MEGHALAYA STATE POLLUTION CONTROL BOARD
Forests & Environment Department, Government of Meghalaya

mspcb

ANNUAL REPORT
2021-2022

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CHAPTER 1

INTRODUCTION

The Government of Meghalaya constituted the State Board for Prevention and Control of Water Pollution on the 16th November, 1983 under the provision of sub-section (1) of Section 4 of the Water (Prevention & Control of Pollution) Act, 1974. Subsequently, the State Board was entrusted with the responsibility for the implementation and enforcement of the Air (Prevention & Control of Pollution) Act, 1981 renamed as Meghalaya State Pollution Control Board in 1988.

Besides the enforcement of the Water Act and the Air Act, the Board is also enforcing/implementing/ monitoring the provisions of the following Acts, Rules and Notifications:-

1) The Environmental Protection Act, 1986 and the Rules framed there under viz.,

- The Hazardous Waste (Management and Handling) Rules, 1989 as amended in 2016.
- The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989.
- The Manufacture, Use, Import, Export & Storage of Hazardous Micro organism or Cells Rules, 1989.
- The Environmental Impact Assessment Notification, 2006 and Amendments.
- The Chemical Accidents (Emergency Planning, Preparedness & Response) Rules, 1996.
- The Bio-Medical Wastes (Management & Handling) Rules, 1998 as amended in 2016
- The Recycled Plastics Manufacture and Usage Rules, 1999 as amended in 2016.
- The Fly Ash Notification, 1999.
- The Noise Pollution (Regulation and Control) Rules, 2000.
- The Ozone Depleting substances (Regulation) Rules, 2000.
- The Municipal Solid Wastes (Management & Handling) Rules, 2000 as amended in 2016.
- The Batteries (Management & Handling) Rules 2001.
- The Construction and Demolition Waste Rules, 2016.
- E-Waste Management Rules, 2016.

2) The Public Liability Insurance Act, 1991.

The Headquarter of the Board is located in Shillong. Presently, the Board does not have any Regional or District Offices. The Board is having its own well equipped environmental Laboratory located at its Head Office, Lumpyngngad, Shillong to augment its activities for performing of its functions. The Laboratory is recognized by the State Government as State Water and Air Laboratory under the provisions of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 respectively. The Board's Laboratory has also obtained the accreditation of the National Accreditation Board of Laboratories for carrying out sampling and analysis of samples of water, waste water, stack emission, ambient air,bacteriological tests etc.

The Board is functioning with 86 Employees as on 31st March 2022 against a sanctioned strength of 152.The details of Staff Position are given in Annexure-I. The Organization Chart of the Board is given in Annexure-II.

The main activities carried out by the State Board in performing of its functions is as highlighted below:-

(i) Inspection of industries and local bodies.

(ii) Monitoring the quality of water and wastewater.

(iii) Monitoring the quality of ambient air and stack emissions.

(iv) Inspection of sites proposed for setting up of industries to verify the suitability of the same from environmental point of view.

(v) Monitoring of water quality and water bodies under National Water Quality Monitoring (NWQM) Programme.

(vi) Monitoring of Ambient air quality under National Air Monitoring Programme (NAMP).

(vii) Offering guidance to industries and local bodies on statutory provisions.

(viii) Issue of "Consents to Establish" and "Consents to Operate" in respects of industries, mining projects specified developmental projects, municipal bodies and health care facilities etc.

(ix) Management of waste as provided in the Rules framed under the Environmental (Proctection) Act, 1986:

(a) Hazardous Waste Management:

- Enforcement of Provisions of the Rules and Regulations through Authorization regulation mechanism.
- Monitoring of Compliance to Standards.
- Submission of Annual Report to Central Pollution Control Board.

(b) Bio-Medical Waste Management:

- Enforcement of Provisions of the Rules and Regulations through Authorization regulation mechanism.
- Monitoring of Compliance to Standards.
- Submission of Annual Report to Central Pollution Control Board.

(c) Municipal Solid Waste Management:

- Enforcement of provisions of the Rules and Regulations through Authorization mechanism.
- Monitoring of Compliance to Standards.
- Submission of Annual Report to Central Pollution Control Board.

(d) Batteries Management

- Enforcement of provisions of the Rules and Regulations through Authorization mechanism.
- Monitoring of Compliance to Standards.
- Submission of Annual Report to Central Pollution Control Board.

(e) Plastic Management :

- Enforcement of Provisions of the Rules and Regulations through Authorization regulation mechanism.
- Monitoring of Compliance to Standards.
- Submission of Annual Report to Central Pollution Control Board.

(f) Noise Pollution Management :

- Enforcement of Provisions of the Rules in respect of industries.
- Monitoring the Compliance of Standards by industries.
- Monitoring of ambient noise in Industrial/Commercial/Residential areas.

(g) E-Waste Management:

- Inventorization of E-Waste generation
- Enforcement and Monitoring the implementation of the Provisions of the Rules.
- Submission of Annual Report to Central Pollution Control Board.

(h) Construction & Demolition Waste Management:

- Enforcement and Monitoring the implementation of the Provision of the Rules.
- Submission of Annual Report to Central Pollution Control Board.

CHAPTER 2

CONSTITUTION OF THE BOARD & CHANGES THEREIN

The Meghalaya State Pollution Control Board was first constituted by the State Government under the provisions of Section 4 of the Water (Prevention & Control of Pollution) Act, 1974 vide Notification No. PHE.161/83/1 dated the 16th November, 1983. The last reconstitution was notified vide Notification No. FOR.107/2014/559dated the 28thJanuary, 2021.

The Board consists of 17(Seventeen) Members nominated by the State Government as per provisions laid down in Sub-Section (2) of Section 4 of the Water (Prevention and Control of Pollution) Act 1974. Besides the Chairman and the Member Secretary, there are 5 (Five) Official Members representing various State Government Departments, 5 (Five) Members representing Local Authorities, 2 (Two) Members representing the Co-operatives and Corporations owned, managed or controlled by the State Government and 3 (Three) Non-Official Members

The Composition of the Board as reconstituted vide Notification No. FOR.107/2014/559 dated the 28th January, 2021 is as shown in Table 2.1 below.

TABLE – 2.1
Composition of the Board

1. ***Shri. B. K. Lyngwa, IFS,***
Principal Chief Conservator of Forests & HoFF ,
Meghalaya (upto 10.02.2022) : Chairman

Shri. R.S. Gill, IFS,
Principal Chief Conservator of Forests (T)
Meghalaya (with effect from 10.02.2022)

2. ***Smti. M.J.A. Sangma, MFS***
Meghalaya State Pollution Control Board : Member Secretary
(with effect from 01.02.2021)

OFFICIAL MEMBERS

3. ***Chief Conservator of Forests / Conservator of Forests***
nominated by the Principal Chief Conservator of : Member
Forests & HOFF, Meghalaya

4. ***Chief Engineer***
Public Health Engineering, Meghalaya, : Member
Shillong or his nominee

5. ***The Director of Industries*** : Member
Meghalaya, Shillong or his nominee

6. ***The Director of Health Services (Research, etc),***
Meghalaya, Shillong or his nominee : Member

7. ***The Director, Urban Affairs***
Meghalaya, Shillong or his nominee : Member

MEMBERS FROM LOCAL AUTHORITIES

8. ***The Chief Executive Member***
Khasi Hills Autonomous District Council or his nominee : Member

9. ***The Chief Executive Member***
Jaintia Hills Autonomous District Council or his nominee : Member

10. ***The Chief Executive Member***
Garo Hills Autonomous District Council or his nominee : Member

11. ***The Chairman***
Shillong Municipality Board or his nominee : Member

12. ***The Chairman***
Tura Municipality Board or his nominee : Member

REPRESENTATIVES FROM COMPANIES OR CORPORATIONS

13. ***The Managing Director***
Meghalaya Industrial Development Corporation or his nominee : Member

14. ***The Managing Director***
Mineral Development Corporation, Meghalaya or his nominee : Member

NON-OFFICIAL MEMBERS

15. ***Dr.(Mrs.) W. Papang***
Retired Director, Animal Husbandary & Veterinary Department,
Bishop Falls, Lower Mawprem,
Shillong, East Khasi Hills District : Member

16. ***Shri Y. Shylla, Retired Director of Horticulture,***
Mynthong, Near District Library,
Jowai, West Jaintia Hills District. : Member

17. ***Shri B.M. Momin, (with effect from 28.01.2021)***
Retired Director of Fisheries,
Upper Chandmary, Tura, West Garo Hills, District. : Member

CHAPTER 3
MEETING OF THE BOARD WITH MAJOR DECISIONS

During the year 2021-2022, the Board conducted the following Meetings

SL. NO.	MEETING NO.	DATE	VENUE	NO. OF MEMBERS ATENDING THE MEETING
1.	79th Board Meeting	19.04.2021	Conference Room of the office of the PCCF & HOFF, Sylvan House, Shillong	12 (Twelve)
2.	80th Board Meeting	30.09.2021	Conference Room of the office of the PCCF & HOFF, Sylvan House, Shillong	9 (Nine)
3.	81st Board Meeting	16.12.2021	Office Chamberof the Chairman, Meghalaya State Pollution Control Board, Shillong	10 (Ten)
4.	82nd Board Meeting	19.03.2022	Conference Room of the Meghalaya State Pollution Control Board, Shillong.	9 (Nine)

The following decisions were taken in the above Meetings: -

79th BOARD MEETING:

- The Board approved the proposal to construct a small office of the Board at the allotted land at Tura Industrial Estate
- The Board decided that the vehicular testing station may be set up at the proposed office building site at the Tura Industrial Estate.
- The Board approved the proposal for appointment of Government Analyst and Board Analysts.
- The Board approved Rs. 20.00 Lakhs (capital cost) as SPCB's share to be borne from the Board's Revenue for setting up of CAAQM station at Byrnihat.
- For operation and maintenance of the CAAQM at Byrnihat, the Board shall submit the proposal to MoEF&CC, Delhi under the Scheme "Control of Pollution".
- The Board approved the proposal for creation of the post of Chief Scientist.

80th BOARD MEETING:

- The Board decided that establishment of the Regional Office at Tura should be completed by January 2022. In the meantime, Building Permission from MUDA should be applied for as required.
- The Board approved the proposal for extension of the service of Shri J.H. Nengnong, Consultant Engineer for another 6 (six) months from the date of expiry of the initial period.
- The Board decided that the matter should be pursued with the Deputy Commissioner, Ri-Bhoi District for carrying up a joint inspection to identify a suitable location for setting up of a CAAQM station at non-attainment city of Byrnihat.

81st BOARD MEETING:

- Installation of CAAQMS at J.N. Complex, Polo has been completed successfully and commissioning of the Station will tentatively be completed by 17th December 2021.

- The Board decided that legal notice may be served to the International Institute of Waste Management, Bengaluru if they fail to submit the final report of Inventorization of E-waste for the whole State of Meghalaya within December 2021.
- The Board requested the office of the Board to expedite the process of recruitment to the post of Laboratory Assistant.
- The Board accepted the recommendation of the Expert Technical Committee on Siting Norms for Coke Plants.
- The Board approved the proposed amendments to be made in the Meghalaya State Pollution Control Board Medical Advance & Reimbursement Regulation 2016.
- The Board approved the proposal to appoint the two Engineers already in place in the office of the Board on contract basis with a monthly emolument of Rs. 45,000/- p.m.

82nd BOARD MEETING:

- The Board decided that a fresh proposal is to be sent in the next financial year to the MoEF&CC for establishment of Regional Office at Tura and Khliehriat.
- The Board endorsed the action by the office of the Board in issuing Show Cause Notice to M/S International Institute of Waste Management, Bengaluru for failure of submission of the final report on Inventorization of E-waste for the whole State of Meghalaya.
- The Board decided that the matter of acquiring approval from the District Horticultural Department for setting up of a CAAQM station at Byrnihat Horticulture Orchard-cum-Nursery at 13th Mile, Tamulkuchi should be pursued.
- The Board approved the proposal to streamline the engagement of Lawyers for representing the Board in dif ferent Courts.
- The Board approved the proposal to adopt the Report of the CPCB In-House Committeeon Methodology for Assessing Environmental Compensation and Action Plan to utilize the Fund.
- The Board Members were requested to send their views/comments on the draft Guidelines for Utilization of Environmental Compensation Fund by Meghalaya State Pollution Control Board to be discussed in the next Board Meeting.
- The Board approved the Standard Operating Procedure for the on-line consent management and monitoring system.
- The Board approved the proposal to adopt the Categorization of CBG Plants as per revised categorization adopted by CPCB.
- The Board approved the proposal for a specific task association of Shri C.P. Marak, I.F.S. (Retired) and former Chairman, Meghalaya State Pollution Control Board.
- The Board approved grant of financial benefits to 9(nine) employees of the Board under MACPS as per recommendation of the Screening Committee.

CHAPTER 4
COMMITTEES CONSTITUTED BY THE BOARD & THEIR ACTIVITIES

The following Committees are constituted by the Board with their activities to strengthen the functions of the Board from time to time.

I. THE CONSENT COMMITTEE

1.	Chairman, Meghalaya State Pollution Control Board, Shillong.	: Chairman
2.	Director of Mineral Resources, Meghalaya, Shillong.	: Member
3.	Conservator of Forests (SF&E), Meghalaya, Shillong.	: Member
4.	Deputy Director of Commerce and Industries (P), Meghalaya, Shillong.	: Member
5.	Join Director Urban Affairs, Meghalaya, Shillong.	: Member
6.	Senior Inspector of Boilers & Factories, Inspectorate of Boilers & Factories, Meghalaya, Shillong.	: Member
7.	Town Planning Officer, MUDA Shillong	: Member
8.	Member Secretary, Meghalaya State Pollution Control Board, Shillong.	: Member Convener

TERMS OF REFERENCE

To examine/scrutinize the applications for Consent and recommend the grant or otherwise of Consent in respect of industries/developmental projects with project costs above Rs.25.00 lakhs.

II. THE PURCHASE COMMITTEE

1.	Chairman, Meghalaya State Pollution Control Board, Shillong.	: Chairman
2.	The Director, Sophisticated Analytical Instrument Facilities N.E.H.U, Shillong.	: Member
3.	Chief Engineer P.H.E Deptt. Meghalaya Shillong.	: Member
4.	Director of Commerce and Industries, Meghalaya Shillong.	: Member
5.	Director of Health Services (Reserch) Meghalaya Shillong	: Member
6.	Regional Director, Regional Directorate North East, CPCB Shillong	: Member
7.	Member Secretary, Meghalaya State Pollution Control Board, Shillong.	: Member Convener

TERMS OF REFERENCE:

To scrutinize the Quotation/Tender documents and make necessary recommendation thereof for purchase of Scientific Instruments/Equipments.

III. THE SELECTION COMMITTEE FOR GRADE 'A' POSTS

1.	Additional Chief Secretary/Principal Secretary/ Commissioner & Secretary to the Govt. of Meghalaya, Forests & Environment Department.	: Chairman
2.	Principal Chief Conservator of Forests/Additional Principal Chief Conservator of Forests, Social Forestry & Environment.	: Member
3.	Chairman, Meghalaya State Pollution Control Board, Shillong	: Member
4.	Regional Director, Regional Directorate, North Eastern Regional Office, Central Pollution Control Board, Shillong.	: Member
5.	Member Secretary, Meghalaya State Pollution Control Board, Shillong.	: Member Convener

TERMS OF REFERENCE

To assess the eligibility of candidates through written examination, interview, practical test etc. for the purpose of direct recruitment to Grade 'A' Posts and to recommend the list of successful candidates in order of merit to the Board for appointment.

I.V THE SELECTION COMMITTEE FOR GRADE 'B', 'C' & 'D' POSTS

1.	Chairman, Meghalaya State Pollution Control Board.	: Chairman
2.	One Service Expert to be nominated by the Chairman of the Board	: Member
3.	One Specialist to be nominated by the Chairman of the Board	: Member
4.	Member Secretary, Meghalaya State Pollution Control Board	: Member Convener

TERMS OF REFERENCE

To assess the eligibility of candidates through written examination, interview, practical test etc. for the purpose of direct recruitment to Grade 'B', 'C' & 'D' Posts and to recommend the list of successful candidates in order of merit to the Board for appointment.

V THE PROMOTION COMMITTEE FOR GRADE 'A' POSTS

1.	Additional Chief Secretary/Principal Secretary/ Commissioner & Secretary to the Govt. of Meghalaya, Forests & Environment Department.	: Chairman
2.	Principal Chief Conservator of Forests/Additional Principal Chief Conservator of Forests, Social Forestry & Environment.	: Member
3.	Chairman, Meghalaya State Pollution Control Board, Shillong	: Member
4.	Regional Director, Regional Directorate, North Eastern Regional Office, Central Pollution Control Board, Shillong.	: Member
5.	Member Secretary, Meghalaya State Pollution Control Board, Shillong.	: Member Convener

TERMS OF REFERENCE:

To assess the eligibility of candidates on the basis of seniority-cum-merit and recommend the list of eligible candidates in order of preference to the Board for promotion.

VI THE PROMOTION COMMITTEE FOR GRADE 'B'&'C' POSTS

1.	Chairman, Meghalaya State Pollution Control Board.	: Chairman
2.	Member Secretary, Meghalaya State Pollution Control Board.	: Member
3.	*Respective Head of Technical/Legal/Scientific/Administrative/ Accounts Branch.	: Member
4.	Administrative Officer, Meghalaya State Pollution Control Board.	: Member Convener

**To attend as and when promotion of employee(s) under their jurisdiction is/are to be recommended.*

TERMS OF REFERENCE:

To assess the eligibility of candidates on the basis of seniority-cum-merit and recommend the list of eligible candidates in order of preference to the Board for promotion.

VII. THE RESEARCH ADVISORY COMMITTEE

1.	Chairman, Meghalaya State Pollution Control Board, Shillong.	: Chairman
2.	Director, SAIF, N.E.H.U, Shillong.	: Member
3.	Chief Conservator of Forests (Social Forestry & Environmnt) Meghalaya, Shillong.	: Member
4.	Director of Health Services (Research), Meghalaya, Shillong.	: Member
5.	Representative of MoEF&CC, North Eastern Regional Office, Shillong.	: Member
6.	Incharge Zonal Office, Central Pollution Control Board, Shillong.	: Member
7.	Senior Accountant, Meghalaya State Pollution Control Board, Shillong.	: Member
8.	Member Secretary, Meghalaya State Pollution Control Board, Shillong.	: Convener

TERMS OF REFERENCE:

To look into the aspects of research needs in the areas of environmental pollution monitoring and control.

CHAPTER 5
AIR QUALITY MONITORING

5A: NATIONAL AIR QUALITY MONITORING

The Meghalaya State Pollution Control Board is monitoring the Ambient Air Quality at 10 (ten) stations in the state under National Air Monitoring Programme (NAMP) sponsored by CPCB (Fig.5.0). The frequency of monitoring is twice a week. During 2021, monitoring in all the stations could not be carried out in the months of May and June due to the Total Lockdown imposed by the State government during the COVID-19 pandemic. Particulate Matter (PM10), Particulate Matter (PM2.5), Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2) and meteorological parameters viz. wind speed, wind direction, ambient air temperature, humidity, etc. were monitored at these stations and the observations are presented below:-

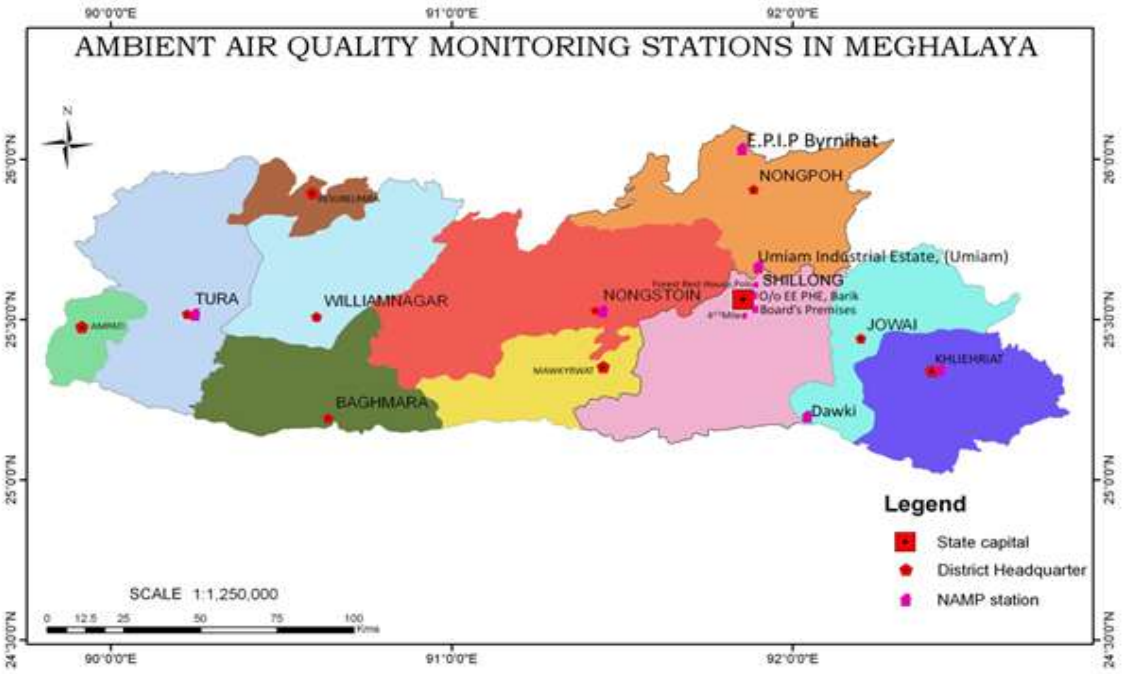


FIG. 5.0: LOCATION OF NAMP STATIONS IN THE STATE

Table 5.0: Annual Average values of air pollutants and Air Quality Index monitored under NAMP in Meghalaya.

Sl. No.	Name of Station	Year	Annual Average Parameters Tested				Air Quality Index (AQI)	
			PM10 (µg/m³)	PM2.5 (µg/m³)	SO^2 (µg/m³)	NO^2 (µg/m³)	Value	Rating
1.	MSPCB Premises, Lumpyngngad, Shillong, East Khasi Hills District.	2020	29.6	13.7	2.0	4.5	30	Good
		2021	35.2	17.3	2.0	4.5	35	Good
2.	O/o EE,PHE,Hills Division, Barik, Shillong, East Khasi Hills District.	2020	47.7	20.9	6.3	20.8	48	Good
		2021	57.5	29.3	7.9	18.2	58	Satisfactory
3.	Export Promotion Industrial Park, Byrnihat, Ri Bhoi District.	2020	115.7	42.8	15.9	15.3	110	Moderate
		2021	178.4	76.5	17.4	17.8	155	Moderate

Table 5.0: Annual Average values of air pollutants and Air Quality Index monitored under NAMP in Meghalaya.

Sl. No.	Name of Station	Year	Annual Average Parameters Tested				Air Quality Index (AQI)	
			PM10 (µg/m³)	PM2.5 (µg/m³)	SO^2 (µg/m³)	NO^2 (µg/m³)	Value	Rating
4.	PHE Quarters, Bakur, Dawki	2020	28.3	16.6	2.0	13.3	28	Good
		2021	36.1	21.1	5.1	10.8	36	Good
5.	O/o BDO, C&RD Block, Khliehriat, East Jaintia Hills District.	2020	37.4	17.0	2.0	11.2	37	Good
		2021	41.9	17.9	4.0	9.0	42	Good
6.	O/o SDO, PHE, Nongstoin, West Khasi Hills District.	2020	31.9	17.9	2.0	13.4	32	Good
		2021	35.1	18.1	2.0	10.1	35	Good
7.	Dakopgre, Tura , West Garo Hills District.	2020	32.4	12.2	2.0	12.5	32	Good
		2021	36.1	17.0	2.0	10.3	36	Good
8.	Umiam Industrial Estate, Umiam, Ri Bhoi District.	2020	74.6	23.5	4.3	11.5	75	Satisfactory
		2021	99.5	31.4	4.4	10.7	100	Satisfactory
9.	Forest Rest House, Polo Hills, Shillong, East Khasi Hills District.	2020	35.3	17.3	4.0	11.1	35	Good
		2021	41.7	21.9	4.4	9.5	42	Good
10.	Mylliem Range Office, Forest & Environment Deptt., 4 ½ Mile, Shillong, East Khasi Hills District.	2020	33.1	18.7	2.0	4.5	33	Good
		2021	40.9	22.5	4.6	10.3	41	Good
Permissible Limits of Ambient Air Quality Standards as per EPA Notification GSR 826(E), dated 16th Nov. 2009.			60	40	50	40	Rating Scale: Good: 0-50; Satisfactory: 51-100; Moderate: 101-200; Poor: 201-300; Very Poor: 301-40 Severe: > 400	

Rating	Effects
Good (0–50)	Minimal Impact
Satisfactory (51–100)	Minor breathing discomfort to sensitive people
Moderate (101–200)	Breathing discomfort to the people with lung,heart disease, children and older adults
Poor (201–300)	Breathing discomfort to people on prolonged exposure
Very Poor (301–400)	Respiratory illness to the people on prolonged exposure
Severe (>401)	Respiratory effects even on healthy people

Observations & Findings:

1. The measured SO2 and NO2 values are well within the prescribed limits in all the locations monitored during 2020 and 2021.
2. PM10 and PM 2.5 values monitored at all locations are within the prescribed limits, except at EPIP, Byrnihat and at Umiam Industrial Estate, Umiam, where PM10 and PM 2.5 values exceeded the prescribed limits.
3. The Air Quality Index (AQI) falls under 'Good' category at all locations except at the location at Barik which is 'Satisfactory' during 2021, 'Moderate' at EPIP, Byrnihat , during 2020 and 2021, and 'Satisfactory' at Umiam Industrial Estate during 2020 and 2021.
4. High concentrations of Particulate Matter (PM10)and Particulate Matter (PM2.5) levels is attributable to the buildup of pollutants owing to emissions from industries located in the industrial area, emission from vehicle, dust generated due to movement of vehicles, natural dust and re-suspension of road dust and construction activities.

5A1: Ambient Air Quality monitored in the Board's Office Premises, Lumpyngngad, Shillong (Station – I):

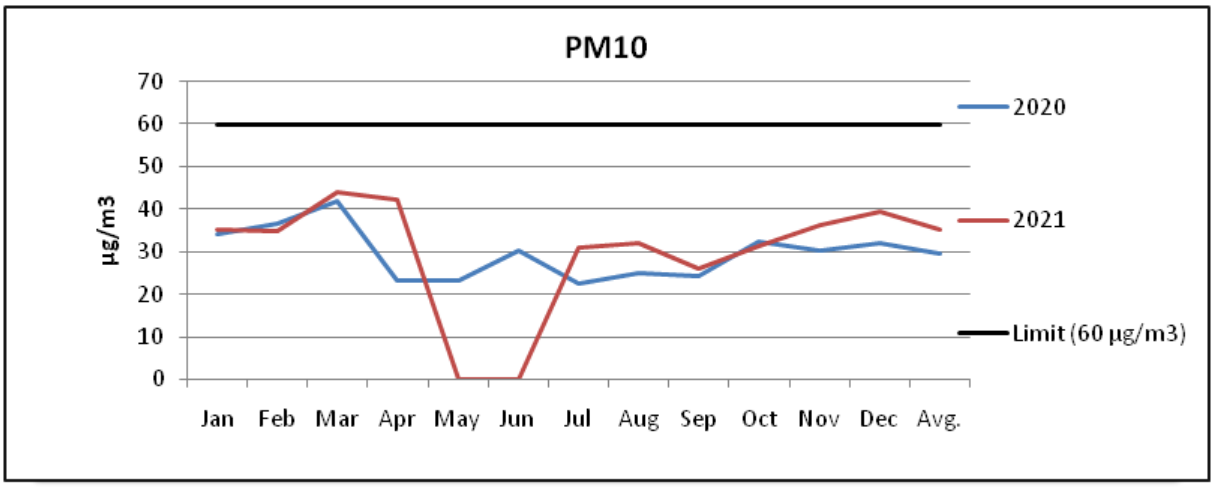
The Board is regularly monitoring the Air Quality from the station under National Air Monitoring programme (NAMP).The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A1 and depicted in Fig. 5.A1.

Findings and Observations:

- As per the air quality data (Table 5.A1), maximum value (44.0 µg/m^3) of PM10 was observed during the month of March 2021 and minimum value (22.4 µg/m^3) was observed during the month of July 2020. Maximum concentration (22.5 µg/m^3) of PM2.5 was observed during the month of March 2020 and minimum concentration (9.7 µg/m^3) was observed during the month of July 2020.
- As per findings, it was observed that there is minimal deviation of values when compared to concentration of particulate matter (PM10 and PM2.5) monitored during 2020 and 2021.
- The Annual Average of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2), Particulate Matter (PM10) & Particulate Matter (PM2.5)levels are within the National Ambient Air Quality standards.

Table 5.A1: Ambient Air Quality data at State Board's Premises, Shillong (Stn – I), during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m^3)			PM2.5 (µg/m^3)			SO_2 (µg/m^3)			NO_2 (µg/m^3)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Board's Premises	2020 (Jan-Dec)	22.4 (Jul)	41.9 (Mar)	29.6	9.7 (Jul)	22.5 (Mar)	13.7	2.0	2.0	2.0	4.5	4.5	4.5
	2021 (Jan-Dec)	31.1 (Jul)	44.0 (Mar)	35.2	13.6 (Sep)	21.7 (Apr)	17.3	2.0	2.0	2.0	4.5	4.5	4.5



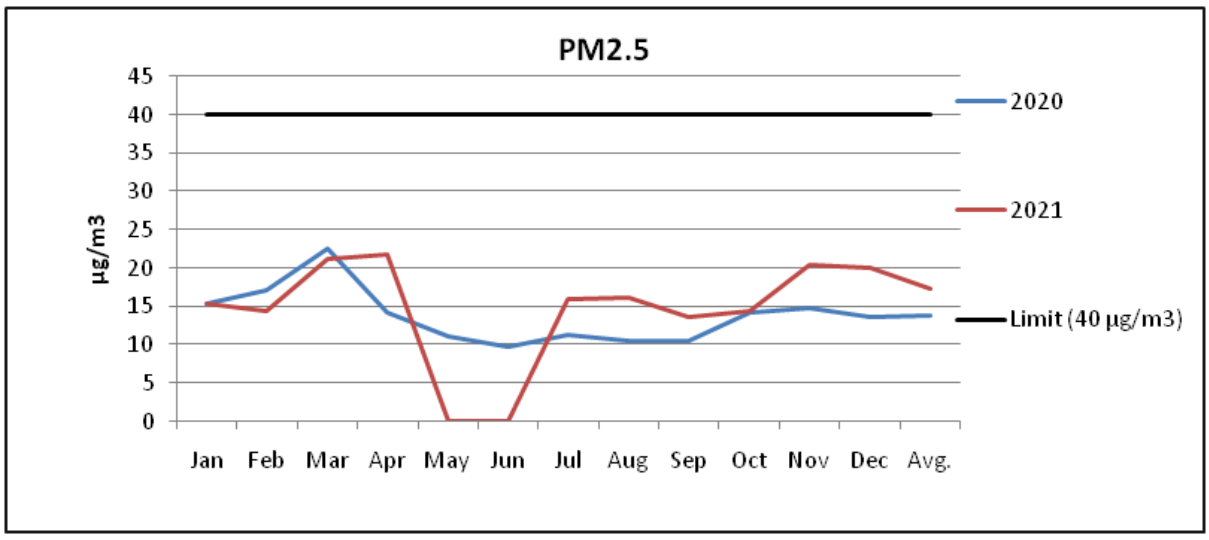


Fig.5.A1: Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021 at Board's Premises, Shillong.

5.A2: Ambient Air Quality monitored in the O/o EE (PHE), Hills Division, Barik, Shillong. (Station – II):

The Board is monitoring the Air Quality from the station. The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A2 and depicted in Fig. 5.A2.

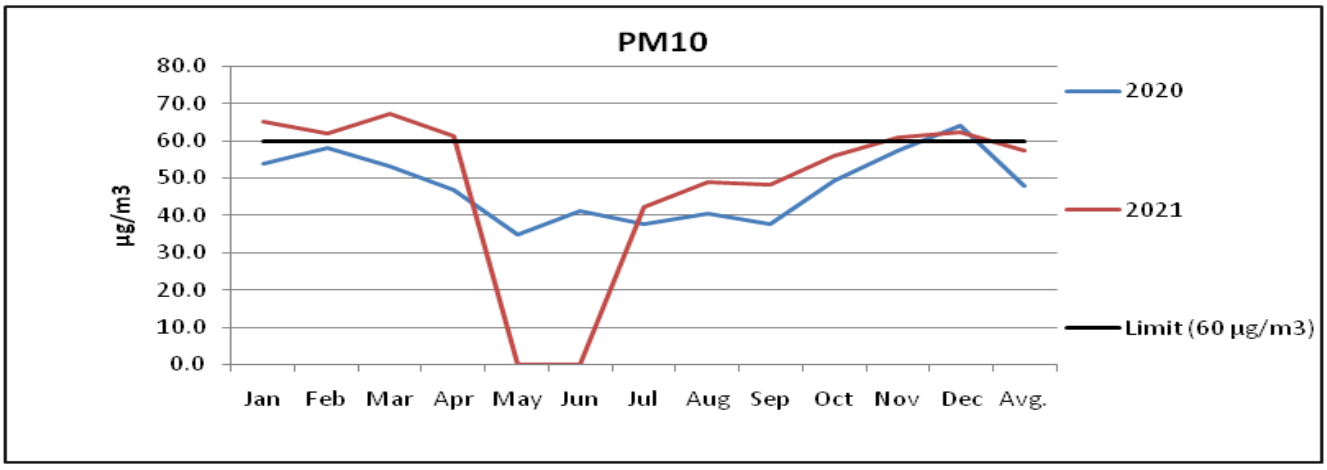
Findings and Observations:

- As per the air quality data (Table 5.A2), maximum value (67.4 µg/m^3) of PM10 was observed during the month of March 2021 and minimum value (34.7 µg/m^3) was observed during the month of May 2020. Maximum concentration (34.3µg/m^3) of PM2.5 was observed during the month of December 2021 and minimum concentration (16.8 µg/m^3) was observed during the month of September 2020.
- As per findings, it was observed that there is minimal deviation of values when compared to concentration of particulate matter (PM10 and PM2.5) monitored during 2020 and 2021.

- The Annual Average of Sulphur Dioxide (SO2), Nitrogen dioxide (NO2), and Particulate Matter (PM2.5) levels remains within the National Ambient Air Quality standards.
- High levels of Particulate Matter (PM10)may be due to emission from vehicle, dust generated due to movement of vehicles, natural dust and re-suspension of road dust and construction activities.

Table 5.A2: Ambient Air Quality data at Barik, Shillong (Stn – II), during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m³)			PM2.5 (µg/m³)			SO_2 (µg/m³)			NO_2 (µg/m³)		
		Range		Annual Avg.	Range		Annu-al Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Barik	2020 (Jan-Dec)	34.7 (May)	64.0 (Dec)	47.7	16.8 (Sep)	33.8 (Dec)	20.9	4.9 (May)	8.9 (Dec)	6.3	14.8 (Aug)	26.9 (Dec)	20.8
	2021 (Jan-Dec)	42.2 (Jul)	67.4 (Mar)	57.5	22.2 (Sep)	34.3 (Dec)	29.3	6.7 (Jul)	8.9 (Dec)	7.9	16.5 (Feb)	21.4 (Dec)	18.2



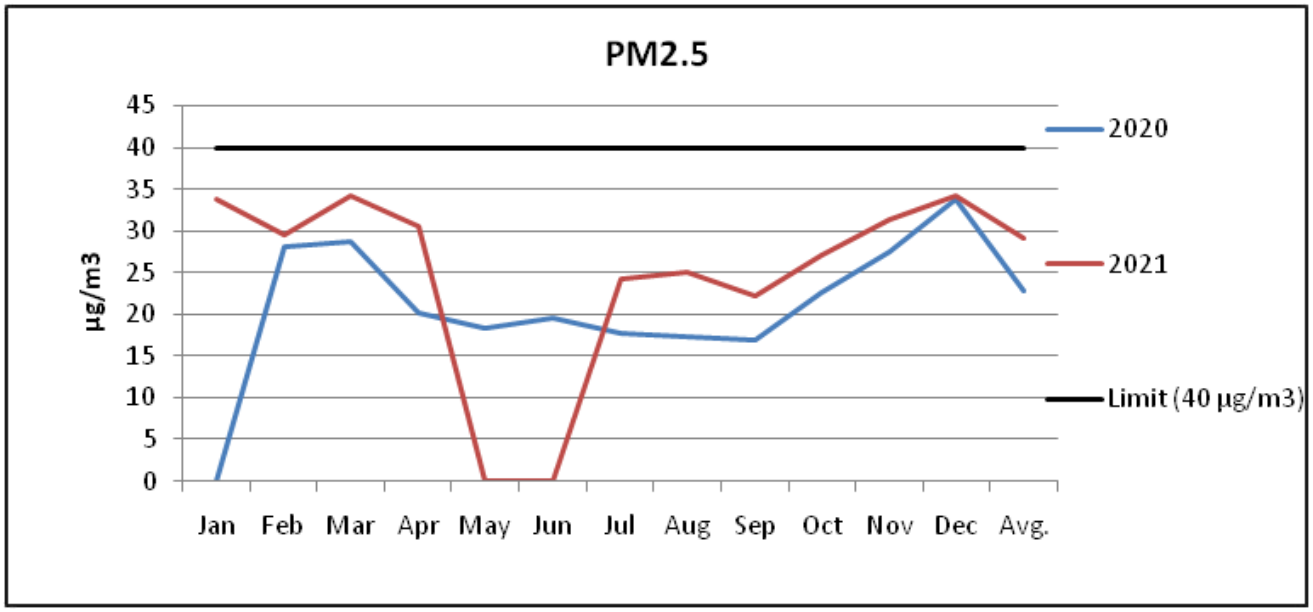


Fig. 5.A2 : Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021 at Barik, Shillong.

5A3: Ambient Air Quality monitored in EPIP, Byrnihat, Ri-Bhoi District (Station – III)

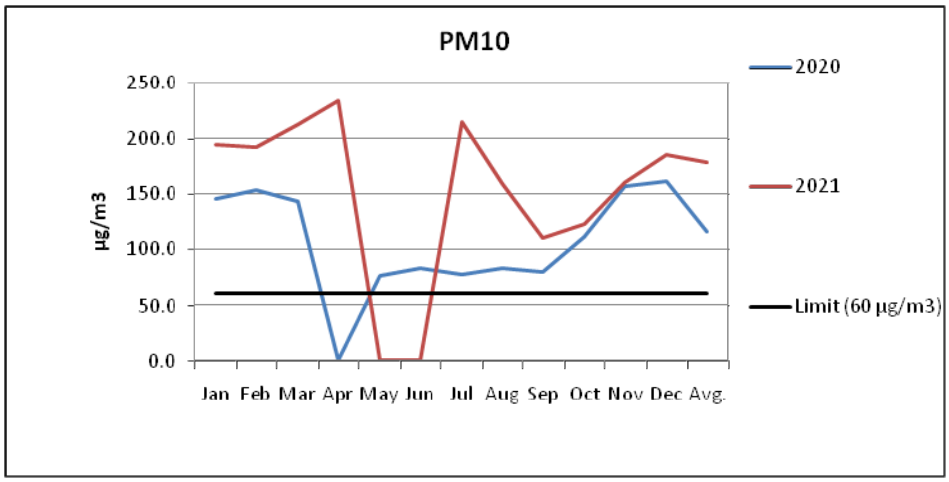
The Board is monitoring the Air Quality from the station. The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A3 and depicted in Fig. 5.A3.

Findings and Observations:

- As per the air quality data (Table 5.A3), maximum value (233.9 µg/m^3) of PM10 was observed during the month of April 2021 and minimum value (76.2 µg/m^3) was observed during the month of May 2020. Maximum concentration (103.9 µg/m^3) of PM2.5 was observed during the month of April 2021 and minimum concentration (22.8 µg/m^3) was observed during the month of September 2020.
- The Annual Average of Sulphur Dioxide (SO2), Nitrogen dioxide (NO2) levels remains within the National Ambient Air Quality standards.
- The Annual Average of Particulate Matter (PM10) and Particulate Matter (PM2.5) levels exceeded the prescribed standards. As per findings, it was observed that there is a 35% increase of concentration of PM10 (annual avg.) during 2021 as compared to 2020. There is a 44% increase of concentration of PM2.5 (annual avg.) during 2021 as compared to 2020.
- High concentrations of Particulate Matter (PM10)and Particulate Matter (PM2.5) levels is attributable to the buildup of pollutants owing to emissions from industries located in the industrial area, emission from vehicle, dust generated due to movement of vehicles, natural dust and re-suspension of road dust and construction activities.

Table 5.A3: Ambient Air Quality data at EPIP, Byrnihat, Ri Bhoi District, (Stn–III), during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m^3)			PM2.5 (µg/m^3)			SO_2 (µg/m^3)			NO_2 (µg/m^3)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
EPIP Byrnihat	2020 (Jan-Dec)	76.2 (May)	161.6 (Dec)	115.7	22.8 (Sep)	70.1 (Mar)	42.8	11.7 (May)	19.1 (Aug)	15.9	13.6 (Mar)	16.9 (Aug)	15.3
	2021 (Jan-Dec)	109.9 (Sep)	233.9 (Apr)	178.4	41.0 (Oct)	103.9 (Apr)	76.5	11.9 (Feb)	22.1 (Nov)	17.4	13.4 (Feb)	20.3 (Jul)	17.4



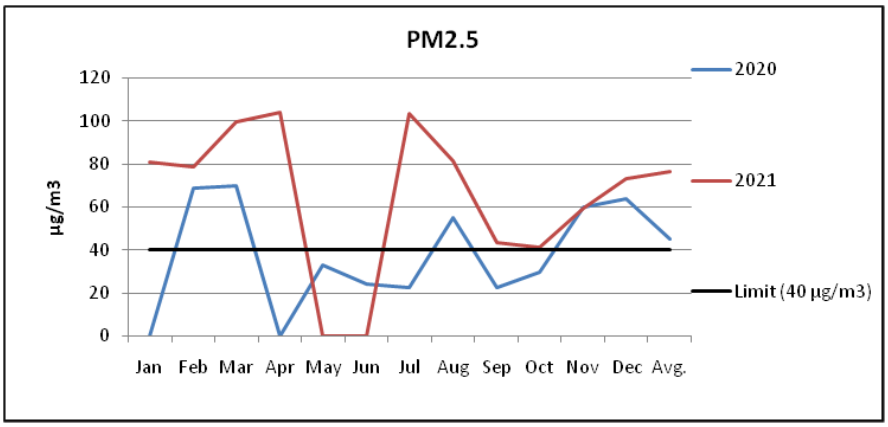


Fig. 5.A3:Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021 at EPIP, Byrnihat, Ri Bhoi District.

5A4: Ambient Air Quality monitored in Dawki, West Jaintia Hills District (Station – IV)

The Board is monitoring the Air Quality from the station. The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A4 and depicted in Fig. 5.A4.

Findings and Observations:

- As per the air quality data (Table 5.A4), maximum value (41.9 µg/m^3) of PM10 was observed during the month of November 2021 and minimum value (17.9 µg/m^3) was observed during the month of May 2020. Maximum concentration (27.7 µg/m^3) of PM2.5 was observed during the month of November 2021 and minimum concentration (9.5 µg/m^3) was observed during the month of May 2020.
- As per findings, it was observed that there is minimal deviation of values when compared to concentration of particulate matter (PM10 and PM2.5) monitored during 2020 and 2021.
- The Annual Average of Sulphur Dioxide (SO2), Nitrogen dioxide (NO2), Particulate Matter (PM10) and Particulate Matter (PM2.5) levels remain within the National Ambient Air Quality standards.

Table 5.A4: Ambient Air Quality data at Dawki, West Jaintia Hills District, (Stn – IV), during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m³)			PM2.5 (µg/m³)			SO_2 (µg/m³)			NO_2 (µg/m³)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Dawki	2020 (Jan-Dec)	17.9 (May)	37.9 (Mar)	28.3	9.5 (May)	26.2 (Feb)	16.6	2.0	4.5 (Dec)	2.0	4.5	16.7 (Dec)	13.3
	2021 (Jan-Dec)	29.5 (Sep)	41.9 (Nov)	36.1	16.9 (Feb)	27.7 (Nov)	21.1	4.0 (Feb)	6.1 (Nov)	5.1	4.5	13.1 (Jan)	10.8

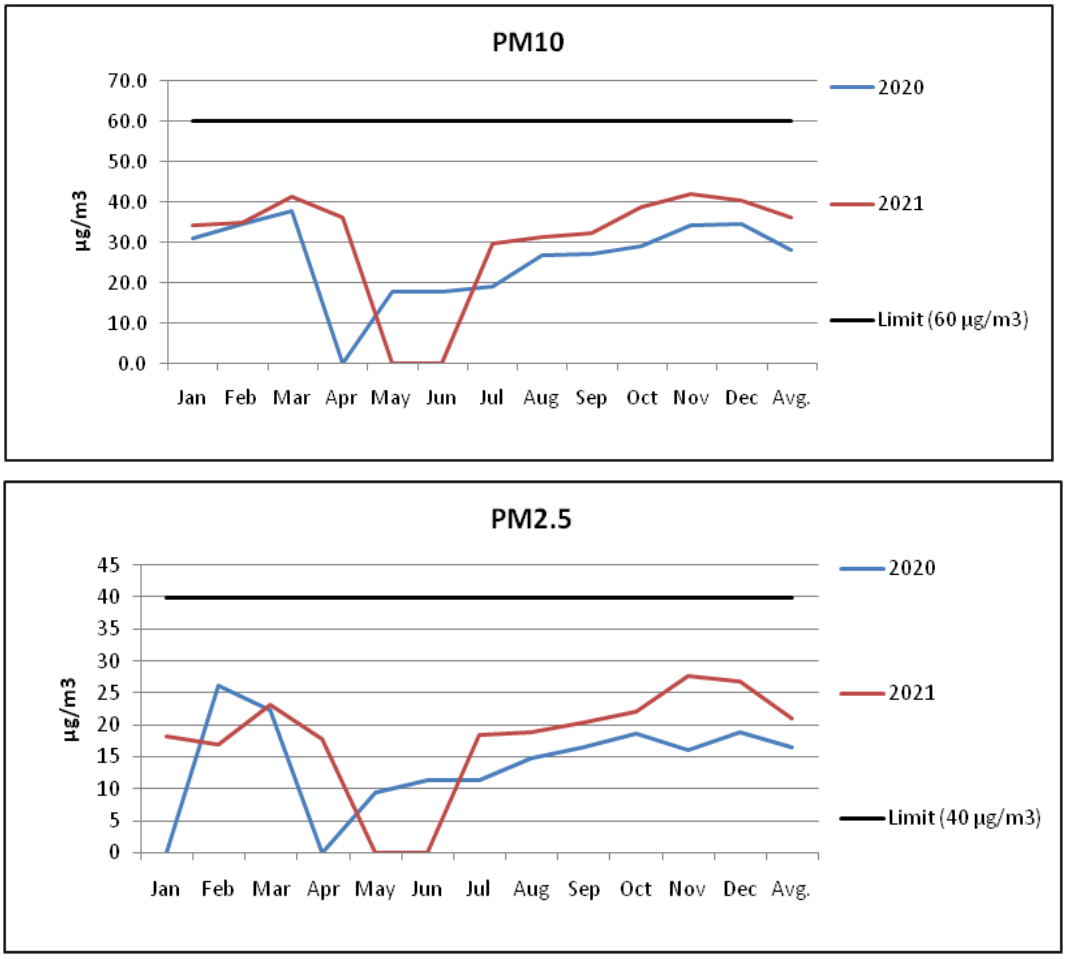


Fig.5.A4: Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021 at Dawki, West Jaintia Hills District.

5A5: Ambient Air Quality monitored in Tura, West Garo Hills District (Station – V)

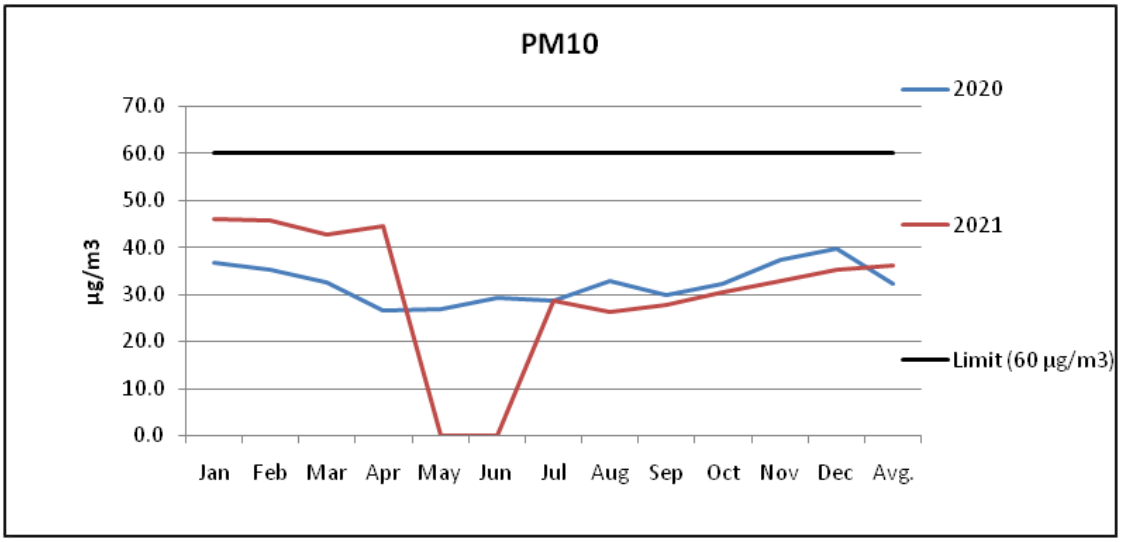
The Board is monitoring the Air Quality from the station. The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A5 and depicted in Fig. 5.A5.

Findings and Observations:

- As per the air quality data (Table 5.A5), maximum value (46.1 µg/m^3) of PM10 was observed during the month of January 2021 and minimum value (26.4 µg/m^3) was observed during the month of August 2021. Maximum concentration (23.8 µg/m^3) of PM2.5 was observed during the month of April 2021 and minimum concentration (11.6 µg/m^3) was observed during the month of May 2020.
- As per findings, it was observed that there is minimal deviation of values when compared to concentration of particulate matter (PM10 and PM2.5) monitored during 2020 and 2021.
- The Annual Average of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2), Particulate Matter (PM10) and Particulate Matter (PM2.5)levels remain within the National Ambient Air Quality standards.

Table 5.A5: Ambient Air Quality data atTura, West Garo Hills District, (Stn – V), during 2020 and 2021

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m^3)			PM2.5 (µg/m^3)			SO_2 (µg/m^3)			NO_2 (µg/m^3)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Tura	2020 (Jan-Dec)	26.7 (Apr)	39.6 (Dec)	32.4	11.6 (May)	13.6 (Dec)	12.2	2.0	5.3 (May)	2.0	4.5	14.0 (Jan)	12.5
	2021 (Jan-Dec)	26.4 (Aug)	46.1 (Jan)	36.1	13.9 (July)	23.8 (Apr)	17.0	2.0	2.0	2.0	4.5	13.9 (Jan)	10.3



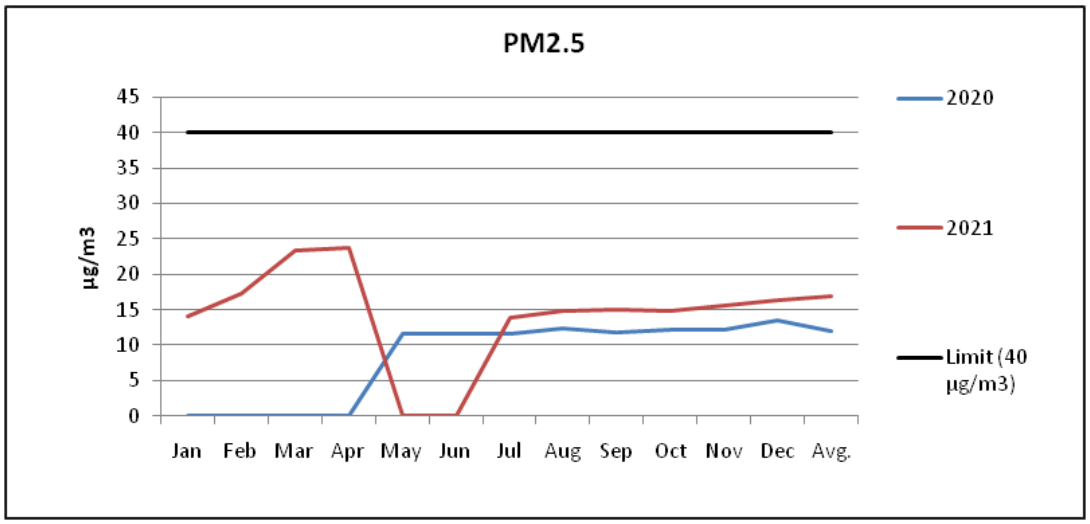


Fig. 5.A5: Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021 at Tura, West Garo Hills District.

5A6: Ambient Air Quality monitored in Khliehriat, Jaintia Hills District, (Station – VI)

The Board is monitoring the Air Quality from the station. The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A6 and depicted in Fig. 5.A6.

Findings and Observations:

- As per the air quality data (Table 5.A6), maximum value (49.6 µg/m^3) of PM10 was observed during the month of November 2021 and minimum value (28.3 µg/m^3) was observed during the month of May 2020. Maximum concentration (24.6 µg/m^3) of PM2.5 was observed during the month of March 2021 and minimum concentration (10.8 µg/m^3) was observed during the month of May 2020.
- As per findings, it was observed that there is minimal deviation of values when compared to concentration of particulate matter (PM10 and PM2.5) monitored during 2020 and 2021.
- The Annual Average of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2), Particulate Matter (PM10) and Particulate Matter (PM2.5)levels remain within the National Ambient Air Quality standards.

Table 5.A6: Ambient Air Quality data at Khliehriat, East Jaintia Hills District, (Station – VI), during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m^3)			PM2.5 (µg/m^3)			SO_2 (µg/m^3)			NO_2 (µg/m^3)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Khliehriat	2020 (Jan-Dec)	28.3 (May)	48.0 (Mar)	37.4	10.8 (May)	24.6 (Mar)	17.0	2.0	4.2 (Mar)	2.0	4.5	13.3 (Mar)	11.2
	2021 (Jan-Dec)	35.2 (Aug)	49.6 (Nov)	41.9	14.5 (Jul)	21.6 (Dec)	17.9	2.0	4.6 (Nov)	4.0	4.5	11.4 (Jan)	9.0

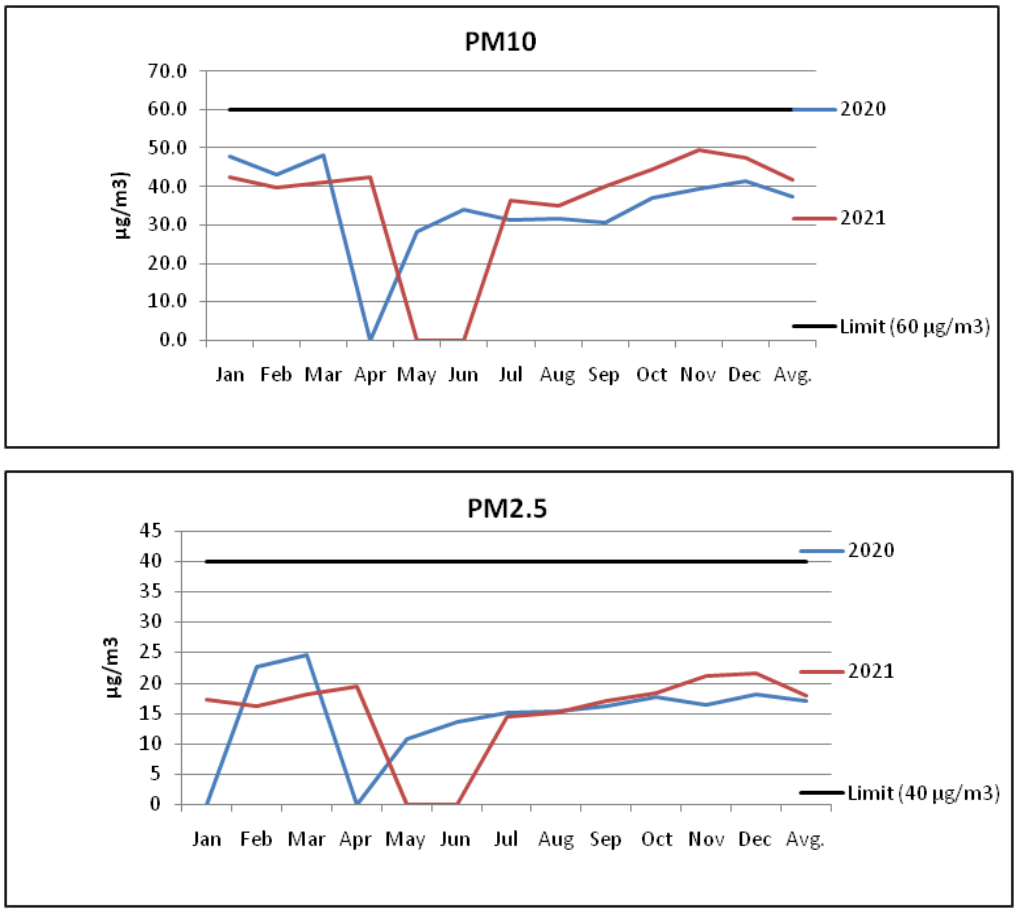


Fig. 5.A6: Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021 at Khliehriat, East Jaintia Hills District.

5A7: Ambient Air Quality monitored in Nongstoin, West Khasi Hills District (Station – VII)

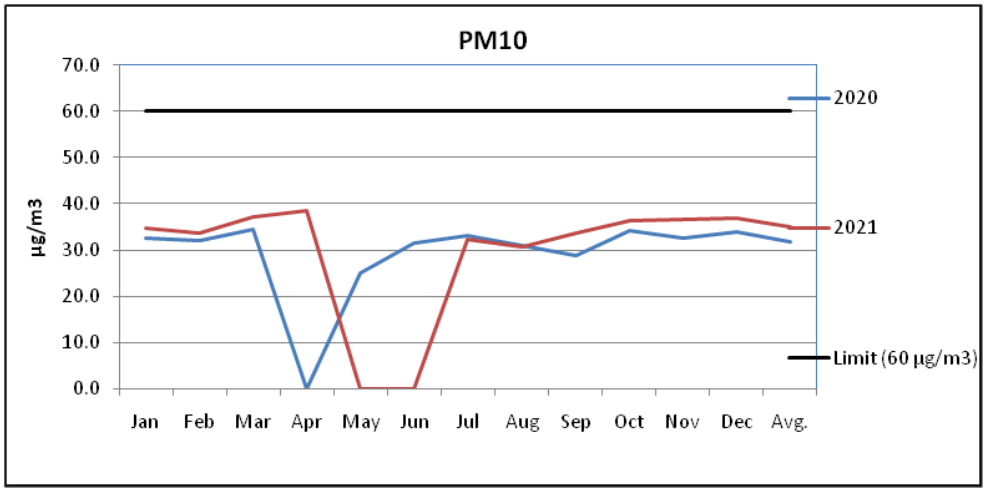
The Board is monitoring the Air Quality from the station. The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A7 and depicted in Fig. 5.A7.

Findings and Observations:

- As per the air quality data (Table 5.A7), maximum value (38.5 µg/m^3) of PM10 was observed during the month of April 2021 and minimum value (25.2 µg/m^3) was observed during the month of May 2020. Maximum concentration (22.1 µg/m^3) of PM2.5 was observed during the month of April 2021 and minimum concentration (14.5 µg/m^3) was observed during the month of September 2020.
- As per findings, it was observed that there is minimal deviation of values when compared to concentration of particulate matter (PM10 and PM2.5) monitored during 2020 and 2021.
- The Annual Average of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2), Particulate Matter (PM10) and Particulate Matter (PM2.5)levels remain within the National Ambient Air Quality standards

Table 5.A7: Ambient Air Quality data at Nongstoin, West Khasi Hills District (Stn–VII), during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m³)			PM2.5 (µg/m³)			SO_2 (µg/m³)			NO_2 (µg/m³)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Nongstoin	2020 (Jan-Dec)	25.2 (May)	34.6 (Mar)	31.9	14.5 (Sep)	22.1 (Mar)	17.9	2.0	2.0	2.0	11.4 (May)	14.8 (Oct)	13.4
	2021 (Jan-Dec)	30.7 (Aug)	38.5 (Apr)	35.1	15.9 (Oct)	22.1 (Apr)	18.1	2.0	5.0 (Dec)	2.0	4.5	11.7 (Jan)	10.1



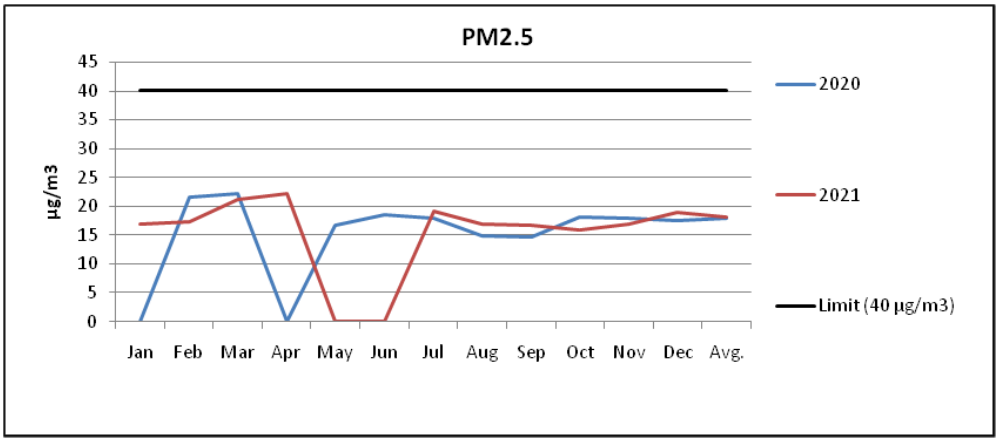


Fig.5.A7 : Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021 at Nongstoin, West Khasi Hills District.

5A8: Ambient Air Quality monitored in Umiam Industrial Estate, Umiam, Ri Bhoi District. (Station – VIII)

The Board is monitoring the Air Quality from the station. The results of monitoring during Jan-2020 and Jan-Dec 2021 are given in Table: 5.A8 and depicted in Fig. 5.A8.

Findings and Observations:

- As per the air quality data (Table 5.A8), maximum value (111.9 µg/m^3) of PM10 was observed during the month of March 2020 and minimum value (56.5 µg/m^3) was observed during the month of September 2020. Maximum concentration (39.0 µg/m^3) of PM2.5 was observed during the month of March 2021 and minimum concentration (20.1 µg/m^3) was observed during the month of September 2020.
- As per findings, it was observed that there is minimal deviation of values when compared to concentration of PM2.5 monitored during 2020 and 2021.
- The Annual Average of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2), and Particulate Matter (PM2.5) levels remain within the National Ambient Air Quality standards.
- The Annual Average Particulate Matter (PM10)levels observed to be above the National Ambient Air Quality standards. As per findings, it was observed that there is a 25% increase of concentration of PM10 (annual avg.) during 2021 as compared to 2020.High levels may be due to emission from vehicle, dust generated due to movement of vehicles, construction activities, emissions from industries located in the industrial area, natural dust andre-suspension of road dust and construction activities.

Table 5.A8: Ambient Air Quality data at Umiam Industrial Estate, Ri-Bhoi District, during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m^3)			PM2.5 (µg/m^3)			SO_2 (µg/m^3)			NO_2 (µg/m^3)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Umiam	2020 (Jan-Dec)	56.5 (Sep)	117.9 (Mar)	74.6	20.1 (Sep)	31.6 (Dec)	23.5	2.0	4.9 (Mar)	4.3	10.9 (May)	12.9 (Mar)	11.5
	2021 (Jan-Dec)	86.2 (Oct)	111.4 (Mar)	99.5	23.4 (Sep)	39.0 (Mar)	31.4	2.0	4.7 (Dec)	4.4	9.8 (Jan)	11.2 (Apr)	10.7

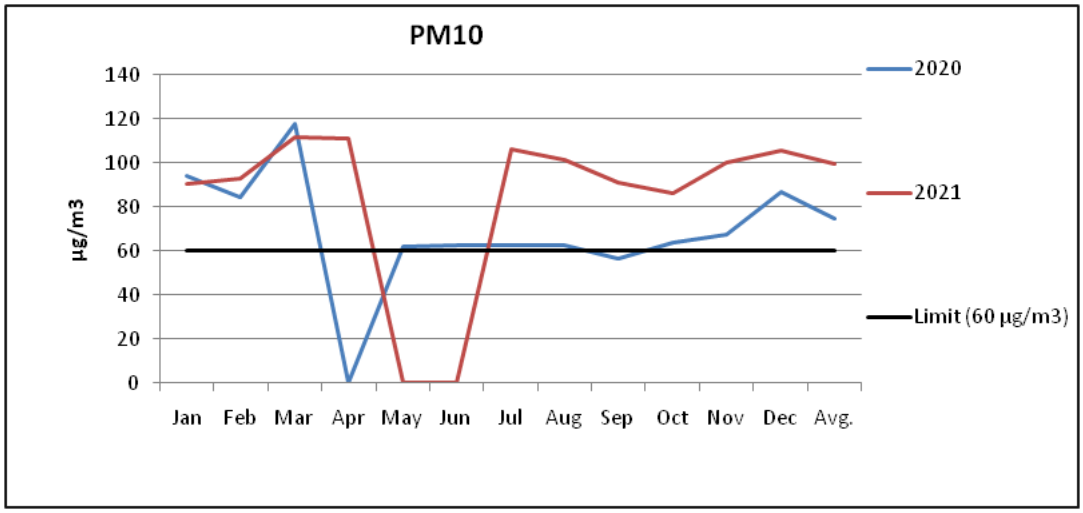
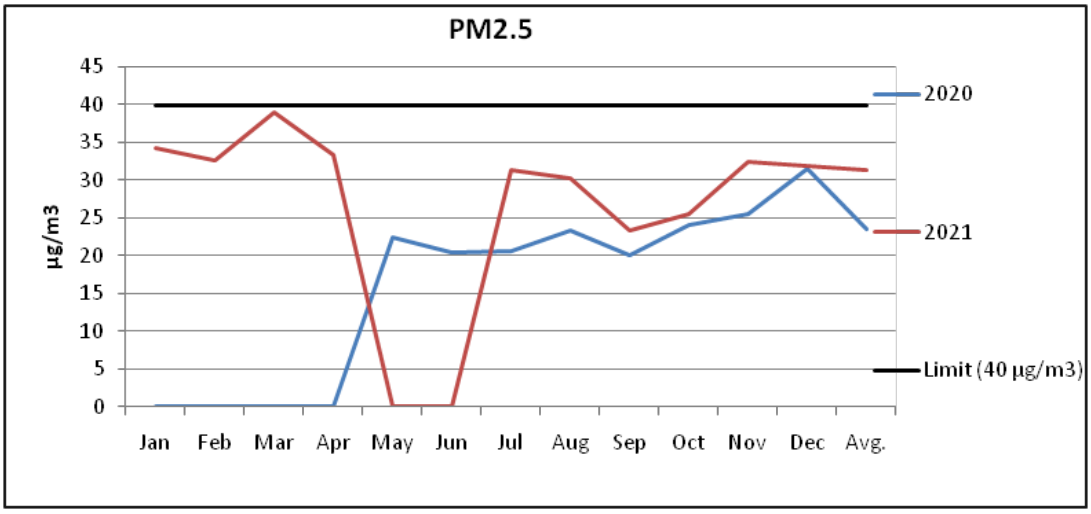


Fig . 5.A8: Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021at Umiam Industrial Estate, Ri-Bhoi District



5A9: Ambient Air Quality monitored in Forest Rest House, Polo Hills, Shillong, (Station – IX)

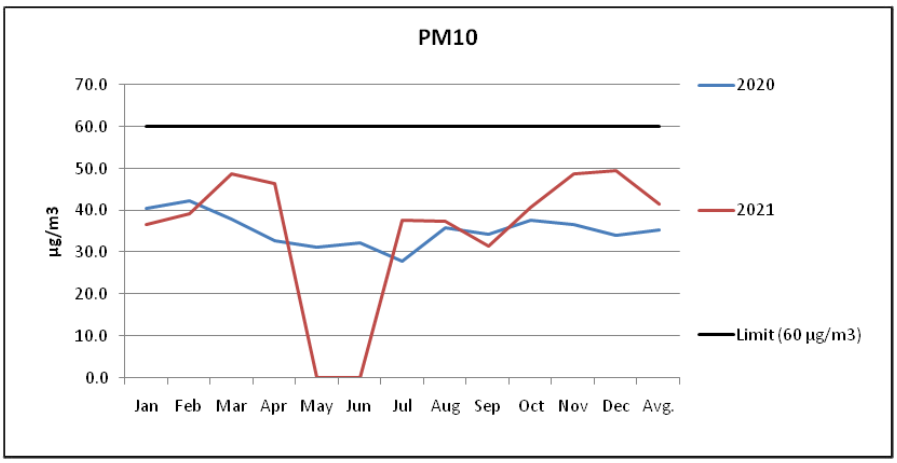
The Board is regularly monitoring the Air Quality from the station under National Air Monitoring programme (NAMP).The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A9 and depicted in Fig. 5.A9.

Findings and Observations:

- As per the air quality data (Table 5.A9), maximum value (49.6 µg/m^3) of PM10 was observed during the month of December 2021 and minimum value (28.0 µg/m^3) was observed during the month of July 2020. Maximum concentration (25.9 µg/m^3) of PM2.5 was observed during the month of March 2021 and minimum concentration (12.6 µg/m^3) was observed during the month of April 2020.
- As per findings, it was observed that there is minimal deviation of values when compared to concentration of particulate matter (PM10 and PM2.5) monitored during 2020 and 2021.
- The Annual Average of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2), Particulate Matter (PM10) and Particulate Matter (PM2.5)levels remain within the National Ambient Air Quality standards.

Table 5 .A9 : Ambient Air Quality data at Forest Rest House, Polo Hills, Shillong, during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m^3)			PM2.5 (µg/m^3)			SO_2 (µg/m^3)			NO_2 (µg/m^3)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Polo	2020 (Jan-Dec)	28.0 (July)	42.2 (Feb)	35.3	12.6 (Apr)	21.8 (Oct)	17.3	2.0	4.8 (Jan)	4.0	9.4 (Sep)	13.1 (Feb)	11.1
	2021 (Jan-Dec)	31.5 (Sep)	49.6 (Dec)	41.7	15.6 (Jan)	25.9 (Mar)	21.9	2.0	5.1 (Nov)	4.4	4.5	12.0 (Dec)	4.5



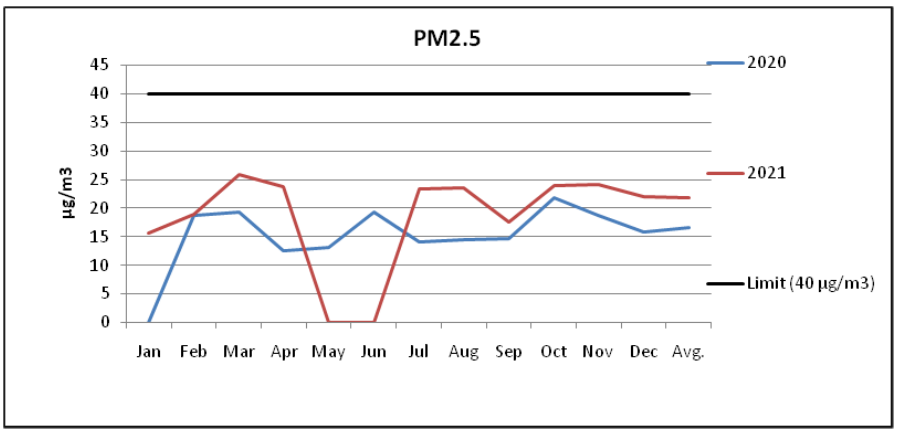


Fig.5.A9: Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021 at Forest Rest House, Polo Hills, Shillong.

5A10: Ambient Air Quality monitored in the Mylliem Range Office, Social Forestry, 4 ½ Mile, Upper Shillong, (Station – X)

The Board is regularly monitoring the Air Quality from the station under National Air Monitoring programme (NAMP).The results of monitoring during Jan-Dec 2020 and Jan-Dec 2021 are given in Table: 5.A10 and depicted in Fig.5.A10.

Findings and Observations:

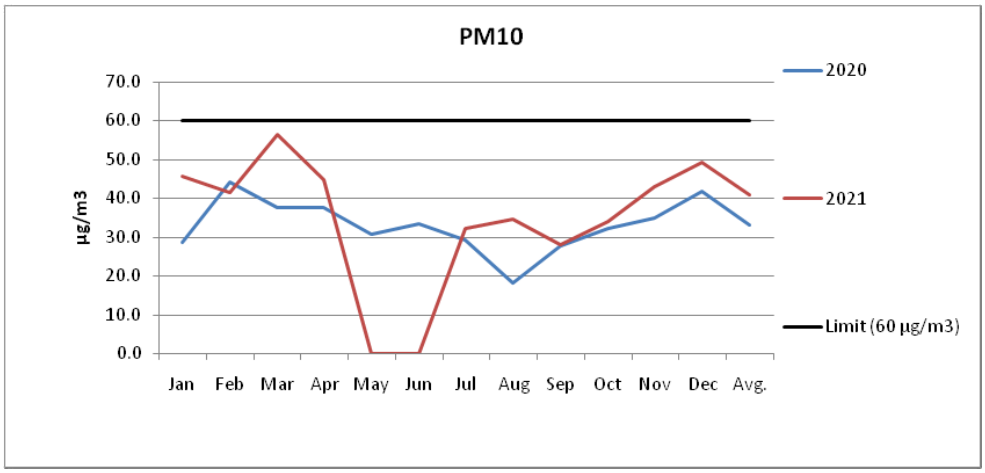
- As per the air quality data (Table 5.A10), maximum value (56.4 µg/m^3) of PM10 was observed during the month of March 2021 and minimum value (18.0 µg/m^3) was observed during the month of August 2020. Maximum concentration (28.2 µg/m^3) of PM2.5 was observed during the month of December 2021 and minimum concentration (13.5µg/m^3) was observed during the month of September 2020.

- As per findings, it was observed that there is minimal deviation of values when compared to concentration of particulate matter (PM10 and PM2.5) monitored during 2020 and 2021.

- The Annual Average of Sulphur Dioxide (SO2), Nitrogen dioxide (NO2), Particulate Matter (PM10) and Particulate Matter (PM2.5)levels remain within the National Ambient Air Quality standards.

Table 5.A10: Ambient Air Quality data at Mylliem Range Office, Social Forestry, 4 ½ Mile, Upper Shillong, during 2020 and 2021.

Sampling Station	Year	PARAMETERS TESTED											
		PM10(µg/m³)			PM2.5 (µg/m³)			SO_2 (µg/m³)			NO_2 (µg/m³)		
		Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.	Range		Annual Avg.
		Min	Max		Min	Max		Min	Max		Min	Max	
Mylliem	2020 (Jan-Dec)	18.0 (Aug)	44.3 (Feb)	33.1	13.5 (Sep)	23.6 (Mar)	18.7	2.0	2.0	2.0	4.5	10.8 (Dec)	4.5
	2021 (Jan-Dec)	28.0 (Sep)	56.4 (Mar)	40.9	15.5 (Sep)	28.2 (Dec)	22.5	2.0	5.8 (Dec)	4.6	4.5	11.9 (Dec)	10.3



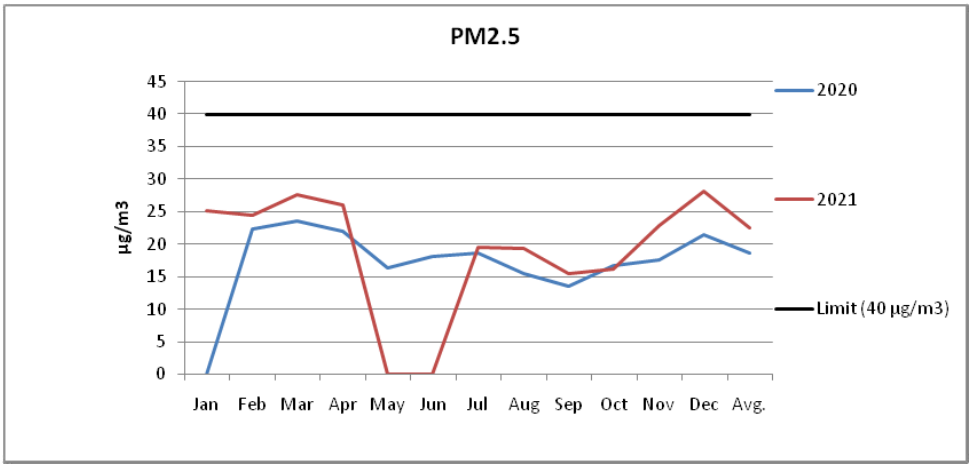


Fig.5.A10: Monthly and Annual average of major criteria pollutants PM10 and PM2.5 during 2020 and 2021at Mylliem Range Office, Social Forestry, 4 ½ Mile, Upper Shillong.

5B: AMBIENT AIR QUALITY AND SOURCE EMISSION MONITORING

5B1: The Board carried out Ambient Air quality (Table 5.1.0) and Source emission monitoring (Table 5.1.1) in residential areas and industrial units operating in the state during 2021-2022.

The following results were obtained during the monitoring: -

Table 5.1.0: Ambient Air Quality data during 2021-2022

Sl. No.	Name of Industry/ Location	Sampling Station	Date of Monitoring	Parameters				Remarks
				PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	
1.	Meghalayan Age, Shillong	Crinoline Complex-near Entrance	30.11.2021	42.1	26.8	1.8	5.6	W
2.	Meghalayan Age, Shillong	Crinoline Complex-near Hoitea Toitea	30.11.2021	31.6	18.5	1.4	4.4	W
3.	Meghalayan Age, Tura	Behind O/o Assistant Development Commissioner C&R.D Tura	30.11.2021	30.0	14.6	2.3	7.9	W
4.	Meghalayan Age, Tura	Near staff quarter O/o Assistant Development Commissioner C&R.D Tura	30.11.2021	31.2	15.3	2.5	8.1	W
5.	Meghalayan Age, Shillong	DalangIndoor Stage-Gymnasium	06.12.2021	78.0	37.9	3.7	9.6	W
6.	Meghalayan Age, Shillong	DalangIndoor Stage	06.12.2021	82.3	39.1	3.5	9.7	W
7.	Union Christian College,Ri Bhoi-Dist	Near Basket Ball Court	15.12.2021	42.0	19.9	2.0	4.5	W
8.	Christmas Festival	Meghalaya Assembly Premises, Police Bazar, Shillong	24.12.2021	60.1	27.3	4.2	13.0	W
9.	New Year's Eve	Meghalaya Assembly Premises, Police Bazar, Shillong	31.12.2021	60.7	28.0	6.4	13.8	W
10.	Shillong College, Shillong	Near Indoor Stadium	03.02.2022	59.7	30.0	5.9	12.3	W
11.	Latyrke, East Jaintia Hills	O/o Block Office	01.02.2022	62.4	37.8	13.7	10.6	W
12.	Moolamylliam, East Jaintia Hills	Res. of ApmonPaching	01.02.2022	53.7	29.4	12.8	16.1	W
13.	Mookympad, East Jaintia Hills	Res. Of Richmond Gympad	01.02.2022	69.8	38.5	14.4	11.4	W
14.	Sookilo, East Jaintia Hills	Office of the VDP	02.02.2022	207.4	108.1	17.4	13.8	A
15.	Moopala, East Jaintia Hills	Res. Of Iaishah Malang	02.02.2022	214.8	110.7	17.8	13.6	A
16.	Lelad, East Jaintia Hills	BNRGSK,C&RD Block Sutnga	03.02.2022	74.8	42.6	13.1	13.7	W
17.	Sutnga, East Jaintia Hills	Community Hall	02.02.2022	68.4	38.2	13.7	10.1	W
18.	Lamyrsiang, East Jaintia Hills	Anganwadi Centre	03.02. 2022	89.4	44.6	14.2	12.6	W
19.	Umpleng, East Jaintia Hills	Jaintia Cements Premises	02.02. 2022	93.6	47.8	14.1	11.7	W

Sl. No.	Name of Industry/ Location	Sampling Station	Date of Monitoring	Parameters				Remarks
				PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	
20.	Tangnub, East Jaintia Hills	SSA LP School,Wahsning	03.02. 2022	79.8	41.6	13.7	14.1	W
21.	Tluh, East Jaintia Hills	Community Hall	03.02. 2022	59.7	38.4	13.1	14.7	W
22.	Jaintia Coke Sookilo, East Jaintia Hills	Jaintia Coke Premises	09.02. 2022	294.5	106.2	17.8	15.1	A
23.	Khliehriat, East Jaintia Hills	NAMP Station	09.02. 2022	54.0	26.1	5.0	10.7	A
24.	M/S.Syrpailang Coke, East Jaintia Hills	Premises	09.02. 2022	325.7	113.7	18.4	17.0	A
25.	Meghalaya coke, Umpleng , E.J. Hills	Premises	10.02. 2022	289.5	87.1	19.3	16.2	A
26.	N.E. Carbon,LiarPynthor Shlep, Sutnga Elaka	Premises	10.02. 2022	192.2	84.9	15.9	18.3	A
27.	NM Fuels, Ingrain, Sutnga Elaka, East Jaintia Hills	Premises	11.02. 2022	309.3	99.6	17.0	17.8	A
28.	CASFOS, Byrnihat	Officers & Staff Quarters	10.02. 2022	233.3	177.8	36.9	20.9	A
29.	Umtyra, E.J. Hills	Res. Of Mrs. Bareh	28.02. 2022	108.1	79.1	26.1	11.2	A
30.	Kantalo Coke &Mahajong Coke, E.J. Hills	Near office of Mahajong Coke	28.02. 2022	329.9	235.7	46.5	20.3	A
31.	Nongrim Hills, E.J. Hills	Res. Of P.S.Nongtdu	28.02. 2022	138.8	97.8	36.6	13.2	A
32.	Nongsning, E.J.Hills	Community Hall	28.02.2022	62.5	32.8	16.9	10.2	W
33.	Khlieh Um Im Coke, E.J. Hills	Residential Quarter	01.03.2022	344.2	217.6	45.1	25.4	A
Sl.No.	Name of Industry/Location	Sampling Station	Date of Monitoring	Parameters				Remarks
				PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	
34.	Ioanis Coke, E.J. Hills	Near office	01.03.2022	316.7	228.5	40.8	21.3	A
35.	N.E.Coke Industry, E.J. Hills	Near office	01.03.2022	390.8	234.0	40.1	26.4	A
36.	Shillong Expressway Pvt. Ltd, Mawkhanu	Near office of the Plant	24.03.2022	98.8	45.7	4.4	11.0	W

W - Within Permissible Limits

A - Above Permissible Limits

5B2: Source Emission Monitoring (Survey): The Board carried out Source Emission monitoring (Table 5.1.1) in of industrial units operating in the State during 2021-2022

Table 5.1.1: Source Emission monitoring data during 2021-2022.

Sl.No	Name of Industry/Firm	Date of Sampling	Type of Stack	Parameters tested	Observed value (mg/Nm3)	Remarks
1.	NERLDC-Power System Operation Corporation Ltd., Nongrah,Shillong	2.12.2021	DG Set	PM	1.28	A
				NOx	1.57	W
				CO	0.1	W

W - Within Permissible Limits

A - Above Permissible Limits

2) Monitoring of Ambient Air Quality at Coke Plants (Consented) and nearby villages in Sookilo-Latyrke-Tangnub area and at Umtyra-Nongsning areain East Jaintia Hills District

The Meghalaya State Pollution Control Board had conducted the ambient air quality monitoring in 24 (twenty four) selected locations comprising of consented Coke plant units and villages located in Sookilo-Latyrke-Tangnub and Umtyra-Nongsning areasin East Jaintia Hills district during 1st February to 2nd March 2022 (Tables 1.0.A, 1.0.B,1.0.C, 1.0.D).

Ambient air quality monitoring was performed by using manually operated semi automatic Respirable Dust Samplers. The monitoring of pollutants is carried out for 24 hours (4-hourly sampling for gaseous pollutants and 8-hourly sampling for Particulate Matter).The monitoring of meteorological parameters such as wind speed and direction, relative humidity and temperature was also integrated with the monitoring of the air quality.

Table 1.0.A: Sampling Locations of Ambient Air Quality Monitoring in nearby villages in Sookilo-Latyrke-Tangnub areas (Sutnga Road)

Sl.No.	Sampling Locations	Area Classification
1.	Sookilo Village	Residential
2.	Moopala Village	Residential
3.	Sutnga Village	Residential
4.	MookympadVillage	Residential
5.	TluhVillage	Residential
6.	LatyrkeVillage	Residential
7.	MoolamylliangVillage	Residential
8.	UmplengVillage	Residential
9.	LamyrsiangVillage	Residential
10.	LeladVillage	Residential
11.	TangnubVillage	Residential
12.	KhliehriatTown	Residential

Table 1.0.B: Sampling Locations of Ambient Air Quality Monitoring in Consented Coke Plants (Sookilo-Latryke-Tangnub area)

Sl.No.	Sampling Locations	Area Classification
1.	M/s Jaintia Coke Industries, Sookilo	Industrial (Coke Plant Unit)
2.	M/s Syrpailang Coke Co., Sookilo	Industrial (Coke Plant Unit)
3.	M/s Meghalaya Coke, Umpleng	Industrial (Coke Plant Unit)
4.	M/s North East Carbon Industries, Liar Pynthor Shlep, Sutnga Elaka	Industrial (Coke Plant Unit)
5.	M/s NM Fuels, Ingrain, Sutnga Elaka	Industrial (Coke Plant Unit)

Table 1.0.C: Sampling Locations of Ambient Air Quality Monitoring of nearby villages at Umtyra-Nongsning areas

Sl.No	Sampling Locations	Area Classification
1.	Umtyra village	Residential
2.	Nongrim Hills village	Residential
3.	Nongsning village	Residential

Table 1.0.D: Sampling Locations of Ambient Air Quality Monitoring in Consented Coke Plants (Umtyra-Nongsning area)

Sl.No	Sampling Locations	Area Classification
1.	M/s Kantalo Coke, Umtyra	Industrial (Coke Plant Cluster)
	M/s Mahajong Coke LLP, Umtyra	
2.	M/s Khlieh Um Im Coke, Umtyra	Industrial (Coke Plant unit)
3.	M/s Ioanis Industries (P) Ltd., Umtyra	Industrial (Coke Plant unit)
4.	M/s N.E. Coke Industry, Mynkre	Industrial (Coke Plant unit)

Findings and Observations:

The findings as per data collected from the 2(two) areas are as follows:

(i) Sookilo-Latryke-Tangnub area

Ambient Air quality in villages around Sookilo-Latryke-Tangnub

The PM10 concentrations in villages around Sookilo-Latyrke-Tangnub ranged from a minimum of 53.7 µg/m^3 at Moolamylliang to a maximum of 214.8 µg/m^3 at Moopala (Table 2.0.A). The PM2.5 concentrations ranged from 26.1 µg/m^3 at Khliehriat to a maximum of 110.7 µg/m^3 at Moopala. PM10 and PM2.5 concentrations at Sookilo and Moopala are found to be above the prescribed standards (Table 3.0). High PM10 and PM2.5 concentrations at Sookilo and Moopala may perhaps be attributed to emission from the coke plants, dust arising from movement of vehicles along the Sutnga Road, and the natural windblown dust. Concentrations of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2) are within the prescribed standards at all the locations (Table 3.0).

Ambient Air quality within the premises of Coke plants located around Sookilo-Latyrke-Tangnub

The PM10 concentrations in Coke plants around Sookilo-Latryke-Tangnub ranged from a minimum of 192.2 µg/m^3 at M/S North East Carbon Industries to a maximum of 325.7 µg/m^3 at M/S Syrpailang CokeCo. (Table 2.0.A). The PM2.5 concentrations ranged from a minimum of 84.9 µg/m^3 at North East Carbon to a maximum of 113.7 µg/m^3 at M/S Syrpailang Coke Co. High PM10 and PM2.5 concentrations may perhaps be attributed to emission from the coke plants, dust arising from movement of vehicles, and the natural windblown dust. PM10 and PM2.5 concentrations at all the location mentioned, are above the prescribed limits. Concentrations of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2) are within the prescribed standards at all the locations (Table 3.0).

(ii) Umtyra-NongsningArea

Ambient Air quality in villages around Umtyra-Nongsning

The PM10 concentrations in villages around Umtyra-Nongsning area ranged from a minimum of 62.5 µg/m^3 at Nongsning to a maximum of 138.8 µg/m^3 at Nongrim Hills (Table 2.0.B). The PM2.5 concentrations ranged from 32.8 µg/m^3 at Nongsning to a maximum of 98.8 µg/m^3 at Nongrim Hills. PM10 and PM2.5 concentrations at Nongrim Hills and Umtyra are found to be above the prescribed standards. High PM10 and PM2.5 concentrations at Nongrim Hills and Umtyra may perhaps be attributed to emission from the coke plants (Table 1.0.B), dust arising from movement of vehicles along the NH6 , and the natural windblown dust. Concentrations of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2) are within the prescribed standards at all the locations (Table 3.0).

Ambient Air quality at Coke plants around Umtyra-Nongsning

The PM10 concentrations in Coke plants around Umtyra-Nongsning ranged from a minimum of 316.7 µg/m^3 at M/S Ioanis Coke (P) Ltd. to a maximum of 390.8 µg/m^3 at M/S NE Coke (Table 2.0.B). The PM2.5 concentrations ranged from 217.6 µg/m^3 at M/S Khlieh Um Im Coke to a maximum of 235.77 µg/m^3 at M/S Kantalo Coke and M/S Mahajong Coke. High PM10 and PM2.5 concentrations may perhaps be attributed to emission from the respective coke plants, dust arising from movement of vehicles within the plant site, and the natural windblown dust. PM10 and PM2.5 concentrations at all the coke plants are above the prescribed limits. Concentrations of Sulphur Dioxide (SO_2), Nitrogen dioxide (NO_2) are within the prescribed standards at all the locations (Table 3.0).

Conclusion:

The findings revealed that the concentrations of Particulate Matter (PM10), Particulate Matter (PM2.5), Sulphur Dioxide (SO_2), and Nitrogen dioxide (NO_2) were found to be within the prescribed standards, in all the sampling locations except at the sampling locations at Sookilo, Moopala, Umtyra, and Nongrim Hills where the PM10 and PM2.5 concentration exceeds the prescribed standards. However, the PM10 and PM2.5 concentrations at all stations within the premises of the coke plants are above the prescribed standards.

Table 2.0.A: Ambient Air Quality data monitored at nearby villages in Sookilo-Latyrke-Tangnub area and Coke Plants (Consented) In East Jaintia Hills District

Sl. No.	Sampling Location	Date of Sampling	Parameters (24 hours avg.)				Meteorological Parameters							
			PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	Temp. (°C)		RH (%)		Wind speed (km/hr)		Wind direction	Weather condition
							Min	Max	Min	Max	Min	Max	Most prevailing	
1.	Sookilo	2.02.22	207.4	108.1	17.4	13.8	7.0	16.9	55.6	89.6	3.2	8.8	SW-NE	P. Cloudy
2.	Moopala	2.02.22	214.8	110.7	17.8	13.6	7.2	17.4	53.8	87.7	3.0	9.4	SW-NE	P. Cloudy
3.	Sutnga	2.02.22	68.4	38.2	13.7	10.1	7.1	17.2	52.4	84.3	2.9	9.7	SW-NE	Cloudy
4.	Mookympad	1.02.22	69.8	38.5	14.1	11.4	6.9	16.4	60.8	97.3	1.7	11.8	NW-SE	Cloudy
5.	Tluh	2.02.22	59.7	38.4	13.1	14.7	7.3	17.0	54.6	85.8	2.3	10.7	SW-NE	P. Cloudy
6.	Latyrke	1.02.22	62.4	37.8	13.7	10.6	6.5	16.1	59.4	90.8	2.2	11.2	SE-NW	Cloudy
7.	Moolamylliang	1.02.22	53.7	29.4	12.8	16.1	6.1	15.8	58.7	92.6	2.7	12.3	SE-NW	Cloudy
8.	Umpleng	2.02.22	93.6	47.8	14.1	11.7	7.2	17.3	50.3	87.4	3.4	10.1	SE-NW	P. Cloudy
9.	Lamyrsiang	3.02.22	89.4	44.6	14.2	12.6	7.8	17.5	49.8	80.6	2.9	10.4	SE-NW	P. Cloudy
10.	Lelad	3.02.22	74.8	42.6	13.1	13.7	7.6	17.9	51.1	79.8	2.0	9.8	SW-NE	P. Cloudy
11.	Tangnub	3.02.22	79.8	41.6	13.7	14.1	7.3	17.3	48.7	81.3	2.4	10.1	SW-NE	P. Cloudy
12.	Khliehriat	9.02.22	54.0	26.1	5.0	10.7	8.0	16.8	52.3	79.5	2.2	9.5	SE-NW	P. Cloudy
13.	Jaintia Coke, Sookilo	9.02.22	294.5	106.2	17.8	15.1	7.8	18.6	45.8	80.4	2.3	10.8	NW-SE	P. Cloudy
14.	M/S Syrpailang Coke Co.	9.02.22	325.7	113.7	18.4	17.0	7.3	18.3	50.3	81.3	2.1	9.9	NW-SE	Cloudy
15.	Meghalaya Coke, Umpleng	10.02.22	289.5	87.1	19.3	16.2	7.0	19.4	42.3	79.6	3.4	11.4	SW-NE	Cloudy
16.	North East Carbon, Liar Pynthor Shlep, Sutnga Elaka	10.02.22	192.2	84.9	15.9	18.3	7.2	19.1	46.9	77.4	3.0	11.2	SW-NE	Cloudy
17.	NM Fuels, Ingrain, Sutnga Elaka	11.02.22	309.3	99.6	17.0	17.8	7.5	18.4	49.6	80.6	2.0	9.7	SW-NE	Cloudy

Table 2.0.B: Ambient Air Quality data monitored at nearby villages in Umtyra-Nongsning areas and Coke Plants (Consented) In East Jaintia Hills District

Sl. No.	Sampling Location	Date of Sampling	Parameters (24 hours avg.)				Meteorological Parameters							
			PM10 (µg/m³)	PM2.5 (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)	Temp. (°C)		RH (%)		Wind speed (km/hr)		Wind direction	Weather condition
							Min	Max	Min	Max	Min	Max	Most prevailing	
1.	Umtyra village	28.02.22	108.1	79.1	26.1	11.2	11.4	22.0	62.0	70.4	2.6	7.8	SW-NE	Clear
2.	Kantalo Coke & Mahajong Coke	28.02.22	329.9	235.7	46.5	20.3	11.2	24.0	59.0	68.0	2.8	10.4	NW-SE	Clear
3.	Nongrim Hills village	28.02.22	138.8	97.8	36.6	13.2	10.8	23.4	51.6	69.4	2.1	8.4	NW-SE	Clear
4.	Nongsning village	28.02.22	62.5	32.8	16.9	10.2	11.1	23.5	52.0	66.0	2.7	6.9	SW-NE	Clear
5.	Khlieh Um Im Coke	01.03.22	344.2	217.6	45.1	25.4	10.4	23.2	52.0	70.0	2.1	8.4	NE-SW	Clear
6.	Ioannis Coke	01.03.22	316.7	228.5	40.8	21.3	11.0	23.0	52.0	67.0	2.0	4.8	SW-NE	Clear
7.	N.E. Coke Industry	01.03.22	390.8	234.0	40.1	26.4	11.3	24.6	52.0	70.0	2.1	7.4	SW-NE	Clear
Permissible Limits (24 hours avg.) : SO_2 : 80 µg/m³ ; NO2: 80 µg/m³ ; PM10: 100 µg/m³ ; PM2.5: 60 µg/m³ National Ambient Air Quality Standards (NAAQS) as per EPA Notification GSR 826(E),dated 16th Nov. 2009.														

Table 3.0: National Ambient Air Quality Standards (NAAQS)

NATIONAL AMBIENT AIR QUALITY STANDARDS				
Sl. No.	Pollutant	Time Weighted Average	* Concentration in Ambient Air	
			Industrial, Rural, and Other Areas	Ecologically Sensitive Areas (Notified by Central Government)
1.	Particulate Matter (PM10) ($\mu g/m^3$)	Annual	60	60
		24 hours	100	100
2.	Particulate Matter (PM10) ($\mu g/m^3$)	Annual	40	40
		24 hours	60	60
3.	Sulphur Dioxide (SO_2) ($\mu g/m^3$)	Annual	50	20
		24 hours	80	80
4.	Nitrogen Dioxide (NO_X) ($\mu g/m^3$)	Annual	40	30
		24 hours	80	80
* Permissible limits of Ambient Air Quality Standards as per EPA Notification GSR 826(E), dated New Delhi, the 16th Nov. 2009.				

5C: ASSESSMENT OF VEHICULAR POLLUTION

The Board has an Auto-emission-testing centre in its office premises at Lumpyngngad, Shillong which has been functioning since January 1994. The centre caters to the exhaust testing needs for the commercial and private light petrol and diesel driven vehicles only.

As per arrangement with the Office of the Commissioner of Transport, Meghalaya, the periodical renewals of permits of taxis are subject to submission of "Green Certificates" issued from the Office of the Board. The number of vehicles tested during the period from 01.04.21 to 31.03.22 is as stated below:-

Period	Type of Vehicle		Total No. of Vehicles Tested	Vehicles Complying To Emission Standards		Vehicles Non-Complying To Emission Standards	
				Nos.	%	Nos.	%
01.04.2021 to 31.03.2022	Petrol Driven	2 (two) wheelers	2563	2553	99.6	10	0.4
		3 (three) wheelers	2	2	100	Nil	-
		LMV	7065	7040	99.6	25	0.4
	Diesel Driven	LMV	1422	1412	99.3	10	0.7
		Medium/Heavy Vehicles	558	551	98.7	7	1.3

CHAPTER 6
WATER QUALITY MONITORING

6.1: MONITORING OF WATER QUALITY

The monitoring of the water quality is one of the functions for prevention and control of water pollution and maintaining or restoring the wholesomeness of water as enshrined in the Water (Prevention and Control of Pollution) Act 1974. In order to obtain information on the overall health and general environmental condition of the surface and ground water resources of the State, the Meghalaya State Pollution Control Board is monitoring the water quality of the selected water bodies in the State under National Water Monitoring Programme (NWMP) on regular basis. During the year 2021-2022 the monitoring network covers 36 rivers/streams, 4 lakes and 13 spring/well comprising a total of 84 sampling locations (67 nos. of surface water and 13 nos. of ground water and 4 lakes).The monitoring was done on monthly basis for surface and on half yearly basis for ground water. The regular parameters analyzed include pH, Conductivity, Turbidity, Total Suspended Solids, Total Dissolved Solids, Nitrite Nitrogen, Nitrate Nitrogen(NO3),AmmoniaNitrogen, KjeldahlNitrogen, Sulphate,Chloride, Hardness, Calcium, Magnesium, Sodium,Potassium, Total Phosphate Acidity, Alkalinity,Flouride, Dissolved Oxygen, Bio-Chemical Oxygen Demand, Chemical Oxygen Demand, Total Coliform, FaecalColiform. The metals viz. Iron, Zinc, Manganese, Copper, Lead, Cadmium, Chromium and Nickel were analyzed once a year in the month of April. The detail of the monitoring stations with regard to location was as mentioned in the Table 6.1

Table 6.1: Monitoring of Surface Water Quality in Meghalaya

SURFACE WATER			
District	**Name of Water Bodies**	**Locations of Sampling Station**	**Monitoring Frequency**
East Khasi Hills	Umkhrah River	Demthring Umkaliar, Shillong Mawlai Slaughter House Mawpdang, Mawlai	Monthly
	Umkhen River	Wahkdait Kshpongdeng Diengpasoh	
	Umshyrpi River	Risa Colony Law College, Dhankheti Umshyrpi Bridge	
	UmiamMawphlang River	Nongkrem Umtyngngar Mawphlang Shella	
	Umngot River	Smit Dawki	
	Ward's Lake	Shillong	
	Sderkariah River	Sohra (Cherrapunjee)	Monthly
	Laitryngew Stream	Laitryngew	
	Wah KhlekKhlek River	Saitsohpen	
	Wahrew River	Majai	

SURFACE WATER			
District	**Name of Water Bodies**	**Locations of Sampling Station**	**Monitoring Frequency**
West Khasi Hills	Nonbah River	Nongstoin,Market Phodsohsat	Monthly
	Kynshi River	Sohiong Nongkhnum	
	Wahblei River	Riangdo Shdaddkhar	
	Rwiang River	Rwiang	
South West Khasi Hills	Rilang River	Mawkyrwat	Monthly
	UmngiRiver	Jakrem Umpung	
	Kynshi River	Ranikor	
Ri – Bhoi	Umiam Lake	Outfall ofUmiam River into lake Middle Point Near United Christian College Exit Point	Monthly
	Umtrew River	Umran Byrnihat	
East Jaintia Hills	Lukha River	Lunar at Myndihati (Tributary of Lunar) Sunapur Khaddum	Monthly
	Thadlaskein Lake	Mukhla	
	Kyrhukhla River	Khliehriat	
	Kalipai River	Rymbai	
	Kme Um River	Rymbai	
	Waikhyrwi River	Mookhlot	
	Kwai River	Sutnga, Mawpun	
West Jaintia Hills	Myntdu River	Leshka Jowai MihMyntdu	Monthly
	Lamu River	Leshka	
	Lynriang River	Leshka	
	Myntang River	Nartiang Mynso	
	Umiurem River	Iale	Monthly
	Kupli River	Iooksi Khandong	
	Thlumuwi River	Thlumuwi	
East Garo Hills	Damring River (Krishnei)	Resubelpara	Monthly
	Manda (Dudhnai) River	Jampa Wagaisi	
	Tasek Lake	Songsak (Naphak)	
	Simsang River	Williamnagar	

SURFACE WATER			
District	**Name of Water Bodies**	**Locations of Sampling Station**	**Monitoring Frequency**
South Garo Hills	Bugi River	Mibanpara Dalu	Monthly
	Simsang River	Baghmara Nangalbibra	
	Nongal River	Nongal	
West Garo Hills	Ganol River	Tura Garobada	Monthly
	Damring River	Boldamgre	
GROUND WATER			
District	**Name of Water Bodies**	**Locations of Sampling Station**	**Monitoring Frequency**
East Khasi Hills	Police Bazar Spring	Shillong	Half Yearly
	Mawpdang Spring	Shillong	
	Wah U DkharSpring	Sohra	
	Deep Tube Well at Dongkamon	Nongmynsong, Shillong	
	Dug Well at Forest Colony	Polo, Shillong	
	Deep Tube Well at Last Stop	Laban, Shillong	
West Khasi Hills	Mawthadrishan Well	Markasa	Half Yearly
South West Khasi Hills	Jakrem Hot Spring	Jakrem	Half Yearly
Ri-Bhoi	NarbongWell	Byrnihat	Half Yearly
West Jaintia Hills	UmsahepSpring	Shangpung	Half Yearly
East Jaintia Hills	Borewell at Good Shephard Parish	Ladrymbai	Half Yearly
	Borewell at KhliehwahShasem- A	Khliehriat	Half Yearly
	Borewell at KhliehwahShasem- B		

6.2: Water Quality of the Sampling Stations in the Districts of Meghalaya

a) WATER QUALITY OF RIVERS IN EAST KHASI HILLS

21(Twenty One) sampling stations were located in East Khasi Hills. In all the monitored locations the pH was observed to be in the normal range of 6.5 to 8.5.The dissolved Oxygen was found to be very low in Umkhrah and Umshyrpi Rivers with the minimum value of 0.7mg/l recorded at Umshyrpi River (Law College) and 0.5mg/l Umkhrah River (Slaughter house) during the dry months of March., whereas its concentration in other rivers was always above 5mg/l, which was the minimum oxygen requirement for propagation of wildlife fisheries etc. The Bio-chemical Oxygen Demand was observed to be above 3mg/latUmkhrah and Umshyrpi Rivers. The total coliform count was observed to be above 5000mpn/100ml in Umkhrah and Umshyrpi Rivers. The monitoring

results indicated that organic and Bacteria were the main pollutants in the water bodies. This was mainly due to direct discharge of waste water in an untreated form from the residential and commercial centers. The amount of waste received by the two rivers viz. Umkhrah and UmshyrpiRiverswas much beyond their assimilative capacity and thus has deteriorated the water quality to the extent that the water of these two rivers cannot be put to any beneficial uses. The water quality of Ward's Lake, meets the criteria for propagation of wildlife and fisheries. The water quality of other water bodies was observed to be satisfactory.

b) WATER QUALITY OF RIVERS IN WEST KHASI HILLS& SOUTH WEST KHASI HILLS

7(Seven) sampling stations were located in West Khasi Hills and 4 (Four) Sampling were Located in South West Khasi Hills. In all the monitored locations the pH was observed to be in the normal range of 6.5to 8.5. The Dissolved Oxygen content in all monitored rivers was always above 5.0mg/l, which was the minimum oxygen requirement for propagation of wildlife fisheries etc. The water quality of the monitored water bodies was observed to be satisfactory.

c) WATER QUALITY OF RIVERS IN RI-BHOI

A Total of 7(Seven) sampling stations were located in Ri-Bhoi. In all the monitored locations the pH was observed to be in the normal range of 6.5to 8.5. The dissolved Oxygen content in all the stations was found to be above 5mg/l, which was the minimum oxygen requirement for propagation of wildlife fisheries etc. The Bio-chemical Oxygen Demand was observed to be above 3mg/l in Umiam Lake. The total Coliform count in this water body was also observed to be high. The Umiam Lake received the waste that was generated in the Shillong city through the two rivers viz. Umkhrah and Umshyrpi Rivers .The water of Umiam Lake can be used for propagation of wildlife & fisheries, and irrigation purposes. The water quality of other water bodies was found to be satisfactory.

d) WATER QUALITY OF RIVERS IN EAST & WEST JAINTIA HILLS

A total of 20(Twenty) sampling stations were located in JaintiaHills,of which 9(Nine)sampling stationswere located at East Jaintia Hills and 11(Eleven) sampling stations were located at West Jaintia Hills. The pH in (i)MyntduRiver at Leshka (ii) Lunar River at Myndihati (iii) KyrhukhlaRiver at Khliehriat (iv) Kalipai River at Rymbai (v) Kme Um at Rymbai(vi) Waikhyrwi at Mookhlot (vii)Kwai River at Sutnga (viii) Lynriang River at Leshka (ix) UmiurematIale(x)Kupli River at Iooksi and Khangdong (xi) Thlumuwi River at Thlumuwiwas observed to be very low, and the minimum value of 2.2 was recorded at KwaiRiver,Sutnga Mawpun during the dry months of January. The dissolved Oxygen in all monitored rivers was always above 5mg/l, which was the minimum oxygen requirement for propagation of wildlife fisheries etc.The water quality of other water bodies was found to be satisfactory.

e) WATER QUALITY OF RIVERS IN GARO HILLS

13(Thirteen) sampling stations were located in Garo Hills. In all the monitored locations the pH was observed to be in the normal range of 6.5 to 8.5 except in Nongal River where the average pH was 4.2. The dissolved Oxygen content in all themonitoring stations was found to be above 5mg/l, which was the minimum oxygen requirement for propagation of wildlife fisheries etc. The Bio-chemical Oxygen Demand was observed to be below 3mg/l in all the monitored water bodies. The water quality of other water bodies was found to be satisfactory.

WATER SAMPLING DURING 2021

Table 6.2(a): Classification of Water bodies in the State in term of the Primary Water Quality Criteria for various uses of fresh water specified by Control Pollution Board

USE CLASS	SL. NO.	NAME OF RIVER/ LAKE	STRETCHES	DISTRICT
(A) Drinking water source without conventional treatment but after disinfection	1.	Rilang River	Mawkyrwat (upstream)	South West Khasi Hills
	2.	Umngi River	Jakrem-Umpung (upstream)	South West Khasi Hills
(B) Organised outdoor bathing including drinking water source with conventional treatment followed by disinfection	1.	Umkren River	Wahkdait-Kseh Pongdeng- Diengpasoh	East Khasi Hills
	2.	Umshyrpi River	Risa Colony (Upstream)	East Khasi Hills
	3.	UmiamMawphlang River	Nongkrem – Shella	East Khasi Hills
	4.	Umngot River	Smit- Dawki	East Khasi Hills
	5.	Wah KhlekKhlek	Saitsohpen (Upstream)	East Khasi Hills
	6.	Wah Rew	Majai (Upstream)	East Khasi Hills
	7.	Nonbah River	Phodsohsat (Upstream)	West Khasi Hills
	8.	Kynshi River	Sohiong – Ranikor	West Khasi Hills
	9.	Wahblei River	Riangdo – SdadDkhar	West Khasi Hills
	10.	Rwiang River	Rwiang (Upstream)	West Khasi Hills
	11.	Umtrew River	Umran (Upstream)	Ri-Bhoi
	12.	Lukha River	Khadum- Sonapur	East Jaintia Hills
	13.	Myntang River	Nartiang – Mynso	West Jaintia Hills
	14.	Myntdu River	Jowai – Mihmyntdu	West Jaintia Hills
	15.	Lamu River	Lashka (Upstream)	West Jaintia Hills
	16.	Thadlaskein River	Mukhla	West Jaintia Hills
	17.	Damsing River (Krishei)	Resubelpara (Upstream)	North Garo Hills
	18.	Manda (Dudnai) River	Wagasi – Jampa	East Garo Hills
	19.	Simsang River	William Nagar – Baghmara	East Garo Hills – South Garo Hills
	20.	Ganol River	Tura – Garobada	West Garo Hills
	21.	Danrung River	Boldamgre (Upstream)	West Garo Hills
	22.	Tasek Lake	Songsak (Naphak)	East Garo Hills
(C) Drinking Water source with conventional treatment followed by disinfection	1.	Umtrew River	Byrnihat (Up & Down stream)	Ri- Bhoi
	2	Nonbah River	NongstoinMarhet (downstream)	West Khasi Hills
(D) Propagation of Wildlife, Fisheries	1	Ward's Lake, Shillong	Whole Lake	East Khasi Hills
	2	Umiam Lake	Whole Lake	Ri-Bhoi
(E) Irrigation, Industrial Cooling and Controlled Waste Disposal	1	Umkhrah River	Whole Stretch	East Khasi Hills
	2	Umshyrpi River	Dhanketi (downstream)	East Khasi Hills

Table 6.2(b): Water Bodies in the State that cannot be classified for various use due to low PH value

Sl. No.	Name of Water Bodies (River/ Lakes)	Stretches	District
1.	Sderkariah River	Sohra (Cherrapunjee)	East Khasi Hills
2.	Laitryngew Stream	Laitryngew	East Khasi Hills
3.	Kyrhuhkhla River	Khliehriat	East Jaintia Hills
4.	Kalipai River	Rymbai	East Jaintia Hills
5.	Kmai Um River	Rymbai	East Jaintia Hills
6.	Waikhyrwi River	Mookhlot	East Jaintia Hills
7.	Kwai River	Sutnga- Mawpun	East Jaintia Hills
8.	Lynriang River	Leshka	East Jaintia Hills
9.	Myntdu River	Leshka	West Jaintia Hills
10.	Umiurem River	Iale	West Jaintia Hills
11.	Kupli River	Iooksi-Khangdong	West Jaintia Hills
12.	Thlumuwi River	Thlumuwi	West Jaintia Hills
13.	Lynriang River	Leshka	West Jaintia Hills
14.	Nongal River	Nongal	South Garo Hills

6.3: Ground Water Quality

A total of 13 (Thirteen) ground water located all over the State was monitored on half-yearly basis. The water of all the monitored sources was used for different purposes. The pH level at hot spring Jakrem was recorded to be high which was probably due to increase solubility of salts in hot water. Flouride concentration was also recorded to be high at this hot spring which is the characteristic of any hot spring.

Table 6.3: Ground Water Quality in Meghalaya

District	Name of Rivers	Locations	Year	pH	Conductivity	Turbidity	Flouride	Iron	Total Coliform
East Khasi Hills	Dreamland Spring	Police Bazar, Shillong	2021	6.1	242.0	1.5	0.06	0.10	35
	Mawpdang Spring	Mawlai		6.0	272.0	1.4	0.06	0.11	<1.8
	Nongmynsong, Dongkamon DTW	Nongmynsong		6.8	92.0	1.3	0.05	0.13	19
	Laban Last Stop DTW	Laban		5.6	61.0	0.9	0.05	0.10	9
	Forest Colony DTW	Polo		6.6	146.0	1.1	0.06	0.14	112
	Wah-U-Dkhar	Sohra		5.5	110	1.6	0.06	0.13	<1.8

District	Name of Rivers	Locations	Year	pH	Conductivity	Turbidity	Flouride	Iron	Total Coliform
Ri - Bhoi	Narbong Well	Byrnihat	2021	6.5	158.0	1.5	0.05	0.11	10
Jaintia Hills	Umsahep Hot Spring	Shangpung		5.6	141.0	1.9	0.06	0.12	<1.8
West Khasi Hills	Mawthadrishan Well	Markasa		6.6	52.0	1.9	0.05	0.13	8
South West Khasi Hills	Jakrem, Hot Spring	Jakrem		9.2	313.0	1.9	22.0	0.17	<1.8
East Jaintia Hills	Borewell at Good Shephard Parish in Lad Rymbai	Khliehriat		6.7	194.0	1.4	0.06	0.17	<1.8
	Borewell at Khliehwah-Shasem-A in Khliehriat	Khliehriat		5.3	131.0	2.1	0.05	0.3	<1.8
	Borewell at Khliehwah-Shasem-B in Khliehriat	Khliehriat		5.7	87.0	2.8	0.06	0.3	<1.8

6.4: Water Quality Monitoring during Idol Immersion

The Meghalaya State Pollution Control Board, Shillong, conducted water quality monitoring before and after puja festival of three immersion ghats in the state viz. (i)Polo immersion site, Shillong, located along the riverUmkhrah (ii) Babupara immersion site, Tura, located along the Babupara-Rongkhon River and (iii) SyntuKsiar (Lynterarchaka) immersion site, Jowai, located along the river Myntdu. The monitoring was conducted in order to assess the environmental impact due to such immersion.From the analysis data **(Table 1, Table 2 & Table 3)**, it was observed that there was no significant changes in the concentration of parameters analysed during the three phases of monitoring at the monitored water bodies so as to characterize any alteration in their characteristics as a result of immersion of idols into the water systems

TABLE 1: WATER QUALITY DATA OF RIVER WAH UMKHRAH DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

	Site I (100m Upstream of Immersion Ghat)						Site II (Site of Immersion Ghat)						Site III (100 m downstream of Immersion Ghat)					
	Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion		
⇨ Date of Sampling	12.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	22.10.2021 (7th)	24.10.2021 (9th)	12.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	22.10.2021 (7th)	24.10.2021 (9th)	12.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	22.10.2021 (7th)	24.10.2021 (9th)
Time	12:30	3:50	1:05	1:00	2:05	1:10	12:45	4:40	1:20	1:20	2:20	1:15	12:55	4:20	1:30	1:35	2:50	1:35
Weather	Clear	Cloudy	Clear	Raining	Clear	Cloudy	Clear	Cloudy	Clear	Raining	Clear	Cloudy	Clear	Cloudy	Clear	Raining	Clear	Cloudy
Colour	Clear	Brown	Clear	Brown	Clear	Clear	Clear	Brown	Clear	Brown	Clear	Clear	Clear	Brown	Clear	Brown	Clear	Clear
Temperature (°C)	15.0	14.0	15.0	15.0	15.0	15.0	15.0	14.	15.0	15.0	15.0	15.0	15.0	14.0	15.0	15.0	15.0	15.0
pH	7.0	7.1	7.0	7.1	7.2	7.2	7.1	7.1	7.1	7.0	7.2	7.3	7.0	7.2	7.1	7.1	7.1	7.3
Conductivity µS/cm	267.0	228.0	277.0	246.0	256.0	267.0	286.0	247.0	292.0	248.0	272.0	282.0	289.0	244.0	298.0	247.0	268.0	280.0
Total Hardness mg/L	78.0	70.0	70.0	74.0	76.0	82.0	80.0	84.0	82.0	82.0	88.0	86.0	80.0	76.0	82.0	82.0	86.0	84.0
Alkalinity mg/L	52.0	64.0	50.0	56.0	50.0	44.0	58.0	58.0	56.0	46.0	54.0	48.0	56.0	66.0	56.0	52.0	52.0	46.0
Dissolved Oxygen mg/L	2.0	2.8	3.4	2.8	3.2	1.9	1.2	2.8	2.2	2.9	1.4	2.6	2.0	2.2	2.4	2.2	2.6	1.8
BOD (mg/L)	34.0	28.0	20.0	25.0	18.0	33.0	42.0	24.0	32.0	27.0	35.0	26.0	32.0	28.0	29.0	30.0	25.0	34.0
COD (mg/L)	70.0	43.0	40.0	60.0	30.0	60.0	80.0	50.0	51.0	50.0	50.0	50.0	60.0	55.0	50.0	70.0	50.0	70.0
Turbidity (NTU)	6.9	12.5	6.5	9.0	10.6	10.9	5.2	17.5	6.9	10.5	9.8	11.7	5.5	13.9	6.0	8.7	9.5	8.8
Total Dissolved Solids mg/L	184.0	157.0	191.0	170.0	177.0	184.0	197.0	170.0	201.0	171.0	188.0	194.0	199.0	168.0	206.0	170.0	185.0	193.0
Total Suspended Solids mg/L	14.0	20.0	14.0	13.0	16.0	18.0	12.0	22.0	18.0	17.0	18.0	22.0	10.0	16.0	11.0	20.0	17.0	16.0

TABLE 1: WATER QUALITY DATA OF RIVER WAH UMKHRAH DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

	Site I (100m Upstream of Immersion Ghat)						Site II (Site of Immersion Ghat)						Site III (100 m downstream of Immersion Ghat)					
	Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion		
Chromium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lead mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc mg/L	0.03	0.01	0.02	0.07	0.06	0.02	BDL	0.02	0.04	0.06	0.04	0.05	0.01	0.08	0.08	0.03	0.03	BDL
Copper mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mercury mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Antimony mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Barium mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cobalt mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Manganese mg/L	0.11	0.06	0.09	0.05	0.07	0.10	0.04	0.08	0.16	0.05	0.12	0.11	0.10	0.15	0.08	0.11	0.06	0.09
Strontium mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 2: WATER QUALITY DATA OF RIVER MYNTDU DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

	Site I (100m Upstream of Immersion Ghat)						Site II (Site of Immersion Ghat)						Site III (100 m downstream of Immersion Ghat)					
	Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion		
⇨ Date of Sampling	20.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	22.10.2021 (7th)	24.10.2021 (9th)	20.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	22.10.2021 (7th)	24.10.2021 (9th)	20.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	21.10.2021 (7th)	24.10.2021 (9th)
Time	1:10	3:15	1:10	1:40	1:05	1:10	1:15	3:32	1:25	1:54	1:20	1:25	1:50	3:50	1:36	2:05	1:45	1:40
Weather	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy
Colour	Clear	Brown	Clear	Clear	Clear	Clear	Clear	Brown	Clear	Clear	Clear	Clear	Clear	Brown	Clear	Clear	Clear	Clear
Temperature (°C)	14.0	21.0	20.9	20.3	20.4	20.1	14.0	20.7	20.1	20.1	20.5	20.3	14.0	20.9	21.0	20.2	20.4	20.5
pH	7.4	7.3	7.1	7.3	7.2	7.1	7.2	7.3	7.2	7.2	7.3	7.3	7.1	7.4	7.3	7.2	7.2	7.2
Chloride mg/L	7.0	8.0	10.0	10.0	10.0	10.0	9.0	8.0	11.0	9.0	10.0	10.0	9.0	8.0	10.0	10.0	8.0	8.0
Total Hardness mg/L	20.0	30.0	36.0	26.0	20.0	20.0	22.0	34.0	30.0	22.0	22.0	24.0	22.0	26.0	24.0	30.0	20.0	22.0
Alkalinity mg/L	14.0	12.0	22.0	24.0	20.0	18.0	14.0	14.0	20.0	18.0	20.0	20.0	14.0	14.0	20.0	18.0	18.0	16.0
Conductivity µS/cm	40.0	41.0	38.0	38.0	35.0	41.0	38.0	46.0	37.0	39.0	37.0	43.0	37.0	43.0	35.0	37.0	38.0	45.0
Dissolved Oxygen mg/L	6.3	6.5	6.7	6.9	7.2	7.2	7.6	6.2	7.0	7.0	7.1	7.7	6.7	6.3	7.6	7.0	7.1	7.8
BOD (mg/L)	2.0	1.9	1.9	1.8	1.5	1.6	1.6	2.0	1.8	1.7	1.7	1.5	1.8	2.0	1.5	1.5	1.9	2.0
COD (mg/L)	8.0	5.0	6.0	6.0	5.0	7.0	5.0	9.0	5.0	6.0	6.0	6.0	5.0	8.0	5.0	4.0	7.0	8.0
Turbidity (NTU)	3.0	3.5	2.9	4.5	3.3	2.9	2.7	7.2	2.5	4.8	3.0	2.8	2.5	5.5	2.7	3.9	2.8	3.3
Total Dissolved Solids mg/L	29.0	32.0	26.0	26.0	24.0	28.0	24.0	28.0	25.0	27.0	25.0	30.0	25.0	24.0	24.0	25.0	26.0	31.0
Total Suspended Solids mg/L	9.0	7.0	9.0	10.0	8.0	6.0	8.0	13.0	7.0	13.0	7.0	5.0	5.0	12.0	6.0	18.0	6.0	8.0
Chromium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 2: WATER QUALITY DATA OF RIVER MYNTDU DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

	Site I (100m Upstream of Immersion Ghat)						Site II (Site of Immersion Ghat)						Site III (100 m downstream of Immersion Ghat)					
	Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion		
Lead mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc mg/L	BDL	BDL	BDL	0.05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Copper mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mercury mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Antimony mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Barium mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cobalt mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Manganese mg/L	0.05	0.05	0.03	0.03	BDL	BDL	0.06	0.02	0.03	0.05	BDL	BDL	0.09	0.03	0.03	0.05	BDL	BDL
Strontium mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 3: WATER QUALITY DATA OF RIVER BABUPARA-RONGKHON DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

	Site I (100m Upstream of Immersion Ghat)						Site II (Site of Immersion Ghat)						Site III (100 m downstream of Immersion Ghat)					
	Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion		
⟹ Date of Sampling	12.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	22.10.2021 (7th)	24.10.2021 (9th)	12.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	22.10.2021 (7th)	24.10.2021 (9th)	12.10.2021	15.10.2021	18.10.2021	20.10.2021 (5th)	22.10.2021 (7th)	24.10.2021 (9th)
Time	11:00	6:00	10:00	9:30	10:30	9:15	11:15	6:15	10:15	9:45	10:00	9:45	4:30	6:30	10:30	10:00	11:00	10:00
Weather	P. Clear	P. Cloudy	P. Rainy	P. Rainy	P. Clear	P. Cloudy	P. Clear	P. Cloudy	P. Rainy	Raining	P. Clear	P. Cloudy	P. Clear	P. Cloudy	P. Rainy	Raining	P. Clear	P. Cloudy
Colour	Clear	Clear	Brownish	Brownish	Clear	Clear	Brownish	Brownish	Brownish	Clear	Clear	Clear	Clear	Brownish	Brownish	Brownish	Clear	Clear
Temperature (°C)	26.4	26.1	26.2	24.6	26.4	25.9	26.4	26.1	26.2	24.6	24.6	25.9	26.4	26.1	26.2	24.6	26.4	25.9
pH	7.0	7.2	7.3	7.2	7.3	7.2	7.1	6.9	7.1	7.3	7.3	7.2	6.9	6.8	7.1	7.3	7.2	7.3
Conductivity µS/cm	92.0	99.0	99.0	93.0	88.0	92.0	96.0	125.0	101.0	88.0	95.0	95.0	98.0	141.0	100.0	92.0	93.0	96.0
Chloride mg/L	9.0	9.0	10.0	10.0	10.0	12.0	11.0	10.0	11.0	9.0	12.0	14.0	8.0	14.0	12.0	9.0	10.0	16.0
Total Hardness mg/L	50.0	40.0	46.0	46.0	42.0	40.0	42.0	42.0	46.0	44.0	46.0	44.0	44.0	50.0	44.0	46.0	44.0	46.0
Alkalinity mg/L	36.0	38.0	38.0	38.0	30.0	32.0	42.0	38.0	38.0	36.0	32.0	30.0	38.0	56.0	38.0	38.0	30.0	32.0
Dissolved Oxygen mg/L	7.3	7.1	6.0	7.1	7.8	8.0	7.4	6.9	6.6	7.0	8.0	8.0	7.2	6.9	7.2	7.2	8.0	7.9
BOD (mg/L)	1.6	1.7	2.0	1.7	1.5	1.2	1.7	1.8	1.8	1.8	1.3	1.3	1.7	1.8	1.6	1.5	1.4	1.4
COD (mg/L)	4.0	5.0	6.0	5.0	4.0	4.0	5.0	7.0	5.0	6.0	8.0	4.0	4.0	8.0	4.0	4.0	8.0	5.0
Turbidity (NTU)	3.5	4.5	4.5	5.5	5.0	4.4	3.7	13.8	5.5	4.9	4.3	3.9	3.7	10.2	5.0	5.0	4.7	4.9
Total Dissolved Solids mg/L	63.0	68.0	68.0	34.0	61.0	63.0	96.0	88.0	69.0	61.0	65.0	65.0	98.0	97.0	69.0	63.0	64.0	66.0
Total Suspended Solids mg/L	9.0	10.0	10.0	13.0	11.0	11.0	11.0	18.0	13.0	11.0	9.0	9.0	10.0	14.0	11.0	12.0	10.0	12.0
Chromium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 3: WATER QUALITY DATA OF RIVER BABUPARA-RONGKHON DURING PRE-IMMERSSION, IMMERSION & POST-IMMERSION DAY, KALI PUJA FESTIVAL 2021

	Site I (100m Upstream of Immersion Ghat)						Site II (Site of Immersion Ghat)						Site III (100 m downstream of Immersion Ghat)					
	Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion			Pre-Immersion Day	Immersion Day	Post Immersion	Post Immersion		
Lead mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc mg/L	BDL	BDL	0.02	BDL	BDL	BDL	0.01	BDL	0.02	BDL	BDL	BDL	BDL	0.03	BDL	BDL	BDL	BDL
Copper mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cadmium mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mercury mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Antimony mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Barium mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cobalt mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Manganese mg/L	0.03	BDL	BDL				BDL	0.26	BDL				BDL	0.09	BDL			
Strontium mg/L	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

6.1.4 : Water Quality Monitoring under Board's Programme.

The Board also carried out the monitoring of the water quality of other water water bodies in the state which were used for different purpose and subjecjected to different types of pollution. Based on the monitoring the following report were published by the Board.

(1) Inspection Report on the compliant against " Encrochment of Assam Regimant Centre at Umkhrah River, Madanriting, Thembasuk, Shillong and illegal construction of retaining guard wall"

6.5: Monitoring of water bodies on account of NGT order

A total of 24 samples were collected and analyzed from the water bodies located in coal mining areas

6.6: Industrial Monitoring

The Meghalaya State Pollution Control Board also carried out the monitoring of effluent/waste water generated from the industrial units, operating in the State. A total of 50(Fifty) such samples were collected and analysed during the year.

6.7: Monitoring of Springs,Streams and Leachates in Municipal dumping ground

The Meghalaya State Pollution Control Board also carried out the monitoring of Leachates, Springs and Stream in and around dumping Sites of the State. A total of 4 (four) samples were collected and analysed during the year.

6.8: Analysis of water bodies received from Government Departments, Private Agencies and Public

In addition to the regular programme the Board was also engaged in analyzing water samples received from Government Departments, Private Agencies and Public. A total of 370 samples were analyzed during the year.

CHAPTER 7
NOISE LEVEL MONITORING

7. 1:NOISE LEVEL MONITORING DURING CHRISTMAS & NEW YEAR FESTIVAL 2021

The Meghalaya State Pollution Control Board, Shillong, conducted Ambient Noise Level monitoring during Christmas and New Year festival on the 24th to 25th December, 2021, and the 31st December 2021 to1st January 2022 respectively.

Shillong, the selected city for conducting the ambient noise level and air quality survey during the two festive periods is Meghalaya's largest and most populous city as well as its capital and therefore has the largest number of people celebrating both festivals.

The location selected is:

Police Bazar (Meghalaya Legislative Assembly office's premises), a commercial area.

The monitoring team was equipped with Envirotech SLM 109 sound level meter. The noise levels were measured in dB (A) i.e. the level of sound in decibels on scale – A as per the human ear sensitivity requirements. The result was expressed in Lmin, Lmax and Leq, wherein Lmin indicates the minimum value of the sound level in decibels and Lmax the maximum value of sound level in decibels occurring during the single event and Leq denotes the A weighted energy mean of the noise level averaged over the measurement period. The noise level was monitored for continuous 6 hours duration i.e. from 19:00 hours (7:00 P.M.) to 01:00 hours (1:00 A.M.) where Lmin, Lmax and Leq readings were recorded for every hourly interval.

Map showing the monitoring location in Shillong city

Police Bazar: This location is a commercial area and the major shopping and business area of the city. People from all over the city as well as the state and even tourists from outside the state and country frequent here for their business and shopping activities. The main noise sources here are vehicular traffic, and noise caused by pedestrians, shoppers and other business activities. During Christmas and New Year, residents and visitors including tourists visit this place to celebrate these festivals with enthusiasm and therefore the location is a suitable site for the above study.

Observations/Interpretation of noise data/results:

Table 1

Location: Police Bazar	Christmas festival period (24.12.2021 to 25.12.2021)			New Year festival period (31.12.2021 to 01.01.2022)		
Time duration	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
19:00 to 20:00 Hr.	58.8	81.8	62.9	59.4	80.5	63.6
20:00 to 21:00 Hr.	51.3	87.9	64.1	57.4	78.2	62.2
21:00 to 22:00 Hr.	58.2	97.2	65.5	54.2	73.5	65.7
22:00 to 23:00 Hr.	53.6	84.8	64.8	55.5	77.4	63.2
23:00 to 24:00 Hr.	53.2	88.0	63.4	53.4	75.2	62.4
24:00 to 01:00 Hr.	58.3	89.3	62.8	52.1	74.2	61.5

It is observed from Table 1 above that the noise level on 24th - 25th December, 2021, is within the day time standard limit of 65.0 dB (A) Leq (for a commercial area) from the time duration of 19:00 Hrs.(7:00 pm) to 21:00 Hrs.(9:00 pm) while it is slightly above the same standard from 21:00 Hrs.(9:00 pm) to 22:00 Hrs.(10:00 pm). During night time, the noise level from 22:00 Hrs. (10:00 pm) to 01:00 Hrs. (1:00 am) is above the night time standard of 55.0 dB (A) Leq. The higher level of noise monitored is mainly due to musical celebrations at Police Bazar junction and not due to firecrackers.

From 31st December, 2021, to 1st January, 2022, it is observed that the noise level from 19:00 Hrs. (7:00 pm) to 21:00 Hrs. (9:00 pm) is within the day time noise level standard of 65.0 dB (A) Leq (for a commercial area) while it exceeds the same standard from 21:00 Hrs. (9:00 pm) to 22:00 Hrs. (10:00 pm). During night time, it is observed that the level exceeds the ambient noise level standards of 55.0 dB (A) Leq (for a commercial area) for all time intervals from 22:00 Hrs.(10:00 pm) to 01:00 Hrs. (01:00 am).Againthe higher level of noise monitored is due to musical celebrations at Police Bazar junction and not due to firecrackers.

From the findings of the study above, it is observed that the ambient noise levels are on the higher side during Christmas as well as New Year festival celebrations especially during the night time. The noise, as mentioned, is due to musical events and celebrations on the respective occasions and not due to the bursting of firecrackers.

7.2: AMBIENT NOISE LEVEL MONITORING DURING DIWALI FESTIVAL 2021

The Meghalaya State Pollution Control Board, Shillong, conducted the Ambient Noise Level monitoring during pre-Deepawali (29th October, 2021) and Deepawali day (4th November, 2022) in pursuance to the interim directions of the Honourable Supreme Court and the Central Pollution Control Board.

The city of Shillong was selected for conducting the ambient noise level and air quality survey during the festive occasion as it is Meghalaya's largest city as well as its capital and has a sizeable population celebrating the festival. Byrnihat, located in the district of Ri Bhoi, was selected as it has been categorized as a non-attainment town.

The three locations selected within Shillong are:

(i) Lumpyngngad (Location A – Meghalaya State Pollution Control Board's premises), a residential area.

(ii) Police Bazar (Location B – Meghalaya Legislative Assembly office's premises), a commercial area

(iii) Lawmali (Location C – Ganesh Das Hospital's premises), a silence zone.

The monitoring team was equipped with Envirotech SLM 109 and Casella Sound level meters. The noise levels were measured in dB(A) i.e. the level of sound in decibels on scale – A as per the human ear sensitivity requirements. The result was expressed in Lmin, Lmax and Leq, wherein Lmin indicates the minimum value of the sound level in decibels and Lmax the maximum value of sound level in decibels occurring during the single event and Leq denotes the A weighted energy mean of the noise level averaged over the measurement period. The noise level was monitored for continuous 6 hours duration i.e. from 18:00 Hours (6:00 pm) to 24:00 Hours (12:00 midnight) where Lmin, Lmax and Leq readings were recorded for every hourly interval.

Map showing the monitoring locations in Shillong city
INDEX: - Sampling Locations

△

(i) Location A – Lumpyngngad: Lumpyngngad is a residential area located in the outskirts of the city. Being a purely residential area, this location is basically a quiet place. There are no commercial complexes here and the main noise sources are vehicular traffic and construction activity. There are a good number of residents celebrating the Diwali festival in this area and noise study on a normal day and on the occasion would give a good comparison on the noise scenario prior to and during the festival period.

(ii) Location B - Police Bazar: This location is a commercial area and the major shopping and business area of the city. People from all over the city as well as the state and even tourists from outside the state and country frequent here for their business and shopping activities. The main noise sources here are vehicular traffic and noise caused by pedestrians, shoppers and other business activities. The shop owners and residents of this area celebrate the Diwali festival with much pomp and enthusiasm and therefore the location is suitable for the undergoing noise study.

(iii) Location C - Lawmali: This station is located in the premises of the Ganesh Das Hospital, which is categorized as a silence zone. It is a Government hospital and one of the biggest in the city. The place is close to Polo and Jail Road, localities that have sizeable residents celebrating Diwali. Therefore it is a suitable location for the undergoing noise study.

Observations/Interpretations:

Table A

LUMPYNGNGAD						
Location : A	Pre-Diwali Day (29.10.2021)			Diwali Day (04.11.2021)		
Time duration	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
18:00 to 19:00 Hr.	33.4	71.5	45.1	34.8	85.7	56.0
19:00 to 20:00 Hr.	33.7	63.4	40.8	49.3	93.3	64.5
20:00 to 21:00 Hr.	34.2	63.1	40.2	48.9	95.0	63.9
21:00 to 22:00 Hr.	34.1	62.4	39.6	49.7	100.0	66.1
22:00 to 23:00 Hr.	34.7	61.4	37.7	49.0	90.5	64.6
23:00 to 24:00 Hr.	34.8	64.8	36.4	48.7	92.0	60.5

Table B

POLICE BAZAR						
Location : B	Pre-Diwali Day (29.10.2021)			Diwali Day (04.11.2021)		
Time duration	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
18:00 to 19:00 Hr.	58.8	78.7	69.5	58.0	88.1	67.6
19:00 to 20:00 Hr.	66.1	82.0	66.1	58.9	86.8	67.5
20:00 to 21:00 Hr.	68.7	83.3	68.7	59.0	92.4	71.0
21:00 to 22:00 Hr.	53.2	67.2	56.8	59.5	84.6	65.0
22:00 to 23:00 Hr.	52.9	62.4	55.6	54.4	98.3	81.0
23:00 to 24:00 Hr.	52.6	63.6	55.0	53.8	84.7	67.3

Table C

LAWMALI						
Location : C	Pre-Diwali Day (29.10.2021)			Diwali Day (04.11.2021)		
Time duration	Lmin	Lmax	Leq dB(A)	Lmin	Lmax	Leq dB(A)
18:00 to 19:00 Hr.	40.2	76.7	54.4	40.2	81.6	53.5
19:00 to 20:00 Hr.	40.1	71.9	52.2	42.3	102.4	59.2
20:00 to 21:00 Hr.	38.4	74.4	52.6	42.9	92.9	60.3
21:00 to 22:00 Hr.	37.1	66.0	48.6	43.2	113.0	63.4
22:00 to 23:00 Hr.	38.0	75.3	50.8	41.2	84.6	63.5
23:00 to 24:00 Hr.	37.2	75.8	50.5	35.8	74.7	54.0

1. Location A – Lumpyngngad (Meghalaya State Pollution Control Board's office premises)

It is observed from the Table A (Location A - Lumpyngngad) that, on 28th October, 2021 (i.e. pre-Diwali day), the monitored ambient noise level from 18:00 Hrs. (6:00 pm) to 22:00 Hrs. (10:00 pm) is well within the ambient noise level standard (for Residential Area) of 55.0 dB(A) Leq for day time while the night time noise level from 22:00 Hrs. (10:00 pm) to 24:00 Hrs. (12:00 midnight) is also within the (night time) ambient noise level standard of 45.0 dB(A) Leq.

On 4th November, 2021 (i.e. Diwali day), however, it is observed that there is an overall increase in the ambient noise level at the location where the average equivalent noise level (Leq) is found to be above the daytime ambient noise standard of 55.0 dB(A) Leq throughout the time duration from 18:00 Hrs. (6:00 pm) to 22:00 Hrs. (10:00 pm). During the night time too, the levels measured were found to be above the standard of 45.0 dB(A) Leq during both monitored hourly intervals from 22:00 Hrs. (10:00 pm) to 23:00 Hrs. (11:00 pm) and 23:00 Hrs. (11:00 pm) to 24:00 Hrs. (12:00 midnight).

2. Location B - Police Bazar (Office of the Meghalaya Legislative Assembly's premises)

It is observed from Table B (Location B - Police Bazar) that the noise level on 28th October, 2021 (i.e. pre-Diwali day), is above the standard limit of 65.0 dB (A) Leq for day time (for a Commercial Area) from 18:00 Hrs. (6:00 pm) to 22:00 Hrs.(10:00 pm). It is above the night time ambient noise level standard of 55.0 dB(A) Leq from 22:00 Hrs. (10:00 pm) to 23:00 Hrs.(11:00 pm) and within the same standard limit from 23:00 Hrs. (11:00 pm) to 24:00 Hrs.(12:00 midnight).

On 4th of November, 2021 (i.e. Diwali day), it is observed that there is an increase in the noise level after 19:00 Hrs. (7:00 pm). Here we see that the noise level exceeds the mentioned day time noise standard limit during the timing from 19:00 Hrs.(7:00 pm) to 22:00 Hrs.(10:00 pm), while the night time noise level standard of 55.0 dB (A) Leq is exceeded during the night time intervals from 22:00 Hrs.(10:00 pm) to 24:00 Hrs.(12:00 midnight).

3. Location C - Lawmali (Ganesh Das Hospital's premises)

It is observed from table C (Location C – Lawmali) that on 28th October, 2021 (i.e. pre-Diwali day), the noise level during respective day and night time, i.e. from 18:00 Hrs. (6:00 pm) to 22:00 Hrs. (10:00 pm) and 22:00 Hrs. (10:00 pm) to 24:00 Hrs. (12:00 midnight) exceeds the day and night time standards (for Silence Zone) of 50.0 dB (A) Leq and 40.0 dB(A) Leq respectively. The observed higher level of sound obtained during the monitored duration may be attributed to various activities in the hospital campus as well as vehicular traffic.

On 4th November, 2021 (i.e. Diwali day), however, it is observed that there is an increase in the noise level after 19:00 Hrs. (7:00 pm). The average equivalent noise level (Leq) is also comparatively higher than that on pre-Diwali day. For all timings from 18:00 Hrs. (6:00 pm) to 24:00 Hrs. (12:00 midnight), the monitored sound level is above the mentioned standard limits during day as well as night time. The higher noise level monitored is attributed to bursting of crackers in the surrounding areas of the neighborhood.

The findings of the monitored study reveal that the ambient noise level is higher during Diwali day (i.e. 4th November, 2021) as compared to that on a normal/pre-Diwali day (i.e. 28th October, 2021). The bursting of firecrackers and burning of sparklers on Diwali day contributes to the overall noise at the monitored locations resulting in an increase in the ambient noise level at the place. However, the data also reveals that the restriction on sale and use of high sounding fire crackers as well as the restriction on timings and duration for sale and bursting of crackers etc. have significantly contributed to the lowering noise during this festive occasion.

Byrnihat is mainly an industrial area where the majority of the industries in the state are located. It is situated along the boundary of the states of Meghalaya and Assam. The national highway passing through the town ensures that the business and industrial activity there continue to thrive and prosper making it the main hub of industrial activity within Meghalaya. The town is one among the identified non-attainment cities/towns in India. The monitoring station is located within the Export Promotion Industrial Park.

Map showing the monitoring location in Byrnihat
INDEX: - Sampling Location

△

Observations / Interpretations

Table D

EPIP,BYRNIHAT						
Location : D	**Pre-Diwali Day (28.10.2021)**			**Diwali Day (04.11.2021)**		
Time duration	**Lmin**	**Lmax**	**Leq dB(A)**	**Lmin**	**Lmax**	**Leq dB(A)**
18:00 to 19:00 Hr.	45.6	75.3	55.8	47.3	96.0	65.9
19:00 to 20:00 Hr.	34.6	82.9	53.8	47.4	74.6	53.6
20:00 to 21:00 Hr.	37.2	71.2	46.9	46.8	78.2	57.5
21:00 to 22:00 Hr.	36.0	76.9	52.3	45.9	76.8	52.9
22:00 to 23:00 Hr.	41.1	71.4	46.0	47.6	94.5	51.0
23:00 to 24:00 Hr.	38.4	77.7	48.0	40.9	80.3	51.7

It is observed from the above Table D (Location - Byrnihat) that on 28th October, 2021 (i.e. pre-Diwali day), the monitored ambient noise level from 18:00 Hrs. (6:00 pm) to 22:00 Hrs. (10:00 pm) is within the ambient noise level standard (for Industrial area) of 75.0 dB(A) Leq for day time while the night time noise level from 22:00 Hrs. (10:00 pm) to 24:00 Hrs. (12:00 midnight) is also within the (night time) ambient noise level standard of 70.0 dB(A) Leq. On 4th October, 2021 (i.e. Diwali day), it is observed that the average equivalent noise level (Leq) is also within the above mentioned ambient noise standards for day and night time (for an Industrial Area). There is no major significant difference in the noise level during pre-Diwali and Diwali day.

7.3: Ambient Noise Level at the Immersion ghats/sites during the Puja Festival 2021

Ambient noise level monitoring was conducted at immersion ghats/sites in Shillong, Tura and Jowai in order to assess the level of noise during the Kali Puja festival.

The monitoring was conducted on the 15th October, 2021, i.e. the day of immersion.

The Board's monitoring team was equipped with Envirotech SLM 109 Sound Level Meters and the noise level was measured in dB (A) i.e. the level of sound in decibels on scale – A, as per the human ear sensitivity requirements. The result was expressed in Leq, denoting the A weighted energy mean of the noise level averaged over the measurement period and compared with the national ambient noise level standard(s).

The noise level was recorded for a total of 1 hour duration wherein Leq readings were monitored for every half-hour interval.

The levels recorded during the occasion at the respective immersion sites in Shillong, Tura and Jowai is given in tables below:

Table 1-A

Location A	**River Umkhrah Immersion Site, Polo, Shillong**	
Time duration	Leq dB(A)	Ambient Noise Level Standard (Day time) [Residential Area] Leq dB(A)
11:50 Hrs. to 12:20 Hrs.	69.5	55.0
12:20 Hrs. to 12:50 Hrs.	70.6	

The above table (Table 1-A) reveals that the ambient noise level at the immersion ghat along the river Umkhrah at Polo, Shillong, monitored on 15th October, 2021, is high.

The levels recorded at every half-hourly interval from the time duration of 11:50 Hrs. (11:50 am) to 12:20 Hrs. (12:20 pm) and 12:20 Hrs. (12:20 pm) to 12:50 Hrs. (12:50 pm) shows that the level exceeds the daytime Ambient Noise Standard of 55.0 dB(A) Leq (for a Residential area).

The noise, as observed on the above day and duration of monitoring, is due to celebration activities at the immersion ghat/site viz. shouts, drum beating and playing of musical instruments etc. during the immersion process.

Table 1-B

Location B	**River Babupara-Rongkhon Immersion Site, Babupara, Tura**	
Time duration	Leq dB(A)	Ambient Noise Level Standard (Day time) [Residential Area] Leq dB(A)
16:00 Hrs. to 16:30 Hrs.	72.6	55.0
16:30 Hrs. to 17:00 Hrs.	75.1	

The above table (Table 1-B) reveals that the ambient noise level at the immersion ghat along the river Babupara-Rongkhon at Babupara, Tura, monitored on 15th October, 2021, is high.

The levels recorded at every half-hourly interval from the time duration of 16:00 Hrs. (4:00 pm) to 16:30 Hrs. (4:30 pm) and 16:30 Hrs. (4:30 pm) to 17:00 Hrs. (5:00 pm) shows that the level obtained exceeds the daytime Ambient Noise Standard of 55.0 dB(A) Leq (for a Residential area).

The noise, as observed on the above day and duration of monitoring, is due to festive activities during the immersion process.

Table 1-C

Location: C	**River Myntdu Immersion Site, Syn-tuKsiar, Jowai**	
Time duration	Leq dB(A)	Ambient Noise Level Standard (Day time) [Residential Area] Leq dB(A)
14:10 Hrs. to 14:40 Hrs.	60.8	55.0
14:40 Hrs. to 15:10 Hrs.	61.2	

The table above (Table 1-C) displaying the ambient noise level at the immersion ghat along the river Myntdu at Lynter Archaka, SyntuKsiar, Jowai, monitored on 15th October, 2021, reveals that the level is above the daytime Ambient Noise Standard of 55.0 dB(A) Leq (for a Residential area) during both half-hourly monitored time intervals from 14:10 Hrs. (2:10 pm) to 14:40 Hrs. (2:40 pm) and 14:40 Hrs. (2:40 pm) to 15:10 Hrs. (3:10 pm).

Here too the noise at the immersion ghat/site as observed on the mentioned day and duration is due to shouts of celebration, drum beating and playing of musical instruments etc. during the immersion process.

CHAPTER 8
ENVIRONMENTAL AWARENESS

8.1:Diwali Festival 2021

"Deepawali" or "Diwali" is an occasion when the Indian sky is lit up with sparks and lights of different hues and colors while colored lightings and decorations adorn the homes of many celebrating this well-known festival. The festival of lights, as it is also known, is said to be a celebration of the triumph of good over evil and is marked by the bursting of crackers, burning of sparklers, beating of drums and playing of musical instruments etc.

However, accompanying the lights and colors is the noise that is emitted by the burning and bursting of crackers and sparklers etc. thus raising the overall ambient noise level in the surroundings and causing noise pollution. This therefore calls for a monitoring of the ambient noise level as well as the air quality at a place in order to assess the level of pollution arising as a result of the celebration.

With this objective, the Meghalaya State Pollution Control Board, Shillong, conducted the Ambient Noise Level and Air Quality monitoring before, on Deepawali day and after, from the 28th October to the 11th of November, 2021, in pursuance to the interim directions of the Honourable Supreme Court and the Central Pollution Control Board.

AREA MONITORED

The city of Shillong was selected for conducting the ambient noise level and air quality survey during the festive occasion as it is Meghalaya's largest city as well as its capital and has a sizeable population celebrating the festival. Byrnihat, located in the district of Ri Bhoi, was selected as it has been categorized as a non-attainment town.

The three locations selected within Shillong are:

(i) Lumpyngngad (Location A – Meghalaya State Pollution Control Board's premises), a residential area.
(ii) Police Bazar (Location B – Meghalaya Legislative Assembly office's premises), a commercial area.
(iii) Lawmali (Location C – Ganesh Das Hospital's premises), a silence zone.

Statistical and physical description of the city and the monitored areas is furnished in the following paragraphs entitled 'CITY' and 'MONITORING LOCATIONS' (as per the Central pollution Control Board's prescribed format).

METHODOLOGY

The monitoring was conducted from 28th October to 11th November, 2021, whereby pre-Diwali monitoring was taken as one week before the 4th of November (Diwali day), 2020, and post-Diwali monitoring, one week after the mentioned day. The monitoring methodology is as per the Protocol specified by Central Pollution Control Board, Delhi.

The monitoring team was equipped with Envirotech SLM 109 and Casella Sound level meters. The noise levels were measured in dB(A) i.e. the level of sound in decibels on scale – A as per the human ear sensitivity requirements. The result was expressed in Lmin, Lmax and Leq, wherein Lmin indicates the minimum value of the sound level in decibels and Lmax the maximum value of sound level in decibels occurring during the single event and Leq denotes the A weighted energy mean of the noise level averaged over the measurement period. The noise level was monitored for continuous 6 hours duration i.e. from 18:00 Hours (6:00 pm) to 24:00 Hours (12:00 midnight) where Lmin, Lmax and Leq readings were recorded for every hourly interval.

The Ambient Air Quality was performed using Respirable Dust Sampler (Envirotech APM 460 & APM 460BL) and PM 2.5 Sampler (Envirotech APM 550 MFC). The monitoring for SO_2, NO , PM2.5 and PM10 was carried out for a sampling period of 24 hours (8 hrs. intervals for Particulate Matter & 4 hour's interval for gaseous pollutants). The results were expressed in μg/m^3.

City
Name: SHILLONG,
State: Meghalaya
Coordinates: 25°34'00"N & 91°53'00"E
Elevation: 1496m (4,908 feet) above sea level
Climate/Meteorology: Yearly average minimum temperature is 13.6° C (56.5° F) and maximum is 21.7° C (71.1° F) and the average yearly rainfall is 4,931 mm (194.13 inches).
Population: 1, 43,229 as per 2011 census

Major Land use: According to the Master Plan of Shillong city, which includes the Shillong Agglomeration and 35 other surrounding villages covering an area of 174 Sq. km., the existing land-use has been classified into the categories viz. Residential, Commercial, Public, semi-Public (administrative, institutional, open space i.e. parks, play ground and graveyards), Industrial, Security, Circulation (roads, parking lots, etc.), Vacant (areas with poor accessibility, steep slopes, etc.), Urban agriculture, Forests and water bodies.

MONITORING LOCATIONS IN SHILLONG

Map showing the monitoring locations in Shillong city

INDEX: - Sampling Locations △

Description of monitoring site

(i) Location A – Lumpyngngad: Lumpyngngad is a residential area located in the outskirts of the city. Being a purely residential area, this location is basically a quiet place. There are no commercial complexes here and the main noise sources are vehicular traffic and construction activity. There are a good number of residents celebrating the Diwali festival in this area and noise study on a normal day and on the occasion would give a good comparison on the noise scenario prior to and during the festival period.

(ii) Location B - Police Bazar: This location is a commercial area and the major shopping and business area of the city. People from all over the city as well as the state and even tourists from outside the state and country frequent here for their business and shopping activities. The main noise sources here are vehicular traffic and noise caused by pedestrians, shoppers and other business activities. The shop owners and residents of this area celebrate the Diwali festival with much pomp and enthusiasm and therefore the location is suitable for the undergoing noise study.

(iii) Location C - Lawmali: This station is located in the premises of the Ganesh Das Hospital, which is categorized as a silence zone. It is a Government hospital and one of the biggest in the city. The place is close to Polo and Jail Road, localities that have sizeable residents celebrating Diwali. Therefore it is a suitable location for the undergoing noise study.

DATA /OBSERVATIONS NOISE LEVEL DURING DIWALI FESTIVAL, 2021:

Table A

LUMPYNGNGAD						
Location : A	**Pre-Diwali Day (29.10.2021)**			**Diwali Day (04.11.2021)**		
Time duration	**Lmin**	**Lmax**	**Leq dB(A)**	**Lmin**	**Lmax**	**Leq dB(A)**
18:00 to 19:00 Hr.	33.4	71.5	45.1	34.8	85.7	56.0
19:00 to 20:00 Hr.	33.7	63.4	40.8	49.3	93.3	64.5
20:00 to 21:00 Hr.	34.2	63.1	40.2	48.9	95.0	63.9
21:00 to 22:00 Hr.	34.1	62.4	39.6	49.7	100.0	66.1
22:00 to 23:00 Hr.	34.7	61.4	37.7	49.0	90.5	64.6
23:00 to 24:00 Hr.	34.8	64.8	36.4	48.7	92.0	60.5

Table B

POLICE BAZAR						
Location : B	**Pre-Diwali Day (29.10.2021)**			**Diwali Day (04.11.2021)**		
Time duration	**Lmin**	**Lmax**	**Leq dB(A)**	**Lmin**	**Lmax**	**Leq dB(A)**
18:00 to 19:00 Hr.	58.8	78.7	69.5	58.0	88.1	67.6
19:00 to 20:00 Hr.	66.1	82.0	66.1	58.9	86.8	67.5
20:00 to 21:00 Hr.	68.7	83.3	68.7	59.0	92.4	71.0
21:00 to 22:00 Hr.	53.2	67.2	56.8	59.5	84.6	65.0
22:00 to 23:00 Hr.	52.9	62.4	55.6	54.4	98.3	81.0
23:00 to 24:00 Hr.	52.6	63.6	55.0	53.8	84.7	67.3

Table C

LAWMALI						
Location: C	**Pre-Diwali Day (29.10.2021)**			**Diwali Day (04.11.2021)**		
Time duration	**Lmin**	**Lmax**	**Leq dB(A)**	**Lmin**	**Lmax**	**Leq dB(A)**
18:00 to 19:00 Hr.	40.2	76.7	54.4	40.2	81.6	53.5
19:00 to 20:00 Hr.	40.1	71.9	52.2	42.3	102.4	59.2
20:00 to 21:00 Hr.	38.4	74.4	52.6	42.9	92.9	60.3
21:00 to 22:00 Hr.	37.1	66.0	48.6	43.2	113.0	63.4
22:00 to 23:00 Hr.	38.0	75.3	50.8	41.2	84.6	63.5
23:00 to 24:00 Hr.	37.2	75.8	50.5	35.8	74.7	54.0

INTERPRETATION OF NOISE DATA/RESULTS

4. Location A – Lumpyngngad (Meghalaya State Pollution Control Board's office premises)

It is observed from the Table A (Location A - Lumpyngngad) that, on 28th October, 2021 (i.e. pre-Diwali day), the monitored ambient noise level from 18:00 Hrs. (6:00 pm) to 22:00 Hrs. (10:00 pm) is well within the ambient noise level standard (for Residential Area) of 55.0 dB(A) Leq for day time while the night time noise level from 22:00 Hrs. (10:00 pm) to 24:00 Hrs. (12:00 midnight) is also within the (night time) ambient noise level standard of 45.0 dB(A) Leq.

On 4th November, 2021 (i.e. Diwali day), however, it is observed that there is an overall increase in the ambient noise level at the location where the average equivalent noise level (Leq) is found to be above the daytime ambient noise standard of 55.0 dB(A) Leq throughout the time duration from 18:00 Hrs. (6:00 pm) to 22:00 Hrs. (10:00 pm). During the night time too, the levels measured were found to be above the standard of 45.0 dB(A) Leq during both monitored hourly intervals from 22:00 Hrs. (10:00 pm) to 23:00 Hrs. (11:00 pm) and 23:00 Hrs. (11:00 pm) to 24:00 Hrs. (12:00 midnight).

5. Location B - Police Bazar (Office of the Meghalaya Legislative Assembly's premises)

It is observed from Table B (Location B - Police Bazar) that the noise level on 28th October, 2021 (i.e. pre-Diwali day), is above the standard limit of 65.0 dB (A) Leq for day time (for a Commercial Area) from 18:00 Hrs. (6:00 pm) to 22:00 Hrs.(10:00 pm). It is above the night time ambient noise level standard of 55.0 dB(A) Leq from 22:00 Hrs. (10:00 pm) to 23:00 Hrs.(11:00 pm) and within the same standard limit from 23:00 Hrs. (11:00 pm) to 24:00 Hrs.(12:00 midnight).

On 4th of November, 2021 (i.e. Diwali day), it is observed that there is an increase in the noise level after 19:00 Hrs. (7:00 pm). Here we see that the noise level exceeds the mentioned day time noise standard limit during the timing from 19:00 Hrs.(7:00 pm) to 22:00 Hrs.(10:00 pm), while the night time noise level standard of 55.0 dB (A) Leq is exceeded during the night time intervals from 22:00 Hrs.(10:00 pm) to 24:00 Hrs.(12:00 midnight).

6. Location C - Lawmali (Ganesh Das Hospital's premises)

It is observed from table C (Location C – Lawmali) that on 28th October, 2021 (i.e. pre-Diwali day), the noise level during respective day and night time, i.e. from 18:00 Hrs. (6:00 pm) to 22:00 Hrs. (10:00 pm) and 22:00 Hrs. (10:00 pm) to 24:00 Hrs. (12:00 midnight) exceeds the day and night time standards (for Silence Zone) of 50.0 dB (A) Leq and 40.0 dB(A) Leq respectively. The observed higher level of sound obtained during the monitored duration may be attributed to various activities in the hospital campus as well as vehicular traffic.

On 4th November, 2021 (i.e. Diwali day), however, it is observed that there is an increase in the noise level after 19:00 Hrs. (7:00 pm). The average equivalent noise level (Leq) is also comparatively higher than that on pre-Diwali day. For all timings from 18:00 Hrs. (6:00 pm) to 24:00 Hrs. (12:00 midnight), the monitored sound level is above the mentioned standard limits during day as well as night time. The higher noise level monitored is attributed to bursting of crackers in the surrounding areas of the neighborhood.

Conclusion

The findings of the monitored study reveal that the ambient noise level is higher during Diwali day (i.e. 4th November, 2021) as compared to that on a normal/pre-Diwali day (i.e. 28th October, 2021). The bursting of firecrackers and burning of sparklers on Diwali day contributes to the overall noise at the monitored locations resulting in an increase in the ambient noise level at the place. However, the data also reveals that the restriction on sale and use of high

sounding fire crackers as well as the restriction on timings and duration for sale and bursting of crackers etc. have significantly contributed to the lowering noise during this festive occasion.

City/Town

Name: EPIP, BYRNIHAT, Meghalaya

Byrnihat is mainly an industrial area where the majority of the industries in the state are located. It is situated along the boundary of the states of Meghalaya and Assam. The national highway passing through the town ensures that the business and industrial activity there continue to thrive and prosper making it the main hub of industrial activity within Meghalaya. The town is one among the identified non-attainment cities/towns in India. The monitoring station is located within the Export Promotion Industrial Park.

Map showing the monitoring location in Byrnihat

INDEX: - Sampling Location △

DATA /OBSERVATIONS
NOISE LEVEL DURING DIWALI FESTIVAL, 2021:

Table D

EPIP,BYRNIHAT						
Location:D	**Pre-Diwali Day (28.10.2021)**			**Diwali Day (04.11.2021)**		
Time duration	**Lmin**	**Lmax**	**Leq dB(A)**	**Lmin**	**Lmax**	**Leq dB(A)**
18:00 to 19:00 Hr.	45.6	75.3	55.8	47.3	96.0	65.9
19:00 to 20:00 Hr.	34.6	82.9	53.8	47.4	74.6	53.6
20:00 to 21:00 Hr.	37.2	71.2	46.9	46.8	78.2	57.5
21:00 to 22:00 Hr.	36.0	76.9	52.3	45.9	76.8	52.9
22:00 to 23:00 Hr.	41.1	71.4	46.0	47.6	94.5	51.0
23:00 to 24:00 Hr.	38.4	77.7	48.0	40.9	80.3	51.7

INTERPRETATION OF NOISE DATA/RESULTS

It is observed from the above Table D (Location - Byrnihat) that on 28th October, 2021 (i.e. pre-Diwali day), the monitored ambient noise level from 18:00 Hrs. (6:00 pm) to 22:00 Hrs. (10:00 pm) is within the ambient noise level standard (for Industrial area) of 75.0 dB(A) Leq for day time while the night time noise level from 22:00 Hrs. (10:00 pm) to 24:00 Hrs. (12:00 midnight) is also within the (night time) ambient noise level standard of 70.0 dB(A) Leq.

On 4th October, 2021 (i.e. Diwali day), it is observed that the average equivalent noise level (Leq) is also within the above mentioned ambient noise standards for day and night time (for an Industrial Area). There is no major significant difference in the noise level during pre-Diwali and Diwali day.

Interpretation of Ambient Air Quality Data/Results

The findings of the monitoring results indicate that:

(i) The concentrations of SO_2, NO_2, PM10 and PM2.5 at Lumpyngngad (the Meghalaya State Pollution Control Board's Premises, **Table – 1**) was found to be within the prescribed limits of National Ambient Air Quality Standards, on Deepawali day (i.e. 4th November, 2021) as well as before and after the festival date throughout the monitored duration from 28th October to 11th November, 2021. However, it is observed that the concentration of PM2.5 was found to be highest on Deepawali day (i.e. 4th November, 2021) as compared to that on any other day before or after the festive occasion.

(ii) The concentrations of SO_2, NO_2, PM10 and PM2.5 at Police Bazar (Meghalaya Legislative Assembly Premises, **Table – 2**) was found to be within the prescribed limits of National Ambient Air Quality Standards, on Deepawali day (i.e. 4th November, 2021) as well as before and after the festival date throughout the monitored duration from 28th October to 11th November, 2021. However, it is observed that the concentration of SO_2, NO_2, PM10 and PM2.5 was found to be highest on Deepawali day (i.e. 4th November, 2021) as compared to any other day before or after the festive occasion.

(iii) The concentrations of SO_2, NO_2, PM10 and PM2.5 at Lawmali (Ganesh Das Hospital Premises, **Table – 3**) was found to be within the prescribed limits of National Ambient Air Quality Standards before, on Deepawali day (i.e. 4th November, 2021) as well as before and after the festival date throughout the monitored duration from 28th October to 11th November, 2021. However, it is observed that the concentration of SO_2, NO_2, PM10 and PM2.5 was found to be highest on Deepawali day (i.e. 4th November, 2021) as compared to any other day before or after the mentioned date.

(iv) The concentrations of SO_2, NO_2, PM10 and PM2.5 at EPIP, Byrnihat (NAMP Station Byrnihat, **Table – 4**) was found to be above the prescribed limits of National Ambient Air Quality Standards before, on Deepawali day (i.e. 4th November, 2021) as well as before and after the festival date throughout the monitored duration from 28th October to 11th November, 2021.

CONCLUSION

The data collected reveals that the concentration of monitored parameters like SO_2, NO_2, PM10 and PM2.5 observed to be within the prescribed limits of National Ambient Air Quality Standards, on Deepawali day (i.e. 4th November, 2021) as well as before and after the festival date throughout the monitored duration from 28th October to 11th November, 2021 in all the monitored locations except EPIP at Byrnihat, where the concentrations was found to be above the prescribed limits of National Ambient Air Quality Standards before, on Deepawali day (i.e 4th November, 2021) as well as after the festival date throughout the monitored duration from 28th October to 11th November, 2021. The high concentrations of Particulate Matter (PM10 & PM2.5) levels is mainly due to the buildup of pollutants owing to emissions from industries located in the industrial area, natural dust, movement of vehicles, construction activities.

8.2: AMBIENT AIR QUALITY DATA DURING DIWALI FESTIVAL 2021

Table-1: Lumpyngngad, Shillong
(Meghalaya State Pollution Control Board's Office Premises)

Name of location: Lumpyngngad, Shillong (Meghalaya State Pollution Control Board's Office Premises)				
Date	Regulatory Parameters			
	SO2 (µg/m^3)	NO2 (µg/m^3)	PM10 (µg/m^3)	PM2.5 (µg/m^3)
28-10-2021	3.8	7.0	30.5	16.0
29-10-2021	3.9	7.2	32.2	16.3
30-10-2021	3.7	7.2	36.9	15.2
31-10-2021	3.5	7.3	31.6	14.7
01-11-2021	3.7	6.9	31.3	17.3
02-11-2021	3.5	7.7	36.8	23.4
03-11-2021	3.3	6.8	31.3	20.6
04-11-2021	4.1	8.5	50.7	36.7
05-11-2021	4.0	7.8	40.5	21.5
06-11-2021	3.2	7.7	32.1	18.7
07-11-2021	3.4	7.6	28.5	17.2
08-11-2021	3.5	7.3	27.2	15.3
09-11-2021	3.7	7.0	30.1	16.0
10-11-2021	3.4	7.2	32.0	16.6
11-11-2021	3.2	7.1	33.2	17.7

Table-2: Police Bazar, Shillong (Meghalaya Legislative Assembly Office's Premises)

Name of location: Police Bazar, Shillong (Meghalaya Legislative Assembly Office's Premises)				
Date	Regulatory Parameters			
	SO2 (µg/m^3)	NO2 (µg/m^3)	PM10 (µg/m^3)	PM2.5 (µg/m^3)
28-10-2021	2.7	6.7	34.4	25.6
29-10-2021	2.8	7.7	33.5	25.3
30-10-2021	2.8	7.8	33.2	26.1
31-10-2021	3.0	8.0	36.6	29.0
01-11-2021	3.1	8.3	50.2	42.3
02-11-2021	2.4	9.0	50.9	40.6
03-11-2021	2.2	9.1	48.1	39.8
04-11-2021	3.3	9.8	75.1	39.7
05-11-2021	2.0	9.0	61.1	40.5
06-11-2021	2.2	7.5	49.6	29.7
07-11-2021	2.0	6.6	41.8	28.7
08-11-2021	2.0	8.8	36.2	29.4
09-11-2021	2.4	8.1	39.6	31.1
10-11-2021	2.0	8.8	38.6	30.1
11-11-2021	2.2	8.4	40.7	28.8

Table-3:Lawmali, Shillong (Ganesh Das Hospital Premises)

Name of location: Lawmali, Shillong (Ganesh Das Hospital Premises)				
Date	Regulatory Parameters			
	SO2 (µg/m^3)	NO2 (µg/m^3)	PM10 (µg/m^3)	PM2.5 (µg/m^3)
28-10-2021	1.4	7.2	58.2	28.2
29-10-2021	1.3	7.5	55.3	27.1
30-10-2021	1.3	8.4	55.4	27.4
31-10-2021	1.4	8.7	57.4	29.0
01-11-2021	1.3	8.5	57.2	27.3
02-11-2021	1.5	8.9	58.9	27.0
03-11-2021	1.4	8.9	58.1	27.2
04-11-2021	1.8	15.9	70.0	32.2
05-11-2021	1.3	10.8	68.8	28.6
06-11-2021	1.5	8.1	57.4	27.6
07-11-2021	1.4	10.2	55.9	26.7
08-11-2021	1.3	10.6	61.7	27.3
09-11-2021	1.7	8.9	53.5	24.9
10-11-2021	1.3	11.1	52.8	27.7
11-11-2021	1.7	11.5	50.1	23.5

Table-4:Byrnihat, (Export Promotion Industrial Park (EPIP), Byrnihat)

Name of location: Byrnihat, (Export Promotion Industrial Park (EPIP), Byrnihat)				
Date	Regulatory Parameters			
	SO2 (µg/m^3)	NO2 (µg/m^3)	PM10 (µg/m^3)	PM2.5 (µg/m^3)
28-10-2021	17.5	15.8	113.9	46.3
29-10-2021	23.4	19.6	175.3	59.6
30-10-2021	26.2	21.1	206.8	64.5
31-10-2021	19.4	18.7	177.9	71.7
01-11-2021	17.5	18.2	165.4	53.7
02-11-2021	19.4	15.7	137.7	43.1
03-11-2021	20.1	17.5	188.7	60.7
04-11-2021	22.8	20.3	200.8	82.7
05-11-2021	24.9	22.5	220.3	74.9
06-11-2021	20.9	21.1	179.1	59.1
07-11-2021	18.3	16.5	165.2	51.7
08-11-2021	24.3	21.1	216.1	63.3
09-11-2021	19.8	16.5	124.9	39.9
10-11-2021	21.1	20.1	130.4	46.5
11-11-2021	25.8	22.2	237.6	90.8

Interpretation of metal/elemental parameters in Ambient Air: Data/Results

The findings of the monitoring results indicate that:

(i) The concentrations of Pb, Ni and As in PM10 at Lumpyngngad, Shillong (the Meghalaya State Pollution Control Board's Premises, Table – 5) was found to be within the prescribed limits of National Ambient Air Quality Standards, on Deepawali day (i.e. 4th November, 2021) as well as before and after the festival date throughout the monitored duration from 28th October to 11th November, 2021. However, it is observed that the concentration of Pb was found to be highest on Deepawali day (i.e. 4th November, 2021) as compared to that on any other day before or after the festive occasion. Concentration of Pb, Al, Ba and Fe in PM2.5 was also found to be highest on Diwali day as compared to other days.

(ii) The concentrations of Pb, Ni and As in PM10 at Police Bazar (Meghalaya Legislative Assembly Premises, Table – 6) was found to be within the prescribed limits of National Ambient Air Quality Standards, on Deepawali day (i.e. 4th November, 2021) as well as before and after the festival date throughout the monitored duration from 28th October to 11th November, 2021. Concentration of Pb, Al, Ba, Fe and Sr in PM2.5 was found to be highest on Diwali day as compared to other days.

(iii) The concentrations of Pb, and As in PM10 at Lawmali (Ganesh Das Hospital Premises, Table – 7) was found to be within the prescribed limits of National Ambient Air Quality Standards before, on Deepawali day (i.e. 4th November, 2021) as well after the festival date throughout the monitored duration from 28th October to 11th November, 2021, while the standard limit for As was exceeded only on Diwali day. The concentration of Pb and

Ni was found to be highest on 4th November, 2021, as compared to that before or after that date. Concentration of Pb, Al, Ba, Fe and Sr in PM2.5 was also found to be highest on Diwali day as compared to that on other days.

(iv) The concentrations of Pb, Ni and As in PM10 as well as that of Pb, Ni, As, Al, Ba, Fe and Sr in PM2.5 at EPIP, Byrnihat (NAMP Station Byrnihat, Table – 8) indicates that there is no higher concentration of the measured parameters on Diwali day (i.e. 4th November, 2021) as compared to that on other days.

CONCLUSION

The data collected reveals that the concentration of monitored parameters like Pb, Ni, Al, Ba, Fe and Sr was observed to be highest on Deepawali day (i.e. 4th November, 2021) as compared to that before or after the festival period in all monitored locations except EPIP at Byrnihat. The higher concentration of metal parameters viz. Pb, Al, Ba and Fe in EPIP, Byrnihat, during other days besides Diwali day may be attributed to the buildup of pollutants owing to emissions from industries located in the industrial area.

Table-5: Ambient Air Quality monitoring data during Deepawali festival (28.10.2021 to 11.11.2021): Data / Observations

Name of location: Lumpyngngad, Shillong (Meghalaya State Pollution Control Board's Office Premises)										
Date	Regulatory Parameters			New Parameters						
	Metals in PM10			Metals / Elements in PM2.5						
	Pb (µg/m³)	Ni (µg/m³)	As (µg/m³)	Pb (µg/m³)	Ni (µg/m³)	As (µg/m³)	Al (µg/m³)	Ba (µg/m³)	Fe (µg/m³)	Sr (µg/m³)
28.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.32	0.04	0.27	<0.02
29.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.04	<0.02	0.13	<0.02
30.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.25	0.04	1.22	<0.02
31.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	<0.02	<0.02	0.15	<0.02
01.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.17	<0.02	0.23	<0.02
02.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	<0.02	<0.02	0.20	<0.02
03.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	<0.02	<0.02	0.18	<0.02
04.11.21	**0.05**	**<0.02**	**<0.004**	**0.03**	**<0.02**	**<0.004**	**0.59**	**0.44**	**1.45**	**<0.02**
05.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.19	0.06	0.06	<0.02
06.11.21	<0.01	<0.01	<0.004	0.03	<0.02	<0.004	0.27	0.05	0.94	<0.02
07.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	<0.02	<0.02	<0.02	<0.02
08.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.28	0.04	0.36	<0.02
09.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	<0.02	<0.02	0.10	<0.02
10.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.23	<0.02	0.27	<0.02
11.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	<0.02	<0.02	0.09	<0.02
* All values (24 hourly Avg.) are in µg/m³										

Table 6: Ambient Air Quality monitoring data during Deepawali festival (28.10.2021 to 11.11.2021): Data / Observations

Name of location: Police Bazar, Shillong (Meghalaya Legislative Assembly Office's Premises)										
Date	Regulatory Parameters			New Parameters						
	Metals in PM10			Metals / Elements in PM2.5						
	Pb ($\mu g/m^3$)	Ni ($\mu g/m^3$)	As ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni ($\mu g/m^3$)	As ($\mu g/m^3$)	Al ($\mu g/m^3$)	Ba ($\mu g/m^3$)	Fe ($\mu g/m^3$)	Sr ($\mu g/m^3$)
28.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.32	0.05	0.42	<0.02
29.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.04	0.02	0.13	<0.02
30.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.33	0.07	0.32	<0.02
31.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.22	0.05	0.15	<0.02
01.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.30	0.10	0.28	<0.02
02.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.21	0.08	0.20	<0.02
03.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.17	0.09	0.18	<0.02
04.11.21	<0.01	<0.02	<0.004	0.06	<0.02	<0.004	1.32	0.95	0.48	0.04
05.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.19	0.06	0.06	<0.02
06.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.35	0.20	0.18	<0.02
07.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.19	0.14	0.15	<0.02
08.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.28	0.06	0.37	<0.02
09.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.18	0.07	0.10	<0.02
10.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.61	0.08	0.26	<0.02
11.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.23	0.05	0.09	<0.02
* All values (24 hourly Avg.) are in $\mu g/m^3$										

Table 7: Ambient Air Quality monitoring data during Deepawali festival (28.10.2021 to 11.11.2021): Data / Observations

Name of location:Lawmali, Shillong (Ganesh Das Hospital Premises)										
Date	Regulatory Parameters			New Parameters						
	Metals in PM10			Metals / Elements in PM2.5						
	Pb ($\mu g/m^3$)	Ni ($\mu g/m^3$)	As ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni ($\mu g/m^3$)	As ($\mu g/m^3$)	Al ($\mu g/m^3$)	Ba ($\mu g/m^3$)	Fe ($\mu g/m^3$)	Sr ($\mu g/m^3$)
28.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.46	0.03	0.32	<0.02
29.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.14	0.02	0.13	<0.02
30.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.27	0.07	0.28	<0.02
31.10.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.22	0.06	0.15	<0.02
01.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.41	0.09	0.55	<0.02
02.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.21	0.08	0.20	<0.02
03.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.19	0.11	0.18	<0.02
04.11.21	0.29	0.03	<0.004	0.04	<0.02	<0.004	1.39	1.40	0.57	0.03
05.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.19	0.19	0.15	<0.02

Name of location:Lawmali, Shillong (Ganesh Das Hospital Premises)										
Date	Regulatory Parameters			New Parameters						
	Metals in PM10			Metals / Elements in PM2.5						
	Pb ($\mu g/m^3$)	Ni ($\mu g/m^3$)	As ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni ($\mu g/m^3$)	As ($\mu g/m^3$)	Al ($\mu g/m^3$)	Ba ($\mu g/m^3$)	Fe ($\mu g/m^3$)	Sr ($\mu g/m^3$)
06.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.25	0.20	0.25	<0.02
07.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.20	0.12	0.15	<0.02
08.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.45	0.14	0.31	<0.02
09.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.28	0.10	0.11	<0.02
10.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.48	0.17	0.17	<0.02
11.11.21	<0.01	<0.01	<0.004	<0.02	<0.02	<0.004	0.29	0.15	0.09	<0.02
* All values (24 hourly Avg.) are in $\mu g/m^3$										

Table 8: Ambient Air Quality monitoring data during Deepawali festival (28.10.2021 to 11.11.2021): Data / Observations

Name of location: EPIP, Byrnihat										
Date	Regulatory Parameters			New Parameters						
	Metals in PM10			Metals / Elements in PM2.5						
	Pb ($\mu g/m^3$)	Ni ($\mu g/m^3$)	As ($\mu g/m^3$)	Pb ($\mu g/m^3$)	Ni ($\mu g/m^3$)	As ($\mu g/m^3$)	Al ($\mu g/m^3$)	Ba ($\mu g/m^3$)	Fe ($\mu g/m^3$)	Sr ($\mu g/m^3$)
28.10.21	<0.01	<0.02	<0.004	0.58	<0.02	<0.004	0.36	0.07	0.60	<0.02
29.10.21	<0.01	<0.02	<0.004	0.52	<0.02	<0.004	0.34	0.02	0.63	<0.02
30.10.21	<0.01	<0.02	<0.004	0.69	<0.02	<0.004	0.37	0.04	0.75	<0.02
31.10.21	<0.01	<0.02	<0.004	0.32	<0.02	<0.004	0.22	0.06	0.55	<0.02
01.11.21	<0.01	<0.02	<0.004	0.21	<0.02	<0.004	0.17	0.03	0.45	<0.02
02.11.21	<0.01	<0.02	<0.004	0.42	<0.02	<0.004	0.21	0.08	0.50	<0.02
03.11.21	<0.01	<0.02	<0.004	0.32	<0.02	<0.004	0.29	0.11	0.28	<0.02
04.11.21	0.02	<0.02	<0.004	0.36	<0.02	<0.004	0.32	0.10	0.37	<0.02
05.11.21	<0.01	<0.02	<0.004	0.40	<0.02	<0.004	0.34	0.12	0.85	<0.02
06.11.21	<0.01	<0.02	<0.004	0.51	<0.02	<0.004	0.31	0.14	1.70	<0.02
07.11.21	<0.01	<0.02	<0.004	0.62	<0.02	<0.004	0.30	0.08	0.65	<0.02
08.11.21	<0.01	<0.02	<0.004	0.76	<0.02	<0.004	0.33	0.04	0.63	<0.02
09.11.21	<0.01	<0.02	<0.004	0.62	<0.02	<0.004	0.38	0.10	0.41	<0.02
10.11.21	<0.01	<0.02	<0.004	0.56	<0.02	<0.004	0.25	0.15	0.48	<0.02
11.11.21	<0.01	<0.02	<0.004	0.50	<0.02	<0.004	0.29	0.13	0.39	<0.02
* All values (24 hourly Avg.) are in $\mu g/m^3$										

8.3: The commemoration of the "International Day of Clean Air for Blue Skies" held on the 7th September, 2021, at the Office of the Deputy Commisioner, Nongpoh, Ri-Bhoi District, Meghalaya

The commemoration of the"International Day of Clean Air for Blue Skies" was observed at the Office of the Deputy Commissioner, Nongpoh, Ri Bhoi District, Meghalaya, on the 7th of September, 2021.

The celebration recorded a total attendance of fifteen (15) participants comprising representatives from various government departments/agencies, industrial units and local bodies.

The meeting was chaired by Smt. R.M. Kurbah, the Deputy Commissioner of Ri Bhoi District, Meghalaya, who also delivered the inaugural address in sync with the Day and the theme: "Healthy Air, Healthy Planet."

Shri W.R. Kharkrang, Senior Environmental Engineer, Meghalaya Sate Pollution Control Board, Shillong, emphasized on the importance of a blue sky and healthy air and the role all stakeholders have to play in bringing about a clean environment especially in the context of Byrnihat, one among 132 listed non-attainment cities/towns in the country.

Shri S. Swer, Scientist 'C', Meghalaya State Pollution Control Board, Shillong, delivered a presentation on "National Clean Air Programme – Towards healthy air and a healthy planet", highlighting the air quality of Byrnihat and the NCAP's city action plan as a way forward in reducing the air pollution in the non-attainment city/town.

During the Group discussion:

1. Each department/agency was encouraged to play a more proactive role from their end in reducing air pollution especially with regard to the action points as laid out in the City Action Plan.

2. Participants were reminded to submit proposals to the Implementation Committee constituted under the National Clean Air Programme for control of air pollution in non-attainment city: Byrnihat, Ri Bhoi District, for funding under the said Programme so that action points as per the City CAP may be implemented in letter and spirit.

3. Some representatives gave updates on latest action taken as per action points under the CAP.

The celebration ended with a vote of thanks from the Deputy Commissioner, Ri Bhoi District.




"International Day of Clean Air for Blue Skies" held at the Office of the Deputy Commissioner, Nongpoh, Ri-Bhoi District, Meghalaya, on 7th September, 2021

CHAPTER 9
PRESENT STATE OF THE ENVIRONMENT, ENVIRONMENTAL PROBLEMS AND COUNTER MEASURES

One of the beautiful hill states of North Eastern Region of India is Meghalaya measuring 22,429 Sq. Kms. of area with 29,66,889 population as per 2011 Census. The State is rich in mineral resources which are found almost in its entire southern belt. Private mining activities were very unscientific and unplanned thus causing severe water pollution and environmental degradation. Small sacle industries have been increasing into larger ones, for example, from small scale industries of stone crushing into large scale cement industries which gives rise to the ecological imbalance in the State. To curb these ever increasing problems, this Board therefore, applies different measures as per the Rules in force.

9.1: Pollution Control and Waste Management:

(a) Solid Waste Management

Indiscriminate dumping of garbage, indiscriminate discharge or disposal of domestic sewage, trade effluents, urban solid wastes due to rapid population growth and fast urbanization also contributed to the ecological imbalance in the State. In this respect, the Meghalaya State Pollution Control Board has issued a direction to all Urban Local Bodies in the State to implement the provisions of the Solid Waste Management Rules, 2016 relating to development of infrastructure for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes (in areas within its jurisdiction) in accordance to the provisions and compliance criteria/ standards as stipulated in the Solid Waste Management Rules, 2016.

(b) Bio-Medical Waste Management:

Hospitals, Nursing Homes, Health Care Facilities has increased tremendously in recent years in the State and without proper methods of disposal of wastes from the health care units may pose great risk to human health and may create environmental pollution. Thus, prompting the government to implement new ways of scientific management of bio-medical wastes. The Board has issued direction to ensure that all health care units to apply for authorization in the prescribed Form II as required under Rule 10 of the Bio-Medical Waste Management Rules, 2016.

(c) Consent Management:

Under the large-scale industrial sector cement plants falls under the 17 categories of highly polluting industries. The others were medium and small-scale industries such as power plants, lime calcination plants, ingot manufacturing and steel rolling mills, Ferro alloys manufacturing unit, stone crushing units, auto workshops,auto servicing units, D.G. Sets etc. Most of the lime calcination units were coal – fired and kilns were of traditional types (pajwa), which do not have even hood and chimney for venting out the smoke.

The Board was regulating the discharged of effluents and air emissions from industries through the issuance of Consents to Establish/Operate under Water & Air Acts. While issuing Consents, conditions were being imposed with regard to the effluent and the emission standards to which industries have to comply with. Conditions were also stipulated for setting up effluent treatment plants and/or installing of air pollution control systems whenever they were found necessary.

The Board periodically collects and analyses effluent samples for verification of compliance to the consent conditions by industrial units. The industries were also instructed to ensure that pollution control systems, whenever necessary, were installed and commissioned within a stipulated period.

During the year **2021-2022** the number of Consent to Establish recommended and cleared is 125 numbers granted to different kinds of Units.Also, the industries/firms/units which the Board granted for Consent to Establish and Consent to Operate and Renewal of Consent to Operate under the Water (Prevention& Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 is appended in the **Annexure-IIIand Annexure-IV** respectively.

(d) Water Quality Assessment:

The Meghalaya State Pollution Control Board (MSPCB) has established a network of Water Quality monitoring stations in the State. The present network comprises of 84 stations in the State under the National Water Monitoring Programme (NWMP). The monitoring network covers 67 Rivers, 4 Lakes, 13 springs/wells.

Out of the 81 stations, the following water bodies have been identified by CPCB as polluted stretched in the State of Meghalaya with respect to BOD level.

	Name of River	District
1	Umkhrah & Umshyrpi Rivers	: East Khasi Hills District
2	Kyrhukhla River, Lunar River (Tributary of Lukha River) at Myndihati	: East Jaintia Hills District
3	UmtrewByrnihat Rivers	: Ri-Bhoi District
4	Myntdu (Jowai)	: West Jaintia Hills District
5	Nanbah (Nongstoin)	: West Khasi Hills District

Measures taken:

1. The Board had informed the respective Deputy Commissioners of the district regarding the status of the water bodies with a request to take necessary steps to formulate action plan to control the pollution sources.

2. The respective Deputy Commissioners had taken up with the line Departments for formulation of action plan. The District Administration has also issued prohibitory orders against dumping of solid waste and liquid waste in the respective rivers/streams.

(e) Air Quality Assessment:

The Meghalaya State Pollution Control Board has been assessing the ambient air quality in the State over a period of time. A monitoring network with 10 (Ten) Ambient air quality-monitoring stations under National Air Monitoring Programme (NAMP) were placed to assess the changes in air quality.

Three criteria pollutants viz. PM10 (Particulate Matter having an aerodynamic diameter less than or equal to 10 µm), Sulphur dioxide (SO2) and Nitrogen dioxide (NO2) were monitored for regular monitoring of air quality. The monitoring of meteorological parameters such as wind speed and direction, relative humidity and temperature were also integrated with the monitoring of air quality.

Air quality monitored during 2020 indicates that PM10 levels exceeded the NAAQS (annual average) at 2 sampling stations viz (i)Export Promotion Industrial Park (EPIP), Byrnihat, (Stn-III- Industrial area) and (ii) Umiam Industrial Estate, Ri-Bhoi District (Industrial area).

High concentrations of Particulate Matter (PM10) levels observed at Export Promotion Industrial Park (EPIP), Byrnihat, (Industrial area) andUmiam Industrial Estate,Ri-Bhoi Districtwhich may be attributable to the buildup of pollutants owing to emissions from industries located in the industrial area, dust generated due to movement of vehicles, natural dust, and construction activities.

Industrial Pollution Control:

1. The air pollution control devices installed should be properly maintained so as to ensure control of the Particulate Emission of the plant.

2. The ambient air quality within the Plant premises and surrounding areas shouldbe maintained within the National Ambient Air Quality Standards.

3. The Board officials inspect the industries regularly to observe the measures taken for compliance of pollution control norms.

4. Appropriate preventive measures shouldbe adopted to reduce fugitive emission so as to control the concentration of particulate matter in the ambient air.

CHAPTER 10
ENVIRONMENTAL TRAINING

Officers of the Board have undergone training on various environmental issues conducted by Central Pollution Control Board and other Institution and Organizations. The Environmental Training attended by the officials of the Board during the year 2021-2022is shown in the following Table-10.1

Table-10.1: Environmental Training attended by the Board's Officials

SL. No.	Date	Name of Officer/Staff	Subject	Training Organizers
1.	29th March 2021	1. Smti J. Sawian, Sc. 'C' 2. Shri S. Swer, Sc. 'C' 3. Smti M.N. Diengdoh, Sc.'B' 4. Shri M.N. Warbah, S.S.A. 5. Shri J. Kharshiing, S.S.A.	CEMS Webinar	Centre for Science and Environment in collaboration with SEPA, New Delhi
2.	February - March 2021	1. Shri S. Swer, Scientist 'C' 2. Shri M.N. Warbah, S.S.A.	Development on long term capacity development program for Air Quality Monitoring	Centre for Science and Environment, Indian Institute of Technology, Kanpur
3.	7th – 11th March 2022	1. Smti J. Sawian, Sc. 'C' 2. Smti M.N. Diengdoh, Sc.'B' 3. Shri M.N. Warbah, S.S.A. 4. Dr.(Ms.) D. Tariang, S.A. 5. Shri A. Lyngdoh, J.S.A.	Occupational Health and Safety Management System 45001:2018	Online Training organised by ICMR-National Institute of Occupational, Ahmedabad
4.	14th – 16th March 2022	1. Shri W.R. Kharkrang, Sr.E.E. 2. Shri J.F. Lamurong, A.E.E. 3. Smti E. Shilla, A.E.E.	Design of Solid Waste Management Treatment Facility, Common BMW Facility	Online Training organised by Engineering Staff College of India, Hyderabad.
5.	23rd – 25th March 2022	1. Dr.(Ms.) D. Tariang, S.A. 2. Shri A. Lyngdoh, J.S.A. 3. Smti H. Kharkongor, J.S.A. 4. Shri S. Wanswett, J.S.A.	Advance Instrumentation Techniques Especially Ion Chromatograph	CPCB sponsored online training programme by CSIR-NEERI Delhi Zonal Centre, New Delhi
6.	28th – 30th March 2022	1. Shri Y.F.H. Laloo, A.E.E. 2. Smti E. Shilla, A.E.E. 3. Smti R.R. Marak, A.E.E. 4. Shri J. Kharshiing, S.S.A. 5. Shri A. Lyngdoh, J.S.A.	E-Learning on Performance Evaluation of ETP/STP/CETPs	National Productivity Council, Chennai

CHAPTER 11
LEGAL MATTERS

CASES PENDING IN THE COURTS INVOLVING THE MEGHALAYA STATE POLLUTION CONTROL BOARD AS ON 31.03.2022.

Cases on Environmental issues involving the Meghalaya State Pollution Control Board (MSPCB) either directly or indirectly and which are pending in the Hon'ble Supreme Court, the High Court, the National Green Tribunals and District Courts are highlighted in the following tables:-

11.1: CASES IN THE HON'BLE SUPREME COURT

The following table highlights the cases involving Meghalaya State Pollution Control Board in the Hon'ble Supreme Court during 2021-202:-

Number of Cases Pending	Number of Cases Disposed
16	1

11.2: CASES IN THE HON'BLE HIGH COURT

In the Hon'ble High Court, the cases involved the Meghalaya State Pollution Control Board either as Direct Respondent or as Proforma Respondent and when involved indirectly the Meghalaya State Pollution Control Board answers through the State Government.

The following table highlights the cases involving the Meghalaya State Pollution Control Board in the Hon'ble High Court during 2021-2022.

Number of Cases Pending	Number of Cases Disposed
10	3

11.3:CASES IN THE HON'BLE NATIONAL GREEN TRIBUNALS

Since the inception of the National Green Tribunal (NGT), cases involving the Meghalaya State Pollution Control Board have been mostly filed in the Tribunals Zonal Benches for hearing cases in the Eastern Zone, in the Western Zone, in the Southern Zone and the Central Zone have also been constituted. The Principal Bench sometimes carries out Circuit Benches in the different States of India in matters having direct connection with the concerned state for quick disposal of the cases.

The following tables display the cases and their nature of involvement in different Tribunals and benches:-

CASES IN THE HON'BLE NATIONAL GREEN TRIBUNAL

11.4: PRINCIPAL BENCH, NEW DELHI

Number of Cases Pending	Number of Cases Disposed
9	20

11.5: NGT EASTERN ZONE, KOLKATA

Number of Cases Pending	Number of Cases Disposed
4	2

11.6: NGT SOUTHEREN ZONE, PUNE

Number of Cases Pending	Number of Cases Disposed
1	1

11.7: NGT WESTERN ZONE, PUNE

Number of Cases Pending	Number of Cases Disposed
0	1

11.8: CASES FILED IN THE DISTRICT COURTS OF MEGHLAYA

The NGT, Eastern Zone Bench, Kolkata in its various orders of the cases pending before it (mentioned above) had directed the Meghalaya State Pollution Control Board to take Legal action against the defaulting industries violating the provision of the Water (Prevention and Control of Pollution) Act, 1974 and under the Air (Prevention and Control of Pollution) Act, 1981. Accordingly, complaints have been made against the defaulting industries before the Magistrate First Class of concerned Districts as empowered under relevant Sections of the Water (Prevention and Control of Pollution) Act, 1974 and Chapter VI of the Air (Prevention and Control of Pollution) Act, 1981.

The following are the Complaints before the District Courts:

Number of Cases Pending		Number of Cases Disposed	
East Khasi Hills	3	West Khasi Hills	11
West Khasi Hills	6		
East Jaintia Hills	32		
Ri Bhoi	97		
Total	**138**	**Total**	**11**

CHAPTER 12
FINANCE & ACCOUNTS

The fund of the Meghalaya State Pollution Control Board comprises of contribution by the State Government in the form of Grant-in-Aid under Salary and Non-Salary Head, the Financial Assistance from the Ministry of Environment, Forests and Climate Change (MoEF&CC) under the Scheme "Assistance for Abatement of Pollution" and the Financial Assistance from the Central Pollution Control Board for monitoring of the Environment Quality under the National Programme viz. National Water Monitoring Programme (NWMP) and National Air Monitoring Programme (NAMP).

Besides, the Board is also generating its own financial Resources through collection of Consent/Authorization Fees, Sales of Form and Publications, Analysis Fees of Air and Water Samples, Vehicular Emmission Test, etc.

During the Financial Year 2021-2022, the Receipt and Expenditure of the Board is Rs.1248.96 Lakhs and Rs.1296.69 Lakhs respectively.

The financial summary of the Board during the year 2021-2022 is as shown in Table12.1

TABLE-12.1: FINANCIAL SUMMARY FOR THE YEAR 2021-2022

Sl.No.	Head of Accounts	Amount Rs.(in Lakhs)	
		Receipt	Expenditure
1.	Board's Own Resources		
	i. Consent Fees,Sale of Forms, Authorization Fees,Vehicle EmisssionTest,Waterand Air Sample Analysis etc.	306.31	238.37
	ii. Bank Interest	42.84	
	Sub Total 1 (i& ii)	349.15	238.37
2.	i.Grant -in-Aid,State Govt.(Salary)	669.41	647.40
	ii.Grant -in-Aid, State Govt.(Non-Salary)	130.40	37.02
	Sub Total 2 (i& ii)	799.81	684.42
3.	State Govt.National Green Tribunal (NGT Committee Fund)	NIL	2.94
4.	Grant -in Aid ,State Govt. Development Scheme	NIL	4.64
5.	Grant,Financial Assistance Ministry of Environment & Forests and Climate Change New Delhi	NIL	80.74
6.	Grant,Financial Assistance from Central Pollution Control Board, New Delhi	100.00	285.58
	Total (1 to 6)	**1248.96**	**1296.69**

Total Receipt Rupees One Thousand Two Hundred Forty Eight Lakhs and Ninety Six Thousand only

Total Expenditure Rupees One Thousand Two Hundred Ninety Six Lakhs and Sixty Nine Thousand only.

CHAPTER 13
OTHER ACTIVITIES OF THE BOARD

13.0 WASTE MANAGEMENT

13.1 Bio-Medical Waste Management Rules, 2016

The Meghalaya State Pollution Control Board as a Prescribed Authority for implementation of theBio-Medical Waste Management Rules, 2016 in the State of Meghalaya carried out the following duties and responsibilities in implementation of the Bio-Medical Waste Management Rules, 2016.

1. Compilation of data and submission of the same in annual report to the Central Pollution Control Board.
2. Grant and renewal, suspension or refusal, cancellation or of authorization under these rules.
3. Monitoring of compliance of various provisions and conditions of authorization.
4. Action against health care facilities or common bio-medical waste treatment facilities for violation of these rules.
5. Organising training programmes for staff of health care facilities and common bio-medical waste treatment facilities on segregation, collection, storage, transportation, treatment and disposal of bio-medical wastes.
6. Inspection of Health Care Facilities from time to time to ensure compliance to the provisions of the Bio-Medical Waste Rules, 2016.

13.2 Status of Health Care Facilities

The category of Health Care Facilities (HCFs) in the State of Meghalaya is shown in the Table – 13.2

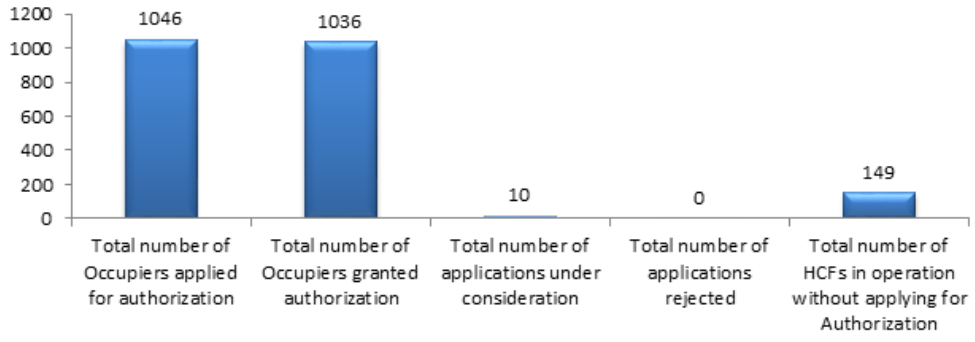
Table – 13.2 Number of HCFs Category-wise in the State as on March 2022

Sl. No.	Name of Health Care Facilities	2021-2022
1	Bedded Hospitals and Nursing Homes (Bedded)	183
2	Dispensaries, Sub Centers, Urban Primary Health Centre	507
3	Veterinary Institutions	198
4	Animal Houses	Nil
5	Pathological Laboratories/ DaignosticCentres/ Clinical Establishment/ Eye Care Centres	305
6	Research Institutions	1
7	AYUSH	1
TOTAL		**1195**

13.3 Status of Authorization under Bio-Medical Waste Management Rules, 2016

Status of authorization granted by the Board to the Health Care Facilities under Bio-Medical Waste Management Rules, 2016 is shown in the figure below:

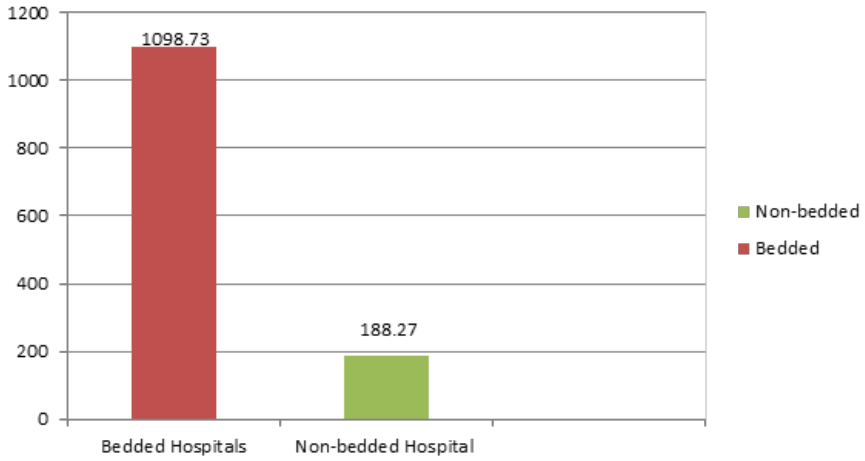
Fig. 13.3: Status of authorization granted by the Board



13.4 Status of Bio-medical Waste Generation

The total quantity of Bio-medical Waste Generation in the State during the year was 1287.00 kg/day. Out of which, 1098.73 kg/day was generated by bedded HCFs and 188.27 kg/day from non-bedded HCFs (Fig. 13.4)

Fig. 13.4 Bio-medical Waste from Bedded and Non-bedded HCF



Total 1287.00 Kg/day

The district-wise distribution of Bio-medical Waste Generation is as shown in Table 13.4.

Table 13.4 District Wise Bio-medical Waste Generation (for the year 2021-2022)

Sl. No.	Name of the District	Number of Health Care Facility submitting Annual Report	Bio-medical Waste Generation (in Kg/day)	Treatment and Disposal of Bio-Medical Waste
1	East Khasi Hills	119	903.8578	In East Khasi Hills District, 36 numbers of Health Care Facility are disposing the Biomedical waste through CBWTF. The remaining 35 numbers of Health Care Facility are disposing the Biomedical waste as indicated in the row below.
2	West Khasi Hills	10	37.1422	In Rural area where there is no common bio-medical waste treatment facility, the HCFs in the Rural areas have their own treatment facilities like Deep Burial Pits and Sharp Pits constructed in accordance to Biomedical Waste Management Rules, 2016. For the Red category biomedical waste in some hospitals and clinics are being collected by the private agency authorized by the Board to be sent to the authorized recyclers for recycling.
3	South West Khasi Hills	5	1.7716	
4	West Jaintia Hills	23	95.6759	
5	East Jaintia Hills	2	0.0134	
6	West Garo Hills	13	121.5917	
7	South Garo Hills	12	22.8498	
8	East Garo Hills	6	5.6096	
9	North Garo Hills	14	10.1876	
10	Ri Bhoi	41	48.25826	
11	South West Garo Hills	16	9.37968	
12	Eastern West Khasi Hill	4	30.663	
TOTAL BIOMEDICAL WASTE – 1287.00054 Kg/Day				

13.5 Bio-medical Waste Treatment and Disposal

The number of Health Facilities having captive treatment and disposal facilities were 229 and the total bio-medical waste treated and disposed by captive treatment facilities in kg/day were 761.00 kg/day. Bio-medical waste treatment and disposal by Common Bio Medical Waste Treatment Facilities was available only in Shillong. The facility comprised of a double chambered incinerator of 100 kg/hr – 50 kg/hr Autoclave, 50 kg/hr Shredder and 1 LKDEffluent Treatment Plant capacity and located at MawlaiMawiong, Shillong. The facility is being operated by the Shillong Municipal Board and has been providing service to hospitals, Veterinary Hospital, Medical Research Institution, Diagnostic Centres, Dispensaries etc. The average quantity of bio-medical waste disposed in the facility is about 526.00 kg/day.

13.6 MANAGEMENT OF COVID-19 BIO-MEDICAL WASTE

The Central Pollution Control Board (CPCB) has developed a software application named COVID-19 Bio-Medical Waste Tracking App (COVID-19 BWM) for the purpose of tracking the generation, collection and disposal of COVID-19 Bio-medical waste in the country. The implementation of the COVID-19 App was made mandatory for all Health Care Facilities (HCF) i.e., Hospital, Quarantine Centres, Isolation Wards, Testing Laboratories, Covid-19 Collection Centre, Home Quarantine Centres etc. generating COVID-19 waste including Local Bodies involved in the collection, handling and treatment of COVID-19 Waste.

The Meghalaya State Pollution Control Board has enforced the implementation of the COVID-19 BWM App in the state with effect from 20th May, 2020. The Board has imparted individual training to all the Nodal Officers of the Health Care Institutions generating COVID-19 waste including Nodal Officers of Urban Local Bodies in respect of registration and utilising the COVID-19 BWM App. There are 39 (Thirty Nine) Health Care Facilities and 2 (Two) Local Body registered in the App in the State who are uploading the daily records of waste generation, handling and disposal from their respective facilities.

The status of Health Care Facilities and Local Bodies registered in the COVID-19 BWM App including the generation, collection and disposal of COVID-19 waste in the respective facilities during 1st April 2021 to 31st March 2022 are as provided in the table:

A. Waste generated from Health Care Facilities:

Sl. No.	Type of Institutions	No of Institutions	Quantity of waste generation /collection/ Disposal (Kg)
1	Hospitals	26	115966
2	Quarantine Centres	1	8083
3	Isolation Wards	3	42695
4	Testing Labs/ Sample Collection Centres	2	10089
Total quantity of waste generation			**176833**

B. Waste collected and disposed in Common Facility

Sl. No.	Type of Institutions	Quantity of waste collection/ Disposal (Kg)
1	Shillong Municipal Board	53451.982
2	Tura Municipal Board	403.65
Total quantity of waste collected and disposal		**53855.632**

Besides, the Meghalaya State Pollution Control Board through the expertise of the International Institute of Waste Management, Bangalore developed the Audio- Visual Training materials on the subject relating to 'Combating Exigencies due to COVID Waste at Common Bio-medical Waste Management Facilities, COVID Hospitals and designated Quarantine Centres'. The resource material thus prepared were circulated to the Director of Health Services (MI), the District Medical & Health Officer of all the Districts, all the Government and private hospitals including Municipal Boards in the State for the purpose of imparting training to the respective officers, staff and employees dealing with COVID waste so as to enhance their capability in Handling, Treatment and Disposal of COVID waste in accordance to the Guidelines and provisions of the BMW Rules, 2016.

13.7 The Batteries (Management and Handling) Rules, 2001.

The implementation of the Batteries (Management and Handling) Rules, 2001 was a continuous process.

Part-A: Quantity of used leads batteries channelized to registered recyclers for the year 2021-2022

A - Manufacturer

No. of Manufacturers	No. of Manufacturers submitted returns	Quantity of Batteries Sold		Quantity of used Batteries sent to Authorised Recyclers		No. of Collection Centres	No. of Dealers	No. of Registered Dealers
		Nos.	Weight(kg)	Nos.	Weight(kg)			
Nil	Nil	Nil	Nil	Nil	Nil	Nil	47	47

B - Assembler

No. of Assemblers	No. of Assemblers submitted returns	Quantity of Batteries Assembled and Sold		Quantity of used Batteries sent to Authorised Recyclers	
		Nos.	Weight(kg)	Nos.	Weight(kg)
Nil	Nil	Nil	Nil	Nil	Nil

C - Importer

Quantity of used Batteries sent to Authorised Recyclers	No. of Importer submitted returns	Quantity of Batteries Sold		Quantity of used Batteries sent to Authorised Recyclers	
		Nos.	Weight(kg)	Nos.	Weight(kg)
Nil	Nil	Nil	Nil	Nil	Nil

D - Bulk Consumers

No. of Bulk Consumers	No. of Bulk Consumers submitted returns	Quantity of Batteries Sold		Quantity of used Batteries sent to Authorised Recyclers	
		Nos.	Weight(kg)	Nos.	Weight(kg)
10	3 (7 Bulk Consumers who have not submitted returns have been directed to file half yearly returns in Form VIII under the Batteries (M&H) Rules, 2001)	0	0	24	509.07

E - Auctioneers

No. of Auctioneers	No. of Auctioneers submitted returns	Quantity of Batteries Sold		Quantity of used Batteries sent to Authorised Recyclers	
		Nos.	Weight(kg)	Nos.	Weight(kg)
Nil	Nil	Nil	Nil	Nil	Nil

F - Recyclers

No. of Authorised Recyclers5	Capacity of Recyclers in MT/ Year	No. of Recyclers submitted returns	Weight of used Batteries received from and recycled							
			Manufacturer	Assembler	Dealer	Importer	Bulk Consumers	Auctioneer	Self imported	Others Sources
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

13.8 E-Waste (Management) Rules, 2016:

E-Waste (Management) Rules, 2016 which was notified vide Notification No.GSR 339(E) dated 23/03/2016 by the Ministry of Environment, Forest & Climate Change, Government of India and enacted and put into force from 1st October,2016. The objective of this Rules was to improve the e-waste management system in the Country and to eliminate the constraints in implementation of the existing Rules and also to give thrust on waste minimization, recycling, for treatment and processing, scientific disposal etc.

The E-Waste Management Rules, 2016 was applied to every manufacturer, producer, consumer, bulk consumer, collection centres, dealers, e-retailer, refurbisher, dismantler and recycler involved in manufacture, sale, transfer, purchase, collection, storage and processing of e-waste or electrical and electronic equipment including their components, consumables, parts and spares which made the product operational.

The Meghalaya State Pollution Control Board has published Public Notice for awareness of all manufacturers, Producers, Collection Centre, Dealers, Refurbishes, Consumers & Bulk Consumers, Dismantler, Recycler on the provisions of E-Wastes Management Rules, 2016 for necessary compliance.

There was no E-Waste Manufacturing Unit, Recycling/DismantlingUnit within the State of Meghalaya. However, there is only one authorized refurbisher namely M/S Rynjah Institute of Information Technology, Don Bosco, Laitumkhrah, Shillong.

For collection and proper disposal of E-Waste generated by Bulk Consumer, Industries, Institution etc the following PRO were actively collecting the E-Waste for channelizing to the authorized recyclers – The PRO are namely M/s Karo Sambhav Pvt. Ltd., M/s RLG Reverse Logistics India Pvt. Ltd. (PRO), M/s Hulladek Recycling Pvt. Ltd.

QUANTITY OF E-WASTE COLLECTED FOR THE YEAR 2021-2022 IN THE STATE OF MEGHALAYA

Sl. No.	COLLECTION PERIOD	ELECTRICAL AND ELECTRONICEQUIPMENT CODE/ITEM/WEIGHT	TOTAL WEIGHT IN KGS
1.	AUGUST,2021	ITEW2-617.75 Kgs. ITEW6-27.10 Kgs. ITEW3-0.60 Kg. ITEW10-3.50 Kgs. GENERAL E- WASTE - 2.10 Kgs.	651.05
2.	DECEMBER,2021	ITEW6-97.70 Kgs. ITEW2-347.15 Kgs. GENERAL E-WASTE - 5.1 Kgs.	449.95
3.	FEBRAURY,2022	ITEW2 - 360.40 Kgs. ITEW6-9.75 Kgs. CEEW2-98.30 Kgs. General -64 Kgs.	532.45
4.	MARCH, 2022	ITEW2 (POWER CORD)- 4 Nos. ITEW2 (KEYBOARD)- 15 Nos. ITEW6 (FUSER ASSEMBLY)- 7 Nos. ITEW6 (SCANNER)- 1 Nos. ITEW2(WIRELESS ROUTER)- 1 No. ITEW2(POWER ADAPTOR)- 3 Nos. ITEW2(LAN NETWORK SWITCH)- 2 Nos. ITEW6(EPSON PRINTER HEADCARRIAGE)- 2 Nos. ITEW6(CATRIDGE- PLOTTER)- 2Nos. ITEW6(LOGIC CARD)- 2900PRINTER)- 4 Nos. ITEW2 (USB LANCONVERTOR)- 1 No. ITEW2(MOUSE)- 10 Nos. ITEW3(LAPTOP BATTERY)- 2 Nos. ITEW2(LAN TESTER)- 1 No. ITEW6(PAPER EJECTERASSEMBLY)- 1 No. ITEW2(MOTHERBOARD)- 2 Nos. ITEW2(MEDIA CONVERTOR)- 1 No. ITEW2(CPU FAN)- 7 Nos. ITEW2(FRONT PANEL USBCONNECTOR)- 2 Nos. ITEW2(HARD DISK DRIVE)- 3 Nos. ITEW2(VGA CABLE)- 1 No. ITEW6(CARTRIDGE LX310)- 1 No. ITEW6(TONER CARTRIDGELASER PRINTER)- 14 Nos. ITEW6(PRINTER ROLLER)- 2 Nos. ITEW6(INK CARTRIDGE)- 2 Nos. ITEW2 (HDMI CABLE)- 1 No. ITEW6(TONER CARTRIDGENPG57)-1 No. ITEW3(DVD DRIVE)5 Nos. ITEW2 (UPS BATTERY)- 3Nos. ITEW6 (CANON LBP2900BPRINTER)- 1 No. ITEW6 (HPDESKJET GT5810 PRINTER)- 1 No. ITEW2(MONITOR)- 5Nos. ITEW2(UPS)- 13 Nos. ITEW2(SMPS)-4 Nos. ITEW2(BATTERY)- 52 Nos. CEEW5(HPSV BULB)- 82 Nos. CEEW5 (ELECTRONIC CHOKE)- 295 Nos. CEEW5 (TUBE LIGHT ROD)- 114Nos. CEEW5 (TUBE LIGHT LED)13 Nos.	717.77

Sl. No.	COLLECTION PERIOD	ELECTRICAL AND ELECTRONICEQUIPMENT CODE/ITEM/WEIGHT	TOTAL WEIGHT IN KGS
5.	APRIL,2022	ITEW2-77.4 Kgs.	79.20
6.	MAY, 2022	ITEW2-8.7 Kgs. ITEW6-87.30	96.00
7.		ITEW2-498.90 Kgs. ITEW6-111.95 Kgs. ITEW3-23.35 Kgs. ITEW1-21.40 Kgs.	655.6
8.	JUNE, 2022	ITEW2-43.90 Kgs. ITEW6-15.50 Kgs. ITEW3-2.15 Kgs.	63
9.	JULY, 2022	ITEW2-165.45 Kgs.	1080.40
		ITEW6-914.95 Kgs.	
		ITEW2-65 Kgs.	65
		ITEW2-453.45 Kgs. ITEW6-68.40 Kgs.	521.85
		ITEW2-7170.15 Kgs.	7170.15
Total quantity of e-waste collected for a period 1/4/2021 to 30/7/2022 is 12082 kgs.			

13.9 Construction and Demolition Waste Management Rules, 2016:

Construction and Demolition Waste Management Rules, 2016 which was notified vide Notification No.G.S.R.317(E) dated 29th March 2016 by the Ministry of Environment, Forest and Climate Change, New Delhi with the objective of this Rule is to improve the management of waste resulting from construction, re-modeling, repair and demolition of any civil structure of individual or organisation or authority who generates construction and demolition waste such as building materials, debris, rubble.

The Construction and Demolition Waste Management Rules, 2016 implies mostly to service provider who provide services like water, sewerage, electricity, telephone, roads, drainage etc. often generate construction and demolition waste during their activities, which includes excavation, demolition and civil work. The Board had advised the Director, Urban Affairs Department to ensure formulation of the policy on Construction and Demolition Waste Management Rules, 2016. The Board, had also instructed the Government Departments/Agencies viz Meghalaya Urban Development Authority, Public Works Department (Roads & Buildings) to prepare Comprehensive Waste Management Plan as required under Construction and Demolition Waste Management Rules, 2016. The Public Works Department had intimated the Board that the Department had already initiated the process for identification of land required for disposal of construction and demolition wastes generated due to construction.

The Meghalaya Urban Development Authority issued a Press Release that prohibited all owner, contractors, firms including Government Department undertaking building construction to dump construction and demolition waste of building materials etc. on roadside, drains and public space.

Site for collection and processing facility yet to be identified by the concerned State Department.

13.10 SOLID WASTE MANAGEMENT

The Meghalaya State Pollution Control Board enforced the Solid Waste Management Rules, 2016 through local bodies and review implementation of these rules twice a year in coordination with the Directorate of Urban Affairs, Government of Meghalaya and the Deputy Commissioner of the respective District. The Board inspects/ monitors environmental standards and adherence to conditions as specified under the Schedule-I and Schedule-II for waste processing and disposal sites, examine the proposal for authorization for waste processing and disposal from the local body or any other agency authorized by the local body. The State is having 7(Seven) Local Bodies viz. Shillong Municipal Board (SMB), Shillong Cantontment Board (SCB), Jowai Municipal Board (JMB), Tura Municipal Board (TMB), Williamnagar Municipal Board (WMB), Resubelpara Municipal Board (RMB) and Baghmara Municipal Board (BMB). These Municipal Authorities were responsible for managing the solid waste generated within their respective jurisdiction. The Shillong Municipal Board however, has extended its disposal facility for other town outside its jurisdiction falling under the Shillong Urban Agglomeration. The status of generation and collection of Solid in the respective towns during 2021-2022 is as shown in the Figure and Chart 13.10

Fig. – 13.10

Status of Solid Waste Management in the State (2020-2021)	
Total number of towns/cities	22
Total number of ULBs	7
Number of Class I & II Cities/ Towns	Class-I: 1No. Class-II: 2Nos
Authorisation	1) Shillong Municipal Board 2) Jowai Municipal Board 3) Tura Municipal Board 4) Williamnagar Municipal Board 5) Resubelpara Municipal Board 6) Baghmara Municipal Board
Solid Waste Generation	Municipal Area Generated – 70 TPD Collected – 67.5 TPD Treated – 68 TPD Landfilled – 95 TPD

13.10.1 Summary Statement on progress made by local bodies in respect of Solid Waste Management

Good practices in cities/towns - Shillong Municipal Board

House-to-house collection - Shillong Municipal Board, Tura Municipal Board, Resubelpara Municipal Board

Segregation - Shillong Municipal Board, Tura Municipal Board, Resubelpara Municipal Board.

Covered transportation - Shillong Municipal Board, Resubelpara Municipal Board, Tura Municipal Board

Solid Waste processing facilities setup:

Sl. No.	Composting	Vermi-composting	Biogas	RDF/Pelletization
1	Shillong Municipal Board	Shillong Municipal Board	Nil	Nil

Processing facility operational:

Sl. No.	Composting	Vermi-composting	Biogas	RDF/Pelletization
1	Shillong Municipal Board	Shillong Municipal Board	Nil	Nil

Processing facility under installation/planned:

Sl. No.	Composting	Vermi-composting	Biogas	RDF/Pelletization
1	Tura Municipal Board	Nil	Nil	Nil

Waste-to-Energy Plants: (Number/names of towns/capacity)

Sl. No.	Plant Location	Status of operation	Power generation (MW)	Remarks
1	Nil	Nil	Nil	Nil

13.10.2 Monitoring at Waste Processing/Landfills Sites (2021-2022)

Sl. No.	Name of Facilities	Ambient Air	Ground Water	Leachate Quality	Compost Quality	VOCs
1.	Dumping Site of Shillong Municipal Board	Yes	Yes	Yes	No	No
2.	Landfill Site of Jowai Municipal Board	Yes	No	No	No	No
3.	Landfill Site of Tura Municipal Board	Yes	No	No	No	No
4.	Landfill Site of Williamnagar Municipal Board	Yes	No	No	No	No

Quarterly Progress Report for Solid Waste Management (including bio-mining of legacy waste dumpsites) for a period from 1st July 2021 upto 31st March 2022

Sl. No.		Questions	Remarks for Qtr. Report for Solid Waste Management		
			01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22
1.		Number of ULBs	7	7	7
2.		Overall Waste Management status on States/ UT			
	a.	Quantity of MSW generated (TPD)	229.18	229.18	229.18
	b.	Quantity of MSW collected (TPD)	191.19	191.19	191.19
	c.	Quantity of segregated & transported (TPD)	191.19	191.19	191.19
	d.	Quantity of MSW processed (TPD)	9.64	9.64	9.64
	e.	Quantity of MSW disposed in secured landfill site (TPD)	50.96	50.96	50.96
	f.	Gap in Solid waste Management UTs (TPD) [1(a) -1(d)-1(e)]	168.58	168.58	168.58
	g.	Solid Waste Management Plan	7	7	7

3.		Waste Collection	Existing			Target			Gap			Timeframe		
			01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	1st July 21 - 30th Sept 21	1st Oct 21 – 31st Dec 21	1st Jan 22 - 31st Mar 22
		ULBs in which waste door-to-door collection is implemented (No)	7	7	7	0	0	0	0	0	0	Completed	Completed	Completed
		ULBs in which segregation of waste is implemented (No)	4	4	4	7	7	7	3	3	3	July, 2021	July, 2021	July, 2021
		ULBs in which transportation of segregated waste is implemented (No)	4	4	4	7	7	7	3	3	3	July, 2021	July, 2021	July, 2021
4.		Waste Processing												
a.		Material Recovery facilities												
	i.	Total Capacity (TPD)	7.64	7.64	7.64	7.64	7.64	7.64	0	0	0	Completed	Completed	Completed
	ii.	Number	1	1	1	1	1	1	0	0	0			
	iii.	Number of UBLs covered	1	1	1	7	7	7	6	6	6	July, 2021	July, 2021	July, 2021

Quarterly Progress Report for Solid Waste Management (including bio-mining of legacy waste dumpsites) for a period from 1st July 2021 upto 31st March 2022

			Existing			Target			Gap			Timeframe		
			01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	1st July 21 - 30th Sept 21	1st Oct 21 – 31st Dec 21	1st Jan 22 - 31st Mar 22
b.		**Recycling**												
	i.	Total Capacity (TPD)	0	0	0	0	0	0	0	0	0			
	ii.	Number	0	0	0	0	0	0	0	0	0			
	iii.	Number of ULBs covered	0	0	0	0	0	0	0	0	0			
c.		**Composting**												
	i.	Total Capacity (TPD)	2	2	2	170	170	170	0	0	0	Completed	Completed	Completed
	ii.	Number	1	1	1	1	1	1	0	0	0	Completed	Completed	Completed
	iii.	Number of ULBs covered	1	1	1	2	2	2	1	1	1	Completed	Completed	Completed
d.		**Biomethanation**												
	i.	Total Capacity (TPD)	0	0	0	0	0	0	0	0	0			
	ii.	Number	0	0	0	0	0	0	0	0	0			
	iii.	Number of ULBs covered	0	0	0	0	0	0	0	0	0			
e.		**RDF**												
	i.	Total Capacity (TPD)	0	0	0	0	0	0	0	0	0			
	ii.	Number	0	0	0	0	0	0	0	0	0			
	iii.	Number of ULBs covered	0	0	0	0	0	0	0	0	0			
f.		**Waste to Energy Plants**												
	i.	Total Capacity (TPD)	0	0	0	0	0	0	0	0	0			
	ii.	Number	0	0	0	0	0	0	0	0	0			
	iii.	Number of ULBs covered	0	0	0	0	0	0	0	0	0			
5.		**Waste Disposal**												
a.		**Landfill**												
	i.	Total Capacity (TPD)	1,34,129 cubic meter	1,34,129 cubic meter	1,34,129 cubic meter									
	ii.	Number	1	1	1	1	1	1	0	0	0			
	iii.	Number of ULBs covered	2	2	2	2	2	2	0	0	0			

Quarterly Progress Report for Solid Waste Management (including bio-mining of legacy waste dumpsites) for a period from 1st July 2021 upto 31st March 2022

			Existing			Target			Gap			Timeframe		
			01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	01.07.21 to 30.9.21	01.10.21 to 31.12.21	01.01.22 to 31.03.22	1st July 21 - 30th Sept 21	1st Oct 21 – 31st Dec 21	1st Jan 22 - 31st Mar 22
6.		**Legacy Waste Management**												
	a.	Number if Dumpsites (No)	6	6	6									
	b.	Quantity of waste dumped at dumpsites (Tons)	7,68,100 MT	7,68,100 MT	7,68,100 MT									
	c.	Number of Dumpsites cleared (No)	No information available	No information available	No information available									
	d.	No of dumpsites in which bio mining has commented	Nil	Nil	Nil									
	e.	Time frame for clearing all dumpsites	0	0	0									
7.		**Other Information**												
	a.	Information regarding development of model towns/ cities/ villages	No information available	No information available	No information available									
	b.	Creation of Environmental cell	Yes	Yes	Yes									
	c.	Standardization of rates for procurement of services/ equipment (to do away with the tendering process) required for solid waste management	No information available	No information available	No information available									

13.11 PLASTIC WASTE MANAGEMENT RULES 2016

The implementation of the Plastic Waste Management Rules 2016 is conjunction with the Solid Waste Management Rules, 2016. All the Municipalities in the State are responsible for proper management of Plastic Waste generated within their respective jurisdiction. But since the Meghalaya State Pollution Control Board did not receive the Annual Report from the Municipal Authority during the year 2021-2022, accordingly vide Office Order No.MSPCB/PWM-1(2019)/2022-23/ dated 25.08.2022 the Board issued directions under Section 5 of the Environment (Protection) Act, 1986 to Shillong Municipal Board, Resubelpara Municipal Board, Williamnagar Municipal Board, Jowai Municipal Board to submit the Annual Report withi 30 days from the date of receipt of the Notice.

13.11.1 Status of Plastic Waste Management Rules, 2016 in the State

Status of Plastic Waste Management			
Estimated Plastic Waste Generation Tons Per Annum (TPA)	Shillong Cantonment Board-720 TPA Baghmara Municipal Board-plastic waste is not segregated		
Registered Plastic Manufacturing or Recycling (including multilayer, compostable) units	1)	M/S Megha Polycon (P) Ltd.	DPE/LLDPE Water Storage Tanks
	2)	M/S Meghalaya Polymers	Water Storage Tanks
	3)	M/S Kakarania Innovative Systems (P) Ltd.	Polythene tubes; Plastic bags (plain/ printed); Plastic sheet films; Linear Wrappers; Laminated rolls/pouches (plain/printed)
	4)	M/S K R Polymers	PVC Pipes and Pipe Fittings, Plastic bags
	5)	M/s S.R.M. Plasto (P) Ltd.	PVC pipes & fittings (Electrical hardware)
	6)	M/s Umadutt Industries Limited	HDPE bags
	7)	M/s Seven Sisters Plastic (P) Ltd.	HDPE and Woven plastic bags
Collection, Segregation, Disposal (Co-processing road construction etc.)	Co-processing of plastic waste in cement kilns undertaken by the following cement plants in the state of Meghalaya – 1. Dalmia Bharat Limited, Lumshnong, East Jaintia Hills District 2. Star Cement Meghalaya Limited, Lumshnong , East Jaintia Hills District 3. Meghalaya Cements Limited, Lumshnong, East Jaintia Hills District The plastic waste is segregated from the dry waste at the dumpsite and collected for compaction and bailing. A 1(one) km road was constructed in Nongkynjeng Village in West Khasi Hills, Meghalaya using plastic waste.		
Partial or complete ban on usage of plastic carry bags (through Executive order)	Manufacture, import, stocking, distribution, sale and use of plastic carry bags/ films of size less than 75 microns and non-woven plastic carry bags of size less than 60 GSM has been prohibited and public notice has been issued vide No. MSPCB/PWM-2/2019/2020-21/66 dated 18th February 2022. w.e.f. 1st July, 2022 – ban on single use plastic, including polystyrene and expanded polystyrene commodities w.e.f. 31st December, 2022 – ban on plastic carry bags/films of size less than 120 microns		
Constitution of State level Advisory Body	State level Advisory Body constituted vide Notification No. UAU.70/2016/81 dated Shillong the 25th January 2018		

13.11.2Steps taken for banning of single use plastic:

The Board has made the following progress in matters relating to elimination of single use plastics in the State –

1. Issue of Public Notice on prohibition of manufacture, import, stocking, distribution, sale and use of (i) plastic carry bags of size less than less than seventy five (75) microns and one hundred and twenty (120) microns w.e.f. 31st December, 2022, non-woven plastic carry bag of size less than sixty (60) gram per square meter and (ii) single use plastic, including polystyrene and expanded polystyrene commodities vide No.MSPCB/PWM-2/2019/2021-22/66 dated 18th February, 2022
2. Issue of Directions to major single use plastic manufacturing unit in the state to comply with the public notice.
3. Issue of Advisories to the following stakeholders with regard to elimination of single use plastic in the state:

i) Home Department, Govt. of Meghalaya, District Administrations and Autonomous District Councils (Garo/ Khasi/Jaintia) for necessary actions on the ban on single use plastic in respective districts.

ii) Forest & Environment Department to declare all parks, sanctuaries, zoos, gardens and other ecologically sensitive areas as 'Plastic Fee Zone' to carry out awareness campaigns through Eco Clubs constituted in various schools in the State.

iii) Education Department to declare all educational institutes as 'Plastic Fee Zone' and to promote the use of plastic alternate materials and promote source segregation so as to inculcate behavioral change in plastic usage by students.

iv) Health Department to ensure zero inventory of banned single use plastic items in commercial establishments in all government as well as private hospitals and health care institutions.

v) Tourism Department to declare all tourist spots in the state as 'Plastic Fee Zone' and to ensure prohibition of sale and use of single use plastics in all the tourist places.

vi) Commerce & Industries to promote manufacturing of alternatives and increasing production capacities of existing ones in order to make alternatives readily available for consumers.

Municipal Boards (Shillong/Jowai/Tura/Resubelpara/Williamnagar/Baghmara/Shillong Cantonment) for necessary actions on the ban single use plastic in respective municipal areas.

13.12 Hazardous Waste Management

All the hazardous waste generating industries in the State are responsible for proper implemention of the Hazardous & Other Waste Management Rules 2016.

Annual Inventory of Hazardous Waste Management (2021-2022)

Sl. No.	Name of the District	Number of Hazardous Waste Generating Industry	Authorized Quantity of Hazardous Waste (Metric Tonne)				Quantity of Hazardous Waste generated as per Annual Return within the State/ UT (Metric Tonne)				Quantity of Hazardous Waste imported during the year (Metric Tonne)	Quantity of Hazardous Waste exported during the year (Metric Tonne)
			Landfillable	Incinerable	Recyclable	Utilizable	Landfillable	Incinerable	Recyclable	Utilizable		
0	1	2	3	4	5	6	7	8	9	10	11	12
1	Ri-Bhoi	7	24		430		2.95		219.89		Nil	Nil
2	East Khasi Hills	1			19.08				7.5			
3	East Jaintia Hills	11			64.133				57.21			

13.13 Online Continous Emission/Effluent Monitoring Systems (OCEMS)

In line with our vision of cleaner and greener India, Meghalaya State Pollution Control Board entrusted Knowledge Lens Pvt. Ltd. with the job of connecting all the industries in Meghalaya State to Meghalaya State Pollution Control Board as well as the Central Pollution Control Board. Keeping up with the current government norms and applying the latest technologies all the industries data pertaining to Emission Monitoring and Air Quality Monitoring using various instruments available in the market is being captured and transmitted to the Pollution Control Boards.

Knowledge Lens Pvt. Ltd. has specifically developed and provided single server platform known as Green Lens (Glens) and installed it on the cloud server for the Pollution Control Board. The pollution data pertaining to Emission and Air Quality is directly captured from different make of instruments installed at the industries and the data is transmitted to Pollution Control Board using dedicated internet connection provided by these industries. The data is presented to the Pollution Control Boards as well as the industries in a user friendly and easy to understand format. A website address as well as username and password have been provided to Pollution Control Board and the industries for viewing the transmitted data in graphical as well as text format and also for downloading the reports. Using their respective username and passwords, the Pollution Control Board can view the data of all the industries present in Meghalaya State connected to the single server platform while the industry can view its individual data only.

The single server platform provided to Meghalaya State Pollution Control Board on cloud platform can keep the data record of all the connected industries for more than 10 years and present it to the Pollution Control Board as and when required. The software is highly customizable and scalable. Various tools have been made available to the Pollution Control Board for monitoring the pollution level. Alarms are generated and sent to the Pollution Control Board as well as industries in case there is a breach of prescribed level of pollutants being discharged into the environment. The software is also equipped with data validation and helps the Pollution Control Board monitor any manipulations that may take place. There is also a provision for integrating the cameras of the industries meeting with Zero Liquid Discharge guidelines. In compliance with the guidelines, video is shown to the Pollution Control Board and the industry without any plug-in and there is a provision of controlling the camera from within the software.

Apart from the single server platform, Knowledge Lens Pvt. Ltd. has provided a separate URL for public viewing as per the Hon'ble Supreme Court order. The same can be viewed on Meghalaya Pollution Control Board website.

The software for Meghalaya Pollution Control Board was customized, installed and made operational in November 2016 and Knowledge Lens will maintain the software platform for the next 5 years from the date of installation.

During the year 2021-2022, the Meghalaya State Pollution Control Board monitored 28 industries that comprises of the Cement, Mining, Coke Oven, Power Plant, Distillery and Iron & Steel around the State of Meghalaya.

The List of Industries is as follows:

Online Pollution Monitoring Portal				
Report Name: Site Details Report				
Report Created by Meghalaya State Pollution Control Board on 2023-08-09 13:32:03				
Sl. No.	**Industry Name**	**Industry Category**	**City**	**State**
1	JUD Cement Ltd.	Cement	Lumshnong	Meghalaya
2	M/s M.D. Coke Industries	Coke	Shallang	Meghalaya
3	M/s Kantalo Coke	Mining	Elaka Sutnga	Meghalaya
4	M/s Mawmluh Cherra Cements Ltd.	Cement	Cherrapunjee	Meghalaya
5	M/s Khliehumim Coke	Coke Oven	Elaka Sutnga	Meghalaya
6	M/s Rilangam Coke Industries	Coke Oven	Shallang	Meghalaya
7	M/s N.M Fules	Coke Oven	Sutnga	Meghalaya
8	M/s Ioanis Industries (P) Ltd.	Coke Oven	Elaka Sutnga	Meghalaya
9	M/s Meghalaya Coke	Coke Oven	Khliehriat	Meghalaya
10	M/s Jiantia Coke Industries	Coke Oven	Khliehriat	Meghalaya
11	Star Cement Limited	Cement	Lumshnong	Meghalaya
12	Shree Shakambari Ferro Alloy Private Limited	Power Plant & Ferro	Rwiang	Meghalaya
13	Shyam Century Ferrous Ltd.	CPP & Ferro	Shillong	Meghalaya
14	CMJ Breweries Pvt. Ltd.	Distillery	Byrnihat	Meghalaya
15	RNB Cement Pvt. Ltd.	Cement	Umiam	Meghalaya
16	Green Valliey Industries Ltd.	Cement	Khliehriat	Meghalaya
17	Lafarge Umiam Mining Pvt. Ltd.	Mining	Nongtrai	Meghalaya
18	Star Cement Meghalaya Ltd.	Cement	Lumshnong	Meghalaya
19	M/s Mahajong Coke LLP	Coke Oven	Khliehriat	Meghalaya
20	Meghalaya Power Limited	Power Plant	Lumshnong	Meghalaya
21	Meghalaya Cement Limited	Cement	Lumshnong	Meghalaya
22	M/s Unique Industry	Coke Oven	Diensatlang	Meghalaya
23	Hills Cement Company Ltd.	Cement	Khliehriat	Meghalaya
24	Goldstone Cements Limited	Cement	Lumshnong	Meghalaya
25	Megha Technical & Engineers Pvt. Ltd.	Cement	Lumshnong	Meghalaya
26	Adhunik Cement Limited (Subsidiary of Dalmia Cement Bharat Limited)	Cement	Thangskai	Meghalaya
27	M/s Northeast Carbon Industries	Coke	Elaka Sutnga	Meghalaya
28	M/s Amrit Cement Limited	Cement	Lumshnong	Meghalaya

13.14 Consent Committees

(i) The function of the Consent Committee is to examine/scrutinize the applications for Consent and recommend the grant or otherwise of Consent in respect of industries/developmental projects with project costs above Rs.25.00 lakhs.

The number of Consent Committees held during the financial year 2021-2022 is as per list below:

Consent Committee during the year 2021-2022				
Sl. No.	**Dates of Consent Committee**	**Numbers of Agendas**	**Cleared**	**Not Cleared**
1	19th March 2021	13	11	2
2	23rd April 2021	12	10	2
3	29th September 2021	41	15	26
4	7th December 2021	40	19	21
5	24th February 2022	52	23	29

13.15 Environmental Compensation

(CIVIL) No. 375/2012), Paryavaran Suraksha Samiti & Anr. Vs. Union of India & Ors has unambiguously directed State & Central Boards to levy Environmental Compensation on violators of Environmental laws.

The NGT Order on the matter is as follows: **"The CPCB may take penal action for failure, if any, against those accountable for setting up and maintaining STPs, CETPs and ETPs. CPCB may also assess and recover compensation for damage to the environment and said fund may be kept in a separate account and utilized in terms of an action plan for protection of the environment."**

In pursuance to the Resolution of Agenda No. 6 of the 82nd Meeting of the Meghalaya State Pollution Control Board held on the 19th March, 2022 the Board recommends that the "**Report of the CPCB In-house Committee on Methodology for Assessing Environmental Compensation and Action Plan to Utilize the Fund"** be adopted for assessment, imposing, collection and utilization of environmental compensation from polluting units in the State of Meghalaya.

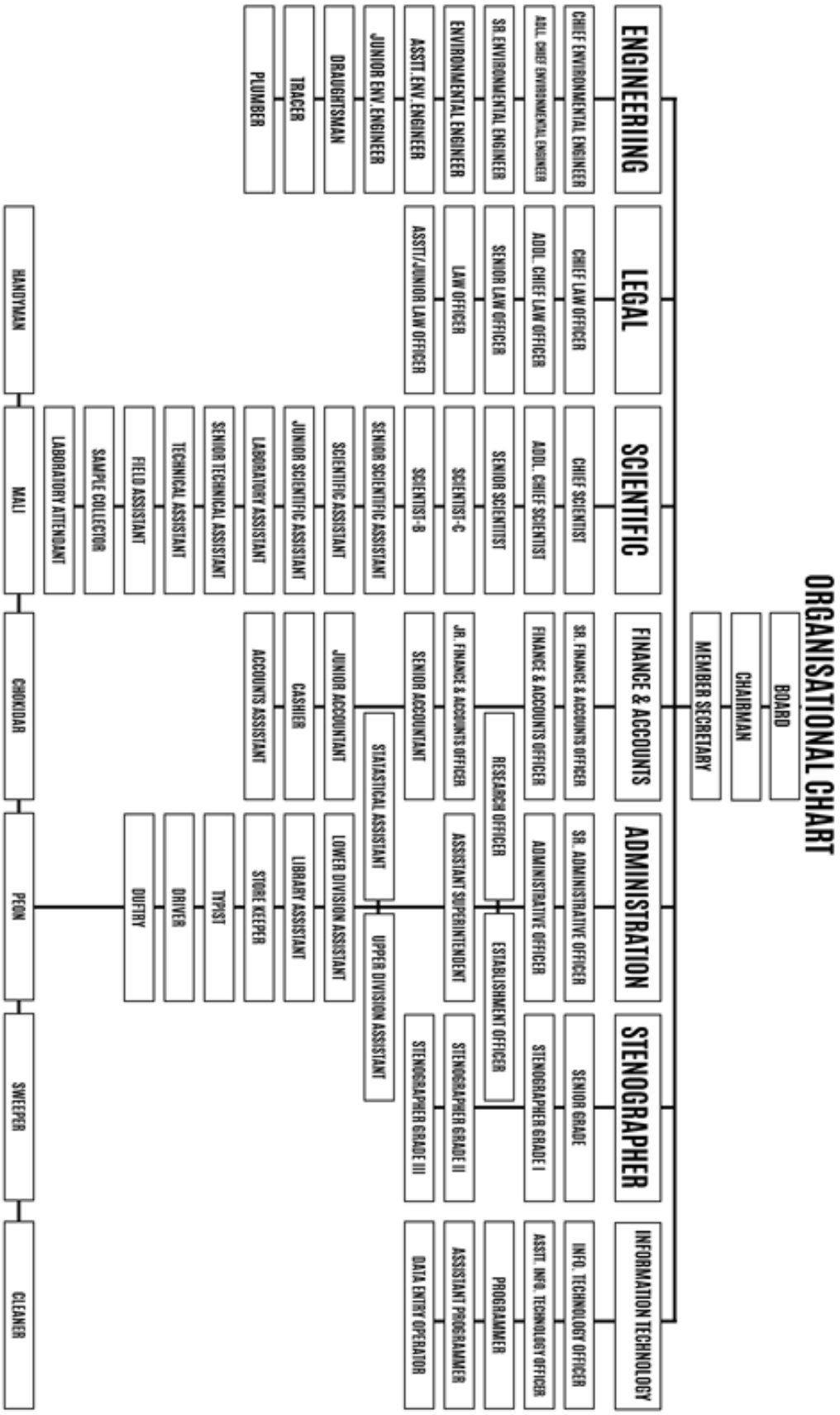
A total of Rs. 26,85,000/- (Rupees Twenty Six Lakhs Eighty Five Thousand) were imposed against 36 (thirty six) violators/ polluting units in the State of Meghalaya during the financial year 2021-2022.

ANNEXURE-I

MEGHALAYA STATE POLLUTION CONTROL BOARD
STAFF POSITION AS ON 31-03-2022

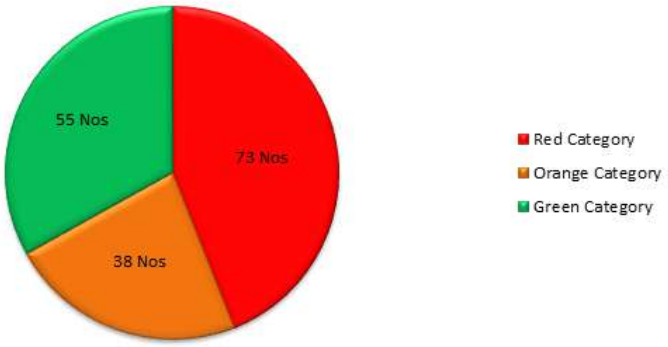
BRANCH	SL. NO.	NAME OF THE POST	SANCTIONED STRENGTH	WORKING STRENGTH	VACANCY
TECHNICAL	1.	Chief Environmental Engineer	1	0	1
	2.	Senior Environmental Engineer	2	2	0
	3.	Environmental Engineer	3	2	1
	4.	Assistant Environmental Engineer	7	5	2
	5.	Junior Environmental Engineer	1	0	1
	6.	Draftsman	1	1	0
	7.	Tracer	1	0	1
	8.	Plumber	1	1	0
LEGAL	1.	Law Officer	1	1	0
	2.	Assistant Law Officer	1	0	1
SCIENTIFIC	1.	Senior Scientist	2	2	0
	2.	Scientist-C	2	1	1
	3.	Scientist-B	3	1	2
	4.	Senior Scientific Assistant	3	2	1
	5.	Scientific Assistant	5	1	4
	6.	Junior Scientific Assistant	6	4	2
	7.	Senior Technical Assistant	1	1	0
	8.	Technical Assistant	2	0	2
	9.	Laboratory Assistant	8	0	8
	10.	Field Attendant/Assistant	2	0	2
	11.	Sample Collector	12	10	2
	12.	Laboratory Attendant	5	4	1
FINANCE & ACCOUNTS	1.	Finance & Accounts Officer	1	0	1
	2.	Senior Accountant	2	2	0
	3.	Junior Accountant	2	0	2
ADMINISTRATION	1.	Administrative Officer	1	0	1
	2.	Research Officer (Info. & Pub.)	1	0	1
	3.	Establishment Officer	1	1	0
	4.	Assistant Superintendent	1	1	0
	5.	Upper Divisional Assistant	5	5	0
	6.	Statistical Assistant (Info. & Pub.)	1	0	1
	7.	Lower Division Assistant	13	11	2
	8.	Typist Grade III	4	1	3
	9.	Library Assistant	1	0	1
	10.	Store Keeper	1	0	1
	11.	Senior Driver/Driver	10	10	0
	12.	Duftry	1	1	0
	13.	Handy Man	1	0	1
	14.	Peon	21	9	12
	15.	Mali	1	0	1
	16.	Chowkidar	4	2	2
	17.	Cleaner	2	1	1
	18.	Sweeper	2	1	1
STENOGRAPHER	1.	Stenographer Grade-II	1	1	0
INFORMATION TECHNOLOGY	1.	Assistant Programmer	1	0	1
	2.	Data Entry Operator	3	1	2
		TOTAL	**152**	**86**	**66**

ANNEXURE-II

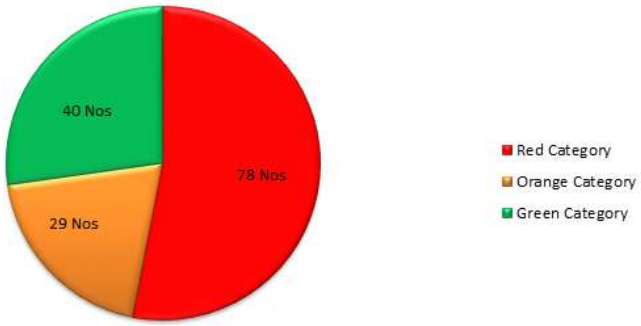

ORGANISATIONAL CHART
BOARD
CHAIRMAN
MEMBER SECRETARY
ENGINEERING
CHIEF ENVIRONMENTAL ENGINEER
ADDL. CHIEF ENVIRONMENTAL ENGINEER
SR. ENVIRONMENTAL ENGINEER
ENVIRONMENTAL ENGINEER
ASSTT. ENV. ENGINEER
JUNIOR ENV. ENGINEER
DRAUGHTSMAN
TRACER
PLUMBER
LEGAL
CHIEF LAW OFFICER
ADDL. CHIEF LAW OFFICER
SENIOR LAW OFFICER
LAW OFFICER
ASSTT./JUNIOR LAW OFFICER
SCIENTIFIC
CHIEF SCIENTIST
ADDL. CHIEF SCIENTIST
SENIOR SCIENTIST
SCIENTIST-C
SCIENTIST-B
SENIOR SCIENTIFIC ASSISTANT
SCIENTIFIC ASSISTANT
JUNIOR SCIENTIFIC ASSISTANT
LABORATORY ASSISTANT
SENIOR TECHNICAL ASSISTANT
TECHNICAL ASSISTANT
FIELD ASSISTANT
SAMPLE COLLECTOR
LABORATORY ATTENDANT
FINANCE & ACCOUNTS
SR. FINANCE & ACCOUNTS OFFICER
FINANCE & ACCOUNTS OFFICER
RESEARCH OFFICER
JR. FINANCE & ACCOUNTS OFFICER
SENIOR ACCOUNTANT
STATASTICAL ASSISTANT
JUNIOR ACCOUNTANT
CASHIER
ACCOUNTS ASSISTANT
ADMINISTRATION
SR. ADMINISTRATIVE OFFICER
ADMINISTRATIVE OFFICER
ESTABLISHMENT OFFICER
ASSISTANT SUPERINTENDENT
UPPER DIVISION ASSISTANT
LOWER DIVISION ASSISTANT
LIBRARY ASSISTANT
STORE KEEPER
TYPIST
DRIVER
DUFTRY
STENOGRAPHER
SENIOR GRADE
STENOGRAPHER GRADE I
STENOGRAPHER GRADE II
STENOGRAPHER GRADE III
INFORMATION TECHNOLOGY
INFO. TECHNOLOGY OFFICER
ASSTT. INFO. TECHNOLOGY OFFICER
PROGRAMMER
ASSISTANT PROGRAMMER
DATA ENTRY OPERATOR
HANDYMAN
MALI
CHOKIDAR
PEON
SWEEPER
CLEANER

ANNEXURE-III

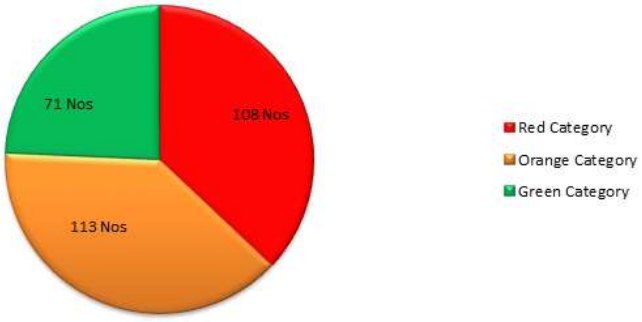
CONSENT TO ESTABLISH ISSUED DURING THE YEAR 2021-2022



TOTAL NUMBERS OF CONSENT TO OPERATE ISSUED DURING THE YEAR 2021-2022



TOTAL NUMBERS OF RENEWAL OF CONSENT TO OPERATE ISSUED DURING THE YEAR 2021-2022



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MEMBER SECRETARY

MEGHALAYA STATE POLLUTION CONTROL BOARD

Forests & Environment Department, Government of Meghalaya

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