodology for Classification

2.1 Need and scope for revision of methodology

Based on the experience gained over the years, a need was felt to revisit the 2016 methodology for classification of sectors considering following scope of improvement:

i. Assessment of Pollution Index:

The category of any industrial sector depends on the Pollution Index (PI), which comprises of scores of three pollutant groups i.e., air pollution, water pollution and hazardous waste. The water and air pollutants were each assigned a weight of 40%. However, the hazardous waste generation was given 20% weightage in pollution index.

As per the classification methodology of 2016, in case of absence of any pollutant groups, pollution index was normalized to 100. As a result, different formulas were required to compute pollution index.

Further, the normalization method has certain limitations while comparing pollution potential among sectors having scores for all three pollutant groups verses score only for any one/two pollutant group(s). Moreover, it was also observed that in some sectors normalization involved subjectivity based on perception.

ii. Size of operations of industrial activities:

It was observed that, there was less variation in PI score of industry based on size of operation in same sector. Limited variables/slabs were considered for the quantity of wastewater discharge and fuel consumption. It was also observed that adequate weightage in the considered variables/slabs to account the variation in size of operations of industrial activities need to introduce.

iii. Consideration to segregated industrial activities:

Although there were differences in pollution potential of integrated and standalone units of a particular sector, the classification methodology (2016) classifies the integrated or standalone units in the same sector. For example, standalone cement grinding units will have less pollution potential than integrated cement plants, but both were classified under red category.

iv. Consideration of type of fuel used:

In industrial operations requiring fuels, the amount of emissions is governed by many factors such as the type of fuel and its calorific value, combustion efficiency, emission factors, etc. Use of biomass and cleaner gaseous fuels such as Piped Natural Gas (PNG), Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG), bio-CNG etc. have increased significantly in recent years. It was observed that adequate weightage based on type of fuel used is required.

v. Separate scoring for sewage and trade effluent:

It is desirable to have separate wastewater scoring criteria for the sectors generating trade effluent and sewage effluent, as characteristics, treatment method and impact are different for trade effluent generated from industrial sectors and sewage effluent generated from infrastructure & development sectors.

vi. Motivation to industries for progressive environmental management:

In the previous classification regime, there was no effective provision for change in category of industries based on the variation in pollution potential of a sector, even if the industries adopt cleaner technologies or switch over to cleaner raw material/cleaner fuel etc., resulting into reduction in pollution index.

2.2 Modified methodology for classification of sectors

Considering the scope of revision, CPCB prepared a draft report on "Classification of Industrial Sectors into Red, Orange, Green and White Categories: A Tool for Progressive Environmental Management". As per the draft report, a revised methodology for the classification is proposed which incorporates, water pollutant score, air pollutant score and waste generation score, based on the pollution potential of a sector on the environment. Scores out of 100 were given to each three pollutant groups and formula for calculating cumulative score based on the impact pollutant is devised. These scores are used for computation of pollution index for deciding the

category of industrial sector. The cut-offs for deciding the category were based on the quartiles of pollution indices, pollution potential of sectors, etc. The draft report was placed on CPCB website in July 2023, for comments/feedback from stakeholders.

CPCB received 161 representations, comprising more than 700 comments from various State Pollution Control Boards, research and technical institutions, industrial associations, NGOs, individual industries, and the public. The stakeholder-wise representations are shown with the help of pie-chart in **Figure III**.

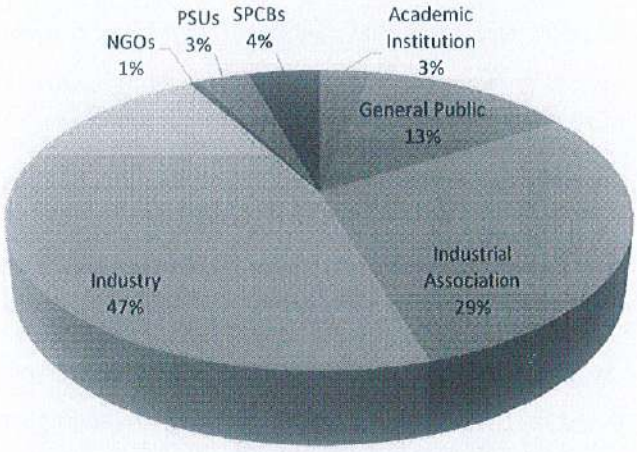


Figure III: Stakeholder-wise representations received

Subsequently, CPCB constituted a committee to critically examine and analyse the comments and to make recommendations for suitable incorporation in the final methodology and classification. After incorporating the feedback received from stakeholders, the Committee has finalized the basic methodology which can be used as a yardstick for classification of the sectors into Red, Orange, Green and White Categories.

Further, based on the stakeholders' comments, a need was felt to introduce a separate "blue category" for Essential Environmental Services (ESS) required for management of waste generated from domestic/household activities and, an incentive mechanism to promote units in a particular sector, taking measures resulting into better environmental performance. An addendum was prepared, shared and presented to all SPCBs/PCCs. The addendum was also placed in the CPCB Website on 11.07.2024 for inputs/comments. Till last date (i.e. 11.08.2024) 09 representations were received in the addendum. All representations were examined, and classification based on revised methodology is finalised.

It is worth to mention that to safeguard the environment, following the fundamental principle of classification i.e., "Precautionary Principle", scope is always available for application of mind and collective wisdom. As per the precautionary principle, when human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. Therefore, variation from methodology is possible in case of projects having high chances of damage to the environment/eco-system such as river mining, etc. or having associated accidental risk such as major accident hazards installations wherein risk is associated with industrial activities having potential in terms of operation or process, manufacturing, transportation, and storage of one or more hazardous chemicals as prescribed by the Manufacture, Storage, and Import of Hazardous Chemical Rules, 1989.

Considering the above issues, the classification methodology was modified based on the potential of three pollutant groups, namely, water pollutant, air pollutant and waste pollutant (which are hazardous/toxic/infectious/bulk in nature), which have been given scores out of 100, each. Slabs are assigned for selection of pollutant groups respectively for water, air, and waste. Score can be decided based on dominant pollutants in the pollutant groups and quantity as detailed in Table-I, Table-II and Table-III. These scores are used for computation of pollution index for deciding the category of sector. The scoring methodology is based on the pollution potential during generation and not at the end of pipe/ after treatment considering the fact that all pollutants need to be treated and disposed as per the provisions/rules notified under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act, 1986 and as amended.

The details of scoring criteria for PI_W for "water pollutant," PI_A for "air pollutant" and PI_H for "waste generating sector" are as follows:

2.2.1 Scoring criteria for Water Pollutant "PI_W"

Water pollution score consider the potential water pollution load from any sector in terms of characteristics and quantity of untreated trade effluent (wastewater). The "trade effluent" includes any liquid, gaseous or solid substance which is discharged from any premises used for carrying on any [industry, operation or process, or treatment and disposal system], other than domestic sewage.

The water pollutant score (PI_W) is the addition of three sub-scores which are based on organic content in terms of oxygen demand of wastewater (W1), potential of other pollutants (W2) and

quantum of wastewater (W3). The weightages of W1, W2 and W3 in the water pollution score are 35%, 30% and 35%, respectively.

Proportionate higher scores are assigned to the sectors generating trade effluent of high BOD and/or high COD, heavy metals/toxic compounds, and large volume of wastewater. The scores are assigned considering the potential for causing damage to the environment. It may be noted that for sectors generating industrial effluent, dominant quantity of trade effluent is considered in score W3 (W3-1 to W3-5). Whereas, for sectors generating huge volume of sewage effluent such as railway stations, STPs, residential building projects, airports etc., the separate scores W3 (W3-6 to W3-10) are assigned. The term used, "Sewage effluent" means effluent from any sewerage system or sewage disposal works and includes sullage from open drains. The scoring criteria for water polluting sectors are given in **Table-I**.

Table I: Scoring Criteria for Water Polluting Sector

Water Pollutant Group	Description	Score
Score W1: Score based on the oxygen demand of wastewater (Maximum of the following scores to be considered)		
W1-1	BOD ≥ 5,000 mg/l or COD ≥ 10,000 mg/l	35
W1-2	1000 ≤ BOD < 5,000 mg/l or 5000 ≤ COD < 10,000 mg/l	30
W1-3	500 ≤ BOD < 1,000 mg/l or 1000 ≤ COD < 5,000 mg/l	25
W1-4	100 ≤ BOD < 500 mg/l or 250 ≤ COD < 1,000 mg/l	20
W1-5	10 ≤ BOD < 100 mg/l or 50 ≤ COD < 250 mg/l	10
Score W2: Score based on other pollutants in the wastewater (Maximum of the following scores to be considered)		
W2-1	Pollutants like pesticides, heavy metals, and toxic compounds: *(Aluminium, Anionic detergents, Barium, Chloramines, Copper, Fluoride, Total residual chlorine, Iron, Manganese, Mineral oil, Phenolic compounds, Selenium, Silver, Sulphide, Cadmium, Cyanide, Lead, Zinc, Mercury, Tin, Vanadium, Antimony, Benzene, Benzo-a-pyrene, Molybdenum, Nickel, Phosphates, Polychlorinated biphenyls, Polynuclear aromatic hydrocarbons, Arsenic, Total/Hexavalent Chromium, Trichloroethane, Trichloroethylene, Adsorbable Organic Halogens (AOx), Pesticides compounds, Residual antibiotic, Radioactive materials, etc.)*	30
W2-2	Pollutants like Nitrate Nitrogen, Nitrate, Ammonical Nitrogen, Total Kjeldahl Nitrogen (TKN), Oil & grease, pH<5.5 or > 9	25
W2-3	Pollutants mainly in terms of inorganic dissolved solids and associated other impurities due to process e.g. wastewater generated from DM water rejects, boiler blowdowns, brine solution rejects, fresh-water RO rejects, etc.	20
W2-4	Pollutants mainly in terms of inorganic dissolved solids e.g. wastewater from cooling towers, cooling-re-circulation processes, etc.	15

Score W3: Score based on quantity of wastewater generated		
A. For sectors generating Industrial Trade effluent (Maximum score to be considered)		
W3-1	Wastewater ≥ 500 KLD	35
W3-2	100 KLD ≤ Wastewater < 500 KLD	30
W3-3	50 KLD ≤ Wastewater < 100 KLD	25
W3-4	10 KLD ≤ Wastewater < 50 KLD	20
W3-5	Wastewater < 10 KLD	15
B. For sectors such as STPs, building projects, etc. generating/handling only high-volume Sewage (Maximum score to be considered)		
W3-6	Sewage ≥ 5,000 KLD	35
W3-7	2,000 KLD ≤ Sewage < 5,000 KLD	30
W3-8	500 KLD ≤ Sewage < 2,000 KLD	25
W3-9	100 KLD ≤ Sewage < 500 KLD	20
W3-10	Sewage < 100 KLD	15
Water Pollutant Score (PI_W) = W1+W2+W3		

2.2.2 Scoring criteria for Air Pollutant "PI_A":

Air pollution score consider the potential air pollution load from any sector in terms of characteristics of emissions and its quantum/scale in terms of quantity of fuel. The air pollutant score is based on generation of emission. The "air pollutant" means any solid, liquid, or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The air pollution score (PI_A) is the addition of three sub-scores which are based on the type of pollutants in emissions (A1), work zone emission/fugitive emissions & odour nuisance (A2), and fuel type & quantity (A3). The weightages of A1, A2 and A3 in air pollution score are 35%, 30% and 35%, respectively.

Proportionate higher scores are assigned to the sectors generating emissions with hazardous air pollutants, process-based fugitive emissions and using solid/liquid fuels, as such pollutants have higher potential to damage the environment.

The California Air Resources Board defines fugitive emissions as "Emissions not caught by a capture system which are often due to equipment leaks, evaporative processes and windblown disturbances." The fugitive emissions from any process having acid mist, VOCs, etc. are given higher weightage (score A2=30) as compared to the fugitive emissions of inert material (score A2=25). Sectors having persistent foul odour issue, will get score A2=20. Sectors/units using solid/liquid fuel will get higher score-A3, compared to the sectors using cleaner gaseous fuel or electricity. The scoring criteria for air polluting sectors are given at **Table-II.**

Table II : Scoring criteria for air polluting sectors

Air Pollutant Group	Description	Score
Score A1: Score based on Process emissions (point source) (Maximum of the following scores to be considered)		
A1-1	Hazardous Air Pollutants (HAPs) and heavy metals: *HAPs (Phosgene, Benzene, Benzo(a)pyrene, Butadiene, Toluene Di-isocyanate, Methylene-di-phenyl Di-isocyanate, Ethylene Oxide, Ethylene Di Chloride, Acrylonitrile, Propylene Oxide), Dioxins & Furans, Asbestos, Polycyclic Aromatic Hydrocarbons (PAHs), HCN, Cd, Th, Hg, Sb, As, Pb, Co, Cr, Cu, Mn, Ni, V, etc.*	35
A1-2	Halogens, acids, and pesticides-based pollutants: *H_2S, HF, HBr, P_2O_5 as H_3PO_4, NH_3, TOC, Cl, HCl, SO_3, CH_3Cl, Total Fluoride, PM having pesticide compounds/other organic compounds, Acid mist, etc.*	30
A1-3	Pollutants due to combustion of fuel or due to process: *PM, CO_2, CO, NOx, SO_2, etc.*	25
A1-4	Volatile Organic Compounds (VOCs): *Ethyl benzene, Styrene, Toluene, Xylene, Aromatics, Propylene Glycol, Ethylene Glycol, etc.*	20
Score A2: Score based on fugitive emissions and odour nuisance (Maximum of the following scores to be considered)		
A2-1	Fugitive emissions of Particulate Matter (PM), acid mist, VOCs, etc. from process	30
A2-2	Fugitive emissions of Particulate Matter (PM), acid mist, VOCs, etc. due to storage and handling, etc.	25
A2-3	Odour nuisance, including odour due to the use of binding gums, cements, adhesives, enamels etc.	20
Score A3: Score based on quantity of fuel (Maximum of the following scores to be considered)		
	Coal or liquid fuels	
A3-1	Fuel consumption ≥ 24 TPD	35
A3-2	12 TPD ≤ Fuel consumption < 24 TPD	30
A3-3	Fuel consumption < 12 TPD	25
	Biomass-based fuels	
A3-4	Fuel consumption ≥ 48 TPD	25
A3-5	24 TPD ≤ Fuel consumption < 48 TPD	20
A3-6	Fuel consumption < 24 TPD	15
	Cleaner/gaseous fuels, such as, PNG, CNG, LPG, Compressed Biogas (CBG), propane, butane etc.	
A3-7	Fuel consumption ≥ 120 TPD	20
A3-8	60 TPD ≤ Fuel consumption < 120 TPD	15
A3-9	Fuel consumption < 60 TPD	10
A3-10	Electricity	0
Air Pollutant Score (PI_A) =A1+A2+A3		
Note: In case, any sector/unit is using more than one type of fuel, the most polluting fuel category, will be considered.		

2.2.3 Scoring criteria for Industrial Waste Generating Sector "PI_H"

Industrial waste generating sectors are considered based on the generation of hazardous waste/high volume low effect waste. As per the Hazardous and Other Wastes (Management & Trans-boundary Movement) Rules, 2016, the "hazardous waste" means any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances and shall include waste as per the Schedule I, Schedule II and Schedule III of the rule. Further, scores are also assigned to the high-volume low effect wastes such as fly ash, phosphogypsum, red mud, jarosite, slags from pyro-metallurgical operations, mine tailings and ore beneficiation rejects.

The score for waste comprises of two sub-scores H1 and H2. The H1 score is based on the different type of hazardous waste which are generated during the process, and which required to be managed/disposed through common facility OR based on the generation of high-volume low effect waste/ HW like contaminated bags/ drums etc. The H2 score is based on the total quantum of waste generated.

The desirable disposal method such as incineration, landfill after treatment, landfill etc. signifies the potency of hazardous waste. In recent time, the utilization of hazardous waste as per the Rule-9 of Hazardous and Other Wastes (Management & Trans-boundary Movement) Rules, 2016, as alternate fuel and raw material in cement kilns, as recyclable hazardous waste etc. has increased. The classification is based on the pollution potential due to generation of such types of hazardous waste from any sector. The score for the quantum of hazardous waste is total potential of generation of such hazardous waste by any sector., Score H1: Based on potency of hazardous waste and score H2: Based on quantum of hazardous waste, are given weightage of 30% and 70%, respectively. Considering the higher risk due to amount of hazardous waste generated rather than its disposal method, more weightage is given to the quantity. Overall waste generation score in case of waste generating sector will be PI_H =H1+H2. The scoring criteria for hazardous waste generating sectors are given at **Table-III**.

A separate scoring criterion has been included for sectors generating bio-medical waste. Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps, including the categories mentioned in Schedule-I appended to the Bio-Medical Waste Management Rules, 2016. As any Health Care

Facilities (HCFs) generates all types of bio-medical waste (red, yellow, blue, and white) and quantities of such wastes may vary considerably based on the type of facility/location of facility (rural/urban), and other such factors. Therefore, scoring based on number of beds in a healthcare facility is considered as sole criteria for assigning waste score (H: B-1 to B-7) as tabulated in **Table-III**.

Least score of 25 is given to non-bedded healthcare facilities and maximum score of 100 is given to facilities having more than 1,000 beds. Overall waste generation score in case of bio-medical waste generating sector will be PI_H.

Table III: Scoring criteria for waste generating Sectors

Waste Pollutant Group	Description	Score
A. Score for sectors generating hazardous waste		
Score H1: Score based on the hazardous waste management/disposal method. (Maximum of the following scores to be considered)		
H1-1	Hazardous wastes which are flammable, ignitable, corrosive, oxidizing toxic, etc. and requiring disposal through incineration	30
H1-2	Hazardous wastes which are reactive, capable of yielding another material post disposal, etc. and requiring disposal in secured landfill after stabilization/treatment	25
H1-3	Hazardous wastes which are requiring direct disposal in secured landfill without stabilization	20
H1-4	High volume and low effect wastes, contaminated bags/ drums/ containers etc.	10
Score H2: Score based on quantity of hazardous waste generation. (Maximum of the following scores to be considered)		
H2-1	Hazardous Waste ≥ 5000 TPA	70
H2-2	1000 TPA ≤ Hazardous Waste < 5000 TPA	50
H2-3	200 TPA ≤ Hazardous Waste < 1000 TPA	30
H2-4	10 TPA ≤ Hazardous Waste < 200 TPA	20
H2-5	Hazardous Waste < 10 TPA	10
B. Scores for the sectors generating bio-medical waste		
B-1	No. of beds ≥ 1,000	100
B-2	500 ≤ No. of beds < 1,000	80
B-3	200 ≤ No. of beds < 500	60
B-4	50 ≤ No. of beds < 200	50
B-5	10 ≤ No. of beds < 50	40
B-6	No. of beds < 10	30
B-7	Non-bedded facility	25
For sectors generating hazardous waste PI_H =H1+H2 **For sectors generating bio-medical waste PI_H =B**		

2.3 Computation of Cumulative Pollution Index and criteria for deciding category of sector

In the revised methodology of classification (2025), all three pollutant scores due to water, air and industrial waste generation are taken into account while computing pollution index. The formula for computing cumulative pollution index (PI) is as follows:

$$PI = i_{max} + (100 - i_{max})\left(\frac{i_2 + i_3}{200}\right)$$

Where, i_{max}, is the maximum score among Water (PI_W), Air (PI_A), and Waste (PI_H) pollutant scores and i_2 & i_3 are the remaining pollutant scores.

The category of the sector will be decided based on the pollution index ranges given at **Table-IV.**

Table IV: Ranges of Cumulative Pollution Index for different categories

Cumulative Pollution Index (PI)	Category of industrial sector
PI ≥ 80	Red
55 ≤ PI < 80	Orange
25 ≤ PI < 55	Green
PI < 25	White

The purpose of classification is to have uniform consent mechanism, defined routine monitoring frequency by concerned SPCB/PCC, environmental protection plans etc. Modified methodology also considers the variation in pollution potential due to various type of activities and operations in a particular sector.

The scores/pollution index/category of any two sectors may be same, however, comparing two different sectors based on the category or pollution index is not desirable as the cumulative PI is a function of air pollutant, water pollutant, and waste pollutant and the cumulative score is arithmetically relates the maximum score of one pollutant with the remaining other two pollutants. Hence, PI/category of sectors may be same but may have different impact on environment.

2.4 Blue Category Projects- Essential Environmental Services for management of environmental pollution arising from domestic/household activities

Essential Environmental Services may be defined as those facilities which are essential to control, abate and mitigate pollution generated from Domestic and Industrial activities. Such Essential environment services for Industrial Activity includes CETP, CHWTSDF, Effluent conveying system etc. and essential environment services for domestic activities includes STP, MSW etc. Both the type of EES plays a vital role in Environment Management. However, during the treatment of waste, some EES generates/handle hazardous waste/infectious waste. The EES which do not generate Hazardous Waste, and which otherwise have large littering potential can be categorised as Blue Category Projects. Further, there are past legal references wherein Hon'ble Apex court has also considered the importance and requirement of such Essential Environment Services.

Human settlements whether located in rural/urban/eco-sensitive area generate sewage, solid waste, and C&D waste, which are required to be managed to prevent adverse impact on environment and human health. Basic environment management facilities are required to be set-up to manage such waste which includes STP, C&D waste processing facility, MSW management facility like sanitary landfill, material recovery facility & waste processing units, bio-methanation, bio-composting, waste to energy, etc.

These facilities are basically essential environment services which play a vital role in protecting environment and human health. These facilities may also bring value addition by producing various by-products such as secondary raw material, compost, energy, etc. and promotes circular economy and sustainable development by converting waste into wealth. Moreover, these categories do not generate hazardous or infectious wastes.

As the role and importance of these facilities is different in nature as compared to other activities and industries in the sense that they are primarily set-up for prevention, control and abatement of soil, water and air pollution. It is more appropriate to have a separate colour category-Blue Category for essential environmental services facilizes related to environmental pollution arising from domestic/household activities. These activities are required to meet all the prescribed environmental norms/rules notified from time to time and the pollution index for such Essential Environmental Services (EES) shall continue to be calculated as per the formula and consent to operate will be governed based on the pollution index. However, the

category of the EES will be termed "Blue Category sector" and as an incentive for the essential services, additional 2 years validity for consent to operate (as per PI) will be provided.

The list of EES facilities is given at **Annexure-II.**

*****

3

Classification of Sectors as per Revised Methodology

3.1 Types of sectors based on their activities

The revised methodology of classification will be applicable to all industries which may have potential for generation of environmental pollutants. As per the Section 2(j) of the Industrial Disputes Act, 1947, "Industry" means any business, trade, undertaking, manufacture, or calling of employers and includes any calling, service, employment, handicraft or industrial occupation or avocation of workman", however, based on type of operational activities, the industries are divided into following four sectors:

i. Industrial Sectors
ii. Essential Environmental Services (EES)
    a. EES for Industrial Waste
    b. EES for Domestic Waste (Blue Category Sector)
iii. Service/Infrastructure Development Sectors
iv. Others/Special Category Sectors

The sectors which are involved in production of goods, products, etc. are considered under "Industrial Sectors". The sectors covered under "Essential Environmental Services (EES)" are those facilities which are essential to control, abate and mitigate pollution generated from Domestic and Industrial activities. These services are essential facilities which are required to reduce pollution load on the environment, such as sewage treatment plants, common bio-medical waste treatment facilities, construction & demolition waste processing plants, etc. Essential Environmental Services Sectors are sub classified as "EES for industrial waste" and "EES for domestic waste (Blue category sectors which do not handle or generate infectious or hazardous waste)". On the other hand, sectors which carry out service-related activities such as infrastructure projects, railways, airports, hospitals, etc. are covered under "Service/infrastructure development sectors".

"Other/special category sectors" include those projects which cannot be classified based on the scoring methodology of pollution index but require classification based on precautionary principle and considering the potential of ecological damage/ health and environment related risk, etc. Few such sectors are sand mining, hydel power plants, etc.

The revised methodology of classification, sub-categorises the main sector based on the usage of cleaner technology/cleaner production/cleaner fuel which has proven reduction in trade effluent generation, emissions, waste, etc., for better environmental management, resulting into overall reduction of pollution index compared to main sector. For example, if coffee seeds processing industries use eco-pulping technology, which generates less water pollution, the pollution index of the said sector gets reduced and category changes from orange to green. Similarly, variation in type/scale of activities in a particular sector is also considered for classification of sub-sectors.

The methodology and scores have been screened through stakeholder feedback/consultation and public opinion. Available standard literature, various documents and guidelines, inspection reports, etc. were also referred, while assessing the scores for water pollution, air pollution, and waste generation for classification of sectors. Based on the modified methodology, the list of sectors and sector specific sub-classification is given at **Annexure-I to Annexure-IV**. Summary of classified sectors is given in **Table-V**.

Table V: Number of sectors classified under different categories

Sl. No.	Type of sector	Total number of sectors/sub-sectors	Red	Orange	Green	White	Blue
1.	Industrial Sectors	359	107	120	81	51	-
2.	Essential Environmental Services (ESS)						
2.a.	ESS for domestic waste	9	-	-	-	-	9
2.b.	ESS for industrial waste	9	9	-	-	-	-
3.	Service/Infrastructure Development Sectors	37	7	15	13	2	-
4.	Others/Special Category Sectors	5	2	2	-	1	-
	Total	419	125	137	94	54	9

3.2. Usage of classification of sectors

The classification of sectors may be used for the following purposes:

i. **Consent management:** SPCBs/PCCs may grant Consent to Operate (CTO) to red, orange, and green categories of industries for validity up to 5 years, 10 years, and 15 years, respectively as per existing provisions which would be later governed as per the provisions/guidelines under Jan Vishwas (Amendment of Provisions) Act, 2023/Water Act, as amended. The validity of blue category sectors will be 2 years more than the category based on PI.

ii. **Inspection frequency:** SPCBs/PCCs may prioritize their environmental surveillance programs based on the categories of sectors. SPCBs/PCCs are required to ensure inspection of red, orange, and green category of industries at least once in six-months, one-year, and two-years, respectively. Common facilities and 17 categories of industries are to be inspected at least once in every three-months.

iii. **Siting criteria:** The categorization may be used as a tool for deciding the location/siting of an industry in a particular location.

iv. **Development of cluster:** The classification will help in planning of sector specific cluster, based on scoring of various pollutants and development of adequate environment management infrastructure facility, accordingly.

v. **Sector specific plans for pollution control:** The plans for control of pollution may be prepared and implemented on priority for the sectors having higher pollution index and overall higher pollution load.

vi. **Levying environmental compensation:** Pollution index may be used for determining and levying environmental compensation on industries violating the environmental norms.

vii. **A tool for progressive environmental management:** Industrial units may adopt cleaner technologies, cleaner fuels, etc. which may result in reduction of pollution index, thus, moving to lower pollution potential category. It will provide incentives to industries in terms of less consent renewal fees, less environmental surveillance/compliance burden, more validity period for consents/authorizations, etc.

3.3 Classification of left-out/new sectors

The revised methodology of classification (2025) and list of sectors classified by CPCB is required to be adopted and implemented by all SPCBs/PCCs. In case of any new or left-out

sector, the SPCB/PCC may categorize the sector at its own level. For this purpose, a committee headed by the Member Secretary, SPCB/PCC and comprising of at least two senior cadre engineers/scientists of the SPCB/PCC (as nominated by the Member secretary of the concerned SPCB/PCC) may be constituted to examine the matter and classify the sector in accordance with the methodology prescribed by CPCB. The State Level Committee may also co-opt subject experts, industrial association representative, etc., as member, as per requirement. CPCB has also developed a tool to assess the Cumulative Pollution Index and category of any sector, which is available on CPCB website (https://cpcb.nic.in/categorization-of-industrial-sectors/).

In addition, all SPCBs/PCCs are required to submit list of all such sector classified under white category to CPCB in the prescribed format (**Annexure-V**), for notification as per provisions of Jan Vishwas (Amendment of Provisions) Act, 2023.

*****

4

Incentives to unit in a sector for adopting measures resulting to better environmental performance

A methodology has been strategized to provide incentives to the unit in a sector which are dedicated to reduce environmental impacts from their operations/process. The objective can be achieved by 100% treatment and reuse of wastewater generated, having complete dependency on cleaner fuel alternatives (such as PNG, LPG, compressed biogas, propane, butane, electricity etc. for meeting energy requirement), implementation & achievements of targets of sector-specific charters of CPCB/SPCB for environmental management, EPR obligations and use of cleaner process/cleaner technology to eliminate generation of toxic/hazardous pollutants.

The units fulfilling the following eligibility criteria may submit their formal proposal to the concerned SPCB/PCC for consideration:

4.1 Eligibility Criteria

- The unit should have completed at least one year of completion of production/operations with demonstrated, verifiable steps and submitted audit report from institute of repute for considering the unit for the purpose by concerned SPCB/PCC. To facilitate verification, the unit must have properly maintained logbooks/bills for production, electricity consumption, fuel, water consumption, wastewater treatment and use of treated wastewater.
- The unit should be located in conforming area with applicable Environment Clearance, Consent to Establishment (CTE) and Consent to Operate (CTO) and hazardous/bio-medical waste authorization from SPCB/PCC.
- Unit should comply with all the norms/conditions stipulated under EC, CTO and Guidelines/Rules issued by CPCB.

- In case, unit using ground water resource, it should have valid permission/NOC and also required to install electronic flowmeter.
- No penalty or legal obligation is imposed/pending against unit for violation of environmental norms. Records for last 5 years may be verified. In case establishment period of the unit is less than 5 years, the past records since the start of production may be verified.
- Unit should not be involved in any sort of accident/incident resulting into emission /discharge into the environment. Records for last 5 years may be verified.

All such units, interested in availing incentives are required to demonstrate and prove their initiatives to the Committee (to be constituted at the level of concerned SPCB/PCC), comprising of members as mentioned in **Table VI.**

Table VI: Structure of Committee to evaluate the request of units adopting measures resulting in better environmental performance

Sl. No.	Members	Role
1	Member Secretary, SPCB/PCC	Chairman
2	Subject expert from Indian Institute of Technologies (IITs) or National Institute of Technologies (NITs) or any other institute/university of repute.	Member
3	Expert from CSIR institute/laboratories, having expertise in industrial process and pollution control technologies/ environmental management	Member
4	Two officials of concerned SPCB/PCC, as nominated by the Member Secretary, SPCB/PCC	Member

4.2. Evaluation Criteria

The committee shall scrutinize the proposals based on the eligibility criteria. The basis of evaluation will be- (i) Measures taken for treatment and reuse of wastewater to reduce freshwater consumption, (ii) Use of alternative cleaner fuel to reduce emissions, and (iii) Use of cleaner technology/ cleaner production which results in reduction in pollution/hazardous waste generation (iv) Recycling units identified for EPR obligations and has fulfilled all requirement including Environmentally Sound Management Facility for recycling.

The unit is required to demonstrate the successful implementation of measures by annual submission of third-party audit report (through institute of repute) regarding performance of environmental management measures. The Committee members may also inspect unit, collect samples, and get it analysed, check logbooks, electricity/water bills, examine system feasibility through mass-balances, ensure real-time submission of environment data to SPCB/PCC server, etc. The check and balances to examine the industry claims are summarized in **Table VII.**

Table VII: Checks and balances to assess the adequacy of environment management measures

Criteria	Checks and balances
I. Wastewater Management	
Installation of wastewater recovery system resulting into treatment and 100% reuse of treated wastewater in industrial process.	• Unit must have adequate operational Effluent Treatment Plant (ETP). The freshwater requirement of the unit has shown proportionate reduction. • There should not be any flow/ponding of wastewater inside the premises or discharge outside from the premises. Further, there should not be any by-pass. • Electronic flowmeters and Pan-tilt-zoom (PTZ) camera should have been installed with connectivity for continuous transmission of data to SPCB/PCC and CPCB servers (as applicable). • Recirculation system should be clearly mapped and visible for inspection and flow meter should be installed at required locations with records. • Mass/water balance based on actual production need to be checked. The claim regarding reduction in freshwater consumption should have concurrency with the readings of flow meters, water bill, log-books, etc. • Treated wastewater should not be used for horticulture or agriculture purposes. • Sludge generated from treatment of wastewater should be managed properly as per the authorization issued by the concerned SPCB/PCC and timely submission of Form-IV as per the requirement of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
II. Air Pollution Management	
100% fuel dependency on cleaner fuels, such as- Piped Natural Gas (PNG), Compressed Natural Gas (CNG), Liquefied Natural Gas (LNG) Liquefied Petroleum Gas (LPG), Compressed	• No other fuel (coal, pet-coke, furnace oil, etc.) should be stored/used in the unit premises. Diesel for Gensets (as an auxiliary power source) may be allowed. Preference may be given to the units using gas based Gensets. • Adequate facility for stack monitoring (port holes, zig-zag ladder etc.) should be available with provision of OCEMS (as applicable).

Biogas (CBG), propane, butane, etc.	• Use of upgraded air pollution control devices with higher efficiency for the reduction of emissions. • Adoption of cleaner technology, advanced pollution control systems etc. to control fugitive/emissions • Use of alternate cleaner raw material for generation of less pollution. • Use of renewable energy as an alternate to conventional fuel/power should be considered.
III. Waste Management	
The unit has adopted cleaner technology/ cleaner production which results in reduction in pollution/ hazardous waste generation	• Reduction in generation of pollution/waste due to adoption of cleaner technology/change in raw material etc. • Mass balance based on actual production need to be checked. There should be concurrency in generation of hazardous waste, utilization, disposal, etc. with respect to net reduction in generation.
IV. EPR Targets (for recycling facilities)	
Recycling units identified for EPR obligations and has fulfilled all requirement including Environmentally Sound Management Facility for recycling.	• Complying with the requirement of EPR obligation identified by CPCB from time to time.

4.3. Re-assessment of Pollution Index (PI)

The purpose of giving star category is to classify the unit in the sector as star performing units. The category of the unit may be re-assessed as detailed below:

A. For Industries, Service/Infrastructure facilities and Essential Environmental Services Sectors for management of waste.

The pollution index of the units in any sector which have proven reduction in trade effluent generation and/or air pollution management and/or waste management measures, can be calculated based on submission of same with the supporting documents for considering the modified score based on the same methodology.

The revised cumulative pollution index (PI) will be calculated with modified air/water/waste scores as discussed in the methodology given in previous section. If revised, cumulative PI results to change in the category of unit in the sector, the nomenclature for revised category will be as per the **Table VIII**.

Table VIII: Nomenclature for revised category

Change in category	Nomenclature of revised category
Red to Orange	Red*
Orange to Green	Orange*
Green to White	Green*

B. Essential Environmental Service Sectors for Domestic/Household Waste- "Blue Category Sectors":

Units under Blue Category are required to reduce their existing PI score by 25%, by meeting evaluation criteria/check and balances, as mentioned in **Table III** to qualify for change in category to Blue*.

4.4 Incentives to the units for better environmental management

Units which have demonstrated the successful implementation of environmental management measures and verified by the Committee, shall be eligible for the incentives, as listed in the **Table IX.**

Table IX: Incentives to units for better environmental performance

Category	Incentives
Red*	• CTO may be granted for the validity of max. 10 years. • Prescribed random environmental surveillance inspection frequency may be once a year, considering the change in category.
Orange*	• CTO may be granted for the validity of max. 15 years. • Prescribed random environmental surveillance inspection frequency may be once in two years, considering the change in category.
Green*	• CTO may be granted for the validity of max. 20 years. • Prescribed random environmental surveillance inspection frequency may be once in four years, considering the change in category and given incentives twice the original category.
Blue*	• CTO may be granted with additional 3 years validity period. • Prescribed random environmental surveillance inspection frequency may be once in 3 months.

In case of non-compliance(s) observed in future, the State Board can remove the star status and for calculation of EC, the PI of original category shall be considered.

*****

5 Implementation pathway/guidelines

The revised methodology and classification of sectors will be implemented in prospective manner. For this purpose, following guidelines may be referred:

i. All pending application for consideration of CTE/CTO and future such application shall be processed as per the revised methodology of classification. In case CTE granted before the revised classification, applicability of CTO will be as per new classification.

ii. New classification will be applicable to existing units at the time of renewal of CTO or within one year from the date of directions issued by CPCB regarding implementation of revised classification, whichever is earlier. The annual fees or cumulative fees for the remaining period shall be as per the revised category.

iii. SPCBs/PCCs may grant Consent to Operate (CTO) to units under red, orange, and green categories for maximum validity up to 5 years, 10 years, and 15 years, respectively as per existing provisions which would be later governed as per the provisions/guidelines under Jan Vishwas (Amendment of Provisions) Act, 2023/Water Act, as amended. SPCBs/PCCs may grant Consent to Operate (CTO) to units under Blue Category sectors with additional 2 years validity, considering their role as Essential Environmental Services for management of waste generated from domestic/household activities.

iv. Requirement of intimation/consent for white category of industries, shall be governed as per the provisions/guidelines under Jan Vishwas (Amendment of Provisions) Act, 2023//Water Act, as amended.

v. All sectors irrespective of category shall follow guidelines for pollution control, if any, issued by SPCB/PCC/CPCB time to time.

vi. Siting of units shall be only in the conforming area as per the guidelines of CPCB/SPCB/PCC. Further, as per the Section 17(1)(n) of the Water Act, 1974 and the Section 17(1)(h) of the Air Act, 1981, SPCB/PCC may also frame policies/advisory with respect to the location of any industry/operations, the carrying on of which is likely to cause air/water pollution, considering the scale/type of industries and sensitivity of area. Siting of units in eco-sensitive area will be governed by their respective notifications.

vii. The classification of sectors shall not be linked to sanction of loans/finance of bank proceedings.

viii. In the matter of Taz Trapezium Zone (TTZ), for air pollution scores of 10 and 20 (as per 2016 methodology), equivalent scores of 30 and 60 (as per 2025 methodology), respectively, may be considered for sectoral guidelines/opinion from NEERI (Ref: Order dated 08.12.2021, in the matter of M.C. Mehta v/s Union of India, Writ Petition (Civil) No.13381/1984, before Hon'ble Supreme Court).

ix. As per CPCB directions dated 12.12.2019, issued under Section 18(1)(b) of the Water Act, 1974 and the Air Act, 1981, SPCBs/PCCs are required to ensure inspection of red, orange, and green category of industries at least once in six-months, one-year, and two-years, respectively. Common waste treatment facilities and 17 categories of industries are to be inspected at least once in every three-months. (Ref: Order dated 05.11.2019, in the matter of Shailesh Singh v/s State of Haryana & Ors., OA No.639/2018, before Hon'ble National Green Tribunal, Principal Bench).

x. The sectors which are classified under white or green category and if such sectors have installed Genset(s) of higher capacity which are classified under orange/green category, then such sector will be considered under higher category.

xi. All Industrial units are encouraged to adopt measures such as cleaner technology/cleaner production, cleaner raw material, cleaner fuel etc., for better environmental management. If such measures result into overall reduction of pollution

index, request regarding change in category of such sectors/units may be made to concerned SPCB/PCC as detailed under Section 8 of this report.

*****

REFERENCES

1. *Bio-medical Waste Management Rules, 2016.* (c3). [Online]. Ministry of Environment, Forest and Climate Change, Government of India. [Accessed 02 April 2024]. Available from: https://cpcb.nic.in/bio-medical-waste-rules/

2. California Air Resources Board. *Glossary of Air Pollution Terms.* [Online]. [Accessed 02 February 2024]. Available from: https://ww2.arb.ca.gov/glossary

3. Central Pollution Control Board, April 1995. *Classification of Industries for Consent Management.* 1st ed. Printed at Prabhat Publicity, New Delhi – 110002

4. Central Pollution Control Board. *Comprehensive Environmental Pollution Index (CEPI), 2024.* [Online]. [Accessed 25 March 2024]. Available from: http://www.cepi.cpcb.gov.in/cpcb_cepi/vwstactions

5. Central Pollution Control Board. April 2021. *Pollution Control Acts, Rules & Notifications Issued Thereunder,* [Online]. 7th ed. Pollution Control Law Series: PCLS/02/2021. [Accessed 10 December March 2023]. Available from: https://cpcb.nic.in/7thEditionPollutionControlLawSeries2021.pdf

6. *Final Document on Revised Classification of Industrial Sectors Under Red, Orange, Green and White Categories, 07 March 2016.* [Online]. Central Pollution Control Board. [Accessed 12 September 2023]. Available from: https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS9MYXRlc3RfMTE4X0ZpbmFsX0RpcmVjdGlvbnMucGRm

7. *Guidelines on Management of Pyro-metallurgical Slags (Iron & Steel Slags) Ver 1.0, December 2023.* [Online]. Central Pollution Control Board. [Accessed 10 January 2024]. Available from: https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS80MDBfMTcwMzg0ODIzMV9tZWRpYXBob3RvMTI0MjkucGRm

8. Government of India, 1988, October 6. Notification S.O. 923(E) of 1988: *Environmental Protection in the Doon Valley.*

9. *Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016.* [Online]. Ministry of Environment, Forest and Climate Change, Government of India. [Accessed 02 April 2024]. Available from: https://cpcb.nic.in/bio-medical-waste-rules/

10. M.C. Mehta v. Union of India & Ors. 2021. Hon'ble Supreme Court of India. Writ Petition (Civil) No.13381/1984. [Accessed 28 May 2024]. Available from: https://webapi.sci.gov.in/supremecourt/1984/63426/63426_1984_5_1_31948_Order_08-Dec-2021.pdf

11. Shailesh Singh v. State of Haryana & Ors. 2019. Hon'ble National Green Tribunal (Principal Bench), OA. No. 639/2018. [Accessed 28 May 2024]. Available from: https://greentribunal.gov.in/gen_pdf_test.php?filepath=L25ndF9kb2N1bWVudHMv

RWZpbGluZ19kb2N1bWVudHMvbmd0ZG9jL2Nhc2Vkb2MvMDcwMTExNjAw
MzY1MjAxOC8wNC8wMS8yNS8wNF8yNV8wMDFfMTU4MTMzNTY2ODExM
S5wZGY=

12. *The Air (Prevention and Control of Pollution) Act, 1981.* (c1). [Online]. Government of India. [Accessed 15 March 2024]. Available from: https://www.indiacode.nic.in/bitstream/123456789/1389/1/Prevwater1981__41.pdf

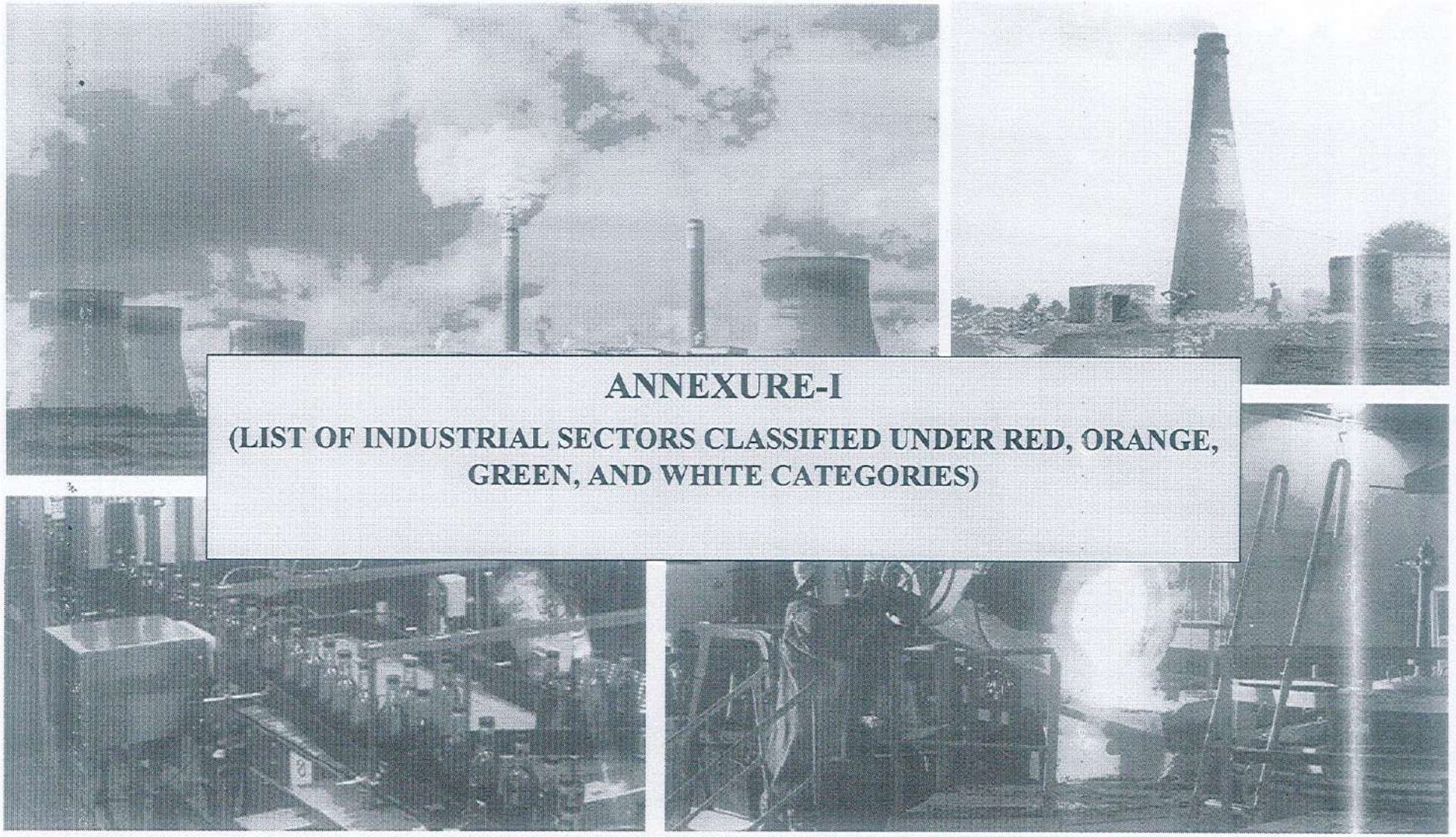
13. *The Environment (Protection) Rules, 1986.* (c3). [Online]. Government of India. Ministry of Environment and Forests (Department of Environment, Forest, and Wildlife). [Accessed 02 April 2024]. Available from: https://upload.indiacode.nic.in/showfile?actid=AC_MP_74_308_00003_00003_1543231806694&type=rule&filename=ep_rules_1986.pdf

14. *The Industrial Disputes Act, 1947. (*C2b). [Online]. Government of India. [Accessed 15 April 2024]. Available from: https://www.indiacode.nic.in/bitstream/123456789/15191/1/A1947-14.pdf#search=dispute

15. *The Occupational Safety, Health, and Working Conditions Code, 2020.* (c2). [Online]. Government of India. Ministry of Law and Justice (Legislative Department). [Accessed 15 April 2024]. Available from: https://labour.gov.in/sites/default/files/osh_gazette.pdf

16. *The Public Liability Insurance Act, 1991.* (c7). [Online]. Government of India. [Accessed 12 March 2024]. Available from: https://www.indiacode.nic.in/bitstream/123456789/1960/1/A1991-06.pdf#search=9.The%20Public%20Liability%20Insurance%20Act,%201991.

17. *The Water (Prevention and Control of Pollution) Act, 1974.* (c1). [Online]. Government of India. [Accessed 15 March 2024]. Available from: https://www.indiacode.nic.in/bitstream/123456789/1612/3/A1974-06.pdf



ANNEXURE-I

(LIST OF INDUSTRIAL SECTORS CLASSIFIED UNDER RED, ORANGE, GREEN, AND WHITE CATEGORIES)

LIST OF INDUSTRIAL SECTORS

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
									~A~							
1	Manufacturing of **Automobiles** (integrated facilities)	20	30	25	**75**	0	25	0	**25**	25	20	**45**	83.8	Red	i. Such types of plants are having either one or combinations of polluting activities viz. washing, metal surface finishing operations, pickling, plating, electro-plating, phosphating, painting, heat treatment etc. ii. Some of such plants may outsource some /all of the polluting activities or may have stand-alone units. In such cases, after thorough inspection of such units by concerned SPCB, re-categorization of the industry shall be made accordingly.	IPC-V
2	**Asbestos** and asbestos based industries	10	30	25	**65**	35	30	30	**95**	25	30	**55**	98	Red	Asbestos is carcinogenic and banned in many countries.	IPC-II
3	**Almirah**, Grill Manufacturing (Dry Mechanical Process)	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green		IPC-V
									~B~							
4.0	**BAKERY**, CONFECTIONERY AND SWEETS PRODUCTS															
4.1	Bakery, confectionery, sweets with production capacity ≥ 1 TPD	25	0	20	**45**	25	0	25	**50**	0	0	**0**	61.3	Orange		IPC-III

891

245

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
4.2	Bakery, confectionery, sweets with production capacity ≥ 1 TPD. (using cleaner/gaseous fuel)	25	0	20	**45**	25	0	10	**35**	0	0	**0**	54.6	Green		IPC-III
5.0	**BRICK** MANUFACTURING															
5.1	Brick kilns using coal as fuel	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75	Orange		IPC-V
5.2	Brick kilns using biomass as fuel	0	0	0	**0**	25	25	15	**65**	0	0	**0**	65	Orange		IPC-V
5.3	Tunnel brick kilns (gas fired)	0	0	0	**0**	25	25	10	**60**	0	0	**0**	60	Orange		IPC-V
6.0	MANUFACTURING OF AUTOCLAVED AERATED CONCRETE (AAC) **BRICKS/BLOCKS.**															
6.1	AAC bricks/blocks manufacturing using coal as fuel (12 TPD and above)	0	0	0	**0**	25	25	30	**80**	0	0	**0**	80	Red		IPC-V
6.2	AAC bricks/blocks manufacturing using coal as fuel (less than 12 TPD)	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75	Orange		IPC-V
6.3	AAC bricks/blocks manufacturing using biomass as fuel	0	0	0	**0**	25	25	20	**70**	0	0	**0**	70	Orange		IPC-V
6.4	AAC bricks/blocks manufacturing using gas as fuel	0	0	0	**0**	25	25	15	**65**	0	0	**0**	65	Orange		IPC-V
7.0	FLY ASH **BRICKS / BLOCK** MANUFACTURING															
7.1	Fly ash bricks/ block manufacturing (with boiler)	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75	Orange		IPC-V
7.2	Fly ash bricks/ block manufacturing (without boiler)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
8.0	MANUFACTURING OF NON-ALCOHOLIC **BEVERAGES**															
8.1	Wastewater generation ≥ 100 KLD	25	20	30	**75**	25	0	25	**50**	0	0	**0**	81.3	Red		IPC-III
8.2	Wastewater generation < 100 KLD	25	20	25	**70**	25	0	25	**50**	0	0	**0**	77.5	Orange		IPC-III

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_R	Pollution Index (PI)	Category	Remarks	Concerned Division
9.0	**BATTERY** MANUFACTURING															
9.1	Lead-acid **Battery** manufacturing (excluding assembling and charging of lead acid **Battery** in micro-scale)	0	30	20	**50**	35	30	25	**90**	25	10	**35**	94.3	Red		IPC-V
9.2	Dry cell **Battery** (excluding manufacturing of electrodes) and assembling & charging of acid lead battery on micro scale	0	30	15	**45**	25	25	10	**60**	25	10	**35**	76	Orange		IPC-V
9.3	**Battery** manufacturing without boiler (excluding lead acid battery)	0	0	0	**0**	0	25	0	**25**	25	10	**35**	43.1	Green		IPC-V
10	**Briquette** manufacturing (coal/biomass/coke)	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green	The process involves mixing, mechanized compression and drying.	IPC-II
11	Assembly of **Bicycles, Baby** carriages and other small non motorizing vehicles	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
12	**Bailing** (hydraulic press) of waste papers	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
13	**Bio fertilizer** and bio-pesticides without using inorganic chemicals	0	0	0	**0**	0	20	0	**20**	0	0	**0**	20	White		IPC-V
14	**Block** making of printing without foundry (excluding wooden block making)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
15	Flavoured **Betel** nuts production/ grinding (completely dry mechanical operations)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
16	Manufacturing of shoe **Brush** and wire **Brush**	0	0	0	**0**	0	20	0	**20**	0	0	**0**	20	White		IPC-V
	~C~															
17.0	MANUFACTURING OF INDUSTRIAL **CARBON** INCLUDING ELECTRODES AND GRAPHITE BLOCKS, ACTIVATED **CARBON, CARBON BLACK**															
17.1	Carbon black manufacturing	20	15	20	**55**	25	30	30	**85**	30	20	**50**	92.9	Red		IPC-I
17.2	Industrial carbon including electrodes & graphite blocks and calcined pet coke	20	15	20	**55**	25	25	25	**75**	30	10	**40**	86.9	Red		IPC-II
17.3	Activated carbon manufacturing (with steam activation)	20	15	20	**55**	25	25	15	**65**	0	0	**0**	74.6	Orange		IPC-V
18.0	INORGANIC **CHEMICALS**															
18.1	Basic inorganic chemicals and electro chemicals and its derivatives including manufacturing of acid	10	30	25	**65**	30	30	20	**80**	20	20	**40**	90.5	Red		IPC-I
18.2	Phosphorous and its compounds, including phosphorous rock processing	20	30	20	**70**	35	25	10	**70**	10	30	**40**	86.5	Red		IPC-I
18.3	Chlorates, per-chlorates & peroxides	20	30	20	**70**	30	20	25	**75**	20	20	**40**	88.8	Red		IPC-I
18.4	Chlorine, fluorine, bromine, iodine, and their compounds	10	30	25	**65**	35	20	10	**65**	20	20	**40**	83.4	Red		IPC-I
19	Coke oven plant, coal liquefaction, coal tar distillation and fuel gas-making	30	30	30	**90**	25	30	35	**90**	25	50	**75**	98.3	Red		IPC-II
20.0	**CEMENT** PLANTS															

894

248

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
20.1	With co-processing with CPP (Captive Power Plant)	20	25	35	**80**	35	30	35	**100**	10	50	**60**	100	Red		IPC-II
20.2	With co-processing without CPP	20	0	20	**40**	35	30	35	**100**	30	20	**50**	100	Red		IPC-II
20.3	Without co-processing with CPP	10	25	35	**70**	35	30	35	**100**	10	50	**60**	100	Red		IPC-II
20.4	Without co-processing without CPP	0	0	0	**0**	25	30	35	**90**	30	10	**40**	92	Red		IPC-II
20.5	Stand-alone grinding units with CPP	20	25	35	**80**	25	30	35	**90**	10	50	**60**	97	Red		IPC-II
20.6	Stand-alone grinding units without CPP	0	0	0	**0**	25	30	0	**55**	30	10	**40**	64	Orange		IPC-II
20.7	Bulk terminals for storage and packaging of cement	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green		IPC-II
21.0	**CHLOR** ALKALI															
21.1	Chlor alkali	10	20	25	**55**	30	25	25	**80**	20	20	**40**	89.5	Red		IPC-I
21.2	Chlor alkali using washed salt	10	20	15	**45**	30	25	25	**80**	20	10	**30**	87.5	Red		IPC-I
21.3	Chlor alkali using cleaner/gaseous fuel	10	20	25	**55**	30	25	10	**65**	20	20	**40**	81.6	Red		IPC-I
21.4	Chlor alkali using cleaner/gaseous fuel and washed salt	10	20	15	**45**	30	25	10	**65**	20	10	**30**	78.1	Orange		IPC-I
22	Manufacturing of **Compact** disc **Computer** (CD/DVD) / cassette manufacturing / reel manufacturing	0	15	15	**30**	30	0	0	**30**	20	10	**30**	51	Green		IPC-V
23.0	MANUFACTURING OF **COIR**/**COIR** PITH AND **COIR** PRODUCTS															
23.1	Coir bleaching and dyeing/printing units	25	0	25	**50**	25	25	20	**70**	0	0	**0**	77.5	Orange		IPC-V
23.2	Coir fibre/pith processing units generating effluent	25	0	20	**45**	0	25	0	**25**	0	0	**0**	51.9	Green		IPC-V

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
23.3	Coir fibre/pith processing and/or Manufacturing of coir products from coir (only dry process)	0	0	0	**0**	0	20	0	**20**	0	0	**0**	20	White		IPC-V
24.0	**CERAMICS**															
24.1	Ceramics/ Glass /Earthen potteries and tile manufacturing using coal/oil fired kilns (fuel consumption: 12 TPD and above)	0	0	0	**0**	25	25	30	**80**	0	0	**0**	80	Red		IPC-V
24.2	Ceramics/ Glass /Earthen potteries and tile manufacturing using coal/oil fired kilns (fuel consumption: less than 12 TPD)	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75	Orange		IPC-V
24.3	Ceramics/ Glass /Earthen potteries and tile manufacturing (using gas fired kilns)/tunnel kiln	0	0	0	**0**	25	25	10	**60**	0	0	**0**	60	Orange		IPC-V
24.4	Ceramics/ Glass /Earthen potteries and tile manufacturing (using only electrical kiln)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
25	**Coal Washeries**	20	25	30	**75**	0	25	0	**25**	0	0	**0**	78.1	Orange		IPC-II
26	Liquid floor **Cleaner**, black phenyl, liquid soap, glycerol mono-stearate manufacturing	25	25	15	**65**	0	20	0	**20**	0	0	**0**	68.5	Orange		IPC-V
27	Phenyl/toilet **Cleaner** formulation and bottling	10	0	15	**25**	0	20	0	**20**	0	0	**0**	32.5	Green		IPC-V

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
28	**Cashew** nut processing	20	0	15	**35**	25	20	15	**60**	0	0	**0**	67	Orange		IPC-III
29.0	**COFFEE** SEEDS PROCESSING INDUSTRY															
29.1	Coffee seeds processing (wet process)	35	0	20	**55**	25	0	15	**40**	0	0	**0**	64	Orange		IPC-III
29.2	Coffee seeds processing with eco-pulper	20	0	15	**35**	25	0	15	**40**	0	0	**0**	50.5	Green		IPC-III
30	Manufacturing of **Candy**	10	0	15	**25**	0	0	0	**0**	0	0	**0**	25	Green		IPC-V
31	**Cardboard** or corrugated box and paper products (excluding paper or pulp manufacturing and without using boilers)	0	0	0	**0**	0	20	0	**20**	0	0	**0**	20	White		IPC-V
32	Manufacturing of precast **Cement** products (without using asbestos/ boiler / steam curing) like pipe, pillar, jafri, well ring, block/tiles etc.(should be done in closed covered shed to control fugitive emissions)	0	0	15	**15**	0	25	0	**25**	0	0	**0**	30.6	Green		IPC-V
33	Manufacturing of **Ceramic Colour** by mixing & blending only (not using boiler and wastewater recycling process)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
34.0	**CHILLING** PLANT, COLD STORAGE AND ICE-MAKING															
34.1	Chilling plant	20	15	15	**50**	0	0	0	**0**	0	0	**0**	50	Green		IPC-IV
34.2	Cold storage	0	15	15	**30**	0	0	0	**0**	0	0	**0**	30	Green		IPC-V
34.3	Ice Making	0	20	15	**35**	0	0	0	**0**	0	0	**0**	35	Green		IPC-V

897

251

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
35	Decoration of **Ceramic Cups** and plates by electric furnace	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
36	Ready mix **Cement Concrete**	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green		IPC-V
37	CO_2 recovery plant	0	0	0	**0**	0	0	0	**0**	20	10	**30**	30	Green	Exhausted molecular sieves are generated as hazardous waste.	IPC-V
38	Assembly of air **Coolers/Conditioners**, repairing and servicing	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
39	**Chalk** making from plaster of Paris (only casting without boilers etc. - sun drying / electrical oven)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
40	Standalone manufacturing of **Concrete** admixtures up to 1000 MT per Month capacity by physical mixing (without boiler and reactor and no generation of wastewater)	0	0	0	**0**	0	0	0	**0**	10	10	**20**	20	White	The sector may become green category if it generates wastewater. The unit needs to be re-classified as per the methodology in case the capacity exceeds 1000 MT per Month.	IPC-V
41	Used **Cooking** oil (UCO) collection centers	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
									~D~							
42.0	**DYES, DYE** INTERMEDIATES AND PIGMENT PRODUCTIONS															
42.1	Dyes, Dye Intermediates and Pigments produced by chemical synthesis	35	30	25	**90**	30	20	25	**75**	30	20	**50**	96.3	Red		IPC-I

898

252

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
42.2	Natural Dye and Pigments requiring acidic/ alkaline/ solvent extraction	30	30	20	**80**	25	20	25	**70**	20	10	**30**	90	Red		IPC-I
42.3	Natural Dye and Pigments not require acidic/ alkaline/ solvent extraction	30	20	20	**70**	25	0	25	**50**	0	0	**0**	77.5	Orange		IPC-I
43.0	**SYNTHETIC DETERGENT AND SOAPS**															
43.1	Synthetic detergents and soaps (wastewater generation ≥ 100 KLD)	20	20	30	**70**	25	0	25	**50**	25	10	**35**	82.8	Red		IPC-I
43.2	Synthetic detergents and soaps (wastewater generation < 100 KLD)	20	20	25	**65**	25	0	25	**50**	25	10	**35**	79.9	Orange		IPC-I
43.3	Synthetic detergents and soaps (only formulation)	0	0	0	**0**	25	0	25	**50**	0	0	**0**	50	Green		IPC-I
43.4	Soap manufacturing (handmade -without steam boiling / boiler)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	DISTILLERIES AND FERMENTATION SECTORS															
44.0	**DISTILLERIES AND FERMENTATION INDUSTRIES**															
44.1	Distillery (Molasses based)	35	25	35	**95**	25	25	35	**85**	0	0	**0**	97.1	Red		IPC-III
44.2	Distillery (Grain based)	35	25	30	**90**	25	25	25	**75**	0	0	**0**	93.8	Red		IPC-III
44.3	Distillery (Grain based) with Distiller's Dried Grains with Soluble (DDGS) as by-product	25	25	20	**70**	25	25	25	**75**	0	0	**0**	83.8	Red		IPC-III
44.4	Standalone yeast manufacturing units	35	25	35	**95**	25	20	25	**70**	0	0	**0**	96.8	Red		IPC-III
44.5	Breweries and malteries industry (with fermentation)- Wastewater generation ≥ 100 KLD	30	15	30	**75**	25	0	25	**50**	0	0	**0**	81.3	Red		IPC-III
44.6	Breweries and malteries industry (with fermentation)- Wastewater generation < 100 KLD	30	15	25	**70**	25	0	25	**50**	0	0	**0**	77.5	Orange		IPC-III

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
44.7	Potable alcohol by blending, bottling of alcohol products	20	0	25	**45**	0	0	0	**0**	0	0	**0**	45	Green		IPC-III
45	**Diesel** pump repairing and servicing (complete mechanical dry process)	0	0	0	**0**	0	0	0	**0**	10	10	**20**	20	White		IPC-V
								~E~								
46	Manufacturing of **Explosives**, detonators, fuses, etc.	25	30	15	**70**	0	30	0	**30**	30	10	**40**	80.5	Red	Explosives manufacture contribute to release of hazardous pollutants, including generation of other toxic chemicals. Accident/safety hazard is also associated with such sector during manufacturing and usages.	IPC-I
47	Manufacturing of coated **Electrode**	0	15	15	**30**	0	25	0	**25**	0	0	**0**	38.8	Green	Process involves preparation of core wire / rod, preparation of dry mix, preparation of wet mix, application of coating by extrusion, baking of coated electrodes.	IPC-V
48	**Emery** powder (fine dust of sand) manufacturing	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green	Fugitive emissions from grinding operations.	IPC-V
49	**Electric** lamp (bulb) and CFL manufacturing by assembling only	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
50	**Electrical** and electronic item assembling (completely dry process)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V

900

254

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
51	**Engineering** and fabrication units (dry process without any heat treatment / metal surface finishing operations / painting)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
									~F~							
52.0	**FIBRE** GLASS (FIBRE REINFORCED PLASTIC) PRODUCTION															
52.1	Fibre glass (containing lead) production and processing (excluding moulding)	0	0	0	**0**	35	0	25	**60**	25	20	**45**	69	Orange		IPC-V
52.2	Fibre glass (without lead) production and processing (excluding moulding)	0	0	0	**0**	30	0	25	**55**	25	20	**45**	65.1	Orange	The use of styrene in most methods of fibre glass production causes hazardous air pollution that is harmful to breathe at excessive levels.	IPC-V
53	Manufacturing of **Firecrackers** including improved crackers/green crackers, etc.	0	0	0	**0**	35	30	0	**65**	30	10	**40**	72	Orange	Various hazardous chemicals are used in the manufacturing process. Accident/safety hazard is also associated with such sector during manufacturing and usages.	IPC-V
54.0	SYNTHETIC **FIBRES** MANUFACTURING															
54.1	Synthetic fibres-PSF & PFY, generated from petrochemical	35	30	35	**100**	30	25	35	**90**	30	20	**50**	100	Red		IPC-I
54.2	Synthetic fibres including rayon, tyre cord, viscose filament yarn/staple fibre, acrylic fibres	25	20	25	**70**	30	20	25	**75**	20	10	**30**	87.5	Red		IPC-I
54.3	Synthetic fibres including rayon, tyre cord, viscose filament yarn/staple fibre, acrylic fibres using cleaner/gaseous fuel	25	20	25	**70**	30	20	10	**60**	20	10	**30**	83.5	Red		IPC-I

901

255

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
55.0	**FERTILIZERS** PRODUCTION															
55.1	Fertilizers (Urea)	10	30	35	**75**	30	30	20	**80**	20	30	**50**	92.5	Red		IPC-I
55.2	Fertilizers (Calcium Ammonium Nitrate/Ammonium Nitrate)	10	30	25	**65**	30	25	25	**80**	20	20	**40**	90.5	Red		IPC-I
55.3	Fertilizers (NPK)	10	30	25	**65**	30	25	25	**80**	20	20	**40**	90.5	Red		IPC-I
55.4	Fertilizers (Straight Phosphatic Fertilizers)	10	30	25	**65**	30	25	25	**80**	20	20	**40**	90.5	Red		IPC-I
55.5	Fertilizer (granulation /formulation / blending) generating wastewater through floor washings, cooling towers etc.	10	30	15	**55**	30	30	0	**60**	10	10	**20**	75	Orange		IPC-I
55.6	Fertilizer (granulation /formulation / blending) not generating wastewater	0	0	0	**0**	30	30	0	**60**	10	10	**20**	64	Orange		IPC-I
56.0	**FOOD AND FOOD PROCESSING** INCLUDING FRUITS AND VEGETABLE PROCESSING															
56.1	Wastewater generation ≥ 10 KLD	25	0	25	**50**	25	0	25	**50**	0	0	**0**	62.5	Orange		IPC-III
56.2	Wastewater generation < 10 KLD (without boiler)	25	0	15	**40**	0	0	0	**0**	0	0	**0**	40	Green		IPC-III
57.0	**FISH** FEED, POULTRY FEED AND CATTLE FEED															
57.1	Fish feed, poultry feed and cattle feed (with boiler)	0	20	15	**35**	25	25	25	**75**	0	0	**0**	79.4	Orange		IPC-V
57.2	Fish feed, poultry feed and cattle feed (without boiler)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
58	**Fish** processing and packing (excluding chilling of fishes)	25	25	20	**70**	0	20	0	**20**	0	0	**0**	73	Orange		IPC-IV
59.0	MANUFACTURING OF MODULAR WOODEN **FURNITURE**															

902

256

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
59.1	Modular wooden furniture from particle board, MDF, swan timber etc, Ceiling tiles/ partition board from saw dust, wood chips etc., and other agricultural waste using synthetic adhesive resin, wooden box making (With boiler)	0	0	0	**0**	25	25	10	**60**	0	0	**0**	60	Orange		IPC-V
59.2	Modular wooden furniture from particle board, MDF, swan timber etc, Ceiling tiles/ partition board from saw dust, wood chips etc., and other agricultural waste using synthetic adhesive resin, wooden box making (Without boiler)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
60.0	CARPENTRY & WOODEN FURNITURE MANUFACTURING															
60.1	Carpentry & wooden furniture manufacturing with spray painting (excluding saw mill) with the help of electrical (motorized) machines such as electrical wood planner, steel saw cutting circular blade, etc.	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
60.2	Carpentry & wooden furniture manufacturing without spray painting (excluding saw mill) with the help of electrical (motorized) machines such as electrical wood planner, steel saw cutting circular blade, etc.	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V

903

257

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
61	**Foam** manufacturing	0	0	0	**0**	35	0	0	**35**	20	10	**30**	44.8	Green	Emissions of VOCs and HAPs. Raw materials are polyurethane, latex etc.	IPC-V
62	**Flour** mills (dry process)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green	Separate classification for domestic flour mills may not require.	IPC-V
63.0	STEEL **FURNITURE** INDUSTRY															
63.1	Steel furniture with spray painting	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green	Obnoxious gases from welding.	IPC-V
63.2	Steel furniture without spray painting	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	~G~															
64.0	MANUFACTURING OF **GLUE** AND **GELATIN**															
64.1	Manufacturing of glue and gelatin using coal/liquid fuel	25	20	15	**60**	25	20	25	**70**	10	10	**20**	82	Red		IPC-I
64.2	Manufacturing of glue and gelatin by using biomass/cleaner fuel	25	20	15	**60**	25	20	15	**60**	10	10	**20**	76	Orange		IPC-I
65.0	MANUFACTURING OF **GLASS** (INCLUDING PRINTING OR ETCHING OF **GLASS** SHEET USING HYDROFLUORIC ACID)															
65.1	Manufacturing of glass (Oil/coal fired)	0	15	15	**30**	25	25	25	**75**	0	0	**0**	78.8	Orange		IPC-V
65.2	Manufacturing of glass (gas fired)	0	15	15	**30**	25	25	10	**60**	0	0	**0**	66	Orange		IPC-V
66	Producer **Gas** plant using conventional coal **Gasification**	20	25	15	**60**	25	0	25	**50**	30	10	**40**	78	Orange		IPC-V

904

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
67.0	COMPRESSED **BIOGAS** (CBG)/BIO-CNG PLANTS															
67.1	CBG plants based on Municipal Solid Waste (MSW) as feed	30	25	25	**80**	0	20	0	**20**	0	0	**0**	82	Red		UPC-II
67.2	CBG plants based on process waste (industrial/ process liquid effluent & solid waste like press mud, organic sludge, molasses, etc.) as feed	30	25	25	**80**	0	20	0	**20**	0	0	**0**	82	Red		IPC-III
67.3	CBG plants based on crop residue (paddy straw /wheat straw /corn sweet sorghum/ Napier grass, etc.) as feed	30	25	20	**75**	0	20	0	**20**	0	0	**0**	77.5	Orange		IPC-III
67.4	CBG plants based on animal waste (dairy farms, poultry farms, and other animal waste) as feed	30	25	20	**75**	0	20	0	**20**	0	0	**0**	77.5	Orange		IPC-III
67.5	CBG plants producing Fermented Organic Manure (FOM) & Liquid Fermented Organic Manure (LFOM) as by-products	0	0	0	**0**	0	20	0	**20**	0	0	**0**	20	White	CBG plants producing FOM & LFOM as by-products in conformity with requirements of Gazette Notification No. 2051 dated 14.07.2020 & No. 1972 dated 01.06.2021, respectively, and utilizing entire FOM & LFOM as a fertilizer or manure on land and also not discharging any waste-water, to be considered under White category, subject to verification by SPCB on case-to-case basis.	IPC-III
68.0	STANDALONE PRODUCTION OF **HYDROGEN** AND/OR **AMMONIA** (WITHOUT CAPTIVE POWER PLANT USING FOSSIL FUEL)															

260

906

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
68.1	Integrated unit for production of Ammonia through Hydrogen generated by pyrolysis/gasification	20	25	20	**65**	20	25	25	**70**	30	20	**50**	87.3	Red	i. Pyrolysis of biomass will generate syn gas and other condensable gases having hydrocarbons and other impurities. ii. Purification of gas will generate wastewater having high organic content and tarry residue as hazardous waste. iii. The process will generate fugitive emissions and due to pyrolysis operation.	IPC-I
68.2	Integrated unit for production of ammonia through Hydrogen generated by electrolysis using renewable energy (capacity ≥ 15 TPD)	10	25	35	**70**	0	20	0	**20**	30	20	**50**	80.5	Red	i. Ammonia manufacturing process (Haber process) and associated safety hazards remain same as per the chemical properties of ammonia. ii. Wastewater generation due to the production of hydrogen through electrolysis and condensation of ammonia, other scrubbed liquid etc. iii.Generation of ETP sludge, exhausted membranes, molecular sieves, spent catalysts, etc. as hazardous waste.	IPC-I

261

907

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
68.3	Integrated unit for production of Ammonia through hydrogen generated by electrolysis using renewable energy (Capacity < 15 TPD)	10	25	20	**55**	0	20	0	**20**	30	10	**40**	68.5	Orange	i. Ammonia manufacturing process (Haber process) and associated safety hazards remains same as per the chemical properties of ammonia. ii. Wastewater generation due to production of hydrogen through electrolysis and condensation of ammonia, other scrubbed liquid etc. iii.Generation of ETP sludge, exhausted membranes, molecular sieves, spent catalysts, etc. as hazardous waste.	IPC-I
68.4	Hydrogen production through pyrolysis/gasification	20	25	20	**65**	20	25	25	**70**	30	10	**40**	85.8	Red	i. Pyrolysis of biomass will generate syn gas and other condensable gases having hydrocarbons and other impurities. ii. Purification of gas will generate wastewater having high organic content and tarry residue as hazardous waste. iii.The process will generate fugitive emissions and due to pyrolysis operation.	IPC-I

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
68.5	Hydrogen production through electrolysis using raw/seawater and renewable energy (capacity ≥ 2.5 TPD)	0	20	35	**55**	0	0	0	**0**	30	10	**40**	64.0	Orange	i. Type of electrolysers may include Alkaline Water Electrolyser (AWE), Proton Exchange Membrane (PEM), Solid Oxide Electrolyser Cell (SOEC) and Anion Exchange Membrane (AEM), etc. ii. Generation of DM reject, cooling tower blowdown, draining of alkaline/electrolyser water during maintenance, etc. as wastewater. iii. Generation of ETP sludge, exhausted membranes, molecular sieves, spent catalysts, etc. as hazardous waste.	IPC-I
68.6	Hydrogen production through electrolysis using raw/sea water and renewable energy (capacity < 2.5 TPD)	0	20	20	**40**	0	0	0	**0**	30	10	**40**	52.0	Green	i. Type of electrolysers may include Alkaline Water Electrolyser (AWE), Proton Exchange Membrane (PEM), Solid Oxide Electrolyser Cell (SOEC) and Anion Exchange Membrane (AEM), etc. ii. Generation of DM reject, cooling tower blowdown, draining of alkaline/electrolyser water during maintenance, etc. as wastewater. iii. Generation of ETP sludge, exhausted membranes, molecular sieves, spent catalysts, etc. as hazardous waste.	IPC-I
68.7	Hydrogen production through electrolysis (using	0	0	0	**0**	0	0	0	**0**	0	10	**10**	10.0	White	i. DM water as feed water for electrolyser and cooling/chilling	IPC-I

263

909

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
	renewable energy) on BOO/BOOT/BOT, mode etc., located in the premises of end user industry and directly using de-mineralized water & other utilities (cooling tower, ETP, etc.) sourced from end user industry														water requirement to be met by the end user industry. ii. Wastewater and other waste generated during O&M shall also be managed by the end user industry.	
69	**Glue** from starch (physical mixing) with Gas/ electrically operated oven /boiler.	0	0	0	**0**	25	0	10	**35**	0	0	**0**	35	Green		IPC-V
70	**Gold** and silver smithy (purification with acid smelting operation and sulphuric acid polishing operation) (using less or equal to 1 litre of sulphuric acid/ nitric acid per month)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
71	Compressed oxygen **Gas** from crude liquid oxygen (without use of any solvents and by maintaining pressure & temperature only for separation of other **Gases**)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
72	**Glass** and ampules and vials making from **Glass** tubes	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
73	**Ground** nut decorticating	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
74	**Medical Oxygen**	0	0	0	**0**	0	0	0	**0**	10	10	**20**	20	White	The sector may become green category if it generates wastewater	IPC-V
	~H~															
75.0	**HOT** MIX PLANTS															
75.1	Hot mix plants using oil as fuel	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75	Orange		IPC-V
75.2	Hot mix plants using gaseous as fuel	0	0	0	**0**	25	25	10	**60**	0	0	**0**	60	Orange		IPC-V
76	**Hazardous** waste pre-processing/processing facility including spent acid processing, spent solvent recovery, etc.	25	30	15	**70**	25	25	15	**65**	30	20	**50**	87.3	Red		WM-II
77	**Handloom**/ carpet weaving (without dying and bleaching operation)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	~I~															
78	**Ice** cream manufacturing units	25	25	20	**70**	25	0	25	**50**	0	0	**0**	77.5	Orange		IPC-IV
79	Printing **Ink** Manufacturing	20	30	15	**65**	0	20	10	**30**	30	10	**40**	77.3	Orange	In the process pigments, binders and solvents are used. VOCs are generated.	IPC-I

910

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
80	Manufacturing of scientific and mathematical **Instrument** (assembling only)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	~J~															
81.0	**JUTE PROCESSING**															
81.1	Jute processing (with dyeing / with boiler)	25	20	25	**70**	25	0	25	**50**	0	0	**0**	77.5	Orange		IPC-III
81.2	Jute processing (without dyeing / without boiler)	20	0	20	**40**	0	0	0	**0**	0	0	**0**	40	Green		IPC-III
81.3	Manufacturing of products from jute (without dyeing/ without boiler)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-III
	~L~															
82	**Lime** manufacturing (using lime kiln)	0	0	0	**0**	25	0	30	**55**	0	0	**0**	55	Orange		IPC-V
83	**Leather** foot wear and **Leather** products (excluding tanning and hide processing)	0	0	0	**0**	0	20	0	**20**	0	0	**0**	20	White	Fumes due to use of adhesives / gums.	IPC-IV
84	Manufacturing of optical **Lenses** (using electrical furnace)	0	20	15	**35**	0	0	0	**0**	0	0	**0**	35	Green		IPC-V
85	**Leather** cutting and stitching (more than 10 machine and using motor)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	~M~															

911

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
86	**Mobile** towers using genset(s)	0	0	0	**0**	25	0	25	**50**	0	0	**0**	50	Green	i. The used oil/waste oil generated during repair and maintenance need to be disposed through authorized hazardous waste recycler by service provider/OEM. ii. Order dated 24.08.2017 in the related matter with OA No. 83(THC) OF 2012 (Bharti Infratel Ltd.) may be referred for issuance of composite consent in case of mobile towers.	UPC-I
87.0	**MILK PROCESSES AND DAIRY PRODUCTS**															
87.1	Milk processes and dairy products (integrated project)	30	25	30	**85**	25	20	30	**75**	0	0	**0**	90.6	Red		IPC-IV
87.2	Dairy and dairy products (Small scale units), using coal/biomass as fuel (Wastewater generation ≥ 100 KLD)	25	25	30	**80**	25	0	25	**50**	0	0	**0**	85	Red		IPC-IV
87.3	Dairy and dairy products (Small scale units), using coal/biomass as fuel (Wastewater generation < 100 KLD)	25	25	20	**70**	25	0	25	**50**	0	0	**0**	77.5	Orange		IPC-IV
87.4	Dairy and dairy products, (Small scale units), using PNG as fuel	25	25	20	**70**	0	0	10	**10**	0	0	**0**	71.5	Orange		IPC-IV
88.0	**MINING AND ORE BENEFICIATION**															
88.1	Open-cast coal mining	10	25	35	**70**	25	30	35	**90**	10	70	**80**	97.5	Red		IPC-II
88.2	Underground coal mining	0	25	35	**60**	25	30	35	**90**	0	0	**0**	93	Red		IPC-II
88.3	Mining of major minerals and ore beneficiation	20	30	35	**85**	25	30	35	**90**	25	70	**95**	99.4	Red	Includes captive limestone mining.	IPC-II

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
88.4	Mining of minor minerals (except Sand/riverbed material mining)	10	0	20	**30**	25	25	25	**75**	0	0	**0**	78.8	Orange		IPC-II
88.5	Grinding, processing, and screening of minor minerals	0	0	0	**0**	25	30	0	**55**	0	0	**0**	55	Orange		IPC-II
89	Manufacturing of **Mirror** from sheet glass	0	0	0	**0**	30	20	0	**50**	25	10	**35**	58.8	Orange		IPC-V
90	**Mineral** processing, industries involving ore sintering, pelletisating, grinding & pulverization	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75	Orange		IPC-II
91	**Malteries** (without fermentation)	30	15	25	**70**	25	0	25	**50**	0	0	**0**	77.5	Orange		IPC-III
92	Manufacturing of **Mosquito** repellent & coil	0	0	0	**0**	30	0	25	**55**	0	0	**0**	55	Orange	Toxic fumes may be released.	IPC-V
93	Organic **Manure** (physical mixing)	0	0	0	**0**	0	20	0	**20**	0	0	**0**	20	White		IPC-V
94	Packing of powdered **Milk**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
METALS AND METALLURGICAL SECTORS																
95.0	**IRON & STEEL** (PRIMARY PROCESSING FROM ORE. INTEGRATED STEEL PLANTS AND SPONGE IRON UNITS)															
95.1	Integrated iron and steel plants	25	30	35	**90**	25	30	35	**90**	25	50	**75**	98.3	Red		IPC-II
95.2	Stand-alone sintering/palletisation	0	0	0	**0**	25	30	35	**90**	0	0	**0**	90	Red		IPC-II
95.3	Sponge iron with CPP (Captive Power Plant)	20	25	35	**80**	25	30	35	**90**	10	50	**60**	97	Red		IPC-II
95.4	Sponge iron without CPP	20	15	30	**65**	25	30	35	**90**	10	50	**60**	96.3	Red		IPC-II

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
95.5	Stand-alone coke oven gas plants	25	30	30	**85**	25	30	35	**90**	25	50	**75**	98	Red		IPC-II
96.0	**ALUMINIUM PROCESSING**															
96.1	Aluminium Refinery	10	30	35	**75**	25	25	35	**85**	10	70	**80**	96.6	Red		IPC-II
96.2	Aluminium Smelter	10	30	35	**75**	30	25	35	**90**	25	70	**95**	99.1	Red		IPC-II
97	**Copper Smelter**	10	30	35	**75**	30	25	35	**90**	10	70	**80**	97.8	Red		IPC-II
98	**Zinc smelter**	10	30	35	**75**	30	25	35	**90**	10	70	**80**	97.8	Red		IPC-II
99.0	**FERROUS AND NON-FERROUS METAL** SECONDARY PROCESSING/REPROCESSING UNITS INVOLVING DIFFERENT FURNACES THROUGH MELTING, REFINING. CASTING, ALLOY-MAKING															
99.1	All Ferrous and Non-ferrous metal secondary processing/reprocessing units involving different furnaces through melting, refining, casting, alloy-making (using coal/liquid fuels)	0	15	15	**30**	25	25	25	**75**	25	10	**35**	83.1	Red		IPC-V
99.2	Ferrous and Non-ferrous metal (excluding lead, nickel, and manganese) secondary processing/reprocessing units involving different furnaces through melting, refining, casting, alloy-making (using cleaner fuels/electricity)	0	15	15	**30**	25	25	10	**60**	10	10	**20**	70	Orange		IPC-V
100	Aluminium & copper extraction from scrap using an oil-fired furnace (dry process only)	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75	Orange		IPC-V
101.0	INDUSTRY OR PROCESS INVOLVING **METAL** SURFACE TREATMENT OR PROCESS/HEAT TREATMENT															

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
101.1	Industry or process involving metal surface treatment or process such as pickling/ electroplating/paint stripping/ heat treatment using cyanide bath/ phosphating or finishing and anodizing / enamellings/ galvanizing	25	30	20	**75**	30	25	0	**55**	25	30	**55**	88.8	Red		IPC-V
101.2	Plasma electrolytic polishing (electroplating)	25	30	15	**70**	30	25	0	**55**	0	0	**0**	78.3	Orange		IPC-V
101.3	Heat treatment using furnace (without cyaniding)	0	0	0	**0**	25	0	25	**50**	0	0	**0**	50	Green		IPC-V
101.4	Heat treatment with any of the new technology like ultrasound probe, induction hardening, ionization beam, gas carburizing etc.	0	15	15	**30**	0	25	0	**25**	0	0	**0**	38.8	Green		IPC-V
102.0	**FORGING OF FERROUS AND NON- FERROUS METALS**															
102.1	Forging of ferrous and non-ferrous metals using liquid fuel	0	0	0	**0**	25	25	20	**70**	30	10	**40**	76	Orange		IPC-V
102.2	Forging of ferrous and non-ferrous metals using gaseous fuel	0	0	0	**0**	25	25	10	**60**	30	10	**40**	68	Orange		IPC-V
102.3	Forging of ferrous and non-ferrous metals using electricity	0	0	0	**0**	25	25	0	**50**	30	10	**40**	60	Orange		IPC-V
102.4	Forging of ferrous and non-ferrous metals (cold forging, without any heat treatment)	0	0	0	**0**	0	0	0	**0**	30	10	**40**	40	Green		IPC-V
103.0	**ROLLING MILLS**															
103.1	Rolling and pickling	25	30	15	**70**	25	30	25	**80**	25	10	**35**	90.5	Red		IPC-V
103.2	Rolling mills (oil and coal fired)	0	15	15	**30**	25	0	25	**50**	0	0	**0**	57.5	Orange		IPC-V
103.3	Rolling mills (gas fired)	0	15	15	**30**	25	0	10	**35**	0	0	**0**	44.8	Green		IPC-V

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
103.4	Cold rolling mill (without heat treatment)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
104.0	**FOUNDRY OPERATIONS**															
104.1	Cupola furnace	**0**	**0**	**0**	**0**	25	25	25	**75**	10	10	**20**	77.5	Orange		IPC-V
104.2	Induction furnace/arc furnace	0	0	0	**0**	25	30	0	**55**	10	10	**20**	59.5	Orange		IPC-V
105.0	**WIRE** DRAWING AND **WIRE** NETTING															
105.1	Wire drawing and wire netting (with pickling)	25	30	15	**70**	30	25	0	**55**	10	10	**20**	81.3	Red		IPC-V
105.2	Wire drawing and wire netting (without pickling and with heat treatment)	0	0	0	**0**	25	0	20	**45**	10	10	**20**	50.5	Green		IPC-V
105.3	Wire drawing and wire netting (without pickling and without heat treatment)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
106	**Die-casting** /extrusion process only	0	0	0	**0**	25	0	25	**50**	0	0	**0**	50	Green		IPC-V
107	Manufacturing of aluminium utensils from aluminium circles pressing/ Brass and bell **Metal** utensils manufacturing from circles (dry mechanical operation only)	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green	Emissions during buffing	IPC-V
108	Manufacturing of **Metal** caps containers etc	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V

~N~

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
109	Formulation/palletisation of camphor tablets, **Naphthalene** balls from camphor/ naphthalene powders.	0	0	0	**0**	35	20	0	**55**	0	0	**0**	55	Orange	Emissions of benzene, hydrocarbons etc. are expected.	IPC-V
110	Organic and inorganic **Nutrients** by physical mixing (without boiler and without any reactor)	0	0	0	**0**	0	0	0	**0**	10	10	**20**	20	White	The sector may become green category if it generates wastewater	IPC-V
111.0	**ORGANIC CHEMICALS INCLUDING HALOGENATED HYDROCARBONS**															
111.1	Organic chemicals including halogenated hydrocarbons (using solid/liquid fuel)	30	30	25	**85**	35	0	30	**65**	30	20	**50**	93.6	Red		IPC-I
111.2	Organic chemicals including halogenated hydrocarbons (using cleaner fuel)	30	30	25	**85**	35	0	10	**45**	30	20	**50**	92.1	Red		IPC-I
112	**Oil** and gas extraction (offshore & onshore extraction through drilling wells), Coal Bed Methane (CBM) drilling and shale gas, including group gathering stations (GGS), etc.	25	30	15	**70**	20	25	0	**45**	30	10	**40**	82.8	Red		IPC-I
113.0	**EDIBLE OIL MILLS**															
113.1	Vegetable oil manufacturing including solvent extraction and refinery /hydrogenated oils	25	25	20	**70**	25	0	20	**45**	0	0	**0**	76.8	Orange		IPC-III
113.2	Oil mills Ghani and extraction without boiler (no refining/ hydrogenation)	10	25	15	**50**	0	0	0	**0**	0	0	**0**	50	Green		IPC-III

917

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
									~P~							
114.0	**POWER GENERATION PLANTS**															
114.1	Power plants based on coal	0	15	35	**50**	35	25	35	**95**	10	70	**80**	98.3	Red		IPC-II
114.2	Power plants based on liquid fuels	0	15	35	**50**	25	25	35	**85**	30	20	**50**	92.5	Red		IPC-II
114.3	Biomass-based power plants	0	15	30	**45**	25	25	25	**75**	10	50	**60**	88.1	Red		IPC-II
114.4	Nuclear energy-based power plants (> 220 MW)	0	30	35	**65**	25	0	25	**50**	25	20	**45**	81.6	Red	Overall safety aspects related with radioactivity is regulated by Atomic Energy Regulatory Board (AERB).	IPC-II
114.5	Nuclear energy-based power plants (up to 220 MW)	0	30	35	**65**	25	0	25	**50**	25	10	**35**	79.9	Orange	Overall safety aspects related with radioactivity is regulated by Atomic Energy Regulatory Board (AERB).	IPC-II
114.6	Gas-based power plants	0	15	35	**50**	25	0	20	**45**	0	0	**0**	61.3	Orange		IPC-II
115.0	**PULP & PAPER** (AGRO & WOOD)															
115.1	Manufacturing of bleached chemical pulp, papers, and paperboards	30	30	35	**95**	30	0	35	**65**	30	30	**60**	98.1	Red		IPC-III
115.2	Unbleached or Totally Chlorine Free (TCF) bleaching for manufacturing of chemical pulp, papers, and paperboards	30	20	35	**85**	30	0	35	**65**	10	30	**40**	92.9	Red		IPC-III
115.3	Bleached grades of chemical pulp, paper, and paperboard having Totally Chlorine Free (TCF) bleaching	30	20	35	**85**	30	0	35	**65**	10	30	**40**	92.9	Red		IPC-III
116.0	**PULP AND PAPER** (RECYCLED FIBRE/WASTE PAPER BASED)															
116.1	Pulp & Paper (With bleaching)	30	15	35	**80**	25	0	25	**50**	10	30	**40**	89	Red		IPC-III
116.2	Pulp & Paper (Without bleaching, capacity ≥15 TPD)	25	15	35	**75**	25	0	25	**50**	10	30	**40**	86.3	Red		IPC-III

918

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
116.3	Pulp & Paper (Without bleaching; plant capacity <15 TPD)	25	15	20	**60**	25	0	25	**50**	10	10	**20**	74	Orange		IPC-III
117.0	MANUFACTURING OF PAINTS, VARNISHES															
117.1	Manufacturing of solvent-based paints/varnish	35	30	20	**85**	25	20	25	**70**	25	30	**55**	94.4	Red	The process may cause considerable emissions of volatile organic compounds (VOC)	IPC-I
117.2	Manufacturing of water-based paints	25	30	20	**75**	25	20	25	**70**	20	20	**40**	88.8	Red		IPC-I
117.3	Manufacturing of powder coatings	0	15	15	**30**	20	30	25	**75**	10	20	**30**	82.5	Red		IPC-I
117.4	Manufacturing of paint and varnishes (only blending and mixing)	20	30	15	**65**	0	20	0	**20**	30	20	**50**	77.3	Orange		IPC-I
118.0	**PESTICIDE** INDUSTRIES															
118.1	Pesticide technical (organic chemicals based)	30	30	20	**80**	30	25	25	**80**	30	30	**60**	94	Red		IPC-I
118.2	Pesticide technical (inorganic chemicals based like Zinc Phosphide and Aluminium Phosphide)	20	30	20	**70**	30	25	25	**80**	20	20	**40**	91	Red		IPC-I
118.3	Pesticide formulation industries (Liquid formulation only) having boiler/thermopack	20	30	20	**70**	25	20	25	**70**	20	20	**40**	86.5	Red		IPC-I
118.4	Pesticide formulation industries (Liquid formulation only) without having boiler/thermopack	20	30	20	**70**	0	20	0	**20**	20	20	**40**	79	Orange	Considering that dry formulation industries can also generate effluent because of equipment cleaning, the water pollution score is given	IPC-I
118.5	Pesticide formulation industries (having both liquid and dry formulation or dry formulation only) without having boiler / thermopack	20	30	20	**70**	30	20	0	**50**	20	20	**40**	83.5	Red	Considering that dry formulation industries can also generate effluent because of equipment cleaning, the water pollution score is given	IPC-I

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
118.6	Pesticide formulation industries (having both liquid and dry formulation or dry formulation only) having boiler / thermopack	20	30	20	**70**	30	20	25	**75**	20	20	**40**	88.8	Red	Considering that dry formulation industries can also generate effluent because of equipment cleaning, the water pollution score is given	IPC-I
119	**Photographic** film and its chemicals	20	20	15	**55**	30	0	25	**55**	20	10	**30**	74.1	Orange	Silver salts and other chemicals are used	IPC-I
120	**Petroleum** oil refineries	35	30	30	**95**	35	20	35	**90**	20	20	**40**	98.3	Red		IPC-I
121.0	**PETROCHEMICALS**															
121.1	Petrochemicals (Naphtha cracker.)	30	30	30	**90**	35	25	35	**95**	30	20	**50**	98.5	Red		IPC-I
121.2	Petrochemicals (Gas cracker)	30	30	30	**90**	35	25	25	**85**	30	20	**50**	96.8	Red		IPC-I
121.3	Petrochemicals (without cracker)	25	30	20	**75**	25	25	15	**65**	20	20	**40**	88.1	Red		IPC-I
121.4	Petrochemicals (without cracker and using cleaner/gaseous fuel)	25	30	20	**75**	25	25	10	**60**	20	20	**40**	87.5	Red		IPC-I
122.0	MANUFACTURING OF LUBRICATING OILS, GREASE AND **PETROLEUM**-BASED PRODUCTS															
122.1	Manufacturing of lubricating oils, grease, and petroleum-based products	20	15	15	**50**	25	20	10	**55**	30	10	**40**	75.3	Orange	Such unit uses distillation columns/ boilers etc	IPC-I
122.2	Manufacturing of lubricating oils, grease, and petroleum-based products (only blending)	0	0	0	**0**	0	25	0	**25**	10	10	**20**	32.5	Green		IPC-I
123.0	**PHARMACEUTICAL** INDUSTRY															
123.1	Pharmaceuticals manufacturing	35	30	30	**95**	35	25	35	**95**	30	20	**50**	98.6	Red		IPC-I
123.2	Pharmaceuticals manufacturing using cleaner/gaseous fuel	35	30	30	**95**	35	25	10	**70**	30	20	**50**	98	Red		IPC-I

920

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
123.3	Pharmaceuticals (Formulation)	20	15	15	**50**	25	0	25	**50**	30	10	**40**	72.5	Orange		IPC-I
123.4	Pharmaceuticals (Formulation) using cleaner/gaseous fuel	20	15	15	**50**	25	0	10	**35**	30	10	**40**	68.8	Orange		IPC-I
123.5	Vaccine manufacturing	20	15	15	**50**	25	0	35	**60**	30	10	**40**	78	Orange		IPC-I
123.6	Vaccine manufacturing using cleaner/gaseous fuel	20	15	15	**50**	25	0	10	**35**	30	10	**40**	68.8	Orange		IPC-I
123.7	Pharmaceutical R&D facilities	20	15	15	**50**	25	0	25	**50**	30	10	**40**	72.5	Orange		IPC-I
123.8	Ayurvedic or Unani medicines manufacturing	20	15	15	**50**	25	0	25	**50**	30	10	**40**	72.5	Orange		IPC-I
123.9	Ayurvedic or unani medicines manufacturing using cleaner fuel	20	15	15	**50**	25	0	10	**35**	0	0	**0**	58.8	Orange		IPC-I
123.10	Ayurvedic or unani medicines manufacturing (Without boiler)	20	15	15	**50**	0	0	0	**0**	0	0	**0**	50	Green		IPC-I
124	Digital **Printing** on flex /vinyl, PVC etc. (more than 5 machines)	0	0	0	**0**	20	0	0	**20**	30	10	**40**	46	Green		IPC-V
125	Spray **Painting**, Paint baking, Paint shipping	0	0	0	**0**	0	25	0	**25**	30	10	**40**	47.5	Green	Emissions in the form of VOCs and HC are generated.	IPC-V
126	**Plywood**/board manufacturing (including Veneer and laminate) with biomass fired boiler / thermic fluid heater (without resin plant)	20	20	15	**55**	25	20	25	**70**	0	0	**0**	78.3	Orange		IPC-V

276

922

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
127	**Printing** press (newspaper, books, magazines, etc./ Gravure printing	20	0	15	**35**	20	0	0	**20**	30	10	**40**	56.5	Orange		IPC-V
128	Manufacturing of bi-axially oriented **Polypropylene** (PP) film along with metalizing operations	0	15	15	**30**	0	0	0	**0**	0	0	**0**	30	Green	Mainly extrusion process involving	IPC-V
129	**Pulse**/Dal Mills	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green		IPC-V
130	Insulation and other coated **Papers** (excluding paper or pipe manufacturing)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
131	**Packaging** materials manufacturing from non-asbestos fibre, vegetable fibre yarn	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
132	**Polythene** and plastic processed products manufacturing (virgin/compostable plastic)	0	15	15	**30**	0	20	0	**20**	0	0	**0**	37	Green		IPC-V
133	**Poultry**, piggery, and hatchery	0	0	0	**0**	30	20	0	**50**	0	0	**0**	50	Green		IPC-V
134	**Puffed** rice (muri) (using gas)	0	0	0	**0**	25	0	10	**35**	0	0	**0**	35	Green		IPC-V

277

923

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
135	Biscuits trays etc from rolled **PVC** sheet (using automatic vacuum forming machines)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
136	Fountain **Pen** manufacturing by assembling only	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
137	Glass **Putty** and sealant (by mixing with machine only)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
138	Manufacturing of **Paper** Pins, U-clips, etc.	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
139	Solar **Power** generation through solar photovoltaic cell and wind power	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	~R~															
140	Synthetic **Rubber** excluding molding	20	15	15	**50**	20	0	25	**45**	20	10	**30**	68.8	Orange	Most synthetic rubber is created from two materials, styrene, and butadiene.	IPC-I
141.0	**REFRACTORIES**															
141.1	Refractories based on coal/liquid fuel (fuel consumption: 12 TPD and above)	0	0	0	**0**	25	25	30	**80**	0	0	**0**	80	Red		IPC-V
141.2	Refractories based on coal/liquid fuel (fuel consumption: less than 12 TPD)	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75	Orange		IPC-V
141.3	Refractories based on cleaner fuels	0	0	0	**0**	25	25	10	**60**	0	0	**0**	60	Orange		IPC-V
142.0	**RUBBER** PRODUCTS MANUFACTURING															

278

924

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
142.1	Tyre and tube manufacturing	0	15	15	**30**	25	25	25	**75**	0	0	**0**	78.8	Orange		IPC-V
142.2	Tyres and tubes vulcanization/ hot retreading	0	15	15	**30**	25	20	10	**55**	0	0	**0**	61.8	Orange	Emissions of PM, VOCs and obnoxious odour are generated.	IPC-V
142.3	Rubber goods industry (with solid fuel/oil-based boiler)	0	15	15	**30**	25	0	25	**50**	0	0	**0**	57.5	Orange		IPC-V
142.4	Rubber goods industry (with gas-based boiler)	0	15	15	**30**	25	0	10	**35**	0	0	**0**	44.8	Green		IPC-V
143.0	**SYNTHETIC RESINS**															
143.1	Synthetic resins manufacturing	20	15	15	**50**	25	20	25	**70**	20	10	**30**	82	Red		IPC-I
143.2	Synthetic resins manufacturing (using only gaseous fuel)	20	15	15	**50**	25	20	10	**55**	20	10	**30**	73	Orange		IPC-I
144	Blending of melamine **Resins** & different powder, additives by physical mixing, including phenolic resin (without boiler)	0	15	15	**30**	0	30	0	**30**	20	10	**30**	51	Green		IPC-I
145.0	**RICE MILLS**															
145.1 *	Parboiled rice mill (with soaking and steam/drier)	25	0	20	**45**	25	0	25	**50**	0	0	**0**	61.3	Orange		IPC-V
145.2	Raw rice mill (Without soaking and steam/drier)/ hullers)	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green		IPC-V
146	**Repairing** of electric motors and generators (dry mechanical process)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
147	Manufacturing of plastic or cotton **Rope**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V

279

925

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
148	Tyre **Retraders**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		WM-III
	RECYCLING AND REPROCESSING SECTOR															
149.0	INDUSTRIES ENGAGED IN **RECYCLING/REPROCESSING/ RECOVERY/REUSE** OF HAZARDOUS WASTE UNDER SCHEDULE IV OF H&OW(M & TBM) RULES, 2016 - ITEMS, NAMELY, SPENT CATALYSTS CONTAINING NICKEL, CADMIUM, ZINC, COPPER, ARSENIC, VANADIUM, AND COBALT, INCLUDING DRY BATTERY (EXCEPT LEAD), AND CLEARED METAL CATALYST.															
149.1	Hydro & pyro metallurgy	0	30	15	**45**	35	25	25	**85**	25	10	**35**	91	Red		WM-II
149.2	Hydro & pyro metallurgy (using cleaner/gaseous fuels & without crushing of materials)	0	30	15	**45**	35	25	10	**70**	25	10	**35**	82	Red		WM-II
149.3	Pyro metallurgy (using coal/liquid fuels)	0	0	0	**0**	35	25	25	**85**	20	10	**30**	87.3	Red		WM-II
149.4	Pyro metallurgy (using cleaner/gaseous fuels)	0	0	0	**0**	35	25	10	**70**	20	10	**30**	74.5	Orange		WM-II
149.5	Hydro metallurgy	0	30	15	**45**	30	25	0	**55**	25	10	**35**	73	Orange		WM-II
150.0	E-WASTE DISMANTLING / **RECYCLING**															
150.1	Industry engaged in recycling of e-waste generated from the electrical and electronic Equipment (EEE) listed in the E-Waste (Management) Rules 2022 using pyro/ hydro/ electro-metallurgical processing and recycling of plastic separated from Waste EEE	30	30	20	**80**	35	25	15	**75**	25	20	**45**	92	Red		WM-III

280

926

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
150.2	Industry engaged in recycling of e-waste generated from the electrical and electronic equipment (EEE) listed in the E-Waste (Management) Rules 2022 (PCB processing limited to only mechanical processing and separation without pyro/ hydro/ electro-metallurgical processing), production of Al, Cu, and other metals from non-PCB sources and/or recycling of plastic separated from Waste EEE.	0	15	15	**30**	20	25	15	**60**	25	10	**35**	73	Orange		WM-III
150.3	Industry engaged in dismantling (only) of e-waste, generated from the electrical and electronic equipment (EEE) listed in the E-Waste (Management) Rules 2022	0	0	0	**0**	0	25	0	**25**	25	10	**35**	43.1	Green		WM-III
150.4	E-waste refurbishing centres	0	0	0	**0**	0	25	0	**25**	25	10	**35**	43.1	Green		WM-III
151.0	INDUSTRIES ENGAGED IN **RECYCLING/REPROCESSING/ RECOVERY/REUSE** OF HAZARDOUS WASTE (Items as per Schedule IV of H&OW(M & TBM) Rules, 2016.)															
151.1	Lead Recycling (Lead Acid Batteries with Acids; Lead Scrap Recycling) Rotary Furnace/ Pit Furnace (Mandir/Canopy Bhatti)	0	30	20	**50**	35	30	25	**90**	20	20	**40**	94.5	Red	This also includes battery scrap, namely: Lead battery plates covered by ISRI, Code word "Rails" Battery lugs covered by ISRI, Code word "Rakes." Scrap drained/dry while intact, lead batteries covered by ISRI, Code word "rains."	WM-II

281

927

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
151.2	Lead Recycling (Drained Lead Acid Batteries; Lead Scrap Recycling) Rotary Furnace/Mandir Bhatti on Cleaner Fuel	0	30	15	**45**	35	30	10	**75**	20	10	**30**	84.4	Red	This also includes, battery scrap, namely: Lead battery plates covered by ISRI, Code word "Rails" Battery lugs covered by ISRI, Code word "Rakes." Scrap drained/dry while intact, lead batteries covered by ISRI, Code word "rains."	WM-II
151.3	Isolated storages (as defined under Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989 as amended)	10	25	15	**50**	20	25	0	**45**	30	10	**40**	71.3	Orange		IPC-I
151.4	Paint and ink sludge / residues recycling	20	25	15	**60**	0	20	0	**20**	30	10	**40**	72	Orange		WM-II
151.5	Industries engaged in recycling / reprocessing/ recovery/reuse of Hazardous Waste, excluding lead, paint, and ink sludge	0	30	15	**45**	35	0	25	**60**	20	10	**30**	75	Orange	This includes items namely - Brass Dross, Copper Dross, Copper Oxide Mill Scale, Copper everts, Cake & Residues, Waste Copper and copper alloys in dispersible form, Slags from copper processing for further processing or refining, Insulated Copper Wire, Scrap/copper with PVC sheathing including ISRI-code material namely "Druid" Jelly filled Copper cables, Zinc Dross-Hot dip Galvanizers SLAB,. Zinc Dross-Bottom Dross, Zinc ash/Skimming arising from galvanizing and die casting operations, Zinc ash/Skimming/other zinc bearing wastes arising from smelting and refining,, Zinc ash and residues including zinc alloy residues in dispersible form.	WM-II

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
151.6	Refining of used oil by hydro-treating/using solvent extraction	10	25	25	**60**	25	0	25	**50**	20	20	**40**	78	Orange		WM-II
151.7	Refining of used oil by using thin film evaporation/vacuum distillation with clay treatment	10	25	15	**50**	25	0	15	**40**	20	10	**30**	67.5	Orange		WM-II
151.8	Recycling / reprocessing of waste oil	20	25	15	**60**	25	0	15	**40**	20	10	**30**	74	Orange		WM-II
152.0	**RECYCLING OF PLASTIC WASTE**															
152.1	Manufacturing of flakes/staple fibre/strip from the recycling of PET bottles	20	15	25	**60**	0	20	0	**20**	0	0	**0**	64	Orange		IPC-I
152.2	Plastic waste processing (manufacturing of flakes/granules)	20	15	15	**50**	0	20	0	**20**	0	0	**0**	55	Orange	Process using In-built heaters. Washwater and fugitive emission.	UPC-II
153.0	**SCRAPING FACILITIES FOR RECYCLING END-OF-LIFE VEHICLES, WAGONS, AND COACHES**															
153.1	Collection, Depollution and Dismantling Centers (Without shredding)	0	30	15	**45**	0	30	0	**30**	25	10	**35**	62.9	Orange		WM-II
153.2	Collection, Depollution, Dismantling and shredding Centers	0	30	15	**45**	0	30	0	**30**	25	10	**35**	62.9	Orange		WM-II
153.3	Common Shredders (Standalone)	0	0	0	**0**	0	30	0	**30**	25	10	**35**	44.8	Green		WM-II
153.4	Collection Centers (Without depollution, dismantling and shredding)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		WM-II
	~S~															
154	**Sugar** (excluding khandsari/jaggery)	30	25	35	**90**	25	0	25	**50**	30	10	**40**	94.5	Red	Generates large volume of wastewater.	IPC-III

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
155	**Ship** breaking industries	0	0	0	**0**	0	30	0	**30**	30	20	**50**	57.5	Orange	Ship breaking releases a large number of pollutants, including toxic waste, used/waste oil, poly-chlorinated biphenyls, and heavy metals.	WM-III
156	**Slaughterhouse** / **Slaughterhouse** (with rendering plant)/ integrated slaughtering unit, meat processing units, bone mill, processing of animal horns, hoofs and other body parts	30	25	30	**85**	25	20	25	**70**	0	0	**0**	90.3	Red		IPC-IV
157	Manufacturing of **Silica** gel	10	25	20	**55**	30	0	20	**50**	25	10	**35**	74.1	Orange		IPC-I
158	Manufacturing of Iodized **Salt** from Crude / Raw Salt	10	20	15	**45**	25	0	25	**50**	0	0	**0**	61.3	Orange	Process may involve boiling in evaporators (multiple effect evaporators), centrifuging, iodization, mixing, etc.	IPC-V
159	Manufacturing of **Starch** / Sago / Sorbitol	20	25	25	**70**	25	0	25	**50**	0	0	**0**	77.5	Orange		IPC-III
160	**Stone** crushers	0	0	0	**0**	25	30	0	**55**	0	0	**0**	55	Orange		IPC-V
161	**Stone** crushing/grinding/washing & screening of riverbed material(s)	10	0	25	**35**	25	30	0	**55**	0	0	**0**	62.9	Orange		IPC-V

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
162.0	**MANUFACTURING OF SURGICAL AND MEDICAL PRODUCTS**															
162.1	Manufacturing of **Surgical** and medical products	10	25	15	**50**	25	0	10	**35**	0	0	**0**	58.8	Orange		IPC-V
162.2	Surgical and medical products assembled only (with effluent-generating processes)	10	25	15	**50**	0	0	0	**0**	0	0	**0**	50	Green		IPC-V
162.3	Surgical and medical products assembled only (without effluent-generating processes)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
163.0	**SEMICONDUCTOR MANUFACTURING INDUSTRIES**															
163.1	Semiconductor fabs manufacturing	25	30	35	**90**	35	30	0	**65**	25	10	**35**	95	Red	i. Toxic wastewater is generated due to presence of Hydrofluoric acid (HF), Mixed Nitric HF ($HF+HNO_3$), Phosphoric acid, Sulphuric acid (H_2SO_4), Hydrogen Peroxide, Isopropyl alcohol (IPA) / Methanol (Methanol Only), Stripper EKC-265 /ACT N396 (ACT N396 Only), BHF – 63 U, Choline etchant, etc. ii. The air pollutants which are being emitted during the manufacturing process are SiH_4, PH_3, B_2H_6, HF, HBr, DCS, NF_3, SF_6, BCl_3, Cl_2, HCL, NH_3, $C2F_6$, CHF_3, CF_4, C_4F_8, C_2F_6 etc. iii. Process waste, used oil etc. are generated as hazardous waste.	WM-III
163.2	Display fabs manufacturing	25	30	35	**90**	25	30	0	**55**	25	10	**35**	94.5	Red		WM-III
163.3	Sensor fabs manufacturing/ Compound semiconductors/ silicon photonics	25	30	35	**90**	25	30	0	**55**	25	10	**35**	94.5	Red		WM-III
163.4	Semiconductor Assembly, Testing, Marking and Packaging Facility (ATMP)	0	0	0	**0**	0	25	0	**25**	25	10	**35**	43.1	Green		WM-III
164	**Saw** mills	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green		IPC-V

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
165	**Spice** grinding	0	0	0	**0**	0	30	0	**30**	0	0	**0**	30	Green		IPC-V
166	Cutting, **Sizing** and polishing of marble, granite and other stones	10	0	20	**30**	0	30	0	**30**	0	0	**0**	40.5	Green		IPC-V
167	Manufacturing of **Solar** module/ non-conventional energy apparatus	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	~T~															
168.0	**TANNERIES**															
168.1	Tanneries (Raw to finish)	35	30	25	**90**	0	20	0	**20**	25	30	**55**	93.8	Red		IPC-IV
168.2	Tanneries (Raw to wet blue)	35	30	25	**90**	0	20	0	**20**	25	30	**55**	93.8	Red		IPC-IV
168.3	Tanneries (Wet blue to finish)	35	30	20	**85**	0	20	0	**20**	25	30	**55**	90.6	Red		IPC-IV
168.4	Vegetable tanning	20	25	25	**70**	0	20	0	**20**	20	10	**30**	77.5	Orange		IPC-IV
169.0	MANUFACTURING OF **TOOTH** POWDER, TOOTHPASTE, TALCUM POWDER AND OTHER COSMETIC ITEMS															
169.1	Manufacturing of toothpaste and other cosmetic items	20	25	20	**65**	25	0	25	**50**	0	0	**0**	73.8	Orange		IPC-V
169.2	Manufacturing of tooth powder, talcum powder	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
170.0	**THERMOMETER** MANUFACTURING															
170.1	Glass (mercury based) thermometer manufacturing	10	30	15	**55**	25	0	10	**35**	25	10	**35**	70.8	Orange	Process involves making of glass bulb, forming reservoir in the glass tube for fluid, inserting fluid, scale marking. Use of fuel to heat the glass tubes and hydrofluoric acid to seal the scaling. Small quantities of spent acids are generated.	IPC-V
170.2	Digital thermometer manufacturing	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V

931

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
171	Manufacturing of **Teflon**-based products	10	0	15	**25**	25	25	25	**75**	0	0	**0**	78.1	Orange	Due to spraying applications, emissions (HC) are generated	IPC-V
172	**Thermocol** manufacturing (with boiler)	0	20	15	**35**	25	0	25	**50**	0	0	**0**	58.8	Orange		IPC-V
173.0	MANUFACTURING OF **TOBACCO** PRODUCTS INCLUDING CIGARETTES AND TOBACCO PROCESSES															
173.1	Manufacturing of tobacco products including cigarettes and tobacco processes (with boiler)	20	0	15	**35**	25	20	25	**70**	0	0	**0**	75.3	Orange		IPC-III
173.2	Manufacturing of tobacco products including cigarettes and tobacco processes (without boiler)	20	0	15	**35**	0	20	0	**20**	0	0	**0**	41.5	Green		IPC-III
174	**Transformer** repairing/ manufacturing (dry process only)	0	0	0	**0**	0	25	0	**25**	30	10	**40**	47.5	Green		IPC-V
175	**Tyre** Pyrolysis Oil Industries-Applicable for advanced batch automated process / continuous TPO units	10	0	15	**25**	25	25	25	**75**	0	0	**0**	78.1	Orange		WM-III
176	**Tamarind** powder manufacturing	10	15	15	**40**	25	0	10	**35**	0	0	**0**	50.5	Green	Dried tamarind fruits are cleaned, soaked, and boiled in steam jacketed kettle. Then pulp is extracted in pulper and dried in drum type drier.	IPC-V

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
177.0	**TEA PROCESSING AND BLENDING**															
177.1	Tea processing (with boiler)	10	0	15	**25**	25	0	25	**50**	0	0	**0**	56.3	Orange		IPC-III
177.2	Tea processing (without boiler)	10	0	15	**25**	0	0	0	**0**	0	0	**0**	25	Green		IPC-III
177.3	Blending and packing of tea	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	TEXTILE SECTOR															
178.0	**TEXTILE INDUSTRY**															
178.1	Yarn / Textile processing involving any effluent/emission generating processes including bleaching, dyeing, printing, and colouring, including the garment and apparel manufacturing industry	30	30	30	**90**	25	0	35	**60**	30	20	**50**	95.5	Red		IPC-III
178.2	Yarn to grey fabric manufacturing with water jet machines	20	25	25	**70**	0	0	0	**0**	0	0	**0**	70	Orange		IPC-III
178.3	Garment and apparel manufacturing industry including Doubling / Reeling / TFO-Two for one unit (dry process)-with boiler	0	0	0	**0**	25	0	25	**50**	0	0	**0**	50	Green		IPC-III
178.4	Garment and apparel manufacturing industry including Doubling / Reeling / TFO-Two for one unit (dry process)-without boiler	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-III
179.0	**SAREE/FABRIC PRINTING** BY SCREEN / WOODEN BLOCK /HAND BLOCK															
179.1	Saree/fabric printing by screen / wooden block/hand block	25	0	25	**50**	25	0	20	**45**	30	10	**40**	71.3	Orange		IPC-III
179.2	Hand block printing without effluent generation	0	0	0	**0**	25	0	20	**45**	0	0	**0**	45	Green		IPC-III

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
180.0	**TEXTILE** SPINNING, SIZING AND WEAVING MILLS															
180.1	Textile spinning, sizing and weaving mills (wastewater generation≥ 10 KLD)	10	20	20	**50**	25	0	15	**40**	0	0	**0**	60	Orange		IPC-III
180.2	Textile spinning, sizing and weaving mills (wastewater generation <10 KLD)	10	20	15	**45**	25	0	10	**35**	0	0	**0**	54.6	Green		IPC-III
181	**Power looms** (without dye and bleaching)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-III
182.0	REPROCESSING OF WASTE **TEXTILE** FABRIC															
182.1	Integrated facility for reprocessing of waste textile fabric (including washing, bleaching, dyeing etc.)	30	30	20	**80**	25	25	15	**65**	0	0	**0**	86.5	Red		IPC-III
182.2	Reprocessing of waste textile fabric (dry process)	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-III
183	**Cotton and woollen Hosiers** making (Dry process only without any dying / washing operation)	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0	White		IPC-V
	~W~															
184	Seasoning of **Wood** in steam heated chamber	0	0	0	**0**	25	0	25	**50**	0	0	**0**	50	Green		IPC-V
185	Pulverization of bamboo and scrap **Wood**	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25	Green		IPC-V
186	Distilled **Water** (without boiler) with electricity as source of heat	0	20	20	**40**	0	0	0	**0**	0	0	**0**	40	Green		IPC-V

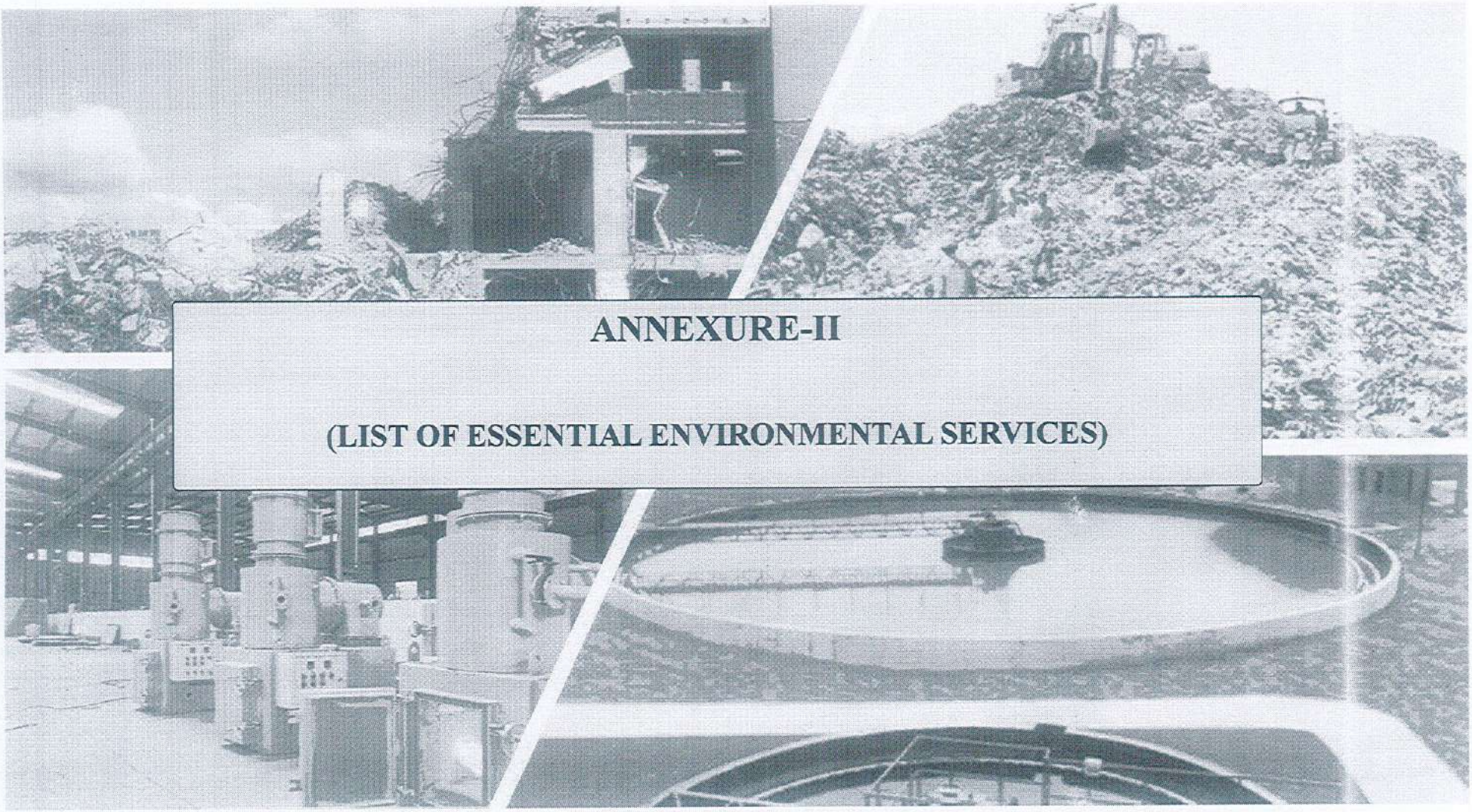
289

935

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
187	Purification of **Water** and packaging (mineralized/non-mineralized water)	0	20	25	**45**	0	0	0	**0**	0	0	**0**	45	Green	RO Rejects.	IPC-V

290

936



ANNEXURE-II

(LIST OF ESSENTIAL ENVIRONMENTAL SERVICES)

291

937

LIST OF ESSENTIAL ENVIRONMENTAL SERVICES

i. Essential Environmental Services for Industrial Waste Management

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
1.0	**COMMON EFFLUENT TREATMENT PLANT (CETP)**															
1.1	CETP having MEE/spray drier	30	30	35	**95**	25	0	25	**50**	25	50	**75**	98.1	Red		IPC-VII
1.2	CETP (without having MEE/spray drier), Common MEE/common spray driers	25	30	30	**85**	0	0	0	**0**	25	30	**55**	89.1	Red		IPC-VII
1.3	Common Sewage-Effluent Treatment Plant (CSETP)	25	30	30	**85**	0	0	0	**0**	25	20	**45**	88.4	Red		WQM-I & IPC-VII
2.0	Effluent conveyance projects	20	30	35	**85**	0	0	0	**0**	25	10	**35**	87.6	Red	Such projects during O&M operation will generate deposited sludge, spillage etc. in addition regular operation of handling of effluent and its disposal.	IPC-VII
3.0	**COMMON HAZARDOUS WASTE TREATMENT, STORAGE AND DISPOSAL FACILITY**															
3.1	Integrated facility (Secured landfill and incinerator)	35	30	15	**80**	25	25	15	**65**	30	70	**100**	100.0	Red		WM-II
3.2	Only secured landfill	35	30	15	**80**	0	25	0	**25**	25	70	**95**	97.6	Red		WM-II
3.3	Only incinerator	35	30	15	**80**	25	25	15	**65**	30	70	**100**	100.0	Red		WM-II
4.0	**COMMON BIO-MEDICAL WASTE TREATMENT FACILITY (CBWTF)**															
4.1	CBWTF	20	25	20	**65**	35	20	25	**80**	20	20	**40**	90.5	Red		WM-I
4.2	CBWTF using cleaner/gaseous fuel	20	25	20	**65**	35	20	10	**65**	20	20	**40**	83.4	Red		WM-I

292

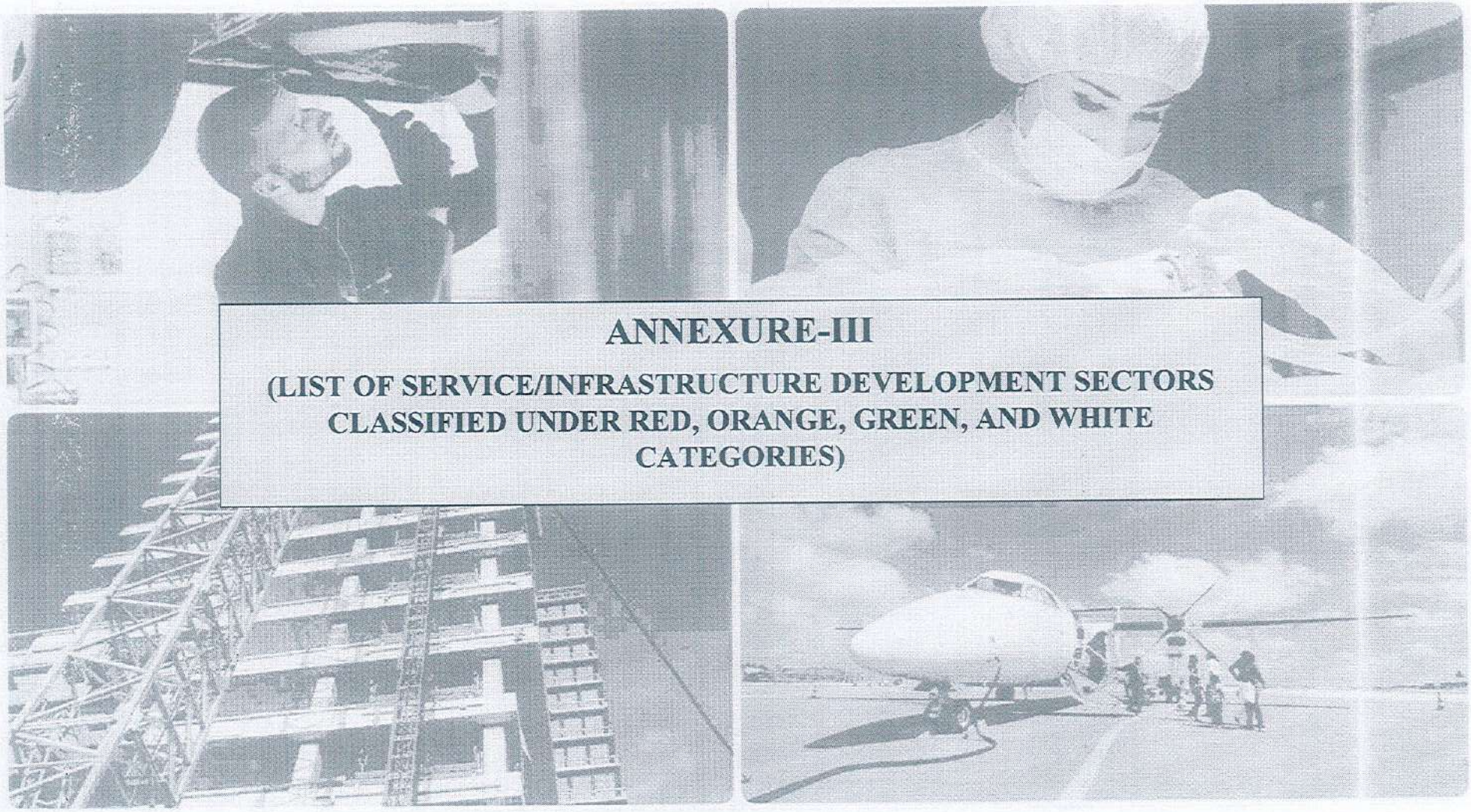
938

ii. LIST OF BLUE CATEGORY SECTORS- Essential Environmental Services for Domestic/Household Activities:

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
1.0	**MUNICIPAL SOLID WASTE MANAGEMENT FACILITY**															
1.1	Municipal Solid Waste Management Facility (Sanitary landfill/ Integrated Sanitary landfill with material recycling facility/ refused derived fuel, etc.)	35	30	15	**80**	35	25	0	**60**	0	0	**0**	86.0	Blue		UPC-II
1.2	Waste to energy power plants	0	15	30	**45**	35	25	35	**95**	10	50	**60**	97.6	Blue		UPC-II
1.3	Bio-mining of legacy waste projects	35	30	25	**90**	35	25	0	**60**	0	0	**0**	93.0	Blue		UPC-II
1.4	Municipal Solid Waste Bio-methanation plant (Quantity of MSW ≥ 5 TPD)	30	25	25	**80**	0	20	0	**20**	0	0	**0**	82.0	Blue		UPC-II
1.5	Municipal Solid Waste Composting Facility (Quantity of MSW ≥ 5 TPD)	30	25	15	**70**	0	30	0	**30**	0	0	**0**	74.5	Blue		UPC-II
1.6	Municipal Solid Waste Material Recovery Facility (Quantity of MSW ≥ 5 TPD)	20	25	15	**60**	0	30	0	**30**	0	0	**0**	66.0	Blue		UPC-II
2.0	Construction and Demolition (C&D) Waste Processing Plants	10	0	15	**25**	25	25	0	**50**	0	0	**0**	56.3	Blue	Wastewater of high TDS of inorganic nature is generated.	UPC-I
3.0	**SEWAGE TREATMENT PLANT**															
3.1	Sewage Treatment Plant (5 MLD and above)	20	0	35	**55**	0	20	0	**20**	0	0	**0**	59.5	Blue		WQM-I
3.2	Sewage Treatment Plant (less than 5 MLD)	20	0	25	**45**	0	20	0	**20**	0	0	**0**	50.5	Blue		WQM-I

293

939



ANNEXURE-III

(LIST OF SERVICE/INFRASTRUCTURE DEVELOPMENT SECTORS CLASSIFIED UNDER RED, ORANGE, GREEN, AND WHITE CATEGORIES)

940

SERVICE/INFRASTRUCTURE DEVELOPMENT SECTORS

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
1.0	**STANDALONE GENERATOR SET** (Genset)															
1.1	Genset(s) of total capacity ≥ 1 MVA, using liquid fuel	0	0	0	**0**	25	0	25	**50**	30	10	**40**	60.0	Orange	i. Standalone genset(s) of total capacity less than 1000 KVA may not require additional classification. The used oil/waste oil generated during repair and maintenance need to be disposed through authorized hazardous waste recycler by service provider/OEM. ii. Projects such data centers etc. having pollution potential due to gensets only, may be classified based on the capacity and fuel used.	UPC-I
1.2	Genset(s) of total capacity ≥ 1 MVA, using cleaner/gaseous fuel	0	0	0	**0**	25	0	10	**35**	30	10	**40**	50.5	Green		UPC-I
2.0	Airports	20	0	35	**55**	25	0	25	**50**	30	10	**40**	75.3	Orange	Airports generates mainly domestic sewage as wastewater. Emissions and generation of hazardous waste due to overall operations in airport are considered.	UPC-I
3.0	**HEALTH CARE FACILITIES (HCFS, AS DEFINED UNDER BIO-MEDICAL WASTE MANAGEMENT RULES, 2016)**															
3.1	HCFs with captive incinerator, irrespective of number of beds	20	0	15	**35**	35	20	25	**80**			**50**	88.5	Red	Sector generates bio-medical waste. As per methodology scores assigned to H.	WM-I
3.2	more than 1000 bedded HCFs	20	0	35	**55**	0	0	0	**0**			**100**	100.0	Red		WM-I
3.3	501 to 1,000 bedded HCFs	20	0	30	**50**	0	0	0	**0**			**80**	85.0	Red		WM-I
3.4	201 to 500 bedded HCFs	20	0	30	**50**	0	0	0	**0**			**60**	70.0	Orange		WM-I
3.5	51 to 200 bedded HCFs	20	0	20	**40**	0	0	0	**0**			**50**	60.0	Orange		WM-I
3.6	11 to 50 bedded HCFs	20	0	20	**40**	0	0	0	**0**			**40**	52.0	Green		WM-I
3.7	Up to 10 bedded HCFs	20	0	15	**35**	0	0	0	**0**			**30**	44.8	Green		WM-I
3.8	Non-bedded HCFs	0	0	0	**0**	0	0	0	**0**			**25**	25.0	Green		WM-I

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
4.0	**HOTELS/BANQUET HALLS HAVING ROOM FACILITY**															
4.1	Hotels (above 3 star) or having 100 & above rooms	20	25	30	**75**	25	0	25	**50**	0	0	**0**	81.3	Red		UPC-I
4.2	Hotels (above 3 star) or having 100 & above rooms (based on cleaner /gaseous fuel)	20	25	30	**75**	25	0	10	**35**	0	0	**0**	79.4	Orange		UPC-I
4.3	Hotels (up to 3 star) or having more than 20 rooms but less than 100 rooms.	20	25	20	**65**	25	0	25	**50**	0	0	**0**	73.8	Orange		UPC-I
4.4	Up to 20 rooms	10	25	15	**50**	0	0	10	**10**	0	0	**0**	52.5	Green		UPC-I
5.0	**RAILWAY LOCOMOTIVE WORK SHOP/ INTEGRATED ROAD TRANSPORT WORKSHOP/ AUTHORIZED SERVICE CENTERS**															
5.1	Railway locomotive work shop/ Integrated road transport workshop/ Authorized service centers (wastewater generation ≥ 10 KLD)	20	25	25	**70**	30	25	0	**55**	30	10	**40**	84.3	Red		IPC-V
5.2	Railway locomotive work shop/ Integrated road transport workshop/ Authorized service centers (wastewater generation <10 KLD)	20	25	15	**60**	30	25	0	**55**	30	10	**40**	79.0	Orange		IPC-V
6.0	**RAILWAY STATIONS**															
6.1	Railway Stations (Wastewater Generation ≥ 5 MLD)	20	0	35	**55**	25	0	25	**50**	30	10	**40**	75.3	Orange	Wastewater generating from public toilets, public taps, platform, and apron washing, coach cleaning, laundry, restaurants etc. Emissions and generation of hazardous waste due to overall operations are considered.	UPC-I
6.2	Railway Stations (Wastewater Generation ≥ 100 KLD, but < 5 MLD)	20	0	15	**35**	0	0	0	**0**	0	0	**0**	35.0	Green	Wastewater generating from various domestic uses as public toilets, public taps, platforms, and apron washing, restaurants etc.	UPC-I

941

296

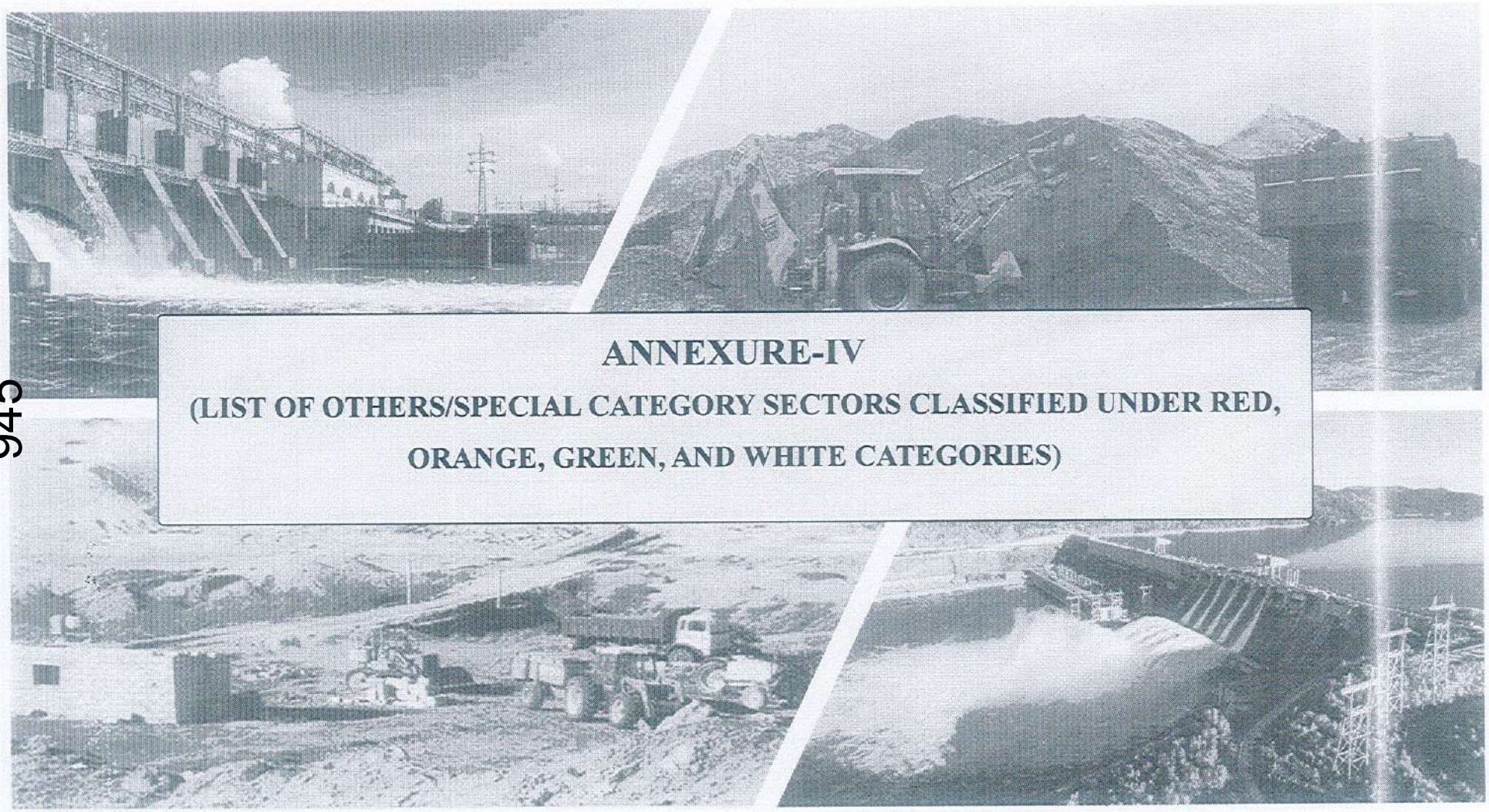
942

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
7.0	**RAILWAY SIDINGS**															
7.1	Railway sidings / Mineral stock yard	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25.0	Green	Fugitive emissions due to loading, unloading, storage and transportation of the minerals.	UPC-I
7.2	Railway sidings only for defence purpose	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0.0	White		UPC-I
8.0	**PORTS AND HARBOURS**															
8.1	Ports and harbours, jetties and dredging operations	20	30	25	**75**	0	25	0	**25**	30	20	**50**	84.4	Red		WM-I
8.2	Ports and harbours (only containers handling)/ Captive jetties	20	25	20	**65**	0	25	0	**25**	30	10	**40**	76.4	Orange		WM-I
9.0	Automobile service stations/ workshops	20	25	20	**65**	20	0	0	**20**	30	10	**40**	75.5	Orange		IPC-V
10.0	**BUILDING CONSTRUCTION PROJECTS**															
10.1	Building construction project ≥ 20,000 sq. m. built-up area	20	0	25	**45**	25	0	25	**50**	0	0	**0**	61.3	Orange	i. During the construction phase, the sector is mainly air polluting. However, in post construction phase it is mainly water polluting due to generation of sewage. Consent to Establish/Operate to be taken as per EC conditions, as applicable. ii. Building construction project ≥ 5,000 sq. m., but < 20,000 sq. m. built-up area (with connectivity to terminal STP) may not require separate classification. iii. For projects < 5000 the wastewater shall be managed according to on-site sanitation methods as mentioned in the Manual on Sewerage and Sewage Treatment System (2013), published by the	UPC-I
10.2	Building construction project ≥ 5,000 sq. m., but < 20,000 sq. m. built-up area (without connectivity to terminal STP)	20	0	20	**40**	0	0	0	**0**	0	0	**0**	40.0	Green		UPC-I

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
															Central Public Health and Environmental Engineering Organisation (CPHEEO), and as amended from time to time.	
11.0	Standalone mechanized laundry (using boiler)	20	0	20	**40**	25	0	25	**50**	0	0	**0**	60.0	Orange		IPC-V
12.0	New highway construction project	0	0	0	**0**	25	25	25	**75**	0	0	**0**	75.0	Orange	Such projects involve use of hot mix plants, ready-mix concrete plants, construction activities generating fugitive emissions, etc.	UPC-I
13.0	**DAIRY FARM**															
13.1	Dairy Farm (having more than 500 animals)	30	25	25	**80**	0	20	0	**20**	0	0	**0**	82.0	Red	Dairy farms having less than 15 animals do not require separate classification.	IPC-IV
13.2	Dairy Farm (having 101 to 500 animals)	30	25	20	**75**	0	20	0	**20**	0	0	**0**	77.5	Orange		IPC-IV
13.3	Dairy Farm (having 15 to 100 animals)	30	25	15	**70**	0	20	0	**20**	0	0	**0**	73.0	Orange		IPC-IV
14.0	Gold Assaying & Hallmarking Centres	0	0	0	**0**	35	0	0	**35**	25	10	**35**	46.4	Green	Lead oxide, nitrous fumes are generated during cupellation and parting acid treatment, respectively contributing to the air emissions.The hazardous waste is generated during fire assay in the form of spent cupels bearing lead, spent acid, scrubbed water etc.	IPC-V
15.0	Facility of handling, storage, and transportation of food grains in bulk	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25.0	Green		IPC-V
16.0	Flyash export or disposal operations	0	0	0	**0**	0	25	0	**25**	0	0	**0**	25.0	Green		IPC-V

943

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
17.0	Oil and gas transportation pipeline (excluding pipeline covered under definition of isolated storage of hazardous chemicals, as per Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989)	0	0	0	**0**	25	0	10	**35**	0	0	**0**	35.0	Green		IPC-I
18.0	Gaushalas	20	0	15	**35**	0	20	0	**20**	0	0	**0**	41.5	Green		IPC-IV
19.0	Household bio-digesters/gobar-gas (cow-dung) plants based on biodegradable wastes, etc.	0	0	0	**0**	0	20	0	**20**	0	0	**0**	20.0	White		IPC-V



ANNEXURE-IV

(LIST OF OTHERS/SPECIAL CATEGORY SECTORS CLASSIFIED UNDER RED, ORANGE, GREEN, AND WHITE CATEGORIES)

300

946

OTHERS/SPECIAL CATEGORY SECTORS

S. No.	Sector	W1	W2	W3	PI_W	A1	A2	A3	PI_A	H1	H2	PI_H	Pollution Index (PI)	Category	Remarks	Concerned Division
1.0	**HYDEL POWER PLANTS INCLUDING PUMPED STORAGE PROJECTS**															
1.1	Hydel power plants (Capacity > 50 MW)													Red	PI may be considered as 90.	IPC-II
1.2	Mini Hydel power plants (Capacity from more than 25 MVA and up to 50 MW)													Orange	PI may be considered as 67.5.	IPC-II
1.3	Mini Hydel power plants (Capacity ≤ 25 MW)													White	PI may be considered as 12.5.	IPC-II
2.0	**SAND / RIVERBED MATERIAL MINING FROM RIVERBED AND ITS FLOODPLAINS** (excluding manual excavation)															
2.1	Mining lease area more than 5 hectares or Mining lease area up to 5 hectares which is part of cluster mining													Red	i. Sand / riverbed material mining from riverbed and its floodplains may cause ecological disturbances, erosion of riverbed, change in hydro-geological conditions & river ecosystem, etc.	IPC-II
2.2	Standalone mining lease area up to five hectares in areas (not a part of any cluster mining)													Orange	ii. Cluster mining means that the distance of mining lease area is less than 500 m from periphery of another lease area. iii. This categorization is made considering the ecological damages and not based on pollution potential/index. iv. Cluster mining as defined in 'Enforcement & Monitoring Guidelines for Sand Mining, 2020', issued by MoEF&CC. v. PI may be considered as 90 and 67.5 for red and orange category, respectively.	IPC-II

301

947

ANNEXURE-V

FORMAT FOR SUBMISSION OF INFORMATION BY SPCBS/PCCS REGARDING SECTORS CLASSIFIED UNDER WHITE CATEGORY

S. No.	Sector	Water Pollutant Score (PI_W)				Air Pollutant Score (PI_A)				Waste Pollutant Score (PI_H)			Pollution Index (PI)	Remarks (including brief description of process and pollution potential)
		W1	W2	W3	W	A1	A2	A3	A	H1	H2	H		



A tool for progressive environmental Management

CPCB

Central Pollution Control Board

"Parivesh Bhawan", East Arjun Nagar, Delhi -110032

Annexure No. R1- 5

Epidemiological study of morbidity patterns in the population of Bawana region in North-West District of Delhi



PROJECT REPORT

Submitted By Dr. Nidhi Yadav

IIHMR DELHI

International Institute of Health Management Research

(IIHMR)

Plot no 3, Sector 18 A, Dwarka, New Delhi

Website: iihmrdelhi.edu.in

Email for correspondence: director.delhi@iihmrdelhi.edu.in

Team Composition

List of Contributors		
1	Dr. Sutapa B. Neogi	Advisor
2.	Dr. Nidhi Yadav	Principal Investigator
3.	Dr. Ratika Samtani	Co-PI
4.	Ms. Ritika	Research Officer
5.	Ms. Pranjali Joshi	Research Officer

Director's Note

It is with great pride that I present the report titled ***"Epidemiological Study of Morbidity Patterns in the Population of Bawana Region in North-West District of Delhi"***. This study represents a significant milestone in our ongoing commitment at International Institute of Health Management Research, Delhi to enhance public health research and evidence-based interventions for marginalized and underserved communities.

The Bawana region, with its socio-economic and environmental landscape, presents a compelling case for targeted health research. This study serves as a critical step in understanding the prevailing health conditions, identifying risk factors, and creating data-driven strategies to address the pressing health challenges faced by this community. By undertaking this initiative, we aim to bridge gaps in public health understanding and facilitate sustainable development interventions that resonate with the needs of the people.

This project aligns closely with the Ministry of Environment, Forest & Climate Change, Govt. of India's directive, which emphasizes the necessity of assessing the potential health impacts of large-scale industrial projects. The proposed Greenfield initiative by the OP Jindal Group to establish a 30 MW waste-to-energy plant underscores the importance of integrating public health considerations into environmental management strategies. By conducting this epidemiological study within a 5-kilometer radius of the proposed plant, we aim to provide actionable insights into endemic diseases and health risks, ensuring that community well-being remains a central focus of development efforts.

At IIHMR Delhi, we are driven by a mission to advance health systems research and contribute to the well-being of communities. This study reflects our multidisciplinary approach,

combining public health expertise, epidemiological analysis, and community engagement. The findings and recommendations of this report will not only inform policy and decision-making but also foster collaboration among stakeholders to create a healthier, more resilient Bawana.

I extend my heartfelt appreciation to the research team (Dr. Nidhi Yadav (PI), Dr. Ratika Samtani (Co- PI), Ms. Ritika (Research Officer), Ms. Pranjali Joshi (Research Officer), community members, and stakeholders (Dr. Preetha G.S. (Dean Research), Dr. Sanghamitra Acharya (Chair IRB) and other members of the Institutional Review Board who have contributed to this research. Your dedication and efforts have been instrumental in realizing the objectives of this study.



Professor Sutapa B. Neogi
Director, IIHMR Delhi

ACKNOWLEDGEMENT

*As the Principal Investigator of this project entitled "**Epidemiological study of morbidity patterns in the population of Bawana region in North-West District of Delhi"**, I would like to convey my heartfelt thanks to*

*I would like to express my sincere gratitude to our Director & Advisor, **Professor Sutapa B Neogi** for her supervision, advice, and guidance for the study as well as giving me extraordinary experiences that I will cherish as a significant part of my life. Above all and the most needed, she provided me unflinching encouragement and support in various ways. The present study could be completed only due to her spontaneous help, supervision, inspiration, and encouragement whenever needed. I thank her immensely for introducing me to a new horizon of research.*

I would like to offer my sincere thanks to Dr Ratika Samtani who was a pillar for the report preparation and guided us at all stages. I thank her for supporting me at all levels starting from planning, field implementation, and overall execution of the project.

Finally, I would like to thank our research officers Ms. Ritika and Ms Pranjali. who provided the necessary guidance and support for conducting the interviews. They were duly supported by Mr. Prashant Sharma.

Thanking You

Dr. Nidhi Yadav

Associate Professor, IIHMR Delhi

nidhi@iihmrdelhi.edu.in

Institutional Overview

International Institute of Health Management Research (IIHMR), New Delhi

The International Institute of Health Management Research (IIHMR), based in New Delhi, is an esteemed institute dedicated to advancing healthcare management, policy analysis, and research in India and the Asia-Pacific region. Since its establishment in 2008 under the Society for Indian Institute of Health Management Research (founded in 1984), IIHMR-Delhi has been at the forefront of fostering sustainable and effective solutions within healthcare, hospital administration, and health policy. With a vision to create a robust healthcare management system, the institute has grown into an internationally recognized autonomous institution, equipped to meet the rising demands of a dynamic and ever-evolving healthcare sector.

Academic Excellence and Capacity Building

IIHMR-Delhi offers diverse programs focused on healthcare, hospital management, and public health administration at both master's and doctoral levels. These programs aim to equip students with the knowledge, skills, and ethical grounding needed to become effective healthcare managers. The institute's comprehensive curriculum covers critical aspects of health systems, hospital administration, health economics, and information technology, preparing graduates to address complex healthcare challenges. In addition to its academic programs, IIHMR-Delhi supports the continued education of working professionals through Management Development Programs (MDPs) and executive training programs that address current healthcare needs and enhance the skill set of healthcare professionals in India and abroad. These programs cover a range of subjects, from health services and policy formulation to project management and quality improvement in healthcare settings.

Research and Technical Expertise

A defining feature of IIHMR-Delhi is its commitment to research that influences national and international health policies. Research initiatives at the institute focus on areas such as public health, health economics, hospital management, and social determinants of health. By conducting policy research, impact assessments, and exploratory studies, IIHMR contributes valuable insights that aid in shaping health policies and programs. The institute's research activities often involve collaborations with governmental and civil society organizations, enhancing its ability to address policy and program needs at both state and central government levels.

The Institute's recent expansion in research scope highlights its responsiveness to emerging health challenges and its dedication to evidence-based policy formulation. Notable research projects have included health service accessibility assessments, program impact evaluations, and health policy analyses, which contribute to health systems strengthening and improved healthcare delivery in India and beyond.

Mission and Vision

Mission: IIHMR-Delhi is committed to improving health standards through better management of healthcare systems and related programs. This mission is realized through a combination of management research, training, technical consultation, and institutional networking at both national and global levels.

Vision: As a premier global institution, IIHMR strives to be a learning organization rooted in values like quality, accountability, transparency, and social equity. By sharing knowledge and supporting programs that target underserved and marginalized populations, IIHMR works to

create a more equitable society. The institute's commitment to continuous learning and development is reflected in its programs that align with the changing demands of the healthcare sector.

Technical Consultation and Global Impact

In addition to its core activities, IIHMR-Delhi is actively involved in providing technical consultation for national and state-level health programs. This includes addressing gaps in program planning and implementation and offering expert advice for policy formulation. The institute's partnerships with various organizations enhance its capacity to support healthcare systems that respond to global health threats, natural disasters, and humanitarian crises. Through such collaborations, IIHMR-Delhi has established itself as a trusted partner in building healthcare resilience and promoting innovative solutions for health management. This international stature has also positioned IIHMR-Delhi as a sought-after institution for consultations on health program strategies, evaluations, and policy advocacy, further cementing its impact on health management education and policy.

Commitment to Inclusive Excellence and Societal Contribution

IIHMR-Delhi aims to cultivate an inclusive learning environment that emphasizes equity, social justice, and ethical decision-making. The institute's faculty, comprising experts from various health and management fields, engages in multidisciplinary research that tackles issues of global significance, such as public health, mental health, and health economics. By fostering an atmosphere of critical thinking and ethical awareness, IIHMR-Delhi prepares students to address pressing social and health-related challenges.

The institute's commitment to excellence extends beyond academia, focusing on creating well-rounded healthcare leaders who are equipped with both practical knowledge and a sense of societal responsibility. Through its research and training initiatives, IIHMR-Delhi continues to play a pivotal role in strengthening India's healthcare infrastructure and improving health outcomes across populations.

IIHMR-Delhi's holistic approach to healthcare management, education, and research has made it an essential contributor to the field of health management, creating professionals who are well-prepared to lead and innovate in a sector that is critical to human well-being and societal progress.



Current Research Focus Areas

The current research focus areas at IIHMR-Delhi cover a diverse range of critical topics essential to addressing contemporary health and social challenges. **Public health and health services research** examines the efficacy of health policies and accessibility of services, particularly for underserved populations, aiming to improve overall system response and equity. **Health economics and financing** research delves into cost-effective solutions, funding models, and economic policies to better allocate resources for enhanced healthcare access. Within **hospital and healthcare management**, research focuses on optimizing operations, resource allocation, and patient care to raise efficiency and quality standards in healthcare facilities. The **health informatics and information technology** domain explore digital health platforms, electronic health records, and AI-driven analytics, which support efficient healthcare delivery and informed decision-making. Studies in **mental health and social determinants of health** seek to understand factors like poverty and education in shaping health outcomes and improving access to mental health services, while reducing associated stigma. In **disaster management and emergency preparedness**, the focus is on resilience-building in communities prone to natural hazards, effective emergency healthcare response, and mitigating the impact of disasters through better preparedness strategies. **Women's and child health** research targets improved maternal and child health outcomes through enhanced nutrition, immunization, and access to preventive services. Finally, **global health and policy research** explores international frameworks and collaborations to address cross-border health challenges and promote global health equity. Collectively, these focus areas at IIHMR-Delhi generate valuable evidence-based insights that shape policy, strengthen healthcare systems, and drive improvements in health outcomes both nationally and internationally.

Institutional Achievements of IIHMR-Delhi

Over the years, the International Institute of Health Management Research (IIHMR), New Delhi, has achieved substantial milestones in healthcare management education, policy influence, and research, cementing its reputation as a leader in the field both nationally and internationally.

IIHMR-Delhi's **research contributions** have significantly impacted policy formulation, particularly through collaborative studies with both government and international organizations, including WHO, UNICEF, and the Ministry of Health and Family Welfare. The institute's research projects have informed various national health programs and influenced state and national health policy decisions, particularly in areas like healthcare financing, hospital management, and health information technology. IIHMR's contributions to **disaster management and emergency preparedness** have also provided critical insights that support more resilient healthcare infrastructures in response to natural disasters and emergencies.

The institute has been a pathfinder in **training and capacity building** through its highly regarded **Management Development Programs (MDPs)**, aimed at upgrading the skills of healthcare professionals. These programs are designed to adapt to industry needs and trends, covering emerging areas like health informatics, disaster management, and health policy analysis. IIHMR-Delhi's **consultation services** have had widespread impact on national and state-level flagship health programs, addressing planning and implementation gaps while contributing to operational efficiencies across health systems.

Further solidifying its commitment to inclusive excellence, IIHMR-Delhi fosters a culture of **equity and social responsibility**. Through various community engagement and outreach

programs, the institute has made strides in promoting health education, extending healthcare access to underserved communities, and raising awareness on pressing health issues. IIHMR's contributions to **global health dialogues** have established it as a critical player in addressing cross-border health challenges, with the institute regularly providing expertise to global health networks on pressing issues like infectious diseases, maternal and child health, and mental health.

In recognition of its **commitment to high standards and academic rigor**, IIHMR-Delhi has been awarded multiple accolades, including prestigious grants and certifications that underline its impact on healthcare management education and policy. The institute's achievements in research, capacity building, and community health have positioned it as a benchmark institution, making it a preferred destination for students and professionals aspiring to make a meaningful difference in the healthcare sector. Through these sustained accomplishments, IIHMR-Delhi continues to lead and shape healthcare management education, research, and practice for a healthier, more equitable world.

NAAC A Accreditation Certificate-IIHMR Delhi



राष्ट्रीय मूल्यांकन एवं प्रत्यायन परिषद

विश्वविद्यालय अनुदान आयोग का स्वायत्त संस्थान

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

An Autonomous Institution of the University Grants Commission

Certificate of Accreditation

The Executive Committee of the
National Assessment and Accreditation Council
is pleased to declare

International Institute of Health Management Research

Dwarka, New Delhi, Dist. South West Delhi,
Stand Alone Institution Recognized by AICTE, Delhi as

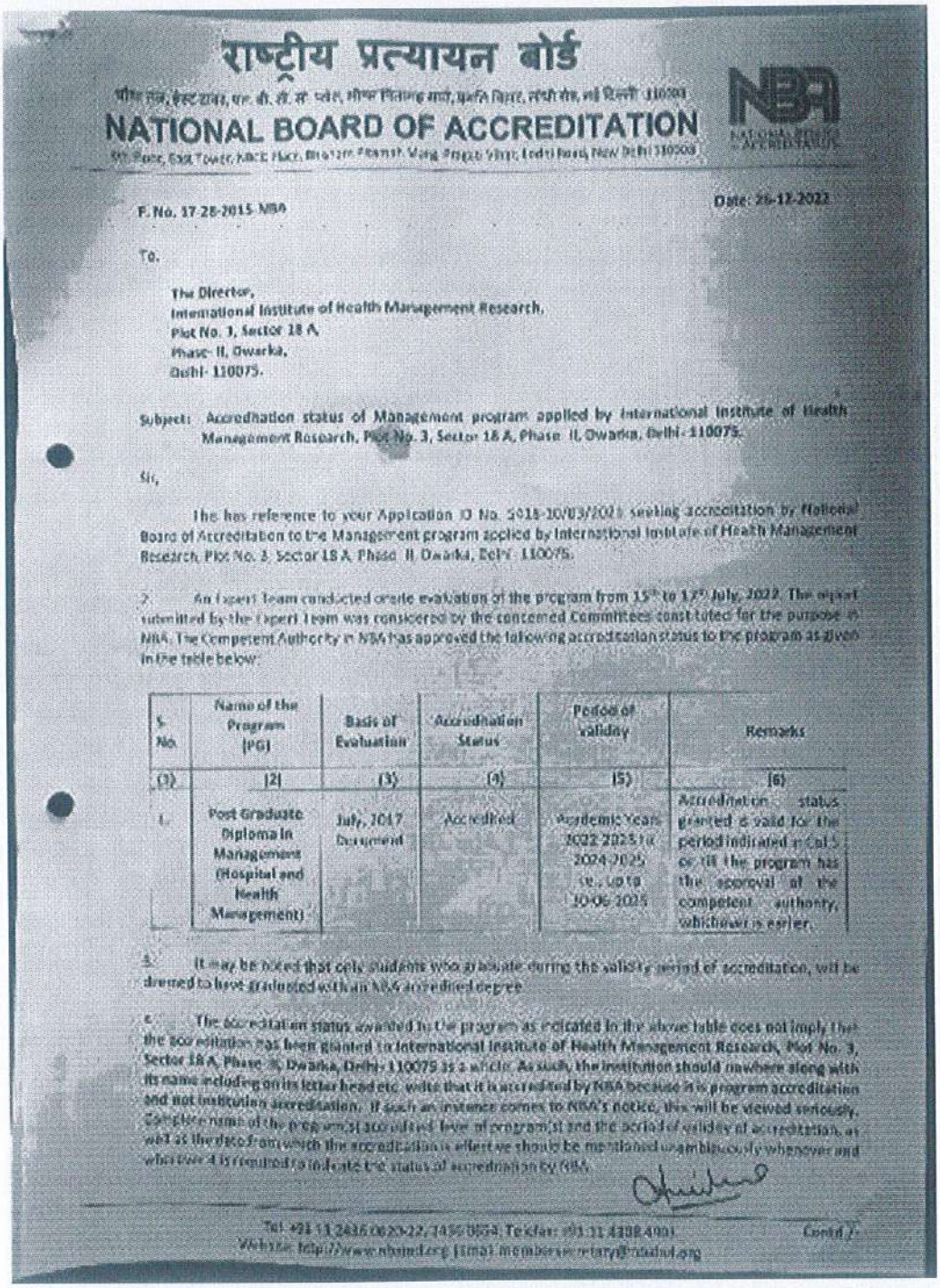
Accredited

with CGPA of 3.10 on four point scale
at A grade
valid up to June 23, 2028

Date : June 24, 2023

Director

NBE Accreditation Certificate – IIHMR Delhi



राष्ट्रीय प्रत्यायन बोर्ड

NATIONAL BOARD OF ACCREDITATION

F. No. 17-28-2015-NBA

Date: 26-12-2022

To,

The Director,
International Institute of Health Management Research,
Plot No. 3, Sector 18 A,
Phase- II, Dwarka,
Delhi- 110075.

Subject: Accreditation status of Management program applied by International Institute of Health Management Research, Plot No. 3, Sector 18 A, Phase II, Dwarka, Delhi- 110075.

Sir,

This has reference to your Application ID No. 5018-10/03/2021 seeking accreditation by National Board of Accreditation to the Management program applied by International Institute of Health Management Research, Plot No. 3, Sector 18 A, Phase II, Dwarka, Delhi- 110075.

2. An Expert Team conducted onsite evaluation of the program from 15th to 17th July, 2022. The report submitted by the Expert Team was considered by the concerned Committees constituted for the purpose in NBA. The Competent Authority in NBA has approved the following accreditation status to the program as given in the table below:

S. No.	Name of the Program (PG)	Basis of Evaluation	Accreditation Status	Period of validity	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
1.	Post Graduate Diploma in Management (Hospital and Health Management)	July, 2017 Document	Accredited	Academic Years 2022-2023 to 2024-2025 i.e., upto 30-06-2025	Accreditation status granted is valid for the period indicated in Col 5 or till the program has the approval of the competent authority, whichever is earlier.

3. It may be noted that only students who graduate during the validity period of accreditation, will be deemed to have graduated with an NBA accredited degree.

4. The accreditation status awarded to the program as indicated in the above table does not imply that the accreditation has been granted to International Institute of Health Management Research, Plot No. 3, Sector 18 A, Phase- II, Dwarka, Delhi- 110075 as a whole. As such, the institution should nowhere along with its name including on its letter head etc. write that it is accredited by NBA because it is program accreditation and not institution accreditation. If such an instance comes to NBA's notice, this will be viewed seriously. Complete name of the program(s) accredited, level of program(s) and the period of validity of accreditation, as well as the date from which the accreditation is effective should be maintained unambiguously wherever and whenever it is required to indicate the status of accreditation by NBA.

Tel: +91-11-2836 0629-32, 7450 0654, Telefax: +91-11-4358 4901 Contd../-
Website: http://www.nbaind.org Email: membersecretary@nbaind.org

5. The accreditation status of the above program is subject to change on periodic review, if needed by the NBA. It is desired that the relevant information in respect of accredited programs as indicated in the table in paragraph 2, appears on the website and information bulletin of the Institute.

6. The accreditation status awarded to the program as indicated in table in paragraph 2 above is subject to maintenance of the current standards during the period of accreditation. If there are any changes in the status (major changes of faculty strength, organizational structure etc.), the same are required to be communicated to the NBA, with an appropriate explanatory note.

7. A copy each of Report of Chairman of the Visiting Team and Evaluators' report in respect of the above program is enclosed.

8 If the Institute is not satisfied with the decision of NBA, it may appeal within thirty days of receipt of this communication giving reasons for the same and by paying the requisite fee.

Yours faithfully,

(Dr. Anil Kumar Nassa)
Member Secretary

Encls.: 1. Copy of Report of Chairman of the Visiting Team
2. Copy of Expert Report of the Visiting Team.

Copy to:

1. The Directorate of Training and Technical Education,
Near PIT,
Guru Govind Singh College,
Pitam Pura,
Delhi, 110034

2. Accreditation File

3. Master Accreditation file of the State

Research Team

This study has been led by a skilled, multidisciplinary team whose combined expertise strengthens the research design and implementation. Each member has contributed to various aspects of the research, from the conceptual framework to data collection and analysis. Here is a brief overview of the team members and their roles:

- **Dr. Sutapa B. Neogi, Advisor**

  Dr. Sutapa Neogi, a distinguished advisor to this research project, brings extensive experience in public health and epidemiology. Her strategic oversight ensures that the study aligns with broader health objectives, promoting scientific accuracy and ethical rigor.

- **Dr. Nidhi Yadav, Principal Investigator (PI)**

  Dr. Nidhi Yadav, as the Principal Investigator, has provided visionary leadership and oversight, shaping the research direction and methodology. Her expertise in health systems and epidemiology has been instrumental in guiding the study's framework and execution.

- **Dr. Ratika Samtani, Co-Principal Investigator (Co-PI)**

  As Co-Principal Investigator, Dr. Ratika Samtani has been pivotal in the methodological design and analysis of the data. Her knowledge of epidemiology and health research has enriched the study, ensuring precise and meaningful results.

- **Ms. Ritika, Research Officer**

  Ms. Ritika has played a crucial role in the fieldwork coordination, data collection and analysis phases and in ensuring logistical support and effective data processing. With

a strong background in research methodologies, she has been key to implementing ethical and rigorous data management processes, adhering to both scientific and ethical standards.

- **Ms. Pranjali Joshi, Research Officer**

  Ms. Pranjali Joshi has contributed significantly to fieldwork coordination and data processing. Her diligent efforts in data management have helped maintain data integrity, supporting accurate analysis and findings.

Each team member's commitment to high standards has ensured that this study meets scientific and ethical requirements, contributing valuable insights to the field of epidemiology and public health.

Table of Contents

Director's Note 3
Institutional Overview 6
List of Abbreviations 20
Executive Summary 21
Introduction 24
Importance of Epidemiological Studies 27
Epidemiological Studies and Health Outcomes 28
Global Trends in Epidemiological Research 30
Epidemiological Research in India 34
Objectives of the Study 38
Methodology 38
Study Area 38
Survey population 40
Sample size 41
Sampling method 41
Tools and techniques 42
Data collection 46
Data management and Ethical Consideration 47
Findings of the Study 48
Discussion 80
Summary of the Findings 84
Annexure 93
Annexure A: Photo Gallery 93
Annexure B: Questionnaire 98
Annexure C: Consent form English 106
Annexure D: Consent form Hindi 109
Annexure E: Referral Slip 112
Annexure F: IRB certificate 115
Annexure G: Terms of Reference 116

LIST OF FIGURES AND TABLES

Table 1. General information of the Study Population 48
Table 2. Socio-Demographic Profile of the Studied Population (n=3092) 51
Table 3. Socio-economic status of the Study Population (n=3092) 57
Table 4. Household and Property status (n=829) 59
Table 5. Nutritional status of the study population (n=3092), (n=829) 61
Table 6. Frequency of Food Intake (n=829) 63
Table 7. Lifestyle and Behavioural Status of the Study Population (n=3092) 65
Table 8. Consumption pattern of Alcohol, Tobacco, and drugs (n=3092) 66
Table 9. Distribution of the study subjects based on Morbidity (n=3092) 69
Table 10. Distribution of Co-morbidity* among the study subjects (n=3092) 72
Table 11. Distribution of Symptoms among the study subjects (n=3092) 74

List of Abbreviations

WHO- World Health Organisation

UNAIDS- Joint United Nations Programme On HIV/AIDS

HIV- Human Immunodeficiency Virus

AIDS- Acquired Immuno-deficiency Syndrome.

COVID-19- Coronavirus Disease 2019

TOPmed- Trans-Omics for Precision Medicine

SARS- Severe Acute Respiratory Syndrome.

MERS- Middle East Respiratory Syndrome

IRB- Institutional Review Board

IIHMR- International Institute of Health Management Research

Mou- Memorandum of understanding

RO- Research Officer

VCR- Video Cassette Recorder

PIS- Participant information sheet

Executive Summary

Originating from Greek words meaning "the study of what is upon the people," epidemiology has grown to investigate the complex interplay of biological, environmental, social, and behavioural factors influencing health and disease patterns within populations. (1) The field employs various research methodologies, including descriptive, analytical, and experimental approaches, to design studies, collect and analyse data, and interpret results that inform public health policies and interventions. Epidemiological studies play a crucial role in public health and its evolution from focusing solely on infectious diseases to encompassing a broad spectrum of health conditions. Certain historical milestones can be highlighted, such as Dr. John Snow's investigation of the 1854 London cholera outbreak, which exemplify epidemiology's long-standing importance in addressing public health challenges. (3) In the modern context, epidemiologists continue to play a vital role in combating emerging infectious diseases like COVID-19, as well as addressing chronic conditions and global health disparities. The importance of epidemiological studies is underscored by their ability to identify disease patterns, causes, and risk factors, thereby informing prevention strategies and guiding public health policies.

Global trends in epidemiological research are explored, focusing on chronic diseases, infectious diseases, environmental and behavioural factors, and health inequities. The document also delves into the specific challenges faced in India, where epidemiological research addresses the dual burden of infectious and non-communicable diseases, significant health disparities, and nutritional issues unique to the country's diverse population. Throughout, the text emphasizes that epidemiological studies serve as the cornerstone for developing effective public health strategies, policies, and interventions aimed at reducing disease burden

and improving quality of life worldwide. As the field continues to evolve, integrating new scientific domains and methodologies, it promises to enhance our ability to predict, prevent, and manage health issues on a global scale.

The present epidemiological study was conducted with the primary objectives of assessing the current health status of residents in the Bawana region, identifying prevalent diseases, symptoms, health disparities, and risk factors affecting the community, and understanding the socio-economic and environmental determinants influencing health outcomes. The project focused on a population residing within a 5-kilometer radius of a proposed waste-to-energy plant, a range chosen to account for prevailing wind patterns and potential environmental influences. A cross-sectional survey was implemented, involving a representative sample of 3,092 participants from 829 households, selected from the total population of 73,680 in the Bawana region. The study population encompassed adults, children, and elderly individuals, ensuring a comprehensive representation of the area's demographic diversity. To select the households, a cluster random sampling method was employed, dividing the population into clusters or groups. This methodological approach allowed for a systematic and representative data collection process, gathering information on demographics, health behaviours, and prevalent health conditions, thus providing a holistic view of the community's health status and the factors influencing it.

The findings of the study revealed significant socio-economic and demographic diversity, with the majority of the population being young, with a median household income of 35,000 INR, and a high prevalence of primary and secondary education levels. Most households lived in pucca houses and owned properties, though a significant portion of the population fell into the lower-income category, with only a small percentage earning above 7.5 lakh INR annually.

The study also highlighted key health indicators. Approximately 26.6% of the population experiences morbidity, with a nearly even split between communicable (52%) and non-communicable diseases (48%). Diarrhoea and typhoid are the most common communicable diseases, while diabetes and high blood pressure are the leading non-communicable conditions. Morbidity is more prevalent among males (56.2%) and individuals aged 15-44 years. Family structure also influences health, with joint families showing a higher incidence of morbidity. There is also a notable prevalence of nutritional deficiencies and long-term illnesses among older adults. Additionally, the study revealed a pattern of substance use initiation during late adolescence and early adulthood, with a decline in new users as age increased, and a diverse range of dietary habits, including a majority preference for non-vegetarian diets. These findings underscore the complex interplay between socio-economic conditions, environmental factors, and health outcomes in the Bawana region, providing valuable insights for targeted public health interventions and policy planning.

Introduction

The term "epidemiology" comes from Greek words that mean "the study of what is upon the people," reflecting its origins in the study of epidemics.(1) Over time, the scope of epidemiology has expanded to include not just infectious diseases but also non-communicable diseases such as hypertension, mental illness, and obesity. This expansion reflects the evolving understanding that the patterns of disease and health are influenced by a complex interplay of biological, environmental, social, and behavioural factors. According to Brachman (1996), epidemiology is the study of the factors that influence, the occurrence, and the distribution of health and disease within a specific population. An epidemiological study is a research endeavour that focuses on understanding the patterns, causes, and effects of health and disease conditions in specific populations. It's a fundamental aspect of public health that informs policy

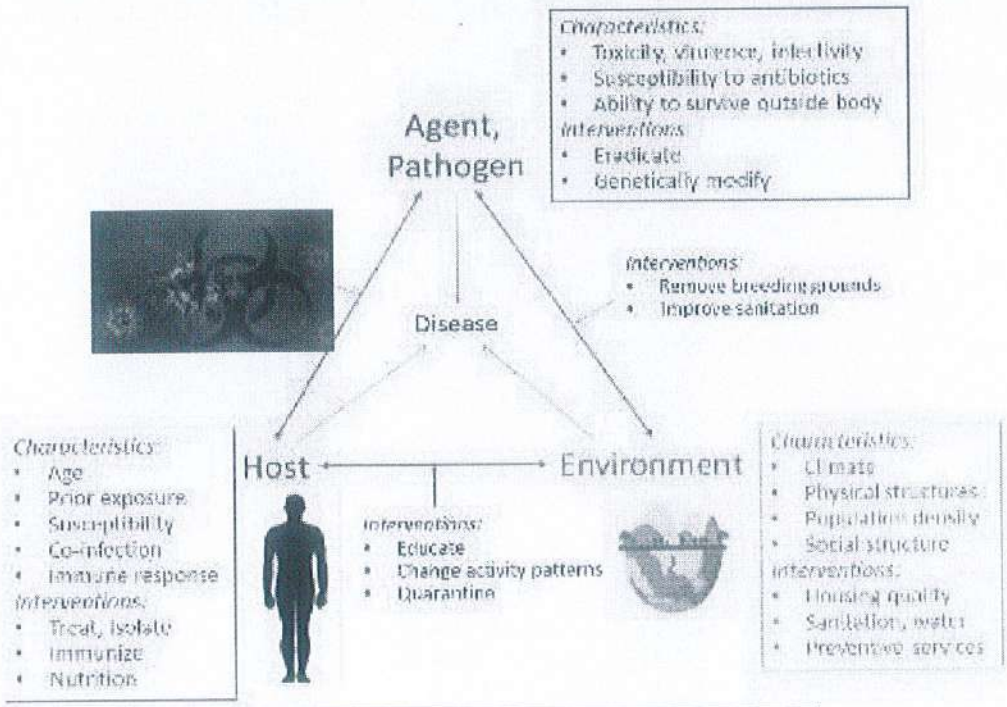


Figure :1. Showing epidemiological triad

decisions and evidence-based practices by identifying risk factors for disease and targets for preventive healthcare. (2)

Epidemiology is a descriptive science, and its purpose is to understand what risk factors are associated with a particular disease, the determination of rates of occurrence of disease within a specific population and the reasons behind the occurrence of the disease i.e. determining the risk factors, if the rate of occurrence is changing and how the disease affect our society.(2) Not only understanding the risk factors, but epidemiological studies also try to understand how these diseases can be prevented in the population or categories of individuals. Though given its observational nature, epidemiology is not apt to give answers to the questions of what caused a specific disease of the individual or population, however it can quiet precisely describe the disease and the factors that are contributing to the occurrence of the disease. Key areas of epidemiological research encompass disease causation, transmission, outbreak investigation, disease surveillance, environmental epidemiology, forensic epidemiology, occupational epidemiology, screening, biomonitoring, and the evaluation of treatment effects in clinical trials. Epidemiology thus is a multidisciplinary field of study, using the methods of biology to understand disease processes, anthropology, and sociology to comprehend proximate and distal causes, statistics to analyse data and draw conclusions engineering for exposure assessment to understand and estimate the frequency of disease, find the association between the diseases, their potential risk factors and the targeted population. It has also contributed significantly to the methodologies used in clinical research, public health studies, and even basic biological research.

Epidemiological studies can be descriptive, analytical, and experimental based on the type of study to be conducted. Epidemiologists are involved in the design, collection, and statistical

analysis of data, as well as the interpretation and dissemination of results, which often includes peer review and systematic review.

Historically, one of the earliest examples of epidemiological practice was during the 1854 cholera outbreak in London, where Dr John Snow's investigation led to the identification of a contaminated water pump as the source of the outbreak. This event is a classic case study in epidemiology, illustrating the importance of careful data collection and analysis in understanding and controlling disease spread. (3)

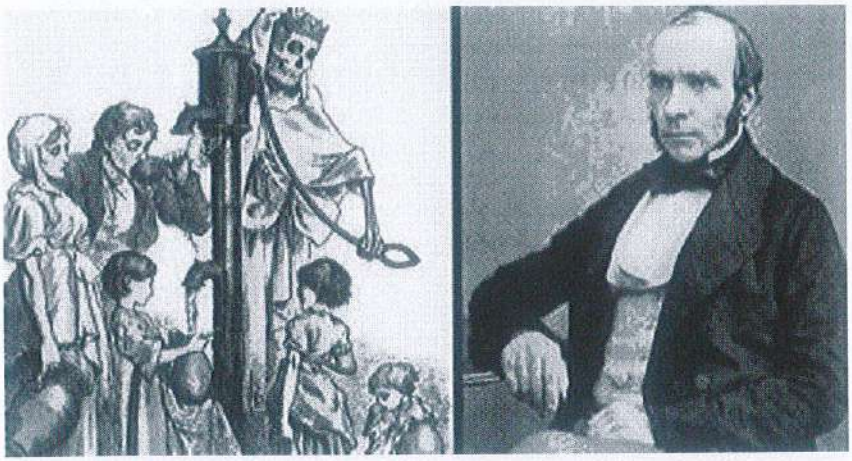


Figure : 2 Showing John Snow and the handpump that caused cholera

Source : https://www factinate.com/ editorial/curing-cholera-one-man-solved-deadly-mystery-time/

Today, epidemiologists continue to play a vital role in addressing public health issues, including emerging infectious diseases like COVID-19. They work on the front lines to track and trace the spread of diseases, develop diagnostic tests and therapies, and assess health systems' preparedness and response. The insights gained from epidemiological research are crucial for developing strategies to prevent and control diseases, thereby improving health outcomes and quality of life for populations around the world. The Global Burden of Disease Study offers comprehensive international data on a wide array of health factors, including

mortality, life expectancy, and disease risk factors. (4) The WHO's Global Health Observatory is a platform that provides access to data and analyses for key health themes by monitoring health situations around the globe. These statistics are vital for public health planning and interventions, helping to allocate resources effectively and measure the impact of health policies and programs. Access to accurate and up-to-date epidemiological data is essential for researchers, policymakers, and healthcare providers to understand and combat health challenges worldwide. According to UNAIDS, in 2023, there were approximately 39.9 million people globally living with HIV, with 1.3 million people newly infected and 630,000 deaths from AIDS-related illnesses. (5)

Importance of Epidemiological Studies

Epidemiological studies are crucial for public health as they provide detailed insights into the distribution, patterns, and determinants of health and disease conditions in specific populations. This field of study is foundational to public health and informs policy decisions and evidence-based practices by identifying risk factors for diseases and targets for preventive healthcare. One of the most significant roles of epidemiology is its contribution to understanding and controlling infectious diseases, such as the COVID-19 pandemic. Epidemiologists track and trace the spread of diseases, understand their development, and devise effective interventions for their prevention and control. For instance, during the COVID-19 pandemic, epidemiologists worldwide worked tirelessly to control the spread by researching to better understand the virus, its transmission, and to develop diagnostic tests and therapies.

Moreover, epidemiological research is not limited to infectious diseases; it also covers a wide range of issues including unintentional injuries and psychosocial stress. The field employs specialized techniques for data collection and interpretation, which are essential for planning

and evaluating strategies to prevent illness and as a guide to the management of patients in whom disease has already developed.

Historically, one of the earliest instances of modern epidemiology can be traced back to an 1854 cholera outbreak in London. Dr John Snow, considered the father of epidemiology, mapped the outbreak and analysed the infected individuals, which led to the discovery that all cholera cases were linked to a single water pump. The removal of this pump halted the spread of the disease, demonstrating the power of epidemiological investigation and intervention.(3)

In summary, epidemiological studies are vital for the following reasons:

- They help understand the "who, when, and where" of disease occurrence.

- They identify the causes and risk factors of diseases.

- They inform the development of strategies for disease prevention and control.

- They guide the management of diseases in affected individuals.

- They shape public health policies and practices by providing a scientific basis for decision-making.

Epidemiological Studies and Health Outcomes

Epidemiology's impact extends beyond the health of individuals to the well-being of societies and economies, highlighting its importance in the contemporary world.(6) Epidemiological studies are pivotal in understanding the complex relationships between various factors and health outcomes in populations. These studies delve into the distribution and determinants of health-related states or events, including diseases, and apply this knowledge to control health

problems. For instance, the foundational work of Dr John Snow in the 1854 cholera outbreak in London is a classic example of epidemiological investigation, where he identified a contaminated water pump as the source of the outbreak, leading to its containment. Modern epidemiologists extend this approach to a wide array of health issues, from infectious diseases like COVID-19 to chronic conditions such as cardiovascular diseases. Thus, research in epidemiology has been instrumental in identifying risk factors for diseases and conditions, enabling public health professionals to formulate targeted interventions. The Framingham Heart Study is another example which has significantly contributed to our understanding of cardiovascular disease risk factors. Similarly, the Women's Health Initiative shed light on the risks associated with hormone replacement therapy in post-menopausal women.



- Each dot represented a cholera death, and their placement helped identify a pattern.
- Snow used this map to identify a cluster of cases near a water pump on Broad Street.

Figure:3. John Snow's Map

The field of epidemiology is not static; it evolves with emerging challenges and leverages new technologies and methodologies. The integration of genomics into epidemiological research, for instance, is providing insights into the genetic predispositions to various diseases, which can lead to more personalized approaches to prevention and treatment. The Trans-Omics for

Precision Medicine (TOPMed) program exemplifies this integration, utilizing data from population studies to enhance our understanding of the biological underpinnings of disease.(7)

Global Trends in Epidemiological Research

Similarly, large-scale epidemiological studies often uncover trends and patterns that can inform policy and healthcare practices, aiming to improve health outcomes on a population level and on a global level. Understanding the health on the global level is a relatively new and evolving field. (8,9) From an epidemiological perspective, global health could be described as consisting of health issues whose causes or redress lie beyond the capability of any one nation state.(10) According to the definition by Koplan and colleagues, global health is "an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide".(11) Global health promotes multidisciplinary collaboration, including epidemiology, mathematical modelling, anthropology, political sciences, sociology, and economics. Essentially, epidemiology is considered the cornerstone of global health. (12)

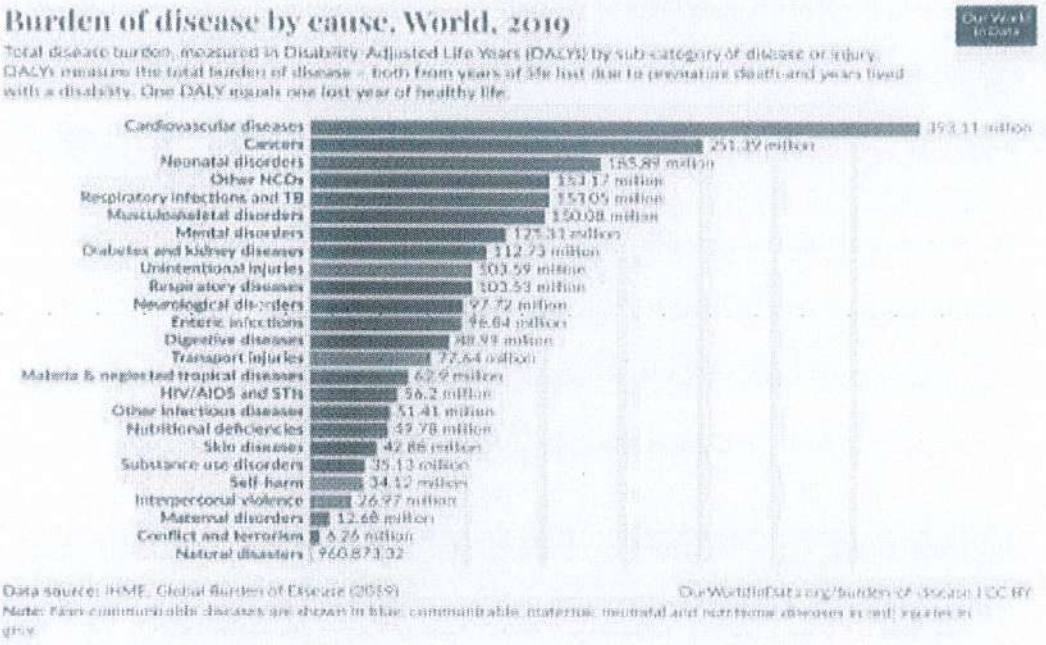


Figure:4. Showing Global disease burden in the year 2019

Epidemiological studies worldwide have revealed significant insights into various health conditions, largely influenced by advancements in research methodologies and data collection. Key global trends include:

1. **Chronic Diseases**: Research has increasingly focused on chronic diseases like cardiovascular diseases, cancer, diabetes, and respiratory disorders. These conditions have become more prominent due to lifestyle changes, aging populations, and urbanization. Chronic diseases are the largest cause of death in the world. In 2002, the leading chronic diseases—cardiovascular disease, cancer, chronic respiratory disease, and diabetes—caused 29 million deaths worldwide. Epidemiological research help identify policy levers to address these impediments elevating chronic diseases on the health agenda of key policymakers, providing them with better evidence about risk

factor control, and persuading them of the need for health systems change. (13) A more concerted, strategic, and multisectoral policy approach, underpinned by solid research, is essential to help reverse the negative trends in the global incidence of chronic disease.

The past 50 years have seen major progress in understanding of the causes of the leading chronic diseases, from the role of behaviours to the importance of social, economic, and environmental factors. This better understanding has been used to develop effective interventions in both clinical and community settings. (14)

2. **Infectious Diseases**: Although chronic diseases dominate, infectious diseases remain a critical area of research, particularly with emerging threats such as COVID-19, Ebola, and antimicrobial resistance. Epidemiological studies have been pivotal in tracking outbreaks, understanding transmission patterns, and evaluating public health responses. Research have been conducted to study the features of and changes in incidence of the infectious diseases, such as the study conducted to understand the prevalence of infectious diseases in China in the first decade after the SARS outbreak in 2017, where they trend, and epidemiological features of infectious diseases are rarely studied. Here specific incidence and mortality trends of 45 notifiable infectious diseases from 2004 to 2013 in China were investigate and the overall effectiveness of current prevention and control strategies was tested. (15) On December 8th, 2015, World Health Organization published a priority list of eight pathogens expected to cause severe outbreaks soon. the following pathogens/infectious diseases: Ebola, Marburg, Lassa, Rift valley, Crimean-Congo, Nipah, Middle Eastern Respiratory Syndrome (MERS), and Severe Respiratory Acute Syndrome (SARS). (16)

Many other such studies have been conducted to study the increasing incidence of serious infectious diseases and emerging challenges in studying these diseases.

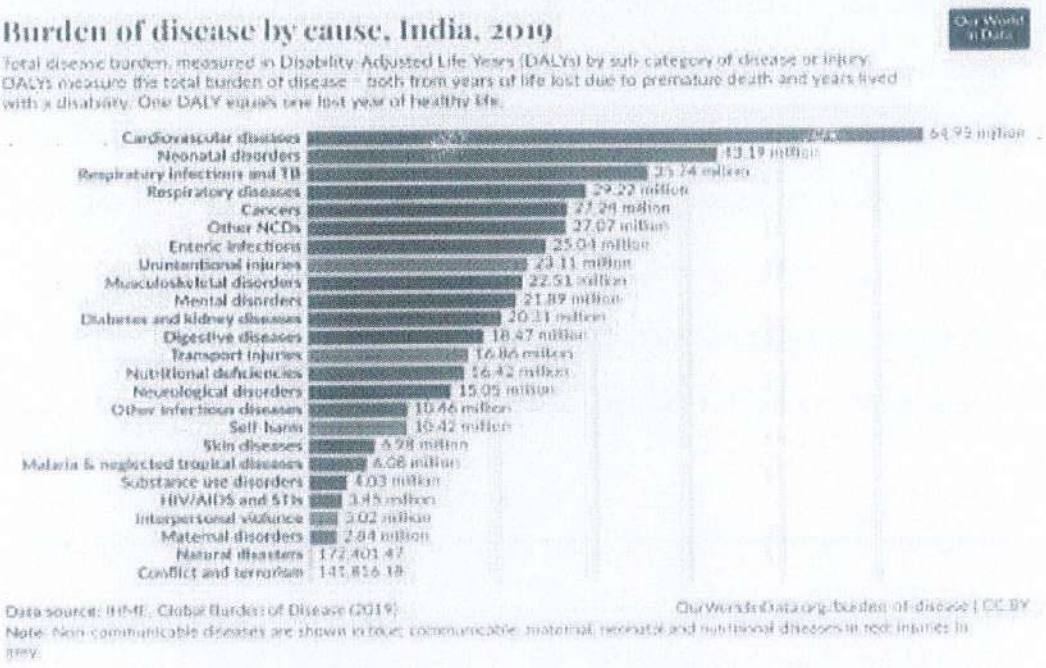
3. **Environmental and Behavioural Factors**: There is growing recognition of the impact of environmental and behavioural factors on health. Studies have examined the effects of air pollution, climate change, and lifestyle factors like diet and physical activity on health outcomes. Like a study was conducted to understand the global, regional, and national comparative risk assessment of 79 behavioural, environmental, and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013.(17)

4. **Health Inequities**: Research increasingly focuses on health disparities among different populations. Studies have highlighted how socio-economic factors, race, and geography contribute to unequal health outcomes and access to healthcare.

Irrespective of the varying definitional approaches, one of the main achievements in global health is the substantial reduction in health inequalities between rich and poor countries, especially in the context of the Millennium Development Goals from 1990 to 2015; this underpins optimism about the possibility of a world where there is a levelling of major health issues, largely in the fields of infectious disease and maternal and child mortality by 2035. (18) However, it is worth noting that as traditional infectious diseases – which have contributed significantly to the proportion of morbidity and mortality – are reduced to comparable global lows, the burden of noncommunicable diseases, such as hypertension, diabetes, and mental health conditions, is increasingly being recognized. (19)

Epidemiological Research in India

Figure:5. Showing disease burden in India in the year 2019



India's diverse population and unique health challenges make epidemiological research particularly complex and vital. Key aspects of epidemiological studies in India include:

1. Emerging Health Issues: India faces a dual burden of disease, with high prevalence of both infectious diseases (e.g., tuberculosis, malaria) and non-communicable diseases (e.g., diabetes, heart disease). Epidemiological studies help in understanding these emerging patterns and developing targeted interventions.
2. Health Disparities: There are significant regional and socio-economic disparities in health outcomes across India. Research highlights the variations in disease prevalence

and healthcare access between urban and rural areas, and among different socio-economic groups.

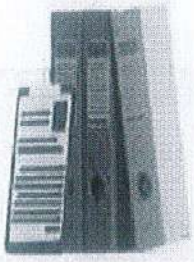
3. Chronic Disease Burden: With increasing urbanization and lifestyle changes, there is a rising incidence of chronic diseases. Studies focus on the impact of dietary changes, sedentary lifestyles, and pollution on health outcomes.
4. Infectious Disease Surveillance: Given the high burden of infectious diseases, epidemiological studies play a crucial role in surveillance and control efforts. The response to diseases like COVID-19 has underscored the importance of timely and accurate data in managing health crises.
5. Nutritional Epidemiology: India's diverse dietary practices and high prevalence of malnutrition among children and women have led to significant research in nutritional epidemiology. Studies assess the impact of nutrition on health outcomes and inform public health nutrition programs.

In conclusion, epidemiological studies serve as a cornerstone for public health, offering a scientific basis for understanding and improving health outcomes. The insights gained from these studies are crucial for developing effective public health strategies, policies, and interventions, ultimately aiming to reduce disease burden and improve the quality of life for populations worldwide. The continuous evolution of epidemiological research, with its integration of new scientific domains, promises to further enhance our ability to predict, prevent, and manage health issues in the future.

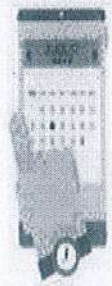
SCOPE OF WORK:

This study in the Bawana district, located in northwestern Delhi, aims to assess the health profile of the residents, identify prevalent diseases and risk factors, and understand the social and environmental determinants influencing health outcomes. This information will be used to improve the overall health and well being of the community and will be conducting by following the foramentioned steps:

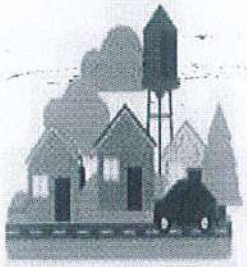
METHODOLOGY



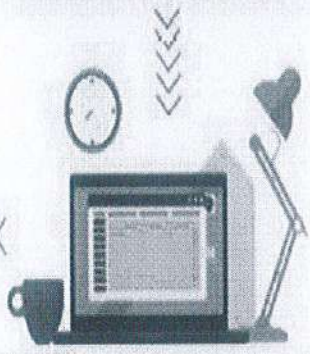
1. Proposal Writing:
A proposal outlining the objectives of the study, the methodology to be used, and the ethical considerations. The proposal needs to be submitted to the Institutional Review Board (IRB) for ethical clearance.



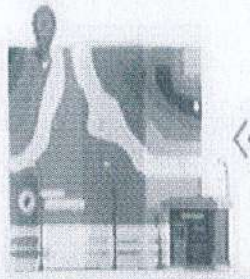
2. Ethical Clearance:
Obtaining ethical clearance from the IRB before commencing the study.



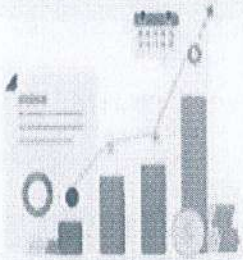
3. Sample Selection:
Using cluster random sampling to select a representative sample of households from the study area (5 km radius of the plant site)



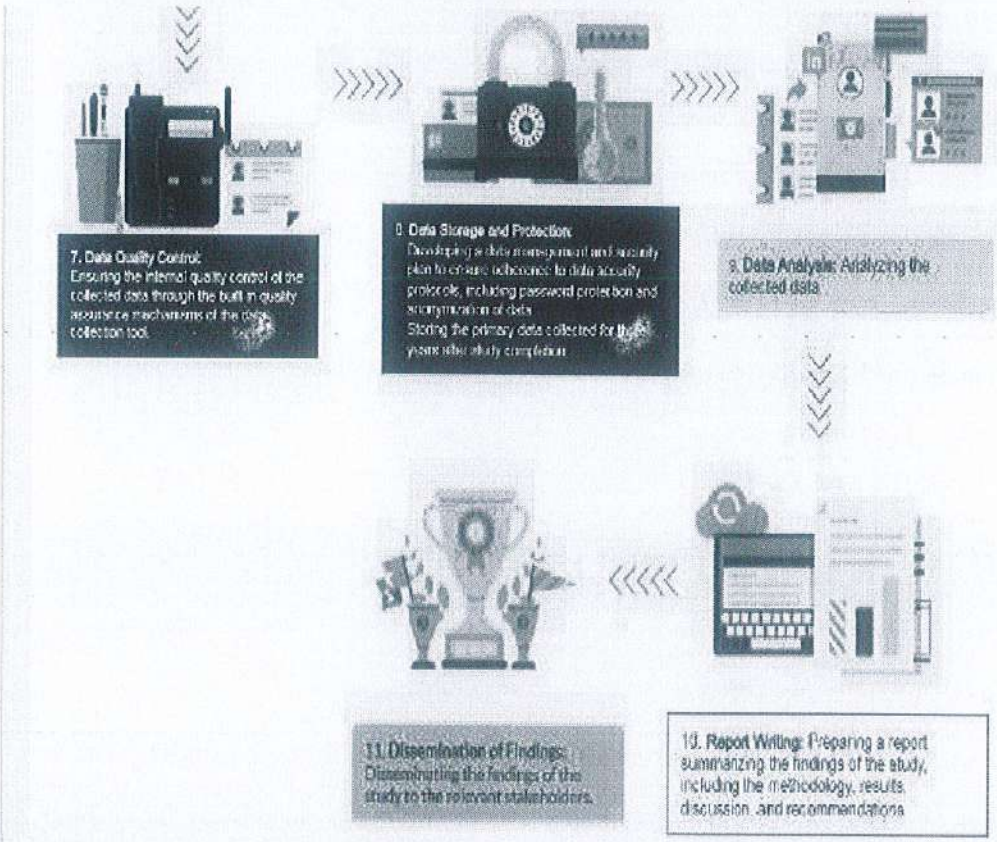
4. Pre-testing the Questionnaire:
- Designing a questionnaire to collect data on demographics, health behaviors, and prevalent health conditions.
- Pre-test the questionnaire on a small sample of the population to ensure its effectiveness and make any necessary adjustments.



5. Mapping of Resources:
Conducting a transect walk in the study area to map the location of health centers, sanitation facilities, water sources, schools, and any health-related messaging displayed in the area.



6. Data Collection:
- Recruiting investigator groups, each comprising a research officer and a field investigator.
- Training the investigators on data collection procedures and ethical considerations.
- Visiting the selected households and administer the questionnaire to all household members.
- Collecting data using electronic tablets and directly feed it into the central server of the institute.





OBJECTIVES

1. To assess the current health status of the residents of the Bawana region.
2. To identify prevalent diseases, health disparities, and risk factors affecting the community.
3. To understand their socio-economic and environmental determinants influencing health outcomes.



Tools and techniques

1. Mapping of Resources
2. Household survey
3. Cluster random sampling

Objectives of the Study

The objectives of the study are:

a. To assess the current health status of the residents in the Bawana region.

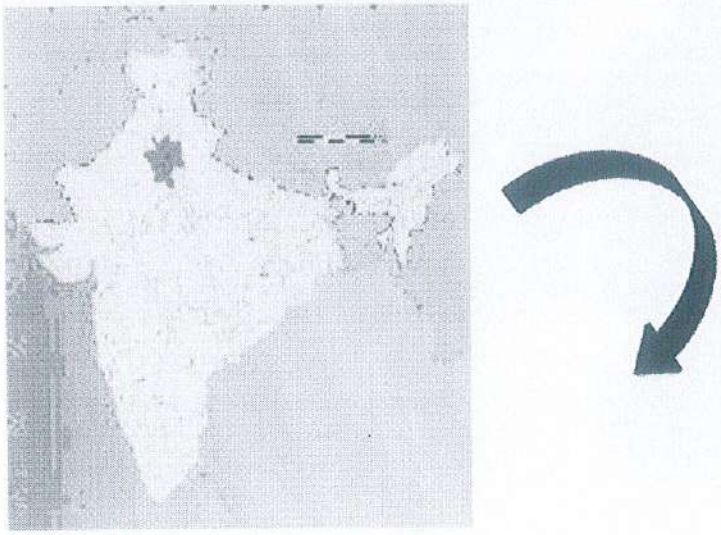
b. To identify prevalent diseases, health disparities, and risk factors affecting the community.

c. To understand the socio-economic and environmental determinants influencing health outcomes.

Methodology

Study Area

The project was conducted in the population residing in 5 km radius from the plant site. The 5-kilometer radius is chosen considering prevailing wind patterns and the potential environmental influence of the plant.




BAWANA
DELHI


BAWANA
ASSEMBLY CONSTITUENCY MAP

Study Design & Selection Study

A cross-sectional survey was conducted involving a representative sample of the Bawana population to gather data on demographics, health behaviours, and prevalent health conditions.

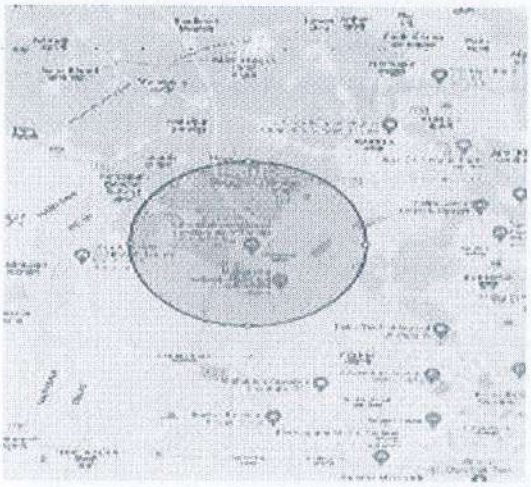
Survey population

The study focused on a population of 3092 participants residing within a 5-kilometer radius of the proposed waste-to-energy plant in the Bawana region. Prevailing wind patterns are critical in environmental studies, particularly when assessing how pollutants or emissions from a plant disperse. These patterns influence the direction and extent of airborne particles or gases, shaping the areas likely to be affected. By adopting a 5-kilometer radius for assessment, researchers can account for localized dispersion driven by wind, ensuring sufficient coverage to monitor and mitigate potential impacts effectively.

Additionally, the **vortex effect** introduces further complexity. Vortices—created by the interaction of wind with obstacles such as buildings, terrain, or plant structures—can lead to localized trapping of pollutants, resulting in higher concentrations in certain areas instead of uniform dispersion. When prevailing winds encounter such obstacles, turbulent flows emerge, altering expected dispersion patterns. A 5-kilometer radius ensures that these concentrated zones are captured and studied, particularly in the immediate vicinity of the plant.

This approach is supported by studies showing the utility of a 5-kilometer range in environmental impact assessments (EIAs). It is widely used to evaluate air and water quality, noise levels, and pollutant dispersion. Research also highlights how localized wind effects and vortex phenomena can significantly influence environmental changes. By integrating these factors into the study, the 5-kilometer radius provides a scientifically sound framework for identifying environmental hotspots and designing effective mitigation strategies.

The plant's capacity is 30 MW. As per the Ministry of Environment's recommendation, there is a need for an epidemiological study to be conducted within a 5-kilometer radius of the plant to assess the prevalence of endemic diseases, referencing MOM 2.9.3, point number 15 of the EAC deliberation. The targeted population included adults, children, and elderly individuals residing in the selected area.



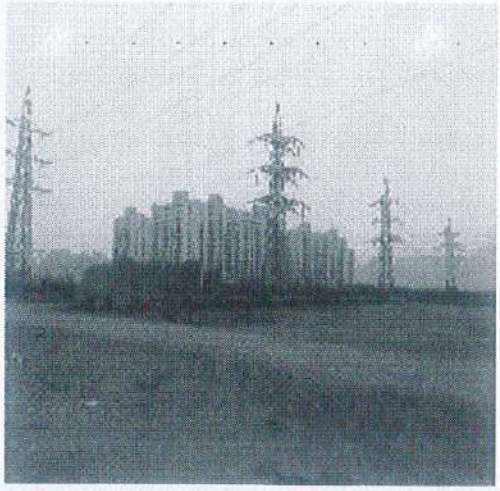
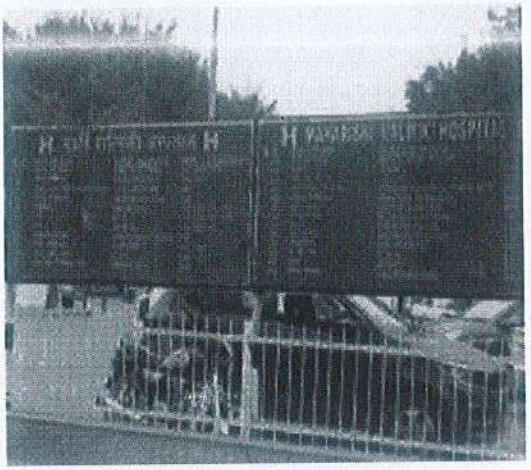


Figure-6: ***Study area***- population residing in 5 km radius from the plant site

Sample size

For the survey, a sample size of 829 households was selected, derived from the total population of the Bawana region, which is 73,680. This sample size is calculated with a 95% confidence interval, a 5% margin of error, and assuming a 30% prevalence of the disease. All individuals living in the selected households will be included in the study. All individuals living in the selected households were included in the study.

Sampling method



A cluster random sampling was adopted to select the households. In this method, the population was divided into clusters or groups. To navigate within the clusters, the researcher started at the central point within the cluster. We identified 12 clusters for the study and all the clusters were selected. Each cluster had approximately 100 households, so we decided to select 75 households from each cluster. This was done selecting every second household in the cluster this was done using right hand rule until the desired sample was achieved.

Tools and techniques

Mapping of Resources- A transect walk in the study area was carried out for mapping of the region. The process of transect walk included observation of major landmarks and resources available in the area and making notes of all vital information gathered and draw sketches. After finishing the transect walk all information was recorded. Following information was mapped by transect walk-

- Location of health centres/ Mohalla clinic / private clinics/ e clinics
- Hygiene and sanitation of the villages
- Tube wells/ wells and their utilization
- Schools/ training centres
- Presence of posters/ wall paintings etc of any health-related messages displayed anywhere.

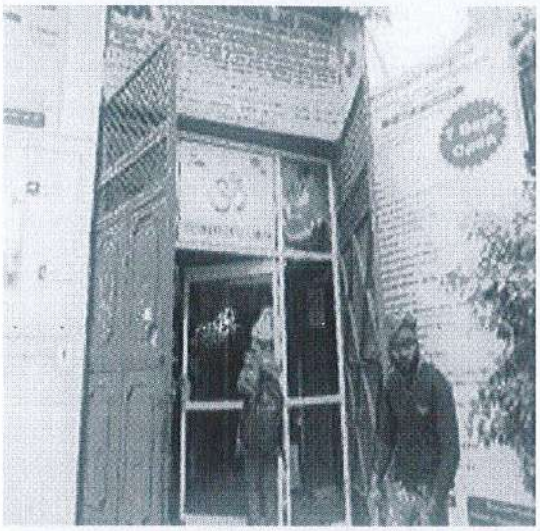




Figure-7: Different health facilities in the area



Figure: 8. Map of health facilities in 5 Km radius of the project site

List of Hospitals within 5 Km radius of the Project Site.		
S.No.	**Hospital Name**	**Distance from the Project Site (JUWMBL)**
1.	Maharshi Valmiki Hospital	2.53 KM, SW
2.	Durga Clinic	1.61 Km, SW
3.	Bhava Medical & Surgical Private Limited.	1.35 Km, SW
4.	Aam Admi Mohalla Clinic	2.42 KM, WSW
5.	Sant Soham Hospital	2.71 Km, WNW
6.	Metro Trauma And Policlinic	1.12 Km, W
7.	Hospital Light India 2	1.90 Km, W
8.	Technomac Medical System Pvt Ltd	1.61 Km, SW
9.	Shri Raja Ram Multi specialty Hospital	2.06 Km, SSW
10.	Mangalam Medical and surgical center	2.70 Km, SSW
11.	Mansa clinic	1.83 Km, S
12.	Sandhyashi Hospital	1.27 Km, E

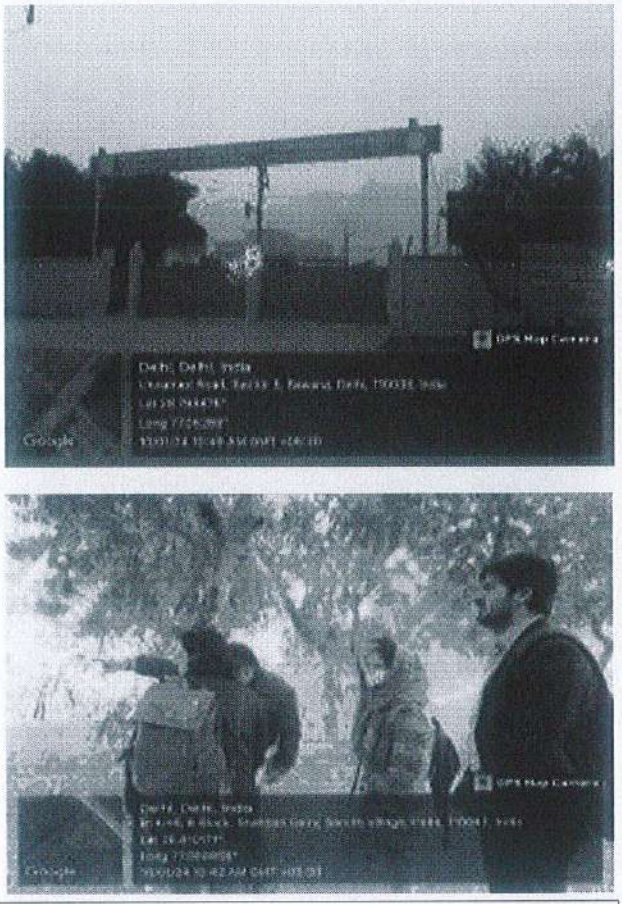


Figure: 9. Showing study site

Household survey

Through the survey, information regarding socio-demographic conditions, the health status of the residents, household composition, nutritional status, house type, and vital events was obtained. A carefully designed questionnaire had been created to collect this information. Before data collection, the questionnaire was passed through pre-testing to ensure its effectiveness and all the necessary adjustments were made before the actual survey commencement. A carefully designed questionnaire, reassessed for clarity and appropriateness across all demographics (including pictures or symbols if necessary), was used to collect data on demographics, health status, household composition, nutritional status, and housing conditions. The questionnaire was focus on symptom-based questions to improve recall accuracy. Technical medical terms will be replaced with simpler language. A pilot study will be conducted to ensure the effectiveness of the questionnaire before full-scale implementation.

Data collection

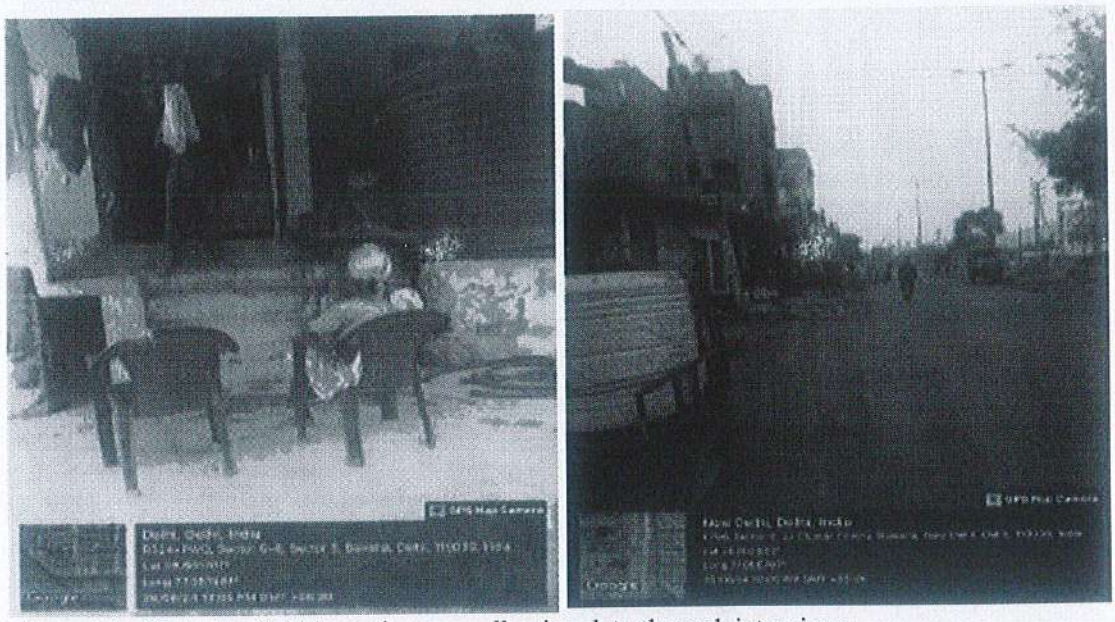


Figure: 10 . Showing field investigators collecting data through interviews

2 group of investigators comprising of a research officer (RO) and a field investigator visited the household selected by cluster sampling technique for data collection in a pre-designed and structured questionnaire. Each RO along with the field officer independently surveyed 20 to 25 households per day. 15-20 Field visits by two teams were organized on working days till 829 households were surveyed to complete the study. The data was collected in hand-held tablets by the investigators and direct feeding will take place in the central server of the institute. Internal quality control of the collective data was ensured by the built-in quality assurance mechanism of the data collection tool.

Data management and Ethical Consideration

The protection of interviewees was maintained by obtaining ethical clearance from the Institutional Review Board (IRB) at IIHMR and strictly adhering to it during data collection and afterwards. Written informed consent was obtained from each study participant after informing them about the purpose, method, expected benefit, and risk of the study, as described in the informed consent document. The principal investigator and the research team were responsible for data protection and use throughout the study. A data management and security plan were developed at the inception for all primary data collected. This plan ensured adherence to data security protocols, including password protection and anonymization of data. The primary data collected has been stored for three years after study completion. No personal identifying information was collected or used during the study.

Informed consent was obtained from all participants after a thorough explanation of the study's purpose, methods, benefits, and risks, using simple and understandable language. A separate consent form was used for any follow-up activities. The contact information provided was the institutional phone number of IIHMR Delhi. The study protocol ensured participant confidentiality throughout the research process. No identifiers were collected or linked to the data. The study was reviewed and approved by the Institutional Review Board (IRB) at IIHMR Delhi. A data management and security plan were developed to ensure adherence to ethical guidelines and data anonymization. Reverse tracing was explicitly excluded. Data sharing and publication policies were clearly outlined in the MoU and protocol. Specific aspects of the study to be shared with the global community were identified.

Findings of the Study

As presented in Table 1, our study covered 829 households, representing a diverse population of 3092 individuals. The median household income was reported as 35,000, offering a glimpse into the economic status of the study population. This data provides valuable insights into the socio-economic conditions that may influence various health outcomes and needs. The comprehensive household coverage and detailed income information allow for an in-depth analysis of the population's socio-economic characteristics, which is crucial for understanding the context and implications of the study's findings.

Table 1 General information of the Study Population

Total Number of Households covered	829
Median income of Household	35000
Total Population covered	3092

Socio-Demographic Profile of the Studied Population

The socio-demographic profile of the studied population provides a comprehensive overview of its age structure, gender composition, marital status, and educational levels, reflecting a community with diverse characteristics and developmental needs.

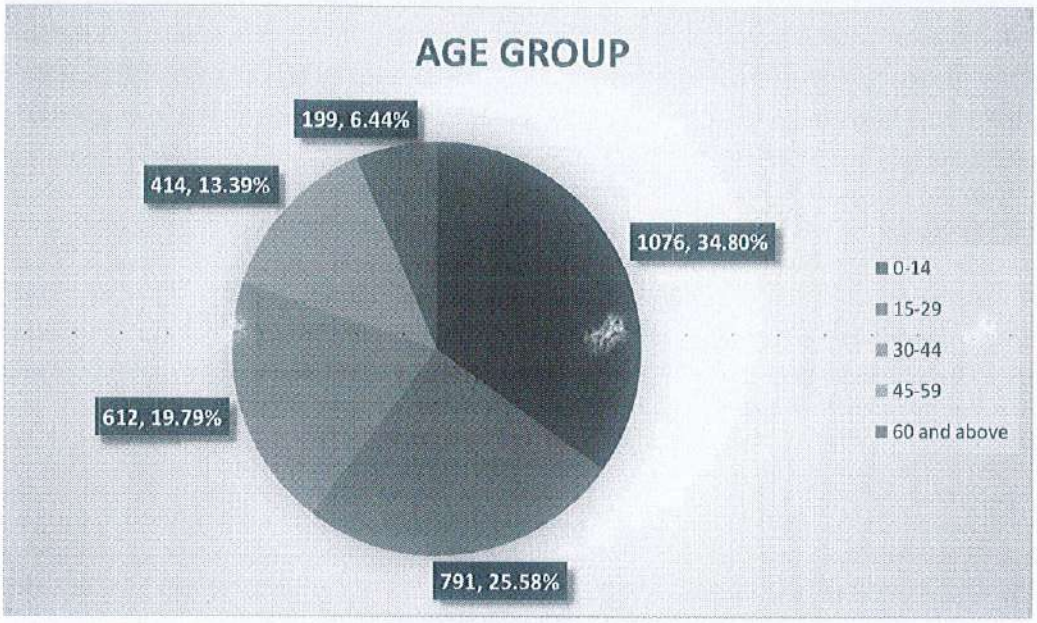


Figure:11. Showing the various proportions of age group in the population

Age distribution indicates a predominantly young population, with the largest group—34.80%—falling within the 0-14 age range. The next largest age group, 15-29 years, comprises 25.58% of the population, representing individuals who are likely entering adulthood, completing their education, or beginning careers. Following this, individuals aged 30-44 constitute 19.79% of the population and are likely to be in established professional roles or managing households. Those aged 45-59 make up 13.39%, likely a group with significant community involvement and experience, potentially influencing leadership and mentorship within the community. The smallest age segment is individuals aged 60 and above, who represent only 6.44%, highlighting a smaller elderly population that may nonetheless benefit from increased geriatric care and support services.

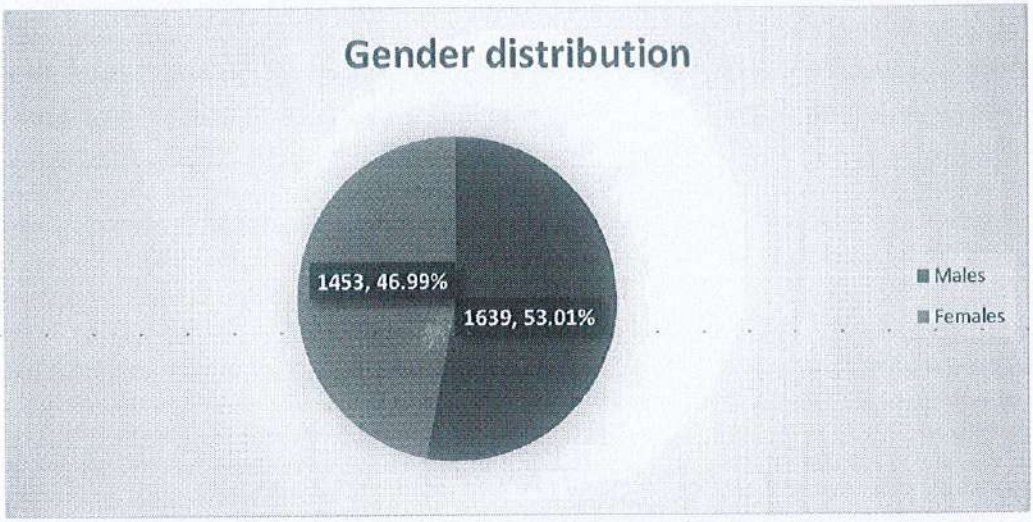


Figure:12. Showing gender distribution of the population

In terms of gender composition, the population has a slight male majority, with 53.01% of the population being male and 46.99% female, indicating a relatively balanced gender ratio. Marital status data reveals that a majority, 55.20%, are married, suggesting a strong presence of family units, while 44.79% are unmarried, which may include both young individuals and those choosing to remain single.

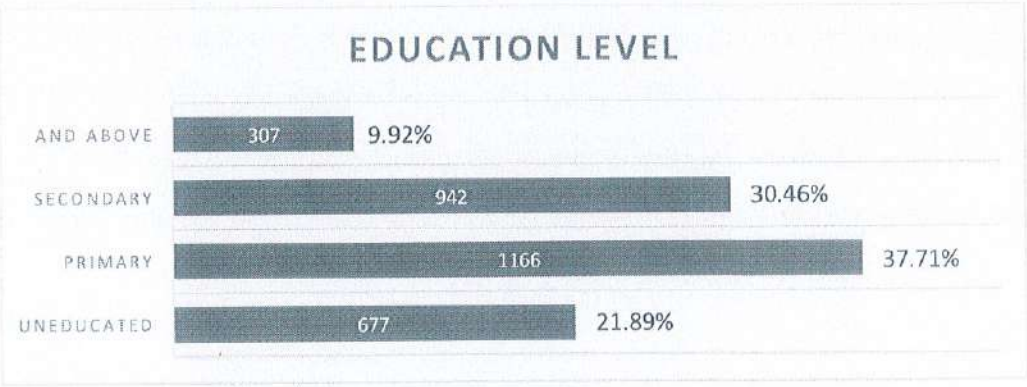


Figure:13. Showing Education level of the population

Educational attainment varies across the community: 37.71% have completed primary education, making it the most common level, followed by 30.46% with secondary education. A significant portion, 21.90%, remains uneducated, reflecting potential areas for educational improvement, while a smaller segment, 9.93%, has pursued education beyond the secondary level. Overall, the population profile highlights a young, moderately educated community with balanced gender representation and a solid base of family units.

Table 2 Socio-Demographic Profile of the Studied Population (n=3092)

S.No.	Characteristics		Frequency	Percentage
1	Age (in years)	0-14	1076	34.79
		15-29	791	25.58
		30-44	612	19.79
		45-59	414	13.38
		60 and above	199	6.43
2	Sex	Male	1639	53.01
		Female	1453	46.99
3	Marital Status	Married	1707	55.21
		Unmarried	1385	44.79
4	Education Level	Uneducated	677	21.90
		Primary	1166	37.71
		Secondary	942	30.46
		And above	307	9.93

Socio-economic status of the Study Population

The socio-economic status of the study population, comprising 3,092 individuals, provides valuable insight into income levels, employment status, residential locality, housing conditions, and family structure, reflecting both economic diversity and the overall standard of living.

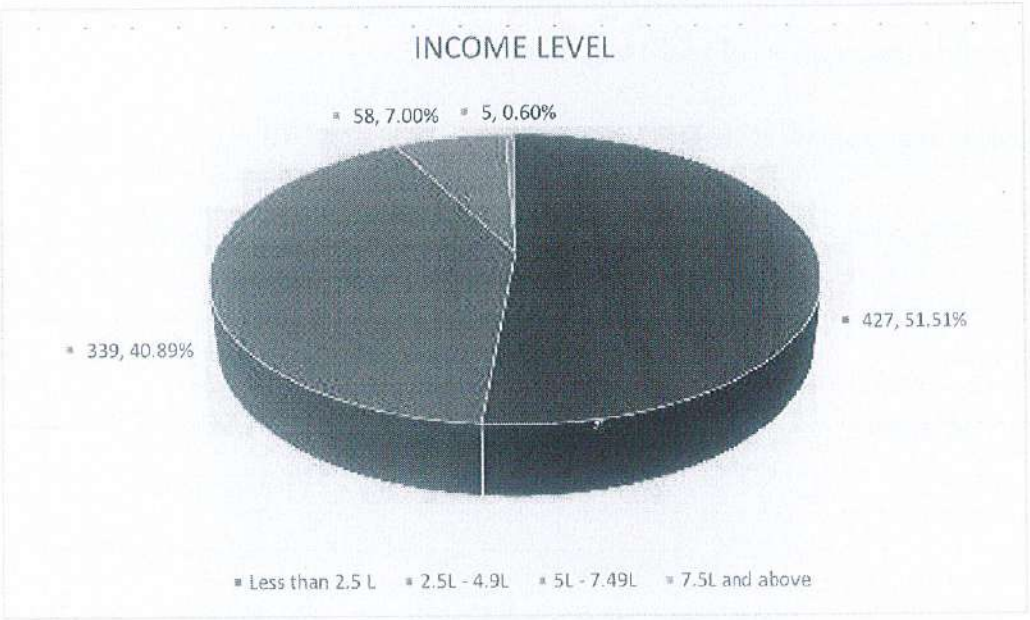


Figure:14. Showing Income level of the population

Starting with **income levels**, most of the population falls within lower-income brackets. Specifically, 51.51% of households have an annual income below 2.5 lakh rupees, highlighting a substantial proportion of the population with limited financial resources. Another 40.89% earn between 2.5 and 4.9 lakh rupees, representing a slightly better but still modest income range. Only a small portion, 7.00%, falls within the 5-7.49 lakh bracket, and a very minimal 0.60% earn above 7.5 lakh rupees annually. This distribution shows a predominantly low-

income population, which could indicate financial constraints impacting their access to resources and services.

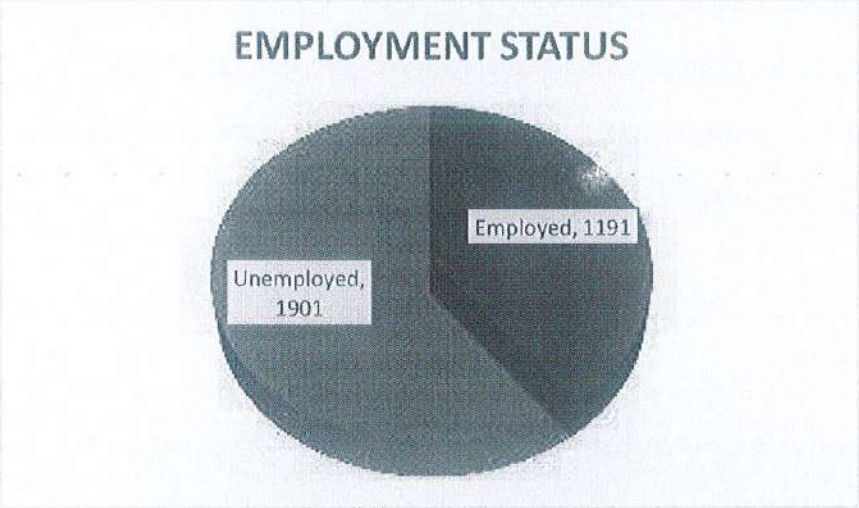


Figure: 15. Showing employment status of the population

In terms of **employment status**, most of the population, 61.48%, is unemployed, while 38.51% are employed. This high unemployment rate could influence the overall economic stability and quality of life, as limited employment opportunities might restrict individuals' ability to improve their financial standing or invest in health, education, and housing.

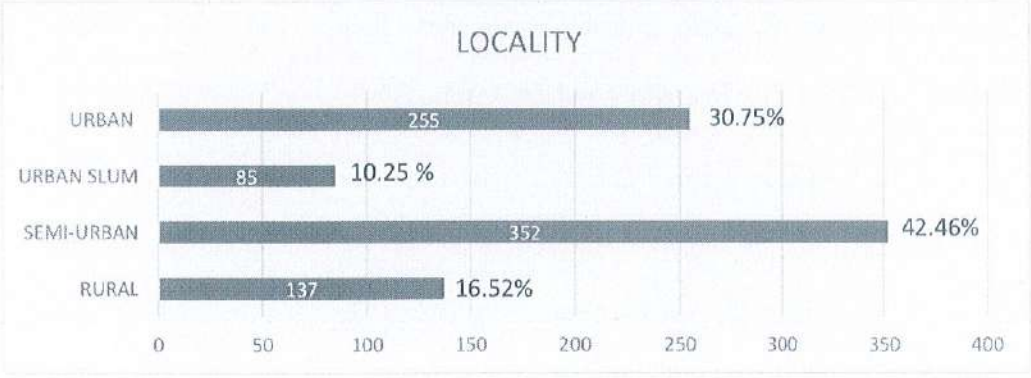


Figure: 16. Showing the distribution of the households in various localities

Regarding **locality**, 16.53% of the population resides in rural areas, while a significant proportion, 42.46%, lives in semi-urban localities. Another 10.25% resides in urban slums, and 30.76% live in urban settings. The mix of rural, semi-urban, urban slum, and urban dwellers suggests a population that spans different environmental contexts, each with distinct access to amenities, healthcare, and educational facilities. Individuals in rural and slum areas might face additional challenges due to limited infrastructure and public services.

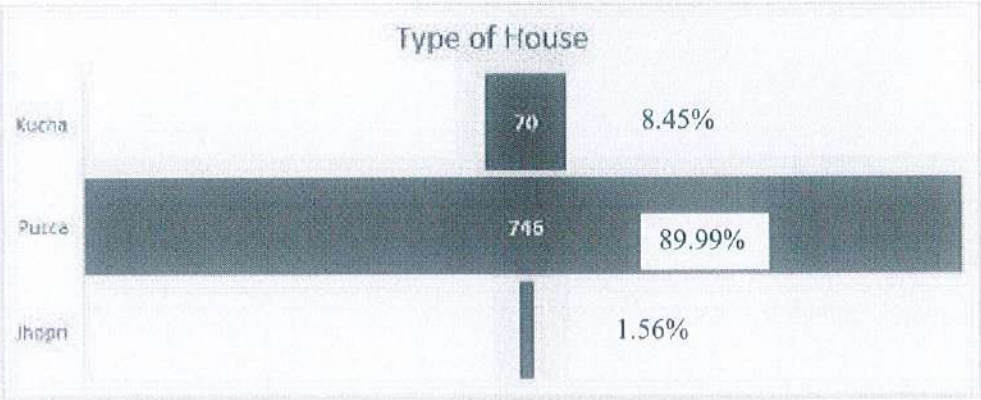


Figure:17. Showing the type of households involved in the study

Housing conditions further reflect the socio-economic variability, with 89.99% of the population living in pucca (permanent) houses, indicating a majority with stable housing structures. Meanwhile, 8.45% reside in Kucha (temporary) houses, and 1.56% in Jopris (makeshift huts), which are often less secure and more vulnerable to environmental factors.

Finally, in terms of **family structure**, 51.62% of households are nuclear families, while 48.38% are joint families. This nearly even distribution shows a balanced mix between traditional joint families and smaller nuclear setups, which may influence household dynamics, resource-sharing practices, and living conditions.

Overall, this socio-economic profile portrays a population with predominantly low-income, high unemployment, varied living conditions, stable housing for most, and a balance between nuclear and joint family structures, which can shape their socio-economic challenges and community dynamics.

1004

S.No	Characteristics	Category	Frequency	Percentage (%)
1.	Income Level	Less than 2.5L	427	51.50
		2.5l- 4.9L	339	40.89
		5L-7.49L	58	6.99
		7.5L and above	5	0.6
2	Employment Status	Employed	1191	38.51
		Unemployed	1901	61.48
3	Locality	Rural	137	16.53
		Semi urban	352	42.46
		Urban Slum	85	10.25
		Urban	255	30.76
4	Type of House	Kucha	70	8.45
		Pucca	746	89.99
		Jhopri	13	1.56
5	Type of Families	Joint	401	48.37
		Nuclear	428	51.63

The table 3 mentioned above shows us the data as follows.

Table 3 Socio-economic status of the Study Population (n=3092)

The data on household ownership status provides insights into the nature of property ownership among the studied population, revealing distinctions in homeownership, rental arrangements, and the specific purposes for which properties are utilized. Among the total households, a majority, 458, own their property, which accounts for a significant portion of the community and suggests a degree of stability in terms of residential security and asset ownership. Out Of the total households who own property, the vast majority—85 households—utilize it specifically for residential purposes, indicating a strong trend toward property ownership primarily for housing. One household reported owning property for an alternative purpose, reflecting the possibility of diverse property uses within the population, though this is rare. On the other hand, 362 households do not own property, indicating a sizable segment of the population without property ownership. Among the non-property-owning households, 30 households reported that they reside in rented accommodations. Further, 14 households that do not own property use it for purposes other than living accommodations, suggesting alternative uses such as business or storage, though these specific purposes are not detailed in the data.

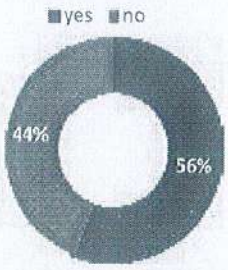


Figure 18- Distribution of Ownership Status of Households

In summary, the household ownership status reveals a predominantly ownership-oriented population focused on residential security, with a smaller segment relying on rental

arrangements or using property for varied purposes, reflecting a blend of stability and flexibility in housing dynamics.

A comprehensive analysis of various characteristics across 829 households shows that most households reside in Pucca houses, which are constructed with durable materials, making up 89.99% of the sample. In contrast, only 8.45% live in Kucha houses, characterized by less permanent materials, and 1.56% are in Jhopri structures, which are typically simpler and more temporary. Regarding property ownership, majority households' households (78.78%) own residential properties, indicating that residential real estate is the primary form of property held. Ownership of agricultural or other types of property is minimal, with just 0.13% reporting such assets, and around 21.10 households own commercial property.

The table 4, further illustrates the distribution of household assets. Refrigerators are the most owned asset, found in 25.61% of households, followed by TV in 22.19% and coolers in 19.13% of households, indicating a high level of access to cooling and entertainment appliances. Washing machines are present in 13.49% of households, and scooters are owned by 11.69%, reflecting a moderate level of access to personal transportation.

Air conditioners are less prevalent, with ownership at 4.15%, and cars are even less common, found in only 3.57% of households. VCRs have nearly disappeared from households, with ownership at just 0.25%. Additionally, a small fraction of households (2.65%) owns domestic animals, while the majority (97.35%) do not.

This data offers a detailed view of living conditions, highlighting that while durable housing and residential property ownership are widespread, ownership of certain household assets and domestic animals is more limited.

Table 4 Household and Property status (n=829)

S.No	Characteristics	Category	Frequency	Percentage
1	Type of House	Kucha	70	8.45
		Jhopri	13	1.56
		Pucca	746	89.99
2	Type of property owned	Residential	653	78.77
		Agricultural	1	0.13
		Commercial	175	21.10
		Others	0	0
3	Household Assets	A.C.	34	4.15
		Refrigerator	212	25.61
		TV	184	22.19
		VCR	2	0.25
		Washing Machine	112	13.49
		Scooter	97	11.69
		Cooler	158	19.13
		Car	30	3.57
4	Domestic Animals	Yes	22	2.65
		No	807	97.35

Nutritional Status of the Study population

Table 5 presents a comprehensive view of the nutritional status and dietary habits of a study population comprising 3092 individuals. The table highlights three main aspects: dietary habits, water sources, and types of milk consumed, each of which offers insight into lifestyle factors impacting health and nutrition. In terms of dietary habits, 43.85% of the population (1,033 individuals) identifies as vegetarian, while the remaining 56.15% (1,323 individuals) are non-vegetarians.

Water sources are also notably varied within the population. The most prevalent source is Reverse Osmosis (R.O.) systems, which supply water to 39.33% of the population (326 households), followed by tap water at 25.33% (210 households) and handpumps at 20.63% (171 households). Tank water serves 12.66% (105 households), and a small portion, only 2.05% (17 households), depends on tubewell water. This distribution indicates that a considerable part of the population relies on filtered or treated water, potentially reducing exposure to waterborne diseases and promoting better health outcomes. However, the diversity of water sources also highlights the unequal levels of water quality and accessibility across the population, which could affect health risks related to water sanitation.

Milk consumption patterns reveal a strong preference for cow milk, with 85.88% of the population (712 households) relying on this source. Buffalo milk is consumed by 3.98% (33 households), and goat milk by 3.02% (25 households). Only minor portions of the population use other milk sources, such as domestic sources (0.12%), milkmen (1.82%), and Mother Dairy (5.18%). Overall, Table 5 provides valuable insights into the population's dietary patterns, access to water, and milk preferences, all of which play a crucial role in shaping their health

and nutritional well-being. The data underscores the importance of understanding such lifestyle factors to assess and improve nutritional status within the community effectively.

Table 5 Nutritional status of the study population (n=3092), (n=829)

Characteristics	Category	Frequency	Percentage
Dietary Habit (n=3092)	Vegetarian	1356	43.85
	Non-Vegetarian	1736	56.14
Source Of Water (n=829)	Handpump	171	20.63
	R.O.	326	39.33
	Tap	210	25.33
	Tank	105	12.66
	Tubewell	17	2.05
Kind Of Milk (n=829)	Domestic Source	1	0.12
	Milkman	15	1.82
	Mother Dairy	43	5.18
	Cow	712	85.88
	Buffalo	33	3.98
	Goat	25	3.02

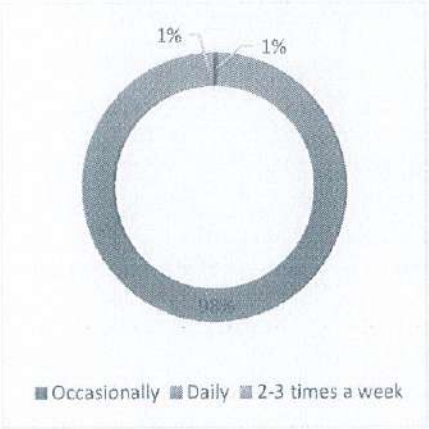


Figure 19- Frequency of vegetarian food intake

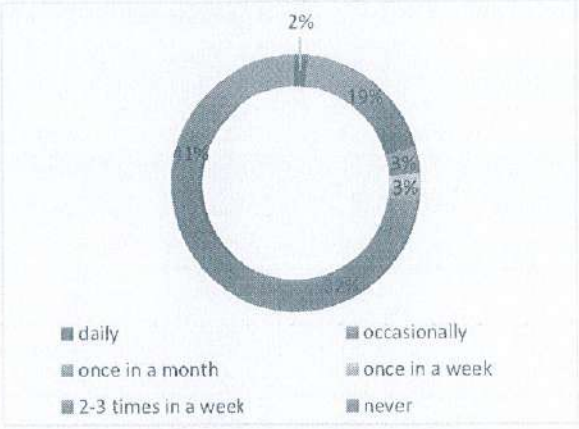


Figure 20- Frequency of non-vegetarian food intake

The above pie charts (Figure 19 and Figure 20) provide a detailed breakdown of the frequency of vegetarian and non-vegetarian food intake within the study population. For vegetarian food consumption, the majority of individuals (480) consume vegetarian food daily, indicating a strong preference for or adherence to a vegetarian diet. In contrast, very few individuals eat vegetarian food only occasionally (3) or 2-3 times a week (6), highlighting that regular consumption is the norm for this group. When it comes to non-vegetarian food intake, the distribution is more varied: a small number of individuals (6) consume non-vegetarian food daily, while 110 individuals eat it 2-3 times a week, making this the most frequent pattern of non-vegetarian consumption. Additionally, 65 individuals consume non-vegetarian food occasionally, 12 eat it once a month, and another 12 do so once a week. Notably, a significant portion of the population (143) reports never consuming non-vegetarian food. This chart illustrates a predominant pattern of daily vegetarian food intake with varied frequencies of non-vegetarian consumption, and a notable segment of the population abstains from non-vegetarian food entirely.

Table 6 Frequency of Food Intake (n=829)

Number of times	Daily	Occasionally	Once in a week	2-3 times a week	Once in a month	Never	Total frequency	Percentage
Milk product	284	115	59	228	7	83	776	93.60
	Non respondent	Non respondent	Non respondent	Non respondent	Non respondent	Non respondent	53	6.4
Pulses	328	15	38	390	9	0	780	94.08
	Non respondent	Non respondent	Non respondent	Non respondent	Non respondent	Non respondent	49	5.92
Fruits	100	139	145	347	31	11	773	92.24
	Non respondent	Non respondent	Non respondent	Non respondent	Non respondent	Non respondent	56	7.76

Table 6 illustrates the frequency of food intake among a sample of 829 Households, focusing on three key food categories: milk products, pulses, and fruits. This data provides a snapshot of dietary habits, showing how often these food types are consumed, with percentages reflecting the proportion of individuals consuming each category to varying degrees.

Milk products are consumed by 93.60% of the population (776 households). Among these, 284 households consume milk products daily, indicating a strong inclination toward regular dairy intake. Additionally, 228 households consume milk products 2-3 times a week, while 115 consume them occasionally. Lower frequencies are seen among households who consume milk products once a week (59 households), once a month (7 households), or never (83 households). The high daily and weekly consumption suggests that milk products are a common and valued source of nutrition within this community, likely contributing essential proteins and calcium.

Pulses show even higher regular consumption, with 94.08% of the sample (780 households) including them in their diets. Among these, a significant portion (328 households) consumes pulses daily, while 390 households include them 2-3 times a week. This pattern underscores the importance of pulses as a staple protein source, especially relevant in regions where plant-based diets are prevalent. Few individuals consume pulses occasionally or once a week, and none reported never consuming them, highlighting pulses' foundational role in the diet.

Fruits are consumed by 92.24% of the sample (773 households), though less frequently compared to pulses and milk products. Only 100 households consume fruits daily, while the largest group (347 households) consumes fruits 2-3 times a week, suggesting that while fruits are accessible, they may be less integral to daily meals. A substantial number (145 households) consume fruits once a week, and 139 households consume them occasionally. Lower consumption frequencies may reflect issues such as seasonal availability or cost.

In summary, Table 6 offers valuable insights into dietary patterns within the population, showing that milk products and pulses are consumed regularly, with high daily and weekly intake levels, while fruits are consumed less frequently. This frequency of intake suggests a dietary structure where pulses and dairy are key protein sources, whereas fruits may be included more sporadically, possibly due to availability or affordability factors. These patterns provide an important context for understanding the nutritional intake and food accessibility in this population.

The Lifestyle and Behavioural Characteristics of The Study Population

The lifestyle and behavioural characteristics of the study population depicted diverse dietary habits and varying levels of substance use. Regarding diet, a significant portion of the population (56.14% or 1736 individuals) follows a non-vegetarian diet, while 43.85% (1356 individuals) adhere to a vegetarian diet. Substance use is present but not widespread, with tobacco consumption observed in 11.96% (370 individuals) of the population, and alcohol consumption in 8.99% (278 individuals). The use of other drugs is minimal, reported in only one individual (0.0005%). Water sources vary among the population, with R.O. (Reverse Osmosis) systems being the most common, used 39.27% (326 households), followed by tap water at 25.40% (210 households) and handpumps at 20.56% (171 households). Tank water serves 12.60% (105 households), and a small portion, only 2.00% (17 households), depend on tubewell water. This data suggests a population with a preference for non-vegetarian diets, relatively low substance use, and a range of water sources, with a notable inclination towards purified (R.O.) water.

Table 7 Lifestyle and Behavioural Status of the Study Population (n=3092)

S.No	Characteristics	Category	Frequency	Percentage
1	Dietary Habits	Vegetarian	1356	43.85
		Non vegetarian	1736	56.14
2	Tobacco Consumption		370	11.96
3	Alcohol Consumption		278	8.99
4	Other drugs		1	0.0005

In terms of alcohol consumption, there are 162 regular drinkers who consume alcohol daily out of a total of 278 instances and an average intake of 250 ml per day, which represents 8.99% of the population. Additionally, 116 individuals are categorized as occasional drinkers, although their specific daily intake is not detailed.

For tobacco use, 289 individuals are regular users, accounting for 11.96% of the population, though no average quantity of tobacco consumed is provided. There are also 81 occasional tobacco users, with no specific data on their daily intake. Overall, the data highlights both the prevalence of regular and occasional consumption of alcohol and tobacco, along with the average intake of alcohol, providing valuable insights into the substance use behaviours within this population.

Importantly, the table notes that there is no consumption of alcohol or tobacco reported during pregnancy among the individuals surveyed, indicating a level of awareness or caution regarding substance use in this context. (Table 8)

Table 8- Consumption pattern of Alcohol, Tobacco, and drugs (n=3092)

Consumption type	Consumption pattern	Frequency	Total	Percentage	Quantity per Day	Intake during pregnancy
Alcohol	Regular	162	278	8.99	282.5 mL	No
	Occasional	116				
Tobacco	Regular	289	370	11.96	2 packets	No
	Occasional	81				

According to Table 8, the overall consumption rates of alcohol and tobacco among the study population show that alcohol consumption is reported regularly by 8.99% of the population (278 individuals), with an average daily intake of 282.5 ml. Additionally, tobacco consumption is also reported regularly by 11.96% of the study group (370 individuals), with an average intake of 2 packets per day. These findings suggest a relatively high prevalence of regular use of both substances. The data also shows that no one reported using other drugs in this sample.

The data from Table 8 (Consumption Pattern of Alcohol, Tobacco, and Drugs) and Figure 21 (Substance Use Initiation by Age) offers a detailed overview of substance use behaviours, with a focus on the initiation and frequency of alcohol and tobacco consumption across different age groups. This comprehensive analysis provides valuable insights into the prevalence of substance use, its initiation across various life stages, and the associated health risks.

Figure 21 further dissects substance consumption by age categories, revealing striking differences in alcohol and tobacco use across various life stages. Alarmingly, the age group 0-14 shows 71 instances of alcohol initiation and 75 instances of tobacco initiation, which is a significant concern as these are young, vulnerable individuals. The age group 15-29 shows a slight decrease in both alcohol (66) and tobacco (65) initiation in compared to the 0-14 age group, but it still indicates a substantial prevalence of substance use. Initiation rates decrease notably in the age group 30-44, with only 22 individuals starting alcohol and 17 individuals starting tobacco. This decline may reflect lifestyle changes such as family commitments, career development, or growing health consciousness. Among individuals aged 45-59, there is a sharp drop in alcohol (2) and tobacco (1) consumption, which may be indicative of a shift towards healthier living in middle age, often motivated by awareness of the risks associated with prolonged substance use. However, this may also indicate that most people in this age group may have already established their substance use patterns earlier in life. Remarkably, no individuals in the age group 60 and above reported initiating alcohol or tobacco, which is a positive finding.

The data on substance use initiation by age category reveals distinct patterns in the ages at which individuals begin using alcohol and tobacco. For both substances, initiation is notably more in younger and rare in older age groups. Overall, the data highlights that the initiation of alcohol and tobacco use predominantly occurs in younger age groups, particularly between 0

and 14 years, with a significant reduction in new use as individuals age beyond this period. (figure 21)

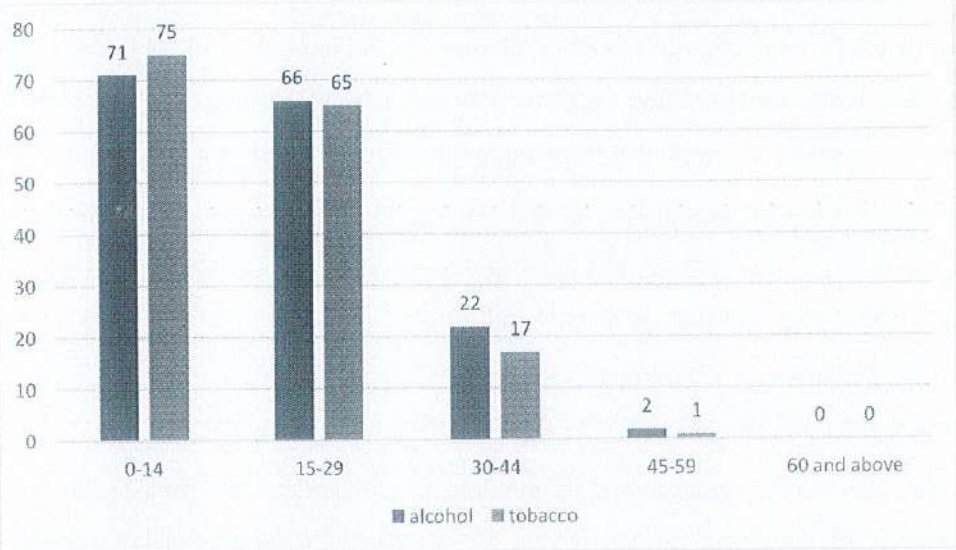


Figure 21- Substance Use Initiation by Age

Morbidity Distribution

Table 10 presents the distribution of morbidity among the study subjects, with a total sample size of 3092 individuals. The data reveals that the majority of the study population, 2335 individuals (75.52%), do not exhibit any morbidity at the time of data collection, indicating a generally healthy status for nearly three-quarters of the subjects. *Conversely, 757 individuals, representing 24.48% of the study population, present with some form of morbidity.* This suggests that just over one-quarter of the subjects are experiencing health issues or conditions that contribute to their morbidity status. The clear division between those with and without morbidity provides a straightforward overview of the health status within the study group, with a notably higher proportion of individuals free from morbidity-related concerns.

Table 9 Distribution of the study subjects based on Morbidity (n=3092)

Morbidity status	Frequency	Percentage (%)
Present	757	24.48
Absent	2335	75.52
Total	3092	100

The study reveals a nearly even split between communicable and non-communicable diseases, with a slight predominance of communicable conditions. *Specifically, 68% of the affected individuals suffer from communicable diseases, while 32% are affected with non-communicable diseases.* This distribution highlights the dual burden of disease facing the study population, with infectious diseases maintaining a marginally higher prevalence.

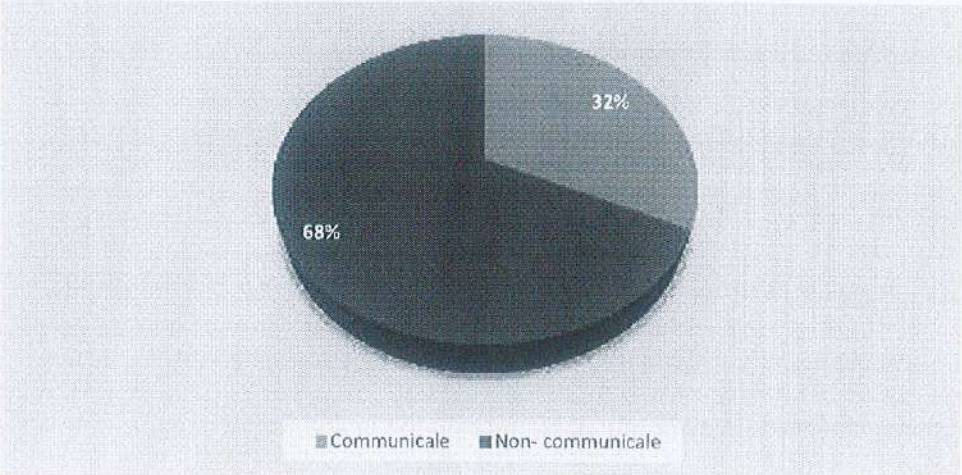


Figure 22. Prevalence of Communicable and Non-Communicable disease (n=3092)

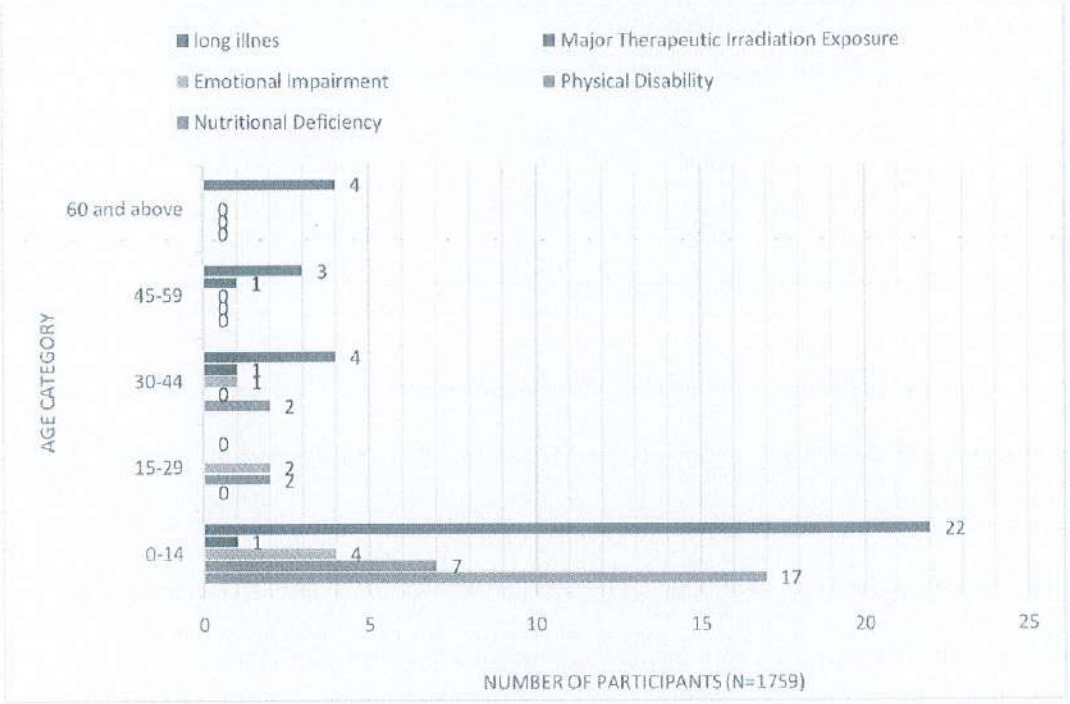


Figure-23. Distribution of Health Conditions by Age Group

Figure 23 illustrates the distribution of morbidity types among the study participants who reported health issues.

The data on various health conditions across different age categories provides insights into the prevalence of nutritional deficiencies, physical disabilities, emotional impairments, major therapeutic irradiation exposure, and long illnesses.

In the youngest age group, 0-14 years, there are 17 individuals with nutritional deficiencies and 7 with physical disabilities, and 4 cases of emotional impairments and 1 major therapeutic irradiation exposure, 22 long illnesses are reported. This suggests that while nutritional and physical health issues are present, along with more severe conditions are also observed in this

age group. Among individuals aged 15-29 years, the data shows 2 case of physical disability and 2 cases of emotional impairment, with no reports of nutritional deficiencies, major therapeutic irradiation exposure, or long illnesses. For the 30-44 age group, there are 2 individuals with nutritional deficiencies, 1 with emotional impairment, 1 exposed to major therapeutic irradiation, and 4 with long illnesses. This suggests a moderate level of health concerns, including chronic conditions and exposure to significant medical treatments, which may reflect the cumulative health impacts of aging and lifestyle factors. In the 45-59 age category, there is 1 case each of major therapeutic irradiation exposure and long illness, but no reports of nutritional deficiencies, physical disabilities, or emotional impairments. This indicates that major therapeutic interventions and long-term illnesses become more prominent in this age group, while other health issues are less common. For individuals aged 60 and above, there are 4 reports of long illnesses, but no cases of nutritional deficiencies, physical disabilities, emotional impairments, or major therapeutic irradiation exposure. This highlights that while severe and chronic health conditions are prevalent in older adults, other specific health issues are not as commonly reported in this age group.

Overall, the data illustrates how the prevalence and types of health conditions shift across different life stages, with early childhood showing issues related to nutrition and physical health, young adulthood exhibiting emerging emotional and physical health challenges, middle age marked by chronic conditions and therapeutic exposures, and older age characterized primarily by long illnesses.

1020

Table 10- Distribution of Co-morbidity* among the study subjects (n=3092)

Type of Morbidity	Co-morbidity	Number of Subjects	Percentage (%)
Communicable disease	Typhoid	154	4.98
	Amoebic Dysentery	22	0.71
	Diarrhoea	122	3.94
	Eye Flu (Conjunctivitis)	108	3.49
Non-Communicable diseases	Heart Failure/Disease	149	4.81
	Irritable Bowel Disease (IBD)	90	2.91
	Chronic Bronchitis	63	2.03
	Arthritis	41	1.32
	Hernia	9	0.29
	Emphysema	3	0.09
	Depression	17	0.54
	Cancer	17	0.54
	Blood Pressure (BP)	24	0.77
	Diabetes	43	1.39
	Fibrosis	1	0.03
	Thyroid Disorders	4	0.12
	Paralysis	3	0.09
	Asthma	8	0.26
	Kidney Stones (Stone in Kidney)	3	0.09
	Bladder Stones (Stone in Bladder)	2	0.06
	Inflammatory Bowel Disease	7	0.22

	Liver Problems (Problem in Liver)	1	0.03

The health profile of the study participants, which includes a total of 3,092 individuals, reflects a diverse range of health conditions, with both communicable and non-communicable diseases being prevalent among the sample. According to the findings, 477 individuals, or 15.42% of the total sample, reported having at least one disease. This indicates a significant portion of the population experiencing health issues, with communicable diseases accounting for a substantial proportion of the reported illnesses.

Out of the 477 individuals with diseases, 243 were affected by communicable diseases. Among these, **typhoid** emerged as the most commonly reported illness, impacting 154 participants. This represents 63.40% of those with communicable diseases and 4.98% of the overall study population. Typhoid is a bacterial infection often associated with poor sanitation and contaminated water, highlighting potential public health concerns in the community. **Diarrhoea** followed closely, reported by 122 individuals (50.20% of communicable disease cases), affecting 3.94% of the total population. Diarrhoea is a major cause of morbidity in many regions, often linked to waterborne pathogens, which can further underscore the importance of clean water and sanitation initiatives.

Another significant communicable disease was **eye flu** (conjunctivitis), which impacted 108 individuals (44.44% of those with communicable diseases), representing 3.49% of the total population. Eye flu is highly contagious and can spread rapidly in crowded conditions, making it a common concern in communities. Additionally, **amoebic dysentery** was reported by 22 individuals, accounting for 9.05% of the communicable disease cases and 0.71% of the study population. This condition is typically caused by contaminated food or water and can lead to gastrointestinal distress, further emphasizing the importance of sanitation.

In the realm of **non-communicable diseases (NCDs)**, 485 participants reported at least one condition. Among these, **heart failure/disease** was the most prevalent, with 149 individuals affected, representing 27.54% of the NCD cases and 4.81% of the total population. Cardiovascular diseases continue to be a major health concern globally, and the findings reflect

a significant burden of heart-related issues within the studied population. **Irritable bowel disease (IBD)** was the second most common NCD, with 90 individuals reporting the condition, which accounts for 17.50% of NCD cases and 2.91% of the total study population. IBD includes chronic conditions like Crohn's disease and ulcerative colitis, which can significantly impact individuals' quality of life.

Other notable NCDs included **chronic bronchitis**, reported by 63 individuals (12.25% of NCD cases, 2.03% of the total population), and **diabetes**, reported by 43 individuals (8.36% of NCD cases, 1.39% of the total population). **Arthritis** was noted in 41 individuals, representing 7.97% of NCD cases and 1.32% of the overall population. Conditions like asthma and high blood pressure (BP) were also reported, with 8 participants affected by asthma (0.26% of the total population) and 24 individuals experiencing high blood pressure (0.77% of the total population). These findings emphasize the growing prevalence of chronic respiratory and cardiovascular conditions, which are often linked to lifestyle factors and aging.

Additional NCDs included **depression** and **cancer**, each reported by 17 individuals (3.3% of NCD cases, 0.54% of the total population), highlighting the psychological and oncological burden within the community. Other rarer conditions included **hernia** (9 individuals, 1.75% of NCD cases, 0.29% of the population), **inflammatory bowel disease** (7 individuals, 1.36% of NCD cases, 0.22% of the population), and **thyroid disorders** (4 individuals, 0.78% of NCD cases, 0.12% of the population). Rare conditions such as **emphysema**, **paralysis**, and **kidney stones** were each reported by three participants (0.58% of NCD cases, 0.09% of the population), while other less common conditions, including **arthritis**, **bladder stones**, **fibrosis**, and **liver problems**, were each reported by two individuals. (table 10)

Table 11- Distribution of Symptoms among the study subjects (n=3092)

Symptoms	Number of Subjects (n)	Percentage (%)
Migraine	126	4.07
Hair fall	228	7.37
Eye pain	145	4.69

Skin Allergy/ Other Allergies	115	3.72
joint pain	4	0.13
Swelling	1	0.03
Total	619	20.01

Table 11 provides a detailed breakdown of the distribution of various symptoms among the study subjects, which consisted of 3092 participants. The table highlights the prevalence of different symptoms experienced by these individuals, presenting both the number of subjects affected and their corresponding percentages within the study group. The purpose of this table is to give a comprehensive overview of the symptoms reported, which could be used to identify potential health trends or associations within the study population.

Migraine emerged as one of the most commonly reported symptoms, with 126 subjects (4.07%) indicating that they had experienced this condition. Migraines are characterized by intense, often debilitating headaches that can be accompanied by nausea, vomiting, and sensitivity to light or sound. Given the moderate prevalence of migraine within this population, it suggests that this symptom might be a significant health concern for a subset of the study group, potentially influencing their quality of life and daily functioning.

Hair fall, reported by 228 subjects (7.37%), was another notable symptom in the dataset. Hair loss can result from a variety of causes, ranging from genetic factors and hormonal imbalances to stress, nutritional deficiencies, or underlying medical conditions. The relatively higher percentage of individuals affected by hair fall may reflect the influence of lifestyle, environmental factors, or other health issues prevalent in the study area or demographic group. Hair loss often has psychological impacts, particularly among individuals who experience significant thinning or bald patches.

Eye pain, experienced by 145 subjects (4.68%), is another symptom with a moderate prevalence. Eye pain can be caused by various factors, including strain from prolonged screen time, dryness, infections, allergies, or other ocular conditions. The percentage of individuals

reporting eye pain suggests that this might be a symptom warranting attention, especially in populations that may be prone to eye strain or environmental irritants.

The **skin allergy/other allergies** category, which includes a wide range of allergic reactions affecting the skin, was reported by 115 subjects (3.71%). Allergic conditions can result from exposure to various environmental triggers such as pollen, dust, food, or chemicals. The presence of skin allergies in 3.71% of the study group indicates that allergic reactions could be a common issue, perhaps influenced by environmental factors or genetic predisposition within the population.

Joint pain, reported by only 4 subjects (0.12%), was the least common symptom in the study. Joint pain can be a sign of various conditions such as arthritis, overuse, or age-related degeneration. Its low prevalence in this study may suggest that joint issues were less of a concern in this particular sample group, or it could point to a younger age demographic with fewer instances of conditions that typically cause joint discomfort.

Lastly, **swelling**, reported by just 1 subject (0.03%), was the rarest symptom identified in the study. Swelling can occur due to a variety of health issues, such as injury, infection, or systemic conditions. The extremely low prevalence of swelling in this study may indicate that it was either not a common symptom in the population or that it was not a major concern for most subjects during the study period.

In summary, the symptoms most commonly reported in the study included hair fall, eye pain, and migraine, which could reflect a combination of environmental, lifestyle, or genetic factors influencing health in the study group. On the other hand, symptoms like joint pain and swelling were relatively rare, suggesting less widespread concern in these areas. These findings could be valuable for understanding health trends, guiding interventions, or identifying potential areas for further research within the studied population. (Table 11)

Table 12- Association between socio-demographic characters and morbidity patterns

Sociodemographic Characteristics	Variables	Morbidity Present N %	Morbidity Absent N %	Chi-square value P value
Sex	Male	218(52.7%)	1435(53.6%)	.103
	Female	196(47.3%)	1242(46.4%)	0.748
Age Groups	0-14	314(75.3%)	907(33.9%)	338.180 0.000*
	15-29	9(2.1%)	714(26.7%)	
	30-44	10(2.4%)	580(21.7%)	
	45-59	30(7.2%)	358(13.4%)	
	60 and above	54(12.7%)	116(4.3%)	
Type of Family	Nuclear	63(57%)	366(51%)	4.591
	Joint	48(43%)	352(49%)	0.032*

Note: *= p value<0.05

Note: *= p value<0.05

Table 12 explores the association between socio-demographic characteristics and morbidity patterns among the studied population, using chi-square tests to identify statistically significant relationships. The analysis examines variables such as sex, age groups, and family type, highlighting both significant and non-significant associations between these factors and the presence or absence of morbidity.

Sex distribution revealed minimal variation in morbidity prevalence between males and females. Among those reporting morbidity, 52.7% were males and 47.3% were females. Similarly, in the morbidity-absent group, 53.6% were males and 46.4% were females. The chi-

square value of 0.103 and a p-value of 0.748 suggest no statistically significant association between sex and morbidity. This finding implies that sex, in isolation, does not strongly influence morbidity patterns within the study population.

Age, on the other hand, showed a strong and statistically significant relationship with morbidity. Among individuals with morbidity, the largest proportion (75.3%) was found in the 0–14 age group, followed by 12.7% in the 60-and-above group, 7.2% in the 45–59 group, and only 2.1% and 2.4% respectively in the 15–29 and 30–44 age brackets. In contrast, for those without morbidity, the highest proportion (33.9%) was also in the 0–14 age group, but a more balanced distribution was observed across other age groups: 26.7% in the 15–29 group, 21.7% in the 30–44 group, 13.4% in the 45–59 group, and only 4.4% in the 60-and-above group. The chi-square value of 338.180 and a p-value of <0.001 indicate a highly significant association, highlighting age as a critical determinant of morbidity, particularly among children and older adults. This underscores the need for targeted health interventions for these age groups to reduce the burden of morbidity.

The age group 0-14 has the largest portion of individuals with morbidity as well as without morbidity because among the 3092 individuals, almost 35% that is 1076 individuals belong to this group only.

Family structure also demonstrated a significant association with morbidity. Among individuals with morbidity, a higher proportion (57%) were from nuclear families, compared to 43% from joint families. Conversely, among those without morbidity, slightly more individuals (49%) belonged to joint families than nuclear families (51%). The chi-square value of 4.591 and a p-value of 0.032 suggest a statistically significant association between family type and morbidity. This finding may reflect the influence of social support systems inherent in joint family structures, which could potentially buffer against health risks or provide better care during illnesses.

Overall, the analysis reveals that while sex does not significantly influence morbidity patterns, age and family structure play substantial roles. The high morbidity prevalence among children (0–14 years) and older adults (60 and above) highlights the vulnerability of these groups, necessitating focused public health strategies. Similarly, the differences in morbidity between

nuclear and joint families underscore the potential impact of family dynamics on health outcomes. These findings provide valuable insights for designing demographic-specific and family-oriented health interventions, emphasizing the importance of age-sensitive and socially informed approaches to addressing morbidity.

Discussion

This study offers an in-depth examination of the health profile of a population of 3092 individuals, highlighting a significant interplay between communicable and non-communicable diseases (NCDs), co-morbidities, and common symptoms. The findings of this study are pivotal in understanding the complex and evolving nature of public health challenges in a community, especially considering changing environmental, socioeconomic, and healthcare conditions.

Prevalence of Morbidity and Health Conditions:

One of the key takeaways from the study is the prevalence of morbidity in the population. A total of 757 individuals, or approximately 24.48%, reported suffering from some form of health condition, which indicates a relatively high burden of disease in the community. This figure raises important questions regarding the adequacy of the existing healthcare system and the need for targeted interventions to reduce morbidity. Out of the total population, 243 individuals (32.1%) were found to be suffering from communicable diseases, while 514 (67.9%) were diagnosed with non-communicable diseases. This bifurcation suggests that while communicable diseases still pose a health risk, NCDs are becoming increasingly prevalent, signalling a shift in public health priorities.

The most common communicable diseases observed in the study included typhoid, diarrhoea, and conjunctivitis. These diseases often arise from poor sanitation, limited access to clean water, and inadequate healthcare facilities, all of which are prevalent in many rural and semi-urban areas. The persistence of these diseases in a significant portion of the population emphasizes the need for continuous improvements in public health infrastructure, particularly in water, sanitation, and hygiene (WASH) practices. Moreover, the increase in these diseases despite advancements in healthcare suggests that prevention campaigns must be reinforced, focusing on hygiene, vaccination, and early detection of symptoms.

On the other hand, the prevalence of NCDs like heart disease, irritable bowel disease (IBD), chronic bronchitis, and diabetes, especially among older age groups, is a clear indication of the transition from infectious diseases to chronic diseases that are often linked to lifestyle factors, aging, and urbanization. NCDs are typically long-term and require a different approach to care

compared to communicable diseases. The management of NCDs is more resource-intensive, involving regular monitoring, medications, lifestyle changes, and, in some cases, surgery or other interventions. This demographic shift in disease burden poses a challenge to public health systems that are often ill-equipped to handle long-term care needs.

Age-wise Distribution and Implications for Public Health Interventions:

The age-wise distribution of morbidity in this study provides a crucial insight into the specific health needs of different population groups. For instance, children (0-14 years) faced health challenges primarily related to nutritional deficiencies and physical disabilities. This group is particularly vulnerable to the effects of malnutrition, which can have lifelong consequences if not addressed early on. Malnutrition, often resulting from inadequate diet, poor sanitation, and lack of awareness, not only compromises the immune system but also stunts physical and cognitive development. Public health strategies for children, therefore, must focus on improving nutrition, sanitation, and preventive care such as vaccinations and early medical screenings.

For the young adult population (15-29 years), emotional impairments and physical disabilities were the most common health issues. This suggests that the mental health of young people should be given more attention in public health campaigns. Mental health issues, which can often be underreported or stigmatized, have been rising in recent years due to various factors such as academic pressure, employment insecurity, and social changes. Addressing mental health requires not only healthcare interventions but also community-based approaches, public awareness campaigns, and support systems that reduce the stigma surrounding mental illnesses. Moreover, physical disabilities among this group could be linked to a lack of physical activity, sedentary lifestyles, or even inadequate healthcare during childhood, underlining the importance of preventive healthcare throughout life.

The middle-aged group (30-44 years) showed a broader range of health issues, including both nutritional deficiency and the emergence of chronic conditions. This highlights the need for preventive healthcare measures to be introduced in early adulthood, especially to counteract the risks of NCDs. The prevalence of these diseases in middle-aged adults suggests that poor dietary habits, lack of exercise, and insufficient management of early-stage NCDs may be

contributing to the rising incidence of chronic conditions like heart disease and diabetes. Additionally, the onset of emotional and mental health issues during this stage, such as stress or depression, requires a more integrated approach to healthcare that includes both physical and psychological care.

In the elderly (60 years and above), the burden of long-term illnesses, particularly cardiovascular diseases, diabetes, and arthritis, was most pronounced. Chronic conditions become more prevalent in this age group due to the natural aging process, compounded by a lifetime of cumulative risk factors such as poor diet, lack of physical activity, smoking, or even genetic predispositions. Healthcare systems need to provide more support for elderly patients, focusing on managing these long-term conditions to improve the quality of life and reduce the economic burden of treating advanced diseases. Programs such as health monitoring, home healthcare services, and facilities for elderly care could help mitigate some of the challenges faced by this demographic.

Co-morbidities and Their Impact:

The co-occurrence of communicable and non-communicable diseases, as observed in the study, further complicates the health challenges faced by the population. For instance, individuals with chronic conditions like heart disease or diabetes may be more susceptible to infections like typhoid or diarrhoea. This co-morbidity can exacerbate the severity of both conditions, making treatment more complicated and resource intensive. For individuals with multiple health conditions, integrated care models that address both types of diseases simultaneously would likely be more effective than fragmented approaches. Such models could include multi-disciplinary teams of healthcare professionals, patient education programs, and chronic disease management strategies that are tailored to individuals' unique needs.

Symptom Prevalence and Health Awareness:

The prevalence of common symptoms like migraines, hair fall, eye pain, and skin allergies further reflect the need for better healthcare and awareness. While these symptoms may seem relatively minor in isolation, they often indicate underlying health issues or can severely affect a person's daily functioning. For example, frequent migraines may be linked to stress or other chronic conditions, while skin allergies could point to environmental factors or immune system

weaknesses. These symptoms require targeted interventions, such as public health campaigns on stress management, proper skincare, and environmental control.

In summary, this study sheds light on the shifting health landscape in the population, highlighting the growing importance of managing NCDs alongside traditional infectious diseases. The findings emphasize the need for a more integrated, multi-faceted approach to public health that accounts for the diverse health needs of different age groups and the complexities of co-morbid conditions. Effective public health policies must not only address immediate concerns like infectious disease prevention but also lay the groundwork for managing chronic diseases and improving mental health in the population.

Summary of the Findings

The study conducted on a population of 3092 participants examined various health conditions, including both communicable and non-communicable diseases, as well as related symptoms. The findings revealed important insights into the health status of the population, highlighting significant trends in morbidity and disease distribution.

Morbidity Distribution:

Out of the 3092 participants, 757 individuals (24.48%) reported morbidity, with 2335 participants (75.52%) reporting no health issues during the study period. Among the 757 individuals with health conditions, the distribution between communicable and non-communicable diseases was notable. Communicable diseases affected 243 individuals (32.1%), while 514 individuals (67.9%) reported non-communicable diseases (NCDs). The most common communicable diseases included typhoid (154 cases), diarrhoea (122 cases), and eye flu (108 cases), while NCDs such as heart disease, irritable bowel disease (IBD), chronic bronchitis, and diabetes were prevalent. The study suggests a dual burden of both communicable and non-communicable diseases, with a clear shift towards chronic health conditions, particularly in older age groups.

Age-wise Distribution of Morbidity:

The distribution of morbidity by age revealed distinct patterns of health challenges across different age groups. Children (0-14 years) faced nutritional deficiencies and physical disabilities, while young adults (15-29 years) experienced emotional impairments and physical disabilities. The middle-aged group (30-44 years) showed a broader range of health issues, including nutritional deficiency, emotional impairments, and long-term illnesses. In the elderly (60 years and above), long-term illnesses dominated, reflecting the higher prevalence of chronic conditions like cardiovascular diseases and diabetes in this demographic. The findings highlight the need for targeted interventions based on age-specific health challenges, particularly focusing on childhood nutrition, mental health, and chronic illness management in older adults.

Co-morbidities:

The study also examined the co-morbidities associated with communicable and non-communicable diseases. Among the 477 participants with diseases, 243 had communicable diseases, with typhoid, diarrhoea, and conjunctivitis being the most prevalent. Among those with NCDs, heart disease, IBD, and chronic bronchitis were the most common, with heart disease being the most significant contributor to the health burden. Additionally, depression, cancer, and asthma were noted, underscoring the psychological and respiratory health challenges within the community.

Association between socio-demographic characters and morbidity patterns

A morbidity prevalence of 24.48% reflects significant health challenges, with NCDs dominating. Socio-demographic analysis revealed critical determinants:

- **Sex:** No significant association with morbidity.
- **Age:** Strong association, with children (0–14 years) and older adults (60 and above) most vulnerable.
- **Family Structure:** Higher morbidity in nuclear families, highlighting the protective role of joint families.

Children face malnutrition and physical disabilities, while the elderly struggle with chronic diseases. Young and middle-aged adults encounter stress-related and lifestyle diseases, necessitating tailored interventions.

Symptoms:

A further breakdown of symptoms among 3092 participants revealed migraine (4.07%), hair fall (7.37%), eye pain (4.68%), and skin allergies (3.71%) as the most frequently reported symptoms. These symptoms suggest the need for attention to both physical and mental health concerns in the population, particularly those affecting daily functioning and quality of life.

The presence of common symptoms such as migraines, hair fall, eye pain, and skin allergies points to underlying health issues and environmental factors affecting the population. Co-morbidities involving communicable and non-communicable diseases exacerbate treatment complexities, making integrated care models essential. For example, individuals with diabetes

are more susceptible to infections, requiring healthcare approaches that simultaneously address multiple conditions.

Conclusion-

This study provides a comprehensive overview of the morbidity status and health challenges within a population of 3092 individuals in the Bawana region. It highlights the growing burden of both communicable and non-communicable diseases, with a notable shift towards chronic conditions such as heart disease, diabetes, and respiratory illnesses. The findings underscore the importance of addressing a dual burden of diseases, with targeted interventions that cater to both infectious and lifestyle-related health issues.

Age-Wise Distribution of Morbidity

The study's age-wise distribution of morbidity reveals the need for age-specific health interventions:

- **Children**: Focus on nutrition and prevention of physical disabilities.
- **Adults and Elderly**: Comprehensive management for chronic diseases and mental health conditions.

Prevalence of Symptoms

The prevalence of symptoms like migraine, hair fall, and skin allergies indicates the need for improved healthcare access and awareness, particularly for symptoms that significantly impact individuals' daily lives.

Holistic Approach to Public Health

Overall, the study emphasizes the importance of a holistic approach to public health, considering both communicable and non-communicable diseases, as well as the diverse range of symptoms that affect the population. It calls for improved healthcare services, particularly in areas of:

- **Sanitation**
- **Disease Prevention**

- **Chronic Disease Management**
- **Mental Health Support**

Government Initiatives and Plans

The Delhi government has undertaken several initiatives to improve public health and environmental conditions in the Bawana region:

- Sewer Infrastructure Overhaul: The Delhi government, has announced a comprehensive plan to overhaul the city's sewer infrastructure within five years, focusing on connecting every household to the sewer system
- Industrial Relocation Scheme: The Supreme Court-mandated relocation of polluting industrial units to Bawana aimed to reduce pollution in residential areas and promote sustainable development. This scheme involved the acquisition of 770 hectares at an estimated cost of ₹11,000 crore, benefiting a workforce of 0.25 million

National Health Policy

The National Health Policy (NHP) 2017 aims to inform, clarify, strengthen, and prioritize the role of the Government in shaping health systems in all its dimensions. It focuses on investments in health, organization of healthcare services, prevention of diseases, and promotion of good health through cross-sectoral actions. The policy emphasizes universal health coverage and aims to reduce out-of-pocket expenses for healthcare. For residents of industrial urban slums like Bawana region, this policy focuses on:

- **Preventive and Promotive Health**: Emphasizing vaccination, sanitation, and health education to prevent diseases.
- **Strengthening Health Infrastructure**: Improving the availability and accessibility of healthcare facilities, which is critical in slum areas where healthcare access is often limited
- **Addressing Non-Communicable Diseases**: Targeting the rising burden of diseases like diabetes and hypertension, which are prevalent in urban slums due to lifestyle factors

Pradhan Mantri Jan Arogya Yojana (PMJAY)

The Pradhan Mantri Jan Arogya Yojana (PMJAY) is a flagship scheme under Ayushman Bharat, launched to achieve the vision of Universal Health Coverage (UHC). It provides a health cover of ₹5 lakhs per family per year for secondary and tertiary care hospitalization to over 12 crore poor and vulnerable families. This scheme aims to reduce the financial burden of healthcare and improve access to quality medical services. This scheme benefits slum dwellers by:

- **Financial Protection**: Reducing the financial burden of healthcare costs, which is a significant barrier for slum residents
- **Access to Quality Healthcare**: Ensuring that even the poorest families can access necessary medical treatments without financial hardship
- **Health and Wellness Centres**: Establishing centres that provide comprehensive primary healthcare services, including preventive, promotive, and curative care.

Alignment with SDGs Related to Climate Change

India's plans align with the Sustainable Development Goals (SDGs) related to climate change through various initiatives:

- **International Solar Alliance (ISA)**: Promotes solar energy and aims to reduce dependence on fossil fuels.
- **Mission LiFE (Lifestyle for Environment)**: Encourages sustainable living practices to reduce environmental impact. Addressing environmental determinants of health, such as air and water quality, which are often poor in slum areas
- **National Action Plan on Climate Change (NAPCC)**: Comprises eight missions addressing climate adaptation and mitigation. Implementing strategies to mitigate the health impacts of climate change, such as heatwaves and vector-borne diseases.

Effects of Climate Change on Health

Climate change impacts human health in both direct and indirect ways:

- **Direct Effects:** Extreme heat waves and changes in precipitation can cause injuries, illnesses, and deaths. It can increase the prevalence of diseases like dengue and malaria
- **Indirect Effects:** Worsening air pollution can exacerbate respiratory and cardiovascular conditions. Changes in temperature and rainfall can alter the distribution of infectious diseases. Poor air quality exacerbates respiratory conditions like asthma and chronic obstructive pulmonary disease (COPD)
- **Mental Health:** Climate-related hazards can lead to stress and mental health issues.

Environmental Benefits of Waste-to-Energy Plant Expansion

Incorporating the comments and prompts above, the study also highlights the potential environmental benefits of the expansion of the waste-to-energy plant:

- **Reduction in Landfill Waste**: The plant converts waste into energy, reducing the amount of waste sent to landfills, which decreases land and water pollution.
- **Renewable Energy Generation**: It generates renewable energy from waste, providing a sustainable energy source and reducing reliance on fossil fuels.
- **Greenhouse Gas Reduction**: By diverting waste from landfills, the plant helps reduce methane emissions, a potent greenhouse gas, thereby mitigating climate change.
- **Resource Efficiency**: The process maximizes resource efficiency by turning waste into valuable energy, contributing to a circular economy.

The combination of targeted health interventions and environmental improvements can create a more sustainable and healthy community in the Bawana region. Addressing both health and environmental challenges through a comprehensive approach will lead to better public health outcomes and a cleaner environment.

Reference

1. Nijsten T, Stern RS. How Epidemiology Has Contributed to a Better Understanding of Skin Disease. J Invest Dermatol. 2012 Mar 1;132(3, Part 2):994–1002.

2. Brachman PS. Epidemiology. In: Baron S, editor. Medical Microbiology [Internet]. 4th ed. Galveston (TX): University of Texas Medical Branch at Galveston; 1996 [cited 2024 Aug 13]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK7993/

3. Tulchinsky TH. John Snow, Cholera, the Broad Street Pump; Waterborne Diseases Then and Now. Case Stud Public Health. 2018;77–99.

4. The Global Burden of Disease Study at 30 years | Nature Medicine [Internet]. [cited 2024 Aug 13]. Available from: https://www.nature.com/articles/s41591-022-01990-1

5. Global HIV & AIDS statistics — Fact sheet | UNAIDS [Internet]. [cited 2024 Aug 13]. Available from: https://www.unaids.org/en/resources/fact-sheet

6. Kumar S, Preetha G. Health Promotion: An Effective Tool for Global Health. Indian J Community Med Off Publ Indian Assoc Prev Soc Med. 2012;37(1):5–12.

7. Trans-Omics for Precision Medicine (TOPMed) Program | NHLBI, NIH [Internet]. [cited 2024 Aug 13]. Available from: https://www.nhlbi.nih.gov/science/trans-omics-precision-medicine-topmed-program

8. Abimbola S. On the meaning of global health and the role of global health journals. Int Health. 2018 Mar 1;10(2):63–5.

9. Scholthof KBG. The disease triangle: pathogens, the environment and society. Nat Rev Microbiol. 2007 Feb;5(2):152–6.

10. 'Global health': meaning what? | BMJ Global Health [Internet]. [cited 2024 Aug 13]. Available from: https://gh.bmj.com/content/3/2/e000843

11. Koplan JP, Bond TC, Merson MH, Reddy KS, Rodriguez MH, Sewankambo NK, et al. Towards a common definition of global health. The Lancet. 2009 Jun 6;373(9679):1993–5.

12. Alba S, Mergenthaler C. Lies, damned lies and epidemiology: why global health needs good epidemiological practice guidelines. BMJ Glob Health. 2018 Oct 1;3(5):e001019.

13. The global burden of chronic diseases: overcoming impediments to prevention and control - PubMed [Internet]. [cited 2024 Aug 13]. Available from: https://pubmed.ncbi.nlm.nih.gov/15173153/

14. Fifty Years of Progress in Chronic Disease Epidemiology and Control [Internet]. [cited 2024 Aug 13]. Available from: https://www.cdc.gov/mmwr/preview/mmwrhtml/su6004a12.htm

15. Yang S, Wu J, Ding C, Cui Y, Zhou Y, Li Y, et al. Epidemiological features of and changes in incidence of infectious diseases in China in the first decade after the SARS outbreak: an observational trend study. Lancet Infect Dis. 2017 Jul 1;17(7):716–25.

16. Global research trends of World Health Organization's top eight emerging pathogens - PubMed [Internet]. [cited 2024 Aug 13]. Available from: https://pubmed.ncbi.nlm.nih.gov/28179007/

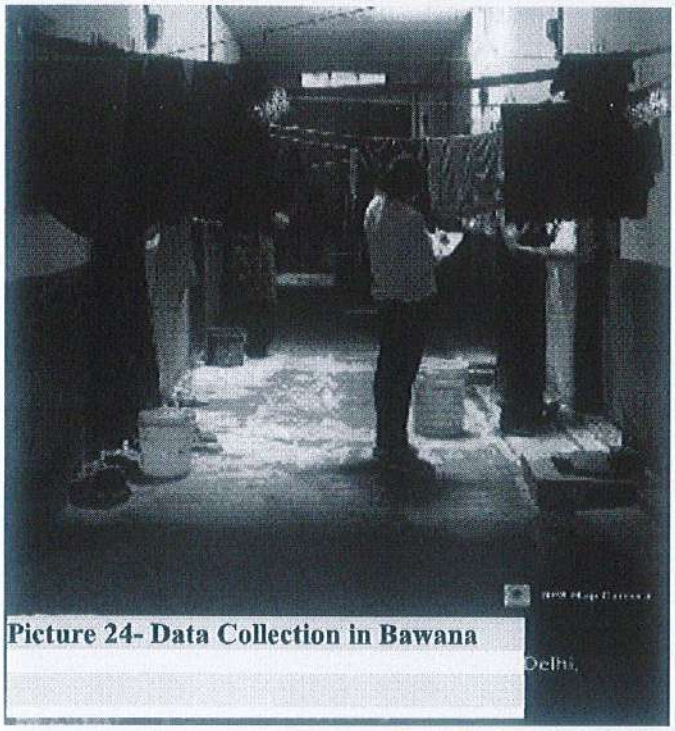
17. Forouzanfar MH, Alexander L, Anderson HR, Bachman VF, Biryukov S, Brauer M, et al. Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet. 2015 Dec 5;386(10010):2287–323.

18. Waage J, Banerji R, Campbell O, Chirwa E, Collender G, Dieltiens V, et al. The Millennium Development Goals: a cross-sectoral analysis and principles for goal setting after 2015. Lancet Lond Engl. 2010;376(9745):991–1023.

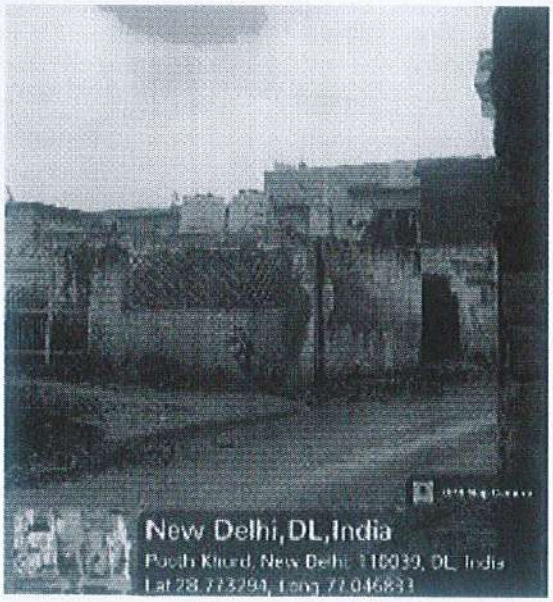
19. Taylor S. 'Global health': meaning what? BMJ Glob Health. 2018 Apr 1;3(2):e000843.

Annexure

Annexure A: Photo Gallery



Picture 24- Data Collection in Bawana



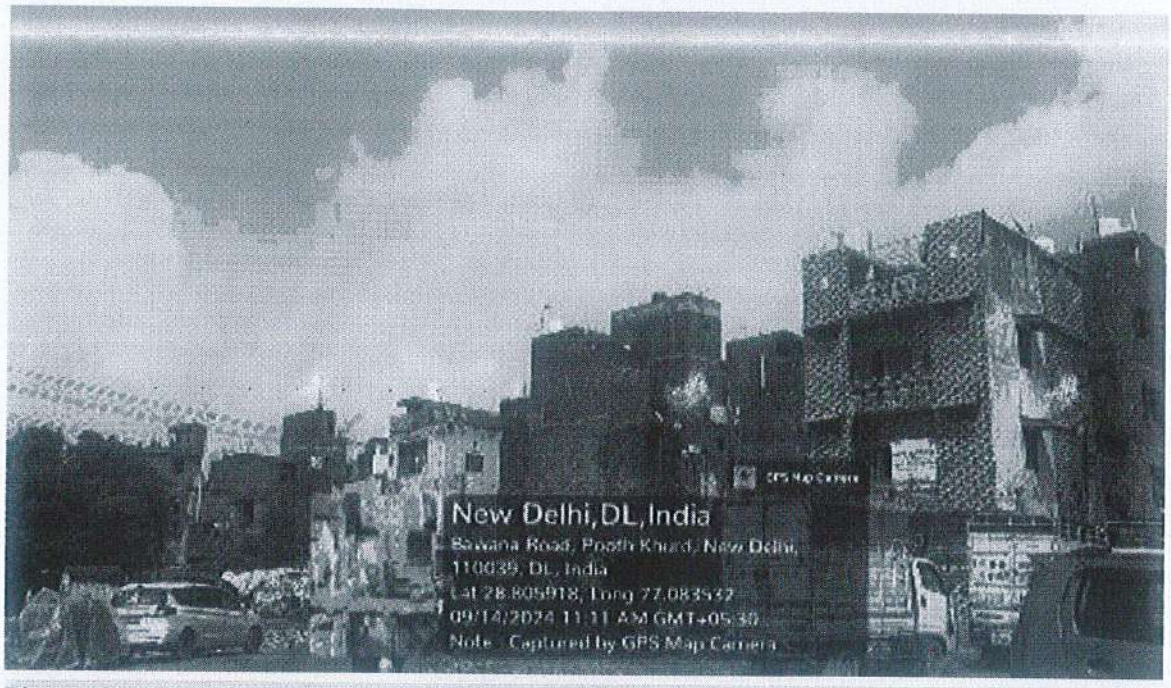
Picture 25- Streets of Bawana



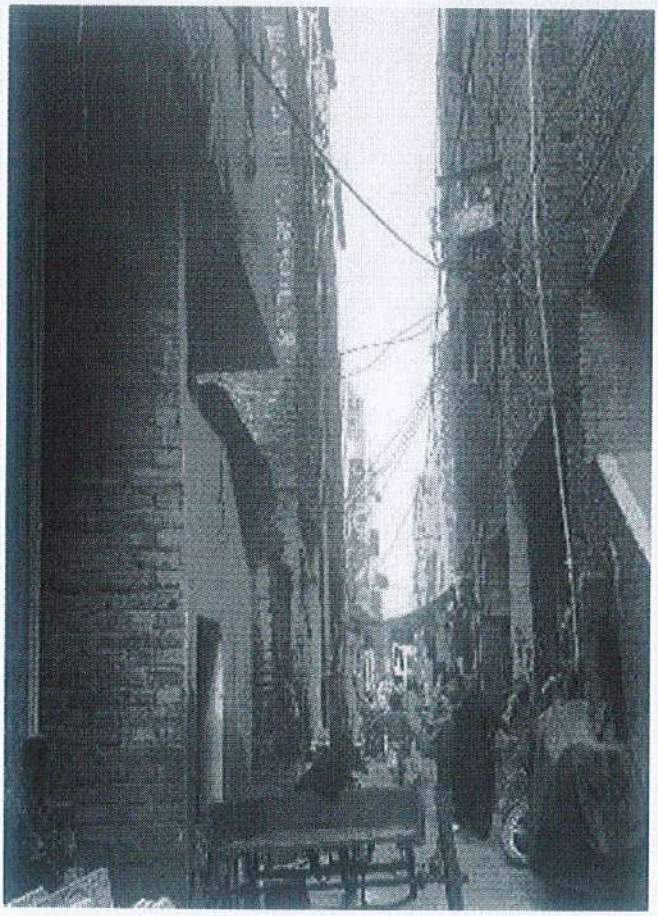
Picture 26- A medical store in Bawana



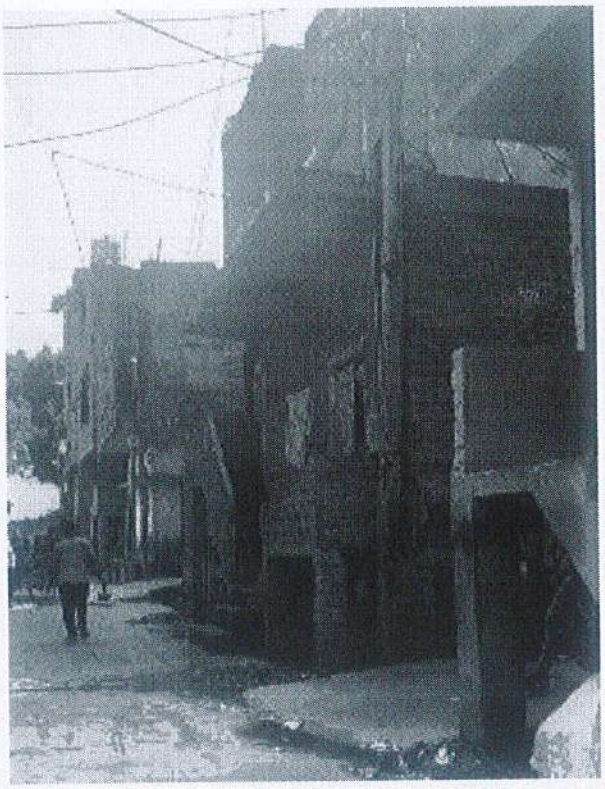
Picture 27- A waterlogged street in Bawana



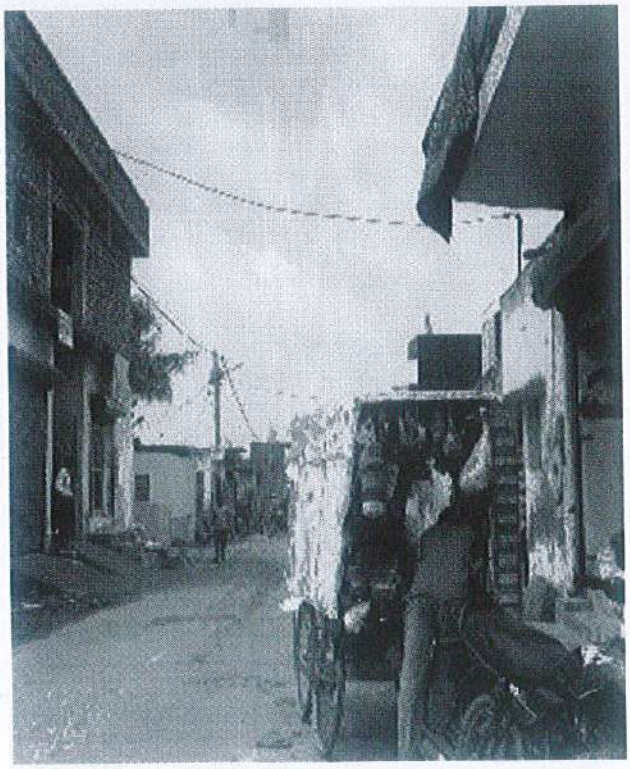
Picture 28-Urban Settlements of Bawana



Picture-29. A narrow alley where our team conducts an interview amidst bustling community life and tightly packed brick buildings.



Picture 30- A bustling alleyway showcasing compact brick homes, hanging laundry, and everyday urban life.



Picture 31- a street vendor operating from a cycle cart, selling a variety of colourful goods.



Picture 32- Entrance to the Mahila Bal Vikas Pariyojana Office



Picture 33- a local medicine shop: A Glimpse Inside a Local Facility

Annexure B: Questionnaire

Project: Epidemiological Profile of Bawana region in Northwest District of Delhi

"□□□□□□ □□ □□□□□ □□□□□□ □□□□ □□ □□□□□ □□□□□ □□ □□□□□□ □□ □□□□□□ □□ □□□□□□"

S. No.	Mohalla/Location □□□□□□/□□□□□	Unique ID

A. HOUSEHOLD COMPOSITION OF RESPONDENT

"□. □□□□□□□□□ / □□□□ □□□□ □□□□ □□ □□ □□□ □□□-□□□ □□□□ □□"

Type of Family (joint/ nuclear):

□□□□□□ □□ □□□□□□ (□□□□□□□/□□□):

Sl. No.	Sex □□□ □	Age (Year/ Month/ Days) □ □□ (□ □□ □/ □ □□ □□/	Relationship with Head of the family □□□ □□□ □ □□ □□ □	Present Marital Status □□ □□ □□□ □□ □□	Educational Status 1. Primary 2. Secondary 3. And above □□ □□□ □□□ □□	Occupational Status □□□□ □□□ □□□ □□□□ □□	Monthly income from all sources □□□ □□ □□ □□ □□□ □□	Total monthly income of household □ □□ □□ □ □□ □□	Monthly household expense on Kitchen □ □□ □ □□ □□	Any kind of Illness? Name and duration □□ □□□ □□	Any treatment Given? If yes, what? □□ □ □ □□ □

		□□ □)	□□□ □□ □□□		□□ □□ 1. □□ □□□ □□□ 2. □□□ 3. □□ □□□		□□ □□ □□□ □□□ □	□ □□ □□ □ □□	□□ □ □□ □□	□□ □□ □□? □□□ □□□ □□ □□ □□□ □	□□ □□ □ □□ ? □□ □ □□□ □□ □□ □□ ?
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											

10.											

B. ALCOHOL/ TOBACCO/ DRUG CONSUMPTION BY EGO/FAMILY MEMBER:

□□□□ □□, □□ □□□□ □□□□□□ □□ □□□ □□□□□ □□□□, □□□□□□□ □□ □□□□□□ □□ □□□□□ □□□□ □□?

	You/Family member/ Both □□/□□□□□ □ □□ □□□□ □/ □□ □□□	Yes / No? □□□ / □ □□□ ?	Regular/ Occasional □□□ □□□/ □□□ - □□□	Age at which you started to take □□ □ □ □□ □□□ □□ □□ □□ □□ □□	Frequency per day □□ □ □□ □□ □ □□ □ □□ □	Quantity per day (average in ml) □□□ □□ □□□ □□ □□ □□ (□□ □□)	Do you take during pregnancy? □□□□ □□ □□□□□ □□□□□ □□ □□□□□ □□□□ □□□?	Frequency per day during Pregnancy □□□□□ □□□□□ □□ □□□□□ □□□□□ □□□ □□□□ □□

				□□ □□				
Alcohol/locally fermented beer* □□□□□□□/ □□□□□□. □□□ □□ □□□□□□ □□□□*								
Tobacco/Pan** □□□□□□□/ □□□**								
Other drugs (specify) *** □□□□ □□□□□□□ (□□□□□□ □□□ □□ □□□□□) ***								

* Mahua; Whisky; Rum; any other

** Chewing; Smoking; direct tobacco; beedi; cigarette; zarda; any other

*** Charas; Ganja; Bhang; Opium; L.S.D; Brown Sugar; any other

*□□□□; □□□□□□□□; □□; □□□ □□

** □□□□□; □□□□□□□□; □□□□□□□□□ □□□□□□□; □□□□□; □□□□□□; □□□□□□; □□□ □□

*** □□□; □□□□□; □□□□; □□□□□; □□.□□.□□.; □□□□□□ □□□□; □□□ □□

C. Nutritional Status

□□. □□□□ □□ □□□□□□

Dietary Habit (Veg/Non-Veg) □□□□ □□□□□□ □□□ (□□□□□□□□/ □□□□□□□□□)	
Source of Water (Tap / tank / tube-well / hand or motor pump / pond / well/river) □□ □□ □□□□□ (□□/□□□□/□□□□□□□□/□□□ □□ □□□□ □□□/□□□□□/□□□□/□□□)	
Kind of Milk (Domestic source / milkman / mother dairy/ Cow/ buffalo / goat): □□□ □□ □□□□□□ (□□□□□ □□□□□/□□□□□□□/□□□ □□□□□/□□□/□□□□/□□□□):	
Amount Consumed (L/day): □□□□□□□ □□□□□ □□ □□ □□□□□□ (□□ /□□□):	
No of Full Meals: □□□□□ □□□□ □□□□□ □□□ □□□□ □□:	
Frequency of Non-Vegetarian Food: □□□□□□□□ □□□□ □□□□□ □□□ □□□□ □□:	
Frequency of Vegetarian Food: □□□□□□□□ □□□□ □□□□□ □□□ □□□□ □□:	
Frequency of Milk Products: □□□□□ □□□□□□ □□□□□ □□□ □□□□ □□:	
Frequency of Pulses: □□□□ □□□□□ □□□ □□□□ □□:	
Frequency of Fruits: □□ □□□□□ □□□ □□□□ □□:	
Any other specific diet □□□ □□□□ □□□□□□□ □□□□	
History of Any Nutritional Deficiency:	

□□□□ □□ □□□□ □□□□□□ □□□ □□ □□□□□□:	

D. House Type

□□□□ □□ □□□□□□

House Type (Kuccha / Jhopri / Pucca): □□□□ □□□ □□□□□□ □□ □□ (□□□□□/□□□□□□/□□□□□):	
Property Owned (Y/N): Residential/ Agricultural/ Commercial/ Others □□□ □□□□□□ □□ □□□□□□□□ □ □□□□□ □□ (Y/N): □□□□□□/□□□□/□□□□□□□□□/□□□□	
Locality (Rural / Semi urban / urban / urban slum / urban planned): □□□□□ (□□□□□□□/□□□□□□□□/□□□□/□□□□ □□□□/□□□□ □□□□□□□):	
Household Assets: (A.C. / refrigerator/ TV / VCR / washing machine/ scooter / car) □□□□□ □□□□□□□: □□□□ □□ (□.□□./□□□□□□□□□□□/□□□□/□□□□□□/□□□□□ □□□□/□□□□□□/□□□)	
Domestic Animals (Cows / buffalos / pigs / horses / goats): □□□□□ □□□ □□□ □□ □□ (□□□/□□□□/□□□□/□□□□□/□□□□):	
Kitchen Garden (Y/N) □□□□ □□□□□□ (Y/N) □□□ □□ □□□□	
Domestic Servants: M- F- □□□□□ □□□□: □□- □□-	

E. Any Illness

□□□ □□□□□□

	Type □□□□□□	Age □□□	Duration □□□□
Nutritional Deficiency □□□□ □□ □□□			
Physical Disability □□□□□□□ □□□□□□			
Emotional Impairment □□□□□□□□ □□□□□			
Major Therapeutic Irradiation Exposure □□□□□□□□ □□□□□ □□□□□□□ □□□ □□			
Long Illness □□□□ □□□□ □□□□ □□□ □□□□□□			

G. Have you ever been diagnosed by a doctor for any of the following conditions?

□□. □□□□ □□□□ □□□ □□□□ □□□□□□ □□□□□□ □□□□□□□□□□ □□□ □□
□□□□ □□ □□□□□□ □□ □□□□□ □□□□ □□□ □□?

	Type □□□□□□	Age □□□
Heart failure/disease □□□□ □□□ / □□□		
Irritable Bowel Disease □□□□□ □□□		
Chronic Bronchitis □□□□ □□□□□□□□ □□□		

Hernia □□□□□□		
Emphysema □□□□□□□□□		
Endometriosis □□□□□□□□□□□□□- □□□□□□□□		
Arthritis □□□□□		
Inflammatory bowel disease □□□□□ □□ □□□□		
Depression □□□□□		
Cancer □□□□□		

H. Have you or your family member suffered from any of the listed symptoms in last 1 year?

□□□□ □□ □□ □□□□ □□□□□□ □□ □□□□□ □□□□□ □□ □□□□ □□□

□□□□□□□□□□ □□□□□□□ □□□ □□ □□□□ □□ □□□□□□ □□□ □□□?

	When & how many times □□ □□ □□□□□ □□□	Age □□□
High fever / □□□□ □□□□□		
Weakness and Fatigue □□□□□□□ □□ □□□□		
Muscle ache □□□□□□□□□□□ □□□ □□□□		
Stomach pain		

□□□ □□□□		
Loss of appetite and weight □□□ □□ □□□ □□□ □□□		
Dry cough □□□□ □□□□□		
Diarrhoea □□□□		
Hair fall □□□ □□□□□		
Itching and rashes □□□□□ □□ □□□□□□		
Headaches □□□ □□□□		
Eye pain □□□ □□ □□□□		

Annexure C: Consent form English

INFORMED CONSENT DOCUMENT

Semi-Structured Interviews Consent Form

Study Title: Epidemiological study of Bawana region in North West District of Delhi

Investigators:

IRB No.:

PI Version No. / Date:

Hello, I am [*Name*] from [*Name of Institution*] and would like to talk to you about your socio-demographic and health related details.

What you should know about this study:

- We are interested in learning more about how your health, nutrition and illness status related to communicable and non-communicable diseases.
- This is related to epidemiological study looking at any prevalent endemic diseases and their possibility of progression in light of the upcoming waste to energy power plant in your area.
- Your participation is voluntary. You do not have to join the study, it is your choice, and there will be no penalty if you decide not to join. You may also quit at any time, if you choose to join. We are thankful for your participation, time, and effort.
- During the research project, we will tell you if we learn any new information that might affect whether you wish to continue to be in the research project.

Why is this research being done?

This study aims to identify endemic diseases prevalence among populations residing in 5km area of the upcoming power plant

Why are you being asked to participate?

You are being asked to participate because you are direct beneficiary of any upcoming projects in and around your primary catchment area

What happens if you join this study?

If you agree to join the study, you will be asked to some questions by our research team regarding your socio-demographic variable health status. The data collection will take no more than 30 minutes of your time.

What are the risks or discomforts of the study?

There are no major risks or discomforts associated with this research project. You may feel bored or tired while participating in the data collection. You do not have to answer any question that makes you feel uncomfortable. There is a chance that data collected during the interview will become known to people outside of this research project, however we will do our best to protect your confidentiality.

What are the potential benefits to being in the study?

There are no direct benefits to being in this research project. However, the study plans to evaluate the existing health status of you and your family members and help in improving it from its current status in future. Therefore, findings from this project can not only contribute to improving health outcomes for people living in your primary catchment area and around any such upcoming plant in India

Collection of audio/visual images

No audio/ visual images related to you or your family will be collected.

How will the confidentiality of your data be protected?

During this research project, we will collect information from you, which includes all information listed in this consent form as well as contact information, like email address and phone number, in case we need to get in contact with you.

Only research staff can see this information, but there is a risk it could become known to people outside of this research project. To protect against this, we assign each participant a unique study identification number that we will use on all research forms. Only research staff will know your study identification number. No names or identifying information will be included in public reports of this research.

We will keep all research forms in locked cabinets and password-protected computer files that only research staff can access. Once this research project is completed, all audio recordings will be destroyed.

What are the costs and compensations for being part of the study?

There are no costs to participating in this study.

Payment of treatment costs for injury or illness from study participation

The chance of sickness or injury due to participating in face-to-face interviews is extremely low. This study does not collect bio-specimens nor investigates a new therapeutic intervention. In the unlikely event of any injury or illness occurring during participation in the face to face interview, we will take necessary actions to support the referral to an appropriate health facility.

What are your options if you do not want to be in the study?

You do not have to join this research project. There will be no penalty for not participating.

What happens if you leave the study early?

You may leave this research project at any time. If you choose to leave, we will only use information that you have provided to research staff up to that point. If you would like to withdraw information that you have already provided, please contact research staff at:

International Institute of Health Management Research

Sector 18A, Plot No. 3,

Sector 18A,

Dwarka- 110075

Phone: 074288 95912

Dissemination of results

The results will be anonymized, combined, and shared by the research team with the implementing partners and relevant policymakers. Results and datasets may be presented at conferences, published

in scientific journals, and used by other researchers. Findings from the study will be disseminated at the national and international levels with the global community. Finally, once the project is terminated, any other information that might have relevance to you as a research participant will be made available to you through local channels.

Questions

Do you have any questions about the study? If you have a concern about any aspect of the study, you should ask to speak to the researchers. They will do their best to answer your questions.

Name:

Signature:

Annexure D: Consent form Hindi

□□□□□ □□□□□ □□□□□□□□□

□□□□□□□ □□□□□□□□□□ □□□□□ □□□□□□

□□□□□□ □□□□□□: □□□□□□ □□ □□□□□ □□□□□□ □□□□ □□ □□□□□ □□□□□□□ □□ □□□□□□□□□□□□□□□□ □□□□□□ □□□□□□□: □□□□□□ □□□□□□:
□□□□ □□□□□□□ □□□□□□/ □□□□:

□□□□□□, □□□ [□□□] [□□□□□□□ □□ □□□] □□ □□□ □□ □□□□ □□□□□□□-□□□□□□□□□□□□ □□ □□□□□□□□□ □□□□□□□ □□□□□□□ □□ □□□□ □□□ □□□ □□□□ □□□□□ □□□□ □□□□ □□ □□□□□□□ □□ □□□□ □□□ □□□□ □□□□□ □□□□□:

- [illegible]
- [illegible]
- [illegible]

[illegible]?

[illegible] 5 [illegible]

[illegible]?

[illegible]?

[illegible] 30 [illegible]

[illegible]?

[illegible]?

[illegible]

Annexure E: Referral Slip

□□□: □□□□□□□□:

Referral Slip/ रेफरल स्लिप

Patient Information/ रोगी की जानकारी

- Patient Name/ रोगी का नाम: ----------
- Date of Birth / जन्म तिथि: ----------
- Address/ पता:: ----------

Date / दिनांक : ----------

Symptoms/ लक्षण: ----------

Referral Information / रेफरल जानकारी

This receipt serves as a referral to nearby hospitals that may be able to assist you with your diagnosis. (यह रसीद आस-पास के अस्पतालों के लिए एक रेफरल के रूप में कार्य करती है जो आपके निदान में आपकी सहायता करने में सक्षम हो सकती है।)

Hospitals within 5km Radius:

S No	Hospital Name/ अस्पताल का नाम	Distance	Contact number
1	Maharshi Valmiki Hospital / महर्षि वाल्मीकि अस्पताल	2.53 KM	01127761524
2	Durga Clinic/ दुर्गा क्लीनिक	1.61 Km	
3	Aam Admi Mohalla Clinic/ आम आदमी मोहल्ला क्लीनिक	2.42 KM	
4	Sant Soham Hospital/ संत सोहम हॉस्पिटल	2.71 Km	01134567890
5	Metro Trauma And Policlinic/ मेट्रो ट्रॉमा और पोलिक्लिनिक	1.12 Km	+91 72106 86188
6	Shri Raja Ram Multi specialty Hospital/ श्री राजा राम मल्टी स्पेशलिटी अस्पताल	2.06 Km	
7	Mansa clinic/ मनसा क्लीनिक	1.83 Km	
8	Sandhyashi Hospital/ संध्याशी हॉस्पिटल	1.27 Km	07428177717

REPORTER/ संवाददाता: _____

SIGN/ दस्तख़त : _____

Annexure F: IRB certificate

IRB No. IRB/2024-2025/04

INSTITUTIONAL REVIEW BOARD,
International Institute of Health
Management Research, Delhi

Request Type Original √ Continuation Exemption	Type of Mechanism Grant √ Contract Fellowship Cooperative Agreement Others:	Name of the funding agency M/s Jindal Urban Waste Management (Bawana) Limited
Title of application: Epidemiological study of Bawana region in North West District of Delhi		
Principal Investigator Dr Nidhi Yadav		**Co-Principal Investigators** Dr Ratika Samtani
Certification of IRB Review This application has been reviewed by the IEC on 12th June 2024 then advised revision and approved by the IEC in accordance with the Indian Council of Medical Research (ICMR) guidelines and other GCP recommendation by: Full Review √ or Expedited Review		
Comment Approved without suggestions Approved with suggestions Advised revision and Approved with suggestions √ Not approved		
Final Recommendation: The clarifications and documents sought have been reviewed and the same are **"Approved from ethical perspective". The validity of this approval is for a period of 06 months with effect from 12th June 2024.** Please note that no significant changes to the research protocol should be made and implemented without prior consent of the IRB.		
Name and address of the Institution: International Institute of Health Management Research, Plot - 3, Sector-18A, Dwarka, New Delhi – 110075, India		
Member Secretary Signature Dr Preetha GS Professor & Dean Research IIHMR-Delhi Email: preetha@iihmrdelhi.edu.in Contact No. +91 9871112107		Chairperson Signature Dr Sanghamitra Acharya, Professor and Chairperson, Centre of Social Medicine and Community Health, School of Social Sciences, JNU, New Delhi Email: sanchamitra@mail.jnu.ac.in Contact No. +91 9810547096