Environment Monitoring Report

April 2025 to September 2025

Submitted to

Ministry of Environment, Forests & Climate Change

Govt. of India.

December 2025

M/S City Corporation Ltd.
Amanora Park Town
Hadapsar - Kharadi Bypass
Pune 411028

Phone - +91 020 2565 4555 **Phone - +91 020 6764 0000**

AMANORA
PARK TOWN

CITYGROUP

CITY CORPORATION LIMITED
CIN: U45202PN2003PLC018435

CCL/JKB/11/26 **DATE: 25th November 2025.**

To,
Addl. Principal Chief Conservator of Forests (Central)
Ministry of Environment, Forest & Climate Change.
Regional office, West Central Zone
Ground Floor, East Wing.
New Secretariat building, Civil Lines,
Nagpur – 440001, India.

Subject: - Six monthly Environmental Monitoring report of Amanora Park Town - Pune, Maharashtra for the period **April 2025 to September 2025**.

Ref: Environmental Clearance letter No. J-12011/22/2005/IA (CIE) dt. 27.10.2005 received from MoEF and MoEF &CC Notification No S.O. 5845(E) dated 26.11.2018.

Dear Sir,

With reference to the MoEF & CC notification dated 26th November 2018 regarding the submission of Six Monthly Compliance report of Prior Environmental Clearance Condition to be submitted on 1st June & December of every year.

Please find enclosed herewith Environmental Monitoring report of Amanora Park Town at Hadapsar, Pune, Maharashtra for the period **April 2025 to September 2025**.

Kindly acknowledge the same.

Thanking you,

Yours Faithfully,
For City Corporation Ltd.

CITY CORPORATION LIMITED
AMANORA PARK TOWN, HADAPSAR

J. K. Bhosale
Director

Encl: As Above

Copy to: 1. Principle Secretary, Environment Dept, Govt. of Maharashtra.
2. Regional Office, Maharashtra Pollution Control Board, Pune.

AMANORA
PARK TOWN

CITY GROUP

CITY CORPORATION LIMITED
CIN: U45202PN2003PLC018435

CCL/JKB/11/26 **DATE: 25th November 2025.**

To,
The Secretary,
Environment Dept.(MS),
Room No. 217, 2nd Floor,
Mantralaya Annexe
Mumbai – 400 432

Subject: - Six monthly Environmental Monitoring report of Amanora Park Town – Pune, Maharashtra for the period **April 2025 to September 2025**.

Ref: Environmental Clearance letter No. J-12011/22/2005/IA (CIE) dt. 27.10.2005 received from MoEF and MoEF & CC Notification No S.O. 5845(E) dated 26.11.2018.

Dear Sir,

With reference to the MoEF & CC notification dated 26th November 2018 regarding the submission of Six Monthly Compliance report of Prior Environmental Clearance Condition to be submitted on 1st June & December of every year.

Please find enclosed herewith Environmental Monitoring report of Amanora Park Town at Hadapsar, Pune, Maharashtra for the period **April 2025 to September 2025**.

Kindly acknowledge the same.

Thanking you,

Yours Faithfully,
For City Corporation Ltd.

CITY CORPORATION LIMITED
AMANORA PARK TOWN, HADAPSAR.

J. K. Bhosale
Director

Encl: As Above

Copy to: 1. Chief Conservator of Forest, MoEF Western Regional office, Nagpur.
2. Regional Office, Maharashtra Pollution Control Board, Pune.

AMANORA
PARK TOWN

CITYGROUP

CITY CORPORATION LIMITED
CIN: U45202PN2003PLC018435

CCL/JKB/11/26 **DATE: 25th November 2025.**

To,
Regional Officer,
Maharashtra Pollution Control Board,
Jog Center, 3rd Floor, Mumbai-Pune road,
Wakadewadi, Pune – 411 003.

Subject: - Six monthly Environmental Monitoring report of Amanora Park Town - Pune, Maharashtra for the period **April 2025 to September 2025**.

Ref: Environmental Clearance letter No. J-12011/22/2005/IA (CIE) dt. 27.10.2005 received from MoEF and MoEF & CC Notification No S.O. 5845(E) dated 26.11.2018.

Dear Sir,

With reference to the MoEF & CC notification dated 26th November 2018 regarding the submission of Six Monthly Compliance report of Prior Environmental Clearance Condition to be submitted on 1st June & December of every year.

Please find enclosed herewith Environmental Monitoring report of Amanora Park Town at Hadapsar, Pune, Maharashtra for the period **April 2025 to September 2025**.

Kindly acknowledge the same.

Thanking you,

Yours Faithfully,
For City Corporation Ltd.

CITY CORPORATION LIMITED
AMANORA PARK TOWN, HADAPSAR

J. K. Bhosale
Director

Encl: As Above

Copy to: 1. Chief Conservator of Forest, MoEF Western Regional office, Nagpur.
2. Principle Secretary, Environment Dept, Govt. of Maharashtra.

Your (Half Yearly Compliance Report) has been Submitted with following details

Proposal No	J-12011/22/2005/IA (CIE)
Compliance ID	446455778
Compliance Number(For Tracking)	EC/M/COMPLIANCE/446455778/2025
Reporting Year	2025
Reporting Period	01 Dec(01 Apr - 30 Sep)
Submission Date	26-11-2025
RO/SRO Name	Shri Senthil Kumar Sampath
RO/SRO Email	agmu156@ifs.nic.in
State	MAHARASHTRA
RO/SRO Office Address	Integrated Regional Offices, Nagpur

Note:- SMS and E-Mail has been sent to Shri Senthil Kumar Sampath, MAHARASHTRA with Notification to Project Proponent.

Half Yearly Compliance Report
2025
01 Dec(01 Apr - 30 Sep)

Acknowledgement

Proposal Name	City Corporation Limited, Amanora Park Town, Hadapsar Pune, Maharashtra
Name of Entity / Corporate Office	Jaymalhar Bhosale
Village(s)	N/A
District	PUNE

Proposal No.	J-12011/22/2005/IA (CIE)
Plot / Survey / Khasra No.	N/A
State	MAHARASHTRA
MoEF File No.	J-12011/22/2005/IA (CIE)

Category	INFRA-1
Sub-District	N/A
Entity's PAN	*****2820K
Entity name as per PAN	CITY CORPORATION LIMITED

Compliance Reporting Details

Reporting Year	2025
Remarks (if any)	City Corporation Limiteds Amanora Park Township project obtained the Environmental clearance (EC) on 27.10.2005 FOR 476 Acre valid till completion of project from MoEF. Govt. of India under EIA Notification 1994. Township project is developing in phases till date, Phase I to VI is completed having BUA of 1933487.9 SQ.MT on plot area of 703852.83 sq. mtr. has completed of construction for consent to operate are obtained from MPCB. Since the last 17 years we are submitting six monthly report to MOEF and MPCB regularly. From 2023 we have started submitting Online Six monthly report as per MOEFandCC guidelines. Now we are submitting herewith Six Monthly report for the Period of April 2025 to September 2025.
Reporting Period	01 Dec(01 Apr - 30 Sep)

Details of Production and Project Area

Name of Entity / Corporate Office Jaymalhar Bhosale

	Project Area as per EC Granted	Actual Project Area in Possession
Private	192.628	192.628
Revenue Land	0	0
Forest	0	0
Others	0	0
Total	192.628	192.628

Production Capacity

Sr. no	Product Name	units	Valid Upto	Capacity	Production last year	Capacity as per CTO
1	Residentail and Commercial Township	Square per Meter(SQM)	N/A	1926289	NA	1926289
2	Total Plot area on construction is completed for part I to VI	Square per Meter(SQM)	N/A	1926289	NA	703852.83
3	Total Built up area of which construction is completed for part I to VI	Square per Meter(SQM)	N/A	3274711	NA	1933487.9
4	Consent to operate - PART II- BUA completed for second part.	Square per Meter(SQM)	31/10/2027	3274711	NA	541142.12
5	Consent to operate - PART I- BUA completed for first part.	Square per Meter(SQM)	31/05/2027	3274711	NA	691864.5
6	Consent to operate - PART III- BUA completed for third part.	Square per Meter(SQM)	31/07/2029	3274711	NA	370329.4
7	Consent to operate - PART IV- BUA completed for Fourth part.	Square per Meter(SQM)	30/09/2029	3274711	NA	211172.71
8	Consent to operate - PART V- BUA completed for Fifth part.	Square per Meter(SQM)	31/03/2027	3274711	NA	63078.77

Conditions

Specific Conditions

Sr.No.	Condition Type	Condition Details
1	Human Health Environment	Provisions of Environmental Management System (ISO 14001) should be implemented right from the construction phase that will include maintaining required sanitary and hygienic measures through out the construction phase. Provision of drinking water, waste water disposal and solid waste management should be ensured for labour camps.

PPs Submission: Complied Provision of Environmental Management System (ISO 14001:2004) has been made right from the construction phase. Company has certified as ISO 14001: 2015, ISO 45001:2018 and ISO 9001:2015 from the LMS Certification Ltd in November 2025 valid till November 2028. See Annexure No 01: ISO certificate. Toilets with septic tank and soak pit are constructed at the labour camp and Construction site for construction workers during construction phase. Drinking water is supplied from Amanoras well equipped Water Treatment Plant provided by Ms Thermax a global expert in the Water and Wastewater. Drinking water is stored in a clean separate tank so that it is free from contamination. For solid waste TWO bins system is implemented for the collection garbage. Excel organic waste converter machine, Biogas Plant and Ecoman machine is operational for disposal of solid waste.	Date: 26/11/2025

2	WASTE MANAGEMENT	During peak construction phase, about 6000 workers will be deployed. Adequate drinking water and sanitary facilities should be provided. The safe disposal of waste water and solid wastes generated during the construction phase should be ensured.

PPs Submission: Complied In this phase of construction about 1500 workers are deployed. Adequate drinking water and sanitary facilities are provided for the laborers. As stated above, septic tanks and soak pits are provided for safe disposal of waste water. Vermi-composting pits, Excel Machine, Biogas plant and Foodie Machine is installed for safe disposal of wet waste and running successfully since last 16 years. The dry waste from various construction sites are collected, segregated by rag-pickers and subsequently sent for recycling by appointed vendor. The construction debris is utilized at site for backfilling purpose. See Annexure No 02: Excel OWC photo.	Date: 24/11/2025

3	MISCELLANEOUS	The average water requirement during construction phase has been estimated to be 0.25 MLD. Water usage during construction should be optimized to avoid any wastage

PPs Submission: Complied Water usage during the construction phase is around 0.25 MLD. It is ensured that there is no wastage of water. Ready Mix Concrete is used for the construction which reduces the wastage of water and demand of water for construction. Water Conservation initiatives are not only during the construction phase but also considered in the operational phase of township	Date: 24/11/2025

4	GREENBELT	All the top soil excavated during construction activities should be stored for use its horticulture/ landscape development within the project site

PPs Submission: Complied The top soil found in the project area is black cotton soil which is extremely fertile and rich soil and this is being used in the entire landscape area as shown in the Photo. The green area approved in 12th PLU plan is 226651 sq. mt plot area for parks, gardens and playgrounds, out of which 118049 sq.mt is green landscape area. See Annexure No 03: Top soil photo.	Date: 26/11/2025

5	WASTE MANAGEMENT	Disposal of muck including excavated material during construction

		phase should not create any adverse effects on the neighboring communities and disposed off taking the necessary precautions for general safety and health aspects

PPs Submission: Complied There was neither road nor muck found in the project area. The entire land was agricultural land and is now being used for the construction activities. Murum soft rock that is excavated is used for back filling and making roads inside the project area. See Annexure No 04: Backfilling photo.	Date: 24/11/2025

6	AIR QUALITY MONITORING AND PRESERVATION	Diesel generator sets used during construction phase should have acoustic enclosures and should conform to EPA rules prescribe for air and noise emission standard

PPs Submission: Complied We have 45 numbers of generators of capacity given below at site office, all construction sites and operational sectors, which is silent and also has acoustic enclosures. The capacities are as follows. a. 1010 KVA : 10 Nos. b. 1700 KVA : 01 Nos. c. 500 KVA :10 Nos. d. 400 KVA : 04 Nos. e. 320 KVA : 01 Nos. f. 250 KVA :04 Nos. g. 200 KVA : 07 Nos. h. 160 KVA : 01 Nos. i. 125 KVA :03 Nos j. 75 KVA : 01 Nos. k. 62.5 KVA : 03 Nos. All these generators are used only in case of emergency or power failures. These are maintained in good condition and monitored regularly. See Annexure No 06: DG Monitoring report.	Date: 24/11/2025

7	AIR QUALITY MONITORING AND PRESERVATION	Vehicle/ equipment deployed during construction phase should be in good condition and should conform to applicable air and noise emission standards. Construction vehicle should be operated non peak hours

PPs Submission: Complied Vehicles deployed during construction phase are in good condition and conform to air and noise emission standards. Construction vehicles are operated during non peak hours. PUC certificates are checked by Security guards on regular basis while entering township premises and data is maintained. See Annexure No 06: PUC Certificates. Also we had organized free PUC checkup camp for Amanora citizens and stakeholders on 29th March 2025.	Date: 24/11/2025

8	AIR QUALITY MONITORING AND PRESERVATION	Ambient noise levels should conform to residential standards both during day and night. Only limited necessary construction should be done during night time. Fortnightly monitoring of ambient air quality (SPM, SO2 and NOx) and equivalent noise levels should be ensured during construction phase.

PPs Submission: Complied Ambient noise levels are monitored fortnightly through MITCON Consultancy Services and Green envirosafe MoEF approved laboratory. These are done during day and night time at THREE locations. All the readings confirm to the guidelines mentioned in MPCB Consent to establish, Operate. Similarly ambient air quality is also monitored fortnightly at TWO different locations and all the readings are within the NAAQ limits. See Annexure No 07: Summary for Environment Monitoring Reports for the period of April 2025 to September 2025.	Date: 25/11/2025

9	WASTE MANAGEMENT	Construction spoils including bituminous material and other hazardous materials including oil from construction equipments must not be allowed to contaminate water courses and the dumpsites for such material must be secured so that they should not leach into the ground water. If necessary, oil trap should be installed where there is deployment of heavy materials

PPs Submission: Complied Bituminous material is not found in the project area. Hazardous material like oil from the vehicles or generator sets is in very less quantity and is stored separately with proper precautions. This year we have stored 300KL used Oil, we have submitted hazardous waste Return online. See Annexure No 08: Hazardous waste Return.	Date: 25/11/2025

10	WASTE MANAGEMENT	Regular supervision of the above and other measures should be in place all through the construction phase so as to avoid disturbance to the surroundings

PPs Submission: Complied Regular supervision of the D.G. sets is done and all preventive measures are being taken	Date: 25/11/2025

11	ENERGY PRESERVATION MEASURES	Use of energy efficient construction materials to achieve the desired thermal comfort should be incorporated. Use of fly ash bricks should be explored to the maximum extent possible

PPs Submission: Complied Fly ash is used in tremendous amount and the percentage of usage of fly ash to the normal bricks in the present activity is more than 80 percentage of total demand and GGBS as strengthening compound which is an eco-friendly product. We have promoted environment friendly technique by using MIVAN technology shuttering which replaces wooden shuttering. As we use the RMC for the construction the required amount of fly ash is being used in RMC. RMC plants are also operated as per MPCB consent guidelines given to them. See Annexure No 9: Fly ash bricks photo	Date: 25/11/2025

12	GREENBELT	Areas around the sewage treatment plant should be properly covered with vegetation to avoid any impact on the receptors nearby

PPs Submission: Complied We have Three Sewage treatment plant with proper vegetation around the periphery is developed. Partially operated on 110 KW Solar power at STP 1 and 50 KW Solar power at STP 2 during availability of sun. See Annexure No 10: Green belt around STP photo	Date: 26/11/2025

13	Statutory compliance	Construction should conform to the requirements of local seismic regulations. The project proponent should obtain permission for the plans and designs including structural design, standard and specifications from concerned authority

PPs Submission: Complied We have obtained certification of the plans and designs including structural design, standard and specifications from the structural consultants, whose certification is accepted by Planning Authority like Collector, PMRDA and ULBs. See Annexure No 11: 12th Approved of Master plan order and approved 12th PLU plan. As per Consent to operate we have completed buildings having BUA of 1933487.9 sq. mt. on plot area of 703852.83 sq. mt. out of 1926289 sq. mt. We are having 60 nos of residential towers - R2, R3, R4, R5, R11, R-21, R22, R26, R25, R8, R19, R29, R6 and R33 with total about 8848 no of flats are completed and Commercial sectors are C2, C6 and C8 and 3 schools- AS1, AS3, AS5: AS6. Mall: EB1 and EB2. Amanora club- ATC all are completed.	Date: 26/11/2025

14	Statutory compliance	All mandatory approvals and permissions as required from Air port Authority, Director of Explosives and Fire Department etc should be obtained

PPs Submission: Complied All mandatory approvals and permissions as required from Airport Authority, Fire Advisory Board, Collector, Irrigation Dept, Gram Panchayat etc are done. 1. We have obtained Consent to operate part I to V, also applied for part VI applied on 25.7.2025. 2. We have obtained EC for plot area of 476 acre valid upto completion of project. 3. As per Consent to operate part I to VI we have completed buildings having BUA of 1933487.9 sq. mt. on plot area of 703852.83 sq. mt. 4. Recent under construction sectors are R32, R7:1, R 18:1, R39, C9, AH1. 5. Total we are having 60 nos of residential towers - R2, R3, R4, R5, R11, R-21, R22, R26, R25, R8, R19, R29, R6 and R33 are completed . Commercial sectors are C2, C6 and C8 and 3 schools- AS1, AS3, AS5 ,AS6. Mall: EB1 and EB2. Amanora club- ATC all these construction are completed. These all are included in Consent to operate part I to VI. 6. Completed utilities:U1, U3, U4, U6 and 7, U8, U18 and green area: G1, G2:1, G2:2, G3, G6, G19, G22 and play ground : PG13, PG1. See Annexure No 12: Consent to operate from Part I to V and NOC from Fire and Airport authority.	Date: 26/11/2025

15	GREENBELT	Green belt development should be initiated right from construction stage itself

PPs Submission: Complied Green belt development has been initiated from construction stage itself. We have planted about 35000 plus plants so far and developed about 26 acre green space and central garden with Temple of Environment in the middle of township. Among the tree plantation which starts from construction phase itself there are different types of plant species which have been planted within the township, which include medicinal plants, ornamental plants, timber yielding plants and edible plants. According to 12th PLU Green space and play ground area is total : 226651 Sq. M out of which green area: G1, G2:1, G2:2, G3, G6, G19, G22 and play ground : PG13, PG1. are completed having Total plot Green area of 100826 sq mt. completed. See Annexure No 13: Green belt at Central Green Amanora G2:1	Date: 26/11/2025

16	MISCELLANEOUS	Natural drainage should not be obstructed by proposed construction activity

PPs Submission: Complied It is ensured that natural drainage is not obstructed by proposed constructed activity. We have landscaped and beautified the Nala passing from the township area. See Annexure No 14: Nala beautification at Amanora Photo.	Date: 25/11/2025

17	MISCELLANEOUS	All the measures for the control of environmental pollution should be provided before commissioning of project

PPs Submission: Complied For the control of environmental pollution, measures such as water sprinkling on the roads during the construction activity, provision of acoustic enclosures for DG set for noise pollution, safe disposal of solid waste disposal through Excel Machine, Biogas plant and Composting are done. Sewage from the township is treated up to tertiary level and reused for flushing and gardening. All suitable measures for the control of environment pollution are taken before commissioning of the project. See Annexure no. 15. Construction site dust controller and fogger photo is attached.	Date: 25/11/2025

18	WASTE MANAGEMENT	The installation of sewage treatment plant (STP) should be certified by an independent expert and should submit in this regard to the Ministry before the project is commissioned for operation

PPs Submission: Complied As township is being developed in a phase manner, for first phase, Second phase, Third phase, Fourth Phase ,Fifth Phase and sixth phase. STP 1 : Cap 1750 CMD, STP 2: Cap 3000 CMD and STP 3 : 150 CMD are constructed and Operational. All STPs are been certified by competent authority. MPCB officials visit the plant and collects joint vigilance samples regularly. We also get it tested from the MoEF accredited lab. See Annexure No 16: JVS STP analysis report.	Date: 25/11/2025

19	WASTE MANAGEMENT	A scheme should be framed for recycling and reuse of water waste generated from the project. At least 40% of the total water requirement should be met from waste water recycling and rain water harvesting

PPs Submission: Complied A scheme for recycling and reuse of water is made. Water required for gardening and flushing is used from treated wastewater Sewage. At present more than 40 percent water requirement is met from the recycled water. We are using 100 percent STP recycled water for Flushing, Gardening and Construction purposes. See Annexure no. 17 Seperate meter for Gardening and flushing.	Date: 25/11/2025

20	WATER QUALITY MONITORING AND PRESERVATION	Proper system for rain water harvesting should be provided. The rain water harvesting should be designed in the consultation with the irrigation Dept., Govt. of Maharashtra. Necessary study like existing contour, drainage should be studied before designing rain water harvesting

		PPs Submission: Complied Rain water harvesting plans are made in consultation with Maharashtra Jeevan Pradhikaran and Rural Irrigation dept Zilla Parishad, Pune a Govt. Authority and all the necessary study has been made for the rain water harvesting. Recently Officers from Central Ground Water Board has visited the township and seen the RWH measures and initiatives taken by the Township. They have appreciated the initiative taken by company and displayed the visit report on their website. See Annexure No 18: RWH structure at Amanora.	Date: 25/11/2025
21	WASTE MANAGEMENT	Sewage Treatment Plant with a capacity of 7.6 MLD has been designed to treat the waste water from the commercial and residential complex. As proposed, the waste water will be treated to tertiary level and after treatment, reused for flushing of toilets and gardening. Discharge of treated sewage shall conform to EP rules prescribed for air and emission standards as per CPCB guidelines exhaust will be taken 4 meters above the roof top	
		PPs Submission: Complied As township is being developed in a phase manner, for first phase, Second phase, Third phase, Fourth Phase ,Fifth Phase and sixth phase. STP 1 : Cap 1750 CMD, STP 2: Cap 3000 CMD and STP 3 : 150 CMD are constructed and Operational. All STPs are been certified by competent authority. MPCB officials visit the plant and collects joint vigilance samples regularly. We also get it tested from the MoEF accredited lab. A scheme for recycling and reuse of water is made. Water required for gardening and flushing is used from treated wastewater Sewage. At present more than 40 percentage water requirement is met from the recycled water. We are using 100 percentage STP recycled water for Flushing, Gardening and Construction purposes. Se Annexure no. 19: STP details with Discharge pattern.	Date: 25/11/2025
22	WASTE MANAGEMENT	The sludge generated from Sewage Treatment Plant should be used as manure	
		PPs Submission: Complied The Sludge generated from the STP is treated into Centrifuge, dried and used as manure	Date: 25/11/2025
23	Noise Monitoring & Prevention	Noise barriers will be provided at appropriate locations so as to ensure that the noise levels do not exceed the prescribed standards. DG sets should be provided with necessary acoustic enclosures as per CPCB norms	
		PPs Submission: Complied A noise barrier in the form of trees double line is already done in certain areas and is still under process. Walls are also constructed as boundary demarcation, which prove to be noise barrier. DG sets are provided with necessary acoustic enclosures as per the norms. See Annexure No 20: DG insertion loss report.	Date: 25/11/2025
24	WASTE MANAGEMENT	The solid waste generated should be properly collected, segregated, treated and disposed off as per Municipal Solid Waste Rules. The project proponent should ensure disposal of waste by making suitable arrangement with PMC or by means of outsourcing and if either of this not possible, the project proponent should develop properly engineered facility for its disposal	
		PPs Submission: Complied The solid waste generated from canteens, labour camps ,resedential sectors, commercial sectors of township is properly collected, segregated and disposed off as per Municipal Solid waste rules. Proper bins are provided at each place for wet garbage and dry garbage. Garbage chutes are installed at each residential sectors for the proper segregation and collection. Total amount of waste generated from township from April 2025 to September 2025 is : 1. Total Wet waste generated is 579.655 MT. which is about 3.16 MT per day average. 2. Dry waste generated is: 347.469 MT.which is about 1.89 MT per day average. 3. Inert waste generated is: 1112.53 MT. which is about 6.07 MT per day	Date: 26/11/2025

		average. Vermicomposting bins are constructed at the labour colonies for management of solid waste. Also Excel Organic Waste Converter machine is operational for compost generation. The compost generated from the machine is used as manure directly. In addition Excel OWC machines are provided, also we have installed Biogas plant of 2500 kg per day capacity and another Biogas plant 5000 kg per day capacity which is been successfully operated at SWM site within the township . Generated gas is utilized as fuel for cooking and is used for Electricity generation. As we implement MSW rule 2016, right from the construction phase. Our efforts in the ecofriendly Solid waste Management had awarded by Most Environmental Friendly Initiative Award by Center for Indian Industry CII in 2013 and Pune Municipal Corporation by SWACH award on 20th October 2016. Recyclings Bins are installed at Every Sectors for Collection of Plastic Waste on every Saturday and Sunday and E Waste on every Wednesday and Thursday. On account of World environment day 2025.: BeatPlasticPollution we had inaugrated Biogas plant 5000 kgperday capacity and a drive to avoid use of plastic. Annexure no: 21: World environment day 2025 photos.
25	WASTE MANAGEMENT	The project proponent should obtain authorization from Maharashtra State Pollution Control Board for waste oil/ used oil generation from DG sets and shall be handed as per provisions of Hazardous Waste (Management and Handling Rules)
		PPs Submission: Complied The source of Waste or Used Oil is the DG sets only. The quantity of waste oil is very less and we have obtained authorization for Used oil cat No 5.1 during Consent to Operate from MPCB. This year we have stored 0.3 KL used Oil. We have filled hazardous and e waste return online on MPCB portal. See Annexure No 8: Hazardous waste return. Date: 25/11/2025
26	AIR QUALITY MONITORING AND PRESERVATION	Incremental pollution loads on the ambient air quality, noise and water quality should be periodically monitored after commissioning of the project. The ambient air quality should be monthly at least at one location inside the project site for SPM, SO2, and NOx. The noise level should be monitored at two locations monthly for equivalent noise levels
		PPs Submission: Complied Every fortnightly we do monitoring through MITCON Consultancy Services and Green envirosafe MoEF approved laboratories. Where air, noise, water, soil compost and DG are monitored fortnightly every month for construction and operational phase in township. Monitoring is done by NEERI team also to check Air, noise and water quality. Environmental audits were initiated in 2010-11, followed by subsequent assessments in 2013 and 2019, based on the 2005 Environmental Impact Assessment (EIA) report. We have done environmental monitoring and evaluation study by NEERI, Delhi on JANUARY 18 AND MAY 18. This audit report submitted separately to MOEF and CC office Nagpur. this time we did environmental evaluation in FEBRUARY 2023 and May 2023 monitoring from NEERI. Detailed report is enclosed seperately. See Annexure no- 22-MOEF inward letter for submission of NEERI REPORT Date: 25/11/2025
27	ENERGY PRESERVATION MEASURES	Use of energy efficient construction materials to achieve the desired thermal comfort should be incorporated. The desired level of R and U factors to be achieved. U factor for the top roof should not exceed 0.4 watt/ sq. m / degree centigrade with appropriate modifications of specifications and building ecologies
		PPs Submission: Complied All efforts are made to achieve R and U factor by selecting suitable building Material. Date: 25/11/2025
28	GREENBELT	The green belt design along the periphery of the plot shall be planned to achieve a density of atleast 1000 tree/ acres of land. The open spaces inside the plot should be suitably landscaped with plants of indigenous variety
		PPs Submission: Complied Date:

		Tree plantation programme is being implemented as per Govt. of Maharashtras township guidelines. We have planted more than 35000 trees so far, for the future plantation we have 25000 nos. of plants at our Nursery. According to 12th PLU Green space and play ground area is total : 226651 Sq. M out of which green area: G1, G2:1, G2:2, G3, G6, G19, G22 and play ground : PG13, PG1. are completed having plot area of 100826 sq mt. Also green area and play ground area is provided inside each sectors present in township. See Annexure no 23: Central Green temple of environment at Amanora	25/11/2025
29	MISCELLANEOUS	To avoid traffic congestion, the proposed design of the main road within the premises should be modified as recommended during the EAC meeting.	
		PPs Submission: Complied EAC s recommendations have been implemented in the road plan. The cycle track and pathways are provided along the road side within the township. To promote cycle in township we have tied up with Yulu cycle station where citizen can rent cycle for travelling this avoids congestion as cycle path is separate and also helps in control of air pollution. See annexure no- 24- Pathways and cycle stations at Amanora.	Date: 25/11/2025
30	Risk Mitigation and Disaster Management	Disaster Management Plan based on Risk Assessment study should be followed	
		PPs Submission: Complied Integrated Disaster Management Plan is being developed with in consultation with local bodies. At present Amanora has developed own fire station in the Township to take care of fire emergency. See Annexure no: 25 Fire station at Amanora.	Date: 25/11/2025
31	AIR QUALITY MONITORING AND PRESERVATION	DG sets emissions should conform to EPA norms. Flue gas should be monitored from SPM, SOx and NOx. Public transportation deployed should conform to EURO- III norms	
		PPs Submission: Complied We are monitoring DG sets fortnightly basis and results are within limit Refer Annexure No. 03. At present there is no public transportation in the project area. In township operation we are using CNG operated buses and battery operated vehicles for transportation inside the township. Township has a separate environment corpus, which will be used to measure and promote environment friendly atmosphere. See Annexure No 26 Monitoring report of township.	Date: 25/11/2025
32	MISCELLANEOUS	Back up supply as well as public transportation system proposed for the project should be based on Natural Gas / Cleaner fuel subject to their availability	
		PPs Submission: Complied As mentioned above we are using CNG operated buses and Battery operated vehicles within the township. Presently 4 Battery vehicles and 1 CNG operated vehicle is operational in the township. Also we have provided sharing cycles at various locations which are used by Citizens for small distance travelling. Also we have recently launched Battery operated cycles for citizens. Also we distributed 11 cycles in EHS department for operators. We have also provided battery charging station at two points so as to promote Electrical vehicles in township. also we have our own electric vehicles in township for office use. Annexure no: 27 Battery and electric operated vehicles at amanora photo.	Date: 25/11/2025
33	ENERGY PRESERVATION MEASURES	Project proponent should resort to solar energy at least for street lighting and water heating for commercial complexes and residential areas	
		PPs Submission: Complied Yes, we are using solar energy for street lighting and water heating in various sectors. At present solar energy plant 110 KW and 50 KW is installed at Sewage treatment plant 1 and 2 respectively	Date: 25/11/2025

also 50 KW at WTP Amanora. One pilot plant of Wind and Solar Hybrid power generation plant is operational. Same plants will be used in 50 Green Bungalows plots in our townships. These entire 50 Plots are Eco - Friendly which run on 50 percent Renewable Energy of the Total Electricity Consumption i. e. only 50 percentage Dependence on Electricity supplied from the State Electricity Board. The Interconnecting Street Lighting is solely powered by Solar Energy. Green Energy will be generated for the Bungalow Plot owners by using Solar Wind Hybrid Power Generation system. In addition to above, we have installed Solar PV pannel bus shelters withinh the township. The lighting of the bus station is operated on the Solar PV pannel. In addition we are also generating electricity by 2 BIOGAS PLANT 2.5 ton per day and 5 ton per day capacity plant each the electricity generated by it is utilized for Solid waste management operation to treat waste. See Annexure no28 : STP 2 Solar panels installed photo.	

General Conditions

Sr.No.	Condition Type	Condition Details
1	MISCELLANEOUS	The environmental safeguards contained in the EIA report should be implemented in letter and spirit

PPs Submission: Complied The safeguards contained in the EIA report is done by NEERI are implemented. Monitoring is done by NEERI team also to check Air, noise and water quality. Environmental audits were initiated in 2010-11, followed by subsequent assessments in 2013 and 2019, based on the 2005 Environmental Impact Assessment (EIA) report. We have done environmental monitoring and evaluation study by NEERI, Delhi on JANUARY 18 AND MAY 18. This audit report submitted separately to MOEF and CC office Nagpur. This time we did environmental evaluation in FEBRUARY 2023 and May 2023 monitoring from NEERI. Detailed report is enclosed seperately. Refer Annexure No-22-MOEF inward letter for submission of NEERI REPORT.	Date: 25/11/2025

2	MISCELLANEOUS	All the conditions, liabilities and legal provisions contained in the EC shall be equally applicable to the successor management of the project in the event of the project proponent transferring the ownership, maintenance or management of the project to any other entity

PPs Submission: Complied Provisions will be followed adhered to.	Date: 25/11/2025

3	MISCELLANEOUS	Provision should be made for the supply of kerosene or cooking gas/ pressure cookers to the labourers during construction phase

PPs Submission: Complied Provision of kerosene or cooking gas is made by the contractors to the labours and monitored by us.	Date: 25/11/2025

4	MISCELLANEOUS	All the laborers to be engaged for construction works should be screened for health and adequately treated before the issue of work permits

PPs Submission: Complied Regular health checkup is organized for all laborers working on the site. Any ailment found during the health check up is immediately taken care of. Health checkup and awareness camp on Malaria, Chikanguniya, Dengue and other diseases were organized with the help of Health Department, Pune Municipal Corporation. We have tie up with the Nobel Hospital for any emergency. Presently one OPD unit is operation in the township for taking care of working staff and Citizens. Frequently there is Sanitization of labour camp, construction material and Equipment.	Date: 25/11/2025

5	MISCELLANEOUS	The project proponent should make financial provision in the total budget of the project for implementation of the suggested safeguard

		measures
PPs Submission: Complied Adequate provision has been made. In fact, Environment department has its Annual Budget for the implementation of environmental safeguard and Environment Management Plan. See Annexure no - 30-EMP expenditure from April 2025 to September 2025.		Date: 25/11/2025
6	Statutory compliance	Six monthly monitoring reports should be submitted to the Ministry and its Regional Office, Bhopal
PPs Submission: Complied Last Six monthly monitoring report for the period October 2024 to March 2025 was sent to Ministry of Environment, Forest and Climate Change, Regional Office, Nagpur in June 2025 submitted online on parivesh 2 site as offline is not accepted. See Annexure No 31: six monthly report submitted online.		Date: 25/11/2025
7	Statutory compliance	Officials from the Regional Office of MoEF, Bhopal who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents/ data by the project proponents during their inspection. A complete set of all the documents submitted to MoEF should be forwarded to the CCF, Regional Office of MoEF, Bhopal.
PPs Submission: Complied 1. First Mr. M. S. Daware inspected the project on 28th March 2008. 2. Secondly Mr. A. K. Rana, Chief Conservator of Forest (C) and Mr. M.S. Dawre, Additional Secretary inspected the project area on 21st August 2010. All relevant documents are submitted and forwarded to CCF, Regional Office, Bhopal. 3. Third time Mr. Suresh Kumar Adapa, Scientist E inspected the project area on 21st January 2022. See Annexure no- 33- MoEF and CC visit report City Corporation Ltd. See Annexure No 32: MOEF Visit report		Date: 25/11/2025
8	Statutory compliance	The responsibility of implementation of environmental safeguard rests fully with the Project Proponent, i.e. City Corporation Limited
PPs Submission: Complied CCL is responsible for implementing environmental safeguards		Date: 25/11/2025
9	Statutory compliance	In case of any changes in the scope of the project, the project would require a fresh appraisal by this Ministry
PPs Submission: Complied We have obtained EC for development of township project on 476 acre of land under EIA notification 1994 and at present we are developing on 326 acre of land in phases as per 12th PLU. There is no change of scope in project and development is going on below 476 acre for which EC has been granted 27.10.2005. As EIA notification 2006 has introduced concept of revalidation of EC, we as precautionary measures had applied for same and it is confirmed by SEIAA that there is no requirement of revalidation. Please find EC revalidation letter stating no EC revalidation required. See Annexure no-33- EC copy with revalidation letter.		Date: 26/11/2025
10	Statutory compliance	The Ministry reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including revoking of the environment clearance under the provisions of the Environmental (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner
PPs Submission: Complied Effective implementation of the suggested safeguard measures is ensured. The implementation of the environmental safeguards is done on the guidelines of MoEF.		Date: 25/11/2025

11	Statutory compliance	A copy of the environmental clearance letter would be marked to the local NGO(s) if any from whom suggestion/ representation were received at the time of public hearing

PPs Submission: Complied Copy of the environmental clearance letter would be marked to the local NGO(s) See Annexure No 34: Copy of environmental clearance letter given to NGOs	Date: 25/11/2025

12	Statutory compliance	A copy of the environmental clearance letter should be displayed at the MoEF's regional office, Bhopal and the Office of the Maharashtra State Pollution Control Board, Mumbai

PPs Submission: Complied Copy of the environmental clearance letter was sent to the office of MPCB for display. See Annexure No 35: Copy of environmental clearance letter given to MPCB.	Date: 26/11/2025

13	Statutory compliance	The project proponent should advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded environmental clearance and copies of clearances letters are available with the Maharashtra State Pollution Control Board, Mumbai and may also be seen on the website of the Ministry of Environment and Forests at http:/www/envfor.nic.in. The Advertisement should be made within 7 days from the day of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at Bhopal

PPs Submission: Complied Advertisement in local newspaper was given informing that the project has been accorded environmental clearance and copies of clearance letters are available with MPCB, Mumbai. See Annexure No 36: Advertisement in local newspaper.	Date: 26/11/2025

14	Statutory compliance	These stipulations would be enforced among others under the provisions of water (Prevention and Control of Pollution) Act, 1974, the Air (prevention and Control of Pollution) Act, 1981, the Environment (Protection) act, 1986, the Public Liability (insurance Act, 1991 and EIA Notification 1994 including the amendments

PPs Submission: Complied Noted.	Date: 25/11/2025

15	Statutory compliance	The project proponent should acknowledge the receipt of the environment clearance letter and convey their concurrence to the conditions stipulated above within 15 days from the date of issue of this letter. In case there is no response from the proponent, it would be deemed to have been agreed to

PPs Submission: Complied The project proponent had acknowledged the receipt of the environment clearance letter. See Annexure No37: Receipt of EC letter.	Date: 26/11/2025

Visit Remarks

Last Site Visit Report Date:	21/01/2022
Additional Remarks:	City Corporation Limiteds Amanora Park Township project obtained the Environmental clearance (EC) on

	27.10.2005 from MoEF. Govt. of India under EIA Notification 1994 and has obtained EC for 476 acre plot area which is valid upto completion of construction. At present we are developing on 326 acre of land in phases. There is no change in scope of project other than residential and commercial development on 326 acres only. Out of 476 acres we have completed BUILT UP AREA of 1933487.9 sq. mt. of construction is done and recived Consent to Operates for present developed area. As EC issued under EIA Notification 1994, there is validity period for Commencement of the Construction within Five years which we have complied. As after EIA Notification 2006 Validity period of Environmental Clearance concept introduced. We have suo moto approached to SEAC and SEIAA for clarification on Revalidation. We had presented our case in 51th SEAC III meeting and 106th SEIAA meeting and it was consented by SEIAA that no revalidation is required for the EC issued under EIA notification 1994. As per MoEFs notification dated 21.08.2013 given clarification about validity of Environmental Clearance issued under EIA Notification 1994 that No revalidation is required for the ECs issued under EIA notification 1994. As per SEIAA suggestion and MoEF and CC notification dated 26th November 2018 regarding the submission of Six Monthly Compliance report we are following the same and also sou motto doing Environmental Evaluation Audit every FIVE years from National Environment Engineering and Research Institute (NEERI). Previous audits done and reports submitted to MOEF office for audit year April 2013, November 2019 and last in March 2024. Latest NEERI Environmental Evaluation Audit Report is attached for your reference.

Note: This acknowledgement is as per the details submitted by project proponent. In no way is this document to be considered as conclusion on any action on the compliance of the project. This is strictly for the project proponent's reference purpose.

CERTIFICATE

This is to Certify that the Management System of

CITY CORPORATION LIMITED

Amanora Park Town, Amanora Magarpatta Road, Hadapsar,
Pune - 411028, Maharashtra, India

has been audited and found to comply with the requirements of:

ISO 9001:2015
(Quality Management System)

For the Scope of activities described below:

Design and Construction of Commercial, Residential Buildings and Associated Infrastructure like Educational Institute, Internal Roads.

Certificate No.: IN251122009

Date of initial registration	*Date of this Certificate*	*Surv. audit on or before/ Certificate expiry*	*Recertification Due*
22 November 2025	22 November 2025	21 November 2026	21 November 2028

Validity of this certificate is subject to successful completion of surveillance audit on or before due date, in case surveillance audit not conducted this certificate shall be suspended/cancelled.

Director

Accreditation

EGAC Accredited

IAF

LMS Assessments Limited
International Office: Barlie House, Oxford Court, Manchester M2 3WQ(United Kingdom) **Phone** : +44-161394 1117
(Company Regd. No: 11029176 Registered in England and Wales)
LMS Assessment Services Private Limited
Corporate Office: TF14, 15 Aarchi arcade, Sector 16, Munshi Puliya, Indira Nagar, Lucknow - 16, India **Phone** : +91 955 464 5466

CERTIFICATE

This is to Certify that the Management System of

CITY CORPORATION LIMITED

Amanora Park Town, Amanora Magarpatta Road, Hadapsar,
Pune - 411028, Maharashtra, India

has been audited and found to comply with the requirements of:

ISO 14001:2015
(Environmental Management System)

For the Scope of activities described below:

Design and Construction of Commercial, Residential Buildings and Associated Infrastructure like Educational Institute, Internal Roads.

Certificate No.: IN251122010

Date of initial registration	*Date of this Certificate*	*Surv. audit on or before/ Certificate expiry*	*Recertification Due*
22 November 2025	*22 November 2025*	*21 November 2026*	*21 November 2028*

Validity of this certificate is subject to successful completion of surveillance audit on or before due date, in case surveillance audit not conducted this certificate shall be suspended/cancelled.

Director

Accreditation

LMS Assessments Limited
International Office: Bartle House, Oxford Court, Manchester. M2 3WQ(United Kingdom) **Phone :** +44-161394 1117
(Company Regd. No. 11029178 Registered in England and Wales)
LMS Assessment Services Private Limited
Corporate Office: TF14, 15 Aarohi arcade, Sector 16, Mumshi Pulya, Indira Nagar, Lucknow - 16, India **Phone :** +91 955 464 5464
Web :- www.lmscert.uk/www.lmscert.com
Email :- info@lmscert.uk

CERTIFICATE

This is to Certify that the Management System of

CITY CORPORATION LIMITED

Amanora Park Town, Amanora Magarpatta Road, Hadapsar,
Pune - 411028, Maharashtra, India

has been audited and found to comply with the requirements of:

ISO 45001:2018
(Occupational Health & Safety Management System)

For the Scope of activities described below:

Design and Construction of Commercial, Residential Buildings and Associated Infrastructure like Educational Institute, Internal Roads.

Certificate No.: IN251122011

Date of initial registration	*Date of this Certificate*	*Surv. audit on or before/ Certificate expiry*	*Recertification Due*
22 November 2025	*22 November 2025*	*21 November 2026*	*21 November 2028*

Validity of this certificate is subject to successful completion of surveillance audit on or before due date, in case surveillance audit not conducted this certificate shall be suspended/cancelled.

Director

Accreditation

LMS Assessments Limited
International Office: Bartle House, Oxford Court, Manchester, M2 3WQ(United Kingdom) **Phone :** +44-161394 1117
(Company Regd. No. 11029178 Registered in England and Wales)
LMS Assessment Services Private Limited
Corporate Office: TF14, 15 Aarohi arcade, Sector 16, Mumsi Puliya, Indira Nagar, Lucknow - 16, India **Phone :** +91 955 464 5464
Web :- www.lmscert.uk/www.lmscert.com
Email :- info@lmscert.uk

Form 59

[See rules 115 (2)]

Pollution Under Control Certificate
Authorised By :
Government of Maharashtra

Date	:	08/09/2025
Time	:	13:33:24 PM
Validity upto	:	07/09/2026

Certificate SL. No.	:	MH01204850009519
Registration No.	:	MH12NX5549
Date of Registration	:	14/Jun/2017
Month & Year of Manufacturing	:	March-2017
Valid Mobile Number	:	******7777
Emission Norms	:	BHARAT STAGE IV
Fuel	:	DIESEL
PUC Code	:	MH0120485
GSTIN	:	
Fees	:	Rs.150.00
MIL observation	:	No

Vehicle Photo with Registration plate
60 mm x 30 mm

Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.2

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to https://puc.parivahan.gov.in

Authorised Signature with stamp of PUC Operator
60mm x 20 mm

Form 59

[See rules 115 (2)]

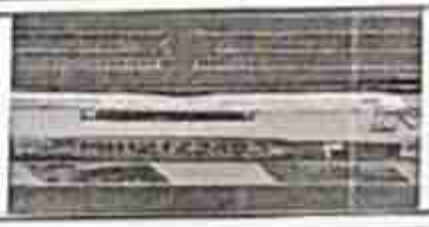
Pollution Under Control Certificate

Authorised By :
Government of Maharashtra

Date	:	**09/06/2025**
Time	:	**13:41:56 PM**
Validity upto	:	**08/12/2025**

Certificate SL. No	:	MH01204650008081
Registration No.	:	MH12FZ3493
Date of Registration	:	20/Aug/2010
Month & Year of Manufacturing	:	July-2010
Valid Mobile Number	:	******6748
Emission Norms	:	BHARAT STAGE III
Fuel	:	DIESEL
PUC Code	:	MH0120485
GSTIN	:	
Fees	:	Rs.150.00
MIL observation	:	No

Vehicle Photo with Registration plate
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	2.45	0.15

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to https://puc.parivahan.gov.in

Authorised Signature with stamp of PUC Operator
60mm x 20 mm

Form 59

[See rules 115 (2)]

Pollution Under Control Certificate

Authorised By :
Government of Maharashtra

Date	:	21/05/2025
Time	:	14:33:46 PM
Validity upto	:	20/05/2026

Certificate SL No.	:	MH012048500007700
Registration No.	:	MH12QG6780
Date of Registration	:	03/Aug/2018
Month & Year of Manufacturing	:	July-2018
Valid Mobile Number	:	******9674
Emission Norms	:	BHARAT STAGE IV
Fuel	:	DIESEL
PUC Code	:	MH0120485
GSTIN	:	
Fees	:	Rs.150.00
MIL observation	:	No

Vehicle Photo with Registration plate
60 mm x 30 mm

Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.2

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to https://puc.parivahan.gov.in

Authorised Signature with stamp of PUC Operator
60mm x 20 mm

Form 59

[See rules 115 (2)]

Pollution Under Control Certificate

Authorised By :
Government of Maharashtra

Date	:	23/02/2025
Time	:	13:38:47 PM
Validity upto	:	22/02/2026

Certificate SL. No.	:	MH01204850006282
Registration No.	:	MH12QW4322
Date of Registration	:	11/Dec/2018
Month & Year of Manufacturing	:	September-2018
Valid Mobile Number	:	******3265
Emission Norms	:	BHARAT STAGE IV
Fuel	:	DIESEL
PUC Code	:	MH0120485
GSTIN	:	
Fees	:	Rs.150.00
MIL observation	:	No

Vehicle Photo with Registration plate
60 mm x 30 mm

Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High Idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.21

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to https://puc.parivahan.gov.in

Authorised Signature with stamp of PUC Operator
60mm x 20 mm

Form 59

[See rules 115 (2)]

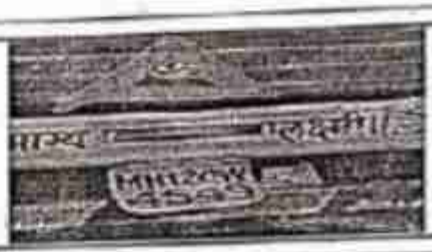
Pollution Under Control Certificate

Authorised By :
Government of Maharashtra

Date	:	21/05/2025
Time	:	14:35:09 PM
Validity upto	:	20/05/2026

Certificate SL. No.	:	MH01204850007701
Registration No.	:	MH12QW4549
Date of Registration	:	14/Dec/2018
Month & Year of Manufacturing	:	September-2018
Valid Mobile Number	:	******1463
Emission Norms	:	BHARAT STAGE IV
Fuel	:	DIESEL
PUC Code	:	MH0120485
GSTIN	:	
Fees	:	Rs.150.00
MIL observation	:	Na

Vehicle Photo with Registration plate
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.09

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to https://puc.parivahan.gov.in

Authorised Signature with stamp of PUC Operator
60mm x 20 mm

Form 59

[See rules 115 (2)]

Pollution Under Control Certificate

Authorised By :
Government of Maharashtra

Date	:	**09/06/2025**
Time	:	**13:39:18 PM**
Validity upto	:	**08/12/2025**

Certificate SL. No.	:	MH01204850008079
Registration No.	:	MH12FZ3491
Date of Registration	:	20/Aug/2010
Month & Year of Manufacturing	:	July-2010
Valid Mobile Number	:	******5748
Emission Norms	:	BHARAT STAGE III
Fuel	:	DIESEL
PUC Code	:	MH0120485
OSTIN	:	
Fees	:	Rs.150.00
MIL observation	:	No

Vehicle Photo with Registration plate
60 mm x 30 mm

Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	2.45	0.26

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to https://puc.parivahan.gov.in

Authorised Signature with stamp of PUC Operator
60mm x 20 mm

Months			Apr-25	Apr-25	Apr-25	Apr-25	Apr-25	Apr-25	May-25	May-25	May-25	May-25	May-25	May-25	Jun-25
Dates monitoring			2	2	2	15	15	15	13	13	13	18	18	18	3
Parameters	**Locations**		R2 site	Elevate Tower	R6 Site	Arbano tower	crown tower	R3 Site	crown tower	Arbano tower	R- 21 Site	Gold Tower	elevate tower	R6 Site ascent avenue	R-11 Future tower
	NAAQ Stds	**Units**													
Time			11:00	10:00	10:20	10:45	11:20	11:50	12:00	11:00	11:30	11:30	12:20	2:30	11:00
Ambient temperature ^{0}C		oC	36	36	36	32	32	32	32	32	32	33	33	33	32
Dry bulb temperature ^{0}C		oC				32	32	32				33	33	33	
Wet bulb temperature ^{0}C		oC				21	21	21				24	24	24	
Relative humidity %		%RH	42	42	42	36.5	36.5	36.5	57	57	57	51	51	51	72
Sampling duration		Min	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
Sulphur Dioxide(SO_2)	≤ 80	µg/M^3	12.72	13.5	12.555	20.56	19.53	18.5	11.21	11.98	11.09	18.57	20.63	19.6	11.86
Oxides of Nitrogen(NO_2)	≤ 80	µg/M^3	32.11	33.98	30.7	27.72	26.45	25.92	24.09	24.61	26.15	23.26	27.91	25.42	23.83
Particulate Matter (PM10)	≤ 100	µg/M^3	76.62	66.64	75.42	47.37	45.92	43.03	55.8	90.85	88.52	43.57	42.42	42.93	76.17
Particulate Matter (PM2.5)	≤ 60	µg/M^3	34.27	31.76	38.04	27.49	27.07	25.41	31.25	37.09	37.5	25.01	24.59	24.18	33.43
Ozone(O_3)	≤ 180	µg/M^3	18.65	18.32	17.98	12.07	11.06	10.56	14.48	14.15	14.15	9.81	9.48	10.56	10.28
Lead(Pb)	≤ 1	µg/M^3	<0.5	<0.5	<0.5	<0.003	<0.003	<0.003	<0.5	<0.5	<0.5	<0.003	<0.003	<0.003	<0.5
Carbon Monoxide(CO)	≤4.0	mg/M^3	0.12	0.09	0.15	0.56	0.53	0.52	0.41	0.26	0.36	0.54	0.51	0.53	0.75
Ammonia(NH_3)	≤400	µg/M^3	<5	<5	<5	10.7	10.27	10.52	<5	<5	<5	11.1	9.48	10.26	<5
Benzene (C_6H_6)	≤ 5	µg/M^3	BDL	BDL	BDL	<0.5	<0.5	<0.5	BDL	BDL	BDL	<0.5	<0.5	<0.5	BDL
Benzo(a) pyrene(BaP)	≤ 1	ng/M^3	BDL	BDL	BDL	<0.02	<0.02	<0.02	BDL	BDL	BDL	<0.02	<0.02	<0.02	BDL
Arsenic (As)	≤ 6	ng/M^3	<0.01	<0.01	BDL	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01	<0.3	<0.3	<0.3	<0.01
Nickel (Ni)	≤ 20	ng/M^3	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3	<0.5

CONSTRUCTION SITE

Ambient Air Monitoring April 25 to September 2025

Jun-25	Jun-25	Jun-25	Jun-25	Jun-25	Jul-25	Jul-25	Jul-25	Jul-25	Jul-25	Jul-25	Aug-25	Aug-25	Aug-25	Aug-25	Aug-25	Aug-25	Sep-25
3	3	16	16	16	1	1	1	15	15	15	4	4	4	18	18	18	1
elevate tower	R6 Site	R-26 Neo tower	crown tower	Arbano tower	crown tower	R- 8 Site	Arbano tower	R22Site	elevate tower	R6 Site	R-7/1 Gateway phase-II	elevate tower	STP-2 Near ruby hospital	crown tower	R-6 Site	Arbano tower	crown tower
10:00	10:20	11:00	11:30	12:30	12:15	10:30	12:45	1:30	12:00	1:00	12:30	12:00	13:00	12:14	12:05	12:34	0:30
32	32	30	30	30	29	29	29	28	28	28	30	30	30	24	24	28	30
		30	30	30				28	28	28				24	24	28	
		18	18	18				24	24	24				22	22	24	
72	72	60	60	60	78	78	78	64	64	64	68	68	68	88	88	64	80
1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
10.89	11.87	20.72	19.42	20.07	11.42	10.15	11.14	18.56	17.46	19.71	11.07	11.79	<10	15.69	17.65	18.63	<10
19.79	25.33	25.78	26.3	27.84	25.22	25.18	26.74	24.26	23.59	25.19	18.13	19.18	19.49	21.85	22.32	20.47	17.7
65.81	64.89	40.42	36.94	37.85	42.08	63.35	50.6	34.84	36.03	35.37	53.59	54.31	48.35	31.56	34.22	32.78	52.46
31.33	27.95	21.68	19.17	20.01	20.05	28	24.19	13.75	14.58	15	27.93	2.93	15.84	11.04	14.12	13.08	19.6
9.29	9.62	8.85	7.96	8.55	7.96	7.96	7.96	7.19	6.61	8.05	7.96	7.57	7.47	6.33	7.18	6.79	7.26
<0.5	<0.5	<0.003	<0.003	<0.003	<0.5	<0.5	<0.5	<0.003	<0.003	<0.003	<0.5	<0.5	<0.5	<0.003	<0.003	<0.003	<0.5
0.46	0.38	0.51	0.56	0.52	0.06	0.07	0.04	0.51	0.54	0.53	0.15	0.18	0.01	0.54	0.51	0.53	0.02
<5	<5	11.75	11.14	11.01	BDL	BDL	BDL	10.45	10.23	11.12	<5	<5	<5	10.51	11.23	10.89	<5
BDL	BDL	<0.5	<0.5	<0.5	BDL	BDL	BDL	<0.5	<0.5	<0.5	BDL	BDL	BDL	<0.5	<0.5	<0.5	BDL
BDL	BDL	<0.02	<0.02	<0.02	BDL	BDL	BDL	<0.02	<0.02	<0.02	BDL	BDL	BDL	<0.02	<0.02	<0.02	BDL
<0.01	<0.01	<0.3	<0.3	<0.3	BDL	BDL	BDL	<0.3	<0.3	<0.3	<0.01	<0.01	<0.01	<0.3	<0.3	<0.3	<0.01
<0.5	<0.5	<0.3	<0.3	<0.3	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3	<0.5

Sep-25	Sep-25	Sep-25	Sep-25	Sep-25	Average Value	Result comparision in "-" negative) Value	
1	1	22	22	22			
Arbano tower	R-4 Site	R-25 sainik city	R-7/1 Gateway phase-II	near Ruby hospital		NAAQ Stds	Result Variances
13:00	11:30	13:00	12:30	12:00	-	-	-
30	30	29	29	29	-	-	-
		29	29	29	-	-	-
		22.5	22.5	22.5	-	-	-
80	80	56.9	56.9	56.9	-	-	-
1440	1440	1440	1440	1440	-	-	-
<10	10.03	17.31	19.54	18.35	**15.57**	≤ 80	**-64.43**
16.2	19.74	20.66	21.76	21.98	**24.08**	≤ 80	**-55.92**
53.16	57.83	36.14	38.65	34.86	**50.87**	≤ 100	**-49.13**
20.01	22.1	15.83	16.66	14.58	**22.96**	≤ 60	**-37.04**
6.93	6.93	7.2	10.82	8.07	**9.78**	≤ 180	**-170.22**
<0.5	<0.5	<0.003	<0.003	<0.003	**BDL**	≤ 1	**BDL**
0.03	0.04	0.52	0.54	0.55	**0.36**	≤4.0	**-3.64**
<5	<5	10.51	7.49	11.03	**BDL**	≤400	**BDL**
BDL	BDL	<0.5	<0.5	<0.5	**BDL**	≤ 5	**BDL**
BDL	BDL	<0.02	<0.02	<0.02	**BDL**	≤ 1	**BDL**
<0.01	<0.01	<0.3	<0.3	<0.3	**BDL**	≤ 6	**BDL**
<0.5	<0.5	<0.3	<0.3	<0.3	**BDL**	≤ 20	**BDL**

GROUND WATER MONITORING April 25-September 2025

Parameters	IS:10500:2012 Req. standards	Month	Apr-25	Apr-25	May-25	May-25	Jun-25	Jun-25	Jul-25	Jul-25	Aug-25	Aug-25	Sep-25	Sep-25	Average Value	Result compar negative)
		Date of sampling	2	15	13	19	3	16	2	15	4	18	2	22		
		Location	Borewell Central green	New Well G6	Mundhwa well	R-9/10 BoreWell water	Labour camp 187 WELL	Neo well	New Well G6	STP-2 Borewell	New Well G6	Borewell central green	New Well G6	Mundhwa well		
		Remarks														Desirable
pH	6.5-8.5	Beyond this range the water will affect the mucous membrane and/or water supply system	7.38	7.32	6.95	7.49	7.18	7.87	7.45	7.27	7.25	7.42	7.39	7.79		6.5-8.6
Total suspended solids	N.S.	Beyond this palatibility decreases and may cause gastro intestinal irritation	<5	6	<5	4	<5	6	<5	<5	<5	<5	<5	8		N.S.
Total dissolved solids	≤ 500mg/l	Beyond this palatibility decreases and may cause gastro intestinal irritation	245	544	556	480	1008	668	930	678	289	380	332	394		≤ 500 mg/lit
Sulphates	≤ 200mg/l	Beyond this causes gastro intestinal irritation when magnesium or sodium are present	9.9	67.25	11.96	62.1	15.54	87.15	14.23	84.18	12.2	47.42	17.98	49.9	**43.25**	≤ 200 mg/lit
Chloride	≤ 250mg/l	Beyond this limit test, corrosion and palatibility are affected.	17.87	13.99	38.26	88.97	39.42	101.38	29.57	95.1	27.79	67.5	35.22	68.97	**51.99**	≤ 250 mg/lit
Nitrate	≤ 45mg/l	Beyond this methaemoglobin takes place	1.02	2.8	1.05	1.75	1.85	<0.5	<1	<0.5	1.05	1.3	1.29	1.34	**2.54**	≤ 45 mg/lit
Calcium	≤ 75mg/l	Encrustation in water supply structure and adverse effects on domestic use	24.29	78.55	55.32	87.37	119.04	102.2	125.49	85.77	42.42	51.58	63.78	53.41		≤ 75 mg/lit
Magnesium	≤ 30mg/l	Encrustation in water supply structure and adverse effects on domestic use	13.75	44.71	32.55	27.22	48.13	42.03	46.65	48.11	13.34	29.34	19.84	30.48		≤ 30 mg/lit
Total Hardness	≤ 200mg/l	Encrustation in water supply structure and adverse effects on domestic use	117.25	380	272.14	330	495.39	428.4	505.4	412	160.85	330	240.91	258.72		≤ 200 mg/lit
Iron	≤ 0.3mg/l	Beyond this limit taste/ apperance are affected, has adverse effect on domestic uses and water supply structures and promotes iron bacteria.	<0.05	<0.025	<0.05	2.4	<0.05	2.4	<0.05	2.2	<0.05	1.9	<0.05	1.97		≤ 0.3 mg/lit
Fecal Coliforms	Absent		Absent	_	Absent	_	Absent	_	Absent	_	Absent	_	Absent	_		Absent
Total coliforms	Absent		Absent	_	present	_	present	_	present	_	present	_	present	_		Absent

ision in "-" Value
Result Variances
-
-
-156.75
-198.01
-42.46

Sr. No	Parameters	Months	Apr-25	Apr-25	Apr-25	Apr-25	Apr-25	Apr-25	May-25	May-25	May-25	May-25	May-25
		Dates of monitoring	2	2	2	15	15	15	12	12	12	19	19
		Location	Site office DG 400 KVA	Mobile DG 125 KVA	ESS-5 DG 62.5 KVA	Data Centre DG 250 KVA	R-2 Site DG set 400 KVA	R-2 Site DG set 400 KVA	R-5 Site DG 200 KVA	R-5 Site DG 200 KVA	WTP DG 320 KVA	R-22 DG 200 KVA	R-22 DG 200 KVA
	Stack No	MPCB limits	S-1	S-2	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12	S-13
1	Time of sampling		14:00	15:30	16:45	2:30	3:00	3:30	11:45	12:15	14:30	2:30	3:00
2	Material of stack		MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS
3	Stack height from GL		6.2	7	4	4.5	7	7	4.5	4.5	3	7	7
4	Type of stack		Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round
5	Flue gas temperature		490	410	371	429	445	465	385	387	511	441	435
6	Differential pressure		7.3	2.7	2.6	5.8	6.8	6.8	5.2	5.6	6	4	4.1
7	Velocity		12.67	7.05	6.58	9.75	10.02	10.27	9.48	9.86	11.73	7.65	7.88
8	Dimensions of stack		0.12	0.1016	0.1	0.18	0.12	0.12	0.1016	0.1016	0.15	0.12	0.12
9	Stack area		0.0113	0.008	0.0078	0.025	0.0113	0.0113	0.008	0.08	0.01766	0.0113	0.0113
10	Gas volume (NM^3/Hr)		313.45	147.57	148.41	620.56	614.53	620	211.32	218.66	434.89	274.36	273.89
11	Particulate matter(Mg/NM^3)	150	65.4	52.4	47.6	35.85	33.27	33.04	61.7	66.5	70.8	35.75	34.43
12	Particulate matter(Kg/day)		0.492	0.186	0.170	0.534	0.491	0.492	0.313	0.349	0.739	0.235	0.226
13	Sulphur dioxide(Mg/NM^3)		60	57	50.0	19.8	15.26	17.37	50	48	72	18.8	17.5
14	Sulphur dioxide(Kg/day)		0.451	0.202	0.18	0.30	0.225	0.258	0.25	0.25	0.75	0.12	0.12
15	Nitrogen dioxide(Mg/NM^3)					25.5	22.92	22.89	_	_	_	22.9	25.5
16	Nitrogen dioxide(Kg/day)					0.380	0.338	0.341				0.151	0.167

DG set Analysis Summary April 25-September 2025

May-25	Jun-25	Jun-25	Jun-25	Jun-25	Jun-25	Jun-25	Jul-25	Jul-25	Jul-25	Jul-25	Jul-25	Jul-25	Aug-25	Aug-25
19	3	3	3	16	16	16	2	2	2	15	15	15	4	4
ESS-1 DG 62.5 KVA	Mobile DG 125	Future tower 500 KVA	Future tower 500 KVA	R-25 DG 200 KVA	NEO tower 250 KVA	NEO tower 250 KVA	Gateway tower 500 KVA	Gateway tower 500 KVA	Adreno Tower 500 KVA	Adreno Tower 500 KVA	Ascent TOWER 200 KVA	Ascent TOWER 200 KVA	R-25 GOLD TOWER 500 KVA	R-25 GOLD TOWER 500 KVA
S-14	S-15	S-16	S-17	S-18	S-19	S-20	S-21	S-22	S-23	S-24	S-27	S-28	S-25	S-26
3:30	13:30	14:30	15:30	2:30	3:00	3:30	14:00	15:00	16:00	2:30	3:00	3:30	13:45	14:45
MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS
4.5	7	7	7	7	7	7	11	11	9.1	9.1	11	11	11	11
Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round
424	408	501	504	444	447	434	550	551	557	471	426	415	552	553
4.1	4.7	5.5	5.8	4.1	3.9	3.5	4.8	4.9	5.5	6.1	4.9	4.8	4.5	4.7
7.54	9.28	11.12	11.45	8.34	8.16	7.62	10.88	11.01	11.72	10.48	8.93	8.72	10.56	10.8
0.1016	0.1016	0.2	0.2	0.12	0.15	0.15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.008	0.008	0.0314	0.0314	0.0113	0.01766	0.01766	0.0314	0.0314	0.01766	0.01766	0.0314	0.0314	0.0314	0.0314
190.99	195.2	747.67	765.28	227.93	346.19	332.83	666.36	673.1	398.64	749.84	182.36	182.86	644.42	657.88
33.22	63.7	69.4	79.4	36.88	35.38	36.17	67.4	72.4	57.4	35.14	31.94	32.54	75.4	68.7
0.152	0.298	1.245	1.458	0.202	0.294	0.289	1.078	1.170	0.549	0.632	0.140	0.143	1.166	1.085
20	71	75.0	78	19	20.2	18	70	73	72	16.50	15.61	14.49	64	66
0.092	0.333	1.346	1.433	0.102	0.168	0.146	1.119	1.179	0.69	0.30	0.068	0.06	0.990	1.04
27.98				22.51	24.98	27				26	24.08	22.85		
0.128				0.123	0.208	0.219				0.459	0.105	0.100		

Aug-25	Aug-25	Aug-25	Aug-25	Sep-25	Sep-25	Sep-25	Sep-25	Sep-25	Sep-25	Average Value	Result comparision in "-" negative) Value	
4	18	18	18	1	1	1	22	22	22			
Elevate tower- DG Set 200 KVA	Ascent avenue 500 KVA	Ascent avenue 500 KVA	Site office DG 400 KVA	Data center DG Set 250KVA	R-2 Site DG set 400 KVA	R-2 Site DG set 400 KVA	ESS-5 DG 62.5 KVA	R-5 Site DG 200 KVA	R-5 Site DG 200 KVA			
S-29	S-30	S-31	S-1	S-6	S-7	S-8	S-5	S-9	S-10		MPCB Limit	Result Variances
16:30	2:30	3:00	3:30	14:00	15:45	16:30	2:30	3:00	3:30	-	-	-
MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS
6.2	7	7	6.2	4.5	7	7	4	4.5	4.5	-	-	-
Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round	Round
460	467	458	455	446	464	467	506	490	516	-	-	-
3.2	6.1	6.2	5.9	3	8.9	9.1	4.4	4.6	4.2	-	-	-
8.13	10.48	10.52	10.13	7.75	13.61	13.81	9.22	9.28	9.1	-	-	-
0.12	0.1	0.18	0.2	0.18	0.12	0.12	0.1	0.1016	0.1016	-	-	-
0.0113	0.0314	0.1016	0.0113	0.025	0.0113	0.0113	0.0078	0.008	0.08	-	-	-
214.25	187.46	189.79	750.3	466.04	355.58	358.48	221.19	229.82	214	-	-	-
54.3	37.06	38.68	33.63	64.7	68.4	66.7	29.46	31.92	32.6	**49.70**	**≤ 150**	**-100.30**
0.279	0.167	0.176	0.606	0.724	0.584	0.574	0.156	0.176	0.167			
51.0	28	29.1	24.4	45	57	62	18.8	21.45	24	**41.08**	-	-
0.26	0.126	0.132	0.440	0.503	0.486	0.533	0.10	0.12	0.12	**0.42**	**≤ 3**	**-2.46**
	25.42	27.92	20.28				19.1	20.38	21.46	**23.86**	-	-
	0.114	0.127	0.365				0.101	0.112	0.110	**0.20**	-	-

Sewage Water Analysis April 25 - September 2025

Parameters	Months		Apr-25	Apr-25	May-25	May-25	Jun-25	Jun-25	Jul-25	Aug-25	Aug-25	Sep-25	Average Value
	Date of sampling		2	15	13	19	3	2	15	4	18	22	
	Location		STP outlet 750 CMD	STP outlet 1 MLD	STP outlet 150 CMD	STP outlet 1.5 MLD A	STP outlet 1.5 MLD B	STP outlet 1 MLD	STP outlet 0.75 MLD	STP outlet 1.5 A MLD	STP outlet 0.15 MLD	STP outlet 1.5 B MLD	
	Units	MPCB limits											
pH		6.5-9.5	6.9	7.62	7.82	7.14	8.09	7.98	7.09	7.08	7.32	6.87	7.39
Total Suspended Solids	Mg/ L	≤ 100	9	<5	<5	<5	5	<5	<5	<5	<5	<5	7.00
Biochemical Oxygen Demand	Mg/ L	≤ 30	5	4.51	7	4.2	8	7	4.35	10	5.65	5.88	6.16
Chemical Oxygen Demand	Mg/ L	≤ 150	25	16	33	14	37	26	16	43	20	19.2	24.92
Total Kj eldhal Nitrogen as N	Mg/ L	≤ 50	2.45	5.63	2.12	1.88	1.98	<1	1.6	1.26	2.24	1.82	2.33
Ammonical Nitrogen as NH3-N	Mg/ L	≤ 25	<0.5	2.24	<0.5	1.2	<0.5	<0.5	1.02	<0.5	1.68	1.1	1.45
Dissolved Phosphates as P	Mg/ L		<5	<2.5	<5	<2.5	<5	<5	<2.5	<5	<2.5	<2.5	
Disssolved Oxygen	Mg/ L	≥ 5	4.6	–	4.2	–	4	6.4	–	4.2	–	–	4.68
Floating Matter	Mg/ L	≤ 10	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	BDL
Residual Chlorine	Mg/ L	≤ 1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	BDL
Detegergents as MBAS	Mg/ L	≤ 1	<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.2	<0.2	BDL
Fecal Coliform	Nos/ 10		70	<2	90	80	70	170	90	70	17	26	76

Result comparision in "-" negative) Value	
MPCB Standards	**Result Variances**
5.5-9.5	.....
≤ 100	**-93.00**
≤ 30	**-23.84**
≤ 150	**-125.08**
≤ 50	**-47.67**
≤ 25	**-23.55**
≥ 5	**-0.32**
≤ 1	**BDL**
≤ 1	**BDL**
≤ 10	**BDL**
500	**-424.11**

Jun-25	**Sep-25**
19	**2**
STP 1INLET	STP 2 INLET
7	6.97
28	42
63.47	64
224.4	235
<1	2.07
<0.1	1.79
3.07	5.28
_	1.3
ABSENT	ABSENT
	<0.1
	<0.1
	900

Ambie

Ambient Noise (day)

	Months	Apr-25						May-25						
	Dates	2	2	2	15	15	15	13	13	13	19	19	19	3
Locations		R2 site	Elevate Tower	R6 site Ascent tower	R3 site	Crown tower	Arbano Site	Crown tower	Arbano Site	R21 site	Elevate tower	R6 site	Gold tower near T-42	R-11 Future Tower
Result	**Stds 65 dB**	61.4	62.4	61.8	59.1	61.2	60.4	59.6	61.2	60.7	58.7	57.3	58.8	64.8

1

	Months	Apr-25						May-25						
	Dates	2	2	2	15	15	15	13	13	13	19	19	19	3
Locations		R2 site	Elevate Tower	R6 site Ascent tower	R3 site	Crown tower	Arbano Site	Crown tower	Arbano Site	R21 site	Elevate tower	R6 site	Gold tower near T-42	R-11 Future Tower
Result	**Stds 55 dB**	52.4	51.7	52.3	50.1	52.9	50.8	51.4	50.6	50.1	52.3	53.7	51.4	53.6

ıt Noise Monitoring April 25-September 2025

Jun-25					Jul-25						Aug-25						Sep-25			
3	3	16	16	16	1	1	1	15	15	15	4	4	4	18	18	18	1	1	1	22
Elevate tower	R6 site Ascent tower	Arbano Site	Crown tower	R 26 site	R-8 Site	Crown tower	Arbano Site	R-22 Site	Elevate tower	R6 site	R-7/1 Gateway phase - II	Elevate tower	STP-2 Near ruby hospital	R-6 Site	Crown tower	Arbano Site	R-4 SITE	Crown tower	Arbano Site	Near Ruby hall
53.1	61.3	57.3	58.8	58.7	50.7	60.5	62.7	57.9	57.1	62.5	61.7	62.4	58.7	57.3	57.9	64.5	62.4	62.6	61.7	57.2

Jun-25					Jul-25						Aug-25						Sep-25			
3	3	16	16	16	1	1	1	15	15	15	4	4	4	18	18	18	1	1	1	22
Elevate tower	R6 site Ascent tower	Arbano Site	Crown tower	R 26 site	R-8 Site	Crown tower	Arbano Site	R-22 Site	Elevate tower	R6 site	R-7/1 Gateway phase - II	Elevate tower	STP-2 Near ruby hospital	R-6 Site	Crown tower	Arbano Site	R-4 SITE	Crown tower	Arbano Site	Near Ruby hall
48.7	52.4	51.4	53.7	52.3	44.7	46.8	47.3	53.2	51.4	53.5	46.5	45.7	42.3	52.2	50.6	54.2	49.5	49.3	49.6	50.7

			Result comparision in "-" negative) Value	
22	22			
R-7/1 Gateway phase - II	Sainik city	**Average Value**	**MPCB Standards**	**Result Variances**
61.9	62.3	**59.96**	**Stds 65 dB**	**-5.04**

			Result comparision in "-" negative) Value	
22	22			
R-7/1 Gateway phase - II	Sainik city	**Average Value**	**MPCB Standards**	**Result Variances**
50.1	52.3	**50.60**	**Stds 55 dB**	**-4.40**

Soil Analysis			
Sr. No	Parameters	Units	December-24
			3
			SWM Site Soil sample
			Result
1	pH	_	7.96
2	Conductivity	µs/cm	422.6
3	Sodium absorption ratio		1.81
4	Texture	_	Clay loam
5	Percentage of different components		
	sand	%	24
	silt	%	30
	clay	%	46
6	Bulk Density	gm/cm2	1.11
7	Organic carbon	%	1.06
8	Water holding capacity	%	42.5
9	Calcium (as Ca)	mg/Kg	87.14
10	Magnesium (as Mg)	mg/Kg	36.63
11	Available Nitrogen	Kg/ha	97.7
12	Pottassium (as K)	Kg/ha	201.6
13	Iron (as Fe)	mg/Kg	0.81
14	Zinc (as Zn)	mg/Kg	0.66
15	Copper (as Cu)	mg/Kg	<0.5
16	Sodium	mg/Kg	38.3
17	Manganese (as Mn)	mg/Kg	1.12
18	Total Chromium (as Cr)	mg/Kg	<0.5
19	Nickel (as Ni)	mg/Kg	<0.5
20	Cadmium (as Cd)	mg/Kg	<0.5
21	Lead (as Pb)	mg/Kg	<0.5

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Form 4

See rules 6(5),13(8),16(6) and 20(2) of Hazardous and other wastes 2016

FORM FOR FILING ANNUAL RETURNS

[To be submitted to state pollution control board/pollution control committee by 30th June of every year for the preceeding period April to march]

Unit Name:	***Plant Name:***	
City Corporation Ltd - Amanora Park Town	Amanora Park Town Project	
Unique Application Number:	***Submitted On:***	***Industry Type :***
MPCB-HW_ANNUAL_RETURN-0000060118	03-07-2025	Generator

Submitted for Year:

2025

1. Name of the generator/operator of facility	***Address of the unit/facility***	
M/s City Corporation Limited	Amanora Park Town, Amanora Magarpatta Road, Hadapsar, Pune -411028.	
1b. Authorization Number	***Date of issue***	***Date of validity of consent***
Format 1.0/CAC-CELL/UAN No. 0000178200/CR/2401000587, Format 1.0/CAC-CELL/UAN No. 0000177804/CR/2401000870,Format 1.0/CAC-CELL/UAN No. 0000216774/CR/2410000172, Format 1.0/CAC-CELL/UAN No. 0000219623/	Jan 6, 2024	Oct 20, 2025
2. Name of the authorised person	***Full address of authorised person***	
J. K. Bhosale	Amanora Park Town, Amanora Magarpatta Road, Hadapsar, Pune -411028.	

Telephone	***Fax***	***Email***
9763720193	NA	amitkumar.saste@amanora.com

3.Production during the year (product wise), wherever applicable

Product Type *	***Product Name ****	***Consented Quantity***	***Actual Quantity***	***UOM***
OTHERS	TOTAL BUA C20 Part 1 sqmt	691864.0000	691864	Sq.M
OTHERS	TOTAL BUA C20 Part II- SQMT	541142.1200	541142.12	Sq.M
OTHERS	TOTAL BUA C20 Part III- SQMT	370329.0000	370329	Sq.M
OTHERS	TOTAL BUA C20 Part IV- SQMT	211172.7100	211172.71	Sq.M

PART A: To be filled by hazardous waste generators

1. Total Quantity of waste generated category wise

Type of hazardous waste	***Wate Name***	***Consented Quantity***	***Quantity***	***UOM***
5.1 Used or spent oil	Used Oil from DG set set	0.670	0.3	KL/Anum

2. Quantity dispatched category wise.

Type of Waste	***Quantity of waste***	***UOM***	***Dispatched to***	***Facility Name***
5.1 Used or spent oil	0	KL/Anum	0	NA

3. Quantity Utilised in-house,If any

Type of Waste	*Name of Waste*	*Quantity of Waste*	*UOM*
	NA	0	KL/Anum

4. Quantity in storage at the end of the year

Type of Waste	*Name of Waste*	*Quantity of Waste*	*UOM*
5.1 Used or spent oil	Used oil from DG sets	0.3	KL/Anum

5. Quantity disposed in landfills as such and after treatment

Type	*Quantity*	*UOM*
Direct landfilling	NA	KL/Anum
Landfill after treatment	NA	KL/Anum

6. Quantity incinerated (if applicable)

UOM
KL/Anum
NA

Personal Details

Place	*Date*	*Designation*
Pune	2025-06-30	Director

पुणे महानगर प्रदेश विकास प्राधिकरण, पुणे

Pune metropolitan Region Development Authority,Pune

नवीन प्रशासकीय इमारत, आकुर्डी रेल्वे स्टेशन जवळ, आकुर्डी, पुणे- ४११०४४

PUNE METROPOLITAN New Administrative Building, Near Akurdi Railway Station, Akurdi, Pune-411044

Ph No.:1020- 250 33 344 / 356 / 333 / फॉक्स नं. ०२०- २५ 33 344/ 356 / 333 E-mail:comm@pmrda.gov.in

विकास परवानगी व प्रारंभ प्रमाण पत्र

(महाराष्ट्र प्रादेशिक नियोजन व नगर रचना अधिनियम १९६६ च्या कलम १८ व ४१ आणि मंजूर विकास नियंत्रण व प्रोत्साहन नियमावलीतील नियम क्र. ३६ नुसार)

जा.क्र. : बीएचए/मौ. हडपसर/स.नं.१३८/१८ व इतर/प्र.क्र. ३१८९/२४-२५/१९०३ दि. ३३ /०४/२०२५

प्रति,

मे. सिटी कार्पोरेशन लि. तर्फे
संचालक श्री. जे. के. भोसले
रा. ९१७/१८, एफ. सी. रोड शिवाजीनगर, पुणे

मौजे- हडपसर, तालुका - हवेली, जिल्हा - पुणे येथील स.नं १३८/१८ व इतर, एकूण क्षेत्र – १३७.३५५१ हे. व निव्वळ क्षेत्र १२५.३०१७ हे. क्षेत्रावरील अमानोरा पार्क टाऊन या एकात्मीकृत नगर वसाहतीचा बारावा सुधारित बृहत आराखडा प्रस्ताव अभिन्यास मंजुरीस्तव प्राधिकरणाकडे प्राप्त झाला आहे. आपण प्रस्तावासोबत सादर केलेल्या कागदपत्रास अधिन राहून सुधारित बारावा बृहत आराखड्यास सोबतच्या परिशिष्ट 'अ' मध्ये नमूद अटी व शर्तीस अधिन राहून उक्त प्रस्तावास मंजूरी देण्यात येत आहे.

(महानगर आयुक्त तथा मुख्य कार्यकारी अधिकारी यांचे मान्यतेने)

(श्वेता पाटील)
सह महानगर नियोजनकार
पुणे महानगर प्रदेश विकास प्राधिकरण, पुणे

पु.म.प्र.वि.प्रा.

पुणे महानगर प्रदेश विकास प्राधिकरण, पुणे यांचेकडील दि.१५/०४/२०२५ रोजीचे पत्र. क्र.३००/२४-२५ सोबतचे

परिशिष्ठ 'अ'

१) एकात्मीकृत नगर वसाहत विकसित करणेबाबत शासन मंजूर दिनांक १६/११/२००५, दि. ०८/०३/२०१९ रोजीच्या विनियमाचे आधारे प्रस्ताव कंपनीने सादर केलेला असल्याने सदर विनियमातील सर्व अटी / शर्तीं व त्यामध्ये वेळोवेळी सुधारित करणेत येणाऱ्या सर्व नियमाचे आणि त्यानुषंगाने शासनाने दिलेल्या निर्णयाचे पालन करणे अर्जदार कंपनीवर बंधनकारक राहील. पूर्व मंजूर बृहत आराखड्यातील सर्व अटी / शर्ती अर्जदार कंपनीवर बंधनकारक राहतील.

२) शासन अधिसुचना दि. ०४/१०/२०१७ अन्वये मौ. हडपसर हे गाव पुणे महानगरपालिका हद्दीमध्ये समाविष्ठ आलेले आहे. शासन निर्णय क्र. टीपीएस / १८१८ / ५० /प्र.क्र. ३६/१९ / नवि – १३ दि. १३/०९/२०१९ अन्वये मौ. मांजरी बु व मौ. हडपसर येथील विशेष नगर वसाहत प्रकल्प, एकात्मीकृत नगर वसाहत प्रकल्पात परावर्तीत करून त्याचे सनियंत्रण पुणे महानगर प्रदेश विकास प्राधिकरणाकडे हस्तांतरीत करण्यात आलेले आहे. त्यास अनुसरून सुधारित बारावा बृहत आराखडा मंजूर करण्यात येत आहे. सदर शासन निर्णयात नमूद सर्व अटी / शर्तींचे पालन करणे अर्जदारांवर बंधनकारक राहील. तसेच शासन निर्णय क्र. टीपीएस / १८१८ / ५० /प्र.क्र. ३६/१९ / नवि – १३ दि. ३०/०९/२०१९ प्राप्त Locational Clearance मध्ये सर्व अटी / शर्तींचे पालन करणे अर्जदार कंपनीवर बंधनकारक राहील.

३) शासनाच्या दि. ०८/०३/२०१९ रोजीच्या नियमावलीतील नियम क्र. १४.१ मधील Transtion Policy नुसार Locational Clearance पूर्वी दिलेले असल्यास एकात्मीकृत नगर वसाहत प्रकल्प राबविता येतो. तदनुषंगाने अर्जदार कंपनीने दि. ०५/०३/२०२५ रोजीच्या पत्रान्वये सादर केलेल्या सुधारित १२ व्या सुधारित बृहत आराखड्यास मान्यता देण्यात येत आहे.

४) महाराष्ट्र राज्य एकात्मीकृत नगर वसाहत बाबतचे शासनाने मंजूर केलेल्या दि. ०८/०३/२०१९ रोजीच्या विनियम क्र. ५.२.२ नुसार मुळ मंजूर चटई क्षेत्राच्या कमाल ७०% वाढीव चटई क्षेत्र प्रिमियमची रक्कम जमा करण्याचे अटींवर अनुज्ञेय आहे. सदर प्रस्तावामध्ये अर्जदारास ७०% वाढीव चटई क्षेत्र ८७७१११ चौ.मी. प्रस्तावित केले आहे. मुळ चटई क्षेत्र १२५३०१७ चौ.मी. वापरुन झालेनंतर या वाढीव क्षेत्राचा वापर करुन बांधकाम परवानगी घेताना त्या बांधकाम क्षेत्राच्या प्रमाणात प्रचिलित प्रिमियमच्या दरानुसार प्रिमियमची रक्कम जमा करणे अर्जदारांवर बंधनकारक राहील.

५) शासनाच्या नगर विकास विभागाकडे शासन निर्णय क्र. टीपीएस-१८१२/९९२/प्र.क्र. ५८८/१३/पुर्नबांधणी क्र. १२०/नवि -१३ दि. १३/०८/२०१४ अन्वये सदर प्रकल्पास अधिसूचित एकात्मीकृत नगर वसाहत प्रकल्प म्हणून काही अटी सापेक्ष महाराष्ट्र प्रादेशिक नियोजन व नगर रचना अधिनियम १९६६ कलम १८ (३) अन्वये मान्यता दिली आहे. या शासन निर्णयामधील सर्व अटी व शर्तींची तसेच शासनाचे दि. ०१/०३/२००६ चे पत्र क्र. टीपीएस-१८०५/२०२०/नवि -१३ रोजीच्या लोकेशनल क्लिअरन्स आणि दि. २०/०५/२०१५ रोजीच्या लेटर ऑफ इंटेट मध्ये नमूद सर्व अटी व शर्तींची पूर्तता करणे कंपनीवर बंधनकारक राहील.

६) मोजणी खात्याकडून दहाव्या सुधारित बृहत आराखड्याचे मंजुरीच्या रेखांकनाबाबत खातरजमा करणेत आल्यानंतर जर त्यामध्ये जागेच्या /प्रस्तावित क्षेत्रामध्ये/हद्दीत बदल झाल्यास /आवळून आल्यास त्या हद्दीनुसार /क्षेत्रानुसार,

बृहत आराखड्यामध्ये योग्य ते बदल /सुधारणा करुन असे सुधारित नकाशे या कार्यालयाकडे सादर करणे व त्यास रितसर अंतिम सुधारित मंजूरी प्राप्त करुन घेणे आवश्यक राहील.

९) प्रकल्पांतर्गत समाविष्ट जमिनीच्या मालकी, वारसा हक्क, करारांबाबत, कुलमुखत्यार पत्राबाबत, ताबा क्षेत्राबाबत, हद्दीबाबत, वहिवाट, पोटहिस्से, समतीपत्र, इ. बाबत भविष्यात कोणताही वाद उत्पन्न झाल्यास त्यास संपूर्णत: कंपनी जबाबदार राहील. अशा प्रकरणी सदर परवानगी, कंपनीस कोणतीही नुकसान भरपाई न देता अथवा पूर्व सूचना न देता रद्द करण्याचे संपूर्ण अधिकार मा. महानगर आयुक्त तथा मुख्य कार्यकारी अधिकारी, पुणे महानगर प्रादेशिक प्राधिकरण पुणे यांना राहतील.

८) बाराव्या सुधारित बृहत आराखड्यामध्ये जमा वापरासाठी भूखंड, सेक्टर, ब्लॉक दर्शविला आहे. निव्वळ त्या वापरासाठी त्या क्षेत्राचा वापर करणे कंपनीवर बंधनकारक राहील. रहिवास विभागातील सेक्टर/ब्लॉक मधील भूखंड सदर क्षेत्रास लागू विकास नियंत्रण नियमावलीनुसार अनुज्ञेय होणाऱ्या रहिवास वापरासाठी वापरावयाचे आहेत. कारण दि. ०८/०३/२०१९ रोजीच्या मंजूर एकात्मीकृत नगर वसाहतीच्या नियमावलीतील नियम क्र. ७.४ नुसार योजना क्षेत्रात अनुज्ञेय Total Floor Area (F.S.I.) च्या ६०% किमान Floor Area (F.S.I.) फक्त निव्वळ निवासी कारणासाठी वापर करणे बंधनकारक आहे. प्रत्येक सेक्टर /ब्लॉकचे अंतर्गत सविस्तर रेखांकन विहित विकास नियंत्रण नियमावलीनुसार स्वतंत्रपणे तयार करुन घेणे कंपनीवर बंधनकारक राहील.

*) केंद्र शासनाच्या पर्यावरण व वन विभागाकडील दि. २७/१०/२००५ अन्वये देण्यात आलेल्या ना-हरकत दाखल्यातील अटी व शर्ती कंपनीवर बंधनकारक राहतील.

१०) शासन अधिसूचना दि. १३/०८/२०१४ रोजीच्या क्र. टीपीएस-१८१२/९१२/प्र.क्र. ५८८/१३/पुर्नरचना क्र. १२०/नवि - १३ नुसार अधिसूचित एकात्मीकृत नगर वसाहत प्रकल्पाखालील जमिनीचा तपशील व बाराव्या सुधारित बृहत आराखड्यात नकाशात दर्शविल्यानुसार क्षेत्र १२५.३०१० हेक्टर घटई क्षेत्र निर्देशांक अनुज्ञेय करण्यात येत आहे.

११) बाराव्या सुधारित रेखांकनानुसाराच्या (बृहत आराखड्यानुसाराच्या) सेक्टर निहाय जागेचे व इतर बाबींची जागेवर प्रत्यक्ष आखणी व मोजणी करुन त्यास मोजणी खात्याकडून प्रमाणिकरण करुन घेणे आवश्यक राहील व तद्नुषंगिक नोंदी महसुल अभिलेखात सुधारित करणे आवश्यक राहील. मात्र कोणत्याही परिस्थितीत खुली जागा, सुविधा क्षेत्र सार्वजनिक वापरानुषंगाने प्रस्तावित क्षेत्र व रस्त्याखालील क्षेत्र हे प्रस्तावित जमिन वापर नकाशावर बाराव्या सुधारित बृहत आराखड्यावर नमूद क्षेत्रापेक्षा कमी भरता कामा नये. मोजणी खाते प्रमाणित करेल त्या हद्दीनुसार/क्षेत्रानुसार, बृहत आराखड्यामध्ये योग्य ते बदल /सुधारणा करुन असे सुधारित नकाशे या कार्यालयाकडे सादर करणे व त्यास रितसर अंतिम मंजुरी प्राप्त करुन घेणे बंधनकारक राहील.

१२) एकात्मीकृत नगर वसाहतीच्या मंजूर विनिमय मधील कलम ७ (सी) (९) नुसार कंपनीचे यापूर्वी जिल्हाधिकारी पुणे यांच्या कार्यालयाकडे रक्कम रु . ७.५० कोटींची बँक गॅरंटी सादर केलेली होती. आता अर्जदार कंपनीने आय.सी.आय.सी.आय. बँक लि. बंडगार्डन पुणे यांचेकडील यांचेकडील रक्कम रुपये ७.५० कोटी रुपयाची बँक गॅरंटी नं. 0006NDDG00249522 सादर केलेली असून त्याची वैधता दिनांक [illegible] पर्यंत आहे. सदर बँक गॅरंटीची मुदत वाढवून घेणे अर्जदार कंपनीवर बंधनकारक राहील.

१३) पूर्व परवानगी शिवाय कोणताही विकास अथवा बांधकाम कंपनीने हाती घेऊ नये. असा अनाधिकृत विकास /बांधकाम निदर्शनास आल्यास कंपनीस कोणतीही पूर्वसूचना न देता कंपनीवर दंडात्मक कारवाई तसेच अनाधिकृत बांधकामा विरुद्ध कारवाई करण्यात येईल तसेच त्यासाठी येणारा खर्च कंपनीस सोसावा लागेल.

१४) कार्यकारी अभियंता, खडकवासला पाटबंधारे विभाग, पुणे यांचेकडील दि. १०/०७/२००९ रोजीचे पत्र क्र.KID/५५७/०२ चे ना-हरकत प्रमाणपत्रामधील अटींचे पालन करणे कंपनीवर बंधनकारक राहील. तसेच उक्त ना-हरकत प्रमाणपत्रासोबत प्राप्त करारनाम्यामधील सर्व अटी कंपनीवर बंधनकारक राहतील.

१५) प्रकल्प क्षेत्रातील Ground Water Source बाबतचा MOEF कडील दि. २७/१०/२००५ चे ना-हरकत पत्रातील नमूद बाबी विचारात घेता तसेच नियम क्र. ३ (अ) विचारात घेता, अग्निप्रतिबंधक उपाययोजनेकरिता लागणारे पाणी, बगीचा कामासाठी लागणारे पाणी व रोजच्या पाण्याच्या आवश्यकतेप्रमाणे लागणाऱ्या पाण्याच्या संबंधित Water Supply Authority कडून सोय करुन घेणे कंपनीवर बंधनकारक राहील.

१६) प्रस्तावित एकात्मीकृत नगर वसाहतीच्या क्षेत्रातील नैसर्गिक ओढे, नाले, तळी, कॅनॉल व त्यातील वाहणारे पाणी यावर कंपनीस हक्क सांगता येणार नाही व त्याच्या नैसर्गिक प्रवाहास अडथळा करता येणार नाही. आवश्यक त्या ठिकाणी संबंधित विभागाच्या पूर्व परवानगीने अशा प्रवाहाचे Channelization करता येईल.

१७) नियम ९.३ (सी) नुसार कंपनीस बांधकामासाठी वीज पुरवठ्याबाबत महावितरण कंपनी (MSEDC LTD) कडून दि. १२/०९/२००६ रोजीच्या पत्राद्वयेच्या अटींवर वीज पुरविणेबाबत तत्वता मंजुरी दिल्याचे नमूद आहे. यानुषंगाने अटींची पूर्तता करणे तसेच नियम क्र. ९.३ (सी) नुसार व प्रकल्पाकरिता आवश्यक वीज पुरवठ्याबाबत महावितरण कंपनीची पूर्तता करणे, (MSEDC LTD) कडून ठाम बांधिलकी (Firm Commitment) कंपनीने प्राप्त करुन घेऊन सब स्टेशनच्या विकासासह वीज पुरवठ्याबाबतची सर्वस्वी जबाबदारी कंपनीची राहील.

१८) भविष्यात प्रकल्प राबविताना उद्भवणाऱ्या कोणत्या अडचणी अथवा प्रश्नांसाठी कंपनी सर्वस्वी जबाबदार राहील. या अडचणींचे निराकरण करुन देण्याची जबाबदारी अथवा बंधन शासनावर, या कार्यालयावर व तसेच महसूल विभागावर असणार नाही.

१९) प्रकल्पाबाबत कोणतीही जाहिरात करतेवेळी जाहिरातीमध्ये मंजूर विकास परवानगी प्रमाणेच तपशील /नकाशे इत्यादींचा समावेश करणे कंपनीवर बंधनकारक राहील.

२०) Sewage Treatment Plant बाबत अन्य सपिस्तर तांत्रिक बाबी अनुषंगाने महाराष्ट्र प्रदुषण नियंत्रण मंडळ यांचेकडे जरुर ती कागदपत्रे सादर करणे व त्यांचे मंजुरी घेणे विकासक कंपनीवर बंधनकारक आहे व त्या मंजुरीनुसार सदर सेवा सुविधा कंपनीस विकसित करणे बंधनकारक राहील.

२१) Municipal Solid Waste (Management and Handling) Rules, 2000 चे तरतुदीनुसार Solid Waste Management Plant चे स्थानास (सेक्टर U – १) महाराष्ट्र प्रदुषण नियंत्रण मंडळ व जिल्हाधिकारी, पुणे व घनकचरा व्यवस्थापन समितीची मान्यता घेणे आवश्यक राहील व तसेच, निर्माण होणाऱ्या घनकचरा व्यवस्थापन करिता आवश्यक ती यंत्रणा उभारणे कंपनीवर बंधनकारक राहील. तसेच परिसरामध्ये कचरा साठवणूक (Garbage Dumping)

करणे अनुज्ञेय राहणार नाही अशी मान्यता प्राप्त न झाल्यास योजना क्षेत्राच्या मंजूर रेखांकनात महाराष्ट्र प्रदूषण नियंत्रण मंडळ व जिल्हाधिकारी, पुणे यांच्या मान्यतेने अन्य सुयोग्य ठिकाणी Solid Waste Management Plant प्रस्तावित करणे व त्यानुसार जागेचे बृहत आराखड्या कंपनीस सुधारितरित्या पुन्हा आवश्यक त्या बदलास मंजूर करुन घेणे बंधनकारक राहील.

२२) प्रस्तावाखालील क्षेत्रामध्ये असणारे अस्तित्वातील अती उच्चदाब विद्युत लाईन लगतच्या बांधकामाचे विकसनाचे नियोजन करताना अती उच्चदाब विद्युत लाईनच्या अनुषंगाने प्रचलित तरतुदीनुसार अंतरे सोडणे आवश्यक राहील.

२३) महाराष्ट्र प्रदूषण नियंत्रण मंडळ, केंद्र शासनाचे वन व पर्यावरण मंत्रालय, जलसंधारण विभागाकडील प्राप्त ना-हरकतपत्र व तसेच Fire Adviser, Govt. of Maharashtra यांचेकडील प्राप्त झालेल्या ना-हरकत प्रमाणपत्रातील सर्व अटींची पूर्तता विकासक कंपनीने व त्यांचे संबंधित सल्लागार यांनी वेळोवेळी करणे आवश्यक राहील व या बाबींची पूर्तता होत आहे किंवा कसे, याबाबत कंपनीने व संबंधित सल्लागार यांनी संबंधित विभागाकडून त्याच्या सुचनांवर अटींनुसार वेळोवेळी तपासणी करुन घेणे आवश्यक राहील.

२४) नियम क्र. ७.३ (a) नुसार प्रकल्प क्षेत्रात Spaces for Recreation करिता प्रस्तावित १२.५% क्षेत्र नकाशावर दर्शविलेप्रमाणे कायमस्वरुपी विना अडथळा खुले ठेवणे व बोजारहित ठेवणे कंपनीवर बंधनकारक आहे. तसेच सदरचे क्षेत्र कंपनीस विक्री करता येणार नाही व या क्षेत्रामध्ये खुल्या स्वरुपाचा वापर करणेचा आहे.

२५) एकात्मीकृत नगर विकसित करणेकामी शासन मंजूर विनिमयान्वयीत नियम क्र. १२.३ नुसार वृक्षांची लागवड करुन त्यांची देखभाल, संवर्धन करणे विकासक कंपनीवर बंधनकारक राहील. तसेच नियम क्र. ११ नुसार प्रकल्प पूर्णत्वाच्या वेळेस याबाबत खातरजमा संबंधित वन विभागाकडून करुन घेणे बंधनकारक राहील.

२६) प्रकल्पाचा फेज प्रोग्रॅम देणेत आलेला आहे. प्रत्येक सेक्टरचे /झोनचे रेखांकन नकाशे सादर करुन त्यास मंजुरी प्राप्त करुन घेणे व त्यानुसार लागू प्रचलित विकास नियंत्रण नियमावली इमारत बांधकाम नकाशे मंजुरीसाठी सादर करुन त्यास मंजुरी प्राप्त करुन घेणे कंपनीवर बंधनकारक आहे. त्याचबरोबर प्रकल्पातील रहिवासी इमारतींचे बांधकाम करताना त्यासोबतच पायाभूत सेवा सुविधा/ सार्वजनिक सुविधा प्राधान्याने विकसित करणे कंपनीवर बंधनकारक राहील.

२७) पूर्व मंजूरीनुसार दि. १६/११/२००५ रोजीच्या विनिमयान्वयीत नियम क्र. ९ नुसार कमाल ४०.०० चौ.मी. क्षेत्राच्या निवासी सदनिका विकासाखालील बांधकाम क्षेत्र इतर निवासी क्षेत्राचा विकास करताना त्या बांधकाम क्षेत्राच्या विकासाबरोबरच किमान १०% च्या प्रमाणात नियोजन करुन विकसित करणे कंपनीवर बंधनकारक आहे.

२८) एकात्मीकृत नगर वसाहत मंजूर करणेबाबत शासन मंजूर दि. ०८/०३/२०१९ रोजीच्या विनिमयातील नियम क्र. ९.३ नुसार प्रस्तावित वाढीव रहिवासी घटई क्षेत्राच्या ५५% क्षेत्राचे बांधकाम Social Housing करिता करणे कंपनीवर बंधनकारक राहील. तसेच Social Housing बाबत शासन मंजूर दि. ०८/०३/२०१९ रोजीच्या विनिमयातील सर्व तरतुदी विकसकांवर बंधनकारक राहतील.

२१) प्रकल्प क्षेत्रातील इमारतींमध्ये भूकंप प्रतिरोधकाचे (Earthquake) दृष्टीने उपाययोजना करणे व इमारतींचे स्ट्रक्चरल डिझाईन कंपनीच्या संबंधित सल्लागार यांचेकडून करुन घेणे कंपनीवर बंधनकारक राहील.

२२) प्रकरणी सर्व तक्रारींची जबाबदारी ही अर्जदारांची राहील. भविष्यात याबाबत वाद उद्भवल्यास त्याचे निराकरण करणे अर्जदारांची जबाबदारी राहील.

२३) प्रकरणांमधील जमिनीबाबत व इतर कारणास्तव मा. न्यायालयात चालू असलेल्या कोर्ट केसेस, नागरिकांच्या तक्रारी व वकिलांमार्फत प्राप्त असलेल्या नोटीसांबाबत मा. न्यायालय, प्राधिकरण (पीएमआरडीए) व इतर समुचित प्राधिकरण अथवा शासनाकडून होणारे निर्णय अर्जदारांवर बंधनकारक राहील.

२४) अर्जदारांचे मालकीच्या नसलेल्या बृहत आराखड्यामध्ये ज्या जमिनी प्रकल्पातील अर्जदारांचे जागेमुळे वेढल्या गेलेल्या आहेत व अशा जमिनींचा ४.५० मी. रुंदीचा पोहोच रस्ता प्रस्तावित केलेला आहे अशा जमिनींच्या मूळ मालकांनी या ठिकाणी काही विकास परवानगी प्रस्ताव सादर केल्यास त्या प्रस्तावाला अर्जदारांचे ना-हरकत प्रमाणपत्रांची आवश्यकता राहणार नाही.

२५) विकसक यांना सदर नगर वसाहत प्रकल्पाच्या अनुशंगाने आवश्यक त्या पायाभूत सुविधा (Infrastructure) विकसित करणे आवश्यक राहील.

२६) सरकार पड जमिनीबाबत मा. जिल्हाधिकारी / संबंधित शासकीय विभाग यांचा जो काही निर्णय असेल तो विकसक यांचेवर बंधनकारक असेल त्यास अनुसरून आवश्यक दुरुस्ती बृहत आराखड्यात करणे विकसक यांचेवर बंधनकारक राहील.

२५) प्रस्तावामध्ये १८.०० मी. रुंद प्रादेशिक योजना रस्त्यावर रेल्वे अंडर ब्रिज दर्शविलेला आहे. त्यानुषंगाने विकास करणेपूर्वी प्रथम रेल्वेचा ना-हरकत दाखला घेणे आवश्यक व बंधनकारक राहील.

२६) मंजूर नकाशानुसार फायर स्टेशनचा विकास पूर्ण करुन ते फायर अँडव्हायजरच्या सल्ल्याने कार्यरत करणे कंपनीवर बंधनकारक राहील. तसेच नियम क्र. १२.७ नुसार नजीकच्या संबंधित प्राधिकरणाकडे हस्तांतरित करणे आवश्यक आहे.

२७) रेल्वे लाईनपासून ३०.०० मी. चे अंतरात कोणताही विकास अनुज्ञेय राहणार नाही.

२८) विशेष प्रसंगी महानगर आयुक्त, पुणे महानगर प्रदेश विकास प्राधिकरण, पुणे यांनी लेखी आदेश दिले तर ते विकासकांवर बंधनकारक राहतील त्यास या सदर परवानगीवरुन बाधा येणार नाही.

२९) सुरक्षिततेच्या दृष्टीने (Safe Planning Norms of Building to Counter Manmade Disasters) आवश्यक ती उपाययोजना करणे कंपनीवर बंधनकारक राहील.

४०) अर्जदार कंपनीने सादर केलेली कोणतेही कागदपत्रे व माहिती चुकीची अगर दिशाभूल करणारी आढळल्यास प्रस्तुत प्रकरणी करण्यात आलेली शिफारस /देण्यात आलेली मंजुरी ही रद्द समजणेत येईल व त्यामुळे कंपनीच्या व इतर सर्व संबंधितांच्या आर्थिक अथवा इतर कोणत्याही प्रकारच्या नुकसानीस स्वत: कंपनी जबाबदार राहील.

४१) आता सुधारित आराखड्यामध्ये करण्यात आलेले बदल हे पर्यावरण व रेरा कायद्याचे अनुषंगाने अंमलबजावणी करणे अर्जदार यांचेवर बंधनकारक राहील.

४२) Aviation विभागाकडील पत्र क्र. Airhq/s १७७३६/४/ATS (Ty BM-MMDCCCLXX) दि. ०९/११/२०१८ अन्वये प्राप्त ना-हरकत दाखल्यामधील नमूद सर्व अटी / शर्तींचे पालन करणे अर्जदार यांचेवर बंधनकारक राहील.

४३) प्रस्तुत जमिनीवर भविष्यात छाननी शुल्क व विकास शुल्क इत्यादी बाबतच्या रक्कमेची बाकी निघाल्यास सदर रक्कम प्राधिकरणाकडे जमा करणे आवश्यक राहील.

(महानगर आयुक्त तथा मुख्य कार्यकारी अधिकारी यांचे मान्यतेने)

(श्वेता पाटील)
सह महानगर नियोजनकार
पुणे महानगर प्रदेश विकास प्राधिकरण, पुणे

TABLE NO.3				
AREA REQUIRED FOR DELETION				
S.No.	Sector No.		Remarks	
1	U17	2416	Land Hand over to Farmers for Individual Development.	
2	C6 (part)	1702	Land Hand over to Farmers for Individual Development.	
		4118		

TABLE NO.4			
AREAS DELETED FROM TOWNSHIP AREA CALCULATIONS			
S.No.	Survey No.	Area (sq.m.)	Remarks
LOCATION CLEARENCE RECEIVED BUT NOT TAKEN IN TOWNSHIP			
1	181/8A	1500	No demarcation
2	181/8B/1	1800	No demarcation
3	181/8B/2	1000	No demarcation
4	182/2/1+2+3+4A/1	929	No demarcation
		5229	
5	184/1	6600	Presently not to be considered
6	188/A/8A	2550	Presently not to be considered
7	188/A/8B	1650	Presently not to be considered
8	189/1D	1800	Presently not to be considered
9	189/3	6100	Presently not to be considered
10	189/4A/4	2534	Presently not to be considered
11	189/5	1000	Presently not to be considered
12	243/3	1100	Presently not to be considered
13	244/2	1900	Presently not to be considered
14	244/9	300	Presently not to be considered
15	244/11	2500	Presently not to be considered
16	244/13	3500	Presently not to be considered
17	244/15	3400	Presently not to be considered
18	244/16	600	Presently not to be considered
		35534	
AREAS DELETED FROM TOWNSHIP			
19	Near R4	1250	Not in township
20	245(P)	400	In Location clearence but not in township
		1650	
Total land area for deletion		42413	

COMMERCIAL OPEN SPACE

SECTOR	LAND USE	AREA (SQM)	OPEN SPACE REQD. Percentage	OPEN SPACE REQD. SQM	OPEN SPACE PROVIDED Percentage	OPEN SPACE PROVIDED SQM	REMARKS Adjustment of Balance Open Space (O.S.)
EB1	Commercial	31976	10%	3197.60	6.21%	1987.05	Balance O.S. Provided in C7
C1	Offices	15065	10%	1506.50	19.04%	2865.80	O.S. Provided for C1,C2,C5 & C6
C2	Offices	10222	10%	1022.20	0.00%	0.00	O.S. Provided in C1
C5	Offices	2406	10%	240.60	0.00%	0.00	O.S. Provided in C1
C6	Offices	926	10%	92.60	0.00%	0.00	O.S. Provided in C1
C7	Offices	9688	10%	968.80	22.51%	2180.87	O.S. Provided for EB1 & C7
C8	Offices	4759	10%	475.90	10.50%	499.61	-
C9	Offices	6448	10%	644.80	10.00%	644.80	-
C10	Offices	17428	10%	1742.80	10.01%	1744.74	-
C11	Offices	3356	10%	335.60	10.01%	335.77	-
		98910	10%	9891.00	10%	10258.93	Total O.S. provided is > 10% of Total Required

TABLE NO.5				
BUILDING PLAN				
S.No.	Sector No.	Area (sq.m.)	Amenity Space Provided (sq.m.)	
1	R2	45802	3925.20	
2	R4	8752	720.16	
3	R5	8545	550.46	
4	R21	32148	1160.43	
5	R22	10286	441.81	
6	R3 + R8	103635	3308.66	
7	R26	15917	889.10	
		225085	10995.82	
REQUIRED AMENITY SPACE (5%)			64965.85	
PROPOSED AMENITY SPACE			54163.00	
AMENITY SPACE PROPOSED IN SECTORS R2,R4,R5,R21,R22,R3+R8 & R26			10995.82	
TOTAL PROPOSED AMENITY SPACE				65158.82

NOTE : TOTAL PROPOSED AMENITY SPACE IS MORE THAN REQUIRED, SO THERE IS NO NEED TO PROVIDE SEPARATE AMENITY SPACE IN REMAINING RESIDENTIAL SECTORS.

TABLE NO.6			
SARKARPAD			
S.No.	Survey No.	Area (sq.m.)	Remarks
1	182/2/6A	3400	Sarakarpad
2	187	14700	Sarakarpad
3	188/1A	1368	Sarakarpad
4	195/1A/1/3	2000	Sarakarpad
		21468	

TABLE NO.7		
AREAS OWNED BY COMPANY BUT PRESENTLY NOT CONSIDERED FOR FSI		
S.No.	Survey No.	Area (sq.m.)
1	243/ 2A	1800
2	243/2B	1600
3	243/ 2C	1600
4	244/ 1	2900
5	244/ 4	3800
6	244/ 5	1900
7	244/ 6	1700
8	244/ 8	3200
9	244/ 12	2600
10	244/ 14	3100
11	189/ 1B /2	9800
12	189/1B/1	9800
13	244/ 10	2500
	Total	46300

Area of 40 Sq. M. Tenaments as per rule no 4(a) which is included in above residential itself in separate buildings shown here for purpose of minimum 10% FSI utilisation.

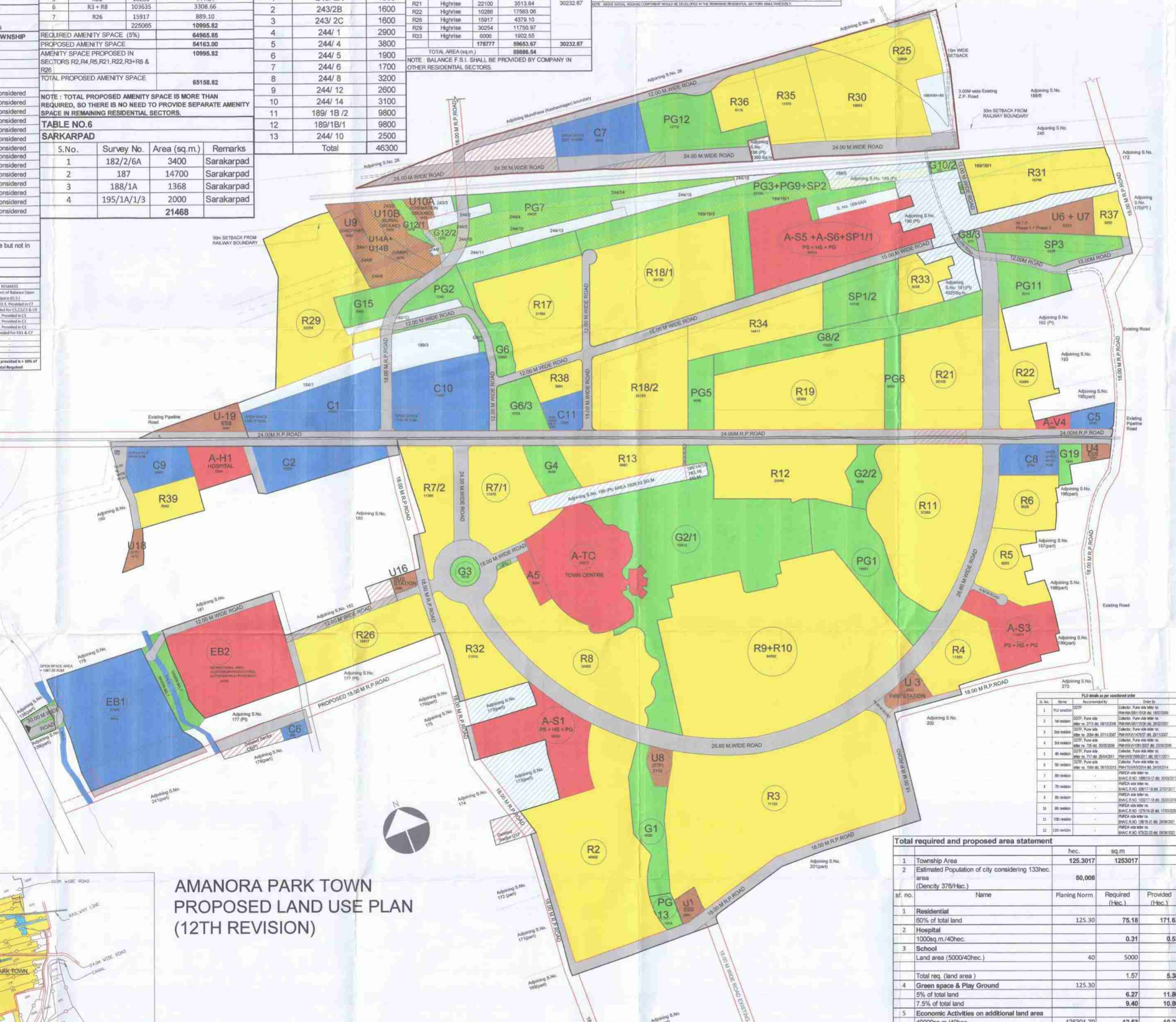
Sector	Description	Plot area (sq.m.)	consumed area as per sanctioned plan (sq.m.)	balance area (sq.m.)
R5 Pt.	Highrise	8545	4765.20	
R6	Highrise	8626	3405.35	
R11 Pt.	Lowrise+Midrise	37288	2878.00	
R19	Highrise	39755	9496	
R21	Highrise	22100	3513.84	30232.87
R22	Highrise	10286	17563.06	
R26	Highrise	15917	4379.10	
R29	Highrise	30254	11750.97	
R33	Highrise	6006	1902.55	
TOTAL AREA (sq.m.)		178777	59653.67	30232.87
			89886.54	

NOTE : BALANCE F.S.I. SHALL BE PROVIDED BY COMPANY IN OTHER RESIDENTIAL SECTORS.

STATEMENT FOR INCLUSIVE HOUSING CONSIDERING TRANSITION FROM STP/ITP 2005 TO ITP 2018

Sr. No.	Particulars	FSI	Total B/u Area (Sq. M.)	Residential B/u Area (SQM)	EWS Housing 10% of (ND) i.e. Prop. resi. Required	Provided	Social Housing (ND) Required	Provided
	A	B	C	D				
1	Permissible B/u area as per the status before transition	1	1204[illegible]	-				
2	Minimum required residential component as per STP/ITP 2005		-	752[illegible]				
3	Permissible B/u area as per latest land status	1	125.3017	75.18102				
4	Total B/U area proposed	1.7	213.0129	-				
5	Minimum required residential componentas per ITP 2018		-	75.18102				
6	Sanctioned B/Up before transition stage		1068[illegible]	[illegible]	[illegible]	[illegible]	22,884.90	-
7	40 Sq. M. Housing as per STP/ITP 2005	10% of the Residential Development		89886.54				
8	Social Housing as per clause 9 of ITP 2018	15% of Basic Residential FSI		112771.[illegible]				
9	Net Social Housing to be provided as per clause 9 of ITP 2018			22884.90				
	BALANCE INCLUSIVE HOUSING				30,232.87		22,884.99	

NOTE : ABOVE SOCIAL HOUSING COMPONENT WOULD BE DEVELOPED IN THE REMAINING RESIDENTIAL SECTORS SIMULTANEOUSLY.



LOCATION PLAN

AMANORA PARK TOWN PROPOSED LAND USE PLAN (12TH REVISION)

NOTE:

SPECIAL TOWNSHIP UNDER REGULATION SANCTIONED BY GOVT.BY NOTIFICATION U/S NO 20(4)OF MRTP ACT 1966 REGARDING DEVELOPMENT OF TOWNSHIP IN AREA UNDER PUNE REGIONAL PLAN ON 16/11/2005 & IN NOTIFIED AREA FOR SPECIAL TOWNSHIP UNDER SECTION 18(3) OF M.R.& T.P. Act.1966 . IN S.Nos. 138 (Pt)+139 (Pt)+173 (Pt)+176 (Pt)+177 (Pt)+180 (Pt)+182 (Pt)+184 (Pt)+185 (Pt)+186(pt)+187 (Pt)+188 (Pt)+189 (Pt)+190 (Pt)+191 (Pt)+192 (Pt)+193 (Pt)+194 (Pt)+195 (Pt)+196 (Pt)+197 (Pt)+198 (Pt)+199 (Pt)+200 (Pt)+201 (Pt)+242 (Pt)+243 (Pt)+244 (Pt)
AT HADAPSAR TAL. HAVELI, DIST. PUNE.

PLU details as per sanctioned order

Sr. No.	Name	Recommended by	Order by
1	PLU sanction	DDTP	Collector, Pune vide letter no. PMH/NA/SR/115/06 dtd. 18/07/2006
2	1st revision	DDTP, Pune vide letter no. 2713 dtd. 06/12/2006	Collector, Pune vide letter no. PMH/NA/SR/115/06 dtd. 26/02/2007
3	2nd revision	DDTP, Pune vide letter no. 2064 dtd. 07/11/2007	Collector, Pune vide letter no. PMH/KAV/1470/07 dtd. 29/11/2007
4	3rd revision	DDTP, Pune vide letter no. 735 dtd. 05/05/2008	Collector, Pune vide letter no. PMH/KAV/1081/2007 dtd. 03/06/2008
5	4th revision	DDTP, Pune vide letter no. 717 dtd. 25/04/2011	Collector, Pune vide letter no. PMH/WS/1580/2011 dtd. 05/11/2011
6	5th revision	DDTP, Pune vide letter no. 1584 dtd. 05/10/2013	Collector, Pune vide letter no. PMH/TS/SR/3/2014 dtd. 24/03/2014
7	6th revision	-	PMRDA vide letter no. BHA/C.R.NO. 188/15-17 dtd. 30/03/2017
8	7th revision	-	PMRDA vide letter no. BHA/C.R.NO. 306/17-18 dtd. 27/07/2017
9	8th revision	-	PMRDA vide letter no. BHA/C.R.NO. 1032/17-18 dtd. 05/03/2019
10	9th revision	-	PMRDA vide letter no. BHA/C.R.NO. 1275/19-20 dtd. 17/03/2020
11	10th revision	-	PMRDA vide letter no. BHA/C.R.NO. 136/18-21 dtd. 20/09/2021
12	11th revision	-	PMRDA vide letter no. BHA/C.R.NO. 675/22-23 dtd. 09/09/2022

Total required and proposed area statement

sr. no.	Name	Planing Norm	Required (Hec.)	Provided (Hec.)
		hec.	sq.m	
1	Township Area	125.3017	1253017	
2	Estimated Population of city considering 133hec. area (Dencity 376/Hac.)	50,008		
1	Residential 60% of total land	125.30	75.18	171.63
2	Hospital 1000sq.m/40hec.		0.31	0.53
3	School Land area (5000/40hec.)	40	5000	
	Total req. (land area)		1.57	5.38
4	Green space & Play Ground	125.30		
	5% of total land		6.27	11.80
	7.5% of total land		9.40	10.86
5	Economic Activities on additional land area 40000sq.m./40hec.	125301.70	12.53	10.23

TABLE NO.1

ABSTRACT

LANDUSE	NET PLOT AREA SQ.M.	NET PLOT AREA HA.	FAR / FSI SQ.M.	FAR / FSI HA.	FAR/FSI INDEX	LANDUSE %	F.A.R. %
1.RESIDENTIAL	659902	65.9902	1693291	169.3291	2.57	52.67	77.82
2.COMMERCIAL	102266	10.2266	314816	31.4816	3.08	8.16	14.47
3.EDUCATIONAL	53802	5.3802	45985.00	4.5985	0.85	4.29	2.11
4.AMENITY SPACES (minimum 5% of gross area)	54163	5.4163	95771.31	9.5771	1.77	4.32	4.40
5.HEALTH FACILITIES	5334	0.5334	21336	2.1336	4.00	0.43	0.98
6.PARKS, GARDENS & PLAYGROUNDS	226651	22.6651	---	---	---	18.09	-
7.PUBLIC UTILITIES	35305	3.5305	4000.00	0.4000	0.11	2.82	0.18
8.TRANSPORT & COMMUNICATION	115594	11.5594	700.00	0.0700	0.01	9.23	0.03
TOTAL	1253017	125.3017	2175899	217.5899	1.74	100.00	100.00

Table No. 2

SCHEDULE OF PLOT AREAS

No.	Code Of Sector	Land Use Description	Required (Sq.m)	Required (Ha.)	Proposed (Sq.M)	Proposed (Ha.)	Index	FSI B/U area Consumed as per sanctioned / recommended Bldg plan (Sq.M.)	B/U Area Proposed (Sq.M.)	Balance (Sq.M.)
1	2	3	4	5	6	7	8	9	10	11
1		Residential - As per rule 7.4 in ITP 2018								
	R2	Midrise+Highrise			45802	4.58	2.48	113639.33		
	R3	Plots+Midrise+Highrise			71153	7.12	0.66	47123.84		
	R4	Highrise			11253	1.13	2.10	23640.84		
	R5	Highrise (Partly for 40 sq.m.Tenaments)			9283	0.93	1.47	13605.59		
	R6	Highrise (Partly for 40 sq.m.Tenaments)			8626	0.86	4.11	35425.39		
	R7/1	Towers			17470	1.75	1.98	34546.35	47272	
	R7/2	Towers			11395	1.14	5.00		56875	
	R8	Towers+Highrise+Midrise+Lowrise			32482	3.25	2.13	69223.70		
	R9 + R10	Plots+Lowrise			84592	8.46	0.46	38510.47		
	R11	Towers (Partly for 40 sq.m.Tenaments)			37288	3.73	3.50	130449.90		
	R12	Towers (Partly for 40 sq.m.Tenaments)			20040	2.00	4.00		80160	
	R13	Towers			9687	0.97	4.00		38748	
	R17	Plots			21868	2.19	0.59	12805.35		
	R18/1	Highrise (Partly for 40 sq.m.Tenaments)			34130	3.41	3.19	108943		
	R18/2	Highrise			22123	2.21	2.35		52071	552501.15
	R19	Highrise (Partly for 40 sq.m.Tenaments)			32262	3.23	3.61	116559.12		
	R21	Highrise (Partly for 40 sq.m.Tenaments)			22100	2.21	4.99	1,10,263.54		
	R22	Highrise (Partly for 40 sq.m.Tenaments)			10284	1.03	2.01	20943.97		
	R25	Highrise			12608	1.26	2.24	28,301.60		
	R26	Highrise (Partly for 40 sq.m.Tenaments)			15917	1.59	4.26	67840.05		
	R29	Highrise (Partly for 40 sq.m.Tenaments)			30254	3.03	3.62	109518.47		
	R30	Highrise			19983	2.00	3.00		59949	
	R31	Highrise (Partly for 40 sq.m.Tenaments)			16798	1.68	2.86		48000	
	R32 (Earlier C4)	Highrise			11310	1.13	3.60	40763.06		
	R33	Highrise (Partly for 40 sq.m.Tenaments)			6006	0.60	3.16	18986.44		
	R34	Highrise			14411	1.44	4.00		57644	
	R35	Highrise			11576	1.16	2.50		28945	
	R36	Social Housing			6116	0.61	4.00		24464	
	R37	Highrise (Partly for 40 sq.m.Tenaments)			3350	0.33	4.00		13000	
	R38	Highrise			3891	0.39	4.00		15564	
	R39	Highrise			5942	0.59	5.00		29710	
		Sub-total 1 --->	-	-	659902	65.99	2.57	1140789.81	552501.15	552501.15
		TOTAL RESIDENTIAL including EWS + SOCIAL HOUSING component						TOTAL		1693290.96
2	1	Commercial- as per Rule no 4(b) in STP 2005								
	EB1	Commercial (Mall)			31976	3.20	2.70	86389.12		
	C2	Offices/Commercial			10222	1.02	0.16	1625.12		
	Earlier C3 merged into R7	Site Office (temporary structure)						1506.71		
		total			42200	4.22				
	2	Economic Activities - as per Rule no 7.3(f) in ITP 2018								
	C1	Economic activity			15065	1.51	4.00		60220	
	C5	Economic activity			2406	0.24	3.00		7218	
	C6	Economic activity			926	0.09	0.99	913.56		211792
	C7	Economic activity			9688	0.97	4.00		38782	
	C8	Economic activity			4759	0.48	2.65	12589.39		
	C9	Economic activity			6448	0.64	4.00		25792	
	C10	Economic activity			17428	1.74	4.00		69712	
	C11	Economic activity			3356	0.34	3.00		10068	
		total			60066	6.01				
		Sub-total 2 --->	125301.7	12.53	102266	10.23	3.08	103023.90	211792	211792
								TOTAL		314816
3		Educational as per Rule no 4(c) & 7.3(b) in ITP 2018			No. of Students - P.S. = 7501, H.S. = 3751 Playground as per Norms, 7sq.m/student					
	A-S1	Primary school + High school + PG			16053	1.61	0.65	10468.30		
	A-S3	Primary school+High school + PG			11673	1.17	1.06	12368.56		1335.90
	A-S5 + A-S6 + SP1/1	Primary school + Play Ground			26076	2.61	0.84	21812.24		
		Sub-total 3 --->	15662.71	1.57	53802	5.38	0.83	44649.10	0.00	1335.90
								TOTAL		45985.00
4		Amenity Spaces - as per Rule no 4(d)								
	A-V4	Masc Shopping+Vegetable Market			1089	0.11	0.35		381	
	A5	Transport/Parking+Badminton Hall			2004	0.20	1.23		2471	2852.31
	A-TC	Town Centre			25273	2.53	0.64	16155.57		
	EB2	Recreational Area (Auditorium+Multiplex+Mall)			25797	2.58	2.98	76763.43		
		Sub-total 4 --->	2000	0.20	54163	5.42	1.77	92919.00	2852.15	2852.31
								TOTAL		95771.31
5		Health Facilities - as per Rule no 7.3(c) in ITP 2018								
	A-H1	Hospital			5334	0.53	4.00		21336.00	21336.00
		Sub-total 5 --->	3132.54	0.31	5334	0.53	4.00		21336.00	21336.00
								TOTAL		21336.00
6		Parks ,Gardens & Playgrounds as per Rule no7.3(a) in ITP 2018								
	G1	Green space			9626	0.96				
	G2/1	Green space			53912	5.39				
	G2/2	Green space			3888	0.39				
	G3	Green space			1810	0.18				
	G4	Green space			4638	0.46				
	G6	Green space			10997	1.10				
	G6/1	Green space			1000	0.10				
	G6/3	Green space			5723	0.57				
	G8/2	Green space			15335	1.53				
	G8/3	Green space			575	0.06				
	G10/2	Green space			722	0.07				
	G12/1	Green space			1479	0.15				
	G12/2	Green space			1273	0.13				
	G15	Green space			5046	0.50				
	G19	Green space			1851	0.19				
	G22	Green space			176	0.02				
				6.27	118049	11.80				
	PG1	Play Ground			16651	1.67				
	PG2	Play Ground			3766	0.38				
	PG3+PG9+SP2	Play Ground			23766	2.38				
	PG5	Play Ground			4888	0.49				
	PG6	Play Ground			3883	0.39				
	PG7	Play Ground			16658	1.67				
	PG11	Play Ground			6014	0.60				
	PG12	Play Ground			12715	1.27				
	PG13	Play Ground			1915	0.19				
	SP1/2	Play Ground			10138	1.01				
	SP3	Play Ground			8226	0.82				
				9.40	108602	10.86				
		Sub-total 6 --->	156627.13	15.66	226651	22.67				
7		Public Utilities - as per Rule no 7.3(g) in ITP 2018								
	U1	Electric Sub-Station			1665	0.17	0.28	460.23		
	U3	Fire Station			2522	0.25	0.74	1870.76		
	U4	Electric Sub-Station			1201	0.12	0.16		195	
	U6	Water Treatment Plant			6251	0.63	0.05		313	
	U7	Water Treatment Plant								
	U8	Sewage Treatment Plant			2110	0.21	0.05		106	
	U9	Solid Waste Composting Plant			6262	0.63	0.05		313	1669.01
	U10A	Cremation Ground	2000		1443	0.14	0.05		72	
	U10B	Burial Ground	2000		3924	0.39	0.00		0	
	U14A	Sewage Waste Management Project	4000		4970	0.50	0.05		249	
	U14B	Sewage Waste Management Project				0.00	0.05			
	U18	Sewage Treatment Plant			1470	0.15	0.05		74	
	U19	Electric Sub-Station			3487	0.35	0.10		349	
		Sub-total 7 --->	8000	0.80	35305	3.53	0.11	2330.99	1669.01	1669.01
								TOTAL		4000.00
8		Transport and Communication - as per Rule no 4(h) in STP 2005								
	U16	Bus Station	3000		1026	0.10	0.68	0.00	700.00	700.00
		Roads			114568	11.46				
		Sub-total 8 --->	3000	0.30	115594	11.56	0.01	0.00	700.00	700.00
								TOTAL		700.00
								TOTAL		792186.62
		GRAND TOTAL			1253017			1383713		2175899

STAMP OF APPROVAL

MASTER LAYOUT 12TH REVISED

Approved as amended in ...
Subject to conditions mentioned in ...
No. BHA 103 / 2024 / 39cel 23-24 / 25496
S. No. ... 93/9ce 2035
Dated 23 / 05 / 2024

Deputy / Joint Metropolitan planner
Pune Metropolitan Region Development Authority, Pune

GROSS AREA STATEMENT

SR. NO.	DISCRIPTION	AREA (Ha.)
1	AREA AS PER LOCATION CLEARENCE Dtd.13.06.14	137.3551
2	AREA AS PER DOCUMENT (137.3551 - TABLE NO.4)	133.1138
3	AREA UNDER EXISTING PIPELINE ROAD	0.4697
4	AREA UNDER EXISTING 3M. WIDE Z.P. ROAD	0.1538
5	AREA UNDER DELETED SECTORS (U17) (TABLE NO.3)	0.4118
6	NET AREA UNDER LAYOUT (2-3-4-5)	132.0785
	CONDITIONAL DEDUCTIONS **	
7**	AREA UNDER SARKARPAD LAND (TABLE NO.6)	2.1468
8**	AREA UNDER COMPANY OWNERSHIP BUT NOT TAKEN IN PLU (TABLE NO.7)	4.6300
9	NET AREA (6-7-8)	125.3017
10	BASIC PERMISSIBLE F.S.I. AS PER CLAUSE NO. 5.1 IN STP 2005 & 7.2.1 ITP 2019	1.00
11	ADDITONAL PERMISSIBLE F.S.I. AS PER CLAUSE NO. 7.2.2 IN ITP 2019	0.70
12	PROPOSED ADDITIONAL F.S.I. TAKEN FOR TOWNSHIP	0.70
13	TOTAL PERMISSIBLE B/UP AREA [9 X (10+12)]	213.0129
14	MINIMUM REQUIRED BASIC RESIDENTIAL BUILT-UP AREA AS PER THE CLAUSE NO. 7.4 OF ITP 2019 (60% of 9)	75.1810
15	RESEDENTIAL BUILT-UP AREA DEVELOPED BEFORE TRANSITION AS PER ITP 2018 (As per 8th Sanctioned PLU)	89.8865
16	REQUIRED BUILTUP AREA COMPONENT UNDER E.W.S. HOUSING UNITS HAVING MAXIMUM 40SQM CARPET AREA AS PER THE SPECIAL/INTEGRATED TOWNSHIP POLICY 2005 (10% OF SR. NO. 15 ABOVE)	8.9887
17	REQUIRED BUILTUP AREA COMPONENT UNDER SOCIAL HOUSING UNITS AS PER THE CLAUSE NO. 9.3 OF ITP 2019 (15% OF SR. NO. 14 ABOVE)	11.2772
18	NET SOCIAL HOUSING COMPONENT TO BE PROVIDED AS PER THE CLAUSE NO. 9.3 OF ITP 2019 (17-16)	2.2885
19	GROSS PERMISSIBLE B/UP AREA (13 + 18)	215.3014
20	ADDITIONAL FSI FOR SOCIAL HOUSING AS PER CLAUSE NO.9 OF ITP 2019	2.2885
21	GROSS PERMISSIBLE B/UP AREA INCLUDING SOCIAL HOUSING (19 + 20)	217.5899
22	R.P./D.P. ROAD AREA	6.6865
	** Refer following mentioned conditions for the description of No.7 & 8 in above table.	
A	THE PROPORTIONATE AREA WILL BE COUNTED IN F.S.I. AFTER BUYING OR TAKING PROPERTY ON LEASE FROM THE GOVERNMENT AUTHORITY.	
B	AREA MAY BE COUNTED TO F.S.I. IN FUTURE.	

NOTE : ANY AREAS UNDER NALA/GREEN BELT SHOWN IN DRAWING ARE DEDUCTED FROM TOWNSHIP AREA.

NOTE:1
The Net Floor Area Shown i.e.125HA.30.17AR.

NOTE:2
Following Provisions in Township will be Fulfilled by Company.

a) SWMP Site No.U-14 Area 4231sq.m. is proposed inside the township & to be developed by the company along with Utilities shown in area statement of Table No.2 at Serial No.7.

b) Conditions mentioned in MOEF NOC dated 27/10/2005 EcoFriendly-amenities to be provided in detail planning of respective block in consultation with MPCB as specified by the company in appendix D-18 of letter dated 29-03-2006.

c) Tree Plantation & it's maintenance to be done as per the rule No. 5.3 (iv) (150 Trees/Ha.)

d) U12 , U13, Transport Terminal & Railway Level Crossing to be developed by Owner with previous N.O.C. from concerned Railway Authority.

e) Designed for population of 50,387 & Gross Density 376/Ha With Respect to Total Area.

NOTE:3
All Dimensions Are In Meter & Sq.m.

LEGEND

- PROJECT BOUNDARY
- PLOT BOUNDARY
- EXISTING ROADS
- PROPOSED R P ROADS
- PROPOSED INTERNAL ROADS
- HIGH TENSION LINE
- NALA
- RAILWAY LINE
- GREEN SPACE (5%)
- PLAY GROUND (7.5%)
- RESIDENTIAL
- AMENITY
- UTILITY
- COMMERCIAL
- AREA NOT INCLUDED IN SCHEME
- SARAKARPAD LAND
- AREA OWNED BY COMPANY BUT NOT TAKEN IN FSI
- (SECTOR NO.) SECTORS WITH SANCTIONED BUILDING PLANS

For City Corporation Ltd.
J. K. Bhosale
Director

AMANORA

CITY CORPORATION LTD.

ARCHITECT :
RAVI S. KADAM
B.Arch.M.Arch.A.I.I.A.
Consulting Architect and Urban designer

SENAPATI BAPAT ROAD
TEL.020/25658578 ,020/25651193

CA/90/10331

SCALE	DATE
1 : 2500	24-04-2025

PROJECT :
AMANORA PARK TOWN
AT HADAPSAR, PUNE.

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010706/24010437
Fax: 24023516
Website: http://mpcb.gov.in
Email: cac-cell@mpcb.gov.in

Kalpataru Point, 2nd, 3rd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

Infrastructure/ORANGE/L.S.I
No:- Format1.0/CAC-CELL/UAN No.0000245073/CR/2508003998 **Date: 30/08/2025**

To,
City Corporation Ltd., Amanora Park Township Project, S. No. 138, 139, 173, 177, 181, 182, 184, 185, 187 to 200, 242 to 245, Village. Sadesatranali & S. No. 111, 113 to 121, Village. Manjari, Tal. Haveli, Dist. Pune.

Your Service Is Our Duty

Sub: Renewal of Consent to Operate(Part-I) for township construction project under Orange Category

Ref:

1. Consent to Establish accorded by the Board vide letter BO/PCI-I/RO(P&P)/101/E/CC-80 dtd.17/06/2005.
2. Renewal of Consent to operate (Part-I) vide No Format1.0/CAC-CELL/UAN No.0000178200/CR/2401000587 dtd 04.01.2024
3. Renewal of Consent to Operate (Part-II) vide No Format1.0/CAC-CELL/UAN No.0000177804/CR/2401000870 dtd 06.01.2024
4. Renewal of Consent to Operate (Part-III) vide No Format1.0/RO/UAN No.0000216774/CR/2410000172 dtd 01.10.2024
5. Renewal of consent to Operate (Part-IV) vide No Format1.0/RO/UAN No.0000219623/CR/2410000171 dtd 01.10.2024
6. Consent to Operate(Part-V) vide No Format1.0//UAN No.0000216859/CO/2505001884 dtd 13/05/2025
7. Environmental Clearance obtained vide No J.12011/22/2005/IA(CIE) dtd 27.10.2005
8. Minutes of 3rd Consent Appraisal Committee meeting of 2025-26 held on 10/06/2025

Your application NO. MPCB-CONSENT-0000245073

For: Grant of Consent to Renewal under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal ofAuthorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundry Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I,II,III & IV annexed to this order:

1. **The Renewal of Consent to Operate (Part-I) is granted up to 31/05/2027**
2. **The capital investment of the project is Rs.855.43 Cr Cr. (As per C.A Certificate submitted by industry).**

3. **The Renewal of Consent to Operate(Part-I) is valid for construction project named as City Corporation Limited Amanora Park Town (Phase-2) S. No. 138, 139, 173, 177, 181, 182, 184, 185, 186, 187 to 200, 242 to 245 from village sadesatranali and Sr. no. 111, 113 to 121 from village Manjari, Hadapsar, Tal Haveli, Dist Pune on Total Plot Area of 361500 SqMtrs (Out of 1926311 SqMtrs) for Part-I total construction BUA of 691864.50 SqMtrs as per EC granted dated 17.06.2005 including utilities and services**

Sr.No	Permission Obtained	Plot Area (SqMtr)	BUA (SqMtr)
1	Renewal of Consent to operate (Part-I) dtd 04/01/2024	361500.00	691864.00

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal
1.	Trade effluent	Nil	Nil	Nil
2.	Domestic effluent	1000	As per Schedule - I	The treated sewage shall be 60% recycled for secondary purposes and remaining shall be utilized on land for gardening and/ or connected to local body sewer line with water metering system.

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
S-1 to S-2	DG Sets of 62.50 kVA x 02	02	As per Schedule -II
S-3	DG Set of 75 kVA	01	As per Schedule -II
S-4 to S-6	DG Sets of 125 kVA x 03	03	As per Schedule -II
S-7 to S-10	DG Sets of 200 kVA x 04	04	As per Schedule -II
S-11	DG Set of 250 kVA	01	As per Schedule -II
S-12	DG Set of 320 kVA	01	As per Schedule -II
S-13 to S-15	DG Sets of 400 kVA x 03	03	As per Schedule -II
S-16 to S-24	DG Sets of 1010 kVA x 09	09	As per Schedule -II
S-25	DG Set of 1700 kVA	01	As per Schedule -II

6. **Conditions under Solid Waste Rules, 2016:**

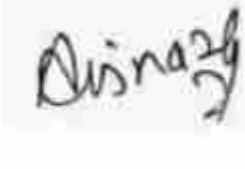
Sr No	Type Of Waste	Quantity & UoM	Treatment	Disposal
1	Bio-degradable Waste	1200 Kg/Day	OWC followed by composting facility	Used as Manure.
2	Non-biodegradable Waste	1800 Kg/Day	Segregation	By Sale to Auth. Vendor.
3	STP Sludge	100 Kg/Day	SDB	Used as Manure.

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for Collection, Segregation, Storage, Transportation, Treatment and Disposal of hazardous waste:**

Sr No	Category No.	Quantity	UoM	Treatment	Disposal
1	5.1 Used or spent oil	0.30	KL/A	Reprocessing	To Authorized Reprocesser

8. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
10. PP shall operate STP scientifically to achieve the treated domestic effluent standard for the parameter BOD-10 mg/lit including disinfection facility to the treated sewage.
11. The treated effluent shall be 60% recycled for secondary purposes such as toilet flushing, air-conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening and/ or connected to local body sewer line with water metering system.
12. PP shall operate organic waste digester along with composting facility/bio-digester (biogas) for the treatment of wet garbage.
13. PP shall extend the existing BG of Rs. 25 Lacs towards O & M of Pollution Control Systems and compliance of Consent conditions.

This consent is issued on the basis of information/documents submitted by the Applicant/Project Proponent, if it has been observed that the information submitted by the Applicant/Project Proponent is false, misleading or fraudulent, the Board reserves its right to revoke the consent & further legal action will be initiated against the Applicant/Project Proponent.



Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	250000.00	TXN2505000344	02/05/2025	Online Payment
2	1460860.00	MPCB-DR-36339	29/08/2025	RTGS

Copy to:

1. Regional Officer, MPCB, Pune and Sub-Regional Officer, MPCB, Pune I
   - They are directed to ensure the compliance of the consent conditions.
2. Chief Accounts Officer, MPCB,Sion, Mumbai

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1) A] As per your application, you have provided FAB based Sewage Treatment Plants (STPs) of combined capacity **1750 CMD for treatment of domestic effluent of 1000 CMD.**

B] The Applicant shall operate the sewage treatment plant (STP) to treat the sewage so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

Sr.No	Parameters	Limiting concentration not to exceed in mg/l, except for pH
1	pH	5.5-9.0
2	BOD	10
3	COD	50
4	TSS	20
5	NH4 N	5
6	N-total	10
7	Fecal Coliform	less than 100

C] The treated effluent shall be 60% recycled for secondary purposes such as toilet flushing, air-conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening and/ or connected to local body sewer line with water metering system.

2) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or and extension or addition thereto.

3) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

4) **The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act,1974 and as amended, and other provisions as contained in the said act.**

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	0.00
2.	Domestic purpose	1250.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	0.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Grandening/Other consumption	

5) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time.

SCHEDULE-II

Terms & conditions for compliance of Air Pollution Control:

1) **As per your application, you have provided the Air pollution control (APC)system and erected following stack (s) and to observe the following fuel pattern-**

Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
S-1 to S-2	DG Sets of 62.50 kVA x 02	Acoustic Enclosure	1.58	HSD 26 Ltr/Hr	1	SO2	12.48 Kg/Day
S-3	DG Set of 75 kVA	Acoustic Enclosure	1.73	HSD 15.60 Ltr/Hr	1	SO2	7.488 Kg/Day
S-4 to S-6	DG Sets of 125 kVA x 03	Acoustic Enclosure	2.24	HSD 78 Ltr/Hr	1	SO2	37.44 Kg/Day
S-7 to S-10	DG Sets of 200 kVA x 04	Acoustic Enclosure	2.83	HSD 966.40 Ltr/Hr	1	SO2	463.872 Kg/Day
S-11	DG Set of 250 kVA	Acoustic Enclosure	3.16	HSD 52 Ltr/Hr	1	SO2	24.96 Kg/Day
S-12	DG Set of 320 kVA	Acoustic Enclosure	3.58	HSD 66.56 Ltr/Hr	1	SO2	31.9488 Kg/Day
S-13 to S-15	DG Sets of 400 kVA x 03	Acoustic Enclosure	4.00	HSD 249.60 Ltr/Hr	1	SO2	119.808 Kg/Day
S-16 to S-24	DG Sets of 1010 kVA x 09	Acoustic Enclosure	30.00	HSD 1890.72 Ltr/Hr	1	SO2	907.5456 Kg/Day
S-25	DG Set of 1700 kVA	Acoustic Enclosure		HSD 353.60 Ltr/Hr	1	SO2	169.728 Kg/Day

2) The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards.

Total Particular matter	Not to exceed	150 mg/Nm3

3) The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacemenalteration well before its life come to an end or erection of new pollution control equipment.

4) The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

SCHEDULE-III

Details of Bank Guarantees:

Sr. No.	Consent(C2E/C2O/C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	Renewal of Consent to Operate (Part-I)	Rs. 25 Lakhs	Extension of existing BG	Towards O & M of Pollution Control Systems and Compliance of Consent conditions.	31/05/2027	31/05/2028

** The above Bank Guarantee(s) shall be submitted by the applicant in favour of Regional Officer at the respective Regional Office within 15 days of the date of issue of Consent.
 # Existing BG obtained for above purpose if any may be extended for period of validity as above.

BG Forfeiture History

Srno.	Consent (C2E/C2O/C2R)	Amount of BG Imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
NA						

BG Return details

Srno.	Consent (C2E/C2O/C2R)	BG Imposed	Purpose of BG	Amount of BG Returned
NA				

SCHEDULE-IV

General Conditions:

1 The applicant shall provide facility for collection of samples of sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.

2 The firm shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act,1981 and Environmental Protection Act 1986 and Solid Waste Management Rule 2016, Noise (Pollution and Control) Rules, 2000 and E-Waste (Management & Handling Rule 2011.

3 Drainage system shall be provided for collection of sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No sewage shall be admitted in the pipes/sewers downstream of the terminal manholes. No sewage shall find its way other than in designed and provided collection system.

4 Vehicles hired for bringing construction material to the site should be in good condition and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.

5 Conditions for D.G. Set

a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.

b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.

c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.

d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.

e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.

f) D.G. Set shall be operated only in case of power failure.

g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.

h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.

6 Solid Waste – The applicant shall provide onsite municipal solid waste processing system & shall comply with Solid Waste Management Rule 2016 & E-Waste (M & H) Rule 2011.

7 Affidavit undertaking in respect of no change in the status of consent conditions and compliance of the consent conditions the draft can be downloaded from the official web site of the MPCB.

8 Applicant shall submit official e-mail address and any change will be duly informed to the MPCB.

9 The treated sewage shall be disinfected using suitable disinfection method.

10 The firm shall submit to this office, the 30th day of September every year, the environment statement report for the financial year ending 31st march in the prescribed Form-V as per the provision of rule 14 of the Environmental (Protection) Second Amended rule 1992.

11 The applicant shall make an application for renewal of the consent at least 60 days before date of the expiry of the consent.

This certificate is digitally & electronically signed.

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010706/24010437
Fax: 24023516
Website: http://mpcb.gov.in
Email: cac-cell@mpcb.gov.in

Kalpataru Point, 2nd, 3rd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

Infrastructure/ORANGE/L.S.I
No:- Format1.0/CAC-CELL/UAN No.0000246112/CR/2508004006 **Date: 30/08/2025**

To,
City Corporation Ltd., Amanora Park Township Project, S. No. 138,139,173, 177,181,182,184,185,187 to 200, 242 to 245, Village. Sadesatranali & S. No. 111,113 to 121, Village. Manjari, Tal. Haveli, Dist. Pune.

Your Service Is Our Duty

Sub: Renewal of Consent to Operate(Part-II) for township construction project under Orange Category

Ref:

1. Consent to Establish accorded by the Board vide letter BO/PCI-I/RO(P&P)/101/E/CC-80 dtd.17/06/2005.
2. Environment Clearance accorded by MoEF,GoI vide letter No. J.12011/22/2005/IA(CIE) GoI, MoEF dtd. 27/10/2005.
3. Renewal of Consent to operate (Part-I) vide No Format1.0/CAC-CELL/UAN No.0000178200/CR/2401000587 dtd 04.01.2024
4. Renewal of Consent to Operate (Part-II) vide No Format1.0/CAC-CELL/UAN No.0000177804/CR/2401000870 dtd 06.01.2024
5. Renewal of Consent to Operate (Part-III) vide No Format1.0/RO/UAN No.0000216774/CR/2410000172 dtd 01.10.2024
6. Renewal of consent to Operate (Part-IV) vide No Format1.0/RO/UAN No.0000219623/CR/2410000171 dtd 01.10.2024
7. Consent to Operate(Part-V) vide No Format1.0//UAN No.0000216859/CO/2505001884 dtd 13/05/2025
8. Minutes of 3rd Consent Appraisal Committee meeting held on 10/06/2025

Your application NO. MPCB-CONSENT-0000246112

For: Grant of Consent to Renewal under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal ofAuthorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundry Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I,II,III & IV annexed to this order:

1. **The Renewal of Consent to Operate (Part-II) is granted up to 31/10/2027**
2. **The capital investment of the project is Rs.331.48 Cr. Cr. (As per C.A Certificate submitted by industry).**

3. **The Renewal of Consent to Operate (Part-II) is valid for building construction project named as City Corporation Limited - Amanora Park Town (Phase-2), S. No 138, 139, 173,177,181,182,184,185, 187 to 200, 242 to 245 from village sadesatranali and Sr. no. 111, 113 to 121 from village Manjari, Hadapsar, Tal Haveli, Dist Pune, on Total Plot Area of 210170.00 SqMtrs for Part-II total construction BUA of 5,41,142.12 SqMtrs out of Total Construction BUA of 2,11,172.71 SqMtr as per EC granted dated 17/06/2005 including utilities and services**

Sr.No	Permission Obtained	Plot Area (SqMtr)	BUA (SqMtr)
1	EC- dtd. 27/10/2005	1926311.00	541142.12
2	C to E- dtd. 17/06/2005	1926311.00	541142.12
3	C to R (Part-I)- dtd. 04/01/2024	210170.00	691864.50
4	C to R (Part-II)- dtd. 06/01/2024	210170.00	541142.12
5	C to R (Part-III)- dtd. 01/10/2024	78538.00	370329.00
6	C to R (Part-IV)- dtd. 01/10/2024	34254.00	211172.71
7	C to O (Part-V)- dtd. 13/05/2025	8626.00	63078.77

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal
1.	Trade effluent	Nil	Nil	Nil
2.	Domestic effluent	1199	As per Schedule - I	The treated sewage shall be 60% recycled for secondary purposes and remaining shall be utilized on land for gardening and/ or connected to local body sewer line with water metering system.

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
S-16	DG Set 500 kVA	01	As per Schedule -II
S-17	DG Set 500 kVA	01	As per Schedule -II
S-18	DG Set 200 kVA	01	As per Schedule -II
S-19	DG Set 250 kVA	01	As per Schedule -II
S-20	DG Set 250 kVA	01	As per Schedule -II
S-21	DG Set 500 kVA	01	As per Schedule -II
S-22	DG Set 500 kVA	01	As per Schedule -II

6. **Conditions under Solid Waste Rules, 2016:**

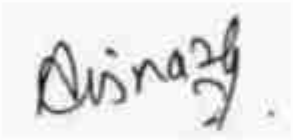
Sr No	Type Of Waste	Quantity & UoM	Treatment	Disposal
1	Bio-degradable Waste	1.3 MT/Day	OWC followed by composting facility	Used as Manure.
2	Non-biodegradable Waste	1.3 MT/Day	Segregation	By Sale to Auth. Vendor.
3	STP Sludge	100 Kg/Day	Dewatering	Used as Manure.

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for Collection, Segregation, Storage, Transportation, Treatment and Disposal of hazardous waste:**

Sr No	Category No.	Quantity	UoM	Treatment	Disposal
1	5.1 Used or spent oil	0.16	KL/A	Stored in drum	By Sale to Auth. reprocesser

8. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
10. PP shall operate STP scientifically to achieve the treated domestic effluent standard for the parameter BOD-10 mg/lit including disinfection facility to the treated sewage.
11. The treated sewage shall be 60% recycled for secondary purposes such as toilet flushing, air-conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening and/ or connected to local body sewer line with water metering system.
12. PP shall properly operate organic waste digester along with composting facility/bio-digester (biogas) for the treatment of wet garbage.

This consent is issued on the basis of information/documents submitted by the Applicant/Project Proponent, if it has been observed that the information submitted by the Applicant/Project Proponent is false, misleading or fraudulent, the Board reserves its right to revoke the consent & further legal action will be initiated against the Applicant/Project Proponent.



Signed by: Dr. Avinash Dhoktre
Member Secretary
For and on behalf of
Maharashtra Pollution Control Board
2025-08-30 13:49:29 IST

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	250000.00	TXN2505001219	07/05/2025	Online Payment
2	412960.00	MPCB-DR-36340	29/08/2025	RTGS

Copy to:

1. Regional Officer, MPCB, Pune and Sub-Regional Officer, MPCB, Pune I
   - They are directed to ensure the compliance of the consent conditions.
2. Chief Accounts Officer, MPCB,Sion, Mumbai

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1) A] As per your application, you have provided MBBR based Sewage Treatment Plants (STPs) of combined capacity **1500 CMD for treatment of domestic effluent of 1199 CMD.**

B] The Applicant shall operate the sewage treatment plant (STP) to treat the sewage so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

Sr.No	Parameters	Limiting concentration not to exceed in mg/l, except for pH
1	pH	5.5-9.0
2	BOD	10
3	COD	50
4	TSS	20
5	NH4 N	5
6	N-total	10
7	Fecal Coliform	less than 100

C] The treated effluent shall be 60% recycled for secondary purposes such as toilet flushing, air-conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening and/ or connected to local body sewer line with water metering system.

2) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or and extension or addition thereto.

3) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

4) **The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act,1974 and as amended, and other provisions as contained in the said act.**

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	0.00
2.	Domestic purpose	1332.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	0.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Grandening/Other consumption	

5) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time.

SCHEDULE-II

Terms & conditions for compliance of Air Pollution Control:

1) **As per your application, you have provided the Air pollution control (APC)system and erected following stack (s) and to observe the following fuel pattern-**

Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
S-16	DG Set of 500 kVA	Acoustic Enclosure	4.50	HSD 150 Ltr/Hr	1	SO2	72 Kg/Day
S-17	DG Set of 500 kVA	Acoustic Enclosure			1	SO2	72 Kg/Day
S-18	DG Set of 200 kVA	Acoustic Enclosure	3.00		1	SO2	48 Kg/Day
S-19	DG Set of 250 kVA	Acoustic Enclosure	3.16		1	SO2	60 Kg/Day
S-20	DG Set of 250 kVA	Acoustic Enclosure		HSD 125 Ltr/Hr	1	SO2	60 Kg/Day
S-21	DG Set of 500 kVA	Acoustic Enclosure	4.50	HSD 150 Ltr/Hr	1	SO2	72 Kg/Day
S-22	DG Set of 500 kVA	Acoustic Enclosure	4.50	HSD 150 Ltr/Hr	1	SO2	72 Kg/Day

2) The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards.

Total Particular matter	Not to exceed	150 mg/Nm3

3) The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacemenalteration well before its life come to an end or erection of new pollution control equipment.

4) The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

SCHEDULE-III

Details of Bank Guarantees:

Sr. No.	Consent(C2E/C2O/C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	Renewal of Consent to Operate (Part-II) Phase-II	Rs. 25 Lakhs	Extension of existing BG	Towards O & M of Pollution Control Systems and Compliance of Consent conditions.	31/10/2027	31/10/2028

** The above Bank Guarantee(s) shall be submitted by the applicant in favour of Regional Officer at the respective Regional Office within 15 days of the date of issue of Consent.
 # Existing BG obtained for above purpose if any may be extended for period of validity as above.

BG Forfeiture History

Srno.	Consent (C2E/C2O/C2R)	Amount of BG Imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
NA						

BG Return details

Srno.	Consent (C2E/C2O/C2R)	BG Imposed	Purpose of BG	Amount of BG Returned
NA				

SCHEDULE-IV

General Conditions:

1 The applicant shall provide facility for collection of samples of sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.

2 The firm shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act,1981 and Environmental Protection Act 1986 and Solid Waste Management Rule 2016, Noise (Pollution and Control) Rules, 2000 and E-Waste (Management & Handling Rule 2011.

3 Drainage system shall be provided for collection of sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No sewage shall be admitted in the pipes/sewers downstream of the terminal manholes. No sewage shall find its way other than in designed and provided collection system.

4 Vehicles hired for bringing construction material to the site should be in good condition and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.

5 Conditions for D.G. Set

a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.

b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.

c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.

d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.

e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.

f) D.G. Set shall be operated only in case of power failure.

g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.

h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.

6 Solid Waste – The applicant shall provide onsite municipal solid waste processing system & shall comply with Solid Waste Management Rule 2016 & E-Waste (M & H) Rule 2011.

7 Affidavit undertaking in respect of no change in the status of consent conditions and compliance of the consent conditions the draft can be downloaded from the official web site of the MPCB.

8 Applicant shall submit official e-mail address and any change will be duly informed to the MPCB.

9 The treated sewage shall be disinfected using suitable disinfection method.

10 The firm shall submit to this office, the 30th day of September every year, the environment statement report for the financial year ending 31st march in the prescribed Form-V as per the provision of rule 14 of the Environmental (Protection) Second Amended rule 1992.

11 The applicant shall make an application for renewal of the consent at least 60 days before date of the expiry of the consent.

This certificate is digitally & electronically signed.

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 020 - 25811627
Fax: 020 -25811029
Website: http://mpcb.gov.in
Email: ropune@mpcb.gov.in

Jog Center, 3rd floor,
Mumbai Pune Road,
Wakdewadi, Pune - 411003.

Infrastructure/RED/L.S.I
No:- Format1.0/RO/UAN No.0000216774/CR/2410000172

Date: 01/10/2024

To,
City Corporation Ltd., Amanora Park Township Project, S. No. 138,139,173,177,181,182,184,185,187 to 200, 242 to 245, Village. Sadesatranali & S. No. 111,113 to 121, Village. Manjari, Tal. Haveli, Dist. Pune.

Your Service is Our Duty

Sub: Consent to Renewal

Your application NO. MPCB-CONSENT-0000216774

For: grant of Consent to Renewal under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal ofAuthorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundry Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I,II,III & IV annexed to this order:

1. **The Consent to Renewal is granted for a period up to 31.07.2029**
2. **The capital investment of the project is Rs.19.22 Cr. (As per C.A Certificate submitted by industry).**
3. **The Consent to Renewal is valid for construction and infra project named as City Corporation Limited, Amanora Park Town Project,138, 139, 173, 177, 181, 182, 184, 185, 187 - 200, 242 -245,111, 113 to 121 Hadapsar and Manjari,Survey No: 138, 139, 173, 177, 181, 182, 184, 185, 187 to 200, 242 to 245 from village Sade Satranali and Sr. No 111, 113 to 121 from village Manjari, Tal – Haveli, Dist – Pune,Haveli,Pune on Total Plot Area of 78538 (out of 1926311 Sq M) SqMtrs for construction BUA of 3,70,329.40 Sq M (FSI+NFSI) SqMtrs including utilities and services**

Sr.No	Permission Obtained	Plot Area (SqMtr)	BUA (SqMtr)
1	Amanora Park Township construction project (Part-III)	1926311.00	370329.00

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal
1.	Trade e uent	Nil	0	0
2.	Domestic e uent	990	As per Schedule - I	The treated e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be connected to the sewerage system provided by local body

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
23 & 24	500 KVA DG at R19 (2 Nos)	2	As per Schedule -II
25	250 KVA DG at C2	1	As per Schedule -II
26	160 KVA DG at C6	1	As per Schedule -II
27	1010 KVA DG at EB1 MLCP	1	As per Schedule -II
28	400 KVA DG at AS5&6	1	As per Schedule -II
29	62.5 DG at AS3	1	As per Schedule -II

6. **Conditions under Solid Waste Rules, 2016:**

Sr No	Type Of Waste	Quantity & UoM	Treatment	Disposal
1	STP Sludge	100 Kg/Day	Centrifuge system	used as Manure
2	Bio-degradable Waste	2000 MT/Day	Biogas & Composting	Biogas is used as Fuel & Compost in landscape area
3	Non-biodegradable Waste	500 MT/Day	Segregation & Handed over to Auth. Vendor	Segregation & Handed over to Auth. Vendor

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for Collection, Segregation, Storage, Transportation, Treatment and Disposal of hazardous waste:**

Sr No	Category No.	Quantity	UoM	Treatment	Disposal
1	5.1 Used or spent oil	0.160	KL/A	NA	Sale to Authorized vendor

8. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
10. PP shall submit the undertaking in Board s prescribed format within 15 days regarding compliance of conditions stipulated in Environmental Clearance (EC) and Consent to Operate (Part-I).
11. PP shall extend the BG of Rs. 25 lakhs towards O&M of STP, OWC and compliance of conditions stipulated in EC and Consent to Operate.
12. PP shall provide adequate capacity of sewage treatment plant so as to achieve treated domestic e uent standard for the parameter BOD- 10 mg/lit.
13. The treated e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening.
14. The online monitoring system installed for the parameters Flow, BOD, TSS at the outlet of STP and shall be connected to MPCB Server.

This consent is issued on the basis of information/documents submitted by the Applicant/Project Proponent, if it has been observed that the information submitted by the Applicant/Project Proponent is false, misleading or fraudulent, the Board reserves its right to revoke the consent & further legal action will be initiated against the Applicant/Project Proponent.

Signed by: Jagannath Sahukhe
Regional Officer
For and on behalf of
Maharashtra Pollution Control Board

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	250000.00	TXN2407005032	26/07/2024	Online Payment

Copy to:

1. Sub-Regional O cer, MPCB, Pune I

- They are directed to ensure the compliance of the consent conditions.

2. Chief Accounts O cer, MPCB,Sion, Mumbai

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1) A] As per your application, you have provided MBBR based Sewage Treatment Plants (STPs) of combined capacity **1500 CMD for treatment of domestic effluent of 990 CMD.**

B] The Applicant shall operate the sewage treatment plant (STP) to treat the sewage so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

Sr.No	Parameters	Limiting concentration not to exceed in mg/l, except for pH
1	pH	5.5-9.0
2	BOD	10
3	COD	50
4	TSS	20
5	NH4 N	5
6	N-total	10
7	Fecal Coliform	less than 100

C] The treated domestic e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening and connected to the sewerage system provided by local body.

2) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade e uent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or and extension or addition thereto.

3) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

4) **The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act,1974 and as amended, and other provisions as contained in the said act.**

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	0.00
2.	Domestic purpose	1237.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	0.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Grandening/Other consumption	0

5) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time.

SCHEDULE-II

Terms & conditions for compliance of Air Pollution Control:

1) **As per your application, you have provided the Air pollution control (APC)system and erected following stack (s) and to observe the following fuel pattern-**

Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
23 & 24	500 KVA DG at R19 (2 Nos)	Acoustic Enclosure Stack	7.00	HSD 50 Ltr/Hr	1	SO2	24 Kg/Day
25	250 KVA DG at C2	Acoustic Enclosure Stack	6.00	HSD 25 Ltr/Hr	1	SO2	12 Kg/Day
26	160 KVA DG at C6	Acoustic Enclosure Stack	5.00	HSD 20 Ltr/Hr	1	SO2	10 Kg/Day
27	1010 KVA DG at EB1 MLCP	Acoustic Enclosure Stack	8.50	HSD 50 Ltr/Hr	1	SO2	24 Kg/Day
28	400 KVA DG at AS5&6	Acoustic Enclosure Stack	7.00	HSD 50 Ltr/Hr	1	SO2	24 Kg/Day
29	62.5 DG at AS3	Acoustic Enclosure Stack	5.00	HSD 20 Ltr/Hr	1	SO2	10 Kg/Day

2) The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards.

Total Particular matter	Not to exceed	150 mg/Nm3

3) The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacemenalteration well before its life come to an end or erection of new pollution control equipment.

4) The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

SCHEDULE-III

Details of Bank Guarantees:

Sr. No.	Consent(C2E/C2O/C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	Renewal of Consent	Rs. 25 Lacs	15 Days	Towards O & M of Pollution Control Systems and Compliance of Consent conditions.	Continuous	30.09.2030

** The above Bank Guarantee(s) shall be submitted by the applicant in favour of Regional O cer at the respective Regional O ce within 15 days of the date of issue of Consent.

 # Existing BG obtained for above purpose if any may be extended for period of validity as above.

BG Forfeiture History

Srno.	Consent (C2E/C2O/C2R)	Amount of BG Imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
NA						

BG Return details

Srno.	Consent (C2E/C2O/C2R)	BG Imposed	Purpose of BG	Amount of BG Returned
NA				

SCHEDULE-IV

General Conditions:

1 The applicant shall provide facility for collection of samples of sewage e uents, air emissions and hazardous waste to the Board sta at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.

2 The firm shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act,1981 and Environmental Protection Act 1986 and Solid Waste Management Rule 2016, Noise (Pollution and Control) Rules, 2000 and E-Waste (Management & Handling Rule 2011.

3 Drainage system shall be provided for collection of sewage e uents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the ow. No sewage shall be admitted in the pipes/sewers downstream of the terminal manholes. No sewage shall find its way other than in designed and provided collection system.

4 Vehicles hired for bringing construction material to the site should be in good condition and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.

5 Conditions for D.G. Set

a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.

b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust mu er with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at di erent points at 0.5 meters from acoustic enclosure/room and then average.

c) Industry should make e orts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.

d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.

e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.

f) D.G. Set shall be operated only in case of power failure.

g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.

h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.

6 Solid Waste The applicant shall provide onsite municipal solid waste processing system & shall comply with Solid Waste Management Rule 2016 & E-Waste (M & H) Rule 2011.

7 A davit undertaking in respect of no change in the status of consent conditions and compliance of the consent conditions the draft can be downloaded from the o cial web site of the MPCB.

8 Applicant shall submit o cial e-mail address and any change will be duly informed to the MPCB.

9 The treated sewage shall be disinfected using suitable disinfection method.

10 The firm shall submit to this o ce, the 30th day of September every year, the environment statement report for the financial year ending 31st march in the prescribed Form-V as per the provision of rule 14 of the Environmental (Protection) Second Amended rule 1992.

11 The applicant shall make an application for renewal of the consent at least 60 days before date of the expiry of the consent.

This certificate is digitally & electronically signed.

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 020 - 25811627
Fax: 020 -25811029
Website: http://mpcb.gov.in
Email: ropune@mpcb.gov.in

Jog Center, 3rd floor,
Mumbai Pune Road,
Wakdewadi, Pune - 411003.

Infrastructure/RED/L.S.I
No:- Format1.0/RO/UAN No.0000219623/CR/2410000171

Date: 01/10/2024

To,
City Corporation Ltd.,
Amanora Park Township Project,
S. No.
138,139,173,177,181,182,184,185,187 to 200, 242 to 245,
Village. Sadesatranali & S. No. 111,113 to 121, Village. Manjari,
Tal. Haveli, Dist. Pune.

Your Service is Our Duty

Sub: **Consent to Renewal**

Ref: Board s granted consent to operate vide number Format1.0/CAC-CELL/UAN No.0000168307/CO/2310002152 Date: 28/10/2023

Your application NO. MPCB-CONSENT-0000219623

For: grant of Consent to Renewal under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal ofAuthorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundry Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I,II,III & IV annexed to this order:

1. **The Consent to Renewal is granted for a period up to 30.09.2029**
2. **The capital investment of the project is Rs.19.22 Cr. (As per C.A Certificate submitted by industry).**
3. **The Consent to Renewal is valid for in infrastructure project named as M/s. City Corporation Limited, Amanora Park Town Project,as mentioned in Location of Unit,Survey No: 138, 139, 173, 177, 181, 182, 184, 185, 187 to 200, 242 to 245 from village Sade Satranali and Sr. No 111, 113 to 121 from village Manjari, Tal – Haveli, Dist – Pune,Haveli, Pune on Total Plot Area of 34254 (out of 1926311 Sq M) SqMtrs for construction BUA of 211172.71 SqMtrs as per EC granted dated including utilities and services**

Sr.No	Permission Obtained	Plot Area (SqMtr)	BUA (SqMtr)
1	Amanora Park Township construction project (Part-IV)	34254.00	211172.71

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal
1.	Trade e uent	Nil	0	0
2.	Domestic e uent	710	As per Schedule - I	The treated e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be connected to the sewerage system provided by local body

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
S31 & S32	DG	2	As per Schedule -II

6. **Conditions under Solid Waste Rules, 2016:**

Sr No	Type Of Waste	Quantity & UoM	Treatment	Disposal
1	STP Sludge	20 Kg/cycle	Centrifuge system	used as manure
2	Wet Waste	1100 Kg/Day	Biogas & Composting	Biogas is used as Fuel & Compost in landscape area
3	Dry Waste	1100 Kg/Day	Segregation & Sale to Vendor	Segregation & Sale to Vendor

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for Collection, Segregation, Storage, Transportation, Treatment and Disposal of hazardous waste:**

Sr No	Category No.	Quantity	UoM	Treatment	Disposal
1	5.1 Used or spent oil	50	Ltr/A	NA	Handed over to Auth. reprocessor.

8. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
10. PP shall submit the undertaking in Board s prescribed format within 15 days regarding compliance of conditions stipulated in Environmental Clearance (EC) and Consent to Operate (Part-I).
11. PP shall extend the BG of Rs. 25 lakhs towards O&M of STP, OWC and compliance of conditions stipulated in EC and Consent to Operate.
12. PP shall provide adequate capacity of sewage treatment plant so as to achieve treated domestic e uent standard for the parameter BOD- 10 mg/lit.
13. The treated e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening.
14. The online monitoring system installed for the parameters Flow, BOD, TSS at the outlet of STP and shall be connected to MPCB Server.

This consent is issued on the basis of information/documents submitted by the Applicant/Project Proponent, if it has been observed that the information submitted by the Applicant/Project Proponent is false, misleading or fraudulent, the Board reserves its right to revoke the consent & further legal action will be initiated against the Applicant/Project Proponent.

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	250000.00	TXN2408005169	29/08/2024	Online Payment

Copy to:

1. Sub-Regional O cer, MPCB, Pune I
   - They are directed to ensure the compliance of the consent conditions.
2. Chief Accounts O cer, MPCB,Sion, Mumbai

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1) A] As per your application, you have provided MBBR based Sewage Treatment Plants (STPs) of combined capacity **1500 CMD for treatment of domestic effluent of 710 CMD.**

B] The Applicant shall operate the sewage treatment plant (STP) to treat the sewage so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

Sr.No	Parameters	Limiting concentration not to exceed in mg/l, except for pH
1	pH	5.5-9.0
2	BOD	10
3	COD	50
4	TSS	20
5	NH4 N	5
6	N-total	10
7	Fecal Coliform	less than 100

C] The treated domestic e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening and connected to the sewerage system provided by local body.

2) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade e uent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or and extension or addition thereto.

3) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

4) **The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act,1974 and as amended, and other provisions as contained in the said act.**

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	0.00
2.	Domestic purpose	888.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	0.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Grandening/Other consumption	0

5) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time.

SCHEDULE-II

Terms & conditions for compliance of Air Pollution Control:

1) **As per your application, you have provided the Air pollution control (APC)system and erected following stack (s) and to observe the following fuel pattern-**

Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
S31 & S32	DG	Acoustic Enclosure Stack	7.00	HSD 50 Ltr/Hr	-	SO2	24 Kg/Day

2) The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards.

Total Particular matter	Not to exceed	150 mg/Nm3

3) The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacemenalteration well before its life come to an end or erection of new pollution control equipment.

4) The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

SCHEDULE-III

Details of Bank Guarantees:

Sr. No.	Consent(C2E/C2O/C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	Renewal of Consent	Rs. 25 Lacs	15 Days	Towards O & M of Pollution Control Systems and Compliance of Consent conditions.	Continuous	30.09.2030

** The above Bank Guarantee(s) shall be submitted by the applicant in favour of Regional O cer at the respective Regional O ce within 15 days of the date of issue of Consent.

 # Existing BG obtained for above purpose if any may be extended for period of validity as above.

BG Forfeiture History

Srno.	Consent (C2E/C2O/C2R)	Amount of BG Imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
NA						

BG Return details

Srno.	Consent (C2E/C2O/C2R)	BG Imposed	Purpose of BG	Amount of BG Returned
NA				

SCHEDULE-IV

General Conditions:

1 The applicant shall provide facility for collection of samples of sewage e uents, air emissions and hazardous waste to the Board sta at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.

2 The firm shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act,1981 and Environmental Protection Act 1986 and Solid Waste Management Rule 2016, Noise (Pollution and Control) Rules, 2000 and E-Waste (Management & Handling Rule 2011.

3 Drainage system shall be provided for collection of sewage e uents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the ow. No sewage shall be admitted in the pipes/sewers downstream of the terminal manholes. No sewage shall find its way other than in designed and provided collection system.

4 Vehicles hired for bringing construction material to the site should be in good condition and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.

5 Conditions for D.G. Set

a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.

b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust mu er with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at di erent points at 0.5 meters from acoustic enclosure/room and then average.

c) Industry should make e orts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.

d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.

e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.

f) D.G. Set shall be operated only in case of power failure.

g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.

h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.

6 Solid Waste The applicant shall provide onsite municipal solid waste processing system & shall comply with Solid Waste Management Rule 2016 & E-Waste (M & H) Rule 2011.

7 A davit undertaking in respect of no change in the status of consent conditions and compliance of the consent conditions the draft can be downloaded from the o cial web site of the MPCB.

8 Applicant shall submit o cial e-mail address and any change will be duly informed to the MPCB.

9 The treated sewage shall be disinfected using suitable disinfection method.

10 The firm shall submit to this o ce, the 30th day of September every year, the environment statement report for the financial year ending 31st march in the prescribed Form-V as per the provision of rule 14 of the Environmental (Protection) Second Amended rule 1992.

11 The applicant shall make an application for renewal of the consent at least 60 days before date of the expiry of the consent.

This certificate is digitally & electronically signed.

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010706/24010437
Fax: 24023516
Website: http://mpcb.gov.in
Email: cac-cell@mpcb.gov.in

Kalpataru Point, 2nd, 3rd and 4th oor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

Infrastructure/RED/L.S.I
No:- Format1.0//UAN No.0000216859/CO/2505001884

Date: 13/05/2025

To,
M/s City Corporation Limited,
Amanora Park Town Project, Survey No: 138, 139, 173, 177, 181, 182, 184, 185, 187 to 200, 242 to 245 from village Sade Satranali and Sr. No 111, 113 to 121 from village Manjari, Tal Haveli, Dist Pune

Your Service is Our Duty

Sub: Consent to Operate(Part-V) for township construction project under Red Category

Ref:

1. Consent to Establish vide No BO/PCI-I/RO P 7 P/101/E/CC-80 dtd 17.06.2005
2. Renewal of Consent to operate (Part-I) vide No Format1.0/CAC-CELL/UAN No.0000178200/CR/2401000587 dtd 04.01.2024
3. Renewal of Consent to Operate (Part-II) vide No Format1.0/CAC-CELL/UAN No.0000177804/CR/2401000870 dtd 06.01.2024
4. Renewal of Consent to Operate (Part-III) vide No Format1.0/RO/UAN No.0000216774/CR/2410000172 dtd 01.10.2024
5. Renewal of consent to Operate (Part-IV) vide No Format1.0/RO/UAN No.0000219623/CR/2410000171 dtd 01.10.2024
6. Minutes of 15th Consent Appraisal Committee meeting held on 24.01.01.2025
7. Personal Hearing extended to PP on 07/4/2025
8. Consent to Operate (Part-V) granted vide No Format1.0/CAC-CELL/UAN No.0000216859/CO/2505000953 dtd 07/05/2025

Your application NO. MPCB-CONSENT-0000216859

For: grant of Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal ofAuthorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundry Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I,II,III & IV annexed to this order:

1. **The Consent to Operate(Part-V) is granted for period up to 31/03/2027**
2. **The capital investment of the project is Rs.213.04 Cr. (As per C.A Certificate submitted by industry).**
3. **The Consent to Operate(Part-V) is valid for construction project named as City Corporation Limited, Amanora Park Town Project, Survey No: 138, 139, 173, 177, 181, 182, 184, 185, 187 to 200, 242 to 245 from village Sade Satranali and Sr. No 111, 113 to 121 from village Manjari, Tal Haveli, Dist Pune Total Plot Area of 8626 Sq M (out of 1926311 Sq M) SqMtrs for Part-V total construction BUA of 63078.77 SqMtrs including utilities and services**

Sr.No	Permission Obtained	Plot Area (SqMtr)	BUA (SqMtr)
1	Renewal of Consent to operate (Part-I) dtd 04.01.2024	1926311.00	691864.50
2	Renewal of Consent to Operate (Part-II) dtd 06.01.2024	210170.00	541142.12
3	Renewal of Consent to Operate (Part-III) dtd 01.10.2024	78538.00	370329.00
4	Renewal of consent to Operate (Part-IV) dtd 01.10.2024	34254.00	211172.71

4. **Conditions under Water (P&CP), 1974 Act for discharge of e uent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal
1.	Trade e uent	Nil	NA	NA
2.	Domestic e uent	170	As per Schedule - I	The treated e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be connected to the sewerage system provided by local body

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
S-1 & S-2	DG set 2 Nos-400 KVA each	02	As per Schedule -II

6. **Conditions under Solid Waste Rules, 2016:**

Sr No	Type Of Waste	Quantity & UoM	Treatment	Disposal
1	Dry Waste	280 Kg/Day	Segregation	Sale to Vendor
2	Wet Waste	280 Kg/Day	Biogas & Composting	As Manure
3	STP Sludge	17 Kg/Day	Biogas & Composting	As Manure

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for Collection, Segregation, Storage, Transportation, Treatment and Disposal of hazardous waste:**

Sr No	Category No.	Quantity	UoM	Treatment	Disposal
1	5.1 Used or spent oil	100	Ltr/A	Sale to Authorized vendor	Sale to Authorized vendor

8. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
10. PP shall provide adequate capacity of sewage treatment plant so as to achieve treated domestic e uent standard for the parameter BOD- 10 mg/lit.
11. The treated e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening.

12. Project Proponent shall operate Organic waste digester with composting facility or biodigester with composting facility e ectively.
13. Project Proponent shall comply with the conditions of Environmental Clearance obtianed vide No J.12011/22/ 2005/ IA(CIE) dtd 27.10.2005 for construction project on total plot area of 476 Acres.
14. PP shall submit certified architect certificate for details of each building, Commencement Certificate, Occupation Certificate within 15 days.
15. This consent is issued with overriding e ect on Consent to Operate (Part-V) granted vide No Format1.0/CAC-CELL/UAN No.0000216859/CO/2505000953 dtd 07/05/2025
16. PP shall submit the undertaking in Board s prescribed format within 15 days regarding compliance of conditions stipulated in Environmental Clearance (EC) and Consent to Operate (Part-V).

This consent is issued on the basis of information/documents submitted by the Applicant/Project Proponent, if it has been observed that the information submitted by the Applicant/Project Proponent is false, misleading or fraudulent, the Board reserves its right to revoke the consent & further legal action will be initiated against the Applicant/Project Proponent.

61e96601
5eb00ae4
43b6aab4
30413af5
2a1d7a72
f216c049
8aacda60
9e589dc6

Signed by: Dr.Avinash Dhakne
Member Secretary
For and on behalf of
Maharashtra Pollution Control Board
2025-05-13 12:58:17 IST

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	852160.00	TXN2407005942	31/07/2024	Online Payment

Copy to:

1. Regional O cer, MPCB, Pune and Sub-Regional O cer, MPCB, Pune I
- They are directed to ensure the compliance of the consent conditions.
2. Chief Accounts O cer, MPCB,Sion, Mumbai

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1) A] As per your application, you have provided MBBR based Sewage Treatment Plants (STPs) of combined capacity **1750 CMD for treatment of domestic e uent of 170 CMD.**

B] The Applicant shall operate the sewage treatment plant (STP) to treat the sewage so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

Sr.No	Parameters	Limiting concentration not to exceed in mg/l, except for pH
1	pH	5.5-9.0
2	BOD	10
3	COD	50
4	TSS	20
5	NH4 N	5
6	N-total	10
7	Fecal Coliform	less than 100

C] The treated domestic e uent shall be 60% recycled for secondary purposes such as toilet ushing, air conditioning, cooling tower make up, firefighting etc. and remaining shall be utilized on land for gardening and connected to the sewerage system provided by local body.

2) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade e uent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or and extension or addition thereto.

3) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

4) **The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act,1974 and as amended, and other provisions as contained in the said act.**

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	0.00
2.	Domestic purpose	218.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	0.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Grandening/Other consumption	0

5) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time.

SCHEDULE-II

Terms & conditions for compliance of Air Pollution Control:

1) **As per your application, you have provided the Air pollution control (APC)system and erected following stack (s) and to observe the following fuel pattern-**

Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
S-1 &S-2	DG set 2 Nos-400 kVA each	Acoustic Enclosure	4.00	HSD 50 Ltr/Hr	1	SO2	24 Kg/Day

2) The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards.

Total Particular matter	Not to exceed	150 mg/Nm3

3) The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacemenalteration well before its life come to an end or erection of new pollution control equipment.

4) The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

5) **Conditions for utilities like Kitchen, Eating Places, Canteens:-**

a) The kitchen shall be provided with exhaust system chimney with oil catcher connected to chimney through ducting.

b) The toilet shall be provided with exhaust system connected to chimney through ducting.

c) The air conditioner shall be vibration proof and the noise shall not exceed 68 dB(A).

d) The exhaust hot air from A.C. shall be attached to Chimney at least 5 mtrs. higher than the nearest tallest building through ducting and shall discharge into open air in such a way that no nuisance is caused to neighbors.

SCHEDULE-III

Details of Bank Guarantees:

Sr. No.	Consent(C2E/C2O/C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	C to O(Part-V)	Rs 25 Lakhs	Existing/Extend	Operation & Maintenance of Pollution Control Systems and compliance of consent conditions	31/03/2027	31/03/2028

** The above Bank Guarantee(s) shall be submitted by the applicant in favour of Regional O cer at the respective Regional O ce within 15 days of the date of issue of Consent.
 # Existing BG obtained for above purpose if any may be extended for period of validity as above.

BG Forfeiture History

Srno.	Consent (C2E/C2O/C2R)	Amount of BG Imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
NA						

BG Return details

Srno.	Consent (C2E/C2O/C2R)	BG Imposed	Purpose of BG	Amount of BG Returned
NA				

SCHEDULE-IV

General Conditions:

1 The applicant shall provide facility for collection of samples of sewage e uents, air emissions and hazardous waste to the Board sta at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.

2 The firm shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act,1981 and Environmental Protection Act 1986 and Solid Waste Management Rule 2016, Noise (Pollution and Control) Rules, 2000 and E-Waste (Management & Handling Rule 2011.

3 Drainage system shall be provided for collection of sewage e uents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the ow. No sewage shall be admitted in the pipes/sewers downstream of the terminal manholes. No sewage shall find its way other than in designed and provided collection system.

4 Vehicles hired for bringing construction material to the site should be in good condition and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.

5 Conditions for D.G. Set

a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.

b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust mu er with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at di erent points at 0.5 meters from acoustic enclosure/room and then average.

c) Industry should make e orts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.

d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.

e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.

f) D.G. Set shall be operated only in case of power failure.

g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.

h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.

6 Solid Waste The applicant shall provide onsite municipal solid waste processing system & shall comply with Solid Waste Management Rule 2016 & E-Waste (M & H) Rule 2011.

7 A davit undertaking in respect of no change in the status of consent conditions and compliance of the consent conditions the draft can be downloaded from the o cial web site of the MPCB.

8 Applicant shall submit o cial e-mail address and any change will be duly informed to the MPCB.

9 The treated sewage shall be disinfected using suitable disinfection method.

10 The firm shall submit to this o ce, the 30th day of September every year, the environment statement report for the financial year ending 31st march in the prescribed Form-V as per the provision of rule 14 of the Environmental (Protection) Second Amended rule 1992.

11 The applicant shall make an application for renewal of the consent at least 60 days before date of the expiry of the consent.

This certificate is digitally & electronically signed.

Regd Post

Tele: 23010237 7310

Directorate of Ops (ATS)
Air Headquarters
Vayu Bhawan, Rafi Marg
New Delhi -110105

Ar HQ/S 17726/4/ATS (Ty BM-MMDCCCLXX) 07 November 2018

Shri Jaymalhar K Bhosale
Chief Operating Officer
Amanora Park Town
City Corporation Ltd
City Chambers, 917/19A
FC Road, Shivajinagar
Pune-411004

NOC FOR CONSTRUCTION OF BUILDING

Sir,

1. Please refer your application on the subject.

2 The application has been examined within **provisions mentioned under section 5(2) of Gazette of India GSR 751 (E) read in conjunction with sub section (1) clause (o) & clause (r) of sub section 2 of section 5 read with section 9 A of Aircraft Act 1934. Works of Defence Act 1903** and other relevant orders on the subject. Air HQ has no objection for construction of building **with a reduced height of 179.128 M AGL or 742.128 M AMSL** at Amanora Park Town, Sy No 185, 180, 193, 242, 182, 200, 199, 195, 191 187 of Sadesatranali Hadapsar & 25, 28, 31 of Mundhwa, Taluka Haveli, Pune (Maharashtra)subject to **following conditions**:

(a) The NOC is for construction of building and cannot be used as document for any other purpose/claim whatsoever including ownership of land.

(b) The applicant is responsible to obtain NOC/all statutory clearances from the concerned authorities including approval of building plans. Clearance shall also be obtained separately from any other defence establishment in the vicinity of proposed construction.

(c) The site elevation and site coordinates provided by the applicant are taken for calculation of the permissible top elevation of the proposed structure. If however at any stage it is established that the actual site elevation and site coordinates are different from those provided by the applicant, the NOC will be invalid.

(d) The issue of the NOC is further subject to the provisions of Sec 9 A of the Indian Aircraft Act 1934 and those of any notifications issued there under from time to time including the Aircraft (Demolition of Obstruction caused by buildings and trees etc) Rules, 1994.

(e) Vertical extent (highest point) of the building proposed at coordinates mentioned overleaf **shall not exceed 742.128 M AMSL or 179.128 M AGL whichever is lower. No extension or structure permanent or temporary (e.g. Cranes, Antennas, Mumtee, Lightening Arresters, Lift machine room, Overhead water tank, Cooling towers, Sign boards, any attachment or fixtures of any kind) shall be permitted above the cleared height**.

Pillar No.	Latitude	Longitude	Site Elevation
1	18° 31' 26.60" N	73° 56' 20.30" E	552 M AMSL
2	18° 31' 19.70" N	73° 56' 08.70" E	550 M AMSL
3	18° 31' 14.50" N	73° 56' 22.90" E	555 M AMSL
4	18° 31' 09.60" N	73° 56' 00.10" E	556 M AMSL
5	18° 31' 03.20" N	73° 56' 00.70" E	557 M AMSL
6	18° 31' 06.70" N	73° 56' 21.10" E	556 M AMSL
7	18° 30' 49.50" N	73° 56' 21.60" E	559 M AMSL
8	18° 30' 48.70" N	73° 56' 4[illegible]" E	552 M AMSL
9	18° 30' 52.20" N	73° 55' 42.20" E	562 M AMSL
10	18° 30' 52.80" N	73° 56' 52.60" E	563 M AMSL
11	18° 31' 01.70" N	73° 56' 57.00" E	563 M AMSL
12	18° 31' 12.70" N	73° 57' 04.20" E	563 M AMSL
13	18° 31' 25.00" N	73° 56' 58.30" E	559 M AMSL
14	18° 31' 25.40" N	73° 57' 16.70" E	562 M AMSL
15	18° 31' 30.10" N	73° 57' 16.90" E	560 M AMSL
16	18° 31' 35.60" N	73° 56' 55.60" E	557 M AMSL
17	18° 31' 36.90" N	73° 56' 32.50" E	551 M AMSL

(f) Standard obstruction lightings as per IS 5613 notification and International Civil Aviation Organization (ICAO) standards as stipulated in ICAO Annex-14 is to be provided by the company. The lights shall be kept 'ON' at all times. Provision shall be made for standby power supply to keep the lights 'ON' during power failure. Company shall carry out periodic maintenance of the lights to keep them in serviceable and visible condition.

(g) A proper garbage disposal system shall be ensured by the applicant prior to the construction of buildings for the purpose of avoiding bird activity.

(h) No light or a combination of lights which by reason of its intensity, configuration or colour may cause confusion with the aeronautical ground lights of the Airport shall be installed at the site at any time during or after the construction of the building.

(j) The commencement and completion of construction including installation of obstruction lights shall be intimated to AOC, AF Station Pune and CATCO, HQ SWAC IAF, Vayu Shakti Nagar,Chiloda, Gandhinagar-382042, Gujarat. Failure to render these certificates within the stipulated time shall lead to cancellation of NOC.

(k) The NOC is valid for five years from the date of its issue. If the building is not constructed and completed within this period, the apolicant shall be required to obtain a fresh/extension of NOC from Indian Air Force. Request for revalidation of NOC will not be entertained after the expiry of validity period.

Yours sincerely

(RK Anand)
Air Commodore
Air Commodore Operations ATS

[illegible] 15/11/2018
[illegible] LTD.

पुणे महानगर प्रदेश विकास प्राधिकरण, पुणे

Pune metropolitan Region Development Authority, Pune

अग्निशमन विभाग, आकुर्डी रेल्वे स्टेशन जवळ, नवीन प्रशासकीय इमारत,

०४ था मजला, अ-विंग, आकुर्डी-४११०३५

ई-मेल- fireofficer.pmrda@gmail.com, दूरध्वनी क्र.- २७६५९८५५

0 2 SEP 2024

Please quote following number to Building Permission for future correspondence with PMRDA No. FFH/130 /2024-25

TO,

M/s. City Corporation Ltd Through
Its Director Mr. J. K. Bhosale.
Sector No. R-6
Survey No. 138/18 and Others
Village- Hadapsar
Tal-Haveli, Dist-Pune.

Sub:- Grant of "Final No Objection Certificate" for your Residential + Club House Building "T-48 and T-49" only on Sector-R-6 Survey No. 138/18 and Others Village-Hadpsar, Tal-Haveli, Dist-Pune.

Ref: i)"Provisional NOC" issued by "this office Pune vide no. **FPH/304/2021** Dated: **08.01.2021**
ii) PMRDA Building Permission Dept. approved by the drawing vide letter No. BHA/C.R.No- 179/2021-22 Dated: 16.07.2021
iii) Final Fire Application Number:-127 of 2024-25 Dated 03.07.2024
iv) Architect Letter No-NIL, Dated-12.06.2024

Dear Sir,

With reference to above, application and certificate submitted by the architect Mr. Gautam Attarde for obtaining "Final No Objection Certificate", Form "A" from licensed agency M/s. Ultra Firetech System Pvt. Ltd. (MFS-LA/RF-433/RD-407/RP-88) and M/s. Square Fire Technologies (MFS-LA/RF-404/RD-382) and M/s. Sneha Electrical and Corporation and co (MFS-LA/RF-571/RD-547) who is licensed agencies registered under the provision of The Maharashtra Fire Prevention and Life Safety Measure Act, 2006, has issued form-A for installation of Fire Protection System.

Considering the Form "A" submitted by the License Agency along with the photographs of fire protection systems, testing and inspection report. The **"Final No-Objection Certificate" is** issued here by to your Residential Building on above-mentioned address for the built up area admeasuring to **33749.76 SQM.** This approval is issued only for the Fire Protection arrangement and it has no relevance with the civil structure or Building permission issues, Building permissioq dept may ascertain it before issue of Final Occupation certificate.

Following details of Buildings as per provisional NOC under ref. (i) above:-

Name Of Building	Height (Mtrs)	No. of Floors	B/U Area (Sqm)
T-48	93.10	2B+G+P+28 Floor	**16486.87**
T-49	87.10	2B+G+2P+26 Floor	**17262.89**
	TOTAL		**33749.76**

Following Statutory Provisions under Maharashtra Fire Prevention and Life Safety Measures Act, 2006, should be adhered.

1. Under **Section 3** of **"Maharashtra Fire Prevention and Life Safety Measures Act, 2006"** (hereinafter referred to as "said Act"). The applicant (developer, owner, occupier by whatever name called) shall comply with all the Fire and Life Safety measures adhering to National Building Code of India, 2005 and as amended from time to time failing which it shall be treated as a violation of the said Act.
2. It is presumed that you have completed the work adhering to the provisions under **Section-3** of the said Act.
3. Under **sub-section (3) of Section 3,** it is responsibility of the Owner or the Occupier as the case maybe, shall furnish to The Chief Fire Officer or nominated officer a Certificate in a prescribed form twice a year in the Month of January & July regarding maintenance of fire prevention and life safety measure in good repair and efficient condition as specified in **sub-section (1).**
4. Under **sub section (4) of Section 3**, no person shall tamper with, alter, remove or cause any injury or damage to any fire prevention and life safety equipment installed in any such building or part thereof or instigate any other person to do so.

As per of "Maharashtra Fire Prevention and Life Safety Measures Act, 2006" Section-25-Annexture- part III. **M/s. City Corporation Ltd Through Its Director Mr. K. Bhosale.** has paid Fire Premium Fees to this Dept. details are as under,

Pune Metropolitan Region Development Authority PMRDA PFF

0219

Details about the Fire protection Fees paid:-

Sr. No.	FIRE-FILE NO.	Built up Area for Fees calculation	Total Amount	Payment Challan No & payment Date
1.	**FIRE/329/2020**	**Residential Building= 1062276.92 SQM.**	**Rs. 9,74,160/- (Nine Lac Seventy-Four Thousand One Hundred and Sixty Rupees Only)**	**CHALLAN NO. 355 DATED 19.10.2020 J. No.8159923**
2.	**FIRE/329/2024-25**	**Residential & Commercial Building=801.85 SQM.**	**Rs. 1,14,130/- (One Lac Fourteen Thousand One Hundred and Thirty Rupees Only)**	**CHALLAN NO. 453 DATED 30.08.2024 J.No. CMS4443602360**

(* In future, if the difference of fees is assessed, the same will be recovered from the owner as the case may be)

The Fire fighting and safety systems installed by you in the Building premises shall be well maintained & shall be kept in tip-top working condition at all the time. If the fire protection system is not maintained, retrenched then this "N.O.C." will stand cancelled without any notice & you will be solely responsible to loss of life or property if any, which may please be noted. The condition mentioned in the "Provisional No-Objection Certificate" will remain unchanged.

Thanking you,

Pune Metropolitan Region Development Authority, Pune
PMRDA FIRE

Yours faithfully,

02/9/2024

(Devendra Potphode)
Chief Fire Officer
PMRDA, PUNE.


373
11 m
1:59
ntral Green
Powere

Note cam lite

Address : Hadapsar,Pune,Maharashtra,India

Latitude : 18.520764999999997°

Longitude : 73.94272166666666°

Altitude : 553.0 meter

Date : 11/24/2025 03:26 pm

Accuracy : 2.5 meter

Time zone : GMT+05:30

Note : construction site dust control

Note cam lite

Address : Hadapsar,Pune,Maharashtra,India

Latitude : 18.520363333333332°

Longitude : 73.94057333333333°

Altitude : 554.0 meter

Date : 11/24/2025 04:04 pm

Accuracy : 1.9 meter

Time zone : GMT+05:30

Note : construction site fogger

"Your Service is our Duty"	**MAHARASHTRA POLLUTION CONTROL BOARD** **Regional Laboratory, Pune.** Regional Laboratory, Pune, Maharashtra Pollution Control Board, Jog Center, 3rd Floor,Mumbai Pune Road, Wakdewadi,Pune- 411 003, Tel : 020-25811698 e-mail : sopunelab@mpcb.gov.in website : http://mpcb.gov.in	TC-16152

NABL Accreditation:- ISO/IEC 17025:2017, TC-16152	Issue Date: 10-01-2023 Validity: 09-01-2025
Certification Standards:- ISO 45001: 2018, C.NO.944015/S-2	Issue Date: 26/02/2024 Validity: 25/02/2027
MoEF Recognition:	Issue Date: 16-06-2023 Validity: 25-02-2024

Test Report No.: MPCB/RL-Pune/JVS/25-26/10/118-A	**Date:** 16/10/2025 10:52 AM
ULR No.: TC-161522500000174 3F	

Test Report-Water (JVS)

Field Sample ID		BR-0102538	Type of Industry	Red (LSI)
Name & Address of the Industry		City Corporation Limited, Amanora Park Town.		
Industry Consent No./UAN No.		MPCB-CONSENT-0000098248	Type of Sample	Water
Sample collected by (Officer Name)		FO-Pune I (Jayant Doke) (SRO-Pune I)	Location of sample collection	OTHERS (STP Outlet 1.5 MLD)
Seal No.:		251	Method of sample collection	Grab
Sample Collection	Date	15/09/2025	Total No. of Containers	1
	Time	03:55 PM	Nature/Description of Sample	Effluent

Lab ID		**MPCB/RL-Pune/JVS/25-26/1365**	Sample condition	Ok, as per QSP 08
Received by lab	Date	16/09/2025	Analysis Started On	16/09/2025 05:15 PM
	Time	04:15 PM	Analysis Completed On	16/10/2025 10:51 AM
Sample recived by (Name & Designation)		Shantilal Nagare (Senior Scientific Officer)		

Sr.No	Parameter	Results	Unit	Test Method
1	pH@25 degree C	7.6		APHA 24th Edition 4500-H+B, Pg. No. 473-478: 2023
2	Suspended Solids (SS) @105 degree C	11.0	mg/l	APHA 24th Edition 2540-D, Pg. No. 146-147: 2023

Sr.No	Parameter	Results	Unit	Test Method
3	Biochemical Oxygen Demand (BOD) 3 days at 27 degree C	6.5	mg/l	IS 3025 (Part 44):2023
4	Chemical Oxygen Demand (COD)	20.0	mg/l	APHA 24th Edition 5220B Page No.544, 545: 2023

Remarks: Nil

Approved & Reviewed By

Shantilal Nagare
Senior Scientific Officer,
Regional Laboratory, Pune,
(Authorized Signatory)

Note :
1. The results refer to the samples and parameters requested for analysis.
2. Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed
3. The Contents of this Report shall not be reproduced in part or in full without written approval of laboratory.

MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL LABORATORY, PUNE

Phone no. : 020-25811698
Visit us at : http://mpcb.gov.in
mail : sopunelab@mpcb.gov.in

"Your Service is our Duty"

Regional Laboratory, Pune, Maharashtra Pollution Control Board, Jog Center, 3rd Floor,Mumbai Pune Road, Wakdewadi,Pune- 411 003

Test Report No.: MPCB/RL-Pune/JVS/25-26/10/118-B	**Date:** 16/10/2025 10:52 AM

Analysis Report-Water (JVS)

Field Sample ID :	BR-0102538		
Name & Address of the Industry	City Corporation Limited, Amanora Park Town O21 Building and construction project more than 20,000 sq. m built up area		
Sampling Location :	OTHERS (STP Outlet 1.5 MLD)		
Lab code :	MPCB/RL-Pune/JVS/25-26/1365		
Sampling Method(s) :	Grab	**Sample Details (Water/Air/HW) :**	Water
Sampling drawn by (Officer name):	FO-Pune I (Jayant Doke)	**Sample Volume Received :**	Plastic can 2.5 ltr
Sample submitted by (Name) :	FO-Pune I (Jayant Doke) (SRO-Pune I)	**Seal No. :**	251
Date of Sample Collection.(dd/mm/yyyy) :	15/09/2025 03:55 PM	**Date of Sample receipt to Laboratory (dd/mm/yyyy) :**	16/09/2025 04:15 PM
Analysis start Date (dd/mm/yyyy). :	16/09/2025 05:15 PM	**Analysis end Date (dd/mm/yyyy). :**	16/10/2025 10:51 AM

Test Report

Sr.No	Parameter	Results	Unit	Method Adopted
1	Ammonical Nitrogen	0.45	mg/l	
2	Nitrate Nitrogen	0.24	mg/l	

Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed

Remarks: Nil
Remark for Amended Report:
Remark: - Note: This test report refers only to the sample submitted for the testing.
Results Compiled by: Shantilal Nagare
Results Approved by: Shantilal Nagare
Results Reviewed by: Shantilal Nagare

 # This is an Electronically generated report does not require signature

---

Note :
1. The results refer to the samples and parameters requested for analysis.
2. Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed
3. The Contents of this Report shall not be reproduced in part or in full without written approval of laboratory.

Shantilal Nagare
Senior Scientific Officer,
Regional Laboratory, Pune,
(Authorized Signatory)

End of The Report

"Your Service is our Duty"	**MAHARASHTRA POLLUTION CONTROL BOARD** **Regional Laboratory, Pune.** Regional Laboratory, Pune, Maharashtra Pollution Control Board, Jog Center, 3rd Floor,Mumbai Pune Road, Wakdewadi,Pune- 411 003, Tel : 020-25811698 e-mail : sopunelab@mpcb.gov.in website : http://mpcb.gov.in	TC-16152

NABL Accreditation:- ISO/IEC 17025:2017, TC-16152	Issue Date: 10-01-2023 Validity: 09-01-2025
Certification Standards:- ISO 45001: 2018, C.NO.944015/S-2	Issue Date: 26/02/2024 Validity: 25/02/2027
MoEF Recognition:	Issue Date: 16-06-2023 Validity: 25-02-2024

Test Report No.: MPCB/RL-Pune/JVS/25-26/10/15-A	**Date:** 01/10/2025 05:10 PM
ULR No.: TC-161522500000l487F	

Test Report-Water (JVS)

Field Sample ID		BR-0102539	Type of Industry	Red (LSI)
Name & Address of the Industry		City Corporation Limited, Amanora Park Town.		
Industry Consent No./UAN No.		MPCB-CONSENT-0000098248	Type of Sample	Water
Sample collected by (Officer Name)		FO-Pune I (Jayant Doke) (SRO-Pune I)	Location of sample collection	OTHERS (STP Outlet 1.5 MLD)
Seal No.:		251	Method of sample collection	Grab
Sample Collection	Date	15/09/2025	Total No. of Containers	1
	Time	03:55 PM	Nature/Description of Sample	Effluent

Lab ID		**MPCB/RL-Pune/JVS/25-26/1366**	Sample condition	Ok, as per QSP 08
Received by lab	Date	16/09/2025	Analysis Started On	16/09/2025 05:15 PM
	Time	04:15 PM	Analysis Completed On	01/10/2025 05:10 PM
Sample recived by (Name & Designation)		R P Raut (JSO)		

Sr.No	Parameter	Results	Unit	Test Method
1	pH@25 degree C	7.8		APHA 24th Edition 4500-H+B, Pg. No. 473-478: 2023
2	Suspended Solids (SS) @105 degree C	12.0	mg/l	APHA 24th Edition 2540-D, Pg. No. 146-147: 2023

Sr.No	Parameter	Results	Unit	Test Method
3	Biochemical Oxygen Demand (BOD) 3 days at 27 degree C	9.4	mg/l	IS 3025 (Part 44):2023
4	Chemical Oxygen Demand (COD)	40.0	mg/l	APHA 24th Edition 5220B Page No.544, 545: 2023

Remarks: Nil

Approved & Reviewed By

R P Raut
JSO,
Regional Laboratory, Pune,
(Authorized Signatory)

Note :
1. The results refer to the samples and parameters requested for analysis.
2. Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed
3. The Contents of this Report shall not be reproduced in part or in full without written approval of laboratory.

MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL LABORATORY, PUNE

Phone no. : 020-25811698
Visit us at : http://mpcb.gov.in
mail : sopunelab@mpcb.gov.in

"Your Service is our Duty"

Regional Laboratory, Pune, Maharashtra Pollution Control Board, Jog Center, 3rd Floor,Mumbai Pune Road, Wakdewadi,Pune- 411 003

Test Report No.: MPCB/RL-Pune/JVS/25-26/10/15-B	Date: 01/10/2025 05:10 PM

Analysis Report-Water (JVS)

Field Sample ID :	BR-0102539		
Name & Address of the Industry	City Corporation Limited, Amanora Park Town O21 Building and construction project more than 20,000 sq. m built up area		
Sampling Location :	OTHERS (STP Outlet 1.5 MLD)		
Lab code :	MPCB/RL-Pune/JVS/25-26/1366		
Sampling Method(s) :	Grab	**Sample Details (Water/Air/HW) :**	Water
Sampling drawn by (Officer name):	FO-Pune I (Jayant Doke)	**Sample Volume Received :**	Plastic can 2.5 ltr
Sample submitted by (Name) :	FO-Pune I (Jayant Doke) (SRO-Pune I)	**Seal No. :**	251
Date of Sample Collection.(dd/mm/yyyy) :	15/09/2025 03:55 PM	**Date of Sample receipt to Laboratory (dd/mm/yyyy) :**	16/09/2025 04:15 PM
Analysis start Date (dd/mm/yyyy). :	16/09/2025 05:15 PM	**Analysis end Date (dd/mm/yyyy). :**	01/10/2025 05:10 PM

Test Report

Sr.No	Parameter	Results	Unit	Method Adopted
1	Ammonical Nitrogen	0.39	mg/l	
2	Nitrate Nitrogen	0.41	mg/l	

Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed

Remarks: Nil
Remark for Amended Report:
Remark: - Note: This test report refers only to the sample submitted for the testing.
Results Compiled by: R P Raut
Results Approved by: R P Raut
Results Reviewed by: R P Raut

 # This is an Electronically generated report does not require signature

---

Note :
1. The results refer to the samples and parameters requested for analysis.
2. Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed
3. The Contents of this Report shall not be reproduced in part or in full without written approval of laboratory.

R P Raut
JSO,
Regional Laboratory, Pune,
(Authorized Signatory)

End of The Report

"Your Service is our Duty"	**MAHARASHTRA POLLUTION CONTROL BOARD** **Regional Laboratory, Pune.** Regional Laboratory, Pune, Maharashtra Pollution Control Board, Jog Center, 3rd Floor,Mumbai Pune Road, Wakdewadi,Pune- 411 003, Tel : 020-25811698 e-mail : sopunelab@mpcb.gov.in website : http://mpcb.gov.in	TC-16152

NABL Accreditation:- ISO/IEC 17025:2017, TC-16152	Issue Date: 10-01-2023 Validity: 09-01-2025
Certification Standards:- ISO 45001: 2018, C.NO.944015/S-2	Issue Date: 26/02/2024 Validity: 25/02/2027
MoEF Recognition:	Issue Date: 16-06-2023 Validity: 25-02-2024

Test Report No.: MPCB/RL-Pune/JVS/25-26/10/119-A	**Date:** 16/10/2025 10:53 AM
ULR No.: TC-161522500000174 4F	

Test Report-Water (JVS)

Field Sample ID		BR-0102540	Type of Industry	Red (LSI)
Name & Address of the Industry		City Corporation Limited, Amanora Park Town.		
Industry Consent No./UAN No.		MPCB-CONSENT-0000098248	Type of Sample	Water
Sample collected by (Officer Name)		FO-Pune I (Jayant Doke) (SRO-Pune I)	Location of sample collection	OTHERS (STP Outlet 1.0 MLD)
Seal No.:		251	Method of sample collection	Grab
Sample Collection	Date	15/09/2025	Total No. of Containers	1
	Time	03:55 PM	Nature/Description of Sample	Effluent

Lab ID		**MPCB/RL-Pune/JVS/25-26/1367**	Sample condition	Ok, as per QSP 08
Received by lab	Date	16/09/2025	Analysis Started On	16/09/2025 05:14 PM
	Time	04:15 PM	Analysis Completed On	16/10/2025 10:53 AM
Sample recived by (Name & Designation)		Shantilal Nagare (Senior Scientific Officer)		

Sr.No	Parameter	Results	Unit	Test Method
1	pH@25 degree C	7.5		APHA 24th Edition 4500-H+B, Pg. No. 473-478: 2023
2	Suspended Solids (SS) @105 degree C	12.0	mg/l	APHA 24th Edition 2540-D, Pg. No. 146-147: 2023

Sr.No	Parameter	Results	Unit	Test Method
3	Biochemical Oxygen Demand (BOD) 3 days at 27 degree C	4.4	mg/l	IS 3025 (Part 44):2023
4	Chemical Oxygen Demand (COD)	12.0	mg/l	APHA 24th Edition 5220B Page No.544, 545: 2023

Remarks: Nil

Approved & Reviewed By

Shantilal Nagare
Senior Scientific Officer,
Regional Laboratory, Pune,
(Authorized Signatory)

Note :
1. The results refer to the samples and parameters requested for analysis.
2. Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed
3. The Contents of this Report shall not be reproduced in part or in full without written approval of laboratory.

MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL LABORATORY, PUNE

Phone no. : 020-25811698
Visit us at : http://mpcb.gov.in
mail : sopunelab@mpcb.gov.in

"Your Service is our Duty"

Regional Laboratory, Pune, Maharashtra Pollution Control Board, Jog Center, 3rd Floor,Mumbai Pune Road, Wakdewadi,Pune- 411 003

Test Report No.: MPCB/RL-Pune/JVS/25-26/10/119-B	**Date:** 16/10/2025 10:53 AM

Analysis Report-Water (JVS)

Field Sample ID :	BR-0102540		
Name & Address of the Industry	City Corporation Limited, Amanora Park Town O21 Building and construction project more than 20,000 sq. m built up area		
Sampling Location :	OTHERS (STP Outlet 1.0 MLD)		
Lab code :	MPCB/RL-Pune/JVS/25-26/1367		
Sampling Method(s) :	Grab	**Sample Details (Water/Air/HW) :**	Water
Sampling drawn by (Officer name):	FO-Pune I (Jayant Doke)	**Sample Volume Received :**	Plastic can 2.5 ltr
Sample submitted by (Name) :	FO-Pune I (Jayant Doke) (SRO-Pune I)	**Seal No. :**	251
Date of Sample Collection.(dd/mm/yyyy) :	15/09/2025 03:55 PM	**Date of Sample receipt to Laboratory (dd/mm/yyyy) :**	16/09/2025 04:15 PM
Analysis start Date (dd/mm/yyyy). :	16/09/2025 05:14 PM	**Analysis end Date (dd/mm/yyyy). :**	16/10/2025 10:53 AM

Test Report

Sr.No	Parameter	Results	Unit	Method Adopted
1	Ammonical Nitrogen	0.58	mg/l	
2	Nitrate Nitrogen	0.18	mg/l	

Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed

Remarks: Nil
Remark for Amended Report:
Remark: - Note: This test report refers only to the sample submitted for the testing.
Results Compiled by: Shantilal Nagare
Results Approved by: Shantilal Nagare
Results Reviewed by: Shantilal Nagare

 # This is an Electronically generated report does not require signature

---

Note :
1. The results refer to the samples and parameters requested for analysis.
2. Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed
3. The Contents of this Report shall not be reproduced in part or in full without written approval of laboratory.

Shantilal Nagare
Senior Scientific Officer,
Regional Laboratory, Pune,
(Authorized Signatory)

End of The Report

"Your Service is our Duty"	**MAHARASHTRA POLLUTION CONTROL BOARD** **Regional Laboratory, Pune.** Regional Laboratory, Pune, Maharashtra Pollution Control Board, Jog Center, 3rd Floor,Mumbai Pune Road, Wakdewadi,Pune- 411 003, Tel : 020-25811698 e-mail : sopunelab@mpcb.gov.in website : http://mpcb.gov.in	TC-16152

NABL Accreditation:- ISO/IEC 17025:2017, TC-16152	Issue Date: 10-01-2023 Validity: 09-01-2025
Certification Standards:- ISO 45001: 2018, C.NO.944015/S-2	Issue Date: 26/02/2024 Validity: 25/02/2027
MoEF Recognition:	Issue Date: 16-06-2023 Validity: 25-02-2024

Test Report No.: MPCB/RL-Pune/JVS/25-26/10/120-A	**Date:** 16/10/2025 10:54 AM
ULR No.: TC-161522500000174SF	

Test Report-Water (JVS)

Field Sample ID		BR-0102541	Type of Industry	Red (LSI)
Name & Address of the Industry		City Corporation Limited, Amanora Park Town.		
Industry Consent No./UAN No.		MPCB-CONSENT-0000098248	Type of Sample	Water
Sample collected by (Officer Name)		FO-Pune I (Jayant Doke) (SRO-Pune I)	Location of sample collection	OTHERS (STP Outlet 7.50 CMD)
Seal No.:		251	Method of sample collection	Grab
Sample Collection	Date	15/09/2025	Total No. of Containers	1
	Time	03:55 PM	Nature/Description of Sample	Effluent

Lab ID		**MPCB/RL-Pune/JVS/25-26/1368**	Sample condition	Ok, as per QSP 08
Received by lab	Date	16/09/2025	Analysis Started On	16/09/2025 05:14 PM
	Time	04:15 PM	Analysis Completed On	16/10/2025 10:54 AM
Sample recived by (Name & Designation)		Shantilal Nagare (Senior Scientific Officer)		

Sr.No	Parameter	Results	Unit	Test Method
1	pH@25 degree C	7.4		APHA 24th Edition 4500-H+B, Pg. No. 473-478: 2023
2	Suspended Solids (SS) @105 degree C	11.0	mg/l	APHA 24th Edition 2540-D, Pg. No. 146-147: 2023

Sr.No	Parameter	Results	Unit	Test Method
3	Biochemical Oxygen Demand (BOD) 3 days at 27 degree C	2.7	mg/l	IS 3025 (Part 44):2023
4	Chemical Oxygen Demand (COD)	8.0	mg/l	APHA 24th Edition 5220B Page No.544, 545: 2023

Remarks: Nil

Approved & Reviewed By

Shantilal Nagare
Senior Scientific Officer,
Regional Laboratory, Pune,
(Authorized Signatory)

Note :
1. The results refer to the samples and parameters requested for analysis.
2. Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed
3. The Contents of this Report shall not be reproduced in part or in full without written approval of laboratory.

MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL LABORATORY, PUNE

Phone no. : 020-25811698
Visit us at : http://mpcb.gov.in
mail : sopunelab@mpcb.gov.in

"Your Service is our Duty"

Regional Laboratory, Pune, Maharashtra Pollution Control Board, Jog Center, 3rd Floor,Mumbai Pune Road, Wakdewadi,Pune- 411 003

Test Report No.: MPCB/RL-Pune/JVS/25-26/10/120-B	**Date:** 16/10/2025 10:54 AM

Analysis Report-Water (JVS)

Field Sample ID :	BR-0102541		
Name & Address of the Industry	City Corporation Limited, Amanora Park Town O21 Building and construction project more than 20,000 sq. m built up area		
Sampling Location :	OTHERS (STP Outlet 7.50 CMD)		
Lab code :	MPCB/RL-Pune/JVS/25-26/1368		
Sampling Method(s) :	Grab	**Sample Details (Water/Air/HW) :**	Water
Sampling drawn by (Officer name):	FO-Pune I (Jayant Doke)	**Sample Volume Received :**	Plastic can 2.5 ltr
Sample submitted by (Name) :	FO-Pune I (Jayant Doke) (SRO-Pune I)	**Seal No. :**	251
Date of Sample Collection.(dd/mm/yyyy) :	15/09/2025 03:55 PM	**Date of Sample receipt to Laboratory (dd/mm/yyyy) :**	16/09/2025 04:15 PM
Analysis start Date (dd/mm/yyyy). :	16/09/2025 05:14 PM	**Analysis end Date (dd/mm/yyyy). :**	16/10/2025 10:54 AM

Test Report

Sr.No	Parameter	Results	Unit	Method Adopted
1	Ammonical Nitrogen	0.37	mg/l	
2	Nitrate Nitrogen	0.23	mg/l	

Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed

Remarks: Nil
Remark for Amended Report:
Remark: - Note: This test report refers only to the sample submitted for the testing.
Results Compiled by: Shantilal Nagare
Results Approved by: Shantilal Nagare
Results Reviewed by: Shantilal Nagare

 # This is an Electronically generated report does not require signature

---

Note :
1. The results refer to the samples and parameters requested for analysis.
2. Abbreviations: - BDL=Below Detectable limit, N.D.=Not Detected, N.A.= Not Analyzed
3. The Contents of this Report shall not be reproduced in part or in full without written approval of laboratory.

Shantilal Nagare
Senior Scientific Officer,
Regional Laboratory, Pune,
(Authorized Signatory)

End of The Report


G
F
G


4
671
8 m
2:15
it for well

Details of Sewage treatment plant at Amanora park town

Design parameters:

1. *Raw water characteristics:*

Flow M^3/Day	**= 1750**
pH	= 7- 8
BOD	= 350 mg/L
COD	= 500 mg/L
TSS	= 300 mg/L

2. *Trade Sewage Characteristics (to be Used for flushing)*

Flow M^3/Day	**= 1750**
pH	= 5.5 - 9
BOD	= < 10 mg/L
COD	= < 50 mg/L
TSS	= < 20 mg/L

- We have designed Sewage treatment plant for capacity of 1750 M^3/Day for the first phase of the township.

- Process Consists: Primary, Secondary & Tertiary treatment. The secondary treatment is a biological treatment which includes **Fluidized Aerobic Bed Reactors** (**FAB**). Treatment details are as follows:

- ***Scheme / Process Description of STPs:***

    a. **Bar Screen Chamber**: The sewage will be first passed through a Bar Screen Chamber where any floating matter would get trapped.

    b. **Oil & Grease trap**: The sewage will be then passed through Oil & grease trap where floating oil & grease from the sewage will be removed.

c. **Equalization tank**: the sewage would be then collected in a equalization tank where variations in flow and characteristics are dampened, which otherwise can lead to operational problems and moreover it allows a constant flow rate downstream. Here the sewage is kept in mixed condition by means of coarse air bubble diffusion.

d. **Fluidized Aerobic Bed Reactors**: The equalized sewage will then be pumped to the Fluidized Aerobic Bed Reactors (FAB) where a BOD/COD reduction is achieved by virtue of aerobic microbial activities. The FAB reactor would be running in series. The oxygen required will be supplied through coarse air bubble diffusers.

e. **Flocculator**: PAC & PE dosing will be done in the Flocculator & mixed in to the sewage which will form a flocks (Bio-solids) which will be settle down in the tube settlers.

f. **Tube Settler**: The excess bio solids formed in the biological process will be separated in the downstream tube settler tank. The clear supernatant after disinfection is suitable for disposal.

g. **Chlorine Contact Tank**: Chlorine is used for the disinfection of the sewage & stored in to the treated water tank before trade sewage used for gardening / flushing purpose.

h. **DMF & ACF**: Dual Media Filter & Activated Carbon Filters will be used in the tertiary treatment of the sewage. After removal of suspended Solids, Odor & Color of sewage, trade sewage will be used for Gardening purpose.

i. **Ozone Treatment:** Ozone plays a vital role in the process of sewage water treatment. It forms a part of the tertiary treatment of the sewage water. Ozone effectively breaks down the lipid layers in the cell membrane. Firstly, ozone is more effective at deactivating viruses and bacteria than any other disinfection treatment, while at the same time requiring very little contact time. After Ozone treatment the treated water can be used for Flushing purpose.

j. **Centrifuge**: The biological sludge generated from the FAB, which is settled in the tube settler, will be drained to the sludge holding tank from where it can be pumped to centrifuge for further treatment after dewatering. Sludge is given for further treatment at SWM Site which is used for composting.

- ***Disposal pattern***: Treated wastewater is reused for gardening & flushing purpose. We have also installed **UV treatment** in tertiary level for the Water used for Flushing to avoid any bacterial growth.

MITCON®
Solutions for Sustainable Tomorrow

MITCON Consultancy & Engineering Services Ltd
Environment Management and Engineering Division
(Environment Laboratory)
Agriculture College Campus, Next to DIC office, Shivaji Nagar, Pune- 411 005.
Ph. No. 66209405/400, email: envlab@mitconindia.com
ISO 45001:2018 Certified Laboratory.
Recognized by MoEF & CC

Format No. EME/LAB/Format 7.8/TR

Report Number : MITCON/2025-26 /September/14 **Test Report** **Issue Date: 06/09/2025**

Client's Name & Address	Reference No.	MITCON/2025-26/September/14/05
M/s. City Corporation Ltd., Amanora Park Town Project (Phase-I), S No. 173,177,182,184,187 to 200, 242 to 245, Village Sadesatara Nali and S. No. 111, 113 to 121,Village- Manjari, Tal. Haveli, Dist. Pune.	Date of Monitoring	01/09/2025
	Product Group	Atmospheric Pollution
	Product Name	DG Set Insertion loss
	Monitoring Done By	MITCON
	Location of Test Performed	In House (Laboratory)

READINGS

Sr. No.	M/C Code#	Description	Test Location	Unit	Readings		Insertion loss ≥25 dB	
					14:00 Hrs. Day Time	22:45 Hrs. Night Time	14:00 Hrs. Day Time	22:45 Hrs. Night Time
01	S # 06	Data Center DG Set 250 KVA	Inside Acoustic Enclosure	dB(A)	103.7	103.7	25.2	25.9
			Outside Acoustic Closure From 0.5 meter away	dB(A)	77.5	77.8		
02	S # 07	RR2 Site DG Set 400 KVA (5-7)	Inside Acoustic Enclosure	dB(A)	104.8	104.8	26.6	26.4
			Outside Acoustic Closure From 0.5 meter away	dB(A)	78.2	78.4		
03	S # 08	RR2 Site DG Set 400 KVA	Inside Acoustic Enclosure	dB(A)	104.7	104.8	26.4	26.1
			Outside Acoustic Closure From 0.5 meter away	dB(A)	78.3	78.7		

REMARKS / OBSERVATIONS: Limits: Maharashtra Pollution Control Board has prescribed in consent, acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standard, whichever is on higher side.

For MITCON Consultancy & Engineering Services Ltd.

Checked by
Mrs. Kadambari Deshmukh
(Chemical)

PUNE

Authorized Signatory
Dr. Sandeep Jadhav
(Quality Manager/HOD)

...End of Report...

- *This Report is valid for tested sample only.*
- *This Report shall not be reproduced except in full & with written permission of MITCON.*
- *This Report should not be used for advertisement / judicial purpose.*
- *Customer complaint register is available in the laboratory.*

AMANORA
PARK TOWN

CITY CORPORATION LIMITED
CIN: U45202PN2003PLC018435

CCL/JKB/11/24 **DATE: 25th November 2024.**

To,
Addl. Principal Chief Conservator of Forests (Central)
Ministry of Environment, Forest & Climate Change.
Regional office, West Central Zone
Ground Floor, East Wing,
New Secretariat building, Civil Lines,
Nagpur – 440001, India.

Subject: - NEERI Environmental Evaluation Audit report of Amanora Park Town - Pune, Maharashtra.

Ref: Environmental Clearance letter No. J-12011/22/2005/IA (CIE) dt. 27.10.2005 received from MoEF and MoEF & CC Notification No S.O. 5845(E) dated 26.11.2018.

Dear Sir,

With reference to the MoEF & CC notification dated 26th November 2018 regarding the submission of Six-Monthly Compliance report of Prior Environmental Clearance Condition to be submitted on 1st June & December of every year.

In addition to this compliance, we sou motto doing **Environmental Evaluation Audit every FIVE years from National Environment Engineering & Research Institute (NEERI).** Previous audits done & reports submitted to your office for audit year April 2013, November 2019 & now in November 2024.

Please find enclosed herewith this year Environmental Audit report for November 2024.

Kindly acknowledge the same.

Thanking you,

Yours Faithfully,
For City Corporation Ltd.

JKB

J K Bhosale
Director

03-12-2024

Encl: As Above

Copy to: 1. Principle Secretary, Environment Dept, Govt. of Maharashtra.

2. Member Secretary, Maharashtra Pollution Control Board, Pune.


Temple
of
Environment
AMANORA
8
595
8 m
2:42
n Temple of Environment


yulu


AMANORA FIRE STATION
AMBULANCE

सीएसआईआर-राष्ट्रीय पर्यावरण अभियांत्रिकी अनुसंधान संस्थान
CSIR-National Environmental Engineering Research Institute
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद / Council of Scientific & Industrial Research)
NEERI

Mumbai Zonal Center

89/B, Dr. Annie Besent Road, Near Worli Flyover, Worli, Mumbai - 400 018, INDIA.

Tel. : (022) 2497 3521 / 2497 4607 / 2492 6859
Fax : (022) 2496 2882
Website : www.neeri.res.in
E-mail : mzl@neeri.res.in
E-mail : neerimumbai@neeri.res.in
E-mail : n.goyal@neeri.res.in

डॉ. नितिन गोयल
वैज्ञानिक एवं प्रमुख
Dr. Nitin Goyal
Scientist & Head

NEERI/MZC/ 24/ 195

18th October, 2024

To,
Mr. Amitkumar Saste
GM- Environment & Safety
City Corporation Limited
Amanora Park Town, Amanora
Magarpatta Roda, Hadapsar,
Pune 411028. Maharashtra

Dear Sir,

Please find attached two hard copies of the Final Report titled "Evaluation of Environment Management Plan with Environmental Auditing and Monitoring, in Amanora Park Town, Pune".

Thank you for your support throughout this process. I look forward to your feedback.

Best regards,

N. Goyal

Principal Scientist and Chair
CSIR-NEERI, Mumbai


WORLD-CLASS EXPERIENTIAL
AMANORA
AMANORA


AMANORA

Shot on narzo 50A

Final Report

Evaluation of Environment Management Plan with Environmental Auditing and Monitoring, in Amanora Park Town, Pune

For

AMANORA
PARK TOWN

City Corporation Limited, Pune (Maharashtra)

By

नीरी
NEERI
ISO 9001:2008

CSIR-National Environmental Engineering Research Institute (NEERI), Mumbai Zonal Centre, Worli, 400 018

October, 2024

Final Report

Evaluation of Environment Management Plan with Environmental Auditing and Monitoring, in Amanora Park Town, Pune

---

For

AMANORA
PARK TOWN

City Corporation Limited, Pune (Maharashtra)

By

CSIR-National Environmental Engineering Research Institute (NEERI), Mumbai Zonal Centre, Worli, 400 018

October, 2024

FOREWORD

Pune is experiencing rapid industrial and economic growth, which has resulted in a high demand for housing. M/s. City Corporation Limited proposed development of first-of-its-kind township project in Maharashtra namely "Amanora Park Town" in Hadaspar, Pune, under the State Government's special Township Policy in 2005. This fully integrated township, supports independent living with residential, commercial, educational, health, sports, and social infrastructure.

Environmental audit of this township was initiated in 2010-11, with subsequent assessments in 2013 and 2019 based on the 2005 Environmental Impact Assessment (EIA) report. M/s. City Corporation engaged CSIR-NEERI, to evaluate environmental compliance in Amanora Park Township. NEERI conducted environmental monitoring during winter (February 2023) and summer (April-May 2023) seasons, covering air, noise, water, soil, biological, and socio-economic aspects. This monitoring adhered to compliance standards outlined in previous reports and clearances granted by MoEF&CC and MPCB. Findings of this monitoring are detailed in this report. Cooperation by M/s City Corporation Limited is gratefully acknowledge.

15/10/24

Director, NEERI

October 2024

Project Personnel

Team CSIR-NEERI, Mumbai Zonal Centre

Project Co-ordinator **Dr. Atul Vaidya,** *Director, CSIR-NEERI, Nagpur*

Project Leaders **Dr. Nitin Goyal,** *Principal Scientist and Chair, CSIR-NEERI Mumbai Zonal Centre, Mumbai*

Team Members

Dr. Shalini Tandon, *Principal Scientist*

Dr. Sashikant Kamble, *Sr. Scientist*

Dr. Arti Soni, *Scientist*

Ms. Komal Kalawapudi, *Technical Officer*

Project Assistant

Mr. Madhur Manve

Mr. Swapnil Dudhwadkar

Mr. Firoz Akhtar

Ms. Shubhangi Shekapure

Ms. Anjali Uniyal

Secretarial Assistant

Mr. Vijay Chaudhari

Mr. Shiwaji Sawant

Team Amanora Park Town, Pune

Mr. Amit Saste, *DGM*, EHS

Mr. Amol Borate, *Manager*, EHS

Ms. Priyanka Jawalkar, *Officer*, EHS

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Executive Summary

About the Project

The revision of Govt. of India's Import-Export Policy between 1997 and 2002 prompted the state of Maharashtra to embrace the concept of 'New Townships.' In 2005, a distinctive policy paved the way for the proposal of "Amanora Park Town" by M/s City Corporation Limited in Hadaspar, Pune. This 476-acre fully integrated township, designed to support independent living, encompasses residential, commercial, educational, health, sports, and social infrastructure, all managed digitally.

Environmental audits were initiated in 2010-11, followed by subsequent assessments in 2013 and 2019, based on the 2005 Environmental Impact Assessment (EIA) report. These audits aimed to evaluate the effectiveness of the environmental management plan. M/s City Corporation engaged CSIR-NEERI, Mumbai, to assess environmental compliance in Amanora Park Township. Their task involved evaluating the status of various environmental compliance conditions using both secondary and primary data, to assess the historical and current environmental quality in the Amanora Park Township.

Environmental Quality Status

NEERI conducted environmental monitoring during both the winter (February 2023) and summer (April- May 2023) seasons, covering various environmental aspects, including air, noise, water, soil, biological, and socio-economic factors. This monitoring aligned with the compliance standards outlined in the previous report and adhered to the clearances granted by MoEF&CC and MPCB. A concise overview of the status of each environmental component is provided here.

Air Quality Status

- The intricate patterns of PM_{10} and $PM_{2.5}$ concentrations were studied from 2017 to 2022. These pollutants exhibit cyclical fluctuations, particularly spiking during winter due to regional climate influence on dispersion. Despite these changes, concentrations consistently remain below NAAQS thresholds (100 $\mu g/m^3$ for PM_{10} and 60 $\mu g/m^3$ for $PM_{2.5}$). Similarly, SO_2 and NO_2 levels fluctuate over time, occasionally peaking in specific months. Nonetheless, they consistently adhere to the NAAQS standard of 80 $\mu g/m^3$, demonstrating effective regulatory oversight.

- In 2023, monitoring took place in both Winter (from February 14th to 24th) and Summer (from April 25th to May 4th). During winter, there were fluctuations in particulate levels, occasionally surpassing NAAQS thresholds at Site Office (PM_{10}) and R-21 Tower ($PM_{2.5}$). The average concentrations for winter were 198.4 $\mu g/m^3$ for PM_{10} and 79.9 $\mu g/m^3$ for $PM_{2.5}$. Elevated concentrations were observed across all sites and dates, exceeding NAAQS standards. These could be attributed to the accumulation of pollutants caused by low wind speed and limited dispersion, which are typical of winter season. SO_2 and NO_2 concentrations generally remained within NAAQS limits (80 $\mu g/m^3$), with occasional deviations. Similarly, O_3 concentration stayed within the NAAQS standard (8-hour average standards of 100 $\mu g/m^3$).

- During the summer season, the average concentrations for PM_{10} and $PM_{2.5}$ were 70.9 and 41.2 $\mu g/m^3$, respectively. Relatively higher levels were observed at the Site Office, while other sites, including the control, remained within NAAQS standards. SO_2 and NO_2 concentrations were also observed to be within NAAQS standards across all sites.

- Average PM concentrations for both seasons consistently exceeded historical averages, suggesting potential air quality degradation. Gaseous pollutants did not exhibit a clear upward trend but occasionally approached or exceeded historical averages.

- The current study identifies fugitive dust emissions from construction activities near the Adreno site, coupled with the use of unpaved roads by construction vehicles, as significant contributors to increased dust dispersion. Operations of Concrete, Asphalt, and RMC Plants, as well as DG sets at construction sites might have contributed to the elevated PM_{10} levels. Vehicle movement and occasional high winds contribute to the re-suspension of road dust, adding to increased air pollutants. Instances of solid waste burning in surrounding fields and villages were also identified during the monitoring period.

Noise Levels

- Over the past five years (2017 to 2022), noise levels monitored in Amanora Townships averaged around 58 to 60 dB(A) during the day time and 47 to 52 dB(A) during the night time. These levels were compared to MPCB standards for ambient noise in commercial zones {65 dB(A) for day time and 55 dB(A) for night time}, and were found to be consistently within the permissible limits.

- Noise levels were recorded during winter (February 2023) and summer (May 2023) in various locations, including residential, commercial, and sensitive areas. In winter, noise levels exceeded the permissible day time limit of 55 dBA at residential sites, except at R-2 and R-5. During the night, noise levels surpassed the permissible limit of 45 dBA at all locations. In summer, all residential sites exceeded both day time and night time limits, except R-9/10 (Sweetwater Villa) where the day time noise level was 53.9 dBA. These high noise levels were attributed to construction activities and traffic in the near vicinity.

- Ongoing construction activities at R-6 and R-29 resulted in elevated day time noise levels compared to night time. In the commercial area, where the permissible daytime limit is 65 dBA and night time is 55 dBA, Amanora Mall experienced high noise levels due to continuous movement, parking, and departure of vehicles. Amanora Fern Club, however, adhered to the limits. In both seasons, Amanora School-2 and Amanora School-3, designated as silence zones, exceeded the permissible limits of 50 dBA during the day and 40 dBA during the night. The Central Green area recorded the lowest noise levels.

- At STP, due to the continuous operation of STP and Air Blowers, noise levels in the winter [daytime- 65.7 dB(A) and nighttime- 65.5 dB(A)] and summer [daytime- 62.5 dB(A) and nighttime- 63.3 dB(A)] seasons were similar. At the Water Treatment Plant (WTP), ongoing construction and proximity to the railway track contributed to moderate noise levels throughout both seasons. During winter season, the highest noise level were recorded at the fire station at night [85.3 dB(A)], the reason being the traffic noise due to proximity to the internal main road. Conversely, the Solid Waste Management (SWM) site exhibited the lowest noise levels.

- In Amanora Park Town, ongoing construction and traffic on internal roads were found to be the primary contributors to noise levels surpassing permissible limits for both day and night. Additionally, noise from railways has been noted as a factor leading to increased noise levels at specific locations.

Water Quality Status

- Water quality in Amanora Park Town was assessed during two seasons, examining physicochemical, bacteriological, and heavy metal parameters at various sites, including the Water Treatment Plant (WTP), Drinking Water at User's End, Ground Water, and Sewage Treatment Plant (STP).

- At the Water Treatment Plant (WTP), pH, and alkalinity remained within acceptable ranges throughout both seasons. Turbidity levels in the WTP outlet remained below the permissible limit of 1/5 NTU (Drinking water Standards, BIS IS 10500: 2012), with values of 0.3 NTU in winter 2023 and 0.5 NTU in summer 2023, indicating the effective removal of suspended particles. The absence of coliforms in the treated water indicates the WTP's effective removal of harmful bacteria, showcasing successful treatment processes to maintain water quality standards.

- For Drinking Water Quality at User Ends, physicochemical properties were within permissible limits, and DO levels exceeded the minimum requirement of 4 mg/L at all locations. All heavy metals were below the detection limit, except for Manganese and Copper. Total coliforms were present in both seasons, with Fecal coliform exceeding detectable limits during winter, as per DWQ standards.

- Although most parameters at the Canteen, Future Tower, and R-4 Site met acceptable limits, attention is needed to address the total coliform presence at the Canteen. Effective measures, including inspecting the canteen's pipelines for potential contamination and implementing regular maintenance practices, are necessary to address this issue.

- For groundwater, occasional instances of turbidity exceeding acceptable limits and elevated chloride levels were observed. G-2 well exhibited high turbidity during the summer, and Labor Camp and Dog Squad recorded elevated TDS levels. Overall, groundwater quality adhered to IS:10500 2012 standards, with undetectable phenols, phosphates, and heavy metals enhancing safety. Comparing data from the last five years, 2022-23 values were generally lower, except for Total Suspended Solids (TSS), which increased from <5 mg/L in 2017-20 to 11.5 mg/L in 2022-23.

- The recorded TSS values at the STP Outlet meet limits for both seasons, indicating effective removal of suspended particles. COD levels (40-60 mg/L) are below the CPCB standard (250 mg/L) and MPCB standard (150 mg/L). BOD values (5.3 to 18.5 mg/L) are within the standards of 30 mg/L for inland surface water (I) and 100 mg/L for land irrigation (II). Oil & Grease levels comply with the CPCB standard (10 mg/L), and most metals are below detectable limits. No growth of total and fecal coliforms is observed in STP 1 and STP 2 due to DCF treatment. This indicates that the STP's treatment process was effective in controlling coliform contamination.

- Comparing historical data with the present study (2022-23) for STP1 and STP2 reveals significant changes. In summer, DO decreases, while BOD and COD increase. In winter, DO increases, but BOD and COD decrease. Post-ACF/DCF treatment, TC and FC are present in all samples, but after chlorination and ozonation, they are absent. For STP 1 and STP 2, non-biological parameter values align with CPCB and MPCB standards for discharge into inland water and irrigation, except for oil & grease, which complies with CPCB but exceeds MPCB standards.

- The Township boasts effective rooftop rainwater harvesting systems. Water conservation and artificial recharge efforts have been undertaken through the creation of structures like percolation lakes/points, recharge dug and bore wells, rectangular recharge wells, and collection tanks. These various initiatives contribute to a total potential recharge of approximately 2,70,952 KL/year as estimated by APT, Pune. It's important to note that this recharge potential is entirely reliant on rainfall.

Soil Quality Status

- Soil samples collected from 8 locations in the township and adjacent agricultural areas during the winter and summer of 2023 revealed moderate-textured soils, mainly sandy loam to sandy clay loam with sandy loam clay in agricultural areas. Sand percentage varied between 43.6%-72% and 56.8%-68.8%, while bulk density ranged from 1.22 g/cm^3 to 1.25 g/cm^3 in winter and summer. Porosity ranged from 44.9%-90% (winter) to 41.9%-63.4% (summer), and water holding capacity was 2.9%-65.9% and 41.9%-63.4% for both seasons, aligning with ideal properties for sandy loam soils.

- Soil pH was neutral to slightly alkaline, ranging from 6.95 to 7.97 in winter and 6.23 to 7 in summer. The electrical conductivity (EC) of soil extracts ranged from 126 µS/cm to 558.4 µS/cm in winter and 168.1 µS/cm to 514.6 µS/cm in summer. Exchangeable sodium percentages were below 15, indicating normal alkalinity in all locations. Dissolved salt concentration increased during the winter season.

- In the study area, cation exchange capacities ranged between 29.6-43 C mol (P+) Kg^{-1} in winter and 33.9-44.9 C mol (P+) Kg^{-1} in summer, with ESP varying between 0.8-2.34 and 0.37-1.14 in the respective seasons. The soils, categorized as moderate to high productivity and very high absorptivity, demonstrate favorable conditions for both seasons.

- Organic carbon levels were lower in winter (0.55%-2.68%) compared to summer (0.70%-2.37%). Available nitrogen varied between 94-236 Kg/ha and 63-210 Kg/ha, phosphorus between 0.29-1.37 Kg/ha and 0.27-1.38 Kg/ha, and potassium between 70-205 Kg/ha and 33-100 Kg/ha in winter and summer, respectively. Heavy metal concentrations were consistent across both seasons. The total viable microbial count (TVC) was similar in both periods, reaching 15.6 x 10^9 CFU/g in winter and 21.5 x 10^9 CFU/g in summer at agricultural land sites.

- Comparing soil fertility in 2018 and 2023, a reduction was observed in organic carbon and potassium content, while nitrogen and phosphorous content improved at all sites.

Biodiversity Status

- In 2023, a comprehensive survey of seven locations within the township identified a rich variety of plant species, including 94 tree species, 23 shrubs, 20 herbs, and 5 grasses. Key findings from the flora study highlighted the highest diversity in Central Green, Pawar Public School, and Amanora Mall. Common roadside trees included Peltophorum pterocarpum, Pithecellobium dulce, Alstonia scholaris, and Azadirachta indica.

- Prominent invasive species were identified, such as Alstonia scholaris, Boganvelia, Casurina, Ficus Benjmina, Foxtail Palm, Langestromia, and Silver Oak. Notably, there was an increase in the number of plant species from 2021 to 2023, including Dillenia indica, Sonchafa Grafted, Spathodia, Karanj (Millettia pinnata), and Kaduneem. Casurina showed the highest increase, constituting 16.5% of the total tree plantation over the last five years. The township featured a diverse range of plants, including timber-yielding, medicinal, ornamental, and edible varieties.

- The township boasts a rich and diverse avifauna population. Common bird species observed during field observations include the Spangled drongo, Dicrurus paradiseus (Racket-tail Drongo), Alcedo atthis (Common Kingfisher), Bubulcus ibis (Cattle egret), and more.

- By 2016-17, the township had 9,181 trees, with a consistent annual increase of 0.8% to 2.9% over the last five years. The most recent two years period a higher growth was observed, reaching 10,041 (4.4%) in 2021-22 and 10,338 (2.9%) in 2022-23. Species richness in residential areas ranges from 12-25 (totalling 409-1,036 plants), parks and open spaces have 27-36 species (952 to 987 plants), and commercial areas have 19 species (596 plants).

- The combined area for shrub and lawn plantation ranged from 8.70 to 9.74 hectares. Over the past five years, the percentage of lawn area slightly decreased from 68.5% to 63.9%, while shrub percentage increased from 31.5% to 36.1%.

Road Infrastructure and Influence of Vehicular Movement

- Vehicle counting survey through video recording was conducted at four key locations in the Township during morning (7:00 am-11:00 am) and evening (5:00 pm-9:00 pm) peak hours for both winter and summer seasons. In the mornings, winter there were 16,475 vehicle counts, compared to 11,085 in summer. Evening counts were 17,614 in winter and 19,984 in summer, indicating higher traffic volume in the evenings. Calculated Passenger Car Units (PCU) ranges from were 7,541 to 13,706. Two-wheelers constituted the majority of vehicles, ranging from 67.3% to 74.4%, followed by cars (17.6- 26.1%) and three-wheelers (5.4- 7.2%).

- ARAI (2008) emission factors were employed to calculate vehicle emissions. The average estimated emission load for vehicle movement around the township (Mall Entry & Exit Gate, Magarpatta -Malwadi Rd, and Crescent Road) ranged from 29-68 g/hr for PM, 247-662 g/hr for NOx, and 734 to 1861 g/hr for CO. Emission loads within the township were relatively lower.

- During winter, dominant winds were West and East at 0.5-2.10 m/s (43.5% of the study period); in summer, they were West at 2.10-3.60 m/s (29.4%).

- Ground level concentrations were estimated using USEPA's AERMOD model. Dispersion is lower in winter than in summer. Maximum concentrations at the road center were 131 $\mu g/m^3$ for PM in winter and 88 $\mu g/m^3$ in summer. Similar patterns were observed for NOx (winter: 139 $\mu g/m^3$, summer: 95 $\mu g/m^3$) and CO (winter: 194 $\mu g/m^3$, summer: 143 $\mu g/m^3$). Traffic significantly impacts air quality near the road (<50 m), but has minimal influence beyond 100 m on background pollution levels.

Solid Waste Management

- Annually from 2017-23, estimated quantity dry solid waste from residential and commercial sectors, clinics, construction sites, biogas plant residues, and Excel Organic Waste Convertor (OWC) machines amounted to 1250, 1284, 1387, 1560, 1430, and 1869 tons. Residential sectors contributed 80-90%, and construction waste ranged from 1-8%.

- The township effectively manages dry waste through recycling and disposal, with a significant portion sent to M/s Rochem Green Energy Pvt. Ltd. for RDF (Refuse Derived Fuel) and Pyrolysis processes, ensuring responsible disposal practices. 92-97% of total solid waste is treated or disposed of, and none is sent for secured landfilling.

- Wet solid waste from residential sectors, labour camps, canteens, and other sources totaled 297, 394, 497, 719, 813, and 1031 tons from 2017-2023. Various treatment technologies, including Excel OWC, Bio-Sanitizer, and Ecoman Machine, treat 100% of wet waste, which is then utilized within the township.

Social Aspects – Facilities and Services in the Township

- Founded in 2005 on 476 acres of acquired agricultural land from three villages (Mundava, Manjari, and Sade Satra Nali), Amanora Township is a self-contained project with schools, hospitals, commercial spaces, and residences. Offering 24/7 water, power, gas, and a clean environment, Amanora prioritizes the well-being of its residents.

- M/s City Corporation Ltd. (CCL) has a confirmed 90 MVA power supply, operating under a franchisee arrangement since April 2011 in collaboration with MSEDCL. Power is distributed from the 220/22KV (Magarpatta) Sub Station to residential and commercial areas, using 55 watts per sq. meter compared to the government norm of 110 watts. Amanora Township's efficient power usage saves 2700 tons of carbon emissions annually.

- Renewable energy, generated from windmills, rooftop solar plants, solar wind hybrid systems, and solar streetlight poles, constitutes 4 to 8% of total energy consumption. The Budh–Satara windmills have a 0.85 MW capacity (total capacity of 1700 KW). Rooftop Photovoltaic (PV) cells in the Sewage and Water Treatment Plant, with capacities of 110 KW and 50 KW, contribute to solar energy utilization. Additionally, 102 Solar Streetlight Poles with a total capacity of about 2.04 KW are installed along the roadsides. Amanora's Biogas Plant has a 2.5-ton capacity, storing methane in a 150 M^3 Gas Balloon. It saves 72 Kg/Day of LPG equivalent for cooking and generates 2000 units/month of electricity.

- The Township receives its gas supply through the Maharashtra Natural Gas Limited (MNGL) network, ensuring a continuous 24-hour service.

- Amanora Township features a 9 km twin pipeline linked to an irrigation canal, supported by a 2.6 MLD Water Treatment Plant. It meets current domestic water needs. The sewage treatment plant handles 1.75 MLD, capacity is 1300 m^3/day, with expansion plans for up to 3.5 MLD. For 12 years, wet waste has been treated using both conventional and modern technologies through the Excel Organic Waste Converter.

- A total of 7799 residential parking facilities with an addition of 517 visitor parking is provided.
- Over the past five years, 2347 employees and 6283 laborers were screened, benefiting 42032 individuals through health camps. The initiative created 2368 job opportunities, conducted 817 training sessions, and trained 21591 workers. Amanora's labor camps offer 472 rooms with proper drinking water, sanitary facilities, septic tanks (40 m^3 capacity), and soak pits (20 sqm.) for wastewater disposal.

- Amanora provides robust Safety/Security Facilities, including backup services and firefighting equipment. Additionally, it offers various amenities such as a helpdesk portal, recreational facilities, well-equipped school infrastructure, advanced digital infrastructure, social awareness programs, and ample employment opportunities.

Environmental Compliance Status

- The township continues to maintain ISO 14001:2015 and OHSAS 18001:2007 certifications for effective environmental and occupational health management.
- The practice of continuous dust suppression through water sprinkling, especially during summer, is consistently followed.
- PUC certificate checking is implemented and maintained for construction site vehicles. The construction vehicles are properly maintained to minimize exhaust emissions
- At present, the total capacity of renewable energy is 1860 KW which needs to be enhanced
- Development of the "Green Building" concept should be initiated
- The landscaping strategy emphasizes the planting of a diverse range of local plant species, contributing to ecological diversity within the township.
- Sites are secured by fencing and entry points are manned.
- Sites are provided with suitable sanitation facilities, which are found to be connected to septic tanks and soak pit.

- Silt traps and other erosion protective measures are taken to minimize erosion of the soil during construction.
- Adequate provisions have been made to supply gas and kerosene to construction workers, reducing dependency on local resources and ensuring their well-being.
- The construction camps are located separately within the site so that there is no interference with the local population.
- Ongoing awareness programs addressing environmental conservation, safety, and health risks are regularly formulated for the residents and workers recognizing them as key stakeholders in the township.
- Some construction workers neglect PPEs despite safety guidelines. EHS conducts regular awareness programs. Amanora advises EHS to enforce strict safety rules for all workers.

Recommendations and Suggestions

- Enhance initiatives to monitor and address air quality issues arising from the re-suspension of road dust and vehicular emissions, particularly during winter.
- Optimal positioning of green buffers and the advocacy for sustainable transportation methods and infrastructure.
- An air quality monitoring system in real-time, easily accessible to residents of the township.
- Install noise barriers strategically for road intersection and construction sites, and introduce plants with noise-reducing properties.
- Enforce water conservation methods to maximize water efficiency within the township. Installing water fixtures featuring low-flush mechanisms and high-efficiency design, along with waterless urinals, significantly contributes to conservation, potentially saving upto 40%.
- Opt for energy-efficient lighting systems and heating/cooling, ventilation, and air conditioning (HVAC) systems to decrease energy usage, cut down on operating expenses, and lessen environmental impact.
- Establish a long-term maintenance plan that takes into account the life cycle of infrastructure elements, emphasizing durability and sustainability. This approach aims to minimize the need for frequent repairs, promote cost-effectiveness, and reduce environmental impact.
- Effective formulation of waste minimization plan needs to be implemented for 3Rs reduce, reuse and recycle.

- Periodically performed internal environmental audits across various units, covering aspects such as waste management, air and water quality, biodiversity conservation, and other sustainable practices.
- Disseminate information through community engagement, promoting a culture of sustainability, heightened awareness, and a shared sense of community responsibility.

Conclusions

The smart city Amanora blends modern living with traditional values. Over the past five years, it largely meets environmental clearance conditions set by the State & Central Government. Minor improvements are advised, like enhancing labour colony housekeeping, rainwater harvesting, and hazardous waste management. Implementing these suggestions will reinforce the township's dedication to environmental sustainability, benefiting residents and the ecosystem.

Chapter 1

Introduction

Chapter 1

Introduction

1.1 Preamble

The Indian government introduced the concept of establishing 'New Townships' by revising the Import-Export Policy for the period 1997-2002. Following this initiative, the State Government of Maharashtra introduced a special township policy for the state in November 2005. In alignment with these policies, M/s City Corporation Limited (CCL) put forth a proposal to develop a new satellite town named "Amanora Park Town" on a 476-acre plot of land in Hadaspar, Pune.

The vision for Amanora Park Town is to create a self-sustaining community that encompasses diverse essential services required for human settlement. This integrated township is thoughtfully designed to include residential, commercial, educational, healthcare, sports, social, and physical infrastructure within designated zones. Notably, the administration and management of Amanora Park Town have been entirely digitized, streamlining operations and services.

Following the recommendations stated in the Environmental Impact Assessment (EIA) report for the project back in 2005, an environmental audit was conducted during 2010-11. The resulting report was subsequently submitted to the project authority. The Township authority has consistently conducted environmental audits to assess the efficacy of the environmental management plan implemented within the township.

Furthermore, M/s City Corporation Ltd., based in Pune, seeks to evaluate the environmental compliance status through secondary data analysis. Additionally, they aim to assess the existing environmental quality status concerning various environmental parameters. In this pursuit, they have engaged CSIR-NEERI to undertake this study.

1.2 Study Objectives

The core aim of this study is first, to gauge how well Amanora Park Township adheres to the stipulated environmental conditions laid out in the Environmental Clearance (EC) and Consent To Operate (CTO) regulations, and second, to evaluate the current environmental quality within the township.

This study involves the following primary objectives:

- Evaluating Environmental Compliance as per EC and CTO using available secondary data.
- Assessing Environmental Quality concerning environmental components air, water, noise, and soil quality. To compare these current environmental conditions with previous.

1.3 Scope of Work and Work Plan

1.3.1 Evaluation of Compliance with EC and CTO Conditions

- To assess the adherence to the EC conditions set by the (MoEF & CC) in 2005, as well as the CTO conditions specified by the MPCB
- Reviewing and analyzing the compliance reports submitted every six months at various stages of the township development

1.3.2 Assessment of Present Environmental Quality Status

- Primary data on air, water, soil, noise, biological and socio-economic aspects shall be gathered to represent different environmental quality parameters in the township, **Table 1.1**. Further, within the premises of the township, monitoring will be carried out for about 10 days representing one season of data
- Assessment and evaluation of pollution control systems (for air, noise, and water, STP/WTP, and solid waste disposal and management practices)
- Assessment of greenbelt and plantation carried out in the township area
- Prediction of impact to the surrounding areas from township traffic movement
- Interaction and consultation with the workforce and residents living in the township
- Comparing the current state of environmental quality with the data from the EIA report and Environmental Audit Report of 2019
- Development of a comprehensive environmental management strategy aimed at enhancing the quality of various environmental aspects

Table 1.1 :Details of Primary Data Collection for Different Environmental Quality Parameters

Sr . No.	Environmental Component	Sampling Locations	Sampling Frequency	Parameters
1.	Air Quality	Five Locations in the vicinity	24 hourly average levels continuously for 5 days in each season	PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3, O_3.
2.	Noise Levels	Different activity zones)about 25 locations)	Once in each season	Noise equivalent levels during daytime and nighttime
3.	Water Quality	Different 14 locations	Once, Grab the sample	Physico-chemical, bacteriological, heavy metals, any specific parameter for drinking water suitability
4.	STP/WTP	Inlet and Outlet	Once, Grab the sample	Physico-chemical, bacteriological, heavy metals, any specific parameter for best-designated usage
5.	Soil Quality	Different 8 locations	Once, Grab the sample	Texture, Physico-chemical, bacteriological, heavy metals, fertility)C, N, P, K)
6.	Biological – Flora & Fauna	Seven locations	In the vicinity of the Township Area	Plant Species and Diversity: List of Trees, Shrubs, Herbs, Grasses, Status of Fauna, Avifauna, Medicinal Plant
7.	Socio-economic Aspects	Primary and Secondary Data	In the vicinity of the Township Area	Facilities and Services in Township
8.	Traffic movement	Major and Atrial Road Vehicle Counting	Two Season	Traffic volume, Emission load estimation, and Prediction of dispersion

1.4 Study Area Details: Amanora Park Township

Amanora Park Town is located at a distance of 10 km from the railway station in the east direction, 2 km from the south river Mula-Mutha, and 1 km north of Pune Solapur National Highway. The land is flat terrain with a very gentle slope towards the NE Side. The gradients of slopes are approx.1 in 80 m. The soil has lower strata of hard murum, disintegrated rock, varying at 0.3 to 2.5 depths. The location is on the Mundhawa bypass connecting Solapur-Nagar road. This road shall important south East circumvention connection in the future. The four sides of the project area have having following features:

- On North – agricultural land
- On East – the coarse agricultural land of the village Manjari
- On South – existing small-rise houses
- On West – developing land

The township plan has well-landscaped parks considering the local environment .The landscaping and garden are developed in the first phase of the project as per the proposed land use plan as shown in **Figure 1.1.**

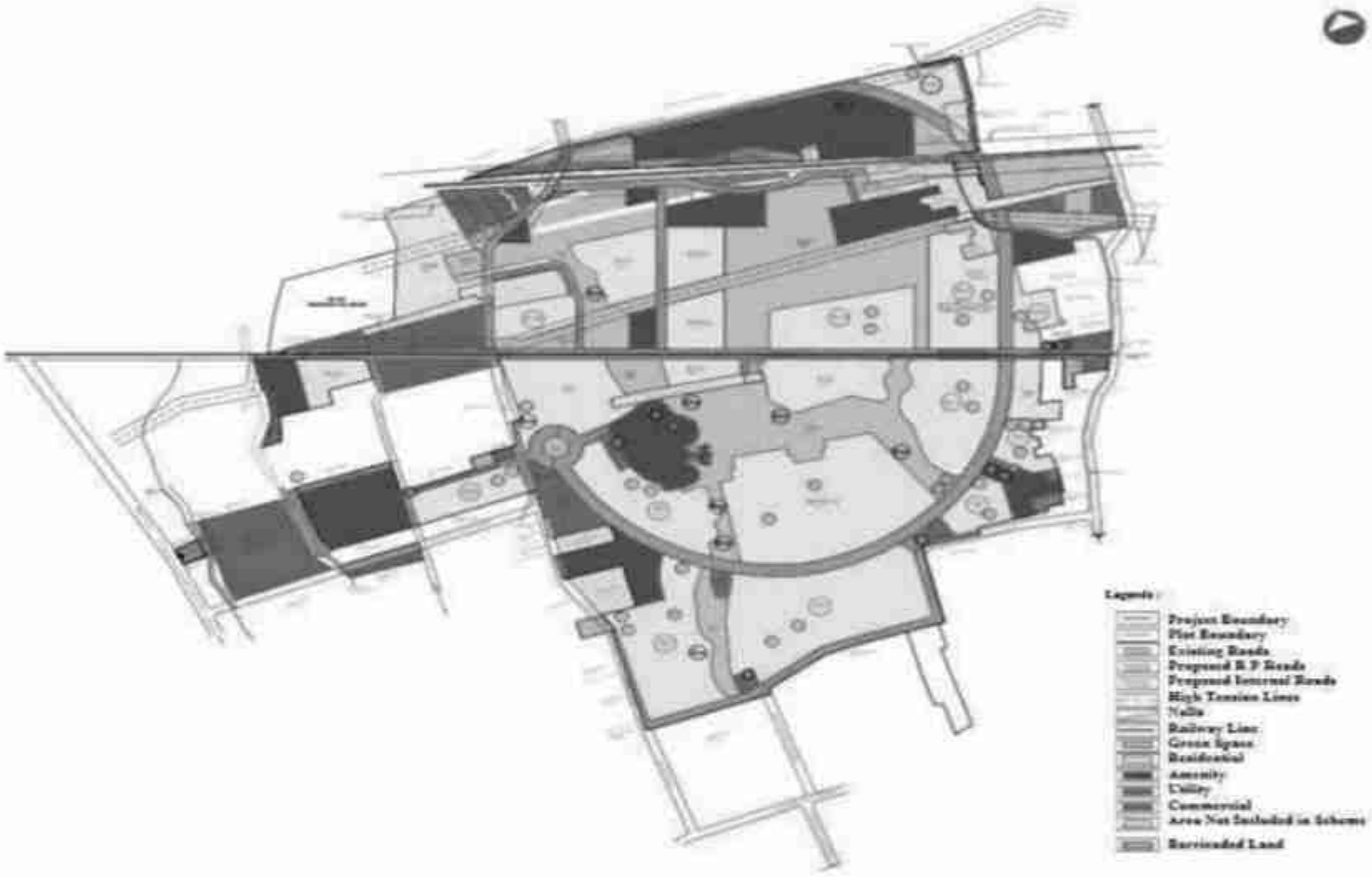


Figure 1.1: Landuse Map for Amanora Park Township

1.5 Brief on Work Done and Report Structure

The main focus of this study revolved around two key aspects: firstly, to gauge how well Amanora Park Township adhered to the environmental conditions specified in the EC and CTO, and secondly, to thoroughly analyze the current state of the environment within the township.

Furthermore, the study involved a detailed evaluation of the existing environmental conditions within the Amanora Township. This evaluation encompassed several factors, including air quality, noise levels, water quality, and soil conditions. To gain a comprehensive understanding, the collected data was then compared with previous records dating back to 2023.

To gather information, a range of environmental indicators such as air, noise, water, soil, biological factors, and socio-economic elements were monitored within the township's boundaries. This monitoring effort extended for approximately 8 to 9 days during both the Winter Season (13th February to 24th February 2023) and the Summer Season (24th April to 6th May 2023).

The report is structured with distinct chapters dedicated to the assessment and evaluation of various pollution control systems. These include systems for air, noise, and water treatment (STP/ETP), and the management practices related to solid waste disposal. Moreover, the report also includes predictive models used to anticipate township activities, especially traffic movement in the nearby vicinity. The evaluation also extends to aspects like the condition of green spaces and plantations, as well as the level of engagement and communication with the township's residents and workforce.

The study concludes by offering recommendations to ensure the continuous enhancement of environmental quality within the Amanora Park Township. The findings and suggestions presented in this study aim to contribute to the ongoing improvement of the township's environmental conditions.

With a keen focus on the study's intended goals and its defined scope, the research was meticulously carried out, yielding outcomes that are systematically detailed across the following chapters:

Chapter 1- Introduction

This chapter provides an initial context, setting the stage for the study's purpose and relevance

Chapter 2- Air Quality Status in the Township

Detailed insights into the air quality within the township

Chapter 3- Noise Levels in the Township

Elaborates on noise parameters within the township

Chapter 4- Water Quality Status in the Township

The quality of water within the township area is assessed

Chapter 5- Soil Quality Status in the Township

A comprehensive analysis of soil quality within the township is presented

Chapter 6- Status of Biological Environment

This section focuses on the biological environment

Chapter 7- Traffic Movement and Related Pollution in the Township

Assessment of traffic movement within the township

Chapter 8- Solid Waste Management in the Township

Solid waste management practices within the township

Chapter 9- Social Aspects: Facilities and Services in the Township

Social dimensions are assessed

Chapter 10- Status of Environmental Compliance and Further Suggestions

The final chapter encapsulates the evaluation of environmental compliance

Chapter 2

Air Quality Status in the Township

Chapter 2

Air Quality Status in the Township

2.1 Air Quality Status in the Township Area

2.1.1 Monitoring Details (2017 to 2023)

To adhere to EC & CTO requirements, the project proponent consistently monitors air quality within the township. This task is entrusted to a third party. The air quality data, which were utilized in the six compliance reports, encompassed six years spanning from 2017 to 2023. These reports, produced bi-annually, captured the air quality parameters, viz. Particulate Matter (PM_{10} and $PM_{2.5}$), Oxides of Sulphur and Nitrogen (SO_2 and NO_2), Ozone (O_3), and Carbon Monoxide (CO).

This comprehensive monitoring process involves conducting measurements twice a month across distinct locations within the township. To uphold the standard measurement practices for various pollutants, the following methodologies are employed: Gravimetric method for PM, Jacob & Hochheiser Modified Method for NO_2, Improved West and Gaeke Method for SO_2, and Non-Dispersive Infrared (NDIR) Method for CO.

From 2017 to 2023, the project carried out ambient air monitoring at approximately 20 locations within the township. Notably, during each fortnight, monitoring activities were concentrated on 2-3 specific locations within the township. It's worth mentioning that certain locations were consistently revisited on an annual or monthly basis. Throughout the year, an average of 48 air quality samples were collected to represent the air quality across the township area.

2.1.2 Site-wise Air Quality Status in the Township Area

The 24-hour average National Ambient Air Quality Standards (NAAQS) for PM_{10} and $PM_{2.5}$ are 100 and 60 $\mu g/m^3$ respectively, whereas for Sulfur Dioxide (SO_2) and Nitrogen Dioxide (NO_2), it is 80 $\mu g/m^3$. The 8-hour average standards for Carbon Monoxide (CO) and Ozone (O_3) are 0.2 mg/m^3 and 100 $\mu g/m^3$ respectively. **Figure 2.1** graphically conveys the variability across different sites, the observations indicate that all monitored air quality parameters consistently remained within the defined standards throughout the years.

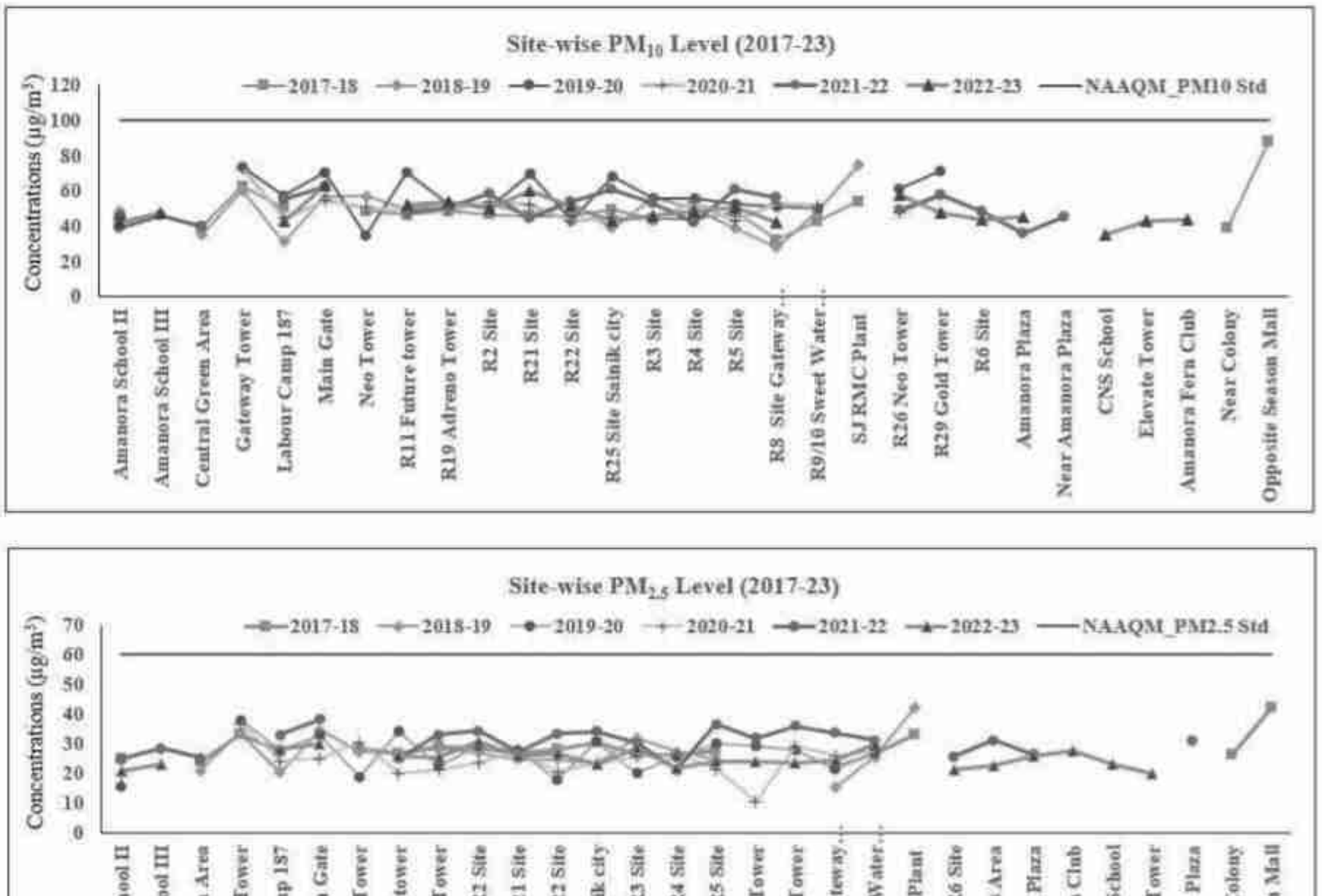
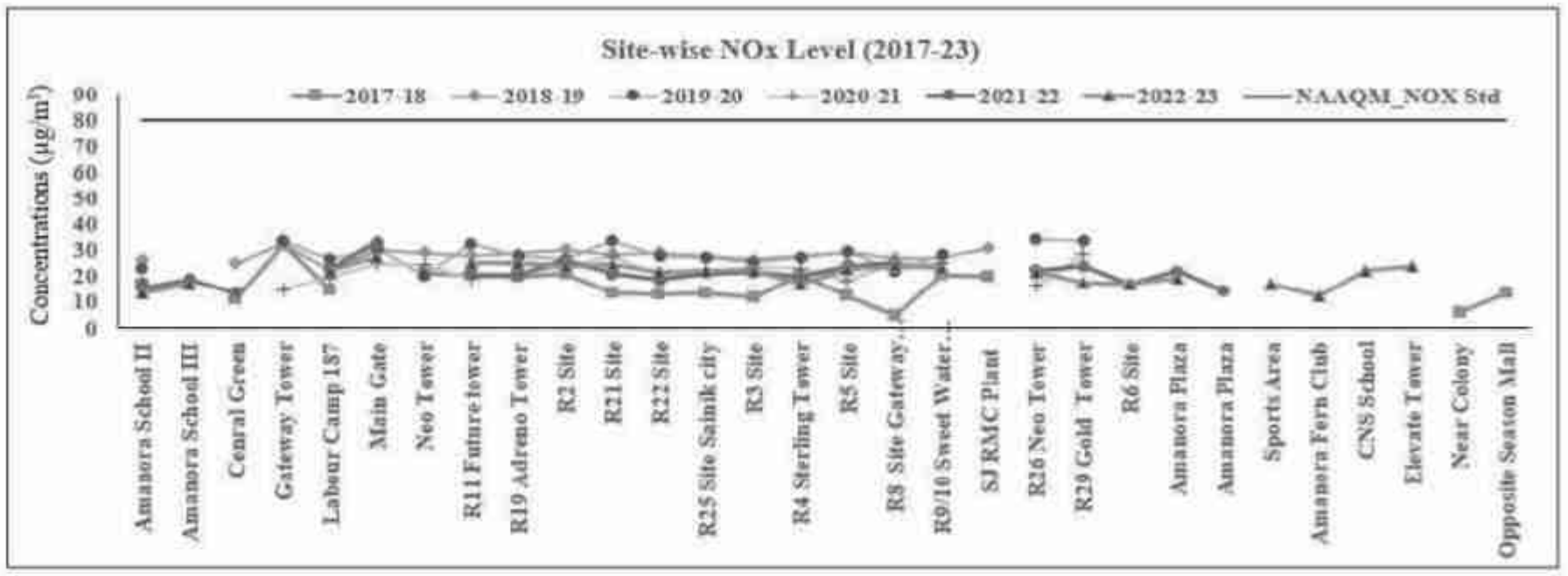
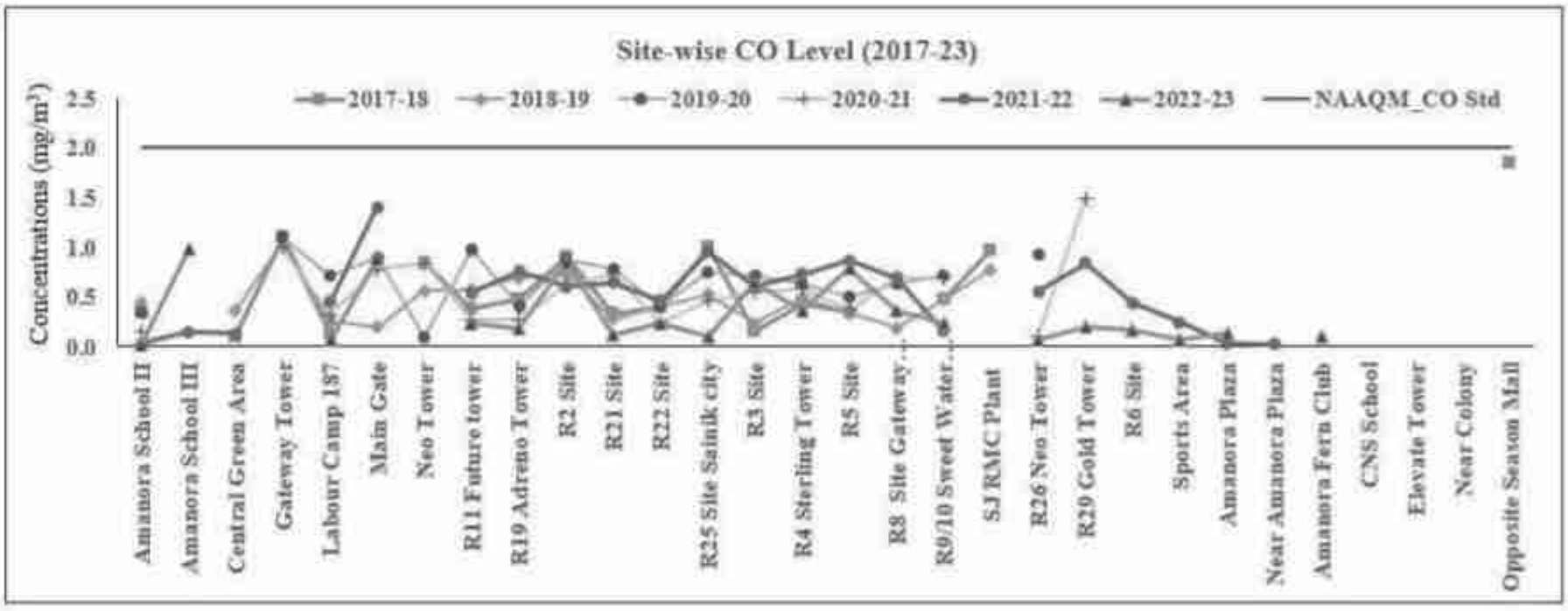


Figure 2.1: Monitoring Location-wise Ambient Air Quality Status in Amanora Township Area During 2017 to 2023 (PM_{10}, $PM_{2.5}$ and SOx)





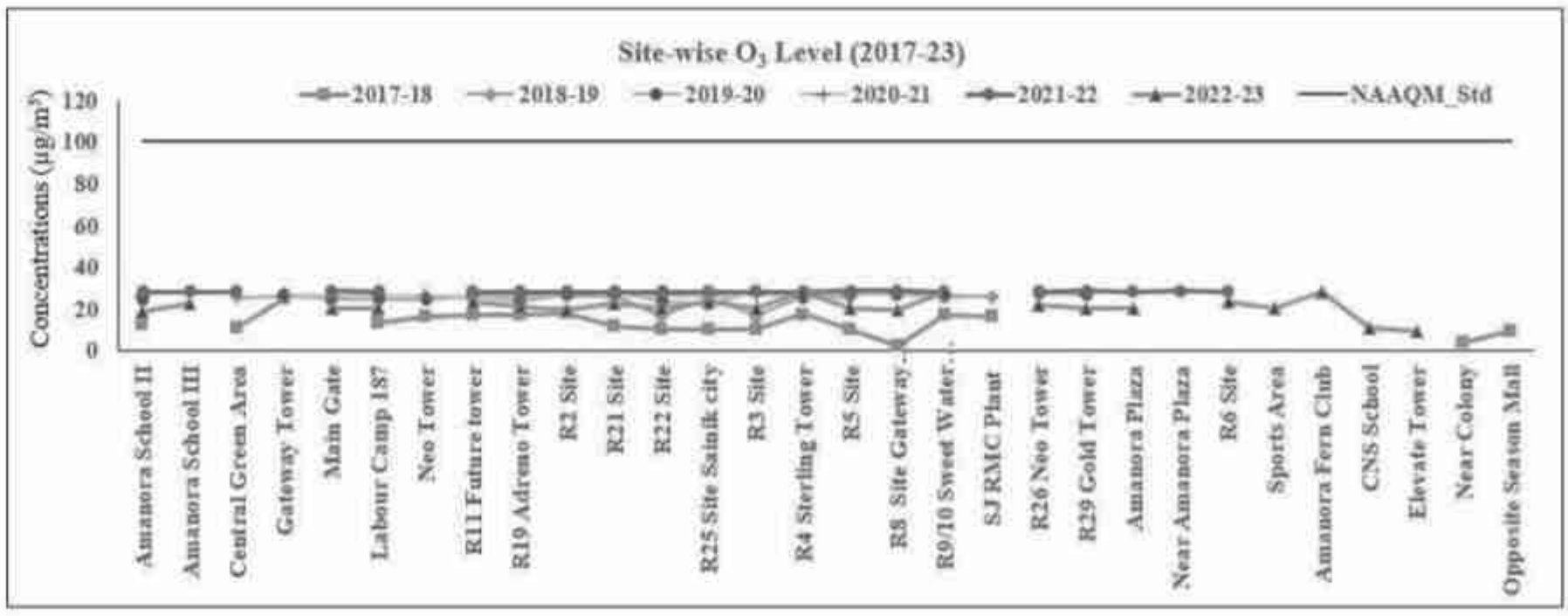


Figure 2.1 *(Contd..)*: Monitoring Location-wise Ambient Air Quality Status in Amanora Township Area During 2017 to 2023 (NOx, CO and O_3)

Particulate Matter (PM_{10} and $PM_{2.5}$):

- The average PM_{10} concentration over the years is around 50.1 $\mu g/m^3$. In the year 2019-20, a higher range of concentrations was observed at specific locations i.e. Gateway Tower, Main Gate, R11 Future Tower, R25 Site Sainik City, and R29 Gold Tower which ranged between 68 to 73 $\mu g/m^3$ indicating potential localized sources of pollution. During 2018-19 reported higher value at site SJ RMC Plant around 74 $\mu g/m^3$. The maximum concentration of 88 $\mu g/m^3$ was observed at Opposite Season Mall station in 2017-2018 due to construction activity. The overall PM_{10} concentrations are well within the 24-hour NAAQS standards of 100 $\mu g/m^3$.
- In the case of $PM_{2.5}$ the average concentration is around 26.9 $\mu g/m^3$. In the year 2021-22, most of the sites viz. Main Gate, R5 Site, R29 Gold Tower, Labour Camp 187, and R25 Site Sainik City are exceeding the average concentrations indicating potential localized sources of pollution. Also, over the years Gateway Tower site concentration is reporting high. The maximum concentration of 42 $\mu g/m^3$ is reported at SJ RMC Plant and Opposite Season Mall station due to construction activity in the vicinity. The overall $PM_{2.5}$ concentrations are well within the 24-hour NAAQS standards of 60 $\mu g/m^3$.

Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2):

- Over the year average concentrations of SOx and NOx were reported as 16.5 and 22.6 $\mu g/m^3$ respectively. In the year 2019-20, maximum concentrations were reported for both parameters. The indicative sites are Gateway Tower, R11 Future Tower, R2 Site, R21 Site, R26 Neo Tower and R29 Gold Tower. SO_2 and NO_2 levels remain consistently low across all monitoring locations over the years, frequently falling below the detection limit of NAAQS standards of 80 $\mu g/m^3$. This suggests that no industrial emissions or DG sets activities are reported within the township area, the minimal concentrations may be due to internal vehicular sources.

Carbon Monoxide (CO)

- The average concentration of CO is reported as 0.5 mg/m^3, and the maximum concentrations are reported at Gateway Tower, Main Gate, Opposite Season Mall, and R29 Gold Tower. Overall CO concentrations display relatively balanced levels across the monitoring locations and over the years, which is within the acceptable range i.e. 2 mg/m^3 (8 hourly average). Indicating relatively stable sources of this pollutant within the area.
- In the case of O_3 average concentration was reported as 23 $\mu g/m^3$ over the years. The maximum concentrations of 28 $\mu g/m^3$ were reported in 2021-22 across all the sites. The overall O_3 concentrations are consistently registering lower levels within the 8 hourly average permissible limits of NAAQS standards i.e. 100 $\mu g/m^3$.

2.1.3 Fortnightly Air Quality Assessment within the Township Area

24 hourly average concentrations of criteria pollutants monitored at different locations in the township area in each of the fortnight of the month during 2017-2023. Within a fortnight, air quality monitoring takes place once at 2-3 distinct locations within the township area. The average value derived from these monitored locations in that specific fortnight represents the overall air quality assessment.

The variations in these air quality parameters within the township area have been depicted in **Figures 2.2a (**PM), **2.2b** (SOx, NOx) **2.2c** (CO), and **2.2d** (O_3). The observations show that air quality parameters consistently remained well within the stipulated standards throughout the specified periods. This reinforces the overarching commitment to maintaining the prescribed environmental standards within the township area throughout the specified timeframes.

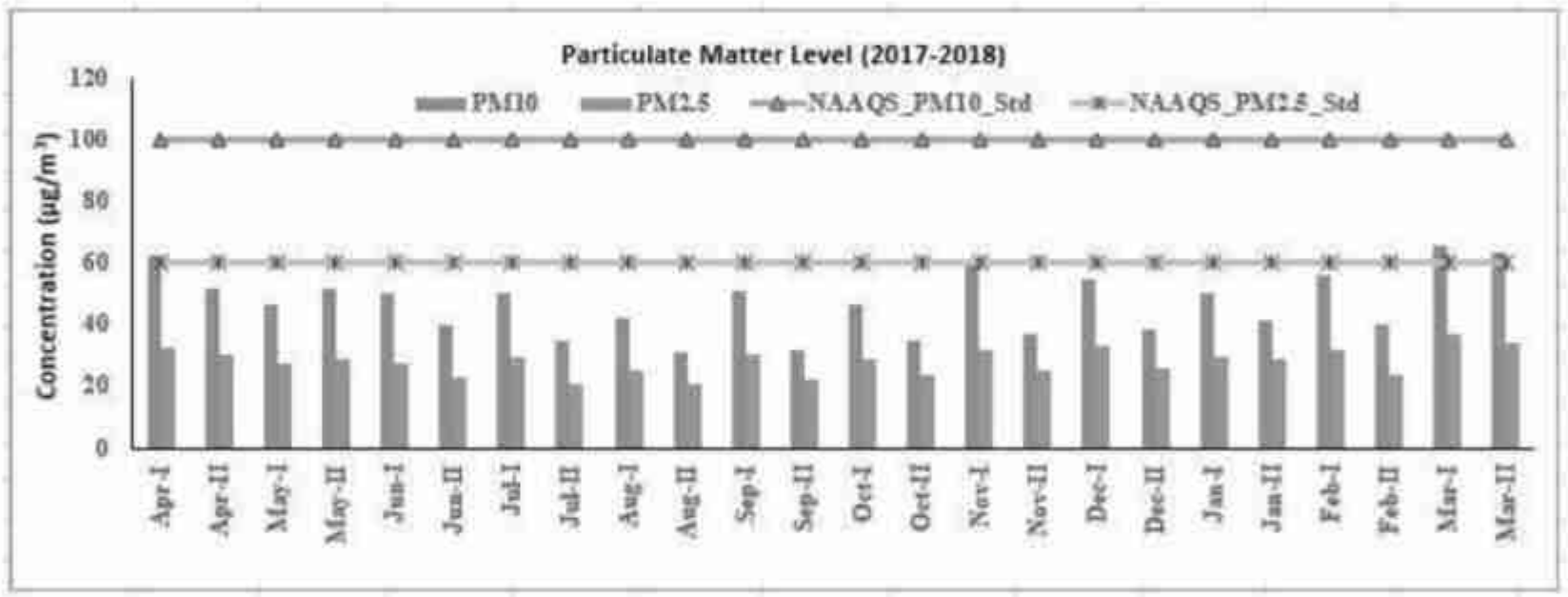
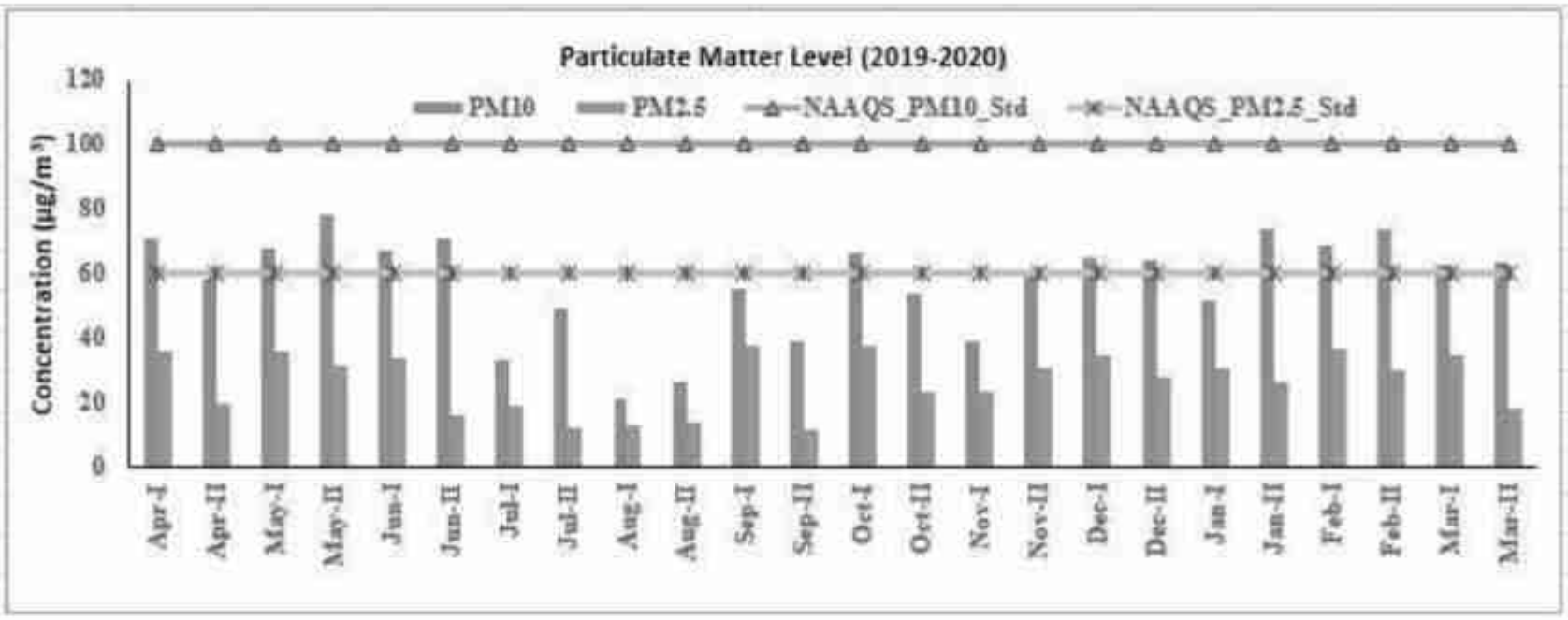
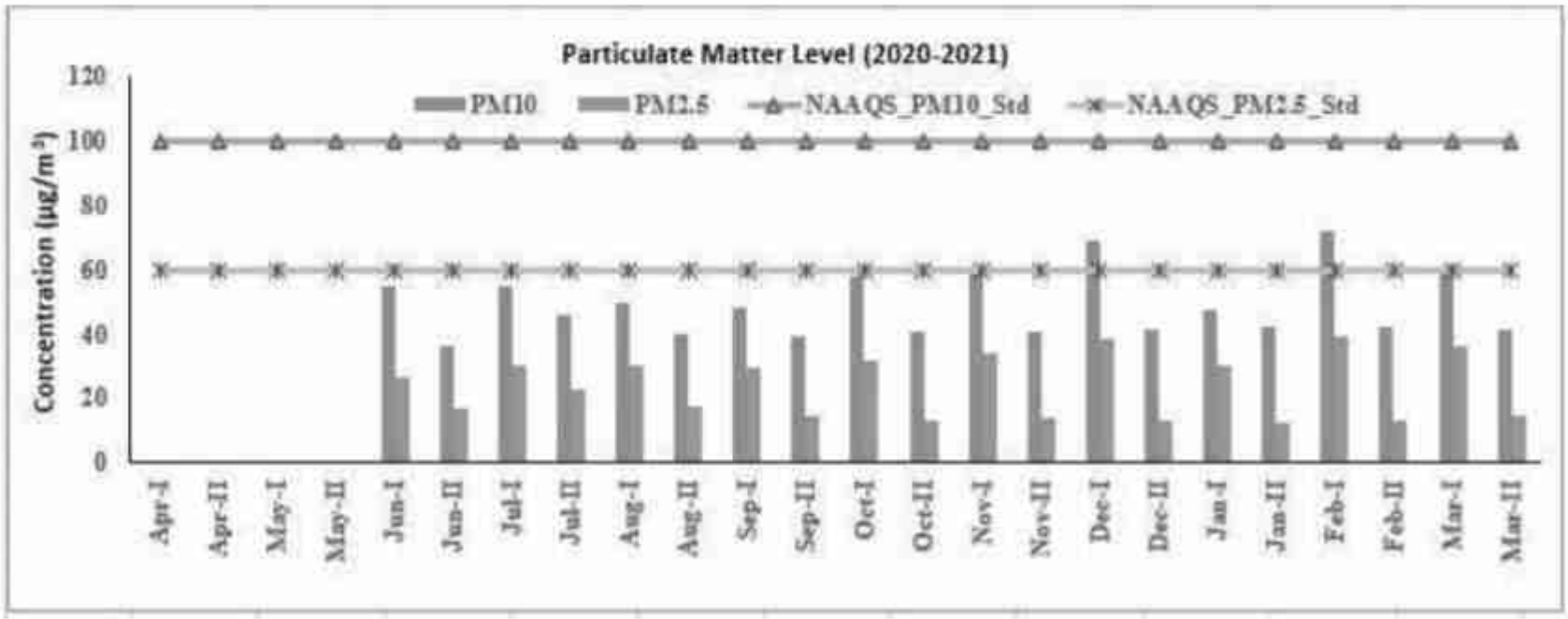


Figure 2.2a: Fortnightly Variation in 24 hourly Average Concentrations of PM_{10} and $PM_{2.5}$ in the Township Area, During 2017-2023





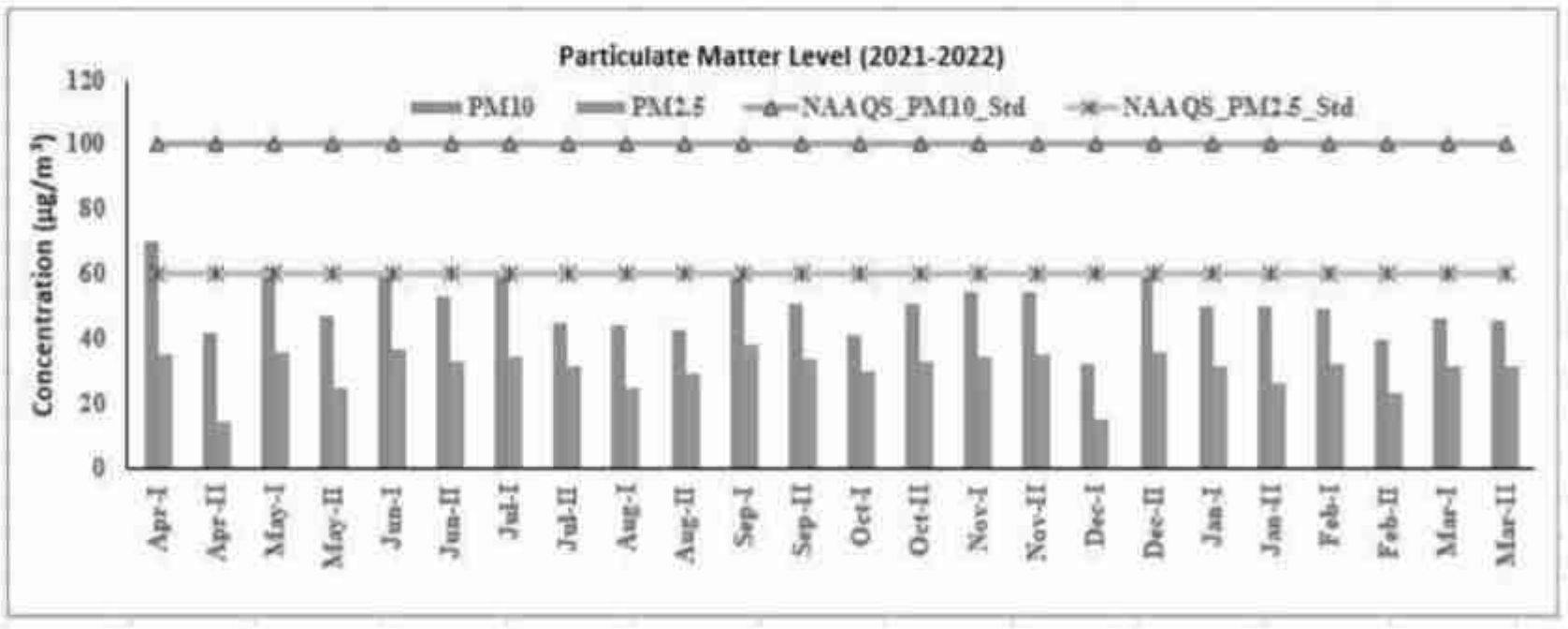


Figure 2.2a *(Contd..)*: Fortnightly Variation in 24 hourly Average Concentrations of PM_{10} and $PM_{2.5}$ in the Township Area, During 2017-2023

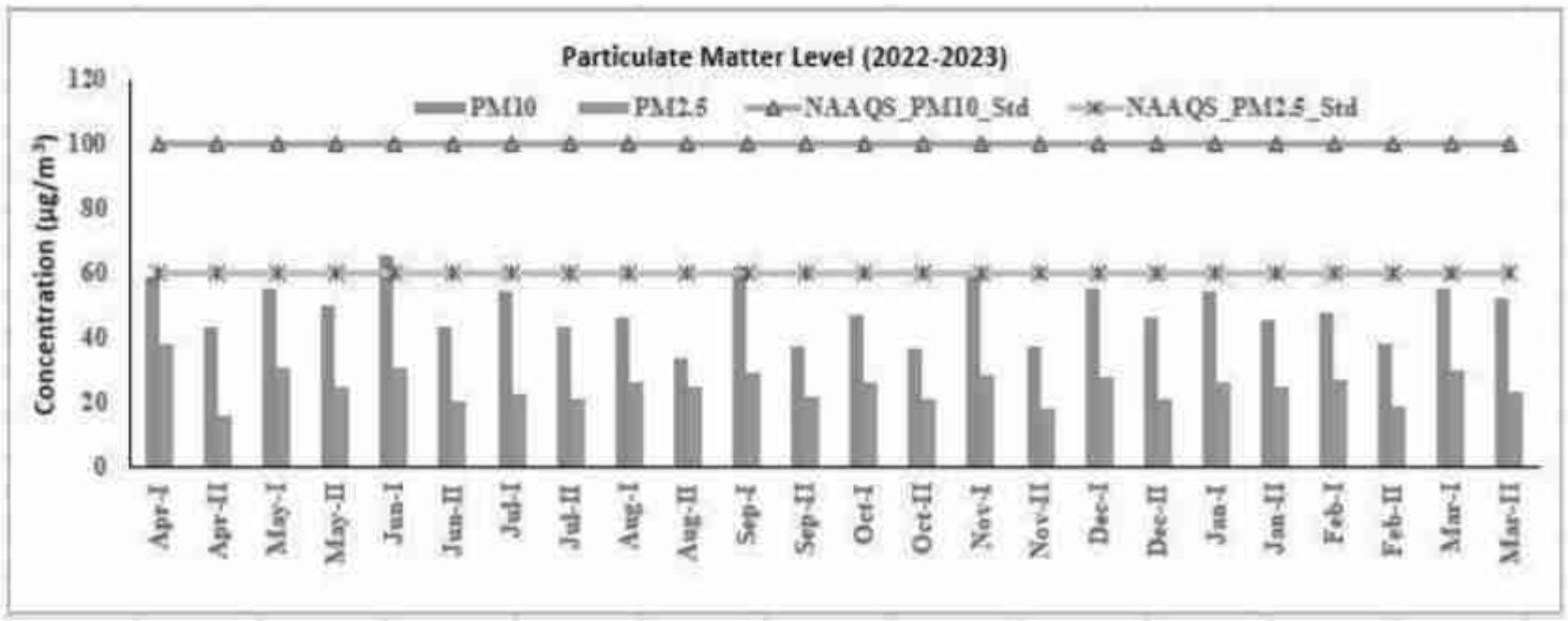
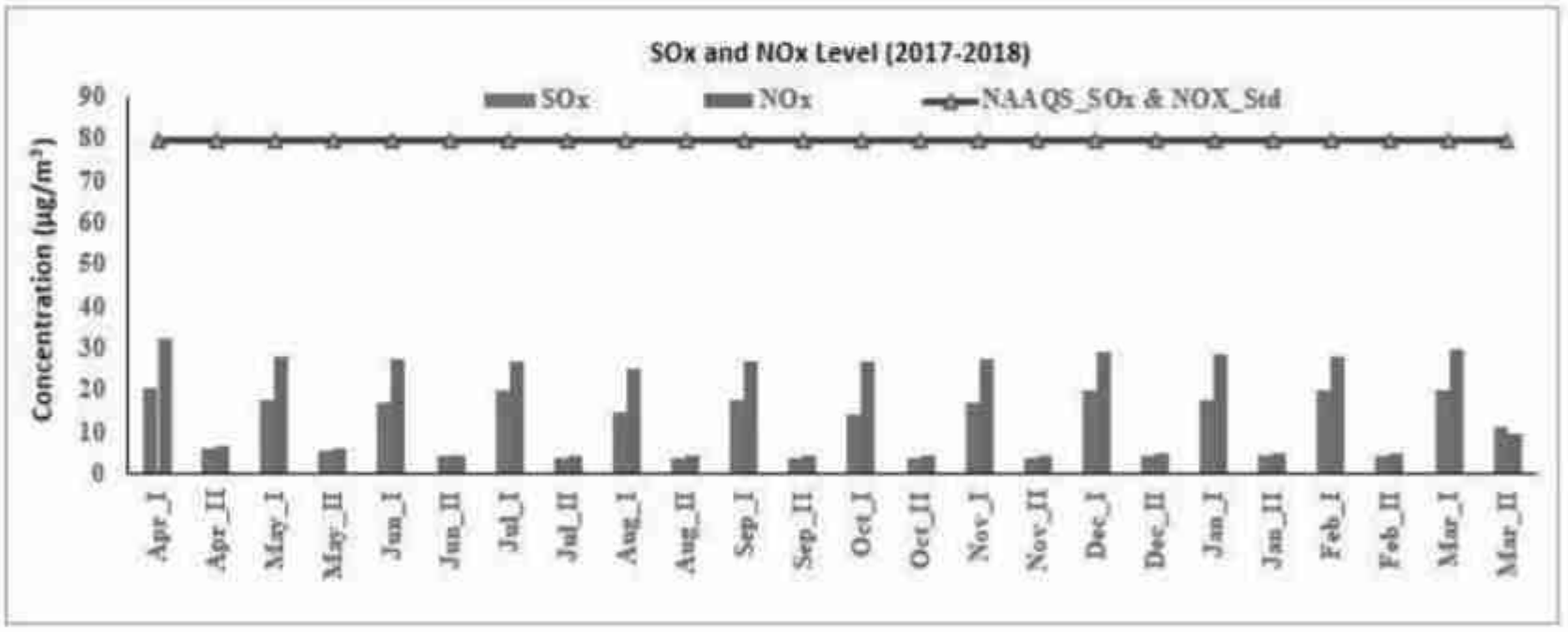


Figure 2.2a *(Contd..)*: Fortnightly Variation in 24 hourly Average Concentrations of PM_{10} and $PM_{2.5}$ in the Township Area, During 2017-2023



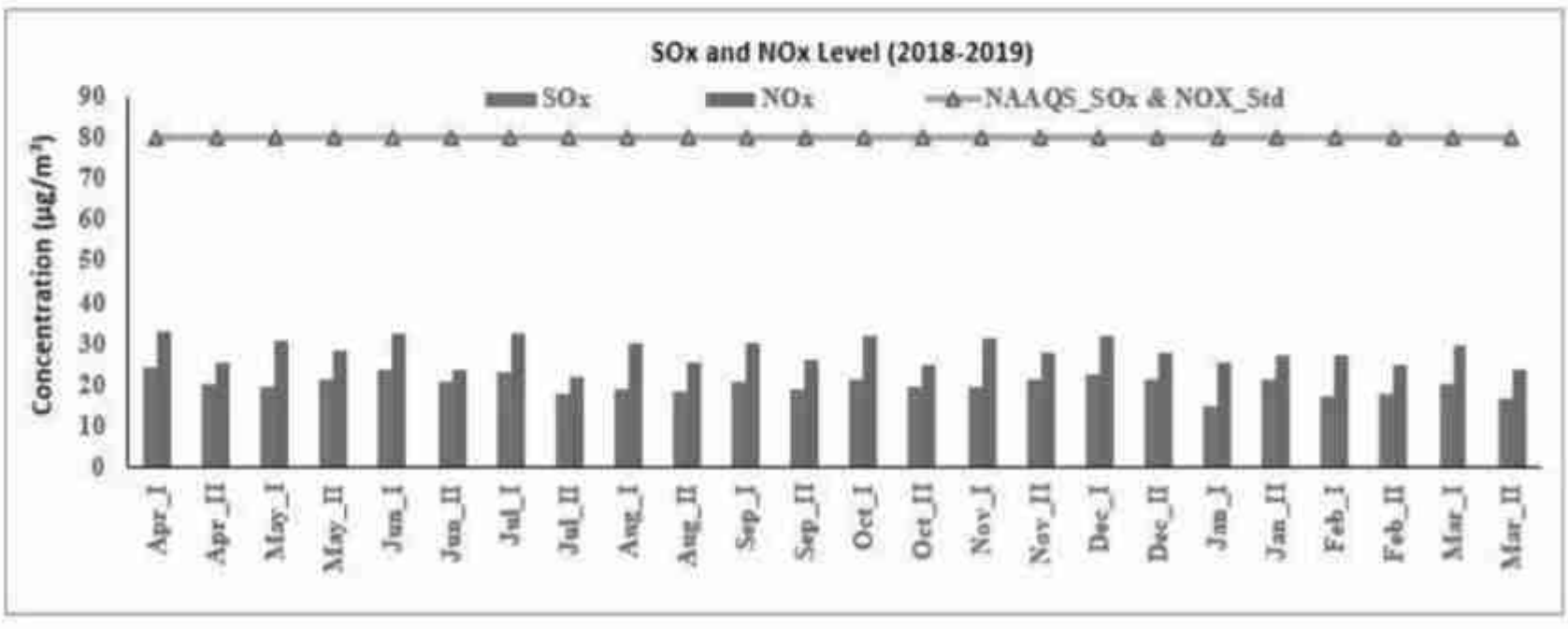


Figure 2.2b: Fortnightly Variation in 24 hourly Average Concentrations of SOx and NOx in the Township Area, During 2017-2023

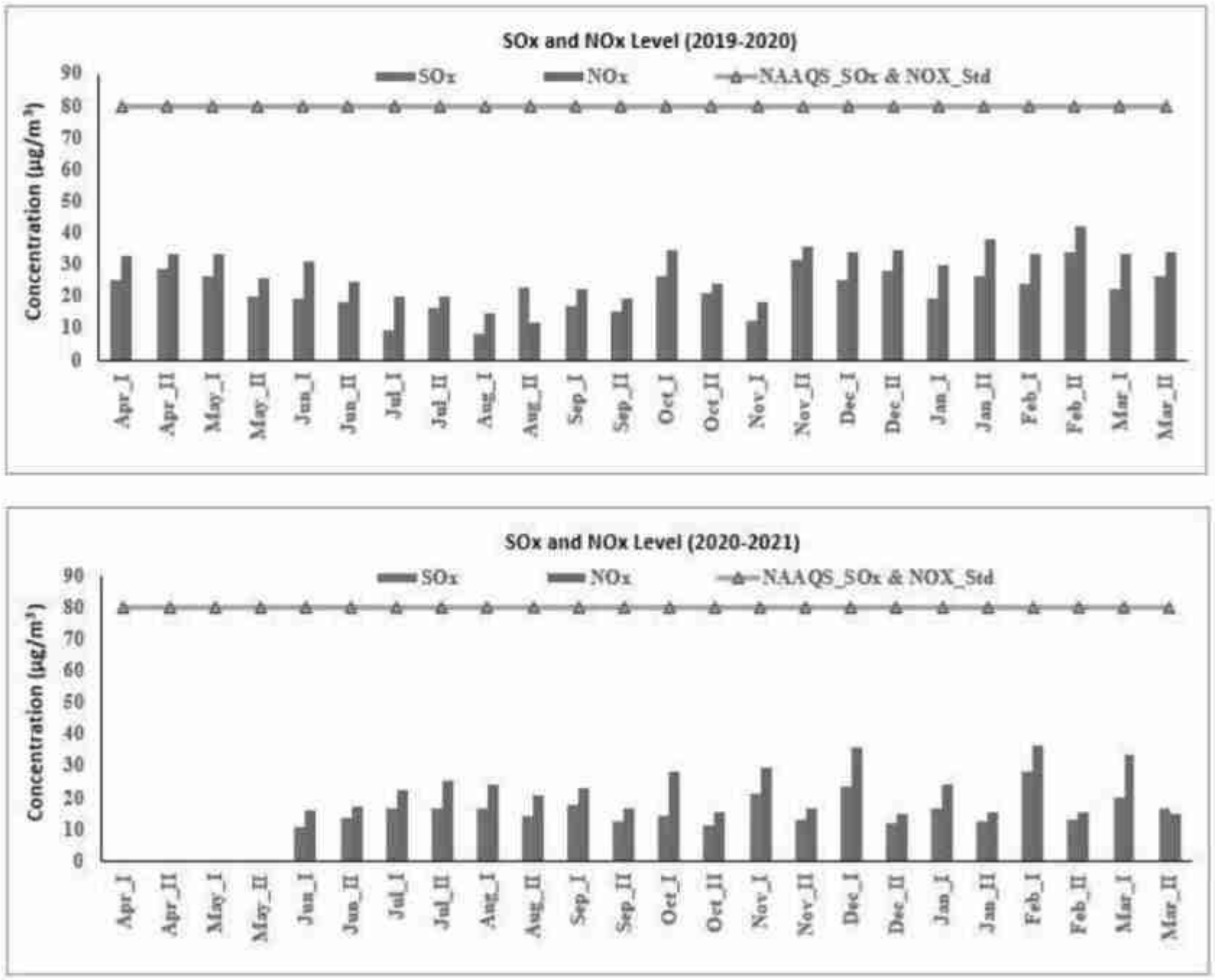


Figure 2.2b *(Contd..)*: Fortnightly Variation in 24 hourly Average Concentrations of SOx and NOx in the Township Area, During 2017-2023

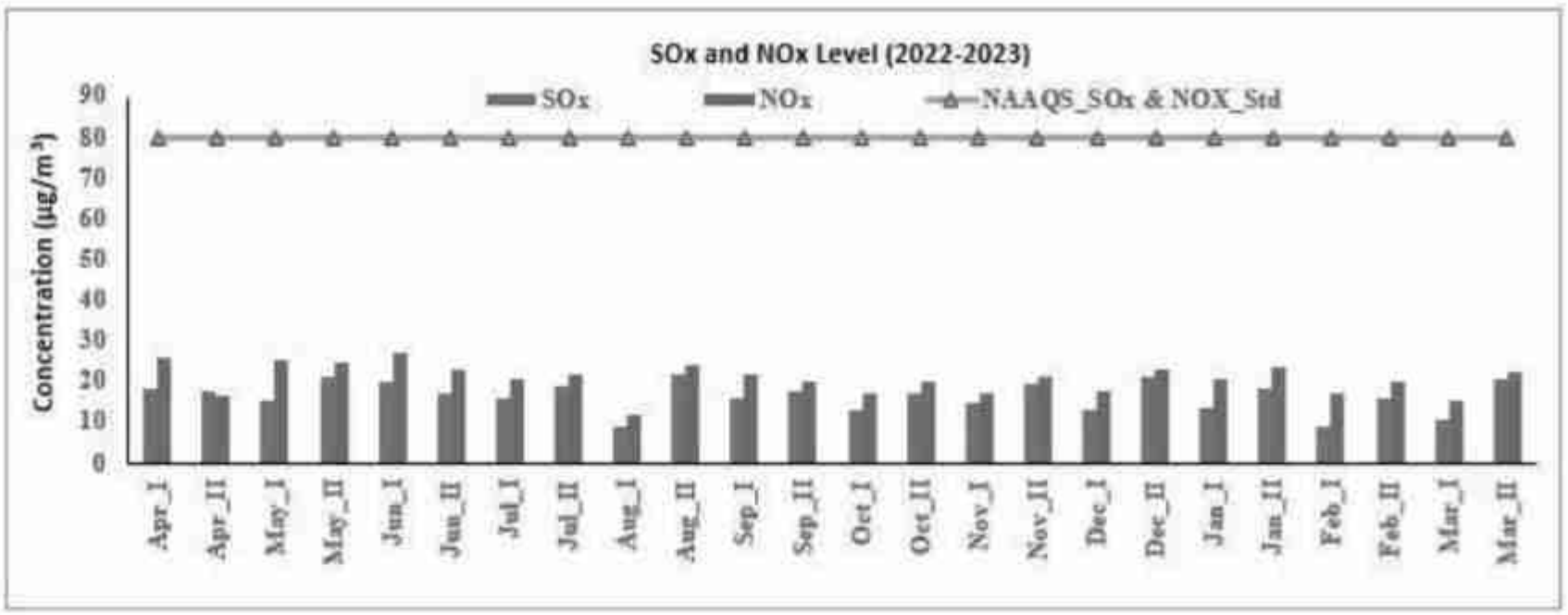


Figure 2.2b *(Contd..)*: Fortnightly Variation in 24 hourly Average Concentrations of SOx and NOx in the Township Area, During 2017-2023

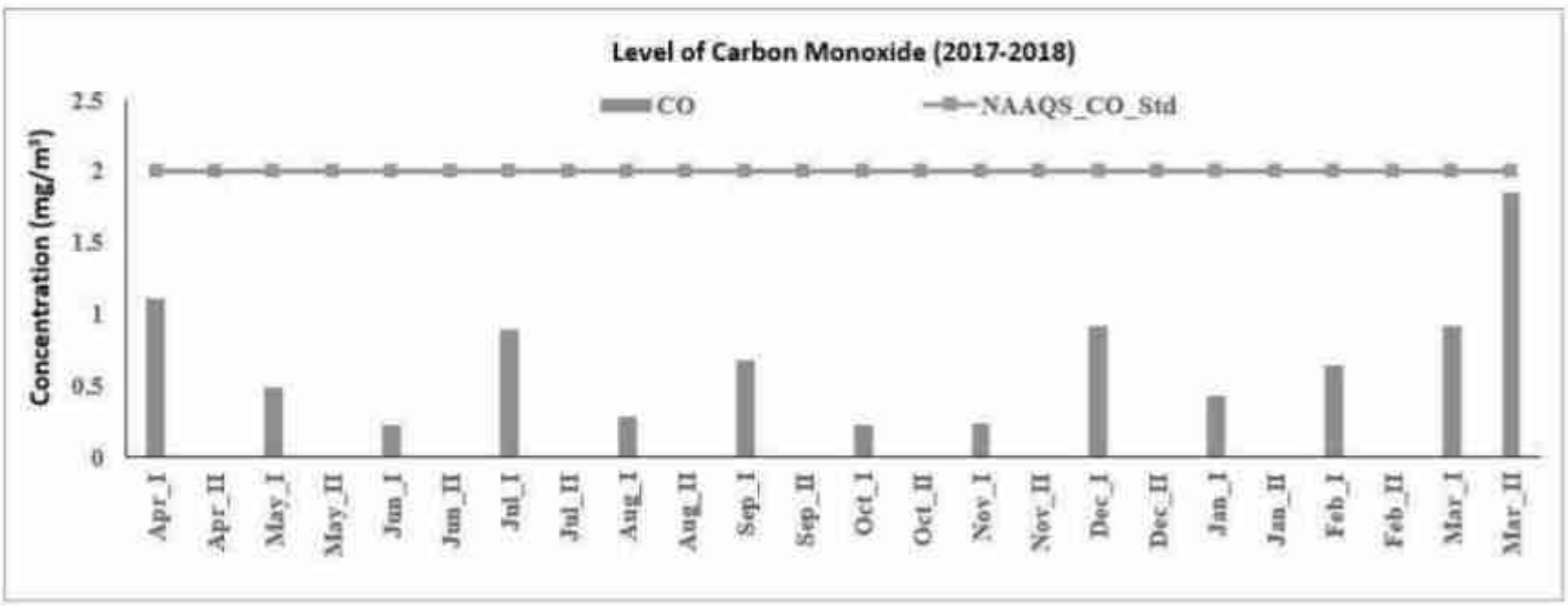


Figure 2.2c: Fortnightly Variation in 24 hourly Average Concentrations of CO in the Township Area, During 2017-2023

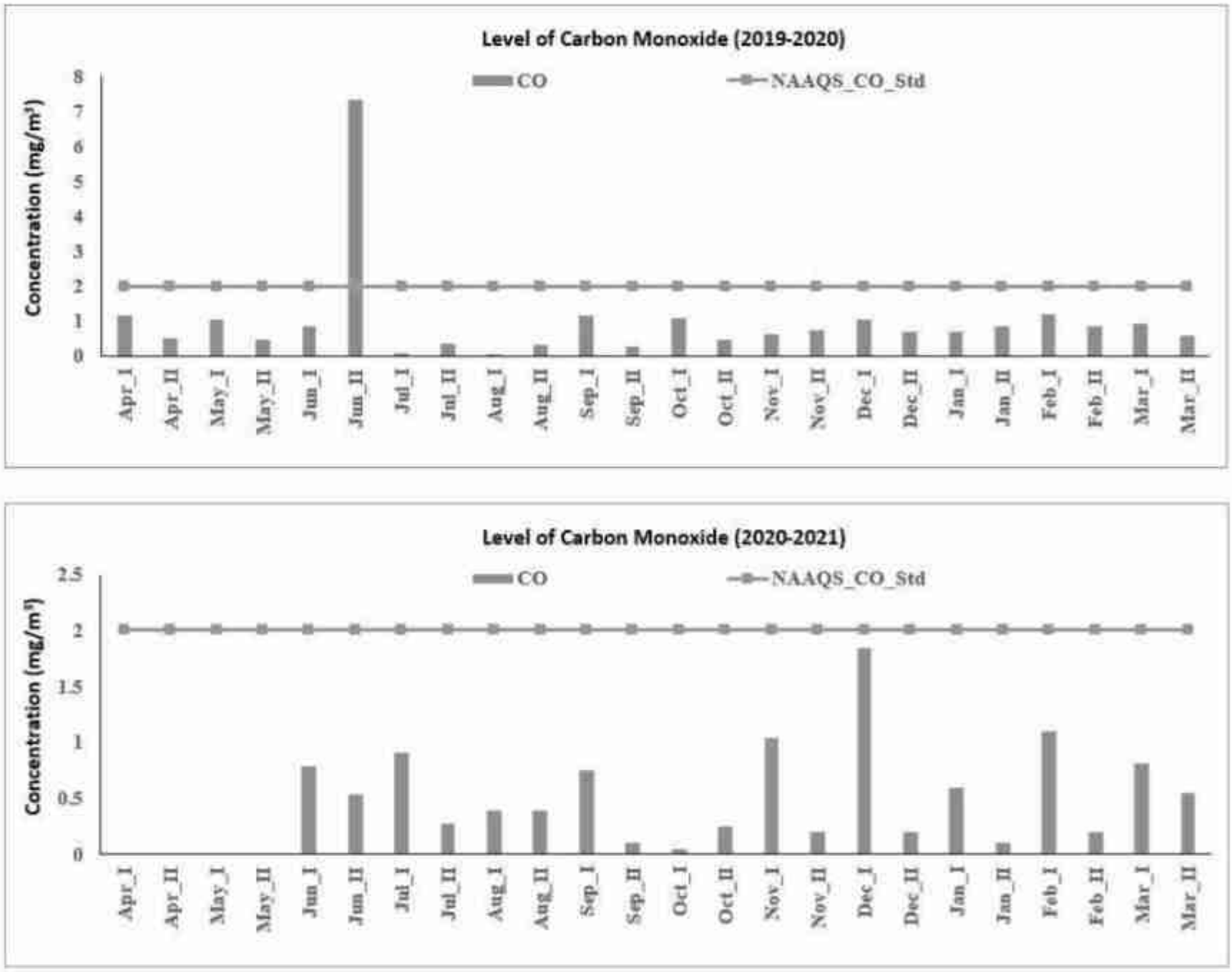


Figure 2.2c *(Contd..)*: Fortnightly Variation in 24 hourly Average Concentrations of CO in the Township Area, During 2017-2023

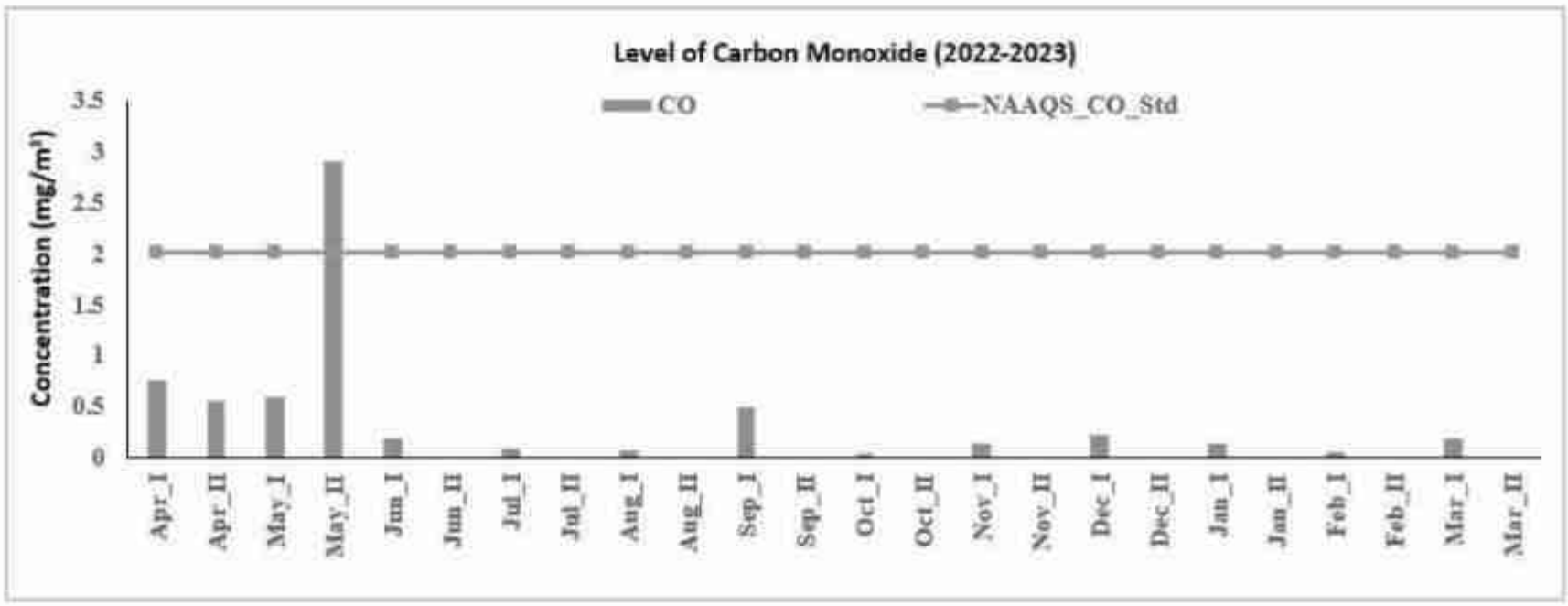
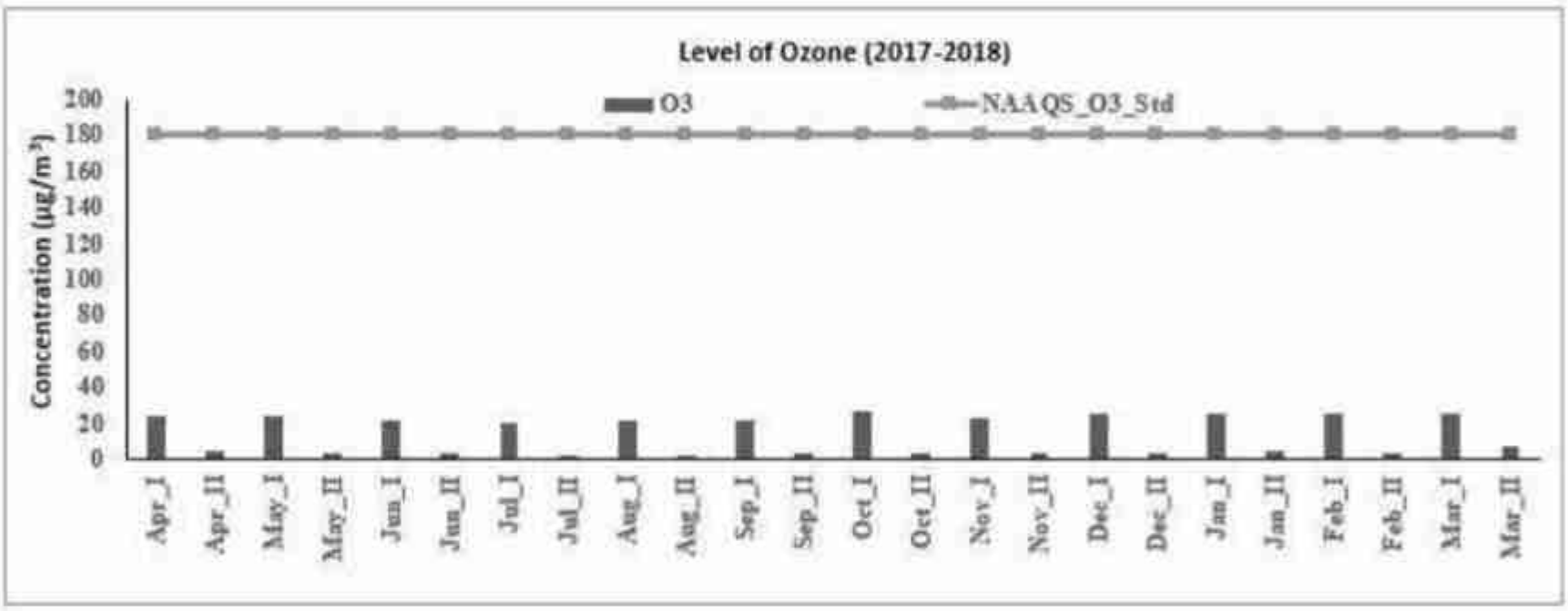


Figure 2.2c *(Contd..)*: Fortnightly Variation in 24 hourly Average Concentrations of CO in the Township Area, During 2017-2023



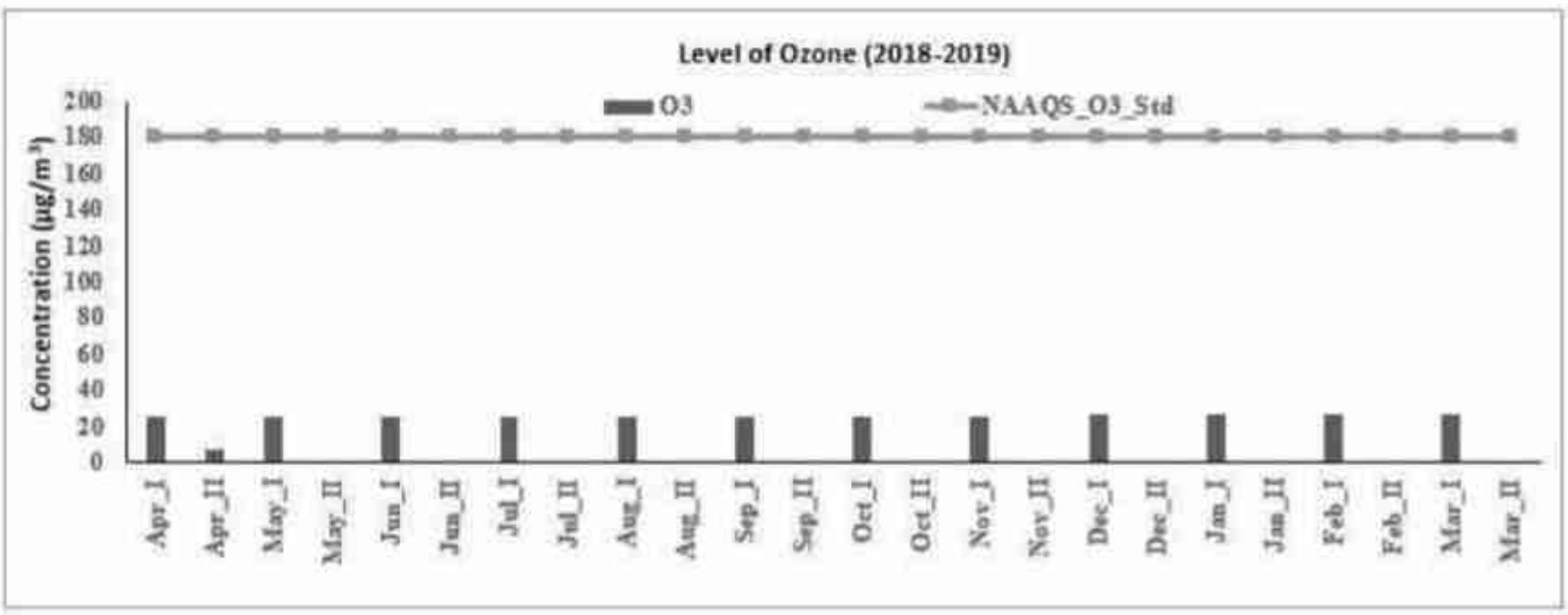


Figure 2.2d: Fortnightly Variation in 24 hourly Average Concentrations of Ozone in the Township Area, During 2017-2023

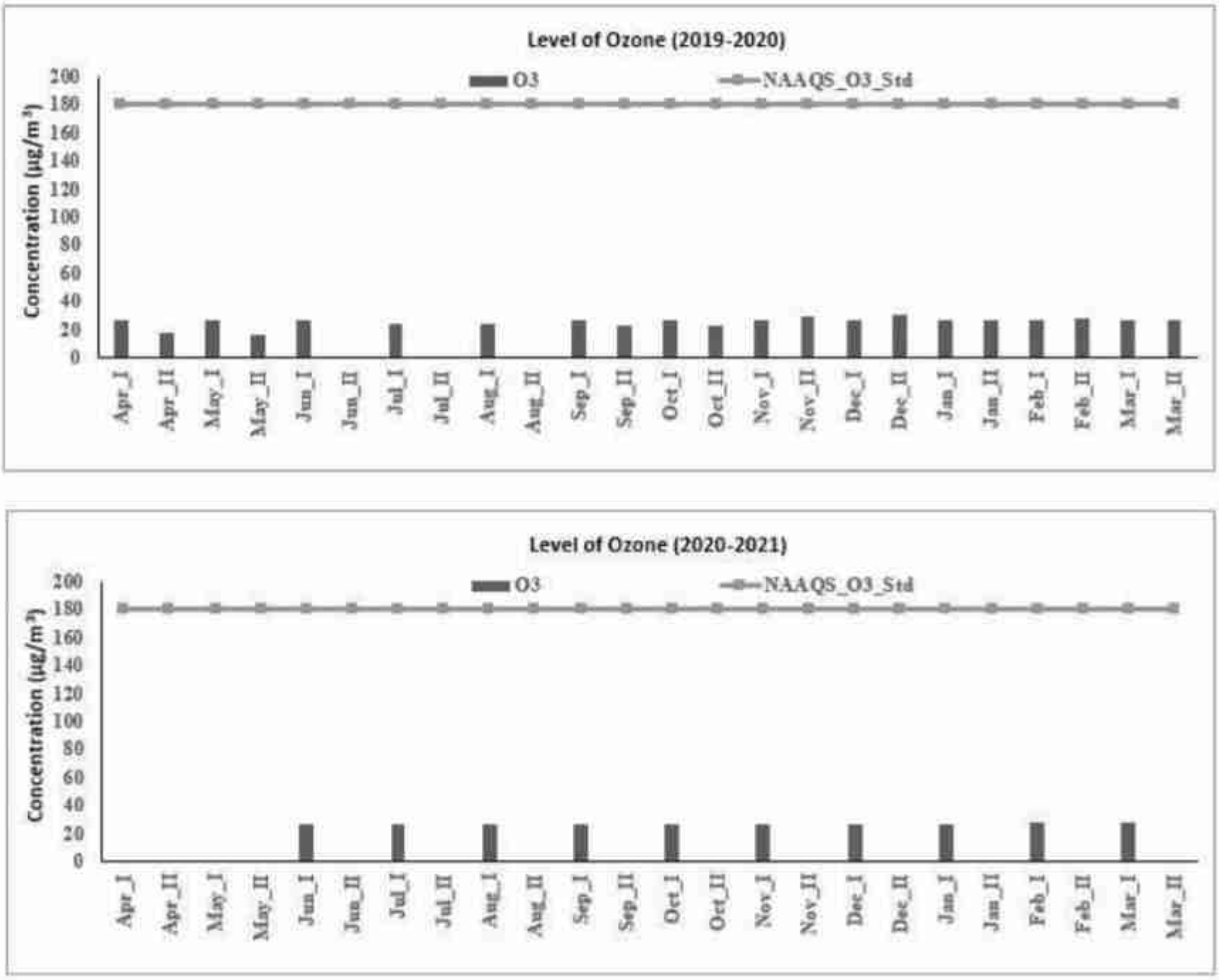


Figure 2.2d *(Contd..)*: Fortnightly Variation in 24 hourly Average Concentrations of Ozone in the Township Area, During 2017-2023

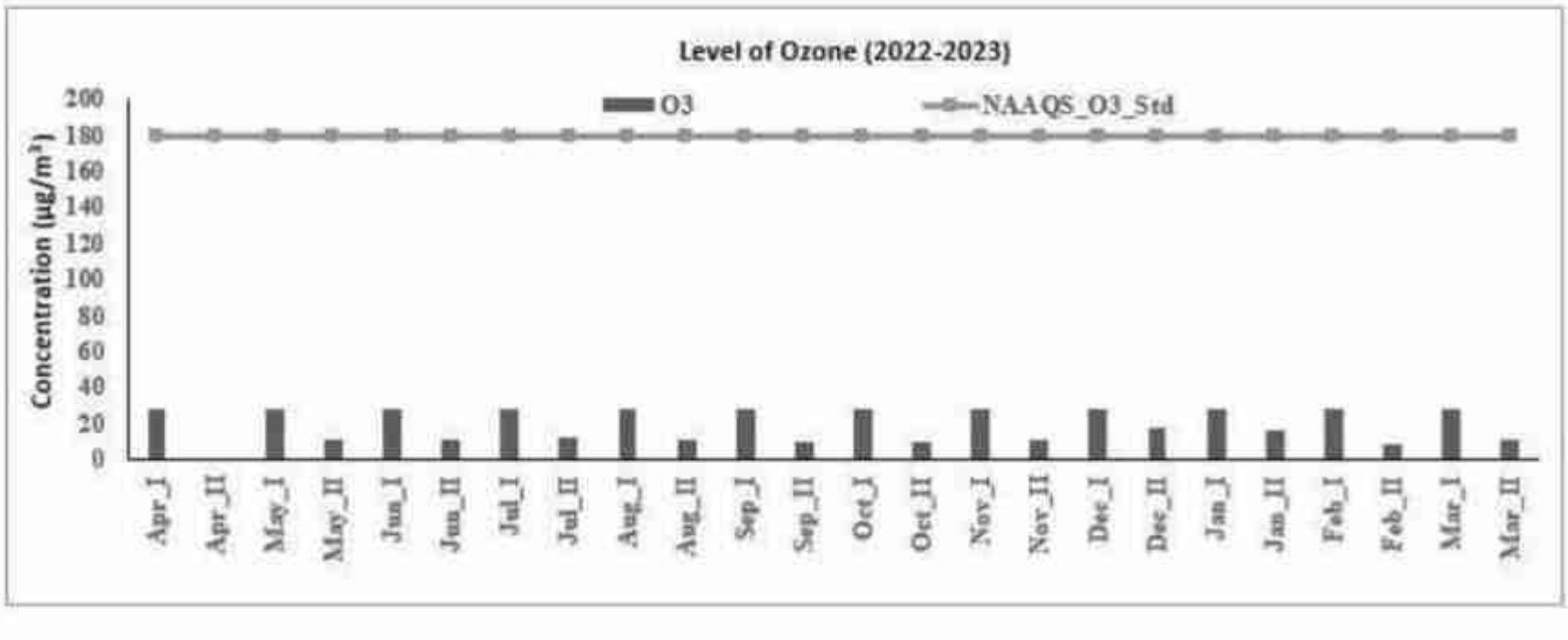


Figure 2.2d *(Contd..)*: Fortnightly Variation in 24 hourly Average Concentrations of Ozone in the Township Area, During 2017-2023

The provided data reveals that both PM_{10} and $PM_{2.5}$ fortnightly levels were not much varied within months and years; consistently staying below the NAAQS standards of 100 µg/m³ and 60 µg/m³, respectively. The fortnightly average concentrations of PM_{10} and $PM_{2.5}$ were 50.4 and 26.9 µg/m³ respectively. A maximum of 78.4 µg/m³ and PM_{10} was reported in (May II, 2019-20) at Main Gate and R25 Site Sainik City site, whereas $PM_{2.5}$ concentration of 39.5 µg/m³ reported in (Feb_I, 2020-21) at R11 Future Tower and Labour Camp 187. The concentrations peak up in winter but remain within the NAAQS standards.

The average fortnightly concentrations for SOx and NOx were 16.7 and 22.9 µg/m³ respectively. Both maximum SOx and NOx were reported as 33.8 µg/m³ and 41.9 µg/m³ in (Feb_II, 2019-20) at R25 Sainik City Site and R11 Future Tower. SO_2 and NO_2 levels exhibit variations but consistently remain below the NAAQS standard of 80 µg/m³.

The fortnightly eight hourly average CO concentrations were reported as 0.62 mg/m³ and a maximum of 7.3 mg/m³ recorded in (Jun_II, 2019-20) at the R29 Gold Tower site. One or more times, in 2019-20 and 2022-23 CO was reported high above the 8 hourly standard of 2 mg/m³, concentrations may increase due to confined sources. The average O_3 concentrations were 22.5 µg/m³ and a maximum of 30 µg/m³ was reported in (Dec_II, 2019-20) at R-19 Adreno Tower and R22 Site. Over the years O_3 concentrations were within the prescribed standards of 100 µg/m³.

2.1.4 Seasonal Variation in Air Quality Status

The seasonal assessment of air quality within the township area has been conducted across various seasons during the monitoring span from 2017 to 2023 and is presented in **Table 2.1**.

Table 2.1: Seasonal Variation in Air Quality Status

	Overall Avg.	Summer Avg.	Monsoon Avg.	Post-Mon. Avg.	Winter Avg.	Max	Min	Stdev (±)	NAAQS Std.
2017-2018									
PM_{10}	47.1	57.0	41.3	43.3	46.9	46.7	65.6	7.7	100
$PM_{2.5}$	28.0	31.6	24.5	27.1	28.9	27.7	36.7	3.4	60
SOx	11.6	13.4	10.8	10.3	11.8	5.6	20.7	6.8	80
NOx	16.7	18.8	15.4	15.9	16.8	6.3	32.5	12.5	80
O_3	13.7	14.6	12.0	13.5	14.7	3.5	25.6	10.9	100
CO	0.7	1.1	0.5	0.4	0.7	0.5	1.9	0.6	2
2018-2019									
PM_{10}	49.0	47.7	44.4	51.0	52.9	30.0	66.7	14.9	100
$PM_{2.5}$	27.0	26.2	25.5	27.5	28.6	15.6	34.1	7.0	60
SOx	20.1	20.5	20.5	20.3	19.2	16.9	24.2	2.4	80
NOx	28.1	28.6	27.8	28.6	27.5	23.7	33.3	3.5	80
O_3	24.3	20.9	25.4	26.0	26.3	7.1	25.6	9.2	100
CO	0.5	0.6	0.5	0.4	0.5	0.2	1.2	0.4	2
2019-2020									
PM_{10}	57.5	66.9	44.5	52.4	66.1	57.9	78.4	7.2	100
$PM_{2.5}$	26.3	29.1	17.8	27.1	31.1	17.9	36.3	8.4	60
SOx	21.8	24.9	15.7	20.5	26.1	20.0	28.8	3.2	80
NOx	28.4	32.1	20.4	25.7	35.4	25.7	34.1	3.2	80
O_3	25.4	23.3	25.0	25.8	27.2	16.1	26.8	5.1	100
CO	1.0	0.8	1.5	0.7	0.9	0.5	1.2	0.3	2
2020-2021									
PM_{10}	49.5	51.3	47.0	48.1	52.8	42.0	60.7	13.3	100
$PM_{2.5}$	24.1	25.7	24.2	23.1	24.6	14.7	36.7	15.6	60
SOx	16.0	18.1	14.7	14.9	17.6	16.3	19.9	2.5	80
NOx	22.3	24.2	21.0	21.6	23.8	15.1	33.3	12.9	80
O_3	26.6	27.7	26.2	26.1	27.2	27.7	27.7	1.2	100
CO	0.6	0.7	0.5	0.4	0.7	0.6	0.8	0.2	2
2021-22									
PM_{10}	50.4	52.3	50.5	52.1	46.9	42.0	70.1	11.2	100
$PM_{2.5}$	30.5	28.8	31.7	33.9	27.5	14.4	36.0	8.1	60
SOx	14.5	19.1	13.5	13.9	11.6	15.7	22.8	2.8	80
NOx	21.4	27.2	20.5	19.8	17.9	15.0	35.7	6.9	80
O_3	28.2	28.5	28.0	28.2	28.1	28.4	28.6	0.1	100
CO	0.5	0.6	0.5	0.5	0.4	0.3	1.0	0.3	2

* BDL – Below Detectable Limits; NAAQS: O_3 (µg/m^3) and CO (mg/m^3) Standards (8 Hrly, Average)
* Summer (Mar to May), Monsoon (Jun to Aug.), Post Monsoon (Sept to Nov.), and Winter (Dec. to Feb.)

Table 2.1 *(Contd..)*: Seasonal Variation in Air Quality Status

	Overall Avg.	Summer Avg.	Monsoon Avg.	Post-Mon. Avg.	Winter Avg.	Max	Min	Stdev (±)	NAAQS Std.
2022-2023									
PM_{10}	48.7	52.3	47.9	46.6	47.9	43.2	58.7	5.4	100
$PM_{2.5}$	24.8	27.0	24.2	24.0	24.1	15.5	38.2	7.7	60
SOx	16.4	17.2	17.1	16.3	15.1	10.8	21.1	3.8	80
NOx	20.7	21.5	21.3	19.5	20.3	15.2	25.7	4.6	80
O_3	20.6	21.7	20.1	19.4	21.4	10.8	28.8	9.5	100
CO	0.5	1.0	0.1	0.2	0.1	0.2	2.9	1.1	2

* BDL – Below Detectable Limits; NAAQS: O_3 (µg/m³) and CO (mg/m³) Standards (8 Hrly, Average)
* Summer (Mar to May), Monsoon (Jun to Aug.), Post Monsoon (Sept to Nov.), and Winter (Dec. to Feb.)

The seasonal average of PM_{10} and $PM_{2.5}$ levels have mostly remained within the NAAQS standard of 100 and 60 µg/m³ respectively. The maximum average concentration of 66.9 µg/m³ for PM_{10} was observed during the Summer of 2019-20 and 33.9 µg/m³ for $PM_{2.5}$ during the Post-monsoon season in 2021-22. Notable improvements in PM levels are observed during the 2020-2021 year across all seasons.

SOx and NOx levels have generally remained within the NAAQS standard of 80 µg/m³. The average highest values show 26.1 µg/m³ of SOx; whereas 35.4 µg/m³ for NOx was observed during winter 2019-20. The concentrations dropped down for both parameters after the 2020-2021 year.

Seasonal O_3 levels are within the prescribed standards, 28.5 µg/m³ maximum average levels were reported during Summer, 2021-22. The CO concentrations were also below standard (2 mg/m³) and the average maximum was observed at 1.1 mg/m³ during Summer, 2017-18. Whereas, a monsoon maximum of 1.5 mg/m³ was noted for CO during monsoon 2019-20, which might indicate a data anomaly.

The air quality varies seasonally, with generally better air quality during the monsoon season and worse during summer and winter. Certain parameters are occasionally exceeded during certain seasons, emphasizing the need for continued monitoring and efforts to mitigate pollution sources. The 2020-2021 year shows improvements in air quality across various pollutants, which could be attributed to the COVID-19 pandemic situation as well as various factors such as reduced construction activity or improved emission control measures.

2.2 Air Quality Status in the Township Area During 2023

2.2.1 Monitoring Details

Air quality monitoring was carried out at selected sites surrounding the township area to assess the prevailing air quality conditions. This monitoring activity took place during different seasons and aimed to provide a present overview of air quality. Specifically, the winter session in February encompassed monitoring locations such as the Site Office, Residential Towers in Sectors R2 Site, R21 Site, and R6 Site, as well as a construction site in Sector R6. Moreover, the summer session in May involved the selection of five monitoring spots. Among these, the Site Office, R2 Site, R6 Site, and R21 Site are all situated within the Amanora campus, whereas Daulat Vihar is situated off-campus. The information about the representative sampling sites within the township and the specific sampling periods are presented in **Table 2.2** and depicted locations in Google Maps are illustrated in **Figure 2.3.**

Table 2.2: Details of Sampling Locations and Period

Sr.	Sampling Locations	Winter Monitoring Period	Summer Monitoring Period
1	Site Office	14th Feb. -18th Feb., 2023	25th April -29th April, 2023
2	R-2	14th Feb. -18th Feb., 2023	25th April -29th April, 2023
3	R-21	20th Feb. -24th Feb., 2023	30th April -4th May, 2023
5	R-6	20th Feb. -24th Feb., 2023	30th April -4th May, 2023
6	Daulat Vihar	-	4-6th May, 2023

Figure 2.3: Ambient Air Quality Sampling and Monitoring Locations in the Township Area

The parameters subjected to monitoring included PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3 and O_3. The duration of sampling varied based on the pollutant type and the season. For instance, during the winter session, the sampling duration was 7- 8 hours, except for gaseous pollutants which were sampled every 4 hours. In both winter and summer sessions, $PM_{2.5}$ and PM_{10} were sampled for 12 hours. All parameters were subjected to monitoring and subsequent analysis following the standard procedures outlined by CPCB (Central Pollution Control Board), as presented in **Table 2.3** Furthermore, photographs of the monitoring sites during both the Winter and Summer seasons are depicted below.

Table 2.3: Ambient Air Quality Pollutants and their Standard Measurement Procedures

Parameter	Equipment/ Instrument	Flow Rate	Analytical Method	Minimum Detection Level	Absorption Wavelength
PM_{10}	Fine Dust Sampler or equivalent	5 lpm	Gravimetric	5 $\mu g/m^3$	NA
$PM_{2.5}$	Fine Dust Sampler or equivalent	5 lpm	Gravimetric	5 $\mu g/m^3$	NA
SO_2	Trapping in the Impinger	1 lpm	West & Gaeke	5 $\mu g/m^3$	560 nm
NO_2	Trapping in the Impinger	0.5 lpm	Jacob & Hochheiser	5 $\mu g/m^3$	540 nm
NH_3	Trapping in the Impinger	0.5 lpm	Nessler"s Reagent	5 $\mu g/m^3$	425 nm
O_3		0.5 lpm		5 $\mu g/m^3$	760 nm

Plate 2.1: Air Quality Monitoring Locations during Winter Season (February 2023)

Plate 2.1*(Contd..)*: AQ Monitoring Locations during Winter Season (February 2023)

Plate 2.2: Air Quality Monitoring Locations during Summer Season (April-May 2023)

2.2.2 Air Quality Status during Winter (February, 2023)

Throughout the winter season, a total of 10 days spanning from 14th February to 24th February 2023, were dedicated to conducting air quality monitoring; 5 days for each sampling location. The observed air quality status at the representative sites has been presented in **Table 2.4** and data is compared with the NAAQS standards.

Table 2.4: Air Quality Status in the Township During Winter (February 2023)

Parameters	Monitoring Dates					NAAQS ($\mu g/m^3$)
	14/2/23	15/2/23	16/2/23	17/2/23	18/2/23	
A. Site Office (Commercial Type)						
PM_{10}	355.1	123.3	219.4	181.0	173.8	100
$PM_{2.5}$	123.8	48.3	83.6	86.2	64.9	60
SO_2	8.1	13.6	11.6	7.6	7.9	80
NO_2	9.2	10.1	12.6	11.2	11.1	80
NH_3	BDL	BDL	BDL	BDL	BDL	400
O_3	26.85	22.5	26.1	29.89	26.35	100
B. R2 Tower (Residential Type)						
PM_{10}	229.2	196.4	200.9	191.4	199.7	100
$PM_{2.5}$	73.4	71.4	67.4	102.0	65.2	60
SO_2	3.6	4.1	3.9	3.8	3.8	80
NO_2	5.6	3.9	4.2	4.9	-	80
NH_3	BDL	BDL	BDL	BDL	BDL	400
O_3	26.2	20.0	26.2	20.0	26.55	100

Parameters	Monitoring Dates					NAAQS ($\mu g/m^3$)
	20/2/23	21/2/23	22/2/23	23/2/23	24/2/23	
C. R6 Site (Construction Type)						
PM_{10}	184.5	209.9	221.9	249.3	230.5	100
$PM_{2.5}$	75.3	78.0	80.6	104.5	97.5	60
SO_2	-	5.2	-	-	6.9	80
NO_2	8.7	5.4	5.5	7.6	5.1	80
NH_3	BDL	BDL	BDL	BDL	BDL	400
O_3	28.0	28.15	28.2	28.2	28	100
D. R21 Tower (Residential Type)						
PM_{10}	135.4	126.7	185.5	189.3	165.1	100
$PM_{2.5}$	79.9	62.1	82.9	76.5	73.6	60
SO_2	6.8	11.2	11.5	13.4	5.9	80
NO_2	23.1	18.5	18.4	13.4	17.6	80
NH_3	BDL	BDL	BDL	BDL	BDL	400
O_3	20.0	26.2	20.0	26.0	20.0	100

BDL – Below Detectable Limits, - Not measured

- PM_{10} and $PM_{2.5}$ levels exhibit prominent variability across the locations in the winter season. The average concentration of winter season for PM_{10} and $PM_{2.5}$ is 198.4 and 79.9 $\mu g/m^3$ respectively. The maximum highest concentrations of 355.1 $\mu g/m^3$ for PM_{10} and 123.8 $\mu g/m^3$ for $PM_{2.5}$ were noticed at the Site Office; whereas the second highest site is the R2 Tower site. Elevated concentrations were observed at all the sites and monitoring dates, which exceeded the NAAQS standards of 100 and 60 $\mu g/m^3$. High concentration reported mostly because of construction activity nearby and resuspension of road dust. Accumulation of pollutants in winter due to low wind speed and less dispersion.

- SO_2 and NO_2 concentrations remain generally within NAAQS (80 µg/m³) across sites, with occasional deviations observed. The average concentration for SO_2 and NO_2 is 7.6 and 10.3 µg/m^3 respectively. Comparatively other sites R21 Site, NO_2 concentration are notably reported.
- The average concentration of O_3 during winter is 25.2 µg/m^3. O_3 concentrations demonstrate moderate fluctuations. The R2 and R21 Towers exhibit comparatively lower O_3 levels. The O_3 levels are within the NAAQ standard (8-hour average standards -100 µg/m³ respectively).

2.2.3 Air Quality Status During Summer (April -May 2023)

In the summer season, comprehensive air quality monitoring was executed across the sites for 5 days, spanning from 25th April to 4th May, 2023. The site-wise and date-wise, concentrations at these representative locations, have been presented in **Table 2.5** and data is compared with the NAAQS standards.

Table 2.5: Air Quality Status in the Township during Summer (April -May 2023)

Parameters	Monitoring Dates					NAAQS (µg/m^3)
	25/4/23	26/4/23	27/4/23	28/4/23	29/4/23	
A. Site Office (Commercial Type)						
PM_{10}	92.4	73.6	103.2	202.0	143.9	100
$PM_{2.5}$	55.5	59.3	69.3	118.8	65.3	60
SO_2	18.2	13.8	11.2	10.4	11.1	80
NO_2	18.4	15.1	13.6	12.9	16.0	80
NH_3	BDL	BDL	BDL	BDL	BDL	400
O_3	22	2.95	20	2.6	22	100
B. R-2 Tower (Residential Type)						
PM_{10}	52.8	54.4	70.7	36.6	30.8	100
$PM_{2.5}$	18.9	14.4	32.03	8.7	13.6	60
SO_2	10.8	13.9	16.85	16.6	16.3	80
NO_2	15.6	15.2	13.9	13.2	14.7	80
NH_3	BDL	BDL	BDL	BDL	BDL	400
O_3	27.7	28.25	28	28	28.1	100

Parameters	Monitoring Dates					NAAQS (µg/m^3)
	30/4/23	1/5/23	2/5/23	3/5/23	4/5/23	
C. R6 Site (Construction Type)						
PM_{10}	42.5	85.8	74.4	89.3	56.1	100
$PM_{2.5}$	22.4	36.1	38.3	41.6	29.6	60
SO_2	6.5	7.8	7.2	7.1	-	80
NO_2	11.3	11.4	12.2	10.9	14.7	80
NH_3	BDL	BDL	BDL	BDL	BDL	400
O_3	8.4	7.9	7.7	8.4	-	100

Table 2.5 (Contd..): Air Quality Status in the Township during Summer (April -May 2023)

Parameters	Monitoring Dates					NAAQS ($\mu g/m^3$)
	25/4/23	26/4/23	27/4/23	28/4/23	29/4/23	
D. R21 Tower (Residential Type)						
PM_{10}	69.1	47.4	57.3	71.6	93.6	100
$PM_{2.5}$	33.9	29.9	28.7	39.1	74.6	60
SO_2	-	4.2	8.1	8.2	8.7	80
NO_2	20.8	19.6	19.1	21.1	19.1	80
NH_3	BDL	BDL	BDL	BDL	BDL	400
O_3	10.1	11.2	10.6	10.3	8.1	100
Daulat Vihar (Control Site)						
	4/5/23	**5/5/23**	**6/4/23**			
PM_{10}	62.4	68.8	65.4			100
$PM_{2.5}$	32.5	36.6	34.3			60
SO_2	10.2	12.8	11.2			80
NO_2	16.4	18.1	15.6			80
NH_3	BDL	BDL	BDL			400
O_3	8.2	6.6	8.6			100

BDL – Below Detectable Limits, - Not measured

- The average concentrations for PM_{10} and $PM_{2.5}$ are 70.9 and 41.2 $\mu g/m^3$ respectively for the Summer season. The higher levels for both parameters were noticed at the Site Office, and all other sites including the control are within the average concentrations. All the concentrations are well within the NAAQS standards of 100 and 60 $\mu g/m^3$.
- SO_2 and NO_2 concentrations remain generally within NAAQS (80 $\mu g/m^3$) across sites. The average concentration for SO_2 and NO_2 is 11.0 and 15.6 $\mu g/m^3$ respectively. Comparatively other sites Site Office and R21 Site are higher values.
- The average concentration of O_3 during summer is 14.4 $\mu g/m^3$. The Site Office and R2 Tower exhibit comparatively higher O_3 levels than other sites. All O_3 concentrations are within the NAAQ standard (8-hour average standards -100 $\mu g/m^3$ respectively).
- Daulat Vihar is located along the Solapur highway, wherein semi-agricultural and residential activity is noticed, and due to this minimal pollution is observed for all the parameters. All the concentrations are within the NAAQ standards. Resuspension dust reflects the elevated particulate matter concentrations.

2.3 Comparison with Historical Air Quality Status

- Recent monitoring data indicates consistent exceedance of historical averages for both PM_{10} and $PM_{2.5}$ concentrations during the Winter and Summer seasons, indicating a gradual rise in particulate matter levels over the years. This trend suggests a concerning deterioration in air quality in terms of particulate matter pollution.
- SO_2 levels fluctuate around historical averages, suggesting no significant recent increase. The gaseous pollutants show (SO_2 and NO_2) lack a clear consistent trend but occasionally approach or exceed historical averages.
- NH_3 levels remain below detectable limits (BDL) across historical and current data, indicating no presence of ammonia pollution
- Ozone levels show slight deviations but generally remain within a similar range as historical averages

This emphasizes the need for enhanced air quality management strategies to address the rising particulate matter pollution in Amanora Township. It is essential to consider these trends while formulating policies and interventions to ensure the preservation and improvement of air quality standards in the region.

2.4 Summary of Air Quality Status

2.4.1 Based on Secondary Data (2017 to 2023)

Throughout these years, the intricate dynamics of PM_{10} and $PM_{2.5}$ concentrations are particularly prominent. These pollutants exhibit cyclical fluctuations, with discernible spikes during winter, indicative of regional climatic conditions influencing dispersion. Although the variations are significant, concentrations consistently remain below the NAAQS thresholds of 100 $\mu g/m^3$ for PM_{10} and 60 $\mu g/m^3$ for $PM_{2.5}$. From historical data sets distinctive sites identified are viz. Gateway Tower, Main Gate, R11 Future Tower, R25 Site, Sainik City, R26 Neo Tower, and R29 Gold Tower were in-depth attention was required.

Similarly, SO_2 and NO_2 levels exhibit nuanced temporal variations, occasionally reaching elevated concentrations during specific months. Despite these fluctuations, both pollutants consistently adhere to the NAAQS standard of 80 $\mu g/m^3$, indicating effective regulatory mechanisms.

In conclusion, the rigorous compliance of criteria pollutant levels with NAAQS standards underscores the success of air quality management measures. To enhance these findings, it is recommended to conduct an in-depth investigation into the intricate interplay of meteorological, geographical, and anthropogenic factors contributing to the observed trends. This could further elucidate the driving forces behind the heightened levels during winter months. Such insights could inform targeted interventions and policies to mitigate air quality degradation during this critical period.

2.4.2 Based on Primary Data (2023)

- Sources of Pollution: Amanora Township, characterized by its residential nature, exhibits specific sources viz. vehicular movement, construction activities, domestic use of LPG, occasional operation of low-sulphur DG sets, and re-suspension of road dust due to vehicle movement and wind pattern. These sources collectively contribute to the air quality dynamics observed during the monitoring period.
- PM_{10} Rise and Construction Activities: The notable rise in PM_{10} levels during winter seasons can be attributed to various factors. Fugitive dust emissions stemming from construction activities near the Adreno construction site have been identified as a significant contributor. Furthermore, the use of unpaved roads by construction vehicles results in heightened dust dispersion. The operation of Concrete, Asphalt, and RMC Plants also contributes to elevated PM_{10} levels. These factors emphasize the importance of addressing construction-related sources to mitigate particulate matter emissions.
- Dust Emissions and Construction Site Activities: Additional dust emissions are linked to specific activities within the construction site. Soil stripping, road cleaning, excavation, and backfilling activities generate substantial amounts of dust that contribute to particulate matter concentrations. The re-suspension of road dust due to vehicle movement and occasionally high winds further exacerbates the dust levels in the air.
- Gaseous Emissions and Construction Equipment: Gaseous pollutants such as NOx and CO are primarily attributed to the operation of construction equipment that relies on diesel as its fuel source. The presence of equipment such as Bulldozers, excavators, cranes, DG sets, and welding machines contributes to the release of these pollutants into the atmosphere. However, it's notable that NO_2 levels remained consistently low across all monitoring locations and seasons, while SO_2 levels were observed to be below detectable levels.

- Negligible Gaseous Pollutants: Importantly, gaseous pollutants such as SO_2, NH_3, and H_2S were found to be negligible when compared to the NAAQS Standards. This suggests that the levels of these gases were well below the permissible limits, indicating a favorable air quality status in this aspect.
- Solid Waste Burning and PM Levels: Instances of solid waste burning in surrounding fields and villages were identified during the monitoring period. These activities significantly contribute to the elevated PM levels observed during specific days. While these instances may not be the primary contributors to air pollution, they underscore the importance of managing waste disposal practices to mitigate any adverse effects on air quality.

2.5 Air Quality Improvement Needs

Amanora Township, devoid of industrial emissions, showcases distinctive air quality dynamics influenced by residential activities and local factors. The assessment was conducted during the Winter and Summer seasons, identifying potential sources of air pollution in the vicinity. The analysis comprehensively evaluates the criteria pollutants concerning standards.

Recommendations

- Focusing on mitigation strategies to address fugitive dust emissions, particularly in areas adjacent to construction sites, is critical to reducing PM_{10} levels.
- Implementing measures to manage unpaved roads and construction vehicle movement can help minimize the dispersion of particulate matter.
- Prioritizing emission control measures for construction equipment powered by diesel fuel can contribute to better air quality, especially for gaseous pollutants.
- Raising awareness and enforcing regulations to discourage solid waste burning practices is essential to prevent localized increases in particulate matter.

The findings of the air quality assessment in Amanora Township highlight the complex interplay of various sources contributing to air pollution. Addressing these sources through targeted strategies, along with promoting cleaner practices, is essential for maintaining air quality standards and ensuring the well-being of residents in the township.

Chapter 3

Noise Levels in the Township

Chapter 3

Noise Levels in the Township

This chapter discusses the noise levels within Amanora Park Town. The secondary data analysis for noise levels within the township has also been discussed for the years 2017 to 2023. The primary data survey for noise levels within the township for the winter (February) and summer (May) seasons of 2023 was conducted. The survey incorporated ambient noise level measurement in residential areas, commercial areas, construction areas, silence areas, and other zones of the township.

3.1 Ambient Noise Levels Status Based on Secondary Data

Ambient noise monitoring was carried out monthly for the consecutive years from 2017 to 2023, during day time and night time in the township, at 25 to 30 different locations; six sites each month. The noise levels are in Leq dB(A) the range of monthly values for the given period is presented in **Table 3.1** and the monthly average concerning MPCB standards is presented in **Figure 3.1.**

Table 3.1: Summary of Noise Levels from 2017- 2023 based on Secondary Data

Sr.	Month	Total No. of Observations	Range of Noise Levels		Average of Noise Levels	
			Day time	Night time	Day time	Night time
MPCB Standards					**65**	**55**
2017-18						
1	Apr-17	6	54- 62	40- 51	59	47
2	May-17	6	56- 63	44- 51	60	49
3	Jun-17	5	52- 64	43- 51	60	48
4	Jul-17	6	52- 61	43- 54	57	50
5	Aug-17	6	56- 64	43- 54	61	49
6	Sep-17	6	57- 62	40- 54	59	48
7	Oct-17	6	53- 59	40- 51	56	47
8	Nov-17	6	53- 61	41- 51	57	47
9	Dec-17	6	56- 60	41- 52	57	46
10	Jan-18	6	53- 64	41- 55	57	48
11	Feb-18	6	53- 63	41- 53	59	48
12	Mar-18	6	53- 64	36- 55	58	46

Table 3.1 *(Contd..)*: Summary of Noise Levels from 2017- 2023 based on Secondary data

Sr.	Month	Total No. of Observations	Range of Noise Levels		Average of Noise Levels	
			Day time	Night time	Day time	Night time
MPCB Standards					**65**	**55**
2018-19						
1	Apr-18	6	52- 60	45- 54	55	49
2	May-18	6	57- 65	44- 54	59	50
3	Jun-18	6	56- 65	51- 55	62	53
4	Jul-18	6	55- 63	52- 54	59	53
5	Aug-18	6	60- 64	53- 55	62	54
6	Sep-18	6	47- 61	41- 54	55	49
7	Oct-18	6	62- 65	54- 55	64	54
8	Nov-18	6	47- 65	44- 58	59	52
9	Dec-18	6	54- 64	50- 55	61	53
10	Jan-19	6	58- 64	51- 55	62	53
11	Feb-19	6	54- 64	50- 55	61	53
12	Mar-19	6	62- 65	50- 55	64	53
2019-20						
1	Apr-19	6	50- 65	40- 55	59	49
2	Mar-19	6	62- 65	45- 54	63	50
3	Jun-19	6	55- 65	47- 55	61	51
4	Jul-19	6	52- 65	44- 55	61	51
5	Aug-19	6	57- 64	47- 54	61	50
6	Sep-19	6	49- 65	37- 55	59	49
7	Oct-19	6	57- 65	47- 55	62	52
8	Nov-19	6	56- 65	45- 55	61	51
9	Dec-19	6	53- 64	45- 55	57	48
10	Jan-20	6	56- 64	48- 54	60	51
11	Feb-20	6	55- 65	46- 53	61	50
12	Mar-20	6	56- 65	49- 55	61	52
2020-21						
1	Apr-20	---	---	---	---	---
2	May-20	---	---	---	---	---
3	Jun-20	6	51- 63	46- 53	58	50
4	Jul-20	6	53- 61	50- 53	57	52
5	Aug-20	6	56- 65	52- 55	62	54
6	Sep-20	6	50- 64	45- 54	57	50
7	Oct-20	6	58- 65	51- 56	62	54
8	Nov-20	6	50- 65	46- 55	59	53
9	Dec-20	6	46- 57	42- 53	52	48
10	Jan-21	6	49- 64	48- 55	58	52
11	Feb-21	6	45- 64	40- 55	55	49
12	Mar-21	6	52- 65	47- 53	60	50

Table 3.1 *(Contd..)*: Summary of Noise Levels from 2017- 2023 based on Secondary data

Sr.	Month	Total No. of Observations	Range of Noise Levels		Average of Noise Levels	
			Day time	Night time	Day time	Night time
MPCB Standards					**65**	**55**
2021-22						
1	Apr-21	6	50- 65	46- 55	58	50
2	May-21	6	51- 63	48- 51	58	51
3	Jun-21	6	56- 64	44- 54	61	49
4	Jul-21	6	55- 64	52- 54	62	53
5	Aug-21	6	45- 64	42- 52	56	49
6	Sep-21	6	56- 64	47- 55	62	51
7	Oct-21	6	55- 64	48- 54	62	52
8	Nov-21	6	51- 64	48- 54	60	52
9	Dec-21	6	51- 65	48- 54	56	50
10	Jan-22	6	56- 65	50- 54	62	52
11	Feb-22	6	54- 64	45- 52	59	48
12	Mar-22	6	56- 65	48- 54	60	52
2022-23						
1	Apr-22	6	58- 65	51- 55	62	53
2	May-22	6	58- 62	50- 55	60	52
3	Jun-22	6	50- 58	44- 54	55	49
4	Jul-22	6	57- 64	51- 54	62	53
5	Aug-22	6	52- 60	41- 54	57	48
6	Sep-22	6	50- 62	46- 55	57	51
7	Oct-22	6	56- 65	51- 54	61	52
8	Nov-22	6	56- 65	48- 54	61	51
9	Dec-22	6	59- 63	50- 55	61	53
10	Jan-23	6	57- 64	50- 53	61	51
11	Feb-23	6	51- 64	46- 54	60	51
12	Mar-23	6	57- 61	50- 54	59	52

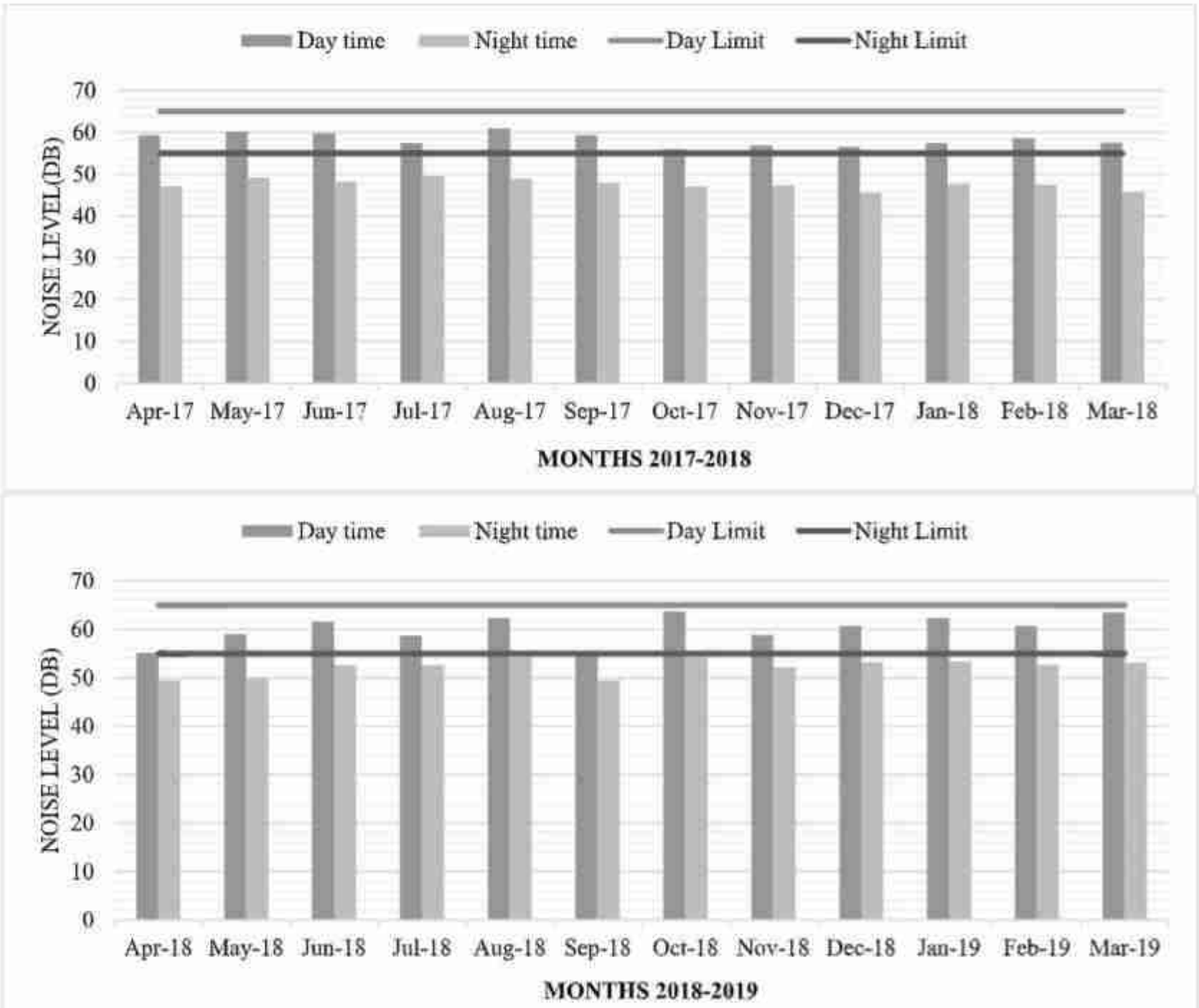


Figure 3.1: Monthly Average Noise Levels during 2017 to 2023

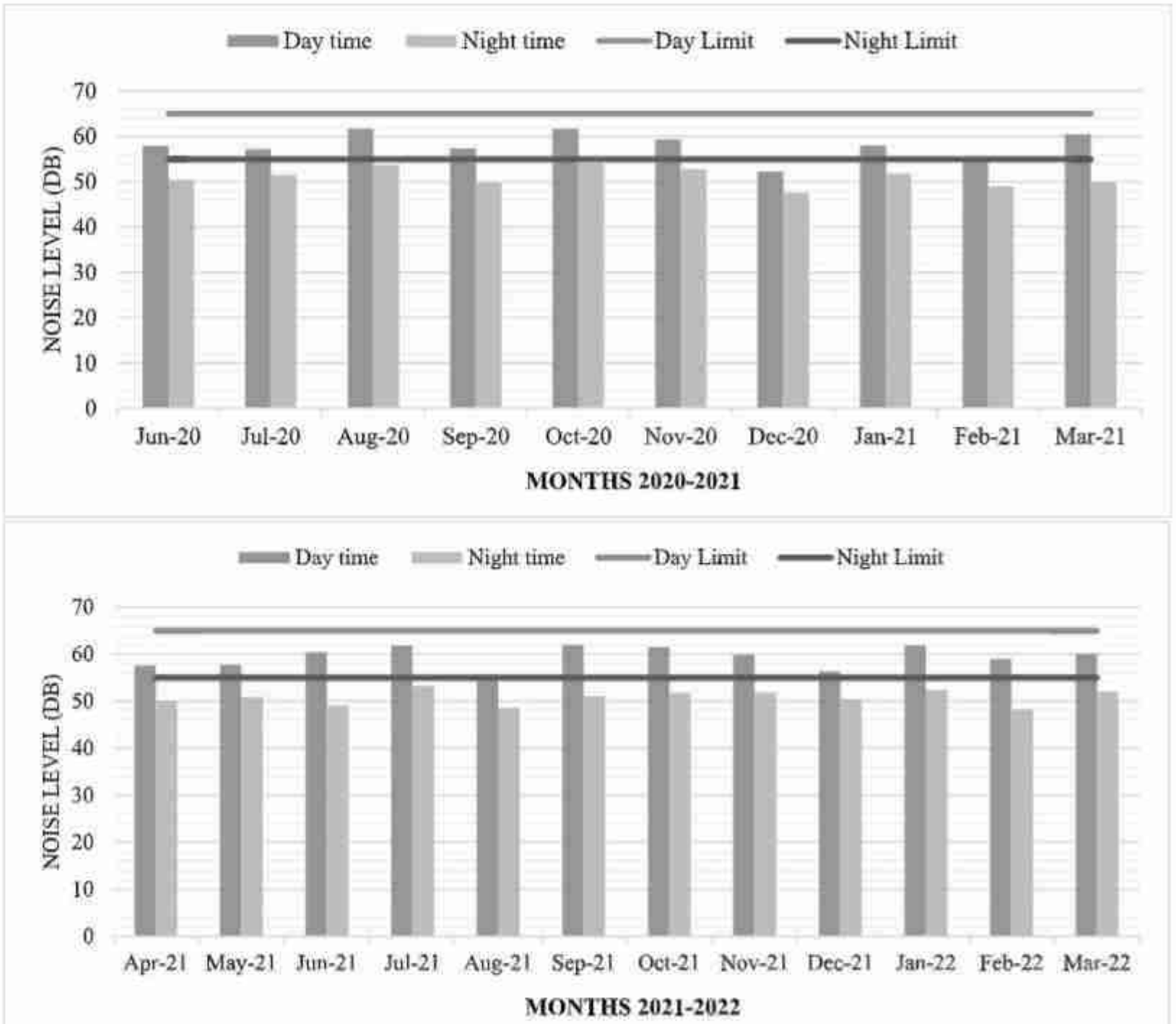


Figure 3.1 *(Contd..)*: Monthly Average Noise Levels during 2020 to 2023

3.2 Ambient Noise Levels Status Based on Primary Data

Ambient noise monitoring was carried out in Winter (February 2023) and Summer (May 2023) during day time and night time in Amanora Park Town at different locations. Noise levels were monitored as per the CPCB Protocol for Ambient Level Noise Monitoring (CPCB, 2015) at 25 different locations spread across the township and one control site outside the township. The winter and summer season noise levels during day and night are given in **Tables 3.4** and **3.5**. All the values of noise levels are in Leq dB(A).

3.2.1 Study Area and Noise Monitoring Locations

The study area is selected in and around the project area in Amanora Park Town as represented in **Figure 3.2**. The details of noise monitoring locations are given in **Table 3.2.** The locations for noise monitoring are strategically identified according to the existing road network and upcoming approach roads in the vicinity of the project site. The locations are spatially distributed within the study area to ensure proper representation of noise levels. The Global Positioning System (GPS) was used to determine the exact position of the locations of the noise monitoring sites.

3.3 Measurement

The methodology for measuring the noise level is divided into two parts and is discussed below.

3.3.1 Data Collection

To assess the ambient noise levels in the environment, noise monitoring was carried out in selected locations for 24 hours. As noise standards for ambient noise levels during day and night are different (**Table 3.3**); hence noise levels are measured during daytime (06:00 am to 10:00 pm) and night time (10:00 pm to 06:00 am) as specified in Noise Pollution (Regulation and Control) Rules, 2000, Amendment 2017.

Table 3.2: Ambient Noise Monitoring Locations in Amanora Park Town

Sr.	Noise Locations	Site Codes	Latitude (°N)	Longitude (°E)
A	**Residential Zone**			
1	R-2 Aspire Tower	R-2	18°51'31.94" N	73°94'03.60"E
2	R-3 Aspire Tower	R-3	18°51'31.41" N	73°94'14.76" E
3	R-4 Sterling Tower (Exit Gate)	R-4	18°51'47.24" N	73°94'59.66" E
4	R-5 Desire Tower	R-5	18°51'54.03" N	73°94'78.84" E
5	R-8 Gateway Tower (Exit Gate)	R-8	18°51'72.53" N	73°94'05.63" E
6	R-9/10 Sweet Water Villas	R-9/10	18°51'53.54" N	73°94'38.74" E
7	R-11 Future Tower	R-11	18°51'54.97" N	73°94'71.35" E
8	R-19 Adreno Tower	R-19	18°51'91.95" N	73°94'44.25" E
9	R-21 Trendy Tower (Near Construction Site)	R-21	18°51'93.29" N	73°94'81.69" E
10	R-22 Metro Tower	R-22	18°31'09.40" N	73°56'54.1" E
11	R-25 Victory Tower	R-25	18°52'32.27" N	73°94'90.18" E
12	R-26 NEO Tower (Entry Gate)	R-26	18°51'82.48" N	73°93'89.53" E
13	Labour Camp 187 (Near Road)	LC	18°51'91.92" N	73°94'60.66" E
14*	Daulat Vihar	DN	18°30'00.30"N	73°56'32.60"E
B	**Construction zone**			
15	R-6 Ascent Tower	R-6	18°51'67.09" N	73°94'76.53" E
16	R-29 Gold Tower	R-29	18°52'22.63" N	73°94'01.02" E
C	**Commercial Zone**			
17	Main Site Office (Near Staff Canteen)	SO	18°51'95.42" N	73°93'91.05" E
18	Amanora Mall	AM	18°51'88.26" N	73°93'33.88" E
19	Amanora Fern Club	FC	18°51'78.88" N	73°94'13.37" E
D	**Silence Zone**			
20	Amanora School -3 (CNS) Near Construction Site	CNS	18°51'97.55" N	73°94'57.18"E
21**	Amanora School -2	AS	18°30'55.20" N	73°56'49.80" E
E	**Open Green area**			
22	Central Green	CG	18°51'76.24" N	73°94'46.30" E
F	**Utility**			
23	STP	STP	18°51'50.58" N	73°94'11.55" E
24	WTP	WTP	18°51'91.31" N	73°94'84.51" E
25	SWM Site	SWM	18°31'12.20"N	73°56'59.40"E
26	Fire Station	FS	18°51'48.22" N	73°94'54.75" E

* Monitoring was done at this site only in the Summer

** Monitoring was done at this site only in Winter

Figure 3.2: Noise Monitoring Locations in Amanora Park Town, Pune

Plate 3.1 depicts the monitoring locations photographs at different zones during both the Winter and Summer seasons.

R-2 Aspire Tower (Residential Zone)

R-3 Aspire Tower (Residential Zone)

R-4 Sterling Tower (Residential Zone)

R-5 Desire Tower (Residential Zone)

R-8 Gateway Tower (Residential Zone)

R-11 Future Tower (Residential Zone)

Plate 3.1: Noise Monitoring Locations at Different Zones during Winter and Summer Seasons

R-19 Adreno Tower (Residential Zone)

R-21 Trendy Tower (Residential Zone)

R-22 Metro Tower (Residential Zone)

R-25 Victory Tower (Residential Zone)

R-26 Neo Tower (Residential Zone)

Labour Camp 187 (Residential Zone)

Plate 3.1 *(Contd..)*: Noise Monitoring Locations at Different Zones during Winter and Summer Seasons

R-9/10 Sweet Water Villas (Residential Zone)

Amanora Fern Club (Commercial Zone)

R-6 Ascent Tower (Construction Zone)

R-29 Gold Tower (Construction Zone)

Staff Canteen (Commercial Zone)

Amanora Mall (Commercial Zone)

Plate 3.1 *(Contd..)*: Noise Monitoring Locations at Different Zones during Winter and Summer Seasons

Amanora School 3 & 2 (CNC) (Silence Zone)

Central Green (Open Green Area)

Fire Station (Utility Zone)

STP-1 (Utility Zone)

WTP (Utility Zone)

SWM Site (Utility Zone)

Plate 3.1 *(Contd..)*: Noise Monitoring Locations at Different Zones during Winter and Summer Seasons

Table 3.3: Noise Pollution (Regulation and Control) Rules, 2000, Amendment 2017

Area Code	Category of Area / Zone	Limits in L_{eq} dB(A)	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

i. Day time shall mean from 6.00 a.m. to 10.00 p.m. and Night time from 10.00 p.m. to 6.00 a.m.
ii. A silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions, and courts. The silence zones are zones, which are declared as such by the competent authority.
iii. Mixed categories of areas may be declared as one of the four mentioned categories by the competent authority.

The noise measurements were carried out using calibrated sound level meters with "fast" response mode keeping in view the quickly changing nature of noise levels. "A" weighting is applied for measuring the sound level as it replicates the response of the human ear to noise and the measuring unit is denoted as dB(A). Data is logged at an interval of 1 second. The sound level meter was mounted on a tripod stand and a wind ball was used to minimize the effect of wind. The instrument was mounted at a height of 1.5 meters from the ground. The microphone on the sound level meter was positioned at least 3 meters away from the hard surface or walls to minimize the effect of reflections.

3.3.2 Data Analysis

The monitored noise levels at the identified locations are analysed and the corresponding Leq in dB(A) during day and night time are calculated. The equivalent continuous sound level (Leq) is the sound pressure level of a steady sound that has the same energy over a given period as a fluctuating sound. It is calculated using the following equation:

$$L_{eq,T} = 10\log\left(1/n\sum_{i=1}^{n}10^{\frac{L_i}{10}}\right)$$

Where Li= levels observed at n equally spaced times during interval T.

3.4 Noise Monitoring Results

Ambient noise level monitoring was carried out during the Winter (February 2023) and Summer (May 2023) seasons at 25 locations in Amanora Park Town, Pune for day and night time. The monitoring locations were spread across the township and categorized as residential, construction zones, commercial zones, silence zones, open green areas, and utility zones. The noise levels during the Winter season are represented in **Table 3.4** and for the Summer season in **Table 3.5.**

Table 3.4: Ambient Noise Levels at Various Locations in Amanora Park Town During Winter Season

Zone	Monitoring Sites	Ambient Noise Level		Field Observations at Monitoring Sites
		Day Leq (dBA)	Night Leq (dBA)	
Residential Zone Noise Limits (MPCB)		**55**	**45**	
Residential Zone	R-2	53.02	69.86	--
	R-3	61.87	56.51	--
	R-4	60.62	51.47	--
	R-5	54.88	58.09	--
	R-8	79.78	53.87	Ongoing renovation work, entry and exit of vehicles in buldg. premises,
	R-9/10	56.61	49.53	--
	R-11	66.59	60.19	Ceremonial drums (Dhol-tasha) being played on the occasion of Shiv Jayanti
	R-19	71.41	52.93	--
	R-21	61.09	65.01	Construction works, railway noise
	R-22	60.68	55.49	Nearby railway track
	R-25	72.61	71.8	Railway tract next to Victory Tower
	R-26	64.67	71.03	Music from loudspeaker due to Mahashivratri celebration at night, heavy vehicle parking -Neo tower.
	Labour Camp	66.82	63.38	Near Munda Road and railway track nearby.
Construction Zone	R-6	65.69	54.23	Ongoing construction activities
	R-29	69.74	70.78	Ongoing construction activities
Commercial Zone Noise Limits (MPCB)		**65**	**55**	
Commercial Zone	Staff Canteen	59.43	52.14	Exit road near site office, other ongoing construction activities
	Amanora Mall	79.3	69.3	Proximity to heavy traffic road
	A.Fern Club	53.22	51.73	--
Silence Zone Noise Limits (MPCB)		**50**	**40**	
Silence Zone	Amanora School-3	64.67	71.03	Nearby construction activity
	Amanora School- 2	54.24	45.11	--
Open Green Area	Central Green	51.51	50.2	--
Utility Zone	STP	65.73	65.53	Noise from STP operation and Air Blowers
	WTP	68.48	57.96	Construction work going on at WTP, the Railway gate is nearby.
	SWM	58.32	50.42	A railway track is nearby.
	Fire Station	65.43	85.32	Traffic noise from the adjacent main road

Table 3.5: Ambient Noise Levels at Various Locations in Amanora Park Town During Summer Season

Zone	Monitoring Sites	Ambient Noise Level		Field Observations at Monitoring Sites
		Day Leq (dBA)	Night Leq (dBA)	
Residential Zone Noise Limits (MPCB)		**55**	**45**	
Residential Zone	R-2	57.03	50.68	--
	R-3	63.5	50.93	Parking slot, behind Gym and swimming pool
	R-4	60.04	55.97	--
	R-5	59.55	50.7	--
	R-8	90.31	54.69	Proximity to the main road
	R-9/10	53.86	51.59	--
	R-11	84.18	51.39	Proximity to the main road, construction activities
	R-19	64.11	59.31	--
	R-21	64.99	55.97	Construction activities and proximity to the railway track
	R-22	60.34	56.54	--
	R-25	78.9	67.06	--
	R-26	61.39	54.94	The playground area is near like badminton court
	Labour Camp	59.09	58.82	--
	Daulat Vihar	68.06	66.17	Adjacent to Highway
Construction Zone	R-6	66.58	63.16	Ongoing Construction activities
	R-29	58	78.17	Ongoing Construction activities
Commercial Zone Noise Limits (MPCB)		**65**	**55**	
Commercial Zone	Staff Canteen	62.14	53.52	Proximity to the main road and Parking lot
	Amanora Mall	76.63	71.36	Proximity to main road, heavy traffic
	Amanora Fern Club	56.61	51.7	--
Silence Zone Noise Limits (MPCB)		**50**	**40**	
Silence Zone	Amanora School- 3	57.3	66.39	Ongoing Construction activities
Open Green Area	Central Green	59.38	48.82	Cricket match at evening 7 PM
Utility Zone	STP	62.53	63.3	Motor Running, Walking track
	WTP	56.61	58.95	Construction work going on at WTP, Dog barking
	SWM	62.58	46.9	A railway track is nearby.
	Fire Station	62.24	56.82	Traffic noise from the adjacent main road

Residential zone: Noise level monitoring at 13 sites was carried out in residential areas of the township. During the winter season, ambient noise levels were found to exceed the permissible limits of day [55 dB(A)] and night [45 dB(A)] time in residential zones **(Figure 3.3).** The highest noise levels at 79.8 dB(A) during day time at R-8 and 71.8 dB(A) during night time at R-25 were recorded. Renovation and construction work was the major cause of high noise levels besides, traffic, railway, and loudspeaker noise. Day time noise levels at R-2 and R-5 were found to be within the permissible limits **(Table 3.4).**

In the summer season, noise level monitoring was carried out at 14 sites including Daulat Vihar, an additional site outside the Amanora township. This site is along Solapur highway and is exposed to heavy traffic. Daulat Vihar is considered the **control site** for the study. Noise levels at all the sites in the residential zone were found to exceed the day and night time permissible limits of 55 dB(A) and 45 dB(A) respectively, except at R-9/10 (Sweet water Villa) where day time noise level was 53.9 dB(A) **(Table 3.5** and **Figure 3.4).** Construction activities and traffic were found to be major causes of high noise levels. Compared to Daulat Vihar, noise levels inside Amanora Park Town were low at most of the sites except for R-8, R-11, and R-25 in daytime. Night time noise levels at R-25 were also found higher than in Daulat Vihar.

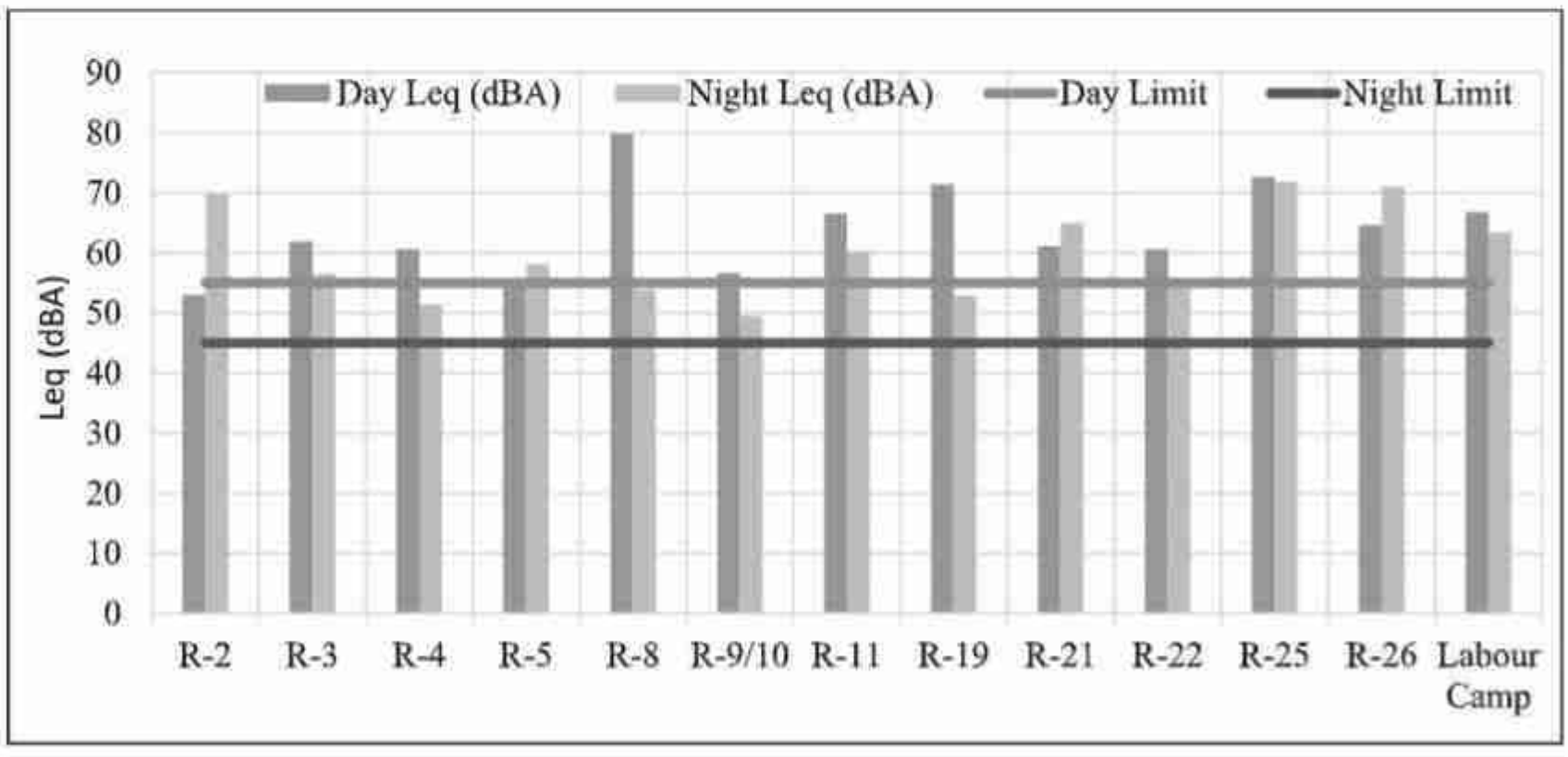


Figure 3.3: Ambient Noise Levels During Winter (Day and Night Time) in Residential Zones of Amanora Town

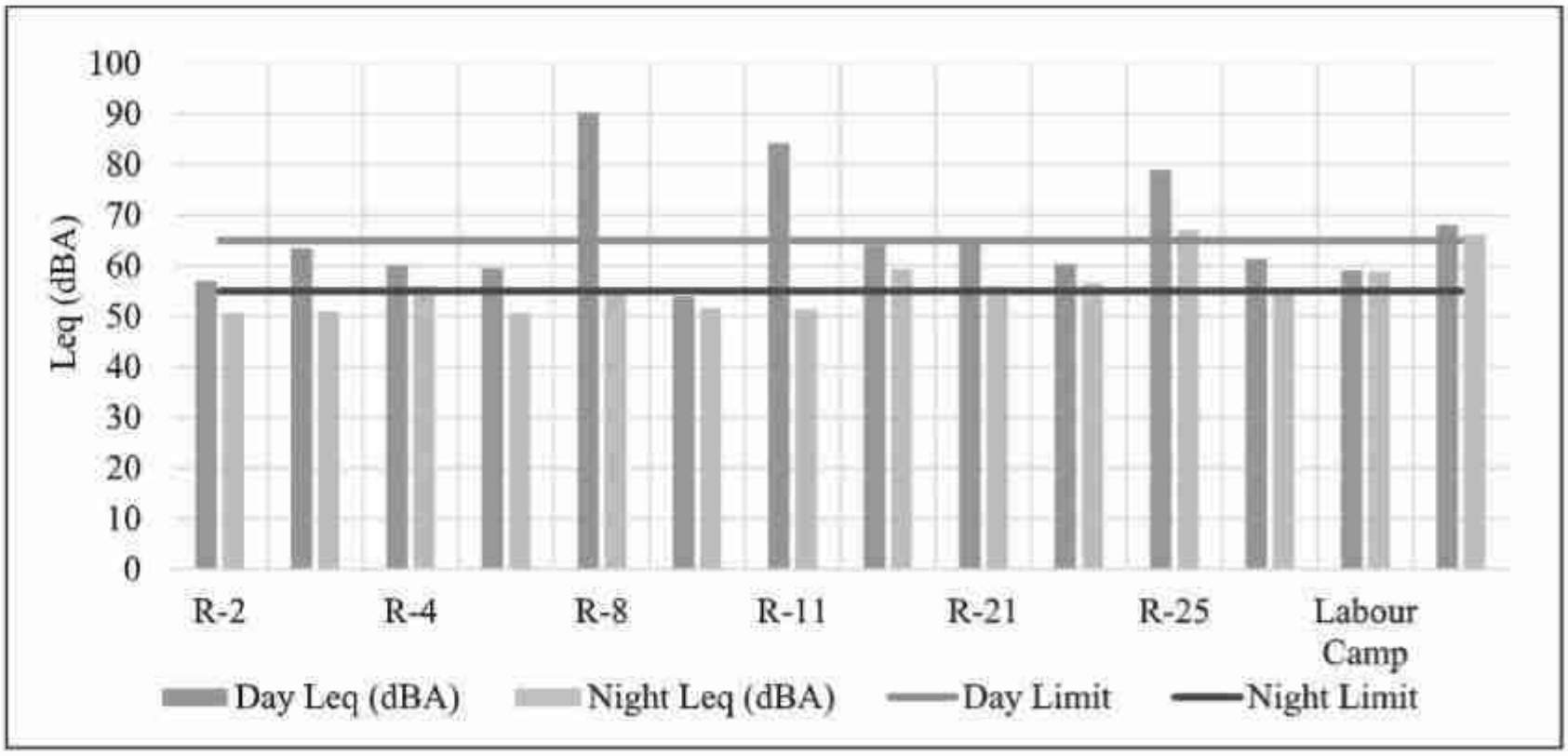


Figure 3.4: Ambient Noise Levels During Summer (Day and Night Time) in Residential Zones of Amanora Town

Construction zone: There are a total 2 sites in a construction zone, R-6, and R-29, which were monitored in the construction zone during winter and summer seasons and noise levels were found in the range of 58 to 69.7 dB(A) during the day time and 54.2 to 78.2 dB(A) during night time (**Figure 3.5**). Continuous construction activities were going on at these sites. During both the winter and summer seasons, due to the loading and unloading of vehicles night time noise levels at R-29 (Gold tower) were found to be more than that during day time.

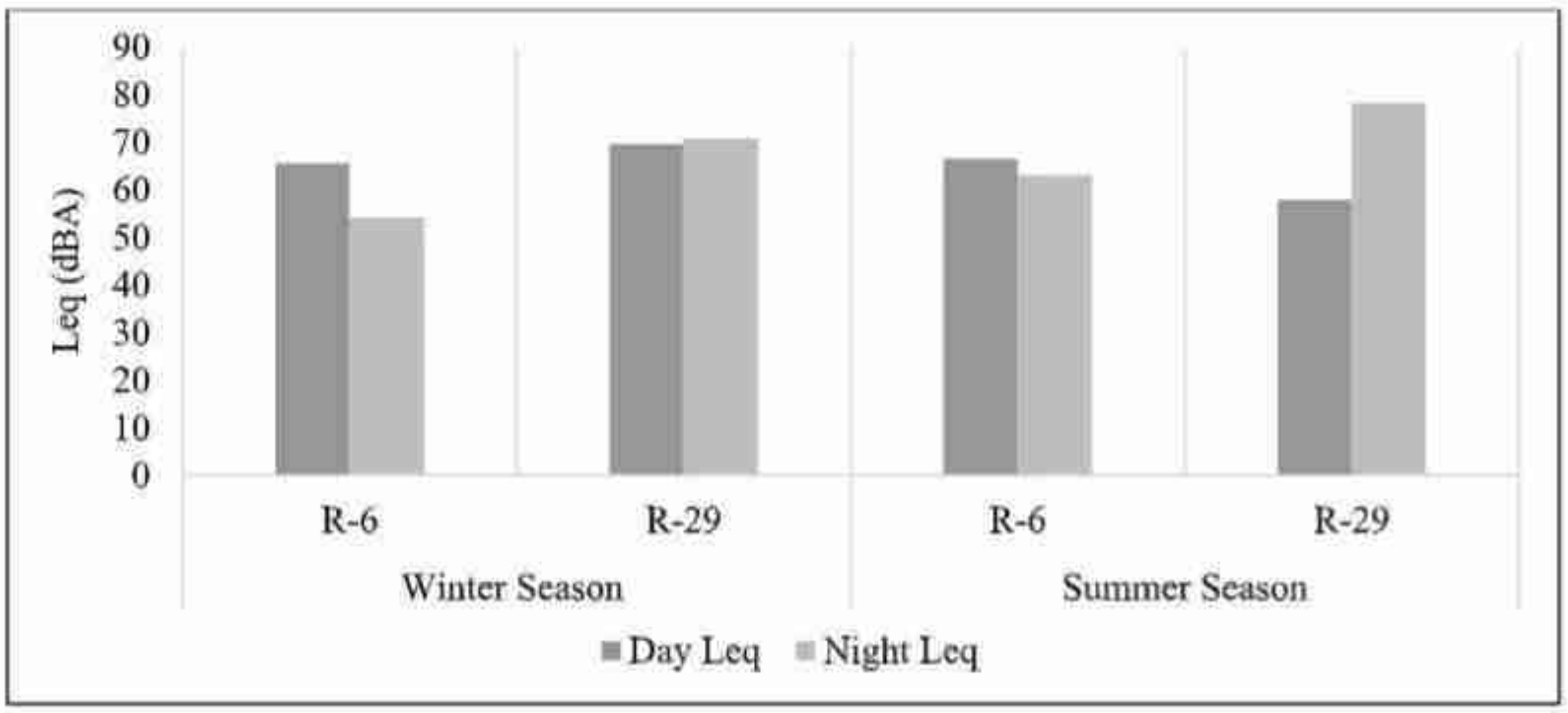


Figure 3.5: Ambient Noise Levels at Construction Sites within Amanora Park Town during Winter and Summer Season

Commercial Zone: Noise level monitoring at three locations namely the staff canteen, Amanora Mall, and the Amanora Fern Club was carried out in the commercial zone during the winter and summer seasons. Noise levels at Amanora Mall were found to exceed the day [65 dB(A)] and night [55 dB(A)] time permissible limits (**Figure 3.6**). The continuous movement of people and parking and departure of vehicles in mall premises and proximity to the main road are the main contributors to high noise levels at this site. At the staff canteen and Amanora Fern Club, noise levels were found to comply with the permissible limits during day and night time.

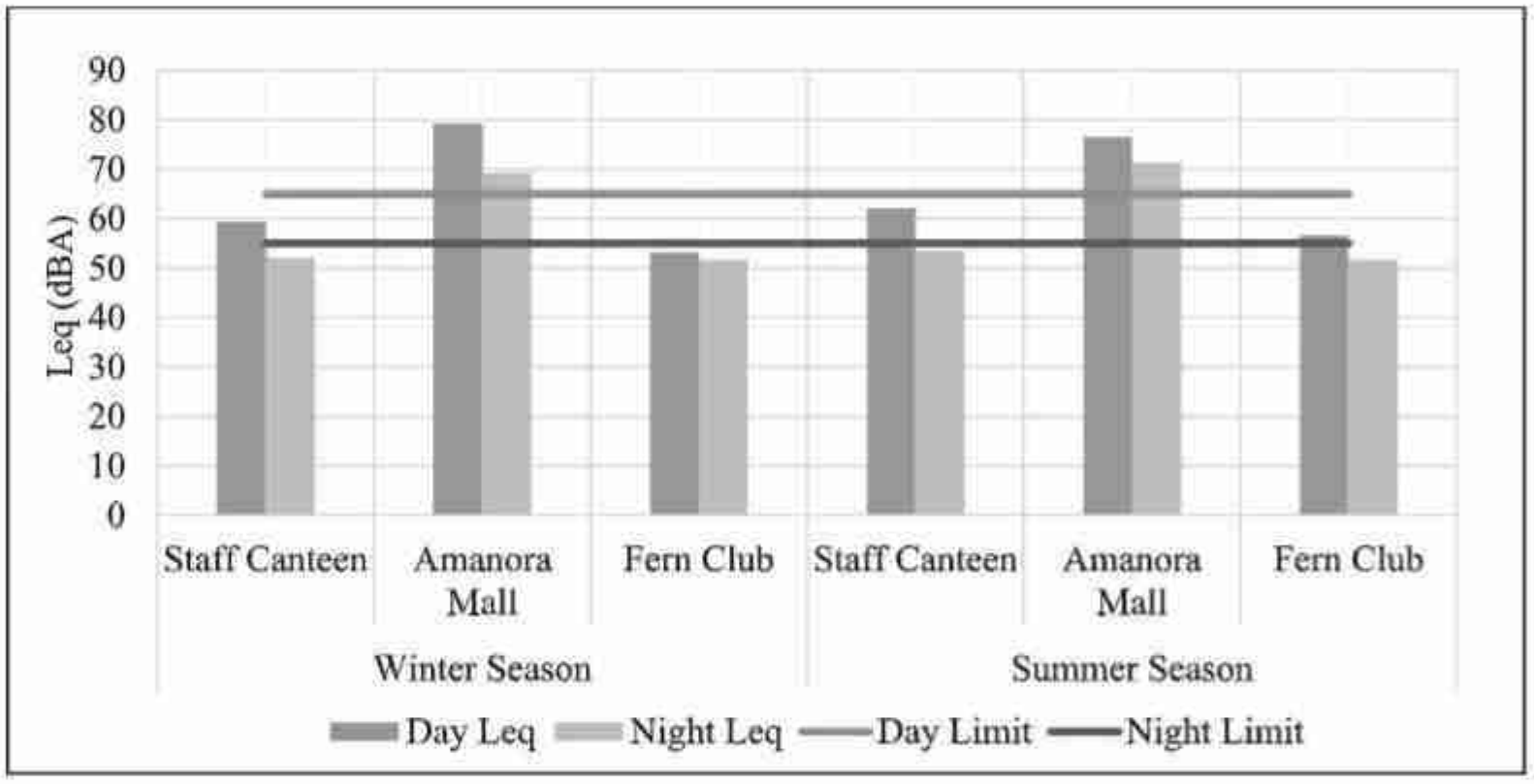


Figure 3.6: Ambient Noise Levels at Commercial Sites within Amanora Park Town during Winter and Summer Season

Silence zone: As per the Noise Pollution (Control and Regulation) Rules, 2000, educational institutions, courts, religious places, and hospitals fall under the silence zone and permissible limits are given as [50 dB(A)] and [40 dB(A)] during the day and night time respectively (**Table 3.4**). In Amanora Park town, noise levels at Amanora school-2 were slightly higher than the permissible limits as the school is adjacent to a busy internal road. At the Amanora school-3 site, noise levels were found very high compared to permissible limits during day and night time (**Figure 3.7**). Construction activity near Amanora school-3 was observed to be contributing to high noise levels, especially during night time.

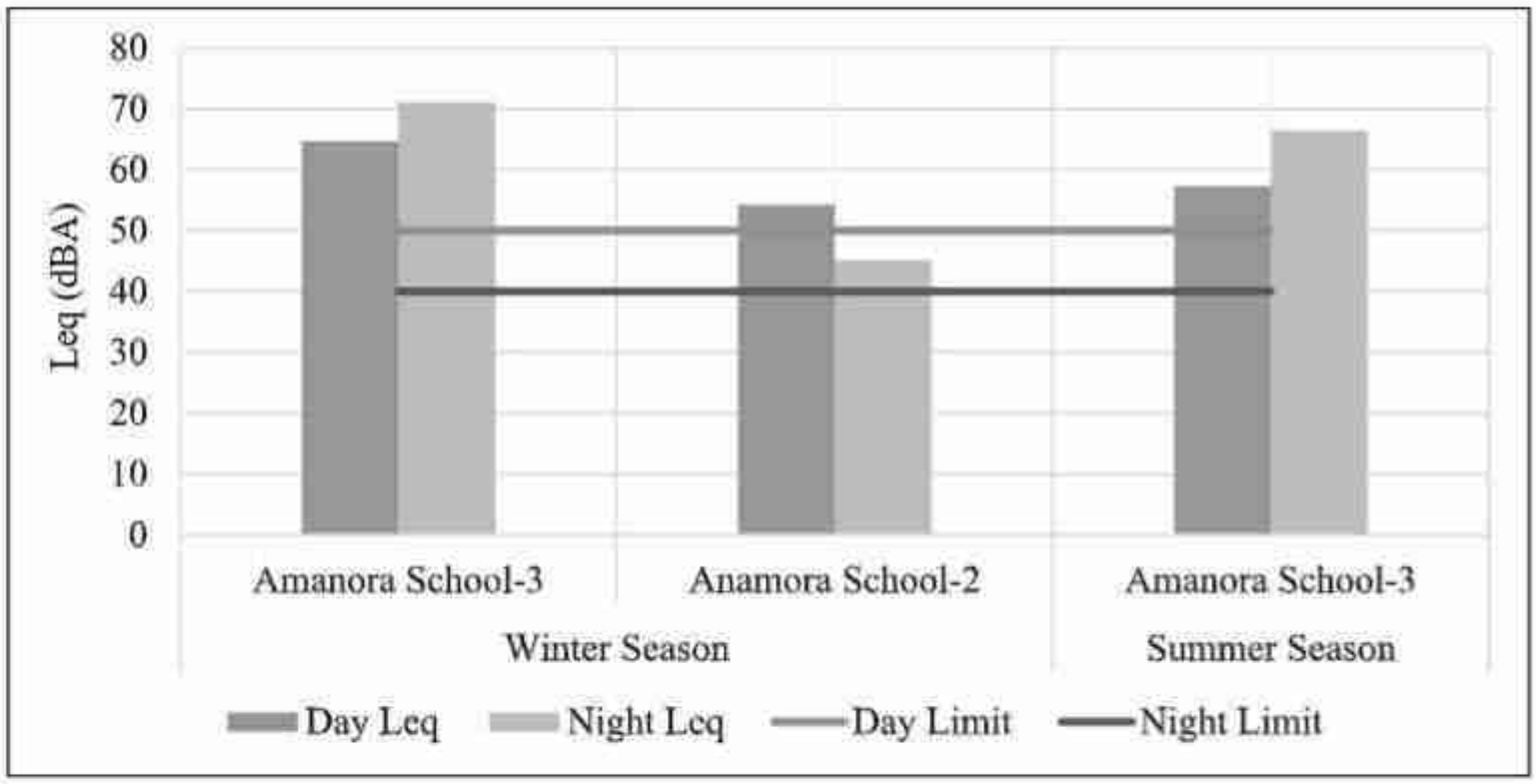


Figure 3.7: Ambient Noise Levels at Silence Zone within Amanora Park Town during Winter and Summer Season

Open green area and utility zone: The central green is a huge open green area for recreational purposes. The noise levels at this location (**Figure 3.8**) were found to be lowest in the range of 50-51.5 dB(A) in the winter season (**Table 3.4**) and 48.8- 59.4 dB(A) in the summer season (**Table 3.5**).

The sewage treatment plant (STP), water treatment plant (WTP), solid waste management (SWM) site, and fire station are utilities for the environment and safety management of the township. Noise levels at these sites were recorded in the range of 58.3-68.5 dB(A) during day time and 50.4 -85.3 dB(A) during night time in the winter season. At STP, due to the continuous operation of STP and Air Blowers, noise levels were similar during day and night time. At WTP, the highest noise level of 68.5 dB(A) was observed during day time due to ongoing construction work and proximity to the railway track. At night, the highest noise level at 85.3 dB(A) was recorded at the fire station, the reason being traffic noise due to proximity to the internal main road. The lowest noise levels were observed at the SWM site in the winter season.

In the summer season, noise levels at STP, SWM, and the Fire station site were similar and lowest at the WTP site during day time whereas highest at STP and lowest at SWM during night time (**Figure 3.8.**

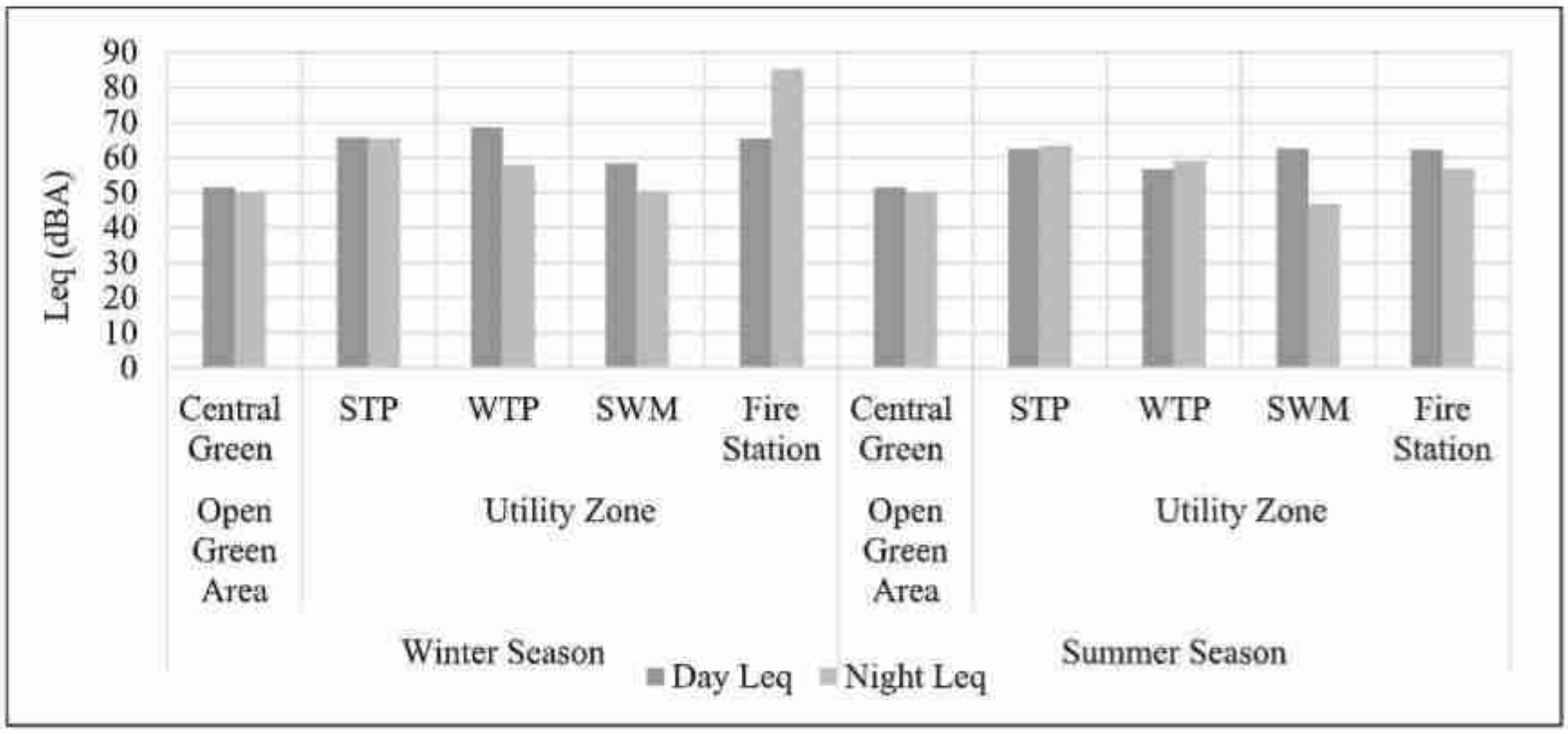


Figure 3.8: Ambient Noise Levels at Open Green and Utility Areas within Amanora Park Town during Winter and Summer Season

Overall noise level monitoring in Amanora Park town shows that ongoing construction activities and vehicular traffic on internal roads are the main contributing factors to noise levels exceeding permissible limits for day and night time. Noise due to railways has also been observed to cause increased noise levels at a few sites.

Noise Monitoring Summary

3.4.1 Based on Secondary Data (2017-2023)

During the years 2017-2023, noise level monitoring was carried out for both day and night time. The selected monitoring sites in the township were a mix of residential, commercial, silence, construction, open green areas, etc. Average noise levels during 2017-18 ranged between 57- 61 dB(A) during daytime and 46 -50 dB(A) during night time. During 2018-19, these values were 55- 62 dB(A) and 49 - 54 dB(A) during daytime and night time respectively, whereas during 2019-20, average noise levels were in the range of 57-63 dB(A) and 48-52 dB(A) during daytime and night time respectively. Further in 2020-21, the average noise levels were recorded in the range of 52-62 dB(A) during day time and 48-54 dB(A) during night time. In 2021-22, the average values ranged from 58-62 dB(A) during the day and 48-52 dB(A) during the night whereas in 2022-23, average noise levels were recorded in the range of 55-62 dB(A) and 48- 53 dB(A) during the day and night time respectively.

The Noise Pollution (Regulation and Control) Rules, 2000 states permissible noise limits in dB(A) Leq which denotes the time-weighted average of the level of sound in decibels on scale A, relatable to human hearing. Hence, continuous noise level monitoring for daytime (06:00 am to 10:00 pm) and night time (10:00 pm to 06:00 am) needs to be carried out to achieve noise levels in dB(A). Till March 2023, instantaneous noise level readings were taken using the sound level meter. Hence, the values cannot be compared with permissible limits prescribed in Noise Pollution (Regulation and Control) Rules, 2000 though vehicular movement and construction activities appear to be sources of noise pollution within the township.

3.4.2 Based on Primary Data

In the year 2023, the noise level monitoring was carried out during the day (06:00 am to 10:00 pm) and night time (10:00 pm to 06:00 am) for the winter (February) and summer (May) seasons at Amanora township.

In the winter season **(Table 3.4)**, noise levels were recorded at 13 sites in the residential zone of the township. Ambient noise levels were found to exceed the permissible limits of day time [55 dB(A)] except at R-2 and R-5 whereas at night, noise levels were recorded above the permissible limit of [45 dB(A)] at all the sites when compared with MPCB standards. Renovation and construction work was a major cause of high noise levels besides, traffic, railway, and loudspeaker noise.

In the summer season **(Table 3.5)**, noise level monitoring was carried out at 14 sites including Daulat Vihar, an additional site outside the Amanora township. This site is along Solapur highway and is exposed to heavy traffic. Daulat Vihar is considered the control site for the study. Noise levels at all the sites in the residential zone were found to exceed the day and night time permissible limits of [55 dB(A)] and [45 dB(A)] respectively, except at R-9/10 (Sweet water Villa) where day time noise level was 53.9 dB(A). Construction activities and traffic were found to be major causes of high noise levels. Compared to Daulat Vihar [68.1 dB(A)], noise levels inside Amanora Park Town were low at most of the sites except for R-8 [90.3 dB(A)], R-11 [84.2dB(A)], and R-25 [78.9 db(A)] in the day time. Night time noise levels at R-25 [67.1 dB(A)] were also found higher than at Daulat Vihar [66.2 dB(A)].

Continuous construction activities were ongoing at R-6 and R-29. During both the winter and summer seasons, due to the loading and unloading of vehicles, night time noise levels at R-29 (Gold tower) were found to be in the range of 58 to 78.17 dB(A) higher than day time noise levels, which is way above standards.

In the commercial zone, noise level monitoring at three locations namely the staff canteen, Amanora Mall, and The Amanora Fern Club was carried out during the winter and summer seasons. The continuous movement of people and parking and departure of vehicles in mall premises and proximity to the main road were found to be the main contributors to high noise levels at Amanora Mall. At the staff canteen and Amanora Fern Club, noise levels were found to comply with the permissible limits of [65 dB(A)] and [55 dB(A)] during the day and night time respectively.

In the silence zone, noise levels in the vicinity of Amanora school-2 and Amanora school-3 were found to exceed the permissible limits of [50 dB(A)] and [40 dB(A)] during day and night time respectively during both winter and summer seasons.

In the Central Green area, the lowest noise levels were recorded during both winter and summer seasons amongst all other locations.

In utility areas, noise level monitoring at the sewage treatment plant (STP), water treatment plant (WTP), solid waste management (SWM) site, and fire station was carried out. At STP, due to the continuous operation of STP and Air Blowers, noise levels in the winter [daytime -65.7 dB(A) and nighttime- 65.5 dB(A)] and summer [daytime -62.5 dB(A) and nighttime- 63.3 dB(A)] seasons were similar. At WTP, due to ongoing construction work and proximity to the railway track, noise levels were observed to be moderate during both seasons. In the winter season, the highest noise level was recorded at the fire station at night [85.3 dB(A)], the reason being the traffic noise due to proximity to the internal main road. The lowest noise levels were observed at the SWM site [46.9 dB(A)] during night time in the summer season.

Overall noise level monitoring in Amanora Park town shows that ongoing construction activities and vehicular traffic on internal roads are the main contributing factors to noise levels exceeding permissible limits for day and night time. Noise due to railways has also been observed to cause increased noise levels at a few sites.

3.5 Recommendations

Following mitigation measures are suggested to control and prevent noise pollution within the Amanora Park township:

- **Awareness:** Noise pollution can be controlled when there is a sense of understanding of the effects of noise. Hence, the initiation of public awareness through hoarding, moving digital displays, paper media, etc. should be carried out to educate the public on the impacts of noise pollution.
- **Control at the Source of Noise**
  - **Vehicular:** Vehicle honking seems to be the major source of noise in the township. Though the rules restrict unwanted honking, they persist. Some of the following measures can be undertaken at various sources of noise:
    - Unnecessary honking should be avoided and penalized. Create awareness to mass for minimizing honking through hoardings/signboards so that the public would practice minimum honking at cross-roads and during movements and jam conditions
    - Movement of Vehicles without silencers such as bikes /modified bikes/ cars should be regulated during day and night time.
    - Based on the monitoring carried out in the premises of silence zones, it is observed that honking must be restricted with proper implementation in silence zones such as the premises of hospitals, educational institutes, and religious places.
- **Road Surface:** Resurfacing roads with low-noise materials such as stone mastic asphalt (SMA) reduces noise levels. Even, the construction of concrete roads in the township may also be resurfaced with asphalt which reduces frictional noise pollution.
- **Construction Site:** There must be strict compliance with the environmental management plan (for noise) at the construction sites in the township, which envisages noise control of construction types of machinery.
- **Procession and Functions:** Banning of noise-producing sources like crackers and bands, DJ music during social events and festivals after 10 pm as per rules

Chapter 4

Water Quality Status in the Township

Chapter 4

Water Quality Status in the Township

Water is one of the most essential resources for human survival, and it is necessary for a wide range of activities, including drinking, cooking, cleaning, and industrial processes. As populations grow, the water demand escalates, and this can lead to a variety of issues related to water management, particularly in urban areas such as townships. One of the biggest challenges facing township residents is the generation of wastewater. This wastewater becomes a source of contamination for freshwater bodies if not treated properly before it is discharged. Thus, adversely affecting various life forms. Effective management of wastewater is essential for ensuring the sustainable use of water resources in townships and preventing environmental degradation.

The chapter discusses the water quality status of the township in the following subsections:

- Water consumption and Sewage generation in the township during 2017-23
- Groundwater quality status during 2017-23
- Status of the monthly quantity of treated sewage during 2017-23 in the township
- Status of water and wastewater quality in the township during Winter and Summer 2023.

4.1 Water Consumption and Wastewater Generation

4.1.1 Water Requirement/Consumption During 2017 to 2023

The total water requirement/demand for the Amanora Township is about 5100 m^3/day, out of which 3000 m^3/day (average) of surface water is being supplied by the Irrigation Department and 800 m^3/day (maximum) of groundwater quantity to be stored in case of emergency conditions. The total quantity of recycled water from STP of 1.75 MLD capacity is 1300 m^3/day, which is used for various purposes to meet the Township's requirements like environment management practices, flushing, etc.

The water requirement of the Amanora Township is met from surface water drawn through the Empress Garden Canal (Main Canal). An alternate Canal (No. 15) has also been laid down, which is used, in case, the main canal is under maintenance. Both the canals carry raw water to the Water Treatment Plant, where water is treated upto the drinking water quality standards and then supplied in the township, mainly for domestic purposes.

Further, there are several borewells in the township, which are primarily used for non-potable purposes like construction activities, green belts, gardening, washing, sprinkling on roads, etc.

Some of the ground water-consuming areas are Ent. Arena, Fire Tanker, Future Tower construction, Sector R9 Site, Office Garden, Central Green Well, Sector R21 Construction, Sector R16 Construction, Gateway Tower etc.

Monthly water consumption/ withdrawal from WTP and groundwater sources during 2017-23 is presented in **Table 4.1**.

Table 4.1: Monthly Consumption of WTP Water and Ground Water in the Township During 2017-23

a) WTP Water Consumption (m^3)

Months/Yrs.	2017	2018	2019	2020	2021	2022	2023*
January	75065	73133	98859	118151	118841	105420	131829
February	68598	70482	88712	110818	108560	95965	126756
March	71815	68996	71680	118630	125436	121973	143207
April	88533	113480	147683	108642	102347	125677	
May	86167	102375	107543	121184	121239	132738	
June	86730	99529	106415	107431	117112	133261	
July	89062	91220	106801	109117	120993	129313	
August	82973	102880	107812	104406	120993	133422	
September	75935	92044	98154	108585	105148	128967	
October	84074	108785	99055	115991	101251	126492	
November	82866	88768	96862	108646	94777	128263	
December	71375	96275	105580	114434	100809	134158	
Total	**963193**	**1107967**	**1235156**	**1346035**	**1337506**	**1495649**	**401792**

b) Ground Water Consumption (KL/month)

Months/Yrs.	2018	2019	2020	2021	2022	2023*
January	--	2953	6825	10559	9987	9987
February	--	11219	6836	14468	11603	11603
March	--	17812	9953	17735	12982	12982
April	--	16465	10675	12807	14369	
May	5083	16182	17995	14686	13495	
June	1840	11159	3760	8019	16123	
July	877	5937	18532	9976	9811	
August	1425	4380	15779	11455	11416	
September	1116	4419	12912	8930	14083	
October	3365	14569	8426	11254	9556	
November	1931	9860	6748	9612	7221	
December	13007	6720	9608	9291	11371	
Total	**28644**	**121675**	**128049**	**138792**	**142018**	**34572**

* Data is acquired during the still study period, from April 2023 onwards data is not present

The annual water consumption/withdrawal from the Water Treatment Plant (WTP) during 2017-23 has consistently increased over a while. Over the previous years, 86% to 91% were reported during

2017 to 2020. In 2021 it gets stagnant and again increases by 89% in 2022. The water consumption from WTP drastically changes upto 401792 m^3 in the first quarter of 2023. Similarly, the annual consumption of groundwater, over the previous years from 2020 to 2022 is 92% to 97%; and it increases upto 34572 KL/month in the initial month of 2023. Water consumption was more due to enhanced occupancy of flats in the township, as compared to that of previous years. Groundwater consumption was more or less consistent, as it is mainly used for non-domestic purposes.

4.1.2 Sewage Treatment in the Township from 2017 to 2023

The monthly quantity of sewage treated in the sewage treatment plant at the Township is given in **Table 4.2**. From 2018 to 2019, an 89% increase was observed, whereas it was reduced by 75% in 2020, and again increased by 98% in 2021 at STP Inlet. The quantum was increased upto 176359 m^3 in the first quarter of 2023.

Table 4.2: Monthly Wastewater Treatment in STP During 2017-23

Months/Yrs.	Quantity of Wastewater Treated (m^3)						
	2017	**2018**	**2019**	**2020**	**2021**	**2022**	**2023***
January	39565	33882	42432	48711	62231	59344	43448
February	34475	30505	36770	42572	54248	53595	61592
March	40840	30557	38480	44163	59610	61638	71319
April	41240	30340	38193	41053	57330	61919	
May	40020	30805	40596	41867	58865	62691	
June	42892	29161	38262	39297	56587	46176	
July	44925	37791	38828	41007	59035	66425	
August	27555	36559	38948	41593	53412	42611	
September	38620	36254	38657	44288	56657	70058	
October	32968	37229	39010	51226	58877	69929	
November	33447	34186	38363	43099	56985	67371	
December	28015	37538	37777	45034	61164	40690	
Total	**444562**	**404807**	**466316**	**523909**	**695001**	**702447**	**176359**

- Data is acquired during still study period, From April 2023 onwards data is not present

Over a period, it was observed that only 35% to 47% of sewage gets generated. Normally, 70 to 80% of the freshwater used for domestic purposes is returned as wastewater/sewage, however, in the present case, this percent is found much less, indicating that the water is used for non-domestic purposes as well, or 100% domestic wastewater/sewage is not received at the STP.

4.2 Water Quality Monitoring

The two-season water quality was monitored during **Winter** (15 -25 February 2023) and **Summer** (25 April to 6 May 2023) for the Water Treatment Plant (WTP), Drinking Water at the User's End, Ground Water, Sewage Treatment Plant (STP) in the vicinity of Amanora Park Town area. The sampling location and map are depicted in **Table 4.3** and **Figure 4.1**. The photographs of water quality sampling and analysis are given in **Plate 4.1**.

Table 4.3: Water Quality Monitoring Locations around Amanora Park Town Area

Sr.	Sources	Sampling Location	Latitude	Longitude	Usage of Water
A.	Water Treatment Plant (WTP)	Inlet of WTP	18°31'13.5"N	73°56'58.8"E	Used for domestic purpose
		Outlet of WTP	18°31'13.5"N	73°56'58.8"E	
B,	Drinking Water at User's End	Canteen	18°31'15.49"N	73°56'6.52"E	Used for domestic purpose
		R-4 Tower Sector	18°30'54.38"N	73°56'47.25"E	
		Future Tower Sector	18°31'04.6"N	73°56'48.1"E	
C.	Ground Water	Central Green (Bore well)	18°31'6.4"N	73°56'34.7"E	Used for non-potable purposes like construction activities, green belts, gardening, washing, sprinkling on roads, etc.
		Dog Squad (Well)	18°31'35.3"N	73°56'53.8"E	
		R-9/10 Sector (Bore well)	18°30'54.3"N	73°56'30.5"E	Used for non-potable purposes like construction activities, green belts, gardening, washing, sprinkling on roads, etc.
		Labor Camp 187 (Well)	18°31'35.9"N	73°56'46.5"E	
		G-2 Sports Arena (Well)	18°30'57.3"N	73°56'44.4"E	
D.	Sewage Treatment Plant (STP)	STP-1 Inlet	18°30'54.2"N	73°56'30.20"E	Used for gardening and flushing
		STP-1 Outlet	18°30'54.2"N	73°56'30.20"E	
		STP-2 Inlet	18°31'15.0"N	73°56'7.3"E	
		STP-2 Outlet	18°31'15.0"N	73°56'7.3"E	

Canteen

R-4 Sector Tower

Future Tower

R9/10

G-2 Sports Arena

Dog Squad

Labor Camp

Central Green

Plate 4.1: Water Quality Monitoring Locations

WTP Inlet

WTP Outlet

STP 1 Inlet

STP 1 Outlet

STP 2 Inlet

STP 2 Outlet

Plate 4.2: Water Quality Monitoring at WTP and STP Locations

Figure 4.1: Water Quality Monitoring Locations Around Amanora Park Town Area

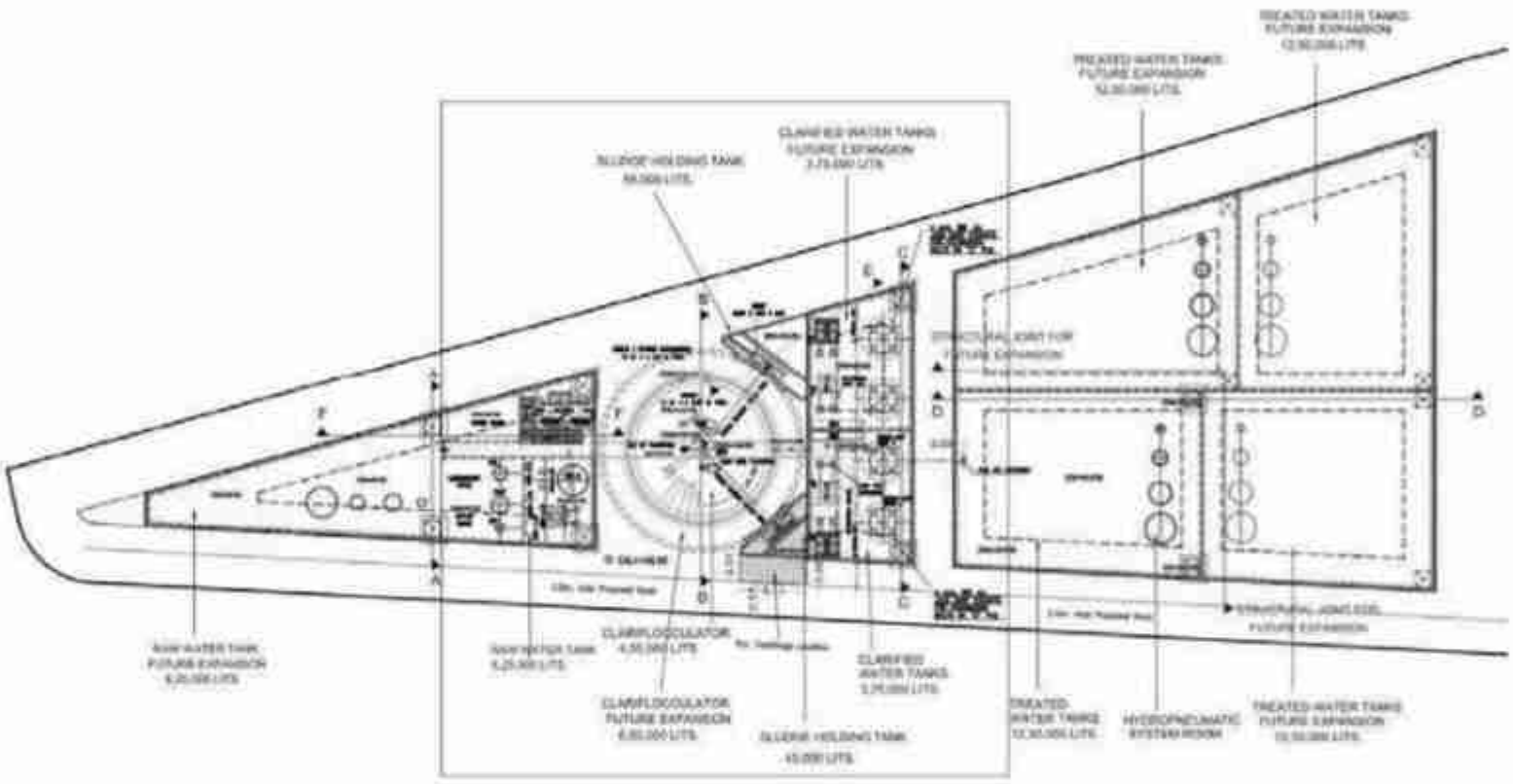
4.3 Performance Evaluation of Water Treatment Plant

Water treatment plants (WTP) play a crucial role in providing safe and clean water to the public. A capacity of 2.6 MLD is designed for the township. The physicochemical and biological parameters of water quality at the WTP inlet and outlet are essential indicators of the effectiveness of the treatment process.

The water treatment process begins with the use of pumps to bring raw water into the plant. Chlorine is then added to the raw water storage tank for disinfection, followed by the addition of lime. The water then flows into a high-rate solid contact clarifier (HRSCC), which is a highly efficient clarifier that produces high-quality treated water using minimal time, space, and chemicals. In the HRSCC, coagulants such as PE and Alum are mixed with large quantities of recirculating sludge to facilitate thorough contact and retention.

After clarification, the clarified water is stored in a dedicated tank. To ensure complete disinfection and eliminate microorganisms, post-chlorine dosing is carried out. In the next step, the water undergoes tertiary treatment using Dual Media Filters (DMF) and Activated Carbon Filters (ACF). The DMF removes suspended matter and turbidity from the water, while the ACF removes unwanted substances like color, odor, chlorine, and organic compounds, which are undesirable for potable

applications. The ACF utilizes activated carbon with its high surface area and absorption properties to effectively remove these impurities. The treated water is collected in a treated water tank before being distributed to various sectors for drinking purposes. Any biological sludge generated during the HRSCC process is transferred to a sludge holding tank and can be further treated using a centrifuge for dewatering, thereby reducing its moisture content.



Process Flow Diagram of Water Treatment Plant

4.3.1 Analytical Results of WTP

The results of physicochemical, and bacteriological parameters and heavy metal analysis for the WTP inlet and outlet during winter and summer seasons are given in **Table 4.4**. The pH values for both seasons were within the acceptable range of 6.5-8.5, ensuring the water's neutrality. Turbidity levels in the WTP outlet remained below the permissible limit of 1/5 NTU (Drinking water Standards, BIS IS 10500: 2012), with values of 0.3 NTU in winter 2023 and 0.5 NTU in summer 2023, indicating the effective removal of suspended particles. Alkalinity levels in the outlet of the WTP were also within the acceptable range of 200-600 mg/L as $CaCO_3$. The values for total phosphate were consistently below the detection limit (BDL).

In terms of heavy metals, except for manganese, all other heavy metals (aluminum, chromium, iron, cobalt, nickel, copper, zinc, cadmium, and lead) were below the detectable limit in both seasons. However, it is worth noting that during the winter season, the manganese levels in the WTP inlet exceeded the acceptable limit of 0.1 but remained below the permissible limit of 0.3 (BIS 10500:2012).

Regarding bacteriological parameters, both total and fecal coliforms were detected in the WTP inlet. However, the treatment process was successful in eliminating coliforms, as they were not found in the outlet water. The absence of coliforms in the treated water signifies the effectiveness of the WTP in removing harmful bacteria and ensuring the safety of the water supply.

Table 4.4: Water Quality Analysis Results at Water Treatment Plant

Sr. no.	Parameters	DWQS-Acceptable/ Permissible Limit BIS 10500:2012	Winter 2023		Summer 2023	
			WTP- Inlet	WTP-Outlet	WTP- Inlet	WTP- Outlet
Physico-chemical						
1	pH	**6.5-8.5**	7.4	7.2	7.2	7.2
2	Turbidity	**1/5**	0.7	0.3	2	0.5
3	EC	-	84	83	175	98
4	TDS	**500/2000**	46	45	86	52
5	TSS	-	22	4	5	1
6	Alkalinity	**200/600**	20	34	64	64
7	Nitrates	**45/NR**	0.2	0.1	0.8	0.3
8	Total Phosphate	-	BDL	BDL	BDL	BDL
9	Total Hardness	**250/600**	36	32	64	50
10	Chlorides	**250/1000**	17	10	28.5	16
11	Phenols	**0.001/0.002**	-	-	BDL	BDL
Heavy Metals						
12	Arsenic	**0.01/NR**	BDL	BDL	BDL	BDL
13	Chromium	**0.05/NR**	BDL	BDL	BDL	BDL
14	Manganese	**0.1/0.3**	0.147	0.008	0.036	0.004
15	Iron	**0.3/NR**	BDL	BDL	BDL	BDL
16	Cobalt	-	BDL	BDL	BDL	BDL
17	Nickel	**0.02/NR**	BDL	BDL	BDL	BDL
18	Copper	**0.05/1.5**	BDL	BDL	BDL	BDL
19	Zinc	**1/5**	BDL	BDL	BDL	BDL
20	Cadmium	**0.003/NR**	BDL	BDL	BDL	BDL
21	Lead	**0.01/NR**	BDL	BDL	BDL	BDL
Bacteriological						
22	Total Coliform	**Nil**	10	0	1.1×10^{3}	0
23	Fecal Coliform	**Nil**	8	0	0	0

All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm), TC, and FC (CFU/100ml)
NA-Not Analyzed; NR-No Relaxation, BDL – Below Detectable Limit

Overall, the WTP demonstrated effective treatment processes for maintaining acceptable water quality standards. However, continuous monitoring and appropriate measures should be implemented to provide safe and clean water to consumers.

4.4 Drinking Water Quality at Users Point

The importance of drinking water quality at the user's point cannot be overstated. Access to clean and safe drinking water is essential for maintaining public health and well-being. Samples were collected from the Canteen, R-4 Tower sector, and Future Tower for physicochemical, bacteriological, and heavy metal content. **Table 4.5** represents the results of the analysis of various drinking water quality parameters at the user's end for the year 2023.

4.4.1 Drinking Water Quality Analytical Results at Users Point

The pH values at all three locations (Canteen, Future Tower, R-4 Site) fall within the acceptable range of 6.5-8.5 for both seasons. Turbidity levels were within the permissible limit of 1/5 NTU at all locations. TDS levels were within the acceptable range of 500-2000 mg/L at all locations.

The values for total phosphate and Phenols were found to be below the detectable limit (BDL) for all sites. The DO levels were above the minimum requirement of 4 mg/L at all locations. Concerning heavy metals, all the heavy metals i.e. Arsenic, Chromium, Iron, Cobalt, Nickel, Zinc, Cadmium, and Lead were found to be below the detection limit (BDL) except for Manganese and Copper. However, the concentration of Manganese was within the acceptable limit (0.1 mg/L) in the case of the Canteen (0.008 mg/L, 0.005 mg/L) and Future Tower (0.001 mg/L) and within the permissible range (0.3 mg/L); concerning R-4 Sector Tower (0.18 mg/L, 0.12 mg/L). In the case of the R-4 Sector, elevated levels of copper (0.115 mg/L, 0.09 mg/L) were observed, which exceeded the acceptable limit but remained below the permissible limit. One potential reason for the increased copper concentration could be attributed to the practice of storing water in copper utensils by the users.

Total and Fecal coliform count for the future tower and R 4 Sector Tower were within the acceptable limit of nil (0). The presence of Total coliforms was detected during both seasons and Fecal coliform during the winter season which was above the detectable limit set by GDWQ standards. In conclusion, while the majority of drinking water quality parameters at the Canteen, Future Tower, and R-4 Site were within acceptable limits, there is a need for further attention to address the presence of total coliforms and to monitor the levels of Manganese.

Table 4.5: Drinking Water Quality Analytical Results at Users Point

Sr.	Parameters	DWQS	Winter 2023			Summer 2023		
		Acceptable/ Permissible limits	Canteen	Future Tower	R-4 Sector	Canteen	Future Tower	R-4 Sector
A.	**Physico-chemical**							
1	pH	**6.5-8.5**	7.5	7.1	7.6	7.4	7.4	7.2
2	Turbidity	**1/5**	0.2	0.3	0.5	0.3	0.3	0.4
3	TDS	**500/2000**	55	52	50	46	40	39
4	Alkalinity	**200/600**	40	34	44	64	68	48
5	Nitrate	**45/NR**	0.1	0.1	0.1	0.4	0.3	0.3
6	Total Hardness	**250/600**	40	36	48	82	115	69
7	DO (dissolved oxygen)	**4 mg/l or More**	7.5	7.4	6.8	6.3	6.6	6.7
8	Chlorides	**250/1000**	7.6	10	7.6	12	47	9.5
9	Phenols	**0.001/0.002**	BDL	BDL	BDL	BDL	BDL	BDL
B.	**Heavy Metals**							
10	Arsenic	**0.01/NR**	BDL	BDL	BDL	BDL	BDL	BDL
11	Chromium	**0.05/NR**	BDL	BDL	BDL	BDL	BDL	BDL
12	Manganese	**0.1/0.3**	0.008	0.001	0.18	0.005	BDL	0.12
13	Iron	**0.3/NR**	BDL	BDL	BDL	BDL	BDL	BDL
14	Cobalt	**-**	BDL	BDL	BDL	BDL	BDL	BDL
15	Nickel	**0.02/NR**	BDL	BDL	BDL	BDL	BDL	BDL
16	Copper	**0.05/1.5**	BDL	BDL	0.115	BDL	BDL	0.09
17	Zinc	**5**	BDL	BDL	BDL	BDL	BDL	BDL
18	Cadmium	**0.003/NR**	BDL	BDL	BDL	BDL	BDL	BDL
19	Lead	**0.01/NR**	BDL	BDL	BDL	BDL	BDL	BDL
C.	**Bacteriological**							
20	Total Coliform	**Nil**	5	0	0	80	0	0
21	Fecal Coliform	**Nil**	2	0	0	0	0	0

All parameters are in mg/L except pH, Turbidity (NTU), TC, and FC (CFU/100ml) NA-Not Analyzed; NR-No Relaxation, BDL – Below Detectable Limit (0.001mg/L)

4.4.2 Inference of Water Quality

The WTP has effectively demonstrated treatment processes to maintain water quality standards. However, it is crucial to implement continuous monitoring and appropriate measures to ensure the provision of safe and clean water to consumers. While the majority of drinking water quality parameters at the Canteen, Future Tower, and R-4 Site are within acceptable limits, special attention is required to address the presence of total coliforms at the Canteen. Total coliforms are naturally found in the soil and vegetation of our environment and are generally harmless. When total coliform bacteria are detected in drinking water, it typically does not pose a health risk, suggesting that the source is likely environmental rather than fecal contamination. To address this issue effectively, it is necessary to inspect the canteen's pipeline for potential contamination and ensure regular maintenance practices are implemented.

4.5 Ground Water Quality

Understanding and monitoring groundwater quality is crucial for assessing its suitability for various purposes, including irrigation, industrial use, and environmental sustainability. Groundwater quality is influenced by a variety of factors, including geological formations, land use practices, industrial activities, agricultural practices, and natural processes. Contaminants can enter groundwater through various pathways such as leaching from surface sources, infiltration from landfills, industrial discharges, and improper disposal of hazardous substances. As a result, assessing the quality of groundwater requires a comprehensive understanding of these sources of contamination and monitoring the presence of various physical, chemical, and biological parameters.

4.5.1 Analytical Results of the Ground Water Quality

The characteristics of the groundwater sample during current monitoring 2023 for winter and summer are presented in **Table 4.6**. pH recorded for all the sites for Groundwater was within the permissible range as per IS:10500 2012 standards. Concerning turbidity, Dog Squad, and central green values exceeded the acceptable limits but were within permissible limits. High turbidity was recorded for the G-2 well during the summer season. High TDS was recorded for Labor Camp and Dog Squad. However, the values lay within the permissible range. Concerning alkalinity, G-2 well values were within the acceptable limit and the rest were within the permissible limit of 600 mg/L. A similar pattern was observed for Hardness. Chlorides for most of the samples were above the acceptable range but within the permissible range. Phenols, Phosphate, and Heavy Metals were all below the detectable limit.

Table 4.6: Characteristics of Groundwater Samples During 2023

Sr. No	Parameters	IS:10500 2012	Winter 2023					Summer 2023				
		Drinking Water acceptable /permissible limit	Central Green	R-9/10	Dog Squad	G -2 Well	Labor Camp Well	Central Green	R-9/10	Dog Squad	G -2 Well	Labor Camp Well
Physico-chemical												
1	pH	**6.5-8.5**	6.9	7.2	6.9	7.4	7.3	7.1	7	7.2	7.8	7
2	Turbidity	**1/5**	0.5	0.4	0.4	7.6	0.8	1.1	0.3	1.8	2	0.5
3	EC	-	1020	1420	1250	710	1270	664	973	864	62	1240
4	TDS	**500/2000**	488	530	793	372	608	381	543	507	35	770
5	TSS	-	15	2	3	26	68	9	10	7	3	4
6	Alkalinity	**200/600**	280	328	346	90	390	284	528	416	76	452
7	Nitrate	**45/NR**	1.3	2	2	2.7	1.9	1	2	1.9	0.4	2.8
8	Total Phosphate	-	1	1.4	0.4	0.4	0.5	BDL	BDL	BDL	BDL	BDL
9	Total Hardness	**250/600**	336	148	388	396	448	225	276	312	82	308
10	Chlorides (mg/L)	**250/1000**	43	58	66	60	70	35	66	33	14	109
11	Phenols	**0.001/0.002**	NA	NA	NA	NA	NA	BDL	BDL	BDL	BDL	BDL
Heavy Metals												
12	Arsenic	**0.01/NR**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13	Chromium	**0.05/NR**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14	Manganese	**0.1/0.3**	0.048	0.013	BDL	0.063	0.014	0.036	0.007	BDL	0.077	0.017
15	Iron	**0.3/NR**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16	Cobalt	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17	Nickel	**0.02/NR**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18	Copper	**0.05/1.5**	BDL	BDL	0.002	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19	Zinc	**5/15**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20	Cadmium	**0.003/NR**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21	Lead	**0.01/NR**	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm), TC, and FC (CFU/100ml) NA-Not Analyzed; NR-No Relaxation, BDL – Below Detectable Limit (0.001mg/L)

In summary, while there were some instances of turbidity exceeding acceptable limits and elevated chloride levels, the overall groundwater quality remained within permissible ranges for most parameters. The absence of detectable phenols, phosphates, and heavy metals further contributes to the overall effectiveness and safety of the groundwater.

The analytical trend for the last five years for groundwater parameters during summer and winter was compared with the current results and presented in **Table 4.7a (Summer)** and **Table 4.7b (Winter).**

Table 4.7a (Summer): Comparison of 2022-23 Data with Historical Data of Groundwater Analysis

Sr. No	Parameters	IS:10500 2012	SUMMER Months (April and May)					
		Drinking Water acceptable/ permissible limit	2017 -18	2018 -19	2019 -20	2020 -21	2021 -22	2022-23
1	pH	6.5-8.5	7.36	7.37	7.5	COVID	7.39	7.1
2	Turbidity	1/5	NA	NA	NA	COVID	NA	1.1
3	TDS	500/2000	381	521	803	COVID	597	381
4	TSS	-	<5	<5	<5	COVID	NA	9
5	Alkalinity	200/600	NA	NA	NA	COVID	NA	284
6	Nitrate	45/NR	4.41	8.2	25.6	COVID	6.65	1
7	Total Phosphate	-	NA	NA	NA	COVID	NA	BDL
8	Total Hardness	250/600	196	373	457	COVID	309	225
9	Chlorides (mg/L)	250/1000	74.8	69.3	168	COVID	71.8	35
10	Phenols	0.001/0.002	NA	NA	NA	COVID	NA	BDL
11	Arsenic	0.01/NR	NA	NA	NA	COVID	NA	BDL
12	Chromium	0.05/NR	NA	NA	NA	COVID	NA	BDL
13	Manganese	0.1/0.3	NA	NA	NA	COVID	NA	0.036
14	Iron	0.3/NR	NA	NA	NA	COVID	NA	BDL
15	Cobalt	-	NA	NA	NA	COVID	NA	BDL
16	Nickel	0.02/NR	NA	NA	NA	COVID	NA	BDL
17	Copper	0.05/1.5	NA	NA	NA	COVID	NA	BDL
18	Zinc	5/15	NA	NA	NA	COVID	NA	BDL
19	Cadmium	0.003/NR	NA	NA	NA	COVID	NA	BDL
20	Lead	0.01/NR	NA	NA	NA	COVID	NA	BDL

All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm); NA-Not Available; NR-No Relaxation, BDL – Below Detectable Limit

Table 4.7b (Winter): Comparison of 2022-23 Data with Historical Data of Groundwater Analysis

Sr. No	Parameters	IS:10500 2012	WINTER Months (December, January, and February)					
		Drinking Water acceptable/ permissible limit	2017 -18	2018 -19	2019 -20	2020 -21	2021 -22	2022 -23
1	pH	6.5-8.5	7.34	7.44	7.75	7.33	7.3	7.1
2	Turbidity	1/5	NA	NA	NA	NA	NA	2.22
3	TDS	500/2000	579	600	644	436	675	453
4	TSS	-	<5	<5	<5	<5	<5	11.5
5	Alkalinity	200/600	NA	NA	NA	NA	NA	261
6	Nitrate	45/NR	14.1	20.55	29.8	9.2	30.42	2
7	Total Phosphate	-	NA	NA	NA	NA	NA	0.8
8	Total Hardness	250/600	358	389	388	282	437	317
9	Chlorides (mg/L)	250/1000	91.4	67.9	61.2	82.3	69.4	56.7
10	Phenols	0.001/0.002	NA	NA	NA	NA	NA	NA
11	Arsenic	0.01/NR	NA	NA	NA	NA	NA	BDL
12	Chromium	0.05/NR	NA	NA	NA	NA	NA	BDL
13	Manganese	0.1/0.3	NA	NA	NA	NA	NA	0.14
14	Iron	0.3/NR	<0.05	<0.05	<0.05	<0.05	<0.05	BDL
15	Cobalt	-	NA	NA	NA	NA	NA	BDL
16	Nickel	0.02/NR	NA	NA	NA	NA	NA	BDL
17	Copper	0.05/1.5	NA	NA	NA	NA	NA	BDL
18	Zinc	5/15	NA	NA	NA	NA	NA	BDL
19	Cadmium	0.003/NR	NA	NA	NA	NA	NA	BDL
20	Lead	0.01/NR	NA	NA	NA	NA	NA	BDL

All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm); NA-Not Available; NR-No Relaxation, BDL – Below Detectable Limit

The pH of groundwater samples in the summer months of 2022-23 is found to be 7.1, lower than the previous year's recorded value of 7.39. The total dissolved solids (TDS) are found to be 381 mg/l in 2022-23, lower than 2021-22 (597 mg/l), 2019-20 (803 mg/l), 2018-19 (521 mg/l) and same as 2017-18 (381 mg/l). The total suspended solids (TSS) in the years 2017-2020 were recorded as <5 mg/l while its value in 2022-23 is found to be 9 mg/l. The nitrate content in the groundwater sample if found to be consistently higher in the years 2017-2022 (4.41 mg/l to 25.6 mg/l), however in the years 2022-23, it was found to be 1 mg/l. The total hardness of the samples ranged from 457 mg/l to 196 mg/l (2017-2022), while in 2022-23, it was 225 mg/l. The chlorides ranged from 168 mg/l to 69.3 mg/l between 2017 and 2022, but in 2022-23, the lowest ever value of chlorides has been observed at 35 mg/l. The historical data (2017-2022) of parameters turbidity, total phosphates, phenols, and Heavy metals (arsenic. Chromium, manganese. Iron, cobalt, copper, Zinc, cadmium, and lead) is not available. But in 2022-23, an analysis of these parameters was done and all the heavy metals and total phosphates were observed Below Detectable Level (BDL), except manganese (0.036 mg/l). In the year 2020-21, sampling in the summer months was not done due to COVID-19 Lockdown restrictions.

The pH of groundwater samples in the winter months of 2022-23 is found to be 7.1, lower than the previous year's recorded value of 7.3. The total dissolved solids (TDS) are found to be 453 mg/l in 2022-23, lower than 2021-22 (675 mg/l), 2019-20 (644 mg/l), 2018-19 (600 mg/l) and 2017-18 (579 mg/l). The total suspended solids (TSS) in the years 2017-2020 were recorded as < 5 mg/l while its value in 2022-23 is found to be 11.5 mg/l. The nitrate content in the groundwater sample if found to be consistently higher in the years 2017-2022 (30.42 mg/l to 9.2 mg/l), however in the years 2022-23, it was found to be 2 mg/l. The total hardness of the samples ranged from 437 mg/l to 282 mg/l (2017-2022), while in 2022-23, it was 317 mg/l. The chlorides ranged from 91.4 mg/l to 61.2 mg/l between 2017 and 2022, but 2022-23 has the lowest value of chlorides 56.7 mg/l. The Iron content in groundwater samples is <0.05 mg/l (2017-2022) and in 2022-23, it was below the detectable range. The historical data (2017-2022) of parameters turbidity, total phosphates, phenols, and Heavy metals (arsenic. Chromium, manganese, cobalt, copper, Zinc, cadmium, and lead) is not available. But in 2022-23, an analysis of these parameters was done and all the heavy metals and total phosphates were observed Below Detectable Level (BDL), except manganese (0.036 mg/l).

As per the compared data, all the values of tested parameters are low in 2022-23 concerning data from 2017-2022, except for Total suspended solids (TSS).

4.6 Performance Evaluation of Sewage Treatment Plant (STP)

Amanora Park town consists of two STPs. One is located within the residential area (STP -1) with a flow of 1750 m^3 /Day and the other is outside the residential area (STP - 2), Phase -II with a flow of 1500 m^3 /Day. The treated water is used for gardening and flushing.

Process Flow of STP:

The primary treatment process flow is similar in both STP 1 and STP 2. However, they employ different methods for secondary treatment. STP 1 utilizes Fluidized Aerobic Bed Reactors (FAB), while STP 2 incorporates Moving Bed Biofilm Reactors (MBBR).

Primary Treatment

- In the primary treatment stage, the sewage undergoes several steps. Firstly, it is directed through a **Bar Screen Chamber** to capture any floating debris. Next, the sewage is passed through an **Oil & Grease trap** to eliminate floating oil and grease substances. After that, the sewage is gathered in a **Sewage Collection/Equalization tank**, where fluctuations in flow and properties are minimized. This prevents potential operational issues and ensures a consistent downstream flow. In this tank, the sewage is continuously mixed through the introduction of coarse air bubbles.

Secondary Treatment

- In the secondary treatment process of STP 1, the equalized sewage is pumped into **Fluidized Aerobic Bed Reactors (FAB).** These reactors facilitate the reduction of BOD/COD through aerobic microbial activities. The FAB reactors are operated in series and receive oxygen through coarse air bubble diffusers. In the Flocculator, PAC and PE dosing takes place, where they are mixed with the sewage to form flocks (Bio-solids) that settle down in the tube settlers.
- In the secondary treatment process of STP 2, the equalized sewage is pumped into an Aeration Tank containing **Moving Bed Biofilm Reactor (MBBR)** media. MBBR is a highly efficient biological treatment process that combines elements of the conventional activated sludge process with biofilm media. The MBBR media provides an expanded surface area for biological microorganisms to attach and grow. This aerobic treatment process operates at high-volume loads and receives oxygen through a diffuser system located at the bottom of the aeration tank.
- **Tube Settler**: The excess bio-solids formed in the biological process will be separated in the downstream tube settler tank. The clear supernatant after disinfection is suitable for disposal.

Tertiary Treatment

- **Chlorine Disinfection Tank:** Chlorine is utilized to disinfect the sewage and is stored in a treated water tank before being used for gardening or flushing purposes.
- **Dual Media Filters (DCF) and Activated Carbon Filters (ACF):** These filters are employed in the tertiary treatment stage of sewage. They help further the removal of suspended solids, odor, and color from the sewage, making it suitable for flushing purposes.
- **Ozone Treatment:** Ozone plays a crucial role in sewage water treatment, specifically in the tertiary treatment phase. Ozone effectively breaks down the lipid layers in cell membranes, making it highly effective in deactivating viruses and bacteria. It requires minimal contact time compared to other disinfection methods. After undergoing ozone treatment, the treated water can be used for flushing.
- **Centrifuge:** A portion of the sludge from the secondary tube settler tank is recycled back to the aeration tank, while another portion is directed to the sludge dewatering unit. The dewatering process removes moisture from the sludge, resulting in STP Sludge weighing approximately 100 Kg/day. This sludge is valuable as it contains high nutrient content and is utilized as manure.

4.6.1 Water Quality Analysis at Sewage Treatment Plant (STP)

The seasonal changes during winter and summer for characteristics of STP are presented in **Table 4.8.** The pH range should be between 5.5 and 9.0 as per CPCB and MPCB standards. The values for STP-1 outlet, and STP-2 outlet in winter 2023 and summer 2023 vary but generally fall within the acceptable range. For TSS, the standards are set at 100 mg/L for inland surface water (I) and 200 mg/L for land for irrigation (II). The recorded values for TSS for STP Outlet are within the limits for both seasons indicating effective removal of suspended particles. The DO of both STPs for outlet was found to be in the range of 2.4 to 4.8. The CPCB standard for COD is 250 mg/L, and the MPCB standard for COD should be below 150 mg/L. The recorded values for COD vary for different sampling points in both seasons and are within the acceptable limit. For BOD, the standards are set at 30 mg/L for inland surface water (I) and 100 mg/L for land for irrigation (II). The recorded values for BOD were found to be in the range of 5.3 to 18.5 mg/L which is within the limits. The values for Oil & Grease in all the outlet samples were within CPCB Standard (10 mg/l). Considering the MPCB standard, only in the STP 1 (winter sample) Oil & Grease within the MPCB standard (5 mg/l). Regarding heavy metals, the majority of the metals were found to be below the detectable limit (BDL).

Table 4.8: Characteristics of STP Samples During 2023

Sr. no.	Parameters	CPCB Standards *		MPCB Standards	Winter 2023				Summer 2023			
		Inland Surface Water (I)	Land for Irrigation (II)		STP-1 INLET	STP-1 OUTLET	STP-2 INLET	STP-2 OUTLET	STP-1 INLET	STP-1 OUTLET	STP-2 INLET	STP-2 OUTLET
Physico-chemical												
1	pH	**5.5 to 9.0**	**5.5 to 9.0**	**6.5 to 9.0**	7.3	6.9	7.1	7.3	7.9	8.7	6.9	6.7
2	TSS	**100**	**200**	-	133	44	181	18	220	7	223	17
3	Nitrate	**10**		45	24	0.5	18	0.9	38	6.5	39	6.6
4	DO (Dissolved Oxygen)	-	-	**≥ 2**	0.8	3.8	0	4.8	0	2.4	0	2.7
5	COD	**250**	-	**≤150**	156	49	268	40	273	41	222	69
6	BOD	**30**	**100**	**≤ 30**	86.2	11.5	133.5	5.3	205	8	170	18.5
7	Oil & Grease	**10**	**10**	**≤ 5**	16	4	22	6	28	6	18	9
8	Phenols	-	-	-	NA	NA	NA	NA	2.12	0.36	2.1	0.38
Heavy Metals												
9	Arsenic	**0.2**	**0.2**	-	0.003	BDL	0.002	BDL	0.005	BDL	0.001	BDL
10	Chromium	**0.1**	-	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11	Manganese	**2**	-	-	0.033	0.011	0.049	BDL	0.012	BDL	0.021	0.009
12	Iron	**3**	-	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13	Cobalt	**3**		-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14	Nickel	**3**	-	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
15	Copper	**3**	-	-	0.001	BDL	BDL	BDL	BDL	BDL	BDL	BDL
16	Zinc	**5**	-	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17	Cadmium	**2**	-	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18	Lead	**0.1**	-	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bacteriological												
19	Total Coliform	**Nil**	-	-	1	6X10^5	9x10^6	55	3.63 X 10^8	6.5 X 10^4	7.5 X 10^7	6.1 X 10^4
20	Fecal Coliform	**Nil**	-	-	1.2X10^7	1X10^4	1.4x10^5	20	1.18 X 10^8	3.1 X 10^3	1.2 X 10^7	4.9 X 10^4

**Note – Samples for outlet were taken from ACF/DCF unit rather than after undergoing chlorination and ozonation treatment. In the summer, additional samples were collected after ozone treatment, and analysis showed no growth of total and fecal coliforms.*

All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm), TC, and FC (CFU/100ml) NA-Not Analyzed; NR-No Relaxation, BDL – Below Detectable Limit (0.001mg/L)

As for the bacteriological parameters, specifically Total Coliform and Fecal Coliform, they were found to be elevated in both STPs. However, it's important to note that the sample from the outlet was taken after passing through a DCF (Dual Media Carbon Filter), rather than after undergoing chlorination and ozonation treatment. In the summer, additional samples were collected after ozone treatment, and analysis showed no growth of total and fecal coliforms in both STP 1 and STP 2. This indicates that the STP's treatment process was effective in controlling coliform contamination. The analytical trend for the last five years at STP1 and STP2 during summer and winter was compared with the current results and presented in **Table 4.9a&b (STP1)** and **Table 4.10a&b (STP2)**.

Table 4.9a (Summer): Comparison of 2022-23 Data with Historical Data of STP 1

Sr. No	Parameters	IS:10500 2012		MPCB Standards	SUMMER Months (April and May)					
		Inland Surface Water (I)	Land for Irrigation (II)		2017 -18	2018 -19	2019 -20	2020 -21	2021 -22	2022-23
1	pH	5.5 to 9.0	5.5 to 9.0	6.5 to 9.0	7.35	7.41	7.2	COVID	7.45	8.7
2	TSS	100	200	-	6.75	6.8	6.6	COVID	5.8	7
3	Nitrate	10		45	NA	NA	NA	COVID	NA	6.5
4	DO (Dissolved Oxygen)	-	-	≥2	6.57	5.72	5.3	COVID	2.8	2.4
5	COD	250	-	≤150	38.75	34	>50	COVID	33.1	41
6	BOD	30	100	≤30	13	6.4	8.33	COVID	9.3	8
7	Oil & Grease	10	10	≤5	NA	NA	NA	COVID	NA	6
8	Phenols	-	-	-	NA	NA	NA	COVID	NA	0.36
9	Arsenic	0.2	0.2	-	NA	NA	NA	COVID	NA	BDL
10	Chromium	0.1	-	-	NA	NA	NA	COVID	NA	BDL
11	Manganese	2	-	-	NA	NA	NA	COVID	NA	BDL
12	Iron	3	-	-	<5	<5	<5	COVID	NA	BDL
13	Cobalt	3		-	NA	NA	NA	COVID	NA	BDL
14	Nickel	3	-	-	NA	NA	NA	COVID	NA	BDL
15	Copper	3	-	-	NA	NA	NA	COVID	NA	BDL
16	Zinc	5	-	-	NA	NA	NA	COVID	NA	BDL
17	Cadmium	2	-	-	NA	NA	NA	COVID	NA	BDL
18	Lead	0.1	-	-	NA	NA	NA	COVID	NA	BDL
19	Total Coliform	NIL	-	-	NA	NA	NA	NA	NA	6.5 X 10^4
20	Fecal Coliform	NIL	-	-	125	193	125	COVID	38	3.1 X 10^3

Note – Samples for outlet were taken from ACF/DCF unit rather than after undergoing chlorination and ozonation treatment.* ***In the summer, additional samples were collected after ozone treatment, and analysis showed no growth of total and fecal coliforms.* *All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm), TC, and FC (CFU/100ml). NA-Not Analyzed; NR-No Relaxation, BDL – Below Detectable Limit (0.001mg/L)*

Table 4.9b (Winter): Comparison of 2022-23 Data with Historical Data of STP 1

Sr. No	Parameters	IS:10500 2012		MPCB Standards	WINTER Months (December, January, February)					
		Inland Surface Water (I)	Land for Irrigation (II)		2017 -18	2018 -19	2019 -20	2020 -21	2021 -22	2022-23
1	pH	5.5 to 9.0	5.5 to 9.0	6.5 to 9.0	7.4	7.2	7.48	7.33	7.47	6.9
2	TSS	100	200	-	6.3	5.2	6.7	8.98	<5	44
3	Nitrate	10		45	NA	NA	NA	NA	NA	0.5
4	DO (Dissolved Oxygen)	-	-	≥ 2	5.8	6.8	5.42	4.25	5.01	3.8
5	COD	250	-	≤150	40.2	>50	>50	>50	36	49
6	BOD	30	100	≤ 30	9.2	7.06	8.4	7.86	8.6	11.5
7	Oil & Grease	10	10	≤ 5	NA	NA	NA	NA	NA	4
8	Phenols	-	-	-	NA	NA	NA	NA	NA	NA
9	Arsenic	0.2	0.2	-	NA	NA	NA	NA	NA	BDL
10	Chromium	0.1	-	-	NA	NA	NA	NA	NA	BDL
11	Manganese	2	-	-	NA	NA	NA	NA	NA	0.011
12	Iron	3	-	-	NA	NA	NA	NA	NA	BDL
13	Cobalt	3		-	NA	NA	NA	NA	NA	BDL
14	Nickel	3	-	-	NA	NA	NA	NA	NA	BDL
15	Copper	3	-	-	NA	NA	NA	NA	NA	BDL
16	Zinc	5	-	-	NA	NA	NA	NA	NA	BDL
17	Cadmium	2	-	-	NA	NA	NA	NA	NA	BDL
18	Lead	0.1	-	-	NA	NA	NA	NA	NA	BDL
19	Total Coliform	NIL	-	-	NA	NA	NA	NA	NA	6X10^5
20	Fecal Coliform	NIL	-	-	57	172	100	66	35	1X10^4

***Note** – *Samples for outlet were taken from ACF/DCF unit rather than after undergoing chlorination and ozonation treatment.*

All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm), TC, and FC (CFU/100ml)
NA-Not Analyzed; NR-No Relaxation, BDL – Below Detectable Limit (0.001mg/L)

The pH of STP 1 outlet samples during the summer months was observed to be 8.7 in 2022-23, higher than in 2021-22 (7.45) and from 2017-2021 the pH ranged from 7.41 to 7.2. The total suspended solids (TSS) showed a value of 7 mg/l in 2022-23 while it ranged from 5.8 mg/l to 6.8 mg/l in 2017-2022. The dissolved oxygen (DO) showed a drop in 2022-23 (2.4 mg/l) while the previous year's DO values ranged from 6.57 mg/l to 2.8 mg/l. the Chemical Oxygen Demand (COD), the 2022-23 (41 mg/l) value is higher than the 2021-22 observation (33.1 mg/l), however, the all-time highest value has been observed during 2019-20 (>50 mg/l). the Biochemical Oxygen Demand (BOD) showed a value of 8 mg/l in 2022-23 which is lower than the previous year (9.3 mg/l). the highest BOD value has been observed in 2017-18 (13 mg/l). The iron content in the samples was found to be < 5 mg/l in 2017-20 data and it was found to be below the detectable limit in 2022-23. Other parameters - Nitrate, oil and

grease, phenols, and Heavy metals (arsenic. Chromium, manganese, cobalt, copper, Zinc, cadmium, and lead) and Total Coliform Count are not available. But in 2022-23, analysis of these parameters was done and all the heavy metals were observed Below Detectable Level (BDL), and the phenolic content of samples was found to be 0.36 mg/l. In the year 2020-21, sampling in the summer months was not done due to COVID-19 Lockdown restrictions.

The pH of STP 1 outlet samples during winter was observed to be 6.9 in 2022-23, lower than 2021-22 (7.47) and from 2017-2021 the pH ranged from 7.4 to 7.2. The total suspended solids (TSS) showed a value of 44 mg/l in 2022-23 while it ranged from 5.2 mg/l to 8.98 mg/l in 2017-2022. The dissolved oxygen (DO) showed a drop in 2022-23 (3.8 mg/l) while the previous year's DO values ranged from 5.01 mg/l to 6.8 mg/l. the Chemical Oxygen Demand (COD), the 2022-23 (49 mg/l) value is higher than the 2021-22 observation (36 mg/l), however, the all-time highest value has been observed during 2018-21 (>50 mg/l). the Biochemical Oxygen Demand (BOD) showed a value of 11.5 mg/l in 2022-23 which is higher than the previous year (8.6 mg/l), the BOD value ranged from 7.06 mg/l to 9.2 mg/l. Other parameters -Nitrate, oil and grease, phenols, and Heavy metals (arsenic. Chromium, manganese, cobalt, iron, copper, Zinc, cadmium, and lead) and Total Coliform count are not available. But in 2022-23, analysis of these parameters was done and all the heavy metals were observed Below Detectable Level (BDL), the oil and grease content of samples were found to be 4 mg/l, and manganese content was found to be 0.011 mg/l.

The historical data of Fecal Coliforms provided by Amanora Park Township is conducted as per the Most Probable Number (MPN) Method and the analysis shows a considerable number of fecal coliforms in both summer and winter months. The 2022-23 fecal coliform data was obtained by Membrane Filtration Technique (MFT), followed by using specific fecal coliform growth media. The latter confirms the presence of fecal coliforms in the tested samples with a value of 3.1 X 10^3 to 1 X 10^4 Colony-forming units per 100 ml of tested samples.

As per the comparison, 2022-23 showed some drastic changes concerning historical data from 2017-2022. The two important parameters are Total suspended solids (TSS, a rise in 2022-23) and dissolved oxygen (DO, lowest value recorded). All the samples, irrespective of season, showed the presence of fecal coliforms.

Table 4.10a (Summer): Comparison of 2022-23 Data with Historical Data of STP 2

Sr. No	Parameters	IS:10500 2012		MPCB Standards	SUMMER Months (April and May)			
		Inland Surface Water (I)	Land for Irrigation (II)		2019 -20	2020 -21	2021 -22	2022-23
1	pH	5.5 to 9.0	5.5 to 9.0	6.5 to 9.0	Data Unavailable	Data Unavailable	7.31	6.7
2	TSS	100	200	-			<5	17
3	Nitrate	10		45	NA	NA	NA	6.6
4	DO (Dissolved Oxygen)	-	-	≥ 2	Data Unavailable	Data Unavailable		2.7
5	COD	250	-	≤150				69
6	BOD	30	100	≤ 30				18.5
7	Oil & Grease	10	10	≤ 5	NA	NA	NA	9
8	Phenols	-	-	-	NA	NA	NA	0.38
9	Arsenic	0.2	0.2	-	NA	NA	NA	BDL
10	Chromium	0.1	-	-	NA	NA	NA	BDL
11	Manganese	2	-	-	NA	NA	NA	0.009
12	Iron	3	-	-	NA	NA	NA	BDL
13	Cobalt	3		-	NA	NA	NA	BDL
14	Nickel	3	-	-	NA	NA	NA	BDL
15	Copper	3	-	-	NA	NA	NA	BDL
16	Zinc	5	-	-	NA	NA	NA	BDL
17	Cadmium	2	-	-	NA	NA	NA	BDL
18	Lead	0.1	-	-	NA	NA	NA	BDL
19	Total Coliform	NIL	-	-	NA	NA	NA	6.1 X 10^4
20	Fecal Coliform	NIL	-	-	Data Unavailable	Data Unavailable		4.9 X 10^4

Note – Samples for outlet were taken from ACF/DCF unit rather than after undergoing chlorination and ozonation treatment.* ***In the summer, additional samples were collected after ozone treatment, and analysis showed no growth of total and fecal coliforms.*

All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm), TC, and FC (CFU/100ml)

NA-Not Analyzed; NR-No Relaxation, BDL – Below Detectable Limit (0.001mg/L)

The STP-2 of Amanora Park town became operational in 2019-20. Due to the lack of availability of analysis data during the summer months of 2019-21, the data of this particular period has not been considered for comparison. The pH of STP 2 outlet samples was observed to be 6.7 in 2022-23, higher than in 2021-22 (7.31). The total suspended solids (TSS) showed a value of 17 mg/l in 2022-23 while it ranged from < 5 mg/l to 9.14 mg/l in 2020-2022. The dissolved oxygen (DO) showed a drop in 2022-23 (2.7 mg/l) while the previous years' DO values ranged from 3.05 mg/l to 4.8 mg/l. The Chemical Oxygen Demand (COD), the 2022-23 (69 mg/l) value is higher than the 2021-22 observation

(43 mg/l). The Biochemical Oxygen Demand (BOD) showed a value of 18.5 mg/l in 2022-23 which is higher than the previous year (10 mg/l).

Table 4.10b (Winter): Comparison of 2022-23 Data with Historical Data of STP 2

Sr. No	Parameters	IS:10500 2012		MPCB Standards	WINTER Months (December, January, and February)			
		Inland Surface Water (I)	Land for Irrigation (II)		2019 -20	2020 -21	2021 -22	2022-23
1	pH	5.5 to 9.0	5.5 to 9.0	6.5 to 9.0	7	Data Unavailable	7	7.3
2	TSS	100	200	-	9		7.12	18
3	Nitrate	10		45	NA	NA	NA	0.9
4	DO (Dissolved Oxygen)	-	-	≥2	5.2	Data Unavailable	1.1	4.8
5	COD	250	-	≤150	42.56		17.37	40
6	BOD	30	100	≤30	9		9.3	5.3
7	Oil & Grease	10	10	≤5	NA	NA	NA	6
8	Phenols	-	-	-	NA	NA	NA	NA
9	Arsenic	0.2	0.2	-	NA	NA	NA	BDL
10	Chromium	0.1	-	-	NA	NA	NA	BDL
11	Manganese	2	-	-	NA	NA	NA	BDL
12	Iron	3	-	-	NA	NA	NA	BDL
13	Cobalt	3		-	NA	NA	NA	BDL
14	Nickel	3	-	-	NA	NA	NA	BDL
15	Copper	3	-	-	NA	NA	NA	BDL
16	Zinc	5	-	-	NA	NA	NA	BDL
17	Cadmium	2	-	-	NA	NA	NA	BDL
18	Lead	0.1	-	-	NA	NA	NA	BDL
19	Total Coliform	NIL	-	-	NA	NA	NA	5.5 X 10^3
20	Fecal Coliform	NIL	-	-	94	Data Unavailable	70	2 X 10^4

**Note – Samples for outlet were taken from ACF/DCF unit rather than after undergoing chlorination and ozonation treatment.*

All parameters are in mg/L except pH, Turbidity (NTU), EC (µS/cm), TC, and FC (CFU/100ml)

NA-Not Analyzed; NR-No Relaxation, BDL – Below Detectable Limit (0.001mg/L)

In STP-2 of Amanora Park town, the other parameters – Nitrate, oil and grease, phenols, and Heavy metals (Arsenic, Manganese, Chromium, manganese, cobalt, copper, Zinc, cadmium, and lead) are not available. But in 2022-23, analysis of these parameters was done and all the heavy metals were observed Below Detectable Level (BDL), The phenolic content of samples was found to be 0.38 mg/l and that of oil and grease was found to be 9 mg/l.

Due to the lack of availability of analysis data during the Winter months of 2020-21, the data of this particular period has not been considered for comparison. The pH of STP 2 outlet samples was observed to be 7.3 in 2022-23, higher than in 2021-22 (7.0) and 2019-20 (7.0). The total suspended solids (TSS) showed a value of 18 mg/l in 2022-23 while in 2019-2020, it showed a value of 7.12 mg/l and in 2019-20, it was 9 mg/l. The dissolved oxygen (DO) showed a rise in 2022-23 (4.8 mg/l) while in 2021-22, the DO was measured to be 1.1 mg/l and in 2019-20, it was 5.2 mg/l. The Chemical Oxygen Demand (COD), the 2022-23 (40 mg/l) value is higher than the 2021-22 observation (17.37 mg/l) and 2019-20 showed a value of 42.56 mg/l. The Biochemical Oxygen Demand (BOD) showed a value of 5.3 mg/l in 2022-23 which is lower than the previous year (9.3 mg/l) and in 2019-20, the BOD is observed to be 9 mg/l. Other parameters, Nitrate, oil and grease, phenols, and Heavy metals (Arsenic, Manganese, Chromium, manganese, cobalt, copper, Zinc, cadmium, and lead) are not available. But in 2022-23, an analysis of these parameters was done and all the heavy metals were observed Below Detectable Level (BDL), and the oil and grease content were found to be 6 mg/l.

The historical data of Fecal Coliforms provided by Amanora Park Township is conducted as per the Most Probable Number (MPN) Method and the analysis shows a considerable number of fecal coliforms in both summer and winter months. The 2022-23 fecal coliform data was obtained by Membrane Filtration Technique (MFT), followed by using specific fecal coliform growth media. The latter confirms the presence of fecal coliforms in the tested samples with a value of 2-4.9 X 10^4 Colony-forming units per 100 ml of tested samples.

As per the comparison, 2022-23 showed some drastic changes concerning the available historical data. In summer, the DO was reduced, BOD and COD increased while in winter DO increased, but BOD and COD decreased. All the samples, irrespective of season, showed the presence of fecal coliforms

Conclusion:

In the case of STP 1, which has FAB, in the outlet sample, the values of all the non-biological parameters fall within the CPCB and MPCB standards for discharge into an inland water body and for irrigation purposes except for oil & grease which exceeds the MPCB prescribed standards (in summer sampling). TC and FC were present in the samples collected post-ACF/DCF. After chlorination and ozonation TC and FC were not found in the treated waste water samples.

Concerning STP 2, which has MBBR, in the outlet sample, the values of all the non-biological parameters fall within the CPCB and MPCB standards for discharge into an inland water body and for irrigation except for oil & grease which falls within CPCB standards but exceed the MPCB prescribed standards. TC and FC were present in the samples collected post-ACF/DCF. After chlorination and ozonation TC and FC were not found in the treated waste water samples.

4.7 Rain Water Harvesting

Rainwater harvesting is the technique of collection and storage of rainwater at the surface or in sub-surface aquifers before it is lost as surface run-off. The Township has good rooftop rainwater harvesting structures. Water conservation and artificial recharge have been done by developing structures such as recharge wells, recharge bore wells, rectangular recharge/open wells, and collection tanks.

4.7.1 Water Conservation and Artificial Recharge by Percolation Lakes/Ponds in Phase- I

Already 2 ponds/tanks existed in Phase-I as per the detailed dimensions given below. It was observed that the percolation lake/pond got filled on an average 3 times during the rainy season, the rainwater harvested by these structures is as estimated below.

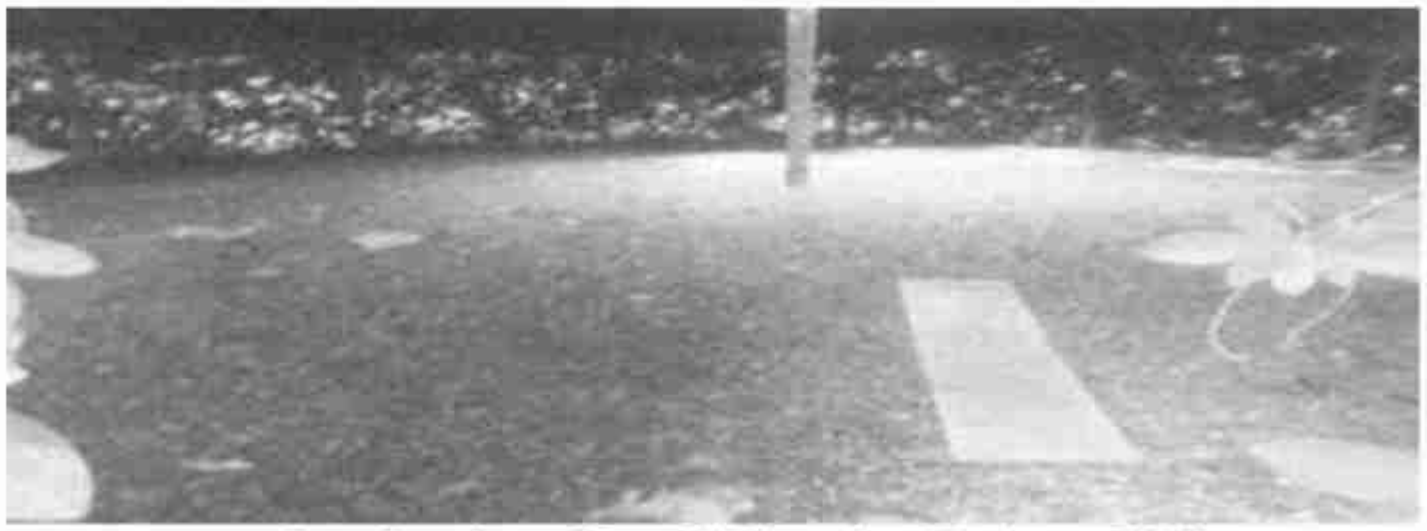
- Phase -I Percolation Lake/Pond # 1: 10,125 sq.m. (area) x 2.0 m (depth) =
  20,250 KL (single filling) x 3 fillings = **60,750 KL.**
- Phase -I Percolation Lake/Pond # 2: 9100 sq.m. (area) x 2.0 m (depth) =
  18,200 KL x 3 fillings = **54,600 KL.**

4.7.2 Roof Top Rain Water Harvesting by Recharge Well in Phase-I

The Recharge well has been taken up in Phase I. This well is one of the 7 dug wells from which groundwater is also intermittently extracted during monsoon season and used to meet the demand. Thus, it serves the dual purpose of recharge well and abstraction structure. All the rooftop rainwater is recharged to the ground through these seven (7) dug wells. In the case of the recharge well it was seen that about 85% of rainwater gets recharged. The details of artificial recharge by the recharge well are given below:

- Depth – 9.00 m
- Diameter – 5.50 m
- Roof Top area connected – 36,115 sq.m
- Average Annual Rainfall – 668 mm i.e. 0.668 m
- Total Rainwater Available – 24,125 KL – 3,619 KL (15% losses) = **20,506 KL**
- Estimated Recharge of available rainwater – 20,506 KL

Exterior View of Dug Well used as Recharge Well for Rain Water Harvesting and Recharge



Interior view of Dug Well used as Recharge Well for Rain Water Harvesting and Recharge and Recharge

4.7.3 Roof Top Rain Water Harvesting by Recharge Bore Well in Phase-I

The Recharge Bore well has been taken up in Phase I. This well is one of the 5 Bore wells from which groundwater is also intermittently extracted during monsoon season and used to meet the demand. Thus, it serves the dual purpose of recharge bore well and abstraction well. All the rooftop rainwater is recharged to the ground through these five (5) bore wells. In the case of the recharge bore well it was seen that about 85% of rainwater gets recharged the details of artificial recharge by the recharge bore well are given below:

- Depth – 18.00 m
- Diameter – 100 mm
- Roof Top area connected – 14,000 sq.m
- Average Annual Rainfall – 668 mm i.e. 0.668 m
- Total Rainwater Available – 9,352 KL – 1,403 KL (15% losses) = 7,949 KL
- Estimated Recharge of available rainwater – **7,949 KL**

4.7.4 Roof Top Rain Water Harvesting by Collection Tank in Phase-I

The Collection Tank has been taken up in Phase I. This collection tank serves as a source of intermittent water supply during monsoon season. The details of the collection tank are given below:

- Area – 1845 m^2
- Depth – 1.50 m
- Roof Top area connected – 16,000 sq.m
- Average Annual Rainfall – 668 mm i.e. 0.668 m
- Total Rainwater Available – 10,688 KL – 1,603 KL (15% losses) = 9,085 KL
- Total Rain Water Harvested / Collected – **9,085 KL**

4.7.5 Nalla /Stream Beautification and Soil Conservation

The local nalla / stream passing through the area has been beautified and vegetation has been grown along the nalla to retain soil moisture for a longer period. Further water conveyance system has also been developed along the nalla to cater to the various recharge /conservation structures existing/planned along the nalla.

Local Nalla / Stream Beautification with increase in Soil Moisture

4.7.6 Water Conservation and Artificial Recharge by Percolation Lakes/Ponds in Phase- II

In addition to these, 2 more ponds/tanks have been taken up in Phase II as per the detailed dimensions given below.

- Phase –II: Main Lake: 10,250 sq.m. (area) x 1.5 m (depth) = 15,375KL (single filling) x 3 fillings = **46,125 KL**.
- Phase –II: Pond: 8,200 sq.m. (area) x 1.5 m (depth) = 12,300 KL x 3 fillings = **36,900 KL**

Percolation Lake / Pond used for Rain Water Harvesting and Recharge in Phase-II

4.7.7 Roof Top Rain Water Harvesting by Rectangular Recharge/Open Well in Phase-II

The large rectangular well serves as an ideal source for rainwater harvesting and artificial recharge in Phase II due to its huge storage capacity and rainwater availability from surrounding open and paved areas as well as proximity to the local stream flowing through the area. Due to the open area, the losses were considered as 35%. In the case of rectangular recharge well it was seen that about 65% of rainwater gets recharged. The details of artificial recharge by the rectangular recharge well are given below.

- Depth – 20.00 m
- Connected Catchment of Open / Paved Area – 49,352 sq.m
- Average Annual Rainfall – 668 mm i.e. 0.668 m
- Total Rainwater Available – 32,967 KL – 11,538 KL (35% losses) = 21,429 KL
- Estimated Recharge of available rainwater – **21,429 KL**

Rectangular Well (New Well G6) used for Rain Water Harvesting and Recharge in Phase-II

4.7.8 Roof Top Rain Water Harvesting by Recharge Bore Well in Phase-II

The Recharge Bore well has been taken up in Phase II. This well is not pumped and serves as a good source for rainwater harvesting and artificial recharge in Phase II due to its huge catchment of surrounding open and paved areas as well as its proximity to the local stream flowing through the area. Due to the open area, the losses were considered as 35%. In the case of recharge bore well it was seen that about 65% of rainwater gets recharged. The details of artificial recharge by the recharge bore well are given below:

- Depth – 21.00 m
- Connected Catchment of Open / Paved Area – 31,340 sq.m
- Average Annual Rainfall – 668 mm i.e. 0.668 m
- Total Rainwater Available – 20,935 KL – 7,327 KL (35% losses) = 13,608 KL
- Estimated Recharge of available rainwater – **13,608 KL**

Bore-Well used for Rain Water Recharge using M/s Furrat Model

4.7.9 Rain Water Harvesting / Water Conservation / Recharge in Phase I and II

Table 4.11: Total Rain Water Harvesting/ Water Conservation /Recharge in Phase I and II

a) Rain Water Harvesting Potential at Amanora Township

Calculations of Rainwater Harvesting Potential At CCL					
Sr.	**Description**	**Area Considered (in Sq. M)**	**Total Annual Rainfall Considered (m) (668 mm/Yr.)**	**Harvesting Surface Runoff Coefficient**	**Total Volume of Rain Water Available for Harvesting (KL)**
1	Paved Area	2,55,170	0.668	0.65	1,10,795
2	Built-up Areas	4,36,695	0.668	0.85	2,47,955
3	Green area	58,200	0.668	0.15	5,832
4	Undeveloped area	18,838	0.668	0.2	2,517
Total area in m^2		**7,68,903**	**Total in KL**		**3,67,098**

The present computation of runoff generated annually in the township has been estimated to be **3,67,098 KL/annum**.

b) Natural Ground Water Recharge

Calculations of Natural Ground Water Recharge					
Sr.	**Description**	**Area Considered (in Sq. M)**	**Total volume of Rainwater available for harvesting (KL)**	**Natural recharge in %**	**Total volume of natural GW Recharge(KL)**
1	Green area	58200	4947	50	2473.5
2	Undeveloped area/ open scrub area	18838.47	2401.9	40	960.76
Total in KL					**3,434.26**

c) Ground Water Recharge at Apt, Pune

Due to the above measures, a considerable quantity of rainwater is harvested on the campus. The total rainwater harvesting, water conservation, and recharge in Phase I and Phase II are presented below:

Artificial Ground Water Recharge			
Structure	**Rain Water Harvested / Conserved/ Recharged (KL)**		
	Phase-I	**Phase-II**	**Total Rain Water Harvested (KL)**
Percolation Lake/Pond 1 & 2 (Rainwater Harvesting only)	60750+54600 =1,15,350	46125+36900 =83,025	198,375
Recharge Dug Well	20,506	-	20,506
Recharge Bore well	7,949	13,608	21,557
Rectangular Recharge Well	-	21,429	21,429
Collection Tank	9,085	-	9,085
Total	**152,890**	**118,061**	**2,70,952**

Total water recharged by APT, Pune is **2,70,952 KL/year.** However, recharge potential is purely dependent upon rainfall.

Chapter 5

Soil Quality Status in the Township

Chapter 5

Soil Quality Status in the Township

5.1 Soil Sampling Details

Soil samples were collected from 8 locations in the township and adjacent agricultural areas during the winter and summer of 2023. Soil sampling locations are shown in **Figure 5.1** and details in **Table 5.1.**

Figure 5.1: Map of the Soil Sampling Locations in the Study Area

Table 5.1: Details of Soil Sampling Locations at Amanora Township

Sr. No.	Sampling Location	Sample Code	Site Characteristics
Within the Township			
1	R4 site	R4	Residential area, the sample was collected from a grass field
2	Agricultural Land near Dog Squad	DS	Maize grown in agricultural land during winter and left fallow in summer
3	Central Green	CG	Park/Garden Area, Plantation rich area for Aesthetic purpose
4	STP-2	STP	Sewage Treatment Plant near the R-2 sector area. The sample was collected from the lawn area
5	Weighbridge	WB	

Table 5.1 *(Contd..)*: Details of soil sampling locations at Amanora Township

Sr. No.	Sampling Location	Sample Code	Site Characteristics
Outside the Township			
6	Forest land	FL	Forest land was next to MSW site. Dominant trees were Eucalyptus, Azadirachta, Acacia, and Peltophorum species. Humus formation has also been seen in the area due to the decomposition of fallen leaves and tree twigs.
7	Agricultural land adjacent to Amanora Township	AL	Vegetable species grown during winter included Onion, Brinjal, and Coriander. The land was left fallow during the summer
8	MSW Site	MSW	Municipal solid waste dumping site involving various activities of segregation and treatment of the township waste to produce compost for agriculture/ gardening purposes

Monitoring photographs for selected sampling locations are presented in **Plate 5.1**.

The representative soil samples were collected from different locations up to a depth of 30-40 cm. The samples were analysed for physico-chemical characteristics, nutrient status, metals content, and microbial parameters of soil. Standard methods have been followed for the analysis of soil samples.

The International Pipette Method *(Black, 1964)* was adopted for the determination of particle size analysis. The textural diagram was generated using the SEE Soil Class 2.0 version based on the United States Department of Agriculture (USDA) classification of soils. Physical parameters such as bulk density, porosity, and water holding capacity were determined by following the KR Box Method *(Keen and Raczkowski, 1921)*.

The chemical characteristics of soil were determined by preparing soil extract in distilled water in a ratio of 1:2 *(as per Jackson procedure, 1967)*. Organic carbon was determined by the *Walkley & Black Method (1972)*. The fertility status of soil in terms of available nitrogen was determined by the Kjeldahl method available phosphorus was determined by Chlorostanus Reduced Molybdo Phosphorus *Blue Colour Olsen's method (1954)* and available potassium was determined by flame photometer method *(Jackson M.L. 1967)*.

Heavy metals in the soil were determined by extracting soil with conc. H_2SO_4 and conc. HNO_3 followed by analysis on ICP-OES.

Agricultural Land Site Soil

Central Green Site Soil

Dog Squad Site Soil

Forest Land Site Soil

MSW Site Soil

R-2 Site Soil

STP Site Soil

Weigh Bridge Soil

Plate 5.1: Photographs Showing Soil Quality Monitoring Locations

5.2 Physical Characteristics of Soil

Air-dried and sieved samples were used for the determination of the physical properties of soil. Particle classification in terms of percentage of sand, silt, and clay and textural class is presented in **Table 5.2.**

Table 5.2: Particle Classification and Texture Class of Soil Samples

Sr.	Sampling Location	Particle Size Distribution (%)			
		Sand	Silt	Clay	Texture Class
Winter Season					
1	Agricultural land	74.0	24	2.0	Loamy sand
2	Dog Squad	74.75	5.25	20	Sandy loam
3	Central Green	74.0	6	20	Sandy loam
4	STP 2	74.85	5.1	20.05	Sandy loam
5	R2	74.02	6	20.02	Sandy loam
6	MSW site	73.36	6.6	20	Sandy loam
7	Weighbridge	74.8	5.2	20.02	Sandy loam
8	Forest land	74.06	5.9	20	Sandy loam
Summer Season					
1	Agricultural land	74.3	5.7	19.96	Sandy loam
2	Dog Squad	74.12	5.9	19.98	Sandy loam
3	Central Green	74.06	6	19.98	Sandy loam
4	STP 2	74.2	5.8	19.96	Sandy loam
5	R2	74.16	5.9	19.94	Sandy loam
6	MSW site	74.16	5.9	19.98	Sandy loam
7	Weighbridge	74.18	5.9	19.94	Sandy loam
8	Forest land	74.18	5.9	19.92	Sandy loam

The soils of both seasons showed slight variation in the percentage of particle size distribution, however, the soils in both seasons were moderately textured varying between sandy loam to sandy clay loam. Sand percentage in the soils of winter and summer sampling ranged between 43.6%-72% and 56.8%-68.8% respectively. However, the textural class of agricultural soils viz., agricultural land (outside the township area) was clay loam, and agriculture land in Amanora was sandy clay in winter sampling and was sandy clay loam in both cases in summer sampling. A textural diagram for the soil under the study area during winter and summer is shown in **Figure 5.2 and Figure 5.3** respectively.

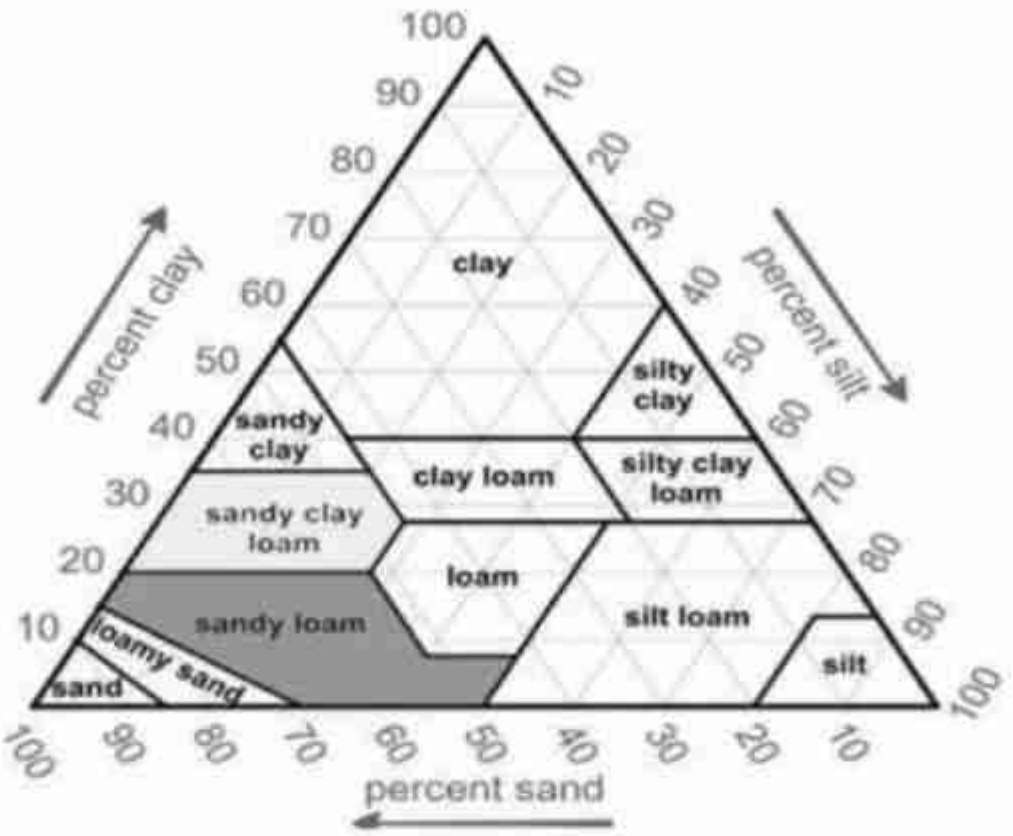


Figure 5.2: Textural Diagram for Soil under Study Area During Winter

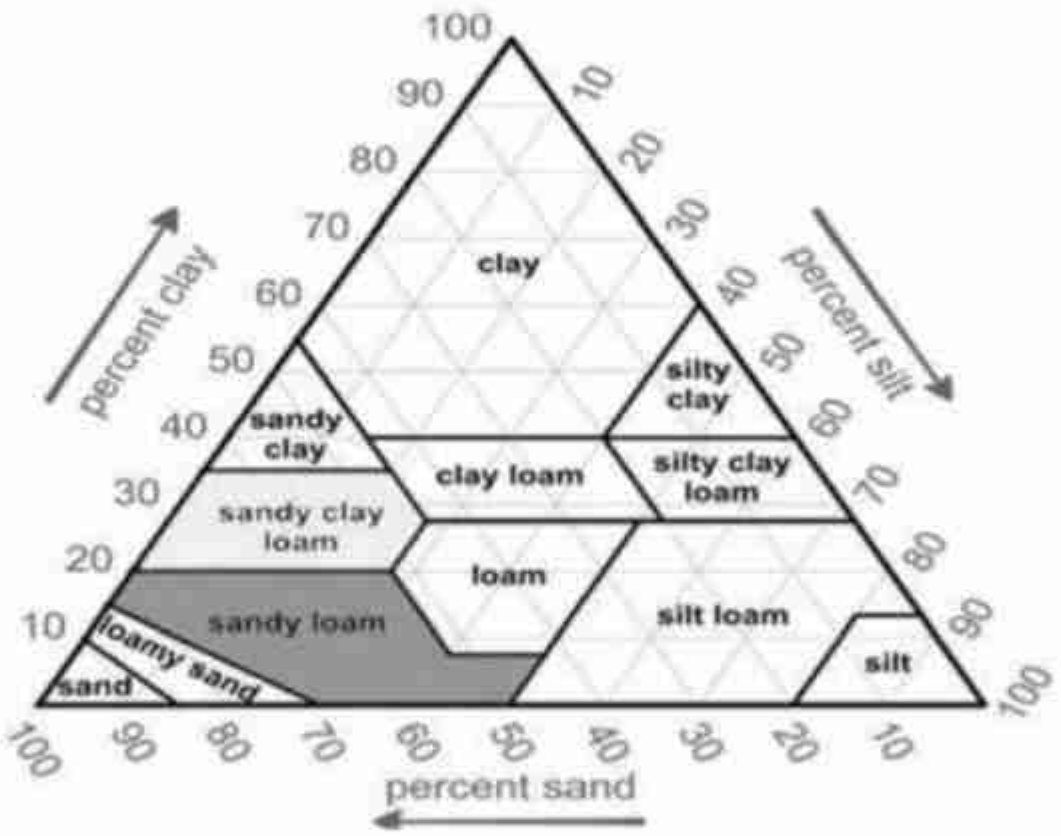


Figure 5.3: Textural Diagram for Soil under Study Area During Summer

The physical characteristics of soils in terms of bulk density, porosity, and water-holding capacity are presented in **Table 5.3.**

Bulk density as an integral value of soil granularity, humus content, and anthropogenic impacts on soil should not exceed the limits given for individual soil types (**Table 5.4**).

Table 5.3: Physical Characteristics of Soils during Winter and Summer

Sr.	Sampling Location	Winter Season			Summer Season		
		Bulk Density (g/cm^3)	Porosity %	Water Holding Capacity %	Bulk Density (g/cm3)	Porosity %	Water Holding Capacity %
1	Agricultural land	1.251	44.89	63.62	1.149	55.26	71.25
2	Dog Squad	1.2505	44.91	61.57	1.282	50	72.5
3	Central Green	1.25075	72.5	51.64	1.298	55.28	61.25
4	STP 2	1.22024	85.37	60.55	1.25	50	93.75
5	R2	1.25375	90	20.01	1.162	51.28	57.5
6	MSW site, Composting	1.2505	55.02	61.81	1.315	41.9	88.75
7	Weighbridge	1.25125	70	65.86	1.25	48.72	72.5
8	Forest land	1.2204	80.47	2.86	1.162	63.41	77.5

Table 5.4: Critical Values of Bulk Density Soil [t.m^{-3}] and Porosity [%] for Different of Soil Texture

Soil texture	Sandy	Loamy sand	Sandy loam	Loam	Clayey loam and clay	Clay
Bulk density	≥ 1.70	≥ 1.60	≥ 1.55	≥ 1.45	≥ 1.40	≥ 1.35
Porosity	≤ 38	≤ 40	≤ 42	≤ 45	≤ 47	≤ 48

The bulk density ranged between 1.22 g/cm^3 to 1.25 g/cm^3 in both seasons which is ideal for sandy loam soils type. The porosity and water-holding capacity of the soils varied slightly in both seasons. The porosity in winter and summer seasons ranged between 44.90%-90% and 41.9%-63.4% respectively, whereas the water holding capacity was found in the range of 2.9% - 65.9% and 41.9% - 63.4% in winter and summer respectively.

5.3 Chemical Characteristics of Soil

The collected soil samples were analysed for various chemical parameters such as pH, electrical conductivity (EC), soluble and exchangeable cations, cation exchange capacity (CEC), exchangeable sodium percentage (ESP), organic carbon content, nutrient status, and heavy metals. The soluble salts were determined from the soil extract (1:2). The soluble salts are expressed in terms of electrical conductivity (EC). The chemical characteristics of soils are given in **Table 5.5.**

The soil pH is an important factor for soil fertility even though its values change dynamically, depending on so-called internal and external factors. It influences the buffering and filtering capacities, the quality of organic substances, nutrient accessibility for plants, and the production of biomass in most crops grown. A majority of arable crops suit the range of slightly acidic to slightly alkaline soil pH- 6 to 7.5 *(Krnáčová, Račko & Bedrna, 1997)*. A pH value lower than 5.5 is undesirable and requires ameliorative lime treatment. Similarly, from the viewpoint of productivity, alkaline soils (pH>8.4) are limiting and require appropriate measures.

In the course of monitoring the study area, the pH of the soils was found to be neutral to slightly alkaline in reaction having a pH in the range of 6.95-7.97 during winter and 6.23-7 during summer. The EC of the soil extract in the study area ranged from 126 µS/cm -558.4 µS/cm and 168.1 µS/cm – 514.6 µS/cm during the winter and summer seasons respectively. It has been observed that there is an increase in the concentration of dissolved salts in the soil in the winter season.

Table 5.5: Chemical Characteristics of Soil Extract (1:2) during Winter and Summer

Sr.	Sampling Location	pH	EC µS/cm	Ca	Mg	Na	K
				meq/l			
Winter Season							
1	Agricultural land	6.95	454.6	0.7	0.8	2.27	0.9
2	Dog Squad	7.76	439.9	1.5	2.3	1.93	0.8
3	Central Green	7.79	296.2	0.7	0.9	1.07	0.89
4	STP 2	7.63	558.4	0.3	0.2	1.49	1.19
5	R2	7.95	186.7	0.7	0.9	0.41	1.09
6	MSW Composting Site	7.83	442.7	1.4	2.0	0.98	1.99
7	Weighbridge	7.86	474.9	1.4	2.1	2.01	0.88
8	Forest land	7.97	126.2	0.7	0.8	0.92	2.34
Summer Season							
1	Agricultural land	7.03	226.5	0.8	1.0	2.43	0.52
2	Dog Squad	6.23	245.7	1.4	2.1	1.97	0.57
3	Central Green	6.75	182.4	0.7	0.9	1.11	0.45
4	STP 2	6.85	514.6	0.4	0.4	1.49	0.78
5	R2	7.06	159.3	0.9	1.0	0.47	0.67
6	MSW site, Composting	6.48	168.1	1.5	2.1	1.07	0.37
7	Weighbridge	6.97	356.1	1.6	2.4	2.07	0.61
8	Forest land	6.88	208.8	0.9	1.1	0.97	1.14

In general, the soil samples in the study area have cation exchange capacities ranging between 29.6-43 C mol (P+) Kg^{-1} and 33.9- 44.9 C mol (P+) Kg^{-1} in winter and summer seasons respectively. Amongst the different exchangeable cations, calcium is prominent followed by magnesium.

Concentrations of cations are shown in **Table 5.6** for both seasons. It has been observed that the concentration of exchangeable sodium has increased in summer as compared to the winter season. Therefore, the Exchangeable sodium percentage (ESP) of the soil samples increased in the summer as compared to the winter season. The ESP varied between 0.8-2.34 and 0.37-1.14 in the winter and summer seasons respectively. Soils from all the locations are normal with respective to alkalinity as the exchangeable sodium percentage of soil is below 15. The classification of soil and its relationship with productivity and absorptivity based on cation exchange capacity is presented in **Tables 5.7** and **5.8** for winter and summer sampling respectively. The soils in both seasons fall under the category of moderate to high productivity and very high absorptivity.

Table 5.6: Cation Exchange Capacity of Soil for Winter and Summer

Sr. No.	Sampling Location	Ca++	Mg++	Na+	K+	CEC	ESP
		M eq/l					
Winter Season							
1	Agricultural land	6.95	454.6	2.27	0.90	34.4	0.9
2	Dog Squad	7.76	439.9	1.93	0.80	63.9	0.8
3	Central Green	7.79	296.2	1.07	0.89	53	0.89
4	STP 2	7.63	558.4	1.49	1.19	47.6	1.19
5	R2	7.95	186.7	0.41	1.09	43.7	1.09
6	MSW site, Composting	7.83	442.7	0.98	1.99	51.7	1.99
7	Weighbridge	7.86	474.9	2.01	0.88	59.5	0.88
8	Forest land	7.97	126.2	0.92	2.34	61.9	2.34
Summer Season							
1	Agricultural land	7.03	226.5	2.43	0.52	37	0.52
2	Dog Squad	6.23	245.7	1.97	0.57	68.9	0.57
3	Central Green	6.75	182.4	1.11	0.45	56.8	0.45
4	STP 2	6.85	514.6	1.49	0.78	52.1	0.78
5	R2	7.06	159.3	0.47	0.67	45.5	0.67
6	MSW site, Composting	6.48	168.1	1.07	0.37	53.4	0.37
7	Weighbridge	6.97	356.1	2.07	0.61	61	0.61
8	Forest land	6.88	208.8	0.97	1.14	63.1	1.14

Table 5.7: Relationship of CEC with Productivity for Winter and Summer

CEC	Range (C mole (p^+) kg-1)	Productivity	Winter Season	Summer Season
			Location Code	Location Code
Very Low	<10	Very Low		
Low	10-20	Low		
Moderate	20-50	Moderate	AL, STP, R2	AL, R2
High	>50	High	DS, CG, MSW, FL, WB, FL	DS, CG, STP, MSW, WB, FL

Table 5.8: Relationship of CEC with Absorptivity for Winter and Summer

CEC	Range (C mole (p^+) kg-1)	Productivity	Winter Season	Summer Season
			Location Nos.	Location Nos.
Limited or Low	<10	Limited or Low		
Moderate	10-20	Moderate		
High	20-30	High		
Very High	>30	Very High	AL, DS, CG, STP, R2, MSW, WB, FL	AL, DS, CG, STP, R2, MSW, WB, FL

5.4 Nutrient Status of Soil

Organic matter present in the soil influences its physical and chemical properties. It commonly accounts for one-third or more of the cation exchange capacity of surface soil and is also responsible for the stability of soil aggregates. The concentration of organic carbon and available nitrogen, phosphorous, and potassium in the soil samples is shown in **Table 5.9** for both seasons.

Total organic carbon (TOC) is the carbon (C) stored in soil organic matter (SOM). Organic carbon (OC) enters the soil through the decomposition of plant and animal residues, root exudates, living and dead microorganisms, and soil biota. SOM is the organic fraction of soil exclusive of non-decomposed plant and animal residues. Nevertheless, most analytical methods do not distinguish between decomposed and non-decomposed residues. SOM is a heterogeneous, dynamic substance that varies in particle size, C content, decomposition rate, and turnover time. Soil Organic Carbon (SOC) is the main source of energy for soil microorganisms. The ease and speed with which SOC becomes available are related to the SOM fraction in which it resides.

Table 5.9: Fertility Status of Soil in Study Area for Winter and Summer

Sr. No.	Sampling Location	Organic Carbon (%)	Available Nitrogen (as N)	Available Phosphorous (as P_2O_5)	Available Potassium (as K_2O)
			Kg/ha		
Winter Season					
1	Agricultural land	2.68	214	0.48	79
2	Dog Squad	1.01	227	0.46	70
3	Central Green	0.75	162	0.34	78
4	STP 2	0.59	154	0.29	104
5	R2	0.79	106	0.72	95
6	MSW site, Composting	0.55	192	0.43	174
7	Weighbridge	1.97	94	0.41	78
8	Forest land	1.01	236	1.37	205
Summer Season					
1	Agricultural land	1.37	183	0.50	46
2	Dog Squad	1.37	194	0.45	50
3	Central Green	0.91	145	0.49	39
4	STP 2	1.27	162	0.27	68
5	R2	0.70	78	0.74	59
6	MSW site, Composting	1.56	63	0.41	33
7	Weighbridge	2.13	75	0.42	53
8	Forest land	2.37	210	1.39	100
Level in Poor Soil		**<0.5**	**<280**	**<23**	**<136**
Level in Medium Soil		**0.5-0.75**	**280-560**	**23-57**	**133-337.5**
Level in Fertile Soil		**>0.75**	**>560**	**>57**	**>337.5**

It is observed that organic carbon in winter was comparatively lower than in the summer season. It ranged between 0.55% - 2.68% in winter and 0.70%- 2.37% in summer. The concentration of available Nitrogen, and phosphorus (as P_2O_5) in soil for winter and summer doesn't have much difference, and potassium (as K_2O) was higher in winter as compared to the summer in most of the soil samples.

The concentration in winter and summer seasons for available nitrogen varied between 94-236 Kg/ha & 63-210 Kg/ha, available phosphorus ranged between 0.29-1.37 Kg/ha and 0.27-1.38 Kg/ha and available potassium ranged between 70-205 Kg/ha & 33-100 Kg/ha during winter and summer respectively. The available potassium concentration was exceptionally high in the case of the Forest land site in the winter season.

The soils were assessed based on organic carbon percent and it was observed that soil samples were under medium to fertile class in winter sampling. However, in summer all the soils were categorized under the fertile class except the R2 site. Soil Nitrogen, in general for both seasons, was poor for all soils. Phosphorus as P_2O_5 is mostly in bound form in the soil. The soils in both seasons have variability in fertility status. In winter sampling all the soils were classified under poor level, whereas in summer, the soils belonged to poor level. Potassium (as K_2O) in both seasons was at poor to medium levels. The forest land soil showed more concentration of nutrients in both these seasons. The fertility status of the soil concerning interpretation at different levels is shown in **Table 5.10**.

Table 5.10: Fertility Status of Soils for Winter and Summer

Parameter	Range	Level of Fertility	Winter 2022 Location & Site Code	Summer 2022 Location & Site Code
Organic Carbon (%)	<0.5	Poor Soil		
	0.5-0.75	Medium Soil	CG, STP, MSW,	R2
	>0.75	Fertile Soil	AL, DS, R2, WB, FL	AL, DS, CG, STP, MSW, WB, FL
Nitrogen (Kg/Ha)	<280	Poor Soil	AL, DS, CG, STP, MSW, WB, FL, R2	AL, DS, CG, STP, MSW, WB, FL, R2
	280-560	Medium Soil		
	>560	Fertile Soil		
P_2O_5 (Kg/Ha)	<23	Poor Soil	AL, DS, CG, STP, MSW, WB, FL, R2	AL, DS, CG, STP, MSW, WB, FL, R2
	23-57	Medium Soil		
	>57	Fertile Soil		
K_2O (Kg/Ha)	<136	Poor Soil	AL, DS, CG, STP, WB, R2	AL, DS, CG, STP, MSW, WB, FL, R2
	133-337.5	Medium Soil	MSW, FL	
	>337.5	Fertile Soil		

The overall fertility status of the soils reveals that the soils belonged to the poor level class in summer but poor to medium soil class in winter season.

5.5 Heavy Metal Content in the Soil

The heavy metals occur in the solution as cations and are absorbed by the negatively charged soil particles. They are held strongly as complex on the surface of the clay, alumino silicates, hydrated oxide, & hummus. In general, adsorption increases with pH. Heavy metal pollution is serious because it can persist for many decades. The heavy metals create problems in nutrient utilization in plants.

In the present study, Soil samples for both seasons were also analyzed for heavy metals such as chromium (Cr), Zinc (Zn), Lead (Pb), Nickel (Ni), Cadmium (Cd), Cobalt (Co), Manganese (Mn), Iron (Fe) and Copper (Cu) using Inductively Coupled Plasma Optical Emission Spectrophotometer (ICP-OES) and their concentration is presented in **Table 5.11.**

Table 5.11: Heavy Metals in Soil samples of Amanora Park town for Winter and Summer Season

Sr. No.	Sampling Location	Heavy Metals (mg/Kg)								
		Cr	Fe	Cu	Zn	Cd	Pb	Mn	Ni	Co
Winter Season										
1	Agricultural land	2.33	793	1.85	1.83	Nil	0.08	15.57	1.29	0.54
2	Dog Squad	1.80	1195	3.69	3.74	Nil	0.43	21.13	1.06	0.78
3	Central Green	2.64	1212	3.05	2.37	Nil	Nil	21.00	1.60	0.81
4	STP 2	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
5	R2	1.97	1080	2.64	2.41	Nil	0.02	17.19	1.18	0.67
6	MSW site, Composting	2.08	1153	3.60	2.74	Nil	0.02	23.44	1.31	0.88
7	Weighbridge	1.49	802	2.03	1.91	Nil	0.04	15.55	0.91	0.51
8	Forest land	2.99	1059	6.53	7.93	Nil	1.29	17.35	1.19	0.64
Summer Season										
1	Agricultural land	1.62	933	2.87	2.96	Nil	0.38	18.59	0.85	0.61
2	Dog Squad	1.68	1007	3.14	3.55	Nil	0.35	19.63	0.93	0.65
3	Central Green	3.73	1038	2.52	2.49	Nil	0.01	18.91	1.89	0.71
4	STP 2	2.97	843	2.00	1.73	Nil	0.03	13.96	1.41	0.50
5	R2	2.52	1160	3.10	2.98	Nil	Nil	20.53	1.41	0.77
6	MSW site, Composting	2.36	745	2.81	3.04	0.01	0.34	14.39	0.97	0.47
7	Weighbridge	1.72	866	2.61	2.61	Nil	0.06	18.13	0.99	0.56
8	Forest land	2.69	833	3.79	5.50	0.01	1.07	14.47	0.90	0.50

The presence of heavy metals at proper pH enhances the microbial activity in soil. The concentration of heavy metals found in the study area for both seasons was almost similar to each other.

5.6 Soil Microbiology

Soil microorganisms play a key role in nutrient transformation. The organic form is transformed into their respective inorganic forms and plants can absorb them for their growth. Physical, chemical, and physico-chemical characteristics of soil and its nutrient status influence the microbial population. Various ecological cycles in the Rhizosphere zone of the plant depend upon the microbiological population. The population of bacteria, fungi, and actinomycetes are the vital components of soils and

they help in maintaining their stability. Microorganisms present in samples of soil are presented in **Table 5.12** as colony-forming units per gram (CFU/g) of soil.

Table 5.12: Microbiological Characteristics of Soil for Winter and Summer

Sr. No.	Sampling Location	TVC	Fungi	Actinomycetes	Rhizobium	Azotobacter
		CFU/g of Soil				
Winter Season						
1	Agricultural land	15.6×10^9	2.5×10^4	30×10^7	7.6×10^7	3.4×10^7
2	Dog Squad	1.0×10^9	13.5×10^4	7.1×10^7	0.8×10^8	0.4×10^7
3	Central Green	1.1×10^9	5.3×10^4	6.1×10^7	4.4×10^7	1.3×10^7
4	STP 2	0.7×10^9	19.3×10^4	14.8×10^7	2.5×10^6	4.8×10^7
5	R2	0.05×10^9	1.7×10^4	7.0×10^7	5.7×10^7	0.1×10^7
6	MSW site, Composting	5.5×10^9	4.1×10^4	24.1×10^7	7.5×10^7	4.9×10^7
7	Weighbridge	2.5×10^9	6.8×10^4	14.6×10^7	4.5×10^7	0.8×10^7
8	Forest land	2.5×10^9	41.5×10^5	12.9×10^7	5.2×10^7	1.4×10^7
Summer Season						
1	Agricultural land	21.5×10^9	TNC	32.8×10^7	9.0×10^7	3.8×10^7
2	Dog Squad	1.8×10^9	6×10^7	5.3×10^7	8.1×10^7	0.2×10^7
3	Central Green	12.5×10^9	5×10^7	5.4×10^7	3.6×10^7	0.7×10^7
4	STP 2	3.2×10^9	7.2×10^7	18.4×10^7	13.5×10^7	4.2×10^7
5	R2	0.6×10^9	2.7×10^7	5.8×10^7	3.6×10^7	0.6×10^7
6	MSW site, Composting	3.5×10^9	1×10^7	34.3×10^7	7.3×10^7	1.8×10^7
7	Weighbridge	5.7×10^9	4×10^7	19.9×10^7	9.6×10^7	0.3×10^7
8	Forest land	5.2×10^9	TNC	7.4×10^7	11.7×10^7	0.3×10^7

Azotobactors are non-symbiotic nitrogen-fixing microorganisms that improve soil fertility by fixing nitrogen in the soil. Fungi also constitute an important part of the microflora of normal soil. They are active in the initial stages of the decomposition of plant residues and actively participate in the process of soil aggregation. The total viable microbial count (TVC) population was almost similar in both sampling periods. It was as high as 15.6×10^9 CFU/g at agricultural land sites in winter and 21.5×10^9 CFU/g at agricultural land in summer sampling. It has been observed that the soil microorganisms are higher in winter sampling than in the summer as the ambient temperature ranged from 27-30°C which is favourable for the growth of microorganisms.

5.7 Status of Soil Quality in Amanora Township During 2018

Details of Sampling Location:

In 2018, soil sampling was done at 9 sites in and around Amanora township in the winter and summer seasons and samples were analysed for physico-chemical parameters and heavy metal content.

Table 5.13 shows the different soil sampling locations in the study area during 2018. The data was collected from the environmental compliance report (NEERI, 2018) submitted about environmental clearance.

Table 5.13: Details of Soil Sampling Locations at Amanora Township in 2018

Sr.	Sampling Locations	Site Characteristics
Within the Township		
1	Site Office (SO)	Samples were collected from the hedge-grown area of shrubs near the canteen building
2	R-2 Sector (R2)	Residential area, the sample was collected from a grass field
3	R-8 Sector (R8)	Residential area, the sample was collected from the garden area
4	MSW Site (MSW)	Municipal solid waste processing site involving various activities of segregation and treatment of the township waste to produce compost for agriculture/gardening purposes
5	STP Site (STP)	Sewage Treatment Plant near the R-2 sector area. The sample was collected from the lawn area
6	Central Green (CG)	Park/Garden area, plantation rich area for aesthetic purpose
Outside the Township		
7	Agricultural Land near Dog Squad (DS)	Maize grown in agricultural land during winter and left fallow in summer
8	Agriculture Adjacent to Amanora Township (AL)	Vegetable species grown during winter included Onion, Brinjal, and Coriander. The land was left fallow during the summer
9	Forest Land (FL)	Forest land was next to the MSW site. Dominant trees were Eucalyptus, Azadirachta, Acacia, and Peltophorum species. Humus formation has also been seen in the area due to the decomposition of fallen leaves and tree twigs.

5.7.1 Soil Quality Status Based on the Assessment Carried Out in 2018 and 2023

In this section, a comparison of soil quality based on productivity, absorptivity, and fertility is represented taking into consideration soil quality data for the years 2018 and 2023. **Table 5.14** shows that the productivity of soil at all sampling sites was moderate in 2018 during the winter and summer seasons. Soil productivity can be defined as the capacity of a soil, in its normal environment, to support plant growth. Because one of the primary components of soil health is the provision of a soil environment that supports biological productivity, we find that soil productivity is directly linked to the concept of soil health. In 2023, the soil quality in Amanora township was found to be improved to a high productivity range at the majority of the sites **(Table 5.14).**

Table 5.14: Productivity of Soil in Amanora Township During Years 2018 and 2023

CEC	Range (C mole (p^+) kg^{-1})	Productivity	Winter Season 2018	Summer Season 2018	Winter Season 2023	Summer Season 2023
			Location Codes	Location Codes	Location Codes	Location Codes
Very Low	<10	Very Low				
Low	10-20	Low				
Moderate	20-50	Moderate	AL, DS, CG, STP, R2, R8, MSW, FL, SO	AL, DS, CG, STP, R2, R8, MSW, FL, SO	AL, STP, R2	AL, R2
High	>50	High			DS, CG, MSW, FL, WB, FL	DS, CG, STP, MSW, WB, FL

Table 5.15 represents a change in the absorptivity of soil collected from various sites during 2018 and 2023. Soils with high CEC can adsorb higher amounts of nutrients. It is observed that the absorptivity of soil at all sites is very high in 2023.

Table 5.15: Relationship of CEC with Absorptivity for Winter and Summer 2018 and 2023

CEC	Range (C mole (p^+) kg-1)	Absorptivity	Winter Season 2018	Summer Season 2018	Winter Season 2023	Summer Season 2023
			Location Codes	Location Codes	Location Codes	Location Codes
Limited or Low	<10	Limited or Low				
Moderate	10-20	Moderate				
High	20-30	High	STP	STP		
Very High	>30	Very High	AL, DS, CG, R2, R8, MSW, FL, SO	AL, DS, CG, R2, R8, MSW, FL, SO	AL, DS, CG, STP, R2, MSW, WB, FL	AL, DS, CG, STP, R2, MSW, WB, FL

Organic matter present in the soil influences its physical and chemical properties. It commonly accounts for one-third or more of the cation exchange capacity of surface soil and is also responsible for the stability of soil aggregates.

The concentration of organic carbon and available nitrogen, phosphorous, and potassium of the soil samples are shown in **Table 5.16** for both the seasons of the year 2018 and 2023.

Table 5.26: Fertility Status of Soils for Winter and Summer 2018 and 2023

Parameter	Range	Level of Fertility	Winter 2018 Location & Site Code	Summer 2018 Location & Site Code	Winter 2023 Location & Site Code	Summer 2023 Location & Site Code
Organic Carbon (%)	<0.5	Poor Soil	SO, R2, R8, STP	--	CG, STP, MSW,	R2
	0.5-0.75	Medium Soil	CG, FL	--	AL, DS, R2, WB, FL	AL, DS, CG, STP, MSW, WB, FL
	>0.75	Fertile Soil	MSW, DS, AL	SO, R2, R8, MSW, STP, CG, DS, AL, FL	--	--
Nitrogen (Kg/Ha)	<280	Poor Soil	SO, R2, R8, MSW, STP, CG, DS, AL	SO, R2, R8, STP	--	--
	280-560	Medium Soil	FL	MSW, CG, DS, AL	--	--
	>560.0	Fertile Soil	--	FL	AL, DS, CG, STP, MSW, WB, FL, R2	AL, DS, CG, STP, MSW, WB, FL, R2
P_2O_5 (Kg/Ha)	<23	Poor Soil	SO, R2, R8, MSW, STP, CG, DS, AL, FL	--	--	--
	23-57	Medium Soil	--	SO, R2, R8	--	--
	>57.0	Fertile Soil	--	MSW, STP, CG, DS, AL, FL	AL, DS, CG, STP, WB, R2	AL, DS, CG, STP, MSW, WB, FL, R2
K_2O (Kg/Ha)	<136	Poor Soil	--	--	AL, DS, CG, STP, WB, R2	AL, DS, CG, STP, MSW, WB, FL, R2
	133-337.5	Medium Soil	R8, CG, AL	--	MSW, FL	--
	>337.5	Fertile Soil	SO, R2, MSW, STP, DS, FL	SO, R2, R8, MSW, STP, CG, DS, AL, FL	--	--

It is observed that in the year 2018, soil fertility was in the highest range at the majority of sites during the summer season concerning organic carbon, phosphorous, and potassium content whereas in the poor to medium range concerning nitrogen content.

In the year 2023, a similar range of soil fertility was observed in the winter and summer seasons. Concerning nitrogen and phosphorous content, soil fertility was found in the highest range at all sites during the winter and summer seasons of 2023. Soil fertility was observed in poor to medium range for organic carbon and potassium content. When compared to the summer of 2018, organic carbon and potassium content was found to deteriorate whereas nitrogen and phosphorous content was found to improve at all sites in 2023.

5.8 Soil Analysis Summary

Soil samples were collected from 8 locations during the winter and summer of 2023, and were analyzed for physical, chemical & microbial parameters as well as for nutrient status and heavy metals content. Among the physical properties, the soils were found moderately textured varying between sandy loams except for the agricultural soil, agricultural land (outside) was sandy loam clay. Soils being friable inconsistently had bulk density ranging between 1.15 g/cm^3-1.31 g/cm^3 in both seasons.

Chemical characterization of the soils showed that the soils of the study area were neutral to slightly alkaline in reaction with conductivity ranging between 126.2 µS/cm- 475 µS/cm and 160 µS/cm-515 µS/cm during winter and summer seasons respectively. The ESP varied between 0.8-2.34 and 0.37-1.14 in the winter and summer seasons respectively. Soils from all the locations are normal concerning alkalinity as the exchangeable sodium percentage of soil is below 15. On the basis relationship of cation exchange capacity with productivity and absorptivity, it was observed that the soils fell under the category of high absorptivity and moderate productivity in both seasons. Overall fertility status of the soil revealed that the soil belonged to moderate to fertile class in summers but poor to moderate class in winters.

The soil samples for both seasons were also analysed for heavy metals such as chromium (Cr), Zinc (Zn), Lead (Pb), Nickel (Ni), Cadmium (Cd), Cobalt (Co), Manganese (Mn), Iron (Fe) and Copper (Cu). The concentration of heavy metals was found almost similar to each other. None of the soils exceeded the Canadian soil quality guideline value for any of the heavy metals.

A study of the soil microbial flora showed that the soil microorganisms are higher in winter sampling than in summer as the ambient temperature ranged from 27-30°C which is favourable for the growth of microorganisms. When compared to soil fertility in 2018, fertility was found to be reduced concerning organic carbon and potassium content whereas nitrogen and phosphorous content was found to improve at all sites in 2023.

Chapter 6

Status of Biological Environment

Chapter 6

Status of Biological Environment

This chapter examines the biological environment in the Township, detailing the Flora and Fauna observed in the study area. The Amanora Park Town Master plan is designed based on eco-friendly aspects and sustainable development. The analysis of secondary data from 2017 to 2023 has been verified during the audit period. Study area biodiversity includes genetic variation within species, species variety, and habitat types. Biological diversity is fundamental to the functioning of natural and human-engineered ecosystems and, consequently, to the ecosystem services provided to human society. Living organisms play central roles in elemental cycles (carbon, nitrogen, etc.), and diversity is crucial as these cycles involve numerous interacting species. Biological communities are reliable indicators of climatic and edaphic factors.

To illustrate basic ecology and biodiversity, bio-monitoring of Amanora Park Township was conducted once during the study period for the following specific objectives:

- Assess the status of the plantation by Amanora Park Management.
- Evaluate the status of floral vegetation and faunal diversity within the study area.
- Identify economically important timber, medicinal plants, and other species.

6.1 Status of Plantation Done by Amanora Park Management

The management of Amanora Township has been carrying out plantations in the township over the years. Details of the planation done during the last five years are given in **Table 6.1**.

Table 6.1: Yearly Plantation Done in the Township During (2016-17 to 2022-23)

Sr.	Year	Total Plantation	Plantation during year	Increase in Plantation (%)
1	2016-17	9181	542	5.9
2	2017-18	9251	70	0.8
3	2018-19	9376	125	1.3
4	2019-20	9569	193	2.0
5	2020-21	9595	26	0.3
6	2021-22	10041	446	4.4
7	2022-23	10338	297	2.9

It is observed that by 2016-17, the total plants (trees) in the township were 9181 Nos., which constantly increased by 0.8 to 2.9% in the last 5 years, the last two years' percent increase is higher by 4.4% and 2.9% (i.e. number of plants in 2021-22 is 10041 and 2022-23 is 10338). The number and type of species available in the township from 2016-17 to 2022-23 are given in **Table 6.2**.

Table 6.2: Status of Plant Species in the Township during the Last Five Years

Sr.	Plant Species	Number of Plants /Trees						
		2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
1	Acasia	1	1	1	1	1	1	1
2	Almond	30	30	30	30	30	30	30
3	Alstonia scholaris	465	465	465	465	465	465	465
4	Areca palm	29	29	29	29	29	29	29
5	Ashoka	101	101	101	101	101	101	113
6	Audumber	6	6	6	6	6	6	6
7	Badam	0	0	0	0	0	0	0
8	Bahunia Species	65	85	91	111	111	150	187
9	Bahunia Tomentosa (Sulpher)	4	4	4	4	4	4	4
10	Bakul	6	6	6	18	18	18	18
11	Bamboo/ Buddha	201	201	201	201	201	201	201
12	Bamboo/Golden	0	0	0	0	0	0	0
13	Bannana	116	116	116	116	116	116	116
14	Bel	0	0	0	0	0	0	0
15	Boganvelia	302	302	302	302	302	302	302
16	Bottle Brush	0	0	0	0	0	0	0
17	Bottle palm	11	11	11	11	11	11	11
18	Brassia Actinophyalla	102	102	102	105	105	105	105
19	Cassia	16	16	22	22	22	52	52
20	Cassia Fistula	0	0	0	0	0	0	0
21	Casurina	1589	1589	1589	1589	1589	1589	1589
22	Cessalpinia	83	83	83	83	83	83	83
23	chafa	1	5	9	14	20	20	20
24	Cherry	9	9	9	9	9	9	9
25	Christmas tree - Arucaria columnaris	15	16	16	16	16	16	16
26	Citrus	13	13	13	13	13	13	13
27	Coconut	55	55	57	57	57	57	57
28	Cordia Sabastina	28	28	28	28	28	28	28
29	Dalimb	12	12	12	12	12	12	12
30	Dillenia indica (Elephant apple)	0	0	0	0	15	255	287
31	Dlbergia sissoo	3	3	3	3	3	3	3
32	Dombia	0	0	0	0	0	0	0

Table 6.2 *(Contd..)*: Status of Plant Species in the Township during the Last Five Years

Sr.	Plant Species	Number of Plants /Trees						
		2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
33	Fanas	4	4	4	4	4	4	4
34	Ficus benghalensis - Wad	115	115	115	115	115	115	115
35	Ficus Benjmina	694	694	694	694	694	694	694
36	Ficus Blackiana	6	6	6	6	6	6	6
37	Ficus -Ficus religiosa	0	0	0	0	0	0	0
38	Ficus Yellow	649	649	649	649	649	649	649
39	Filicium	68	68	68	68	68	68	68
40	Foxtail Palm	281	285	285	285	290	290	290
41	Golden Bottle Brush	164	164	164	164	164	164	164
42	Graphted chafa	156	156	156	156	156	156	156
43	Green Bottle Brush	5	5	5	5	5	5	5
44	Gulmohor	0	0	0	0	0	0	0
45	Jacaranda	62	62	62	62	62	62	62
46	Jacaranda	4	4	4	4	4	4	4
47	Jamun	7	7	7	7	7	7	7
48	Kadamba	2	2	2	7	7	7	7
49	Kadipatta	2	2	2	2	2	2	2
50	Kaduneem	6	9	15	18	18	51	51
51	Karanj (Millettia pinnata)	1	1	1	1	1	35	35
52	Khaya	7	7	7	7	7	7	7
53	Kigelia	44	44	44	44	44	44	44
54	Langestromia	432	437	437	446	446	516	553
55	Magnolia champaka	552	552	552	552	552	552	552
56	Malberry	58	58	58	58	58	58	58
57	Mangifera indica	6	6	6	6	6	6	6
58	Mango	6	6	6	6	6	6	6
59	Manilkara zapota - Chikku	6	6	6	6	6	6	6
60	Markhamia	50	50	75	75	75	75	75
61	Millingtonia	532	532	604	604	604	604	604
62	Mohgani	0	0	0	0	0	0	0
63	Mujkunj	3	3	3	3	3	3	3
64	Nilgiri	38	38	38	38	38	38	38
65	Nyctanthus arbortristis - Parijatak	1	1	1	1	1	1	4
66	Palas - Betua Monosperma	44	44	44	44	44	44	44
67	Pangara	9	9	9	9	9	9	9
68	Parijatak	1	1	1	1	1	1	1
69	Parkin Sonia	57	57	57	57	57	57	57
70	Peltaphorum - Peltophorum pterocarpum	440	440	440	440	440	440	440
71	Phonix Palm	4	4	4	4	4	4	4
72	Phyllanthus emblica - Aawla	8	8	8	8	8	8	8

Table 6.2 *(Contd..)*: Status of Plant Species in the Township during the Last Five Years

Sr.	Plant Species	Number of Plants /Trees						
		2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
73	Pimple	9	9	9	9	9	9	9
74	Plumeria	101	101	101	101	101	101	130
75	Plumeria Alba	25	25	25	25	25	25	37
76	Plumeria Dwarf Singapuri	6	6	6	6	6	6	6
77	Plumeria Pudica	9	9	9	9	9	9	9
78	Plumeria Red flower	73	73	73	73	73	73	73
79	Psidium guajava	1	1	1	1	1	1	1
80	Putranjiva	7	7	7	7	7	7	7
81	Rain Tree	4	4	4	4	4	4	4
82	Raphis palm	17	17	17	77	77	77	143
83	Rubber Tree	35	35	35	35	35	35	35
84	Senegalia catechu	5	5	5	5	5	5	5
85	Silver Oak	470	470	470	470	470	470	470
86	Sita Ashok	27	40	44	54	54	54	87
87	Sitaphul	2	2	2	2	2	2	2
88	Sonchafa Grafted	0	0	0	0	0	0	30
89	Spathodia	0	0	0	5	5	5	10
90	Sterclix Foietda	10	10	10	10	10	10	10
91	Sterculia Alata	126	126	126	126	126	126	126
92	Supari Palm	0	0	0	20	20	20	20
93	Syzygium cumini	5	5	5	5	5	5	5
94	Tabebuia	150	150	150	156	156	156	156
95	Tamarindus indica	6	6	6	6	6	6	6
96	Tecoma	4	24	24	44	44	44	44
97	Terminalia mantaly	0	0	0	15	15	15	15
98	Terminalia Mentallis	1	1	1	1	1	1	1
99	Thevatia	10	10	10	10	10	10	10
100	Thrinax radiata	8	8	8	8	8	8	8
101	Ticoma Gaudichoda	0	0	0	0	0	0	0
102	Umbrella tree	101	101	101	101	101	101	102
103	Vilaiti Chinch	182	182	182	182	182	182	182
Total		**9181**	**9251**	**9376**	**9569**	**9595**	**10041**	**10338**

A perusal of the above table indicates that the dominant tree species planted within the township included Casurina, *Alstonia scholaris, Boganvelia, Ficus Benjmina, Ficus Yellow, Langestromia, Magnolia champaka. Millingtonia, Peltophorum pterocarpum*, Silver Oak, etc. It has been observed that the number of many species like *Dillenia indica (Elephant apple), Spathodia, Karanj (Millettia pinnata), Kaduneem, Raphis palm, Sonchafa Grafted, Bahunia Species*, Bakul, *Cassia,* chafa, Kadamba, Sita Ashok, Supari Palm, *Terminalia mantaly* etc. have been gradually increased in year

2021 to 2023 period. Casurina has also been noticed maximum in number during all these years in the total plantation. Casurina is a timber plant but also an invasive species.

In addition to tree species, plantation concerning shrubs and lawns was also undertaken in the township as detailed in **Table 6.3**.

Table 6.3: Year-wise Shrub Area observed during the year 2017-23 in the Township

Sr.	Year	Lawn Area (Ha)	Lawn Area (%)	Shrub Area (Ha)	Shrub Area (%)	Total Area (Ha)
1	2016-17	5.96	68.5	2.74	31.5	8.70
2	2017-18	6.01	68.5	2.76	31.5	8.77
3	2018-19	6.04	67.9	2.85	32.1	8.89
4	2019-20	6.21	65.7	3.25	34.3	9.45
5	2020-21	6.21	65.4	3.28	34.6	9.49
6	2021-22	6.23	63.9	3.51	36.1	9.74
7	2022-23	6.23	63.9	3.51	36.1	9.74

It was found that the total area under plantation for shrubs and lawns was 8.70 ha in 2016-17, which increased by 9.74 ha in 2022-23. No significant change was noticed during 2020-21 (i.e. 0.25 ha) during the COVID period.

6.2 Status of Floral Vegetation in the Township Area

6.2.1 Sampling Locations

The qualitative assessment of flora and fauna diversity was carried out within the township at seven locations as shown in **Figure 6.1**. Details of sampling locations are given in **Table 6.4** and physical locations are shown in **Plate 6.1**.

Table 6.4: Biological Sampling Locations in the Township

Sr.	Locations	Area Usage	Latitude	Longitude
1	R2- Sector	Residential	18°30'54.09"N	73°56'28.14"E
2	Pawar Public School	Educational	18°30'57.29"	N 73°56'22.79"E
3	Amphitheatre/ Club House	Amenities	18°31'5.55"N	73°56'32.10"E
4	Gateway Site/ Crescent	Construction	18°31'6.28"N	73°56'27.09"E
5	Central Green & G2 Playground (Sports arena)	Park and open space	18°31'2.73"N 18°31'3.00"N	73°56'39.15"E 73°56'43.59"E
6	Stream Area	Open space	Stretch between R2 Sector to Central Green	
7	Amanora Mall	Commercial	18°31'7.89"N	73°56'6.81"E

Figure 6.1: Map of Biological Monitoring Locations at the Township

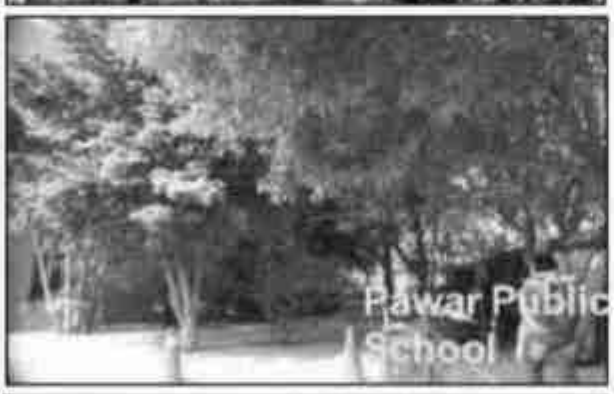


Plate 6.1: Photographs Showing Biological Monitoring Locations at the Township

6.3 Status of Flora

The evaluation of floral diversity in the specified area within the township deviated from the conventional quadrate method. Given the artificial nature of the green space in this limited region, the quadrate method was deemed inappropriate. The assessment of floral diversity involved the systematic listing and observation of various species within the township. The monitoring included recording area-specific data, enumerating the number of species (species richness), and documenting the total plant count, as outlined in **Table 6.5**.

Table 6.5: Total Plant Species and Diversity at Selected Sampling Locations

Sr.	Locations	Usage	Area of the Location (Ha)	Number of species (Species Richness)	Total Number of Plants
1	R2- Sector	Residential	4.58	12	409
2	Pawar Public School	Educational	1.6	38	227
3	Amphitheatre/ Club House	Amenities	2.52	12	200
4	Gateway Site/ Crescent	Residential#	3.24	25	1036
5	Central Green & G2 Playground (Sports arena)	Park and Open Space	7.04	36	952
6	Stream Area	Open space	1.15	27	987
7	Amanora Mall	Commercial	5.77	19	596

Qty increased=construction changed to residential
Source: Secondary data and field visit by NEERI Team

It has been observed that the maximum types of species were found in Pawar Public School and Central Green and G2 Playground followed by Stream Area. The number of plants was maximum at Gateway Site/ Crescent which was changed from construction to residential zone, followed by Central Green and G2 Playground as their usage was for Park and Open Spaces, and in the zone of Stream area and Amanora Mall.

Details of various existing plant species, like tress (94 species), shrubs (23 species), herbs (20 species), and grasses (5 species), and the one observed by the NEERI study Team at different sampling locations in the township is given in **Table 6.6.**

Table 6.6: List of Floral Species (Trees, Shrubs, Herbs & Grasses) in the Township (including observation of study team)

A. List of Trees

Sr.	Plant Common Name	Scientific Name	Family	Observed by the Study Team at the Location
1.	Aawala	*Phyllanthus emblica*	Phyllanthaceae	
2.	Almond	*Prunus dulcis*	Rosaceae	2
3.	Anar	*Punica granatum*	Lythraceae	5
4.	Amaltas	*Cassia fistula*	Fabaceae	5,6
5.	Arand	*Ricinus communis*	Euphorbiaceae	4
6.	Areca Palm	*Dypsis lutescens*	Arecaceae	2,3,4,7
7.	Ashoka	*Saraca asoca*	Fabaceae	5
8.	Audumber	*Ficus racemosa*	Moraceae	4,5,6
9.	Australian Acacia	*Acacia auriculiformis*	Fabaceae	4
10.	Baheda	*Terminalia bellirica*	Combretaceae	7
11.	Bahunia	*Bauhinia variegata*	Fabaceae	6
12.	Bahunia	*Phanera purpurea*	Fabaceae	2,5,6,7
13.	Bakul	*Mimusop selengi*	Sapotaceae	5,6
14.	Banyan Tree	*Ficus bengalensis*	Moraceae	
15.	Bel	*Aegle marmelos*	Rutaceae	
16.	Bottle Palm	*Hyophorbe lagenicaulis*	Arecaceae	7
17.	Casurina	*Casuarina equisetifolia*	Casuarinaceae	
18.	Chamaedorea Palm	*Chamaedorea elegans*	Arecaceae	3
19.	Champa	*Plumeria Spp.*	Apocynaceae	2,5,6,7
20.	Cheeku	*Manilkara zapota*	Sapotaceae	2
21.	Cherry	*Prunus avium*	Rosaceae	
22.	Chinch/ Jungle jalebi	*Pithecellobium dulce*	Fabaceae	4,5
23.	Christmas Tree	*Araucaria araucana*	Araucariaceae	2
24.	Coconut	*Cocos nucifera*	Arecaceae	1,2,5,6,7
25.	Cycas	*Cycas revoluta*	Cycadaceae	1,2,5
26.	Date palm	*Phoenix dactylifera*	Arecaceae	3
27.	Dreaceana	*Dracaena draco*	Asparagaceae	2,3,7
28.	Fanas/ Jack Fruit	*Artocarpus heterophyllus*	Moraceae	6
29.	Ficus	*Ficus benjamina*	Moraceae	5
30.	Ficus	*Ficus blackiana*	Moraceae	6
31.	Ficus	*Ficus variegata*	Moraceae	7
32.	Filicium	*Filicium decipiens*	Sapindaceae	5,6
33.	Florida thatch palm	*Thrinax radiata*	Arecaceae	
34.	Foxtail Palm	*Wodyetia bifurcata*	Arecaceae	7
35.	Giant Bamboo	*Bambusa oldhamii*	Poaceae	3

A. List of Trees *(Contd..)*

Sr.	Plant Common Name	Scientific Name	Family	Observed by the Study Team at the Location
36.	Golden Bamboo	*Phyllostachys aurea*	Poaceae	3,6
37.	Golden Bottle Brush	*Melaleuca bracteata*	Myrtaceae	5,7
38.	Guava	*Psidium guajava*	Myrtaceae	2
39.	Gulmohar	*Delonix regia*	Fabaceae	5,6
40.	Jacaranda	*Jacaranda mimosifolia*	Bignoniaceae	6
41.	Jamun	*Syzygium cumini*	Myrtaceae	2,5
42.	JungaliBadam	*Sterculia foetida*	Malvaceae	
43.	Kadamb	*Neolamarckia cadamba*	Rubiaceae	5
44.	Khaya	*Khaya senegalensis*	Meliaceae	5
45.	Khair	*Senegalia catechu*	Fabaceae	
46.	Kordia	*Cordia sebestena*	Boraginaceae	1,6
47.	Lagerstroemia	*Lagerstroemia indica*	Lythraceae	6
48.	Lagerstroemia	*Lagerstroemia speciosa*	Lythraceae	5,7
49.	Madagascar almond	*Terminalia mantali*	Combretaceae	7
50.	Mahaneem	*Melia azedarach*	Meliaceae	5
51.	Mango	*Mangifera indica*	Anacardiaceae	2
52.	MeethiNeem	*Murraya koenigii*	Rutaceae	2
53.	Millingtonia	*Millingtonia hortensis*	Bignoniaceae	1,6
54.	Muchukund	*Pterospermum acerifolium*	Sterculiaceae	1,6
55.	Mahogany	*Swietania macrophylla*	Meliaceae	
56.	Mulberry	*Morus alba*	Moraceae	
57.	Neem	*Azadirachta indica*	Meliaceae	2,4,5,6,7
58.	Nilgiri	*Eucalyptus obliqua*	Myrtaceae	5,6
59.	Nile tulip	*Markhamia lutea*	Bignoniaceae	
60.	Palm	*Palm sp.*	Arecaceae	7
61.	Pangara	*Erythrina indica*	Fabaceae	
62.	Palas	*Butea monosperma*	Fabaceae	6
63.	Papaya	*Carica papaya*	Caricaceae	2
64.	Parijaat	*Nyctanthus arbortristis*	Oleaceae	1,6
65.	Peepal	*Ficus religiosa*	Moraceae	2,3,4,5,6
66.	Plumbago	*Plumbago europaea*	Plumbaginaceae	3
67.	White frangipani	*Plumeria pudica*	Apocynaceae	
68.	Pongamia	*Millettia pinnata*	Fabaceae	5
69.	Putranjeeva	*Putranjiva roxburghii*	Putranjivaceae	2
70.	RadhaChura	*Peltophorum pterocarpum*	Fabaceae	2,3,4

A. List of Trees *(Contd.)*

Sr.	Plant Common Name	Scientific Name	Family	Observed by the Study Team at the Location
71.	Raphis	*Rhapis excelsa*	Arecaceae	7
72.	Rain Tree	*Albizzia saman*	Fabaceae	
73.	Red Champa	*Plumeria rubra*	Apocynaceae	3
74.	Royal Palm	*Roystonea regia*	Arecaceae	2
75.	Rubber Tree	*Ficus elastica*	Moraceae	
76.	Saptaparn	*Alstonia scholaris*	Apocynaceae	2,3,4,5,6,7
77.	Sausage tree	*Kigelia africana*	Bignoniaceae	
78.	Shareefa	*Annona squamosa*	Annonaceae	2
79.	Sheesham	*Dalbergia sissoo*	Fabaceae	2
80.	Silver Oak	*Grevillea robusta*	Proteaceae	1,3
81.	Sita Ashok	*Saraca indica*	Fabaceae	5,6
82.	Sonchampa	*Magnolia champaca*	Magnoliaceae	2
83.	Spathodea	*Spathodea campanulata*	Bignoniaceae	5,6,7
84.	Sterculia	*Sterculia urens*	Malvaceae	5
85.	Subabool	*Leucaena leucocephala*	Fabaceae	4,5
86.	Supari Palm	*Areca catechu*	Arecaceae	
87.	Tabebuia	*Tabebuia aurea*	Bignoniaceae	1,5,6,7
88.	Tamarind	*Tamarindus indica*	Fabaceae	2
89.	Tecoma	*Tecoma stans*	Bignoniaceae	1,2,4,7
90.	Terminalia	*Terminalia catappa*	Combretaceae	7
91.	Washingtonia Palm	*Washingtonia robusta*	Arecaceae	7
92.	Umbrella tree	*Brassia actinophylla*	Araliaceae	7
93.	Weeping fig	*Ficus benjamina*	Moraceae	5,7
94.	Yellow Bells	*Tecoma gaudichaudi*	Bignoniaceae	7

1: R2 Sector, 2: PP School, 3: Club House, 4: Gateway Construction Site,
5: Central Green& G2 Play Ground, 6: Stream area, 7: Amanora Mall

B. List of Shrubs

Sr.	Plant Common Name	Scientific Name	Family	Observed by the Study Team at the Location
1.	Acalypha	Acalypha	Euphorbiaceae	1
2.	Agave	Agave americana	Verbenaceae	5
3.	Bougainvillea	Bougainvillea spectabilis	Nyctaginaceae	3
4.	Bottle Brush	Callistemon citrinus	Myrtaceae	6
5.	Cassia	Cassia Spp.	Fabaceae	6
6.	Citrus	Citrus limon	Asteraceae	2
7.	Duranta	Duranta erecta	Rutaceae	2

B. List of Shrubs *(Contd.)*

Sr.	Plant Common Name	Scientific Name	Family	Observed by the Study Team at the Location
8.	Dombia	Dombeya wallichii	Malvaceae	
9.	Dwarf Gulmohar	Caesalpinia pulcherrima	Fabaceae	
10.	Golden Shower	Pyrostegia venusta	Bignoniaceae	
11.	Hibiscus	Hibiscus rosa-sinensis	Verbenaceae	2
12.	Ixora	Ixora coccinea	Malvaceae	3
13.	Juhi	Jasminum auriculatum	Oleaceae	2
14.	Kaner	Cascabela thevetia	Apocynaceae	4,5
15.	Lantana	Lantana camara	Verbenaceae	1,3,4
16.	Mogra	Jasminum sambac	Solanaceae	1
17.	Parthenium	Parthenium hysterophorus	Apocynaceae	1
18.	Pedalenthis	Euphorbia tithymaloides	Verbenaceae	
19.	Pedilanthus	Euphorbia tithymaloides	Asparagaceae	3,5
20.	Raatraani	Cestrum nocturnum	Apocynaceae	3
21.	Rose	Rosa damascena	Euphorbiaceae	2
22.	Slender goldshower	Galphimia gracilis	Malpighiaceae	7
23.	Vilaytikikar	Parkinsonia aculeata	Fabaceae	

1: R2 Sector, 2: PP School, 3: Club House, 4: Gateway Construction Site,
5: Central Green& G2 Play Ground, 6: Stream area, 7: Amanora Mall

C. List of Herbs

Sr.	Plant Common Name	Scientific Name	Family	Observed by the Study Team at the Location
1.	Aloe	*Aloe vera*	Asteraceae	2
2.	Asparagus	*Asparagus officinalis*	Asparagaceae	3,7
3.	Banana	*Musa paradisiaca*	Musaceae	
4.	Basil	*Ocimum tenuiflorum*	Lamiaceae	2
5.	Bird of Paradise	*Strelitzia reginae*	Asteraceae	3
6.	Chlorophyttum	*Chlorophytum borivilianum*	Solanaceae	7
7.	Creeping Fig	*Ficus pumila*	Poaceae	7
8.	Curtain creeper	*Vernonia elaeagnifolia*	Araceae	7
9.	Genda	*Tagetes erecta*	Asparagaceae	2
10.	Green Chilli	*Capsicum annuum*	Strelitziaceae	2

C. List of Herbs *(Contd.)*

Sr.	Plant Common Name	Scientific Name	Family	Observed by the Study Team at the Location
11.	Kava	*Piper methysticum*	Passifloraceae	7
12.	Lemon grass	*Cymbopogon citratus*	Asparagaceae	2
13.	Lumina	*Aglaonema Lumina*	Asparagaceae	7
14.	Passion Flower	*Passiflora incarnata*	Asteraceae	5
15.	Philodendron	*Philodendron bipinnatifidum*	Moraceae	2
16.	Rhoeo	*Tradescantia spathacea*	Commelinaceae	7
17.	Sonchus	*Sonchus oleraceus*	Araceae	1
18.	Spider Lilly	*Hymenocallis caribaea*	Amaryllidaceae	1
19.	Syngonium	*Syngonium podophyllum*	Araceae	7
20.	Zebra plant	*Calathea zebrina*	Marantaceae	7

1: R2 Sector, 2: PP School, 3: Club House, 4: Gateway Construction Site,
5: Central Green& G2 Play Ground, 6: Stream area, 7: Amanora Mall

D. List of Grasses

Sr.	Plant Common Name	Scientific Name	Family	Observed by the Study Team at the Location
1.	Cynodon (Doob Grass)	Cyanodon dactylon	Poaceae	1,2,5
2.	Pampas Grass	Cortaderia selloana	Poaceae	3
3.	Phosphyllum	Paspalum notatum	Poaceae	5
4.	Ribbon Grass	Phalaris arundinacea	Poaceae	3
5.	Runner Grass	Stenotaphrum secundatum	Poaceae	1

1: R2 Sector, 2: PP School, 3: Club House, 4: Gateway Construction Site,
5: Central Green& G2 Play Ground, 6: Stream area, 7: Amanora Mall

From the above table, it has been found that the variety of plant species was maximum in Central Green, Pawar Public School, and Amanora Mall. Further, during the field visit it was observed that the common roadside trees planted in the Township were Peltophorum pterocarpum, Pithecellobium dulce, Alstonia scholaris, Azadirachta indica, etc. Some of the plant species observed in the township area are shown in **Plate 6.2.**

Red Pulmeria

Sanpdragon

Cheeku

Bahunia

Fig (Gooler)

Sagon (Teak)

Orange Trumpet

Banyan Tree

Plate 6.2: Some of the Plant Species Observed in the Township

6.4 Status of Fauna

The NEERI team evaluated the faunal diversity in the township through on-site observations, utilizing a digital camera to document various faunal species. A local expert joined the study team to aid in the identification of different species. Avifaunal observations specifically took place in the morning hours from 5 to 9 am.

6.4.1 Avifauna

The study area boasts a plentiful and varied population of avifauna. Among the birds observed during the initial field study were species such as the *Spangled drongo* (Drongo), *Dicrurus paradiseus* (Racket-tail Drongo), *Alcedoatthis* (Common Kingfisher), *Bubulcus ibis* (Cattle Egret), and others, as detailed in **Table 6.7**. **Plate 6.3** showcases some of these species.

Table 6.7: List of Avifauna Observed in the Township during the Study Period

Sr.	Common Name	Scientific Name	Family
1.	Drongo	Spangled drongo	Dicruridae
2.	Racket-tail Drongo	Dicrurus paradiseus	Dicruridae
3.	Golden Oriolus	Oriolus kundoo	Oriolidae
4.	Oriental Magpie Robin	Copsychus saularis	Muscicapidae
5.	Green Bee-Eater	Merops orientalis	Meropidae
6.	Ashy- crowned sparrow lark	Eremopterix griseus	Alaudidae
7.	Common Kingfisher	Alcedoatthis	Alcedinidae
5.	Laughing Dove	Spilopelias enegalensis	Columbidae
9.	Cattle egret	Bubulcus ibis	Ardeidae
10.	Common iora	Aegithina tiphia	Aegithinidae
11.	Cormorant	Microcarbo melanoleucos	Phalacrocoracidae
12.	Sun Bird	Aethopyga vigorsii	Nectariniidae
13.	Butterflies	-	Miscellaneous

Cattle Egret

Common Myna

Common Raven

Common Drongo

Laughing Dove

Wagtail

Yellowhammer

Kingfisher

Plate 6.3: Avifauna Species Observed in the Township

6.4.2 Other Faunal Species

In addition to diverse avian species, the township also exhibited a variety of other fauna, including dogs, cats, garden lizards, peacocks, squirrels, rats, and snakes. **Plate 6.4** shows some of these species. Various types of butterflies were also noted in the central green area.

Fan-throated Lizard

Domestic Cats

Squirrel

Peacock

Domestic Dogs

Domestic Cattles

Plate 6.4: Other Fauna Species Observed in the Township

6.5 Identification of Economically Important Timber, Medicinal Plants and Other Species

Plantation in the township has been conducted with consideration for the ethnobotanical usefulness of diverse trees, shrubs, herbs, climbers, and grass species. **Table 6.8** displays the roster of plant species in the study area that possess economic value. Approximately 20 medicinal plants are identified in this region.

Table 6.8: Importance of Various Plant Species with their Characteristics in the Township

Sr.	Plant Species	Characteristics
1	Acacia	Seeds contain as much as 25% more protein than common cereals Acacia gum is used as an emulsifier in food
2	Almond	Edible (Fruit bearing)
3	Alstonia scholaris	Medicinal Plant; useful in the manufacture of pencils
4	Areca palm	According to NASA, it filters xylene and toluene from the air
5	Ashoka	Vulnerable Species
6	Audumber	Medicinal Plant
7	Bahunia species	Flowering Plant
8	Bahunia tomentosa	Source of food, medicines, and dye
9	Bakul	Medicinal Plant
10	Bamboo/ Buddha	Commercial timber
11	Bamboo/Golden	Ornamental also planted for erosion control
12	Bannana	Edible, Medicinal Plant
13	Bel	Edible, Medicinal Plant
14	Boganvellia	Ornamental Plant
15	Bottle palm	Ornamental Plant
16	Cassia	Ornamental and Medicinal Plant
17	Casurina	Wood is used commercially for shingles or fencing
18	Caesalpinia	Ornamental Plant
19	Chafa	Ornamental Plant
20	Cherry	Edible, in manufacturing fine furniture
21	Christmas tree	Ornamental Plant
22	Citrus	Edible, Fragrance
23	Coconut	Edible Fruit
24	Cordia sabastina	Ornamental Plant
25	Dalimb	Edible plant
26	Dalbergia sissoo	Used as timber, fuel wood.
27	Dombia	Ornamental Plant
28	Fanas	Edible (Fruit bearing)
29	Ficus benghalensis	Edible (Fruit bearing)
30	Ficus benjmina	Ornamental Plant
31	Ficus blackiana	Ornamental Plant
32	Ficus religiosa	Medicinal Plant
33	Filicium	Fragrant flowers or leaves
34	Golden Bottle Brush	Ornamental Plant
35	Graphted chafa	Ornamental Plant
36	Green Bottle Brush	Ornamental Plant
37	Gulmohor	Ornamental Plant
38	Jamun	Edible, Medicinal Plant
39	Kadamba	Ornamental Plant
40	Kadipatta	Edible, Medicinal Plant

Table 6.8 *(Contd..)*: Importance of Various Plant Species …in the Township

Sr.	Plant Species	Characteristics
41	Kaduneem	Medicinal Plant
42	Karanj	Fuel Plant
43	Khaya	To feed cattle
44	Kigelia	Ornamental Plant
45	Langestromia	Used in landscaping and gardening as screens, lawn specimens, shrub borders, and container plants
46	Magnolia champaka	For fragrance, timber, and also an ornamental plant
47	Mulberry	Edible Used in silk industries and for food pigment
48	Mangifera indica	Edible, medicinal and timber
49	Manilkara zapota	Fruit-bearing Plant
50	Markhamia	Ornamental Plant
51	Millingtonia	Ornamental, Fragrance, and Timber
52	Mohgani	Used for musical instruments, Invasive species
53	Muchkund	Ornamental Plant
54	Nilgiri	Basis for several industries, such as sawmilling, pulp, charcoal, etc., invasive species
55	Nyctanthus arbortristis	Fragrance, Medicinal plant
56	Palas	Used for leather and dye
57	Parkin Sonia	Ornamental Plant
58	Peltaphorum	Ornamental, Fodder
59	Phonix Palm	Edible, Fruit Bearing
60	Phyllanthus emblica	Commercially important, Edible and Medicinal
61	Pimple	Medicinal Plant
62	Psidium guajava	Edible, Fruit Bearing, and medicinal
63	Rain Tree	Ornamental Plant
64	Rubber Tree	Commercially useful
65	Senegalia catechu	Food, Fodder, Wood, Medicinal Value
66	Sitaphul	Edible, Fruit bearing Plant
67	Spathodia	Ornamental Plant
68	Sterclix foietda	Oil plant (Biofuel)
69	Sterculia alata	Ornamental Plant
70	Supari Palm	Popular for chewing throughout some Asian countries
71	Syzygium cumini	Edible (Fruits) and Medicinal Plant
72	Tabebuia	Flowering and Timber
73	Tamarindus indica	Edible Plant
74	Terminalia mentallis	Ornamental Plant
75	Thevatia	Ornamental but poisonous, used in biological pest control
76	Thrinax radiata	In broom construction, handicrafts, and food wrapping
77	Umbrella tree	Ornamental Plant
78	Vilaiti Chinch	Edible and Traditional Medicine

6.6 Summary of Biological Environment

During the primary survey, seven sampling locations were selected within the township for listing and identifying different flora and fauna species. Flora's study showed that the variety of plant species was maximum in Central Green, Pawar Public School, and Amanora Mall. It has been observed that the common roadside trees planted in the Township were Peltophorum pterocarpum, Pithecellobium dulce, Alstonia scholaris, Azadirachta indica, etc.

The Avifauna population was found to be rich and diverse within the township. Common bird species seen during field observation were *Spangled drongo* (Drongo), *Dicrurus paradiseus* (Racket-tail Drongo), *Alcedo atthis* (Common Kingfisher), *Bubulcus ibis* (Cattle egret), etc.

Among the tree plantation, different types of plant species have been planted within the township. They include medicinal plants, ornamental plants, and edible plants. Timber-yielding plants were also found within the township during the primary survey in 2023. There were prominent plant species that were found to be invasive namely; Alstonia scholaris, Boganvelia, Casurina, Ficus Benjmina, Ficus Yellow, Foxtail Palm, Langestromia, Magnolia champaka, Millingtonia, Peltaphorum- Peltophorum pterocarpum, Silver Oak. From 2021 to 2023 the percent number of increased plant species for Dillenia indica (Elephant apple), Sonchafa Grafted, Spathodia, Karanj (Millettia pinnata), Kaduneem. It has also been noticed that the maximum number of Casurina was found, around 16.5% in the last cumulative five years of the total tree plantation.

It is observed that by 2016-17, the total plants (trees) in the township were 9181 Nos., which constantly increased by 0.8 to 2.9% in the last 5 years, the last two years' percent increase is higher by 4.4% and 2.9% (ie. number of plants in 2021-22 is 10041 and 2022-23 is 10338). The selected sampling location shows the species richness for the residential area is around 12-25 (total number of plants 409-1036); whereas for park and open space is 27-36 (total number of plants 952 to 987) and commercial area having 19 (total number of plants 596). Further, the total area under shrub and lawn plantation over the years was 8.70 to 9.74 Ha. The percentage of lawn area has slightly decreased by 68.5% to 63.9% over the last five years, and in the case of shrub percent, it has increased by 31.5% to 36.1%.

Thus, it can be concluded that the ecology and biodiversity of Amanora Park Township are well-developed and well-maintained by the management. Further, additional plantation/ greening can be done, wherever possible in the township.

Chapter 7

Traffic Movement and Related Pollution in the Township

Chapter 7

Traffic Movement and Related Pollution in the Township

The development of residential townships necessitates transport infrastructure for residents' well-being. Vehicle movement results in the emission of air pollutants, potentially increasing pollution levels. Assessing the impact of vehicle movement on air quality involves using air quality dispersion modeling, a mathematical simulation of how pollutants disperse and affect ambient air quality. This modeling estimates the relationship between pollution sources and their effects, assisting air quality managers in identifying contributions and designing effective strategies to reduce harmful pollutants. This chapter evaluates township traffic load by collecting traffic count data at various locations and estimating pollution emissions. These estimates are later incorporated into the air quality model along with meteorological data to predict pollutant concentrations.

7.1 Transport Infrastructure in the Township

7.1.1 Road Network in the Township

The township is specifically designed to function as an independent enclave providing essential services for human settlement. The primary entry and exit points are located at Amanora Mall, featuring a 30 m wide road with minimal congestion. Two separate entry and exit points exist for the mall's blocks. An 18 m wide road connects the township to the mall exit road, merging into a 26 m wide road within the township that links different sectors. Internal roads, 18 m wide, connect various towers. All roads in the township are tar roads.

The east exit road connects to Manjri village, and the south exit road connects to Hadapsar road. The road linking Sanik City (Victory Tower) and R-25 with the township is somewhat well-maintained. A railway line to the north, originating from Manjari village through Hadapsar and heading to Pune Junction Railway station, disconnects the Sanik City tower from the rest of the township.

Amanora Township boasts a robust road infrastructure, particularly the Crescent Roads, with a total width of 26 m and a length of approximately 1.2 km. The roads adhere to the Ministry of Road, Transport, and Highways (MoRTH) norms, utilizing bituminous material for construction. Bituminous roads are preferred over concrete ones to reduce tire abrasion, ensure a smooth ride, and prevent skidding accidents during the monsoon season. All roads have pavements on both sides, shaded by trees. Special zones for cyclists on the pavements aim to promote cycling, and the roads feature two lanes to prevent traffic snarls. **Figure 7.1** illustrates the traffic flow of Amanora Park Township.

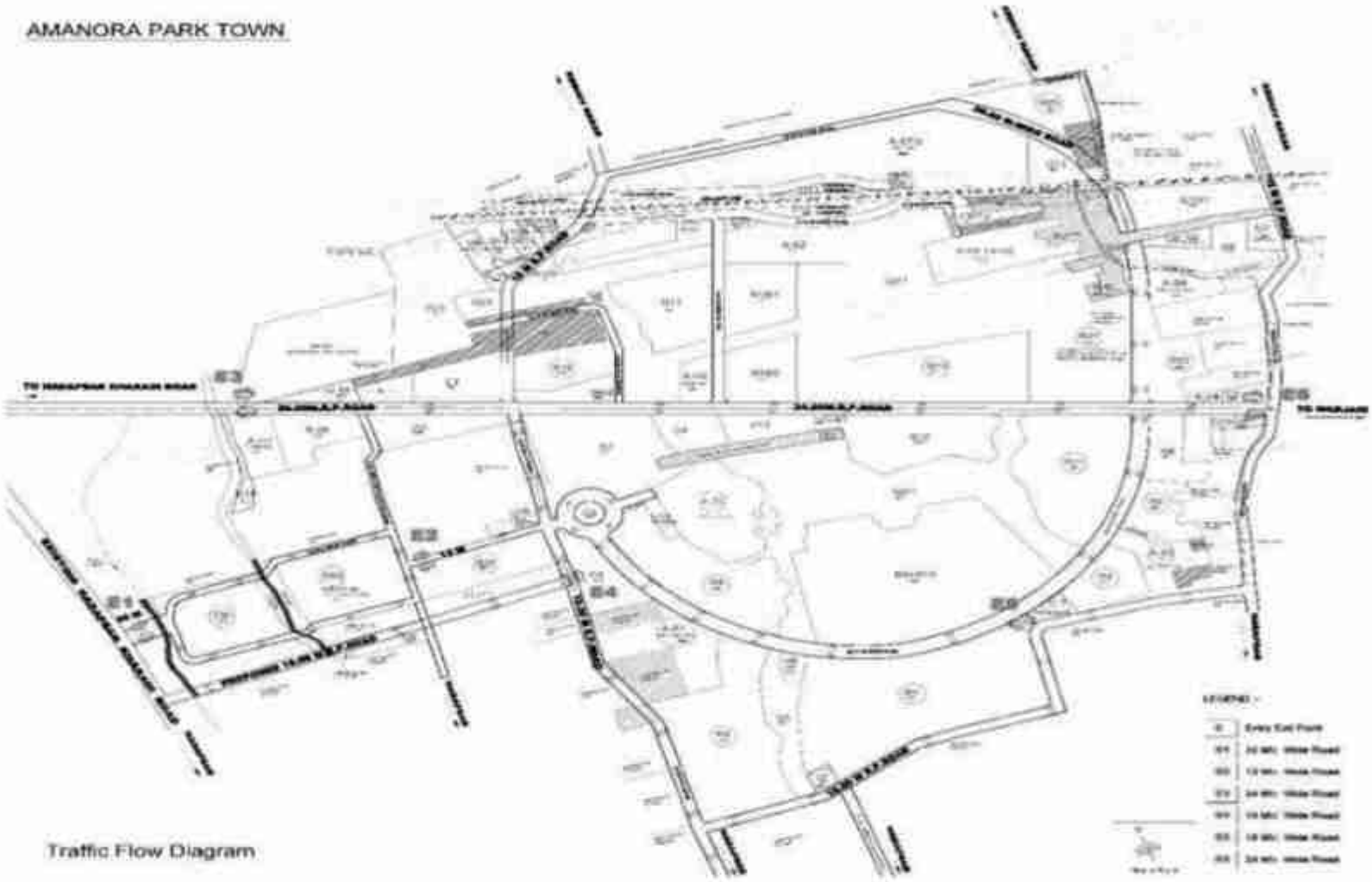


Figure 7.1: Traffic Flow Diagram for Amanora Township

7.1.2 Traffic Movement in the Township

The traffic count data has been collected from four main locations of the Township as described in **Table 7.1**. For Traffic count, the video recording was carried out for two seasons (Winter: 14-15, Jan.23) and (Summer: 18-19, Apr.23) at Mall Gate, Material Gate, and Crescent Road (PP School Chowk) which are faced towards the roadside.

Table 7.1: Traffic Movement Monitoring Location in the Township

Sampling Locations	Traffic Movement	Road Width
Mall Entry & Exit Gate (Plaza Mall)	Two Way	30 m
Magarpatta Road to Malwadi Road	Two Way	24 m
Township Entry (Reception Gate)	Two Way	18 m
Crescent Road	Two Way	26 m

The traffic data recorded under different categories of vehicles at selected locations during the morning (7:00 am-11:00 am) and evening (5:00 pm -9:00 pm) hours of the day is summarized in **Table 7.2.**

Table 7.2: Hourly Traffic Density at Different Locations in the Township

Sr. No.	Location	Total No. of Vehicles per hour					Total	PCU
		2-W	3-W	4-W	Truck / Mini Truck	Bus/ Mini Bus		
Morning Peak Hour (07:00 am - 11:00 am) –Winter Season (14-15, Jan.23)								
1.	Mall Entry & Exit Gate	3336	353	647	72	44	4452	3016
2.	Magarpatta -Malwadi Rd	3439	306	692	44	64	4545	3042
3.	Township Entry (Recep. Gate)	1087	53	274	22	37	1473	1048
4.	Crescent Road	3791	449	1609	128	28	6005	4422
	Total	**11653**	**1161**	**3222**	**266**	**173**	**16475**	**11527**
	Percentage	**70.7**	**7.0**	**19.6**	**1.6**	**1.1**		
Evening Peak Hours (5:00 pm - 9:00 pm) - Winter Season (14-15, Jan.23)								
1.	Mall Entry & Exit Gate	2253	277	784	61	14	3389	2413
2.	Magarpatta -Malwadi Rd	4041	357	814	60	30	5302	3462
3.	Township Entry (Recep. Gate)	1275	65	411	19	15	1785	1216
4.	Crescent Road	4745	569	1714	90	20	7138	4986
	Total	**12314**	**1268**	**3723**	**230**	**79**	**17614**	**12075**
	Percentage	**69.9**	**7.2**	**21.1**	**1.3**	**0.4**		
Morning Peak Hour (07:00 am - 11:00 am) –Summer Season (18-19, Apr.23)								
1.	Mall Entry & Exit Gate	2250	180	405	38	70	2943	2034
2.	Magarpatta -Malwadi Rd	2438	153	349	63	7	3010	1931
3.	Township Entry (Recep. Gate)	818	30	155	29	26	1058	759
4.	Crescent Road	2739	235	1044	36	20	4074	2817
	Total	**8245**	**598**	**1953**	**166**	**123**	**11085**	**7541**
	Percentage	**74.4**	**5.4**	**17.6**	**1.5**	**1.1**		
Evening Peak Hours (5:00 pm - 9:00 pm) - Summer Season (18-19, Apr.23)								
1.	Mall Entry & Exit Gate	4015	291	1002	42	14	5364	3469
2.	Magarpatta -Malwadi Rd	3370	293	944	43	4	4654	3063
3.	Township Entry (Recep. Gate)	1281	72	583	36	9	1981	1431
4.	Crescent Road	4787	439	2683	61	15	7985	5744
	Total	**13453**	**1095**	**5212**	**182**	**42**	**19984**	**13706**
	Percentage	**67.3**	**5.5**	**26.1**	**0.9**	**0.2**		

* PCU – Passenger Car Unit

In the winter season, the morning peak hours recorded a total of 16,475 vehicle movements, while in the summer season, it was 11,085. In contrast, during the evening, the counts were 17,614 in winter and 19,984 in summer. The traffic volume was higher in the evening compared to the morning hours.

Additionally, the Passenger Car Unit (PCU) during the morning hours was 11,527 in winter and 7,541 in summer. In the evening, the PCU counts were 12,075 in winter and 13,706 in summer. Out of the total vehicles, the 2 Wheelers proportion was the maximum, i.e. 67.3-74.4%, followed by cars of 17.6-26.1%, and 3 Wheelers of 5.4-7.2%, as shown in **Figure 7.2**.

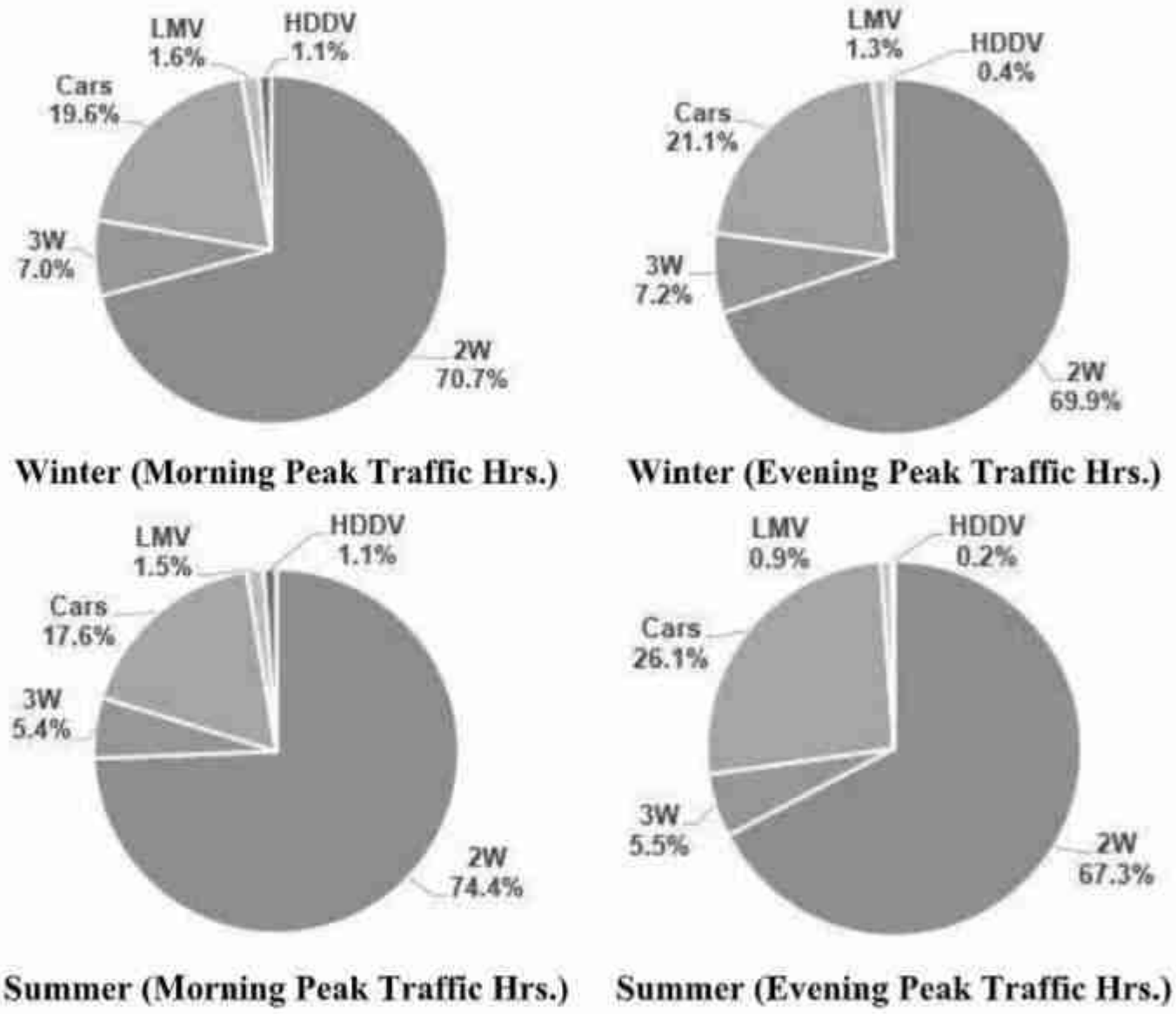


Figure 7.2: Percent Share of Vehicles during Morning and Evening Peak Traffic Hours

7.2 Vehicular Emission Inventory

The pollutant emission rate from vehicle exhaust has been estimated using vehicle emission factors *(ARAI, 2007)*. These emission factors are based on average speed and standard Indian driving cycle on chassis dynamometers. The emission rates have been calculated using the equation;

$$ER(i) = \sum(j) \sum(k) N(j) \times EF(i, j) \times L$$

Where,

ER (i) = Emissions rate of pollutant 'i',(g/s); N (j) = Number of vehicles of a particular type 'j'

EF (i, j) = Emission factor for pollutant 'i' in the vehicle type 'j'

j = Type of vehicle (2W-2S & 4S, 3W, 4W-Petrol & Diesel, driven, Bus, Truck)

L = Road length (m).

According to the vehicle count and survey, total 4 wheelers cars are distributed as 45% petrol, 33% diesel, and 20% CNG. Heavy-duty trucks make up 60%, while buses constitute 40%. Vehicle exhaust emission factors for different categories of vehicles registered after the year 2005 (ARAI, 2008) are given in **Table 7.3.** The estimated average hourly pollutants emission load due to traffic movement at select locations in the Township is presented in **Table 7.4**.

Table 7.3: Pollutant Emission Factor for Different Types of Vehicles

Sr	Types of Vehicles	Emission Factor (g/km)		
		PM	NOx	CO
1.	2 W	0.013	0.150	0.720
2.	3 W -CNG	0.118	0.190	0.690
3.	4 W -Petrol	0.002	0.090	0.840
4.	4 W -Diesel	0.015	0.280	0.060
5.	4 W -CNG	0.006	0.740	0.060
6.	LCV –Diesel	0.475	2.12	3.66
7.	BUS -Diesel	0.300	6.530	3.920
8.	Truck- Diesel	1.240	9.300	6.000

Sources: Emission Factors

- Air Quality Monitoring Project-Indian Clean Air Programme (ICAP)- The Automotive Research Association of India (ARAI), March 2008
- Status of Pollution Generated from Road Transport in Six Mega Cities, CPCB, March 2015
- Air Quality Monitoring, Emission Inventory & Source Apportionment Study -Indian Cities, February 2011

Table 7.4: Estimated Hourly Pollutants Emission Load due to Traffic Movement at Select Locations in the Township

	Time	Emission Load (g/hour)					
		PM (Win)	PM (Sum)	NOx (Win)	NOx (Sum)	CO (Win)	CO (Sum)
Traffic Movement at Mall Entry & Exit Gate							
1.	Morning Hrs.	39	37	317	321	781	686
2.	Evening Hrs.	28	31	209	285	611	941
Traffic Movement at Magarpatta -Malwadi Rd							
1.	Morning Hrs.	51	30	433	240	996	766
2.	Evening Hrs.	43	32	348	290	1029	989
Traffic Movement at Township Entry (Recep. Gate)							
1.	Morning Hrs.	11	8	97	72	180	141
2.	Evening Hrs.	7	7	67	67	165	180
Traffic Movement at Crescent Road							
1.	Morning Hrs.	68	56	549	541	1631	1472
2.	Evening Hrs.	75	61	678	646	1955	1767

*Per hour average pollutant emission load in each shift
Morning Hrs. (7:00 am-11:00 am) and Evening Hrs. (5:00 pm -9:00 pm)

The average PM emission load in winter and summer during the morning at Mall Entry & Exit Gate is estimated to be 38 g/hr and in the evening 29 g/hr; whereas NOx is around 319 and 247 g/hr and CO emission load is 734 and 776 g/hr respectively.

The Magarpatta -Malwadi Rd average PM emission load is estimated at around 40 and 37 g/hr for morning and evening for both seasons. The respective concentration load for NOx is around 337 and 319; whereas CO is reported to be 881 and 1009 respectively.

At Township Entry (Reception Gate) the estimated average PM load is less than 9 and 7 g/hr during morning and evening for both seasons. The hourly NOx is 84 and 67 g/hr; while CO is 160 and 173 g/hr.

The maximum average emission load of PM at Crescent Road is worked out as 62 and 68 g/hr in morning and evening; whereas NOx concentrations are 545 and 662 g/hr and CO is coming around 1552 and 1861 for both seasons during morning and evening.

7.3 Air Quality Dispersion Modelling for Traffic Emissions

7.3.1 Details of Air Quality Dispersion Model (AERMOD)

AERMOD is a USEPA-recommended model for air pollution dispersion and was adopted by MoEF&CC. AERMOD was developed by AMS/EPA Regulatory Model Improvement Committee (AERMIC). It is a steady-state plume model. The stable boundary layer (SBL), assumes the concentration distribution to be Gaussian in both the vertical and horizontal direction, and in the convective boundary layer (CBL), the horizontal distribution is also assumed Gaussian, but the vertical distribution is described with a bi- Gaussian probability density function. This behaviour of the concentration distributions in the CBL was demonstrated by Willis and Deardorff (1981) and Briggs (1993). The AERMOD model applies to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources).

The AERMOD has two pre-processors for meteorological data and surface data, as shown in **Figure 7.3**. AERMET calculates the PBL parameters: friction velocity (u*), Monin- Obukhov length (L), convective velocity scale (w*), temperature scale (θ*), mixing height (zi), and surface heat flux (H). All these parameters are transferred to AERMOD to calculate vertical profiles of wind speed (u), lateral and vertical turbulent fluctuations (Fv, Fw), potential temperature gradient (d2/dz), and potential temperature.

The AERMIC terrain pre-processor AERMAP uses gridded terrain data to calculate a representative terrain-influence height (hc), also referred to as the terrain height scale. The gridded data needed by AERMAP is selected from Digital Elevation Model (DEM) data. The elevation for each specified receptor is automatically assigned through AERMAP. It is the advancement of the ISCST3 model. The run stream setup file contains the selected modeling options as well as source locations and parameter data, receptor locations; meteorological data file specifications, and output options. It is widely used in air quality prediction through various kinds of sources for decision-making and other regulatory purposes.

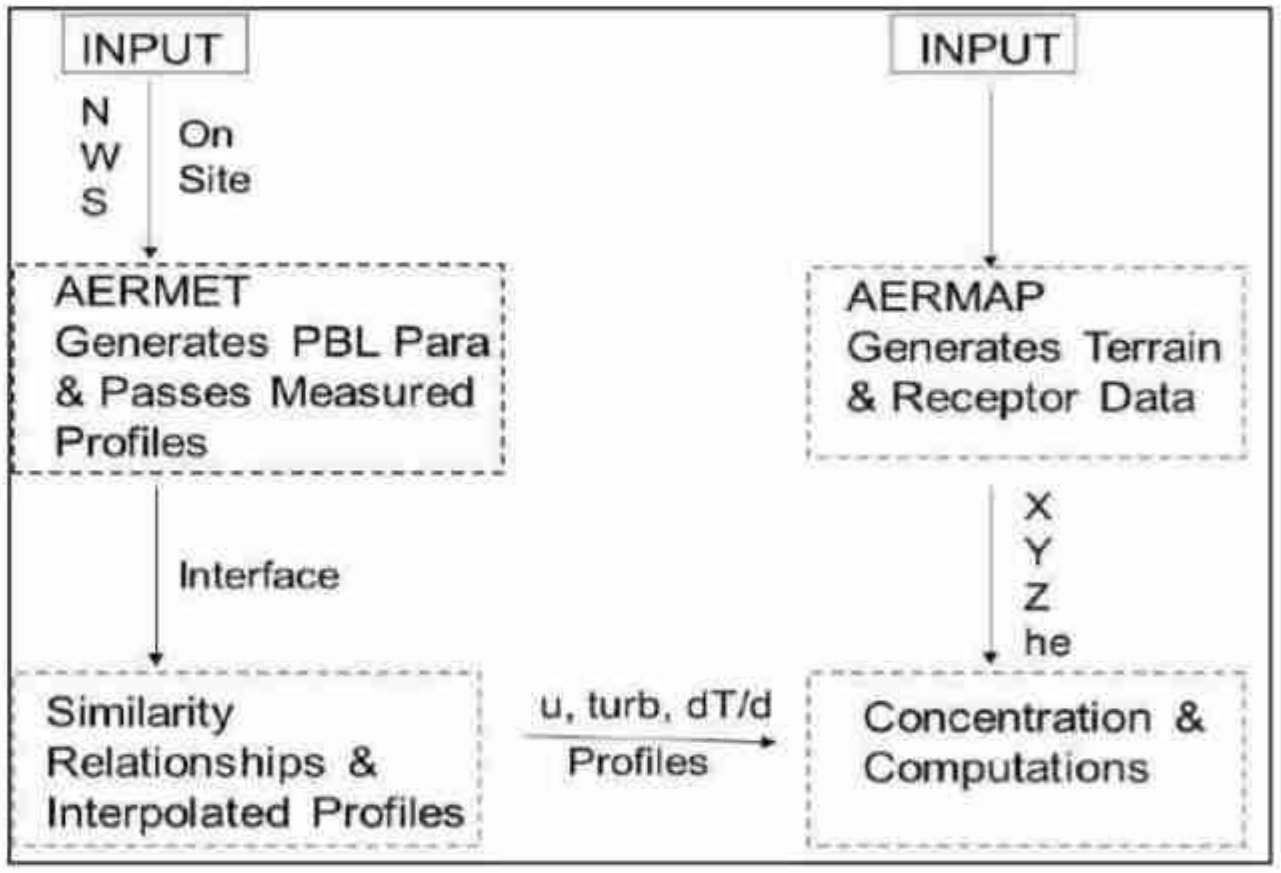


Figure 7.3: Flow Chart of Information Flow of AERMOD Model

Model Domain Setup

AERMOD model is set up and run using input data of sources, emissions, meteorology, and geography. The model is set up keeping the township area as a center of the modelling domain using the actual UTM coordinate system, which is converted to local coordinates for better understanding.

Receptor Grid

The receptor grid is defined for an area of 2 km x 2 km covering the township area with each grid cell size of 50 m x 50 m. A total of 1681 receptor points are defined to capture the impact of emission from vehicle exhaust due to their movement. **Figure 7.4** shows the receptors grid with Local coordinates systems (Keeping the center of Township as a center of Domain with 0, 0 coordinates).

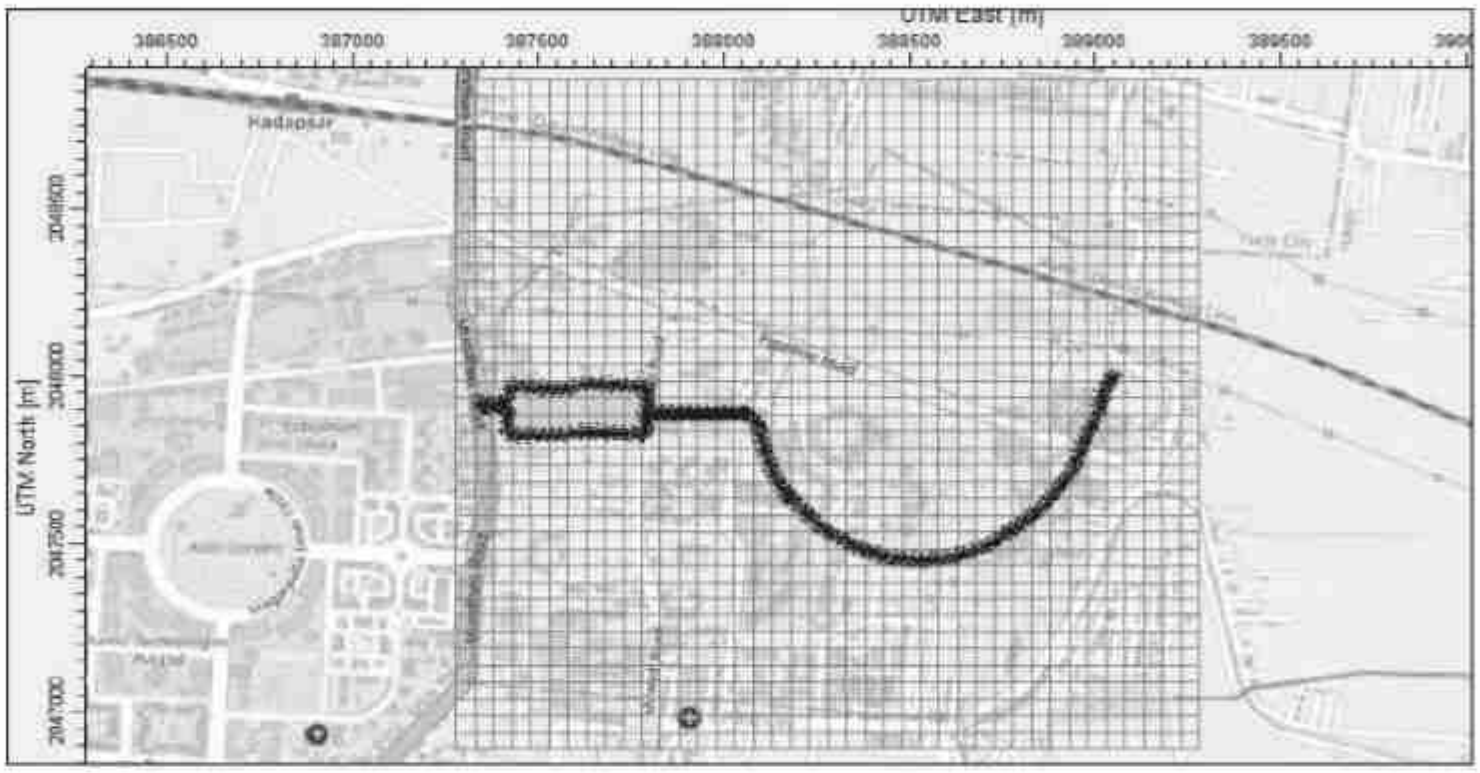


Figure 7.4: Air Modeling Domain Setup, Line Sources, and Receptor Grid Points

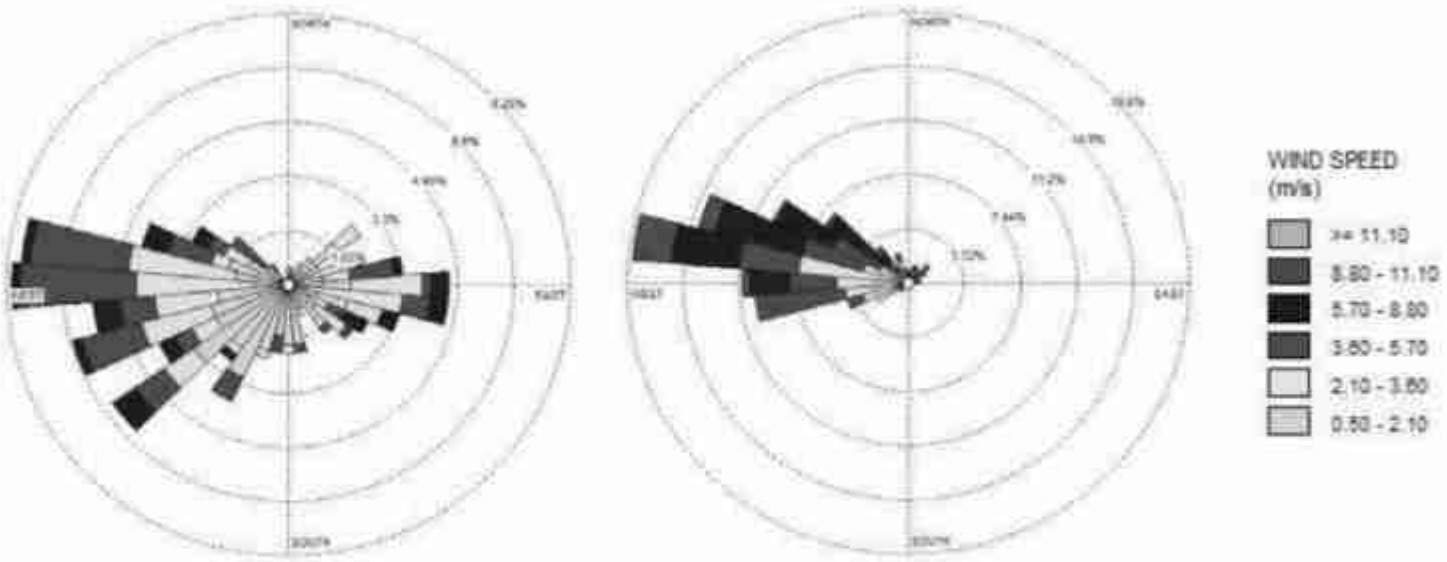
7.3.2 Vehicular Pollution Emission Rate

The road starting from Mall Entry & Exit Gate, Magarpatta -Malwadi Rd, Township Entry (Reception Gate) to Crescent Road has been considered for the dispersion modelling. The total road length considered for the modelling is 1.4 km around Amanora Mall and Township Circle. Additionally, a crescent road (Circle to Material Gate) has also been considered for the modelling i.e., ~1.2 km as shown in **Figure 7.4**. Further, the emission rate ($g/s/m^2$) of CO, NOx, and PM were estimated as per the methodology discussed in section 7.2. To estimate the 24-hour average pollutant concentration, the traffic data for the morning (07:00-11:00 hrs) and evening hours (17:00-21:00 hrs) has been extrapolated for 24 hours keeping the highest number during peak hours of morning and evening. These emission rates are further used in the model to predict the ground-level concentrations.

7.3.3 Meteorological Data

The meteorological pre-processor, AERMET has been set up and run for the study periods of winter (January 10-20, 2023) and summer (April 15-25, 2023) using surface meteorological measurement and limited upper air data collected from IMD weather station Pune. The meteorological parameters used in the AERMET are wind speed, wind direction, relative humidity, ambient temperature, Solar radiation, cloud cover, and precipitation. In addition to that, the upper air estimator, an inbuilt feature of AERMOD, is used to estimate the upper air profile of meteorological parameters. This estimator has been developed using well well-defined and validated algorithm that uses surface data and estimates the upper air meteorological data.

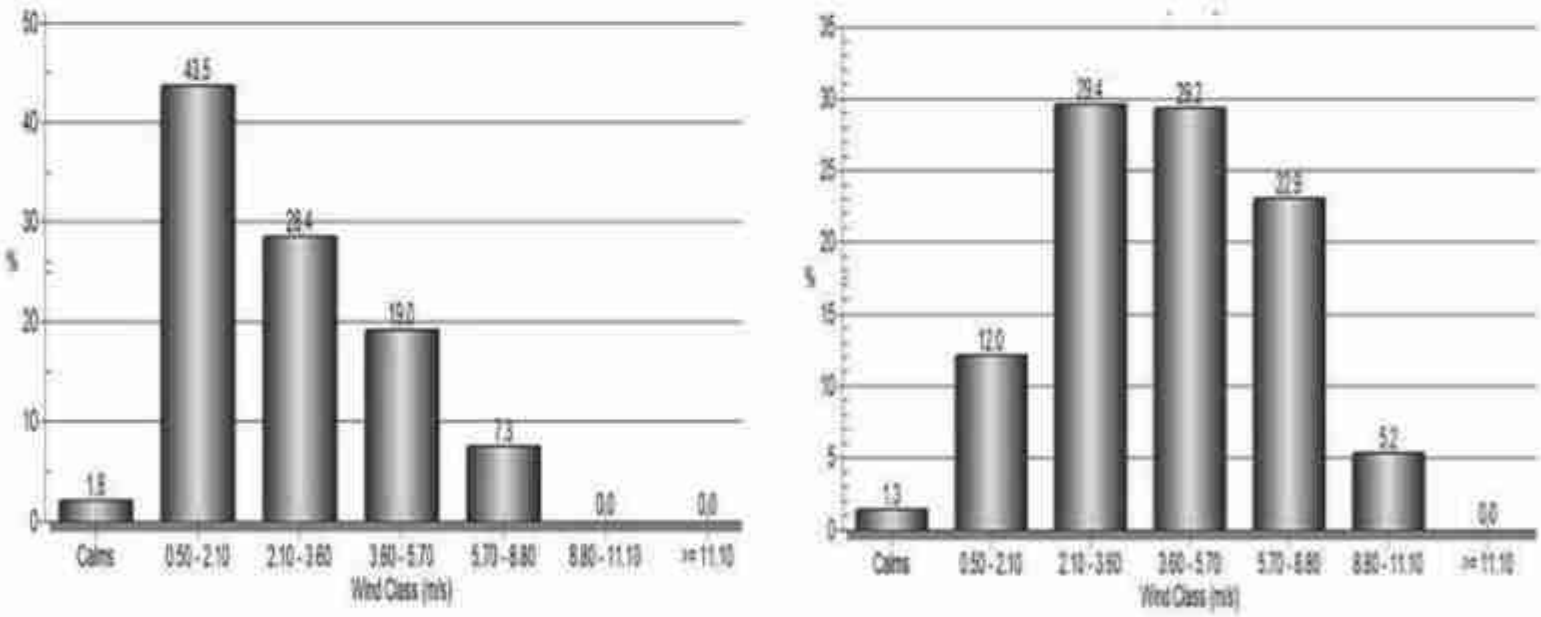
The frequency of wind direction during the monitoring period of winter (January 10-20, 2023) and summer (April 15-25, 2018) in the form of Windrose and frequency diagram is shown in **Figures 7.5** and **7.6**, respectively.



Winter (January 10-20, 2023) **Summer (April 15-25, 2023)**

Figure 7.5: Windrose of Study Site for Winter and Summer Monitoring Period

The average wind speed during summer is around 4.53 m/s and calm wind frequency is 1.30%; whereas during winter wind speed is reported as 2.75 m/s and calm Wind is 1.82%.



Winter (January 10-20, 2023) **Summer (April 15-25, 2023)**

Figure 7.6: Wind Speed Frequency at the Site During the Study Period

During the Winter season, the dominant wind direction was found to be West and East with wind speed in the range of 0.5-2.10 m/s (43.5% of the study period). During the Summer season, the dominant wind direction was West direction with dominant wind speed in the range of 2.10-3.60 m/s (29.4% of the study period).

7.3.4 Air Quality Prediction Due to Traffic Movement

The result of air quality dispersion modelling for the movement of traffic in the Township is predicted using the traffic movement in the township and prevailing meteorological conditions during the study period. This represents only the contribution of the vehicular sources to the air pollution level, and should not be compared with the actual observed concentration at the monitoring site. It should be considered as part of the observed concentrations, as there are other sources of air pollution in the region.

Figure 7.7 and **Figure 7.8** shows the predicted maximum ground level concentrations (GLCs) of Particulate Matter (PM), Nitrogen Oxides (NOx), and Carbon Monoxide (CO) emitted due to the movement of vehicles in the township during the winter and summer period respectively. **Table 7.5** summarizes the predicted concentration along the road corridor and at various distances away from the road. Fenceline Cartesian Plant Boundary estimation of 5m, 10m, 50m, and 100m was also worked out.

Table 7.5: Predicted Ground Level Concentrations at Different Distances from Road

Pollutants	Predicted Concentration ($\mu g/m^3$) wrt edge of the Road				
	Centre of Road	5 m	10 m	50 m	100 m
Winter					
PM	131	120	104	92	47
NOx	139	128	119	84	48
CO	194	179	166	131	67
Summer					
PM	88	78	69	52	29
NOx	95	89	74	56	31
CO	143	124	112	85	47

During winter the maximum GLCs concentration of PM, NOx, and CO at the centre of the road were 131 $\mu g/m^3$, 139 $\mu g/m^3$, and 194 $\mu g/m^3$ respectively, which decreased drastically to 92 $\mu g/m^3$, 84 $\mu g/m^3$ and 131 $\mu g/m^3$ respectively at a distance of 50 m from the road.

Similarly, during summer, the predicted maximum GLCs of PM, NOx, and CO, and at the center of the road were 88 $\mu g/m^3$, 95 $\mu g/m^3$, and 143 $\mu g/m^3$ respectively, which decreased considerably to 52 $\mu g//m^3$, 56 $\mu g/m^3$ and 85 $\mu g/m^3$ respectively at a distance of 50 m from the road.

Further, it can be seen that the predicted concentrations near the road reduce significantly and contribute negligible to ambient air quality beyond 100 m, which is the general feature of ground-based emission sources.

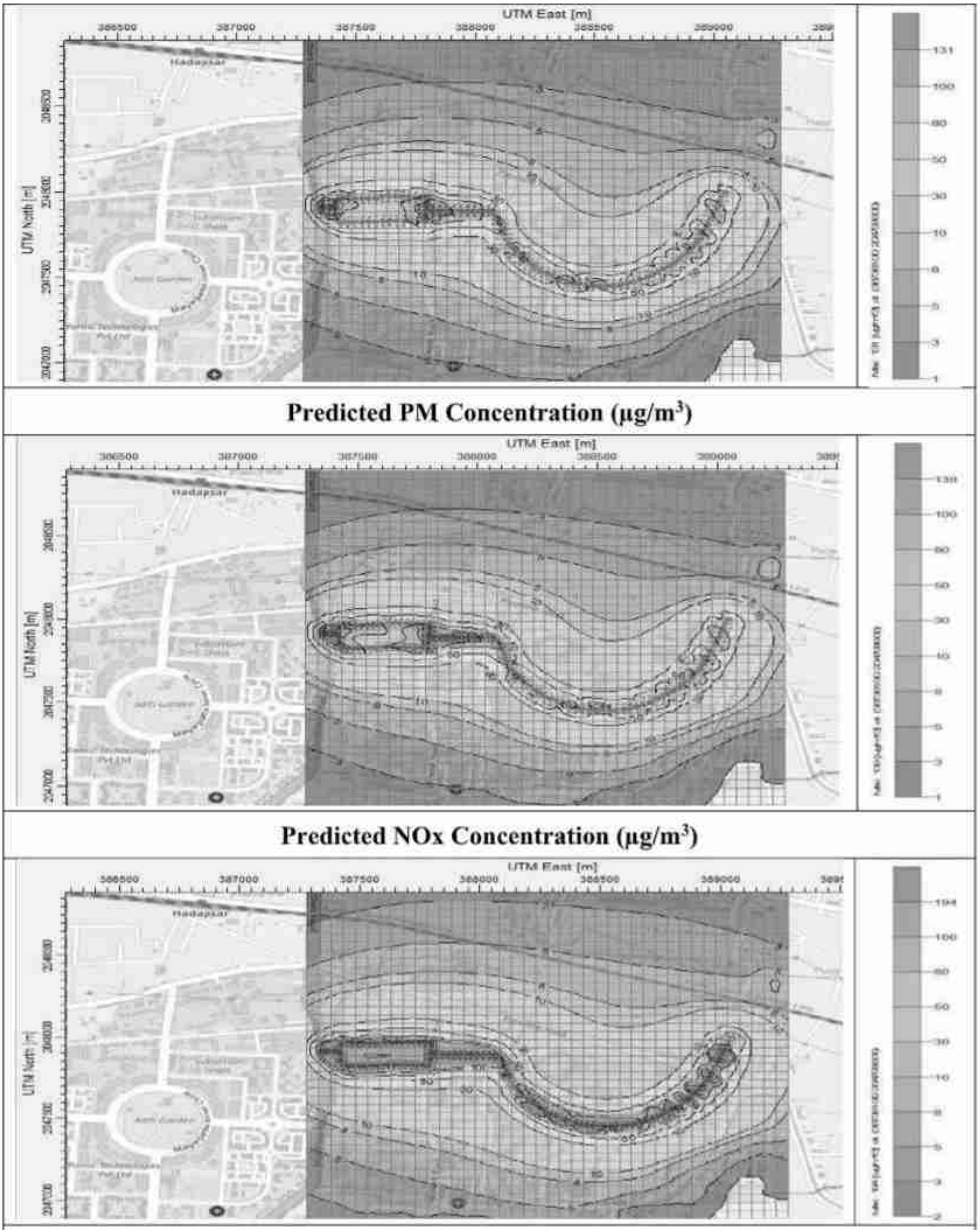


Figure 7.7: Isopleths Showing Predicted GLCs of PM, NOx, and CO During Winter

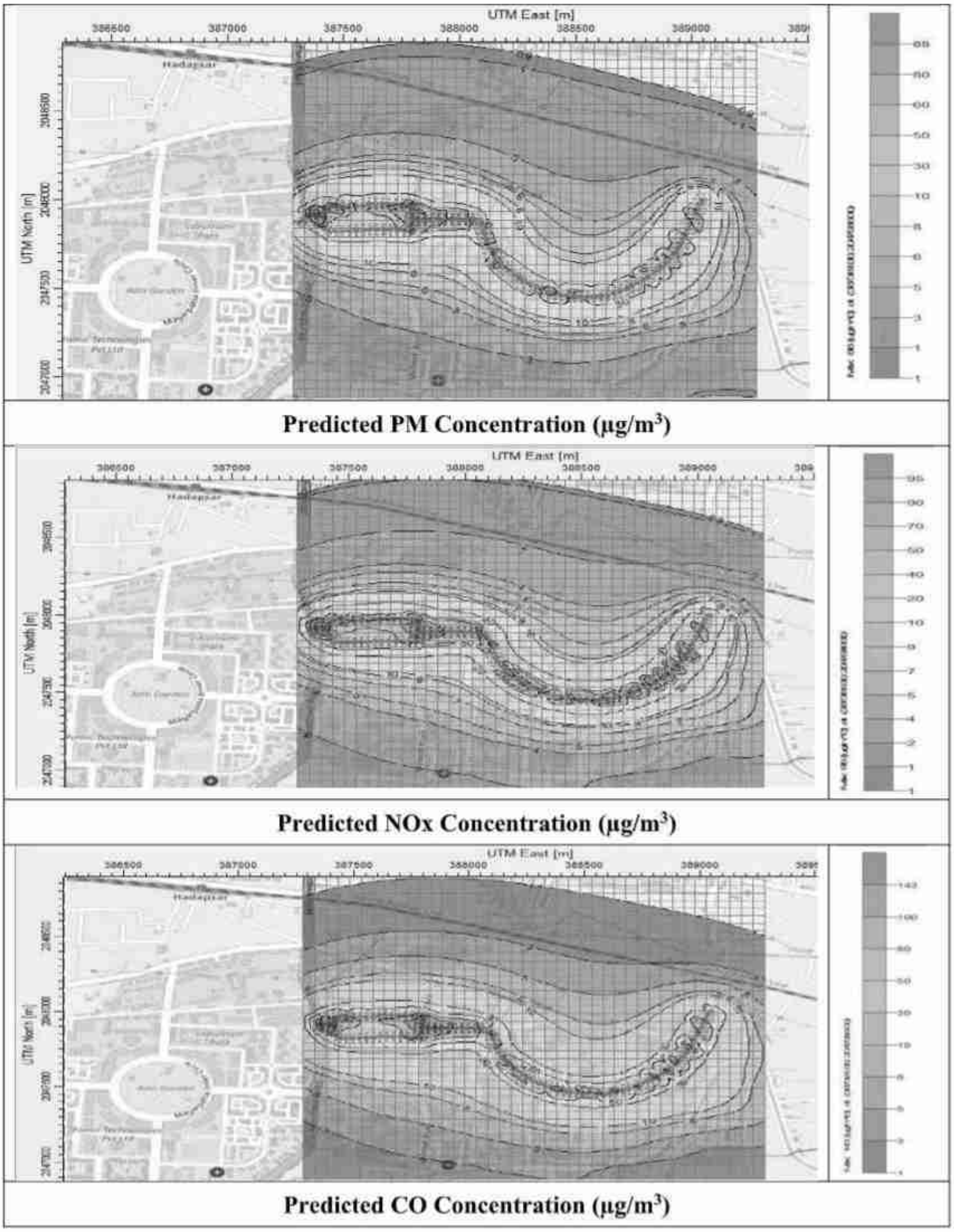


Figure 7.8: Isopleths Showing Predicted GLCs of PM, NOx, and CO During Summer

7.4 Summary of Traffic & Air Dispersion Study

It is observed from two phases of the traffic survey that 2 wheelers are contributing highest around 67 to 74% (more during morning hours) and 17 to 26% of 4 wheelers (more during evening hours). Three-wheelers contributed 5 to 7%; the trend is not changing significantly, but the total number of heavy-duty vehicles (such as Trucks/mini trucks & buses/minibus) was more during morning hours, in percentage 1-2%, which might be due to offices or business peak hours. The to and fro movement around Mall Entry & Exit Gate, Magarpatta -Malwadi Rd, Crescent Road connecting to Township Entry area the influencing zone. The PCU shows 11527 and 12075 during the winter season; whereas it was 7541 and 13706 during summer, which signifies the evening is more than the morning.

It is also observed that the estimated average emission load due to the movement of vehicles around the township (Mall Entry & Exit Gate, Magarpatta -Malwadi Rd, and Crescent Road) ranged between 29-68 g/hr, 247-662 g/hr, and 734 to 1861 g/hr for PM, NOx and CO, respectively. The emission loads inside the township are comparatively less.

Analysis of meteorological data indicates that Winter season, the dominant wind direction was found to be West and East with wind speed in the range of 0.5-2.10 m/s (43.5% of the study period). During the Summer season, the dominant wind direction was West direction with domain wind speed in the range of 2.10-3.60 m/s (29.4% of the study period).

USEPA Recommended air dispersion model AERMOD was used to estimate ground-level concentration. Dispersion and dilution of pollutants are lesser in winter as compared to summer. The maximum concentration is estimated at the center of the road, for PM it was 131 $\mu g/m^3$ in winter, whereas 88 $\mu g/m^3$ in summer. The same pattern is observed for NOx (139, 95 $\mu g/m^3$) and CO (194, 143 $\mu g/m^3$) for winter and summer respectively. The impact of traffic movement on the air quality of the township is significant near the road (< 50 m distance from the road), but does not contribute much to the background pollution levels beyond 100 m.

Chapter 8

Solid Waste Management in the Township

Chapter 8

Solid Waste Management in the Township

The Amanora Township adheres to the Solid Waste Management (SWM) Rules of 2016, emphasizing the systematic execution of collection, segregation, storage, transportation, processing, and disposal of municipal waste. This commitment to SWM principles is integrated from the initial construction phase onward.

8.1 Flat Occupancy Status at the Township

The township has many towers in the residential sectors and each sector has a different population size. **Table 8.1** summarizes the sector-wise occupancy by 2017-18 to 2022-23. Having 8219 flats in 57 towers, occupation density increased upto 32931 in 2022-23 from 16391 in 2017-18; which increased by 50%. Yearly growth of observed at around 35%.

Table 8.1: Sector-wise Details of Occupancy in the Amanora Township

Sr.	Type of Occupancy	No. of Towers	No. of Flats	Total Population (Capacity)	Actual Occupancy					
					2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
1	R2 Sector	10	676	3380	3380	3380	3380	3380	3380	3380
2	R3 Sector (Towers)	2	400	2000	2000	2000	2000	2000	2000	2000
3	R3 Sector & R-9/10 (Bungalows)	-	67	335	335	335	335	335	335	335
4	R4 Sector	3	210	840	840	840	840	840	840	840
5	R5 Sector	5	240	960	960	960	960	960	960	960
6	R11 Sector	9	1117	4468	4468	4468	4468	4468	4468	4468
7	R21 Sector	5	880	3520	3520	3520	3520	3520	3520	3520
8	R22 Sector	3	390	888	888	888	888	888	888	888
9	R25 sector	3	286	1144	NA	1144	1144	1144	1144	1144
10	R26 sector	4	574	1880	NA	1880	1880	1880	1880	1880
11	R08 sector	3	465	1860	NA	1860	1860	1860	1860	1860
12	R19 sector	5	1328	5312	NA	NA	NA	NA	5312	5312
13	R29 sector	5	1586	6344	NA	NA	NA	NA	NA	6344
	Total	57	8219	32931						

Source: Secondary Data

8.2 Solid Waste Generation, Collection and Treatment/Disposal During 2017-23

The primary sources of solid waste generation in the township are the 13 residential sectors. Minor sources include the construction site, unacceptable waste from biogas or OWC, and clinical waste. Specific locations for the collection of dry and wet solid waste in the township are detailed in **Table 8.2**.

Table 8.2: Dry & Wet Solid Waste Collection Locations in the Township

Sr.	Waste Source	Dry Waste	Wet Waste
1	**Residential**	All Canteens	All Canteens
		R-2 Sector	R-2 Sector
		R-3 Sector	R-3 Sector
		R-4 Sector	R-4 Sector
		R-5 Sector	R-5 Sector
		R-21 Sector	R-21 Sector
		R-22 Sector	R-22 Sector
		R-11 Sector	R-11 Future Tower
		R19 (ADRENO)	R19 (ADRENO)
		R26 (NEO)	R26 (NEO)
		R-25 Victory tower	R-25 Sainik City
		R29 (GOLD)	----
		R3, R-9/10 (Bungalows)	R3, R-9/10 (Bungalows)
		R8 (GATEWAY)	
2.	**Construction**	Construction Site Waste	----
3.	**Commercial**	Site Offices	----
		Amanora School	----
		Fire Station & Civic Center	----
4.	**Bio-medical**	----	----
5.	**Biogas and Excel, others**	Other	Others are rejected from Biogas Waste, Excel Organic Waste Converter Wastes, etc.

8.2.1 Dry Solid Waste Generation/Collection During 2017-2023

The annual generation and collection data for dry solid waste from different sources during 2017-23 are summarized in **Table 8.3**.

Table 8.3: Annual Generation and Collection of SWM 2017-2023

Year	Quantity of Dry Solid Waste Generation/Collection (Tons)					
	Residential Waste	**Construction Waste**	**Commercial Waste**	**Clinic Dry Waste**	**Biogas & Excel OWC (Dry Waste) and others**	**Total**
2017-18	1051.4	86.5	57.6	4.0	50.8	1250.3
2018-19	1095.5	100.7	51.4	1.2	36.1	1284.8
2019-20	1243.5	64.3	66.2	1.1	11.9	1387.0
2020-21	1217.2	284.0	15.9	0.5	42.7	1560.3
2021-22	1263.9	53.1	39.0	0.0	74.1	1430.1
2022-23	1638.5	46.5	62.9	0.0	121.2	1869.2

Dry solid waste is generated from various sources, including residential sectors, construction sites, commercial sites, clinics, Excel waste units, and other miscellaneous sources. The collection of dry solid waste is facilitated through garbage chutes strategically positioned within the township. In Residential Waste, notable variations are observed over the years, with an increase from 1051.4 tons in 2017-18 to 1638.5 tons in 2022-23. Construction waste exhibits fluctuating trends, reaching a peak at 284.0 tons in 2020-21 and then declining to 46.5 tons in 2022-23. The quantity of commercial waste displays fluctuations, with a significant drop from 66.2 tons in 2019-20 to 39.0 tons in 2021-22. The clinic's dry waste remains relatively low, with minimal changes over the years. Biogas & Excel OWC (Dry Waste) and Others category experiences substantial variations, peaking at 121.2 tons in 2022-23 compared to 11.9 tons in 2019-20. The overall dry solid waste collection sees a continuous increase, reaching the highest point at 1869.2 tons in 2022-23. **Figure 8.1** shows trends suggest a dynamic waste generation landscape within the township, with shifts in specific categories over the years. The notable increase in residential waste and the fluctuations in construction and commercial waste highlight the evolving waste composition and emphasize the importance of adaptive waste management strategies.

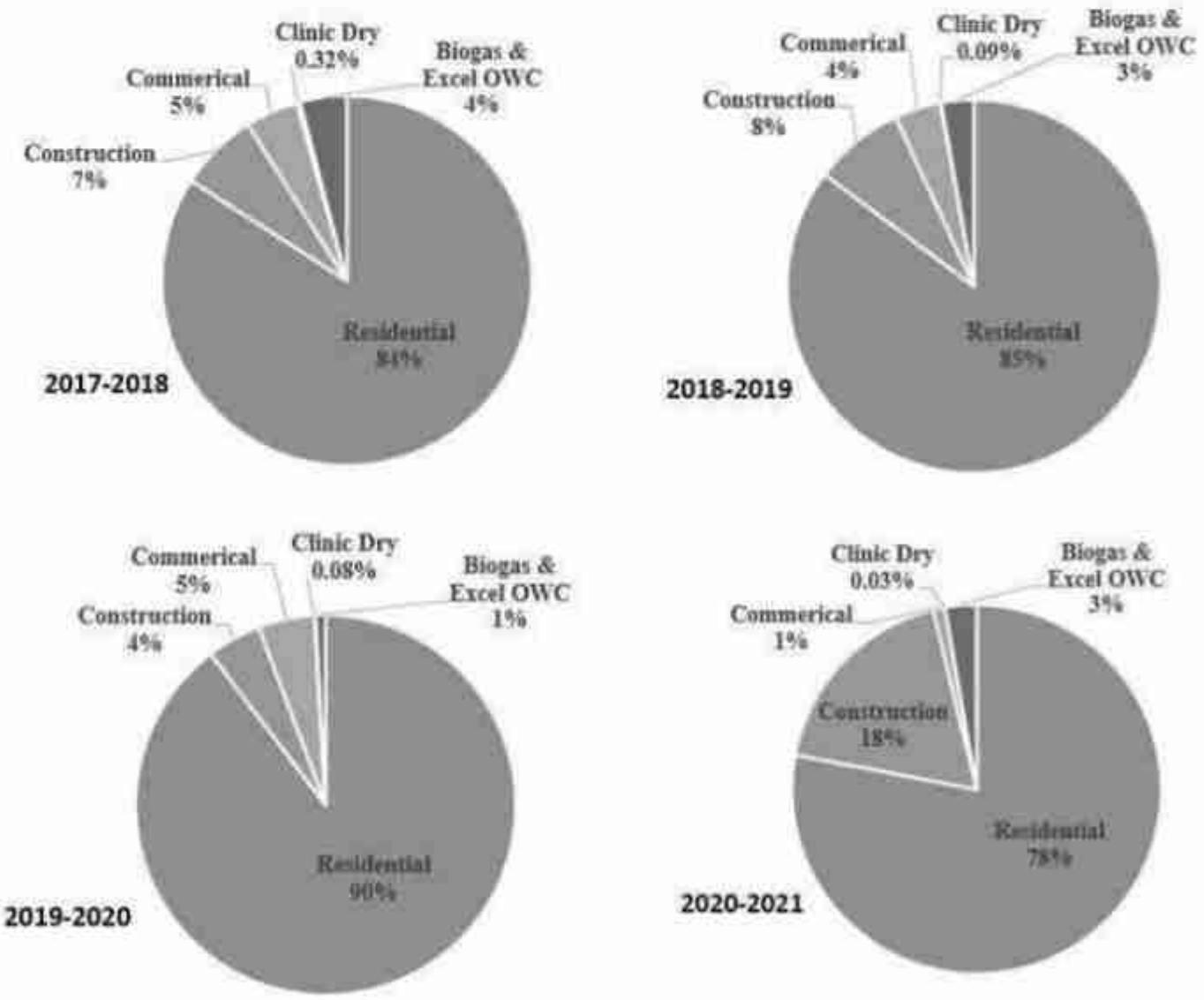


Figure 8.1: Percent Share of Dry Waste Collection from Different Locations in the Township during 2017-2023

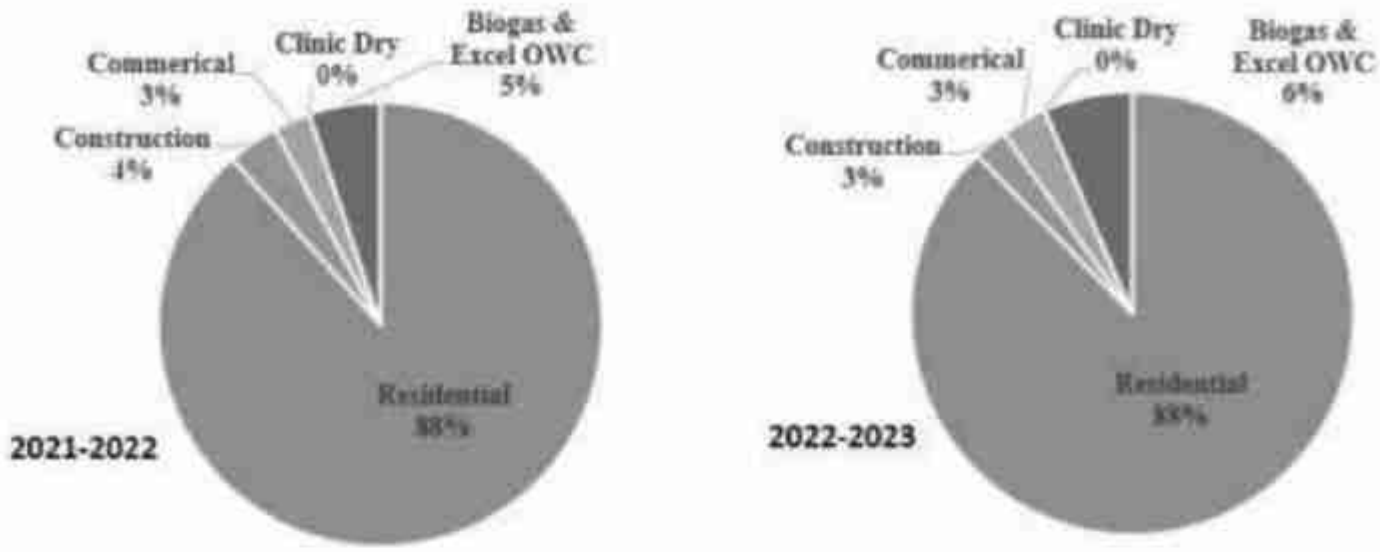


Figure 8.1 *(Contd..)*: Percent Share of Dry Waste Collection from Different Locations in the Township during 2017-2023

8.2.2 Treatment/Processing and Disposal of Dry Solid Waste

Dry waste at Amanora Township is systematically segregated into recyclable and non-recyclable solid waste. The recyclable dry waste undergoes a beneficial process by being sold to vendors and sent to recycling units, while the non-recyclable waste is directed to M/s Rochem Green Energy for RDF (Refuse Derived Fuel) and Pyrolysis processes, ensuring responsible disposal practices. Notably, no dry waste from Amanora Township is sent for secured landfilling.

Table 8.4 provides a comprehensive overview of the monthly quantities of dry waste managed through recycling processes and disposal units from 2017 to 2023. Observation reveals that a substantial amount of dry waste is directed for disposal at M/s Rochem Green Energy Pvt. Ltd., emphasizing the commitment to sustainable waste management practices during this period. **Figure 8.2** shows the year-wise dry waste management. It can be seen that the highest dry waste collection was in the year 2019-20.

Figure 8.2: Year-wise Dry Waste Management in the Township during 2017-18 to 2022-23

Table 8.4: Dry Solid Waste Management in the Township during 2017-2023

Month	Quantity of Dry Waste Treated (Tons)											
	Sent to Rochem						Sale to vendor					
	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
April	54.7	67.5	189.8	150.9	65.9	79.9	26.1	29.8	30.8	0.0	38.7	49.1
May	67.3	58.0	194.7	150.4	53.1	75.3	26.6	33.0	22.6	0.0	35.7	56.6
June	64.0	56.0	193.4	176.3	73.4	85.1	30.4	39.2	29.7	27.3	32.4	55.6
July	73.4	69.0	193.4	177.9	83.8	105.0	32.2	21.8	25.6	21.3	41.7	47.2
August	76.1	82.2	207.1	202.3	78.6	110.1	28.7	27.1	27.4	32.5	32.5	40.8
September	69.0	101.5	210.7	205.1	79.5	107.8	24.9	74.4	26.3	35.8	41.5	43.5
October	76.6	108.4	212.9	214.6	96.5	97.5	25.7	64.4	13.0	33.6	43.1	53.9
November	72.9	106.2	209.2	186.1	61.2	86.2	27.2	53.2	20.5	31.0	42.5	60.4
December	75.4	113.3	203.6	178.8	77.7	93.6	35.7	55.8	22.2	42.6	34.6	64.0
January	79.7	111.3	203.8	171.5	76.6	97.7	24.6	65.1	36.3	38.7	48.4	43.5
February	72.1	100.5	183.6	154.9	61.7	82.0	26.0	65.7	29.4	34.4	39.7	40.7
March	76.1	115.2	201.8	182.3	87.1	92.8	33.4	79.4	19.2	42.8	43.7	59.6
Total	**857.9**	**1284.8**	**2404.0**	**2151.1**	**895.1**	**1113.0**	**341.4**	**790.6**	**302.8**	**340.0**	**474.5**	**614.9**

8.3 Wet Solid Waste Generation/Collection and Treatment during 2017-2023

8.3.1 Wet Waste Generation/Collection

Wet solid waste is produced in the residential sectors, labour camps, canteens, and other sources within the township. The collection of this waste occurs through garbage chutes strategically positioned at various locations within the township. Monthly data on wet solid waste collected from different locations within the township for the years 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, and 2022-23 are detailed in **Tables 8.5 to 8.10**, respectively. It is observed that waste collected in the township from 2017-18 to 2022-23 was 297, 394, 497, 719, 813, and 1031 tons, respectively.

Table 8.5: Monthly Wet Solid Waste Collection from Different Locations during 2017-18

Month	R-2	R-3	R-4	R-5	R-21	R-22	R-11 (Future tower)	Canteen	Club house	other	Sainik city	Total Waste Collected
April	4.0	1.6	2.9	2.5	2.2	1.8	1.4	3.0	0.0	0.2	0.0	19.6
May	4.5	1.8	2.7	2.5	2.1	1.8	2.1	3.1	0.0	0.1	0.0	20.7
June	5.9	2.5	4.2	3.0	2.7	2.3	2.0	3.0	0.0	0.0	0.0	25.6
July	4.6	2.2	3.5	2.9	2.6	2.2	1.9	3.1	1.9	1.5	1.1	27.5
Aug	4.6	2.0	3.5	2.8	2.5	2.2	1.9	3.1	1.7	1.4	1.2	26.9
Sep	4.8	2.1	3.9	3.0	2.6	2.4	2.1	3.0	1.8	1.6	1.4	28.7
Oct	3.6	1.6	3.1	2.6	2.4	2.1	1.9	3.2	1.6	1.3	1.2	24.6
Nov	4.4	1.9	3.7	2.8	2.5	2.2	1.9	3.0	1.7	1.6	1.3	27.0
Dec	4.6	2.0	3.5	2.8	2.5	2.2	2.3	2.7	0.6	1.5	1.5	26.2
Jan	4.2	2.1	3.5	2.9	2.6	2.3	2.1	1.7	0.0	1.9	1.7	25.0
Feb	3.7	1.4	2.8	2.5	2.2	1.9	1.7	1.7	0.0	1.6	1.4	20.9
Mar	3.9	2.1	3.3	2.9	2.5	2.3	2.1	2.0	0.0	1.8	1.7	24.6
Total Wet Waste Collected (Tons)												**297.3**

Table 8.6: Monthly Wet Solid Waste Collection from Different Locations during 2018-19

Month	R-2	R-3	R-4	R-5	R-21	R-22	R-11 (Future tower)	Canteen	Other	Sainik city	Neo Tower	Bungalow	Total Waste Collected
April	4.6	2.0	3.7	3.1	2.6	2.3	2.1	2.0	1.7	1.6	0.0	0.0	25.7
May	4.6	2.2	3.8	3.2	2.7	2.5	2.4	2.2	1.9	1.6	0.0	0.0	27.1
June	4.1	1.8	3.2	2.8	2.5	2.2	1.9	2.0	1.8	1.5	0.0	0.0	23.8
July	4.7	2.0	3.6	3.1	2.7	2.5	2.2	2.1	1.9	1.7	0.0	0.0	26.5
Aug	5.8	2.4	4.6	4.0	3.0	2.8	2.5	2.2	2.3	2.1	0.0	0.0	31.7
Sep	6.8	2.6	5.6	4.7	3.7	3.1	2.8	1.9	1.5	2.3	1.3	0.0	36.3
Oct	5.0	2.2	4.4	3.8	3.1	2.7	2.5	2.0	2.3	2.1	1.8	0.0	31.9
Nov	5.0	2.3	2.4	3.8	3.5	2.9	5.6	2.1	2.1	1.9	1.8	0.0	33.4
Dec	8.4	2.7	5.6	4.9	4.6	3.4	5.1	2.2	2.3	2.4	2.4	0.0	44.0
Jan	7.7	2.7	3.4	3.2	4.6	3.8	6.0	2.2	2.4	2.3	2.4	1.1	41.8
Feb	6.9	2.4	2.9	2.8	3.9	3.2	6.3	2.2	2.1	2.1	2.1	1.1	38.0
Mar	4.9	2.6	2.5	2.6	3.1	3.6	4.9	1.9	1.6	2.4	2.2	1.1	33.4
Total Wet Waste Collected (Tons)													**393.6**

Table 8.7: Monthly Wet Solid Waste Collection from Different Locations during 2019-20

Month	R-2	R-3	R-4	R-5	R-21	R-22	R-11 (Future tower)	Canteen	Other	Sainik city	Neo Tower	Bungalow	Gateway	Total Waste Collected
April	4.7	2.5	2.4	2.6	3.0	3.1	4.6	1.9	1.6	2.2	2.2	1.1	0.0	31.9
May	5.4	2.7	2.9	2.9	3.5	3.2	5.2	2.1	1.7	2.2	1.9	1.3	0.0	35.0
June	5.6	2.4	2.5	2.8	3.4	2.9	5.2	2.2	2.0	1.9	1.8	1.3	0.0	34.0
July	6.5	2.5	2.7	3.0	3.9	3.3	6.4	2.3	2.2	2.2	2.0	1.6	0.0	38.6
Aug	7.6	2.4	2.5	3.0	3.6	3.7	6.7	2.3	2.4	2.1	1.9	1.6	0.0	39.8
Sep	6.9	2.5	2.8	2.9	3.5	3.2	6.4	2.1	2.1	2.1	2.1	1.7	0.0	38.3
Oct	6.8	2.6	2.9	3.1	3.6	3.3	6.7	2.2	2.1	2.1	2.0	1.6	0.0	39.0
Nov	7.2	2.5	2.5	2.9	3.5	3.5	6.7	2.3	2.3	2.1	1.9	1.7	0.0	39.1
Dec	8.8	3.3	3.2	3.4	3.7	3.9	7.7	2.9	2.6	2.5	2.2	2.0	1.8	48.0
Jan	8.9	3.7	3.5	3.7	3.8	4.0	8.6	2.9	2.7	2.4	2.2	2.0	1.8	50.2
Feb	8.0	3.6	3.4	3.4	3.6	3.8	8.4	2.8	2.6	2.3	2.1	1.9	1.8	47.7
Mar	10.2	3.4	3.7	3.9	4.0	4.1	10.2	3.1	2.9	2.7	2.5	2.3	2.2	55.2
Total Wet Waste Collected (Tons)														**496.8**

Table 8.8: Monthly Wet Solid Waste Collection from Different Locations during 2020-21

Month	R-2	R-3	R-4	R-5	R-21	R-22	R-11 (Future tower)	Canteen	Other	Sainik city	Neo Tower	Bungalow	Gateway	Total Waste Collected
April	10.2	3.5	3.5	3.4	4.0	2.7	12.8	2.9	3.0	1.9	3.0	1.5	1.8	54.2
May	11.4	3.7	3.6	3.7	3.9	3.2	13.2	3.1	4.4	2.5	3.2	2.2	3.0	61.1
June	10.2	4.3	4.0	3.9	4.8	3.2	13.5	3.2	3.0	2.0	4.0	1.3	1.8	59.2
July	8.6	3.8	3.4	3.4	4.5	3.6	12.2	1.4	3.2	2.2	5.7	1.6	2.0	55.6
Aug	8.3	3.4	3.3	3.3	4.1	3.5	11.5	1.7	3.0	2.0	5.0	1.5	1.9	52.5
Sep	9.7	4.2	3.9	3.5	4.4	3.1	12.6	2.1	3.1	2.2	4.9	1.7	2.0	57.4
Oct	9.7	4.7	4.7	4.7	7.7	4.8	10.9	3.7	3.7	4.5	4.6	4.0	3.0	70.7
Nov	7.6	4.4	4.4	4.4	6.5	3.9	8.7	3.3	3.3	3.5	4.5	3.3	3.0	60.8
Dec	13.8	6.9	3.4	1.8	9.4	2.3	14.7	1.1	2.7	0.0	6.9	1.4	2.1	66.5
Jan	14.3	6.5	2.8	1.3	9.5	1.8	15.1	0.3	2.1	0.0	7.4	0.9	1.9	63.9
Feb	13.0	5.6	2.6	1.1	8.5	1.7	13.7	0.3	2.0	0.0	6.7	0.8	1.7	57.7
Mar	12.6	7.4	2.8	1.2	9.3	1.8	14.7	0.3	2.7	0.0	1.9	3.6	1.2	59.5
Total Wet Waste Collected (Tons)														**719.1**

Table 8.9: Monthly Wet Solid Waste Collection from Different Locations during 2021-22

Month	All Canteens	Other	R11	R19	R2	R21	R22	R25	R26	R3	R3, 9-10	R4	R5	R8	Total Waste
April	0.3	2.2	13.9	0.0	12.8	9.5	1.8	2.0	7.4	5.5	3.6	2.8	1.3	3.6	66.7
May	0.3	1.8	14.0	0.1	12.9	9.0	1.7	2.5	7.5	5.6	3.7	2.8	1.2	3.5	66.6
June	0.3	2.3	13.5	0.0	12.2	8.9	1.6	2.2	7.1	5.3	3.8	2.9	1.1	3.8	65.0
July	0.3	2.6	11.6	0.0	11.5	9.0	1.7	2.1	6.8	5.1	3.8	2.7	1.2	3.6	62.0
Aug	0.3	3.2	10.5	0.0	11.3	8.9	1.7	2.4	6.2	5.4	2.9	2.7	1.2	3.3	60.0
Sep	0.3	2.8	11.8	0.0	12.2	8.9	1.6	2.3	7.0	5.7	4.9	2.8	1.1	3.4	64.8
Oct	0.3	2.8	11.7	0.0	11.5	8.9	1.6	1.8	6.7	5.8	5.1	2.7	1.3	3.1	63.3
Nov	0.3	2.8	10.8	0.0	10.9	8.4	1.5	1.8	6.1	5.4	5.6	2.7	1.1	3.2	60.6
Dec	0.3	6.2	13.2	0.0	13.0	10.3	1.7	2.6	7.0	6.7	6.7	3.0	1.5	3.8	76.0
Jan	0.3	6.1	14.8	0.0	13.1	10.3	1.9	3.0	7.4	6.5	5.1	3.1	1.3	4.0	76.9
Feb	0.3	3.6	13.5	1.1	12.0	9.2	1.8	2.4	6.9	5.8	6.4	3.0	1.2	3.5	70.7
March	0.3	3.5	13.3	7.8	13.0	9.9	1.9	2.8	7.1	6.1	6.5	3.1	1.4	3.9	80.6
Total Wet Waste Collected (Tons)															**813.2**

Table 8.10: Monthly Wet Solid Waste Collection from Different Locations during 2022-23

Month	All Canteens	Other	R11	R19	R2	R21	R22	R25	R26	R3	R3, 9-10	R4	R5	R8	Total Waste Collected
April	0.3	4.6	13.8	10.4	13.5	11.0	2.0	3.2	7.7	6.7	8.2	3.1	1.6	4.0	89.8
May	0.3	3.7	13.4	12.3	12.3	11.1	2.1	3.5	6.8	6.0	7.6	2.9	1.8	3.6	87.1
June	0.3	3.0	14.1	12.8	12.3	11.0	1.8	3.5	6.6	5.5	8.3	2.7	1.5	3.2	86.3
July	0.3	5.4	12.6	11.0	11.5	10.0	1.9	3.1	6.1	4.4	10.2	2.8	0.9	3.2	83.1
Aug	0.4	3.7	12.2	11.5	11.5	10.1	2.0	3.2	6.3	4.9	10.5	2.8	1.1	3.8	83.6
Sep	0.3	2.6	11.1	11.3	11.1	10.0	1.9	2.8	5.7	5.0	10.6	2.7	1.5	3.2	79.5
Oct	0.3	2.5	10.5	10.5	10.2	8.3	1.7	2.3	5.0	4.5	9.8	2.6	1.4	3.4	72.7
Nov	0.3	2.5	13.6	12.7	11.2	9.1	1.7	3.1	6.6	5.0	8.2	2.8	1.4	4.7	82.6
Dec	0.3	2.9	15.0	14.8	12.9	11.6	1.9	3.5	7.8	6.1	10.8	3.0	1.9	4.6	96.8
Jan	0.3	2.8	14.8	14.9	12.7	11.4	2.0	3.4	7.6	6.5	9.2	2.8	1.8	4.4	94.3
Feb	0.3	2.5	14.0	13.1	11.6	9.7	1.7	3.1	6.8	5.1	9.0	2.5	1.5	4.5	85.1
March	0.3	3.3	14.5	14.0	11.7	10.0	1.8	3.4	6.9	5.2	10.0	2.8	1.8	4.5	89.9
Total Wet Waste Collected (Tons)															**1030.8**

8.3.2 Treatment/Disposal of Wet Waste

The township has embraced a combination of conventional and modern technologies for the treatment of wet waste, as outlined below:

a) Excel Organic Waste Converter (Excel OWC): Waste is processed in batches using the Excel machine, with each batch consisting of approximately 35 kg of food waste, 10 g of sawdust as an absorbing agent, 7 g of harvested compost, and 50 g of culture. After a scientifically curated 10-day curing process, the compost becomes ready for direct use as fertilizer. The system has been operating effectively for the past 12 years, and the resulting compost is utilized for landscaping purposes.

b) Bio-sanitizer Project: Composting pits, designated for seven days a week, are constructed for solid waste management. This employs the conventional method of treating food waste, previously utilizing earthworms but now incorporating the use of "Vermi ++" culture. Daily, 50 kg of waste is introduced into these pits, where organisms (Vermi ++) decompose the waste into compost. Harvesting of this compost occurs after 5 to 6 months, ensuring its quality.

c) Biogas Plant: In 2010, the township installed a biogas plant with a capacity of approximately 500 kg/day, with the mission of converting waste to energy within the premises. Presently second plant having a capacity of 2500 Kg /Day is Operational & treating around 2400 kg of food waste daily, which generates approximately 180 to 200-meter cubes of biogas. This biogas is supplied to the canteen, partially fulfilling its fuel requirements & used as Electricity generation.

d) Ecoman Machine: This South Korean machine is utilized for rapid composting. It transforms food waste into compost within 24 hours through an external heating mechanism.

The monthly quantities of wet solid waste treated from 2017-18 to 2022-23 are detailed in **Tables 8.11 to 8.16**.

Out of the total wet waste, the most quantity of wet waste was treated for Biogas Generation i.e., around 18-66%. **Figure 8.3** shows the percent share of treatment of Wet Solid Waste in the Township during 2022-23.

Table 8.11: Quantity of Monthly Average Wet Solid Waste Treatment during 2017-18

Month	Biogas	Composting Methods			Reject Waste	Total (tons)
		Excel OCW	Ecoman	Sanitizer		
April	9.4	5.5	1.7	1.5	1.4	19.5
May	10.0	7.1	1.5	0.8	1.4	20.8
June	10.6	12.3	0.8	0.5	1.5	25.7
July	10.6	14.8	0.1	0.6	1.6	27.7
Aug	11.0	12.6	0.0	1.4	1.9	26.9
Sep	10.6	14.6	0.0	1.6	1.8	28.6
Oct	11.2	11.7	0.0	0.0	1.8	24.7
Nov	10.8	14.1	0.0	0.0	2.1	27
Dec	9.9	13.8	0.0	0.0	2.5	26.2
Jan	7.0	14.1	0.0	2.1	1.8	25
Feb	4.8	12.3	0.0	1.9	1.6	20.6
Mar	8.6	12.4	0.0	2.1	1.8	24.9
Total	**114.4**	**145.1**	**4.1**	**12.6**	**21.2**	**297.6**

Table 8.12: Quantity of Monthly Average Wet Solid Waste Treatment during 2018-19

Month	Biogas	Composting Methods			Reject Waste	Total (tons)
		Excel OCW	Ecoman	Sanitizer		
April	9.1	13.3	1.3	0.0	1.9	25.6
May	9.0	12.7	0.9	1.7	2.8	27.1
June	7.7	9.5	1.1	2.3	2.9	23.5
July	8.5	10.7	2.7	1.9	2.6	26.4
Aug	8.8	14.0	3.1	2.3	3.3	31.5
Sep	9.5	21.1	2.4	2.0	1.3	36.3
Oct	9.1	16.6	3.1	1.8	1.2	31.8
Nov	8.8	19.5	1.9	1.6	1.7	33.5
Dec	9.3	28.0	3.1	1.6	2.0	44
Jan	8.2	27.9	2.2	1.6	1.9	41.8
Feb	8.0	26.9	0.0	1.4	1.7	38
Mar	8.8	21.0	0.0	1.6	1.9	33.3
Total	**104.8**	**221.2**	**21.7**	**19.7**	**25.1**	**392.8**

Table 8.13: Quantity of Monthly Average Wet Solid Waste Treatment during 2019-20

Month	Biogas	Composting Methods			Reject Waste	Total (tons)
		Excel OCW	Ecoman	Sanitizer		
April	8.3	18.8	0.4	1.5	2.8	31.8
May	8.6	21.7	0.5	1.6	2.5	34.9
June	5.5	24.6	0.0	1.5	2.6	34.2
July	8.4	25.5	0.0	1.6	3.2	38.7
Aug	8.1	27.0	0.0	1.6	3.1	39.8
Sep	7.3	25.4	0.7	1.5	3.3	38.2
Oct	8.3	24.1	1.7	1.6	3.4	39.1
Nov	8.5	24.2	1.8	1.5	3.2	39.2
Dec	5.9	33.8	1.8	1.6	4.9	48
Jan	7.0	35.0	1.9	1.6	4.8	50.3
Feb	8.4	32.2	1.7	1.5	4.0	47.8
Mar	7.2	40.9	1.9	1.6	3.6	55.2
Total	**91.3**	**333.0**	**12.4**	**18.3**	**41.4**	**497.2**

Table 8.14: Quantity of Monthly Average Wet Solid Waste Treatment during 2020-21

Month	Biogas	Composting Methods			Reject Waste	Total (tons)
		Excel OCW	Ecoman	Sanitizer		
April	22.6	26.2	0.2	1.5	3.8	54.3
May	30.1	25.8	0.0	1.6	3.3	60.8
June	38.7	13.7	0.0	1.8	5.1	59.3
July	23.8	25.4	0.0	1.7	4.6	55.5
Aug	31.9	15.2	0.0	1.6	3.8	52.5
Sep	36.6	15.2	0.0	1.5	4.2	57.5
Oct	58.2	7.3	0.0	1.6	3.4	70.5
Nov	46.9	10.0	0.0	1.5	2.4	60.8
Dec	25.6	23.6	0.0	13.6	2.3	65.1
Jan	59.8	9.1	0.0	0.0	2.3	71.2
Feb	56.4	9.7	0.0	0.0	2.3	68.4
Mar	58.3	7.9	0.0	0.0	2.1	68.3
Total	**488.9**	**189.1**	**0.2**	**26.3**	**39.7**	**744.2**

Table 8.15: Quantity of Monthly Average Wet Solid Waste Treatment during 2021-22

Month	Biogas	Excel OCW	Total (tons)
April	57.9	5.4	63.3
May	61.5	6.3	67.8
June	58.0	5.2	63.2
July	56.3	5.9	62.2
Aug	57.3	5.1	62.4
Sep	59.5	4.1	63.6
Oct	60.8	3.7	64.5
Nov	57.5	1.7	59.2
Dec	66.3	8.3	74.6
Jan	68.6	6.8	75.4
Feb	62.6	6.6	69.2
Mar	71.1	7.6	78.7
Total	**737.4**	**66.6**	**804.1**

Table 8.16: Quantity of Monthly Average Wet Solid Waste Treatment during 2022-23

Month	Biogas	Excel OCW	Total (tons)
April	72.1	10.4	82.5
May	68.6	17.1	85.7
June	66.6	17.2	83.8
July	65.5	15.0	80.5
Aug	81.9	0.0	81.9
Sep	79.7	0.0	79.7
Oct	75.9	0.0	75.9
Nov	83.0	0.0	83
Dec	92.5	0.0	92.5
Jan	92.7	0.0	92.7
Feb	82.2	0.0	82.2
Mar	90.4	0.0	90.4
Total	**950.9**	**59.7**	**1010.8**

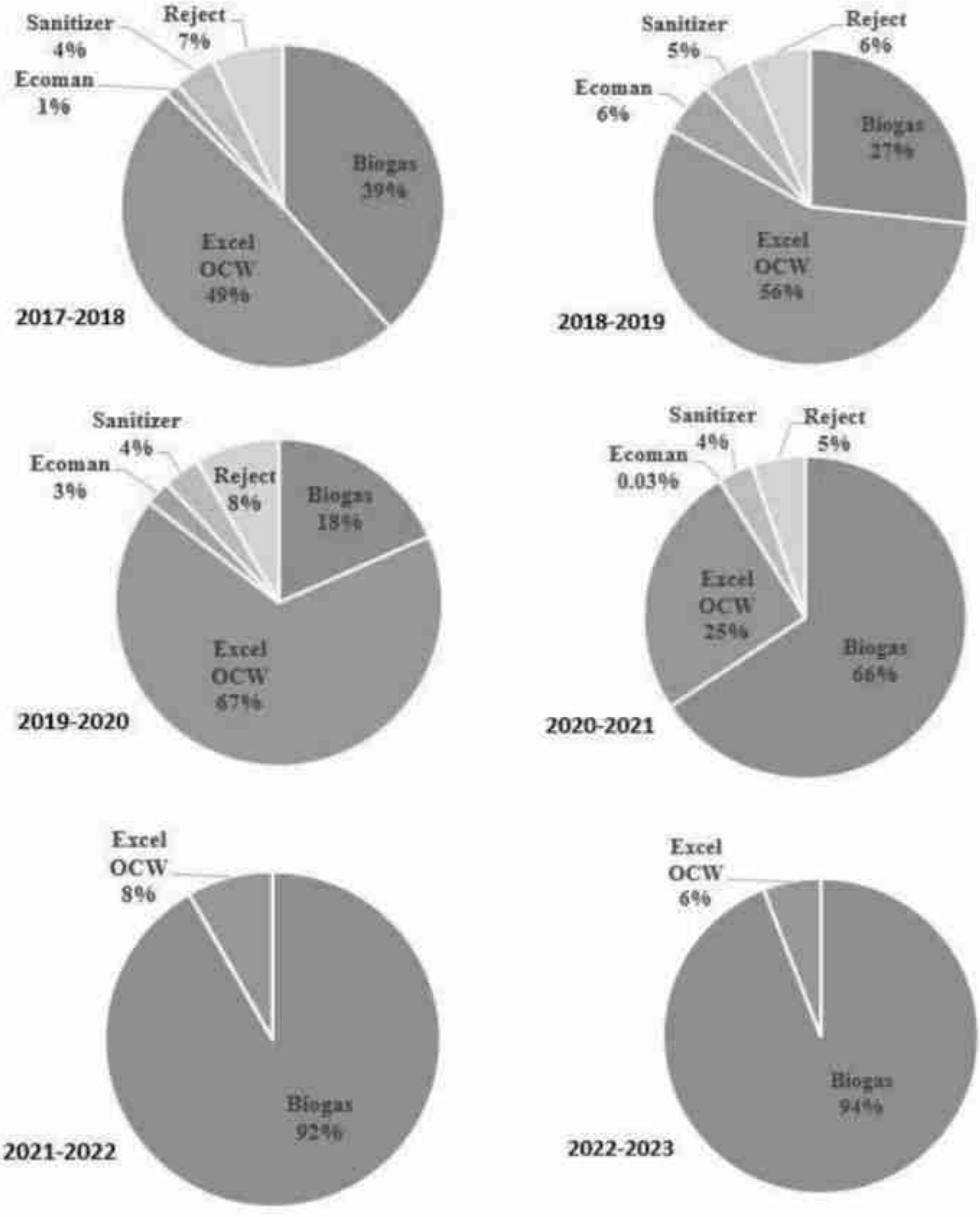


Figure 8.3: Percent Share of Treatment of Wet Solid Waste in the Township during 2022-23

8.4 Overall Summary of Solid Waste Management in the Township

Dry solid waste, originating from residential and commercial sectors, clinics, construction sites, and biogas plant residues, as well as waste from the Excel Organic Waste Convertor (OWC) machine, amounted to 1250,1284, 1387, 1560, 1430, and 1869 tons annually during 2017-23. Residential sectors contributed to 80-90% of waste, while construction waste ranged from 1-8%.

The township manages dry waste through recycling processes and disposal units, with a significant portion sent to disposal through M/s Rochem Green Energy Pvt. Ltd. The authority effectively handles 92-97% of the total solid waste through treatment or disposal.

Wet solid waste is generated from residential sectors, labour camps, canteens, and other sources within the township. The total quantity collected during 2017-2023 was 297, 394, 497, 719, 813 and 1031 tons, respectively. Various conventional treatment technologies, including Excel OWC, Bio-Sanitizer, and Ecoman Machine, treat 100% of the wet waste, which is then utilized within the township.

The analysis of the solid waste management system/practices in the township reveals a well-integrated and efficient approach.

Chapter 9

Social Aspects – Facilities and Services in the Township

Chapter 9

Social Aspects - Facilities and Services in the Township

The Amanora Park Township project, initiated in 2005 in Pune district, Maharashtra, is a City Corporation Limited (CCL) development approved as a fully-fledged township under the special Township Policy of the Government of Maharashtra. Encompassing 476 acres, the township is equipped with essential amenities such as schools, hospitals, commercial spaces, and residential complexes. Adhering to the Township policy, the developer is obligated to provide all utilities and ensure a reliable power supply to the township. Amanora Park Township guarantees a round-the-clock water supply, power, gas, and a clean environment for its residents. City Corporation Limited has secured a 90 MVA power supply confirmation, and since April 2011, a franchisee arrangement has been operational in collaboration with the Maharashtra State Electricity Distribution Company Limited (MSEDCL).

This section delves into the various facilities and services offered to the township's residents. The design of Amanora reflects a smart city concept, aiming to provide an advanced urban lifestyle that seamlessly blends modern aspirations with traditional community values. The services can be broadly categorized as 24/7, ensuring constant availability for the residents.

1. Basic Facilities
   - Water Supply
   - Rainwater Harvesting
   - Electricity Supply
   - Gas Supply/Distribution
   - Healthcare or Medical Facilities
2. Environment Sustainable Infrastructure
   - Road Infrastructure
   - Sewage Treatment Plant
   - Renewable Energy
   - Parking Facilities
   - Solid Waste Management/ Garbage Disposal
3. Safety/Security Facilities
   - Security/Backup Services
   - Fire Fighting Equipment Services
4. Others
   - School Infrastructure/Facility
   - Recreational Facilities
   - Digital Infrastructure
   - Help-desk Portal/Domestic Help
   - Social Awareness programs/trainings
   - Employment Opportunities

9.1 Basic Facilities

9.1.1 Water Supply

The township is equipped with a twin pipeline extending 9 km, connecting to an irrigation canal. This system is supported by a Water Treatment Plant (WTP) with a capacity of 2.6 MLD, effectively fulfilling the current domestic water needs of its residents. In 2023, a comprehensive survey was conducted for both seasons (winter and summer) to assess the water quality within the township. Results indicate that throughout both seasons, treated water consistently met IS: 10500 drinking water standards for physicochemical and bacteriological parameters. Turbidity levels at the WTP outlet remained below the permissible limit of 1/5 NTU (BIS IS 10500: 2012), with values of 0.3 NTU in winter 2023 and 0.5 NTU in summer 2023, demonstrating effective removal of suspended particles. Alkalinity levels at the outlet were within the acceptable range of 200-600 mg/L as $CaCO_3$. Total phosphate values were consistently below detection limits. Heavy metals remained undetectable in both seasons. Although both total and fecal coliforms were detected in the WTP inlet, the treatment process successfully eliminated them from the outlet water, indicating the WTP's effectiveness in removing harmful bacteria and ensuring water safety.

Rainwater Harvesting: The Township has good rooftop rainwater harvesting structures. Water conservation and artificial recharge have been done by developing structures such as recharge wells, recharge borewells, rectangular recharge/open wells, and collection tanks. Total rainwater harvested and conserved /recharged is about 2,70,952 KL/year.

9.1.2 Electricity Supply

In Amanora Park Township power is distributed from 220/22KV (Magarpatta) Sub Station to residential and commercial areas of the township, which utilizes 55 watts per sq. meter of power as against government norms of 110 watts. Amanora Township saves 2700 tons of carbon emissions per year. Amanora Park Township also generates clean and green renewable energy through solar and wind. Monthly total energy consumption and renewable energy generation in the township during 2018-2022 are presented in **Table 9.1**. As the population of the township increased, the needs of the people increased, increasing the demand for energy within the township. The maximum energy consumption in the township was 3845350 KWH during May 2022 and the minimum during February, 2022 (341406 KWH).

Table 9.1: Monthly Total Energy Consumption and Renewable Energy Generation in Township During 2018-23

Sr.	Month /Year	Wind Mill Generation (0.85 MW Capacity) 2 Each $	STP Solar Generation (110KW)	WTP Solar Generation (50 KW) #	Consumption in KWHz		Total Consumption in KWHz	% Share of Renewable Energy
					Amanora Phase I	Amanora Phase II		
1	Apr-2018	74859	5722	2860	1662400	1648600	3311000	2.4
2	May-2018	142440	6155	3077	1747100	1810500	3557600	4.2
3	Jun-2018	353195	5076	2538	1433000	1667300	3100300	11.6
4	Jul-2018	537064	3537	1769	1389200	1531200	2920400	18.5
5	Aug-2018	415619	6165	3083	1412200	1419800	2832000	14.9
6	Sep-2018	131120	9145	4573	1427700	1439200	2866900	4.9
7	Oct-2018	65063	10548	5274	1591900	1523800	3115700	2.4
8	Nov-2018	52497	9027	4514	1406000	1368200	2774200	2.2
9	Dec-2018	77044	7769	3884	1450700	1279500	2730200	3.1
10	Jan-2019	56736	6551	3275	1392700	1277500	2670200	2.4
11	Feb-2019	66142	5220	2610	1268100	1276600	2544700	2.8
12	Mar-2019	84512	5641	2820	1598200	1608000	3206200	2.8
Total		**2056291**	**80556**	**40276**	**17779200**	**17850200**	**35629400**	**6.0 ****
1	Apr-2019	102275	9554	4777	1900200	1767700	3667900	3.0
2	May-2019	148066	13400	6700	1891300	1921900	3813200	4.2
3	Jun-2019	330791	11260	5630	1741100	1789200	3530300	9.7
4	Jul-2019	517107	7979	3989	1536900	1636400	3173300	16.5
5	Aug-2019	528759	8337	4169	1512100	1573100	3085200	17.4
6	Sep-2019	350254	7494	3747	1471200	1506300	2977500	12.0
7	Oct-2019	74386	8559	4280	1534500	1559300	3093800	2.7
8	Nov-2019	52775	7762	3881	1476700	1513500	2990200	2.0
9	Dec-2019	54078	5581	2790	1497700	1496800	2994500	2.0
10	Jan-2020	70029	5825	2912	1478700	1414600	2893300	2.6
11	Feb-2020	79477	8489	4245	1445000	1373600	2818600	3.1
12	Mar-2020	112187	11537	5768	1518200	896600	2414800	5.1
Total		**2420184**	**105776**	**52888**	**19003600**	**18449000**	**37452600**	**6.7 ****

$ Wind mill Generation in units (Credit Units) at Satara-0.85MW Capacity each-2 windmill

WTP Solar Generation (50KW) (half the value taken of STP Generation); ** Average % Share of Renewable Energy

Table 9.1 *(Contd..)*: Monthly Total Energy Consumption and Renewable Energy Generation …During 2018-23

Sr.	Month /Year	Wind Mill Generation (0.85 MW Capacity) 2 Each $	STP Solar Generation (110KW)	WTP Solar Generation (50 KW) #	Consumption in KWHz		Total Consumption in KWHz	% Share of Renewable Energy
					Amanora Phase I	Amanora Phase II		
1	Apr-2020	88613	12610	6305	1587600	372000	1959600	5.2
2	May-2020	115607	12778	6389	1708200	394400	2102600	6.1
3	Jun-2020	331901	497	5630	1330000	369500	1699500	19.6
4	Jul-2020	295756	5838	2919	1326200	355800	1682000	17.9
5	Aug-2020	454743	7656	3828	1294100	627500	1921600	24.1
6	Sep-2020	86816	9021	4510	1375200	739700	2114900	4.5
7	Oct-2020	62226	3851	1926	1389200	957600	2346800	2.8
8	Nov-2020	86119	0	4514	1362700	925000	2287700	3.8
9	Dec-2020	60145	76	3884	1396600	936900	2333500	2.6
10	Jan-2021	0	6728	3364	1478800	1041200	2520000	0.3
11	Feb-2021	65636	7472	3736	1494600	803800	2298400	3.2
12	Mar-2021	80800	10290	5145	1949000	961500	2910500	3.1
Total		**1728362**	**76817**	**52150**	**17692200**	**8484900**	**26177100**	**7.8 ****
1	Apr-2021	87128	11176	5588	1943300	298900	2242200	4.4
2	May-2021	0	11791	5896	1767800	243800	2011600	0.6
3	Jun-2021	327943	9824	4912	1626500	413100	2039600	16.6
4	Jul-2021	440343	8343	4171	1749800	284500	2034300	22.1
5	Aug-2021	250063	8149	4075	1746000	679400	2425400	10.6
6	Sep-2021	310904	7920	3960	1741750	793600	2535350	12.6
7	Oct-2021	62548	9586	4793	1749650	1112900	2862550	2.5
8	Nov-2021	86747	6587	3293	1796850	967900	2764750	3.4
9	Dec-2021	50444	4564	2282	1825350	910900	2736250	2.0
10	Jan-2022	69579	4525	2263	1816950	802850	2619800	2.8
11	Feb-2022	51572	6933	3467	239785.5	101620	341405.5	17.1
12	Mar-2022	63328	10417	5208	2331750	1014450	3346200	2.2
Total		**1800598**	**99814**	**49907**	**20335486**	**7623920**	**27959406**	**8.1 ****

$ Wind mill Generation in units (Credit Units) at Satara-0.85MW Capacity each-2 windmill

WTP Solar Generation (50KW) (half the value taken of STP Generation); ** Average % Share of Renewable Energy

Table 9.1 *(Contd..)*: Monthly Total Energy Consumption and Renewable Energy Generation …During 2018-23

Sr.	Month /Year	Wind Mill Generation (0.85 MW Capacity) 2 Each $	STP Solar Generation (110KW)	WTP Solar Generation (50 KW) #	Consumption in KWHz		Total Consumption in KWHz	% Share of Renewable Energy
					Amanora Phase I	Amanora Phase II		
1	Apr-2022	106707	10517	5259	2731100	1112600	3843700	3.0
2	May-2022	246770	11472	5736	2631950	1213400	3845350	6.7
3	Jun-2022	301189	9499	4749	2340500	1141850	3482350	8.9
4	Jul-2022	400909	6177	3089	2173850	1085950	3259800	12.5
5	Aug-2022	228152	7606	3803	2188800	1094000	3282800	7.2
6	Sep-2022	183364	7250	3625	2205300	1077150	3282450	5.8
7	Oct-2022	72527	7992	3996	2118500	1088050	3206550	2.5
8	Nov-2022	86155	7947	3973	2024000	977500	3001500	3.1
9	Dec-2022	48409	6419	3210	2190550	1018550	3209100	1.7
10	Jan-2023	56736	7008	3504	2188450	967400	3155850	2.0
11	Feb-2023	51572	8153	4076	2083100	914400	2997500	2.0
12	Mar-2023	84512	10721	5360	2363300	1116600	3479900	2.7
Total		**1867003**	**100761**	**50379**	**27239400**	**12807450**	**40046850**	**4.9 ****

$ Wind mill Generation in units (Credit Units) at Satara-0.85MW Capacity each-2 windmill
# WTP Solar Generation (50KW) (half the value taken of STP Generation); ** Average % Share of Renewable Energy

The township generates renewable energy mainly from sources like windmills, rooftop solar plants, solar wind hybrid systems, and solar street light poles. Share of total renewable energy to the total energy consumption in the township during 2018-19, 2019-20, 2020-21, 2021-22 and 2022-23 is estimated to be 6%, 6.7%, 7.8%, 8.1% and 4.9% respectively.

9.1.3 Power Backup - DG Sets in the Township

There are an availability of diesel generator sets of different capacities which are used in the residential as well as for commercial purposes in the township during main power failure. The details of the DG sets are presented in **Table 9.2.**

Table 9.2: Details for Diesel Generator (DG) Sets at the Township in the Year 2017 to 2023

Sr.	Sectors	Capacity of DG (KVA)	No. of DG Sets	Total Load (KVA)		Capacity of DG (KVA)	No. of DG Sets	Total Load (KVA)
		2017-2018				2018-2019		
1	Site office DG 400 KVA	400	1	400		400	1	400
2	Mobile DG 125 KVA	125	3	375		125	3	375
3	Mobile DG 75 KVA	75	1	75		75	1	75
4	ESS-5 DG 62.5 KVA	62.5	1	62.5		62.5	1	62.5
5	Data Centre DG 250 KVA	250	1	250		250	1	250
6	R-2 Site DG Set 400 KVA	400	2	800		400	2	800
7	R-5 Site DG Set 200 KVA	200	2	400		200	2	400
8	WTP DG 320 KVA	320	1	320		320	1	320
9	R-22 DG 200 KVA	200	2	400		200	2	400
10	ESS-1 DG 62.5 KVA	62.5	1	62.5		62.5	1	62.5
11	Future tower 500 KVA	500	2	1000		500	2	1000
12	R-25 DG 200 KVA					200	1	200
13	NEO tower 250 KVA					250	2	500
14	Gateway Tower 500 KVA					500	2	1000
15	Adreno Tower 500 KVA							
		Total	**17**	**4145**		**Total**	**22**	**5845**

Table 9.2 *(Contd..)*: Details for DG Sets-Township in the Year 2018 to 2023

Sr.	Sectors	Capacity of DG (KVA)	No. of DG Sets	Total Load (KVA)	Capacity of DG (KVA)	No. of DG Sets	Total Load (KVA)
		2019-2020			2020-2021		
1	Site office DG 400 KVA	400	1	400	400	1	400
2	Mobile DG 125 KVA	125	3	375	125	3	375
3	Mobile DG 75 KVA	75	1	75	75	1	75
4	ESS-5 DG 62.5 KVA	62.5	1	62.5	62.5	1	62.5
5	Data Centre DG 250 KVA	250	1	250	250	1	250
6	R-2 Site DG Set 400 KVA	400	2	800	400	2	800
7	R-5 Site DG Set 200 KVA	200	2	400	200	2	400
8	WTP DG 320 KVA	320	1	320	320	1	320
9	R-22 DG 200 KVA	200	2	400	200	2	400
10	ESS-1 DG 62.5 KVA	62.5	1	62.5	62.5	1	62.5
11	Future tower 500 KVA	500	2	1000	500	2	1000
12	R-25 DG 200 KVA	200	1	200	200	1	200
13	NEO Tower 250 KVA	250	2	500	250	2	500
14	Gateway Tower 500 KVA	500	2	1000	500	2	1000
15	Adreno Tower 500 KVA						
		Total	**22**	**5845**	**Total**	**22**	**5845**

Table 9.2 *(Contd..)*: Details for DG Sets-Township in the Year 2018 to 2023

Sr.	Sectors	Capacity of DG (KVA)	No. of DG Sets	Total Load (KVA)	Capacity of DG (KVA)	No. of DG Sets	Total Load (KVA)
		2021-2022			2022-2023		
1	Site office DG 400 KVA	400	1	400	400	1	400
2	Mobile DG 125 KVA	125	3	375	125	3	375
3	Mobile DG 75 KVA	75	1	75	75	1	75
4	ESS-5 DG 62.5 KVA	62.5	1	62.5	62.5	1	62.5
5	Data Centre DG 250 KVA	250	1	250	250	1	250
6	R-2 Site DG set 400 KVA	400	2	800	400	2	800
7	R-5 Site DG Set 200 KVA	200	2	400	200	2	400
8	WTP DG 320 KVA	320	1	320	320	1	320
9	R-22 DG 200 KVA	200	2	400	200	2	400
10	ESS-1 DG 62.5 KVA	62.5	1	62.5	62.5	1	62.5
11	Future tower 500 KVA	500	2	1000	500	2	1000
12	R-25 DG 200 KVA	200	1	200	200	1	200
13	NEO Tower 250 KVA	250	2	500	250	2	500
14	Gateway Tower \ 500 KVA	500	2	1000	500	2	1000
15	Adreno Tower 500 KVA	500	2	1000	500	2	1000
		Total	**24**	**6845**	**Total**	**24**	**6845**

During the last five years around 17 to 24 numbers DG sets of different capacities were used, the total minimal load is 4145 kVA maximum load of up to 6845 kVA was consumed.

9.1.4 Gas Supply/Distribution

The Township receives its gas supply through the Maharashtra Natural Gas Limited (MNGL) network, ensuring a continuous 24-hour service. Residents are spared the hassle of scheduling, waiting, storing, or replacing cylinders.

9.1.5 Healthcare /Medical Facilities

The Township features a comprehensive medical facility known as "Amanora Hospital," overseen by Ruby Hall Clinic, offering around 150 beds. Regular health check-up camps and programs for workers and employees are also organized by the Township. The details of these health initiatives conducted within the premises are outlined in **Table 9.3**. Intensive worker's health checks were conducted from 2017 to 2023. Similarly, various health camps were also organized after Corona pandemic 2021-22 and benefited users around 18089. In the last five years around 2347 employees and 6283 workers labour forces were checked, and in health camps, 42032 people benefited due to various health camps. Among different health checkups Spirometric tests, Cancer checkups, Eye & Dental Checkups, Breathe Checkups, Breast cancer HB, and Sugar checks are the key components, whereas, Vitamins, Tonic, ORS distributions, Corona Vaccination, Blood Donation Camp were also conducted.

Table 9.3: Health Check-ups within the Township During 2017-23

Year	Employees Checked	Workers Checked	Health Camp (People Attended)	Total Benefited Peoples
2017-18	330	340	12854	13524
2018-19	1210	953	3219	5382
2019-20	34	1138	1562	2734
2020-21	469	2161	5779	8409
2021-22	132	1616	18089	19837
2022-23	172	75	529	776
Total	**2347**	**6283**	**42032**	**50662**

9.2 Environment Sustainable Infrastructure

9.2.1 Sewage Treatment Plant

The township has a sewage treatment plant with a capacity of 1.75 MLD with an additional capacity of up to 3.5 MLD shortly. The STP is operated with Fluidized Aerobic Bio-reaction (FAB) technology, which is maintained by Thermax Company and also provides reuse and recycling options for the treated water. Thus, recycled water from the sewage treatment plant is used for gardening and flushing purposes within the township.

9.2.2 Renewable Energy Structures

The township generates power from renewable sources which are utilized and fulfill many domestic purposes of its residents.

Amanora Township is developing phase-wise. The first phase and second phases are in operation and have a total population of approx. **34000**, excluding floating. There are two electrical substations for the operation of the first phase. Total connected power for the existing phase is taken from MSEDCL. The Proposed Project has installed renewable energy techniques and other innovative technology which has having total power generation capacity of **1860 KW.**

- **The Biogas Plant** installed at Amanora has a **2.5-ton** capacity and the Gas Balloon that is used for storage of methane gas has a capacity of **150 M^3**. (An average of 150 m^3 of daily gas is generated). The plant saves up to **72 Kg/Day** of equivalent LPG gas which is used for cooking. The plant generates up to **2000 units/month** of electricity.

- **Windmills** installed at Budh-Satara have **0.85 MW** Capacity. (Total capacity in KW 1700) The total credit unit generation from Wind mill in the current financial year (April 2022- March 2023) is **1867003.09 units.**

Wind Turbines Located at Satara by Developer

- **Solar Energy:** The daily mean temperature starts rising from February and May is the peak summer and the maximum temperature during these months often rises above 36°C. Thus, the project site has a huge amount of potential to utilize solar energy through various applications
  - The company has utilized solar energy by using Photovoltaic (PV) cells placed on the rooftop of the Sewage treatment plant, the total amount of capacity of the solar plant is having capacity of **110 KW** which is connected to the grid system. The total unit generation from solar at STP in the current financial year (April 2022- March 2023) is **100760.6 units.**
  - The company has utilized solar energy by using Photovoltaic (PV) cells placed on the rooftop of the Water treatment plant, the total amount of capacity of the solar plant is having capacity of **50KW** which is connected to the grid system. The total unit generation from solar at WTP in the current financial year (April 2022- March 2023) is **50379 units.**

Current Methods to Save the Energy

Solar Street light poles are proposed by the developer for the internal road in the bungalow plot area, 102 Solar Streetlight Poles each having a **70W** Solar Panel and **20W LED** which will have a total capacity of about **2.04 KW** are installed on both sides of the road at a distance of 12 m. providing adequate illumination.

- Solar streetlights should give the output with full intensity for 11 Hrs. after completion of 1 charging cycle of battery on 1st day. In a cloudy atmosphere, min 4 Hrs. of output should be discharged Solar Street light pole with 20W LED and, a 70 W Solar panel. The entire required power for street lighting is 100% from solar and it will be free from power requirements.
- **Solar signal poles** are proposed by the developer for the internal road where the signals will have a **5W LED** Lamp blinker and solar panel of 20W each which will be sufficient to provide adequate.
- **Solar Arrow** will have had **8W LED** Lamp blinker and solar panel of 20W each which will be sufficient to provide adequate.

Solar Streetlight Pole

Solar Power Signal & Arrow

9.2.3 Road Infrastructure

All roads of the Township are made up of Bituminous and have pavements on either side along with roadside plants/ trees. The total road width of Crescent Road is 26 meters. It has two lanes to prevent traffic snarls. Smooth traffic movement was observed during the site visit. All the sectors and common facilities are well connected through a good network of roads.

Parking Facilities

In the township, a large space has been allotted for parking vehicles as the total number of flats in all the residential sectors is 8219, and for this total parking allotted is 7799 number. 517 Extra parking lots have also been provided for visitors. The sector-wise parking provision is given in **Table 9.4.**

Table 9.4: Summary of Parking Facilities at the Township

Sectors	No. of Flats	Population	No of Car Parking's (Approx)	Visitors Parking
R2 sector (10 Towers)	676	3380	676	74
R3 sector (2 Towers)	400	2000	400	75
R3 & R9 sector (Bungalows)	67	335	67	0
R4 sector (3 Towers)	210	840	105	20
R5 sector (5 Towers)	240	960	120	10
R11 sector (9 Towers)	1117	4468	1117	138
R21 sector (5 Towers)	880	3520	880	70
R22 sector (3 Towers)	390	888	195	0
R25 sector (3 Towers)	286	1144	286	14
R26 sector (4 Towers)	574	1880	574	10
R08 sector (3 Towers)	465	1860	465	6
R19 sector (5 Towers)	1328	5312	1328	37
R29 sector (5 Towers)	1586	6344	1586	63
Total	**8219**	**32931**	**7799**	**517**

* Occupancy Details as per Sector & Towers updated 2023

9.2.4 Solid Waste Management

The main source of solid waste is from residential sectors (85%) generating approx. 25.4 tons daily which is being collected in garbage chutes provided at each residential sector. The solid waste is properly segregated in separate bins for dry and wet wastes. Dry waste composed of recyclable garbage is being sent for recycling by appointed vendors and non-recyclable garbage is sent to M/s Rochem for disposal while segregated wet waste (food waste) is being sent to the biogas plant for biogas generation and Excel OWC & Ecoman machine for composting.

A Separate Scarp yard was built with separate compartments for separate waste having a storage capacity of 1000 Kg and garbage is stored as per the recycling categories like paper, plastic, steel, glass, metal, etc. Separate 5 Vehicles are designed and provided for the collection of waste from the respective sources daily.

Treatment of Waste: All the collected waste is brought to the '*Waste to Energy site*' for processing. Waste is treated in mainly TWO types i. e. Dry waste & Wet waste.

I. Wet waste: Wet waste is treated by the following Conventional and Modern technologies

- *Excel Organic Waste Converter*: In the Excel machine waste is treated in batch-wise process. One batch is about 35 kg of food waste, 10 Sawdust as an absorbing agent, 7 of harvested compost, and 50 gm of culture. After 10 days of scientific curing compost is ready to use as manure directly. For the last 12 years, the system has operated effectively and the compost generated is used for landscaping purposes.
- *Biosanitizer Project*: Biosanitizer composting pits are constructed Seven days of week for the management of solid waste. This is the conventional method of treatment of food waste. Previously it was treated by earthworms but nowadays 'Vermi ++' culture is used for the treatment of waste. Daily 50 Kg of waste is put in these pits. In these pits, waste is decomposed by organisms (Vermi ++) into compost. This compost is harvested after 5 to 6 months after ensuring its quality.
- *Biogas Plant:* On the premises 2500 kg/day biogas plant has been installed as a mission of 'Waste to Energy'. Presently treating about 2400 kg of food waste daily. It generated about 180 to 195 M^3 of Biogas daily, which is used for power generation and supplying enough fuel to meet our partial requirement of Canteen fuel.
- *Ecoman Machine*: This South Korean machine is used for quick compost. It covers food waste into Compost within 24 hours by an external heating mechanism.

II. Dry Waste:

Dry waste from offices, canteen construction sites, etc. is collected separately and segregated into recyclable materials like Paper, cardboard, plastic, glass, metal, etc. segregated by Authorised rag-pickers from the SWACH an NGO working for SWM in Pune city.

Due to the proper segregation, only about 20% Inert and non-recyclable material is sent to M/s Rochem Green Energy for the RDF and pyrolysis process. So, there is 0% waste sent for secured landfilling from Amanora Township.

9.3 Safety/Security Facilities

9.3.1 Security/Backup Services

Township has two layered security systems wherein around 400 trained security personnel are engaged. There is a security check through a special dog squad & patrolling vehicles for the citizens of the township. It has 24 X 7 CCTV surveillance.

9.3.2 Fire Fighting Equipment Services

The township has a facility of 24-hourly operated fire stations with the latest firefighting equipment 55 meters which has a high turntable ladder facility and Accommodation Facility for Firemen.

9.4 Other Facilities

9.4.1 Schools

There are 2 premier schools in the township affiliated to CBSE and ICSE.

- *Amanora Public School* (2000 Students)
- *Pawar Public School* (2000 Students)

9.4.2 Recreational Facilities

Following recreational facilities are provided within the Township for its citizens:

- ***Sports & Fitness facilities*** such as swimming pool, kid's pool, squash and badminton court, rooftop tennis court, gymnasium, table tennis lounge, chess, carom room, yoga and meditation hall.
- ***Relaxation facilities*** such as a Card Room, Snooker and Pool, Library, Upcoming Salon and Spa, and Upcoming Auditorium.
- ***Events Spaces*** such as 2.3 Acre open-air Amphitheatre, Banquet Hall EMERALD with Open Deck, Banquet Hall JADE, Upcoming Floating Restaurant, CRESCENT Bar and lounge, VISTA Coffee Shop with Private Dining Room, Upcoming Fine Dine Restaurant.
- ***Facilities within the Township*** such as Kids Play Area, Music Academy, Business Centre, Guest Rooms, Gourmet Shop.

9.4.3 Digital Infrastructure

The township provides good digital services for its residents such as:

- ***Home Automation System***, such as guard phone with webcam facility at security gate, Lobby phone with webcam at each lobby, Doorbell with webcam, VDP (Visual Display Processor) connected with lobby and guard station.
- ***DTH Services,*** such as DTH (TV) services provided by multiple operators.
- ***Pre-paid Utility Services,*** *such as* automatic ON/OFF System for water tanks, PAYGTL GAS AMR-based gas distribution system, Centralized Electricity Recharge System, and BMS for monitoring & measuring all services.

9.4.4 Help-desk Portal/Domestic Help

The township has domestic helpline numbers to address all township-related concerns on "Dial 555" for Amanora Residents.

9.4.5 Social Awareness Programmes/Training

Amanora Township has conducted some training sessions on various topics related to solid waste management, environment health, and safety, quality management systems, road safety training, etc. as summarized in **Table 9.5.** It was observed that a maximum of 216 training sessions were conducted during 2022 and a minimum of 39 sessions were worked out during the pandemic period in 2020. The highest number of 4962 workers were trained in 2018 and a minimum of 1913 in 2020.

Table 9.5: Total Trainings Conducted and Number of Workers Trained During 2018-23

Sr.	Year	No. of Training Sessions Conducted	Trainings Conducted	No. of Workers Trained
1.	2018	114	Housekeeping at construction sites, Quality Management System (QMS), Road Safety Training, Safety at construction sites, EHS awareness	4962
2.	2019	139	Safety at the Construction site, ISO, EHS Awareness, Work Permit, Wastewater analysis	4664
3.	2020	39	Road Safety Training, Safety at construction sites, EHS awareness.	1913
4.	2021	118	Fire safety, EHS awareness, Safety at construction sites, Work Permit, safety measures, and use of PPE'S	3148
5.	2022	216	Housekeeping at construction sites, Quality Management System (QMS), Road Safety Training, Safety at construction sites, EHS awareness, work permit, quality in construction	3706
6.	2023	191	Safety at the Construction site, ISO, EHS Awareness, Work Permits, Wastewater analysis, and safety precautions while handling chemicals.	3198
	Total	**817**		**21591**

Source: Secondary Data

9.4.6 Employment Opportunities

The Township has provided some employment opportunities for the comfort of its residents. Several opportunities such as maid, cook, driver, caretaker, babysitter, assistant, car washer, dog walker, domestic helper, flower delivery, yoga teacher, laundry, tutor, milk men, doctor, etc. were given. By 2023, it is observed that the maximum number of employments provided to housemaids (1830 nos.) followed by drivers (153 nos.) and cooks (135 nos.) as detailed in **Table 9.6.**

Table 9.6: Employment Status within the Township During 2023

Sr.	Type of Employment	Total Number of Employment Given
1	Maid	1830
2	Cook	135
3	Driver	153
4	Caretaker	28
5	Baby Carer	9
6	Gym trainer	8
7	Baby sitter	7
8	Baby Massage	3
9	Assistant	3
10	Car washing	21
11	Doctor	5
12	Nurse	5
13	Dogwalker	6
14	Domestic Helper	32
15	Flower Delivery	14
16	Nanny	6
17	Yoga teacher	5
18	Laundry	23
19	Tutor	19
20	Tiffin	13
21	Milk	43
	Total	**2368**

Source: Secondary Data

Amanora Township has trained a number of its employees in several departments for better operation and maintenance of the township from 2018 to 2023 which has been listed in **Table 9.7.** It has been observed that the total numbers of employees trained in the engineering or construction department followed by electrical and infrastructure department were 129, 81 and 67 respectively.

Table 9.7: Manpower (Employees) Trained in Various Departments in the Township during 2018-23

Sr.	Name of Department	No. of Employees	Total Manpower Trained
1	Account	13	22
2	Administration	17	9
3	Contract & billing	14	8
4	Electrical	38	81
5	Engineering/construction	90	129
6	EHS	13	54
7	HR & CS	4	9
8	Infrastructure	46	67
9	IT	18	27
10	Landscaping	3	10
11	Marketing	25	12
12	Planning	15	18
13	Quality	9	18
14	Security	79	42
15	Purchase	4	12
16	Store	22	72
17	Fire	13	30
18	Maids	NA	25
Total		**423**	645

9.5 Labour Colony Details of the Township

The labour colony is the place for labourers who work on Construction sites within the township and these construction workers live in labour camps provided by Amanora Corporation Limited. As of now in 2023 approximately 766 labourers are living in the labour camps of the township. Out of 472 rooms 395 are occupied. 48 bathrooms and 54 toilet facilities are available for Gents and ladies each, whereas almost similar facilities are available for Ladies.

Labour colony is clean and hygienic having all basic requirements such as health camps conducted for the labourers to make awareness among labours about epidemic diseases like Malaria, Dengue, chikungunya, etc. Adequate drinking water and sanitary facilities are provided for the labourers. Septic tanks and soak pits are provided for the safe disposal of wastewater (septic tank capacity 40 m^3, Soak pit- 20 sqm.).

Chapter 10

Status of Environment Compliance and Recommendations

Chapter 10

Status of Environment Compliance and Recommendations

10.1 Environment Compliance Status

Amanora Park Town stands as the inaugural township developed under the State Government's Integrated Township Policy, occupying 476 acres on the outskirts of Pune. Having secured all necessary clearances, including environmental clearance from relevant authorities, the township has obtained approvals from the Ministry of Environment, Forest and Climate Change (MoEF&CC) as per EIA Notification 1994, Government of India, and the State Pollution Control Board's Consent to Establish and Operate, with timely renewals. The development of the township is unfolding in phases, with the initial phase operational since 2011.

Acknowledging its commitment to environmental stewardship, the township has garnered more than 24 Environment Excellence Awards for its outstanding efforts in Environment Management and Sustainable Development. Representatives from the MoEF&CC have expressed appreciation for the environmental friendliness of the township, particularly highlighting its noteworthy "Temple of Environment" and unwavering dedication to environmental causes.

Amanora Park Township project has obtained the Environmental clearance (EC) No. J-12011 /22/2005/IA (CIE) dated 27.10.05 from MoEF. Govt. of India under EIA Notification 1994. No validity period was mentioned on EC as validity at that time was for 5 years to start/commencement of construction of work. As Townships are long gestation projects, an abundant precaution Amanora Park Township has asked clarification to the SEIAA, Maharashtra about the revalidation of the Environmental clearance (EC). SEIAA wide their letter no SEIAA-2017/CR-04/TC-3 dated 22nd February 2017 confirmed that no “revalidation” is required for Amanora Park Township project.

In line with Environmental Clearance (EC) conditions, Amanora Township has diligently ensured compliance with the recommendations put forth by NEERI in its 2005 Environmental Impact Assessment (EIA) Report and subsequent 2013 and 2018 Audit Report. The implementation status of actions taken by Amanora Township is succinctly summarized in **Table 10.1**.

Table 10.1: EC Compliances Status of NEERI Recommendations (2005 EIA Report and 2013 and 2019 Audit Report) by Amanora Township

NEERI Recommendations	Implementation Status/Observations
Continuation of ISO certification for ISO 14001:2015 & OHSAS 18001:2007, if it is organizationally beneficial	The township continues to maintain ISO 14001:2015 and OHSAS 18001:2007 certifications for effective environmental and occupational health management.
There should be continuous provision to sprinkle water to minimize the dust on site, during summer GRT Wet lock chemicals are used for the construction road, which should be continued.	The practice of continuous dust suppression through water sprinkling, especially during summer, is consistently followed.
Explore ways & means to use more renewable energy like Solar and wind wherever possible in the township	At present, the total capacity of renewable energy in 1860 KW
The maximum number of local plant species should be planted with varieties.	The landscaping strategy emphasizes the planting of a diverse range of local plant species, contributing to ecological diversity within the township.
Provision should be made to supply gas and kerosene to the construction workers to avoid dependency on the local resources	Adequate provisions have been made to supply gas and kerosene to construction workers, reducing dependency on local resources and ensuring their well-being.
Awareness programs related to environment conservation, safety, and health risks should be formulated for Citizens as they are the main stakeholders in the Township	Ongoing awareness programs addressing environmental conservation, safety, and health risks are regularly formulated for the residents, recognizing them as key stakeholders in the township.
Development of the "Green Building" concept should be initiated.	The plans are under consideration at the management level.

10.2 Summary and Recommendations

The township has diligently implemented the recommendations outlined in the Environment Management Plan, as proposed by NEERI through the Environmental Impact Assessment (EIA) report in 2005 and the subsequent Audit report in 2013 and 2018. Additionally, it has adhered to the conditions specified in the environmental clearances granted by the State and Central Governments. Regular 6-monthly environmental compliance reports are consistently submitted to the Ministry of Environment, Forest, and Climate Change (MoEF&CC).

In its pursuit of being an environmentally friendly township, Amanora sought an evaluation of the construction phase and the initial operational phase. Consequently, NEERI conducted an audit encompassing the township's Environment Management Plan, both secondary and primary environmental data parameters, and the compliance status with the stipulated clearances from State and Central governments. The comprehensive audit revealed that, overall, the township has adhered to the conditions outlined in the statutory clearances.

In instances where minor deficiencies were identified, such as enhancements needed in the labour colony, measures for ambient air quality improvement, and noise monitoring regularly, appropriate actions were recommended. A commitment to monitoring and addressing these minor shortfalls in the future was communicated to NEERI.

- ***Air Quality Monitoring and Mitigation:*** Strengthen efforts in monitoring and mitigating air quality concerns resulting from the re-suspension of road dust and vehicular emissions, especially in winter. This may involve regular air quality assessments, strategic placement of green buffers, and the promotion of sustainable transportation modes and infrastructure. We recommend exploring the feasibility of a real-time air quality monitoring system, which is visibly accessible to township residents as an additional measure.
- ***Water Conservation Strategies:*** Implement water conservation strategies to optimize water usage within the township. Water fixtures equipped with low-flush mechanisms or designed for high efficiency, along with waterless urinals, make substantial contributions to water conservation. Incorporating air into the flow of water through contemporary faucets and showers also effectively reduces overall water usage. The adoption of water-saving fixtures and appliances emerges as a significant factor in achieving notable reductions in water consumption, with potential savings upto 40%.
- ***Energy Efficiency Measures:*** Explore opportunities for enhancing energy efficiency within the township, such as increasing the share of renewable energy sources, energy-efficient lighting systems, and sustainable building practices. Use energy-efficient lighting systems and heating/cooling, ventilation, and air conditioning (HVAC) systems. This will lower energy consumption, reduce operating costs, and minimize environmental impact.
- ***Infrastructure Maintenance:*** Develop Long-Term Maintenance Planning and follow that considering the life cycle of infrastructure elements and emphasizing durability and sustainability. This would minimize the need for frequent repairs, cost-effectiveness, and reduced environmental impact associated with constant maintenance.

- ***Regular Environmental Audits:*** Conduct periodic environmental audits to assess the effectiveness of implemented measures and identify areas for improvement. These audits should encompass various aspects, including waste management, air and water quality, biodiversity conservation, and other sustainable practices.
- ***Community Engagement:*** Foster community engagement initiatives to raise awareness among residents and adjoining communities about the importance of environmental conservation. Foster a culture of sustainability, increased awareness, and a sense of community responsibility.

By incorporating these recommendations into the ongoing development and management strategies, the township can further solidify its commitment to environmental sustainability and contribute to the well-being of its residents and the surrounding ecosystem.

Annexure No 30 - FINANCIAL DETAILS

CCL has estimated the total cost of the project at Rs. 4289.36 Crores when completed. The composition of the same is as under.

Project cost	**Amount (In crores)**
Land cost	648.34
Construction cost	
a. Construction cost	2799.65
Infrastructure, plantation & other cost	430.91
Marketing & Advertising expenses, Overheads & brokerage	345.90
Financial charges	64.56
Total	**4289.36**
Infrastructure cost (Approx.)	**Amount (In Lacs)**
Solid waste management, Transport, STP etc.	800.00

Actual Expenditures incurred on the environmental management plans so far in Rupees.

Sr. No	Heads	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total in Rs
1	Monitoring of air, water, noise and DG by external agency	16400	49200	16400	49200	16400	49200	**1,96,800**
2	Solid waste Management at site - Operation & Monitoring	660209.1	587552.72	536794.3	702361.17	911868.09	693040.23	**40,91,825.61**
3	Sewage Treatment Plant – Operation & Monitoring	218660.7	456497.7	151657.2	366811.3	447253.1	303755	**19,44,635.02**
4	Manpower Expenditures	500000	500000	500000	500000	500000	500000	**30,00,000**
5	Vehicle / Transport expenditure	25000	25000	25000	25000	25000	25000	**1,50,000**
Total Expenditure in Rs								**9383260.63**

Environment Monitoring Report

October 2024 to March 2025

Submitted to Ministry of Environment and Forests

June 2025

City Corporation Ltd.
Amanora Park Town
Hadapsar - Kharadi Bypass
Pune 411028

Phone - +91 020 25654555 **Fax - +91 020 25657555**

AMANORA®
PARK TOWN

CITYGROUP

CITY CORPORATION LIMITED
CIN: U45202PN2003PLC018435

CCL/JKB/05/25 **DATE: 27th May 2025.**

To,
Addl. Principal Chief Conservator of Forests (Central)
Ministry of Environment, Forest & Climate Change.
Regional office, West Central Zone
Ground Floor, East Wing,
New Secretariat building, Civil Lines,
Nagpur – 440001, India.

Subject: - Six monthly Environmental Monitoring report of Amanora Park Town – Pune, Maharashtra for the period **Oct 2024 to March 2025**.

Ref: Environmental Clearance letter No. J-12011/22/2005/IA (CIE) dt. 27.10.2005 received from MoEF and MoEF&CC Notification No S.O. 5845(E) dated 26.11.2018.

Dear Sir,

With reference to the MoEF & CC notification dated 26th November 2018 regarding the submission of Six Monthly Compliance report of Prior Environmental Clearance Condition to be submitted on 1st June & December of every year.

Please find submitting herewith Environmental Monitoring report of Amanora Park Town at Hadapsar, Pune, Maharashtra for the period **Oct 2024 to March 2025**.

Kindly acknowledge the same.

Thanking you,

Yours Faithfully,
For City Corporation Ltd.

CITY CORPORATION LIMITED AMANORA PARK TOWN HADAPSAR

J. K. Bhosale
Director

Encl: As Above

Copy to: 1. Principle Secretary, Environment Dept, Govt. of Maharashtra.
2. Regional Office, Maharashtra Pollution Control Board, Pune.

AMANORA
PARK TOWN

CITYGROUP

CITY CORPORATION LIMITED
CIN: U45202PN2003PLC018435

CCL/JKB/05/25 **DATE: 27th May 2025.**

To,
The Chairman /Member Secretary,
SEIAA, Maharashtra
Environment Dept,(MS),
Room No. 217, 2nd Floor,
Mantralaya Annexe
Mumbai – 400 432

Subject: - Six monthly Environmental Monitoring report of Amanora Park Town - Pune, Maharashtra for the period **Oct 2024 to March 2025**.

Ref: 1. Environmental Clearance letter No. J-12011/22/2005/IA (CIE) dt. 27.10.2005 received from MoEF and MoEF & CC Notification No S.O. 5845(E) dated 26.11.2018.
2. SEIAA, Maharashtra letter no SEIAA-2017/CR-04/TC-3 dated 22nd February 2017

Dear Sir,

With reference to the MoEF & CC notification dated 26th November 2018 regarding the submission of Six Monthly Compliance report of Prior Environmental Clearance Condition to be submitted on 1st June & December of every year.

We have submitted Environmental Monitoring report of Amanora Park Town at Hadapsar, Pune, Maharashtra for the period **Oct 2024 to March 2025** through ONLINE Parivesh Portal.

Please find submitting herewith copy of same, kindly acknowledge the same.

Thanking you,

Yours Faithfully,
For City Corporation Ltd.

CITY CORPORATION LIMITED AMANORA PARK TOWN HADAPSAR

J. K. Bhosale
Director

Encl: As Above

Copy sent by email to: 1. ACS/CCF, MoEF Western Regional office, Nagpur.

2. Regional Office, Maharashtra Pollution Control Board, Pune.

AMANORA
PARK TOWN

CITYGROUP

CITY CORPORATION LIMITED
CIN: U45202PN2003PLC018435

CCL/JKB/05/25 **DATE: 27th May 2025.**

To,
Regional Officer,
Maharashtra Pollution Control Board,
Jog Center, 3rd Floor, Mumbai-Pune road,
Wakadewadi, Pune – 411 003.

Subject: - Six monthly Environmental Monitoring report of Amanora Park Town - Pune, Maharashtra for the period **Oct 2024 to March 2025**.

Ref: Environmental Clearance letter No. J-12011/22/2005/IA (CIE) dt. 27.10.2005 received from MoEF and MoEF & CC Notification No S.O. 5843(E) dated 26.11.2018.

Dear Sir,

With reference to the MoEF & CC notification dated 26th November 2018 regarding the submission of Six Monthly Compliance report of Prior Environmental Clearance Condition to be submitted on 1st June & December of every year.

We have submitted Environmental Monitoring report of Amanora Park Town at Hadapsar, Pune, Maharashtra for the period **Oct 2024 to March 2025** through ONLINE Parivesh Portal.

Please find submitting herewith copy of same, kindly acknowledge the same.

Thanking you,

Yours Faithfully,
For City Corporation Ltd.

CITY CORPORATION LIMITED
AMANORA PARK TOWN HADAPSAR

J. K. Bhosale
Director

Encl: As Above

Copy sent by email to: 1. ACS/CCF, MoEF Western Regional office, Nagpur.
2. Principle Secretary, Environment Dept, Govt. of Maharashtra.

Half Yearly Compliance Report
2025
01 Jun(01 Oct - 31 Mar)

Acknowledgement

Proposal Name	City Corporation Limited, Amanora Park Town, Hadapsar Pune, Maharashtra
Name of Entity / Corporate Office	Jaymalhar Bhosale
Village(s)	N/A
District	PUNE

Proposal No.	J-12011/22/2005/IA (CIE)
Plot / Survey / Khasra No.	N/A
State	MAHARASHTRA
MoEF File No.	J-12011/22/2005/IA (CIE)

Category	INFRA-1
Sub-District	N/A
Entity's PAN	*****2820K
Entity name as per PAN	CITY CORPORATION LIMITED

Compliance Reporting Details

Reporting Year	2025
Remarks (if any)	City Corporation Limiteds Amanora Park Township project obtained the Environmental clearance (EC) on 27.10.2005 from MoEF, Govt. of India under EIA Notification 1994. Since the last 17 years we are submitting six monthly report to MOEF and MPCB regularly. From last year we have started submitting Online Six monthly report submission as per MOEFandCC guidelines. Now we are submitting herewith Six Monthly report for the Period of Oct 2024 to March 2025.
Reporting Period	01 Jun(01 Oct - 31 Mar)

Details of Production and Project Area

Name of Entity / Corporate Office Jaymalhar Bhosale

	Project Area as per EC Granted	Actual Project Area in Possession
Private	192.628	192.628
Revenue Land	0	0

Forest	0	0
Others	0	0
Total	192.628	192.628

Production Capacity

Sr. no	Product Name	units	Valid Upto	Capacity	Production last year	Capacity as per CTO
1	Residentail and Commercial Township	Square per Meter(SQM)	N/A	1926289	NA	1926289
2	Total Builtup area for Township	Square per Meter(SQM)	N/A	3274711	NA	3274711

Conditions

Specific Conditions

Sr.No.	Condition Type	Condition Details
1	Human Health Environment	Provisions of Environmental Management System (ISO 14001) should be implemented right from the construction phase that will include maintaining required sanitary and hygienic measures through out the construction phase. Provision of drinking water, waste water disposal and solid waste management should be ensured for labour camps.

PPs Submission: Complied Provision of Environmental Management System (ISO 14001:2004) has been made right from the construction phase. Company has certified as ISO 14001: 2015, ISO 45001:2018 and ISO 9001:2015 from the LMS Certification Ltd in December 2022 which is valid till November 2025. See Annexure No 01: ISO certificate. Toilets with septic tank and soak pit are constructed at the labour camp and Construction site for construction workers during construction phase. Drinking water is supplied from Amanoras well equipped Water Treatment Plant provided by Ms Thermax a global expert in the Water and Wastewater. Drinking water is stored in a clean separate tank so that it is free from contamination. For solid waste TWO bins system is implemented for the collection garbage. Excel organic waste converter machine, Biogas Plant and Ecoman machine is operational for disposal of solid waste.	Date: 30/05/2025

2	WASTE MANAGEMENT	During peak construction phase, about 6000 workers will be deployed. Adequate drinking water and sanitary facilities should be provided. The safe disposal of waste water and solid wastes generated during the construction phase should be ensured.

PPs Submission: Complied In this phase of construction about 1500 workers are deployed. Adequate drinking water and sanitary facilities are provided for the laborers. As stated above, septic tanks and soak pits are provided for safe disposal of waste water. Vermi-composting pits, Excel Machine, Biogas plant and Foodie Machine is installed for safe disposal of wet waste and running successfully since last 15 years. The dry waste from various construction sites are collected, segregated by rag-pickers and subsequently sent for recycling by appointed vendor. The construction debris is utilized at site for backfilling purpose. See Annexure No 02: Excel OWC photo.	Date: 30/05/2025

3	MISCELLANEOUS	The average water requirement during construction phase has been estimated to be 0.25 MLD. Water usage during construction should be optimized to avoid any wastage

PPs Submission: Complied Water usage during the construction phase is around 0.25 MLD. It is ensured that there is no wastage of water. Ready Mix Concrete is used for the construction which reduces the wastage of water and demand of water for construction. Water Conservation initiatives are not only during the construction phase but also considered in the operational phase of township	Date: 30/05/2025

4	GREENBELT	All the top soil excavated during construction activities should be stored for use its horticulture/ landscape development within the project site

PPs Submission: Complied The top soil found in the project area is black cotton soil which is extremely fertile and rich soil and this is being used in the entire landscape area as shown in the Photo. See Annexure No 03: Top soil photo.	Date: 30/05/2025

5	WASTE MANAGEMENT	Disposal of muck including excavated material during construction phase should not create any adverse effects on the neighboring communities and disposed off taking the necessary precautions for general safety and health aspects

PPs Submission: Complied There was no muck or road found in the project area. The entire land was agricultural land and is now being used for the construction activities. Murum (soft rock) that is excavated is used for back filling and making roads inside the project area. See Annexure No 04: Backfilling photo.	Date: 30/05/2025

6	AIR QUALITY MONITORING AND PRESERVATION	Diesel generator sets used during construction phase should have acoustic enclosures and should conform to EPA rules prescribe for air and noise emission standard

PPs Submission: Complied We have 41 numbers of generators of capacity given below at site office, all construction sites and operational sectors, which is silent and also has acoustic enclosures. The capacities are as follows. a. 1010 KVA 10 Nos. b. 1700 KVA 01 Nos. c. 500 KVA 06 Nos. d. 400 KVA 04 Nos. e. 320 KVA 01 Nos. f. 250 KVA 04 Nos. g. 200 KVA 07 Nos. h. 160 KVA 01 Nos. i. 125 KVA 03 Nos j. 75 KVA 01 Nos. k. 62.5 KVA 03 Nos. All these generators are used only in case of emergency or power failures. These are maintained in good condition and monitored regularly. See Annexure No 05 DG Monitoring report.	Date: 30/05/2025

7	AIR QUALITY MONITORING AND PRESERVATION	Vehicle/ equipment deployed during construction phase should be in good condition and should conform to applicable air and noise emission standards. Construction vehicle should be operated non peak hours

PPs Submission: Complied Vehicles deployed during construction phase are in good condition and conform to air and noise emission standards. Construction vehicles are operated during non-peak hours. PUC certificates are checked by Security guards on regular basis while entering township premises and data is maintained. See Annexure No 06: PUC Certificates. Also we had organized free PUC checkup camp for Amanora citizens and stakeholders on 29th March 2025. See Annexure No 07: PUC free checkup camp Amanora.	Date: 30/05/2025

8	AIR QUALITY MONITORING AND PRESERVATION	Ambient noise levels should conform to residential standards both during day and night. Only limited necessary construction should be done during night time. Fortnightly monitoring of ambient air quality (SPM, SO2 and NOx) and equivalent noise levels should be ensured during construction phase.

	PPs Submission: Complied Ambient noise levels are monitored fortnightly through MITCON Consultancy Services and Green envirosafe MoEF approved laboratory. These are done during day and night time at THREE locations. All the readings confirm to the guidelines mentioned in MPCB Consent to establish Operate. Similarly, ambient air quality is also monitored fortnightly at TWO different locations and all the readings are within the NAAQ limits. See Annexure No 08 Summary for Environment Monitoring Reports for the period of October 2024 to March 2025.	Date: 31/05/2025
9	WASTE MANAGEMENT	Construction spoils including bituminous material and other hazardous materials including oil from construction equipments must not be allowed to contaminate water courses and the dumpsites for such material must be secured so that they should not leach into the ground water. If necessary, oil trap should be installed where there is deployment of heavy materials
	PPs Submission: Complied Bituminous material is not found in the project area. Hazardous material like oil from the vehicles or generator sets is in very less quantity and is stored separately with proper precautions. This year we have sent 0.3 KL used Oil to MPCB approved vendor for reprocessing. See Annexure No 09 Hazardous waste Return.	Date: 30/05/2025
10	WASTE MANAGEMENT	Regular supervision of the above and other measures should be in place all through the construction phase so as to avoid disturbance to the surroundings
	PPs Submission: Complied Regular supervision of the D.G. sets is done and all preventive measures are being taken.	Date: 30/05/2025
11	ENERGY PRESERVATION MEASURES	Use of energy efficient construction materials to achieve the desired thermal comfort should be incorporated. Use of fly ash bricks should be explored to the maximum extent possible
	PPs Submission: Complied Fly ash is used in tremendous amount and the percentage of usage of fly ash to the normal bricks in the present activity is more than 80 percentage of total demand and GGBS as strengthening compound which is an ecofriendly product. We have promoted environment friendly technique by using MIVAN technology shuttering which replaces wooden shuttering. As we use the RMC for the construction the required amount of fly ash is being used in RMC. RMC plants are also operated as per MPCB consent guidelines given to them. See Annexure No 10: Fly ash bricks photo	Date: 30/05/2025
12	GREENBELT	Areas around the sewage treatment plant should be properly covered with vegetation to avoid any impact on the receptors nearby
	PPs Submission: Complied We have Two Sewage treatment plant with proper vegetation around the periphery is developed. Partially operated on 110 KW Solar power at STP1 and 50 KW Solar power at STP 2 during availability of sun. See Annexure No 11 Green belt around STP photo.	Date: 30/05/2025
13	Statutory compliance	Construction should conform to the requirements of local seismic regulations. The project proponent should obtain permission for the plans and designs including structural design, standard and specifications from concerned authority
	PPs Submission: Complied We have obtained certification of the plans and designs including structural design standard and specifications from the structural consultants whose certification is accepted by Planning Authority like Collector, PMRDA and ULBs. See Annexure No 12: Approval of Master plan.	Date: 30/05/2025
14	Statutory compliance	All mandatory approvals and permissions as required from Air port

		Authority, Director of Explosives and Fire Department etc should be obtained
PPs Submission: Complied All mandatory approvals and permissions as required from Airport Authority, Fire Advisory Board, Collector, Irrigation Dept, Gram Panchayat etc are done. See Annexure No 13: NOC from Fire and Airport authority.		Date: 30/05/2025
15	GREENBELT	Green belt development should be initiated right from construction stage itself
PPs Submission: Complied Green belt development has been initiated from construction stage itself. We have planted about 35000 plus plants so far and developed about 26 acre green space and central garden with Temple of Environment in the middle of township. Among the tree plantation which starts from construction phase itself there are different types of plant species which have been planted within the township, which include medicinal plants, ornamental plants, timber yielding plants and edible plants. See Annexure No 14 Green belt at Central Green Amanora.		Date: 30/05/2025
16	MISCELLANEOUS	Natural drainage should not be obstructed by proposed construction activity
PPs Submission: Complied It is ensured that natural drainage is not obstructed by proposed constructed activity. We have landscaped beautified the Nala passing from the township area. See Annexure No 15 Nala beautification at Amanora Photo.		Date: 30/05/2025
17	MISCELLANEOUS	All the measures for the control of environmental pollution should be provided before commissioning of project
PPs Submission: Complied For the control of environmental pollution, measures such as water sprinkling on the roads during the construction activity, provision of acoustic enclosures for DG set for noise pollution, safe disposal of solid waste disposal through Excel Machine, Biogas plant and Composting are done. Sewage from the township is treated up to tertiary level and reused for flushing and gardening. All suitable measures for the control of environment pollution are taken before commissioning of the project.		Date: 30/05/2025
18	WASTE MANAGEMENT	The installation of sewage treatment plant (STP) should be certified by an independent expert and should submit in this regard to the Ministry before the project is commissioned for operation
PPs Submission: Complied As township is being developed in a phase manner, for first phase STP 1 Cap 1750 CMD and Second Phase STP 2 Cap 1500 CMD, STP 3 150 CMD are constructed and Operational. Both first phase and second phase STPs are been certified by competent authority. MPCB officials visit the plant and collects joint vigilance samples regularly. We also get it tested from the MoEF accredited lab. See Annexure No 16 STP analysis report.		Date: 30/05/2025
19	WASTE MANAGEMENT	A scheme should be framed for recycling and reuse of water waste generated from the project. At least 40% of the total water requirement should be met from waste water recycling and rain water harvesting
PPs Submission: Complied A scheme for recycling and reuse of water is made. Water required for gardening and flushing is used from treated wastewater Sewage. At present more than 40 percentage water requirement is met from the recycled water. We are using 100 percentage STP recycled water for Flushing, Gardening and Construction purposes. See Annexure No 17 Separate meter for gardening and flushing.		Date: 30/05/2025

20	WATER QUALITY MONITORING AND PRESERVATION	Proper system for rain water harvesting should be provided. The rain water harvesting should be designed in the consultation with the irrigation Dept., Govt. of Maharashtra. Necessary study like existing contour, drainage should be studied before designing rain water harvesting

PPs Submission: Complied Rain water harvesting plans are made in consultation with Maharashtra Jeevan Pradhikaran and Rural Irrigation dept Zilla Parishad, Pune a Govt. Authority and all the necessary study has been made for the rain water harvesting. Recently Officers from Central Ground Water Board has visited the township and seen the RWH measures and initiatives taken by the Township. They have appreciated the initiative taken by company and displayed the visit report on their website. See Annexure No 18: CGWA letter and report.	Date: 30/05/2025

21	WASTE MANAGEMENT	Sewage Treatment Plant with a capacity of 7.6 MLD has been designed to treat the waste water from the commercial and residential complex. As proposed, the waste water will be treated to tertiary level and after treatment, reused for flushing of toilets and gardening. Discharge of treated sewage shall conform to EP rules prescribed for air and emission standards as per CPCB guidelines exhaust will be taken 4 meters above the roof top

PPs Submission: Complied As township is being developed in a phase manner, for first phase STP 1 Cap 1750 CMD and Second Phase STP 2 Cap 1500 CMD, STP 3 150 CMD are constructed and Operational. Both first phase and second phase STPs are been certified by competent authority. A scheme for recycling and reuse of water is made. Water required for gardening and flushing is used from treated wastewater Sewage. At present more than 40 percentage water requirement is met from the recycled water. We are using 100 percentage STP recycled water for Flushing, Gardening and Construction purposes. See Annexure No 19 STP details with Discharge pattern.	Date: 30/05/2025

22	WASTE MANAGEMENT	The sludge generated from Sewage Treatment Plant should be used as manure

PPs Submission: Complied The Sludge generated from the STP is treated into Centrifuge, dried and used as manure	Date: 30/05/2025

23	Noise Monitoring & Prevention	Noise barriers will be provided at appropriate locations so as to ensure that the noise levels do not exceed the prescribed standards. DG sets should be provided with necessary acoustic enclosures as per CPCB norms

PPs Submission: Complied A noise barrier in the form of trees double line is already done in certain areas and is still under process. Walls are also constructed as boundary demarcation, which prove to be noise barrier. DG sets are provided with necessary acoustic enclosures as per the norms. See Annexure No 20 DG insertion loss report.	Date: 30/05/2025

24	WASTE MANAGEMENT	The solid waste generated should be properly collected, segregated, treated and disposed off as per Municipal Solid Waste Rules. The project proponent should ensure disposal of waste by making suitable arrangement with PMC or by means of outsourcing and if either of this not possible, the project proponent should develop properly engineered facility for its disposal

PPs Submission: Complied The solid waste generated from canteens, labour camps and operational phases of township is properly collected, segregated and disposed off as per Municipal Solid waste rules. Proper bins are provided at each place for wet garbage and dry garbage. Garbage chutes are installed at each residential sectors for the proper segregation and collection. Vermicomposting bins are constructed	Date: 30/05/2025

	at the labour colonies and near the canteen for management of solid waste. Also Excel Organic Waste Converter machine is procured for compost generation. The compost generated from the machine is used as manure directly. In addition to Biosanitizer, FOODIE ECOMAN ration. As we implement MSW rule 2016, right from the construction phase. Our efforts in the eco-friendly Solid waste Management had awarded by Most Environmental Friendly Initiative Award by Center for Indian Industry CII in 2013 and Pune Municipal Corporation by SWACH award on 20th October 2016. Recyclings Bins are installed at Every Sectors for Collection of Plastic Waste on every Saturday and Sunday and E Waste on every Wednesday and Thursday. On account of World environment day 2024, with a focus on land restoration, desertification, and drought resilience	
25	WASTE MANAGEMENT	The project proponent should obtain authorization from Maharashtra State Pollution Control Board for waste oil/ used oil generation from DG sets and shall be handed as per provisions of Hazardous Waste (Management and Handling Rules)
	PPs Submission: Complied The source of Waste Used Oil is the DG sets only. The quantity of waste oil is very less and we have obtained authorization for Used oil cat No 5.1 during Consent to Operate from MPCB. This year we have sent 0.3 KL used Oil to MPCB approved vendor for reprocessing. Refer Annexure No 09 Hazardous waste Return.	Date: 30/05/2025
26	AIR QUALITY MONITORING AND PRESERVATION	Incremental pollution loads on the ambient air quality, noise and water quality should be periodically monitored after commissioning of the project. The ambient air quality should be monthly at least at one location inside the project site for SPM, SO2, and NOx. The noise level should be monitored at two locations monthly for equivalent noise levels
	PPs Submission: Complied Monitoring by NEERI team also to check Air, noise and water quality. We have done environmental monitoring and evaluation study by NEERI, Delhi on January 2018 and May 2018. This audit report had submitted separately to MoEF and CC office Nagpur on CD. This time we did Environmental evaluation Audit in February 2023 and May 2023 monitoring from NEERI. Detailed Report enclosed separately. See Annexure No 21 Air, water, noise, soil and compost report.	Date: 30/05/2025
27	ENERGY PRESERVATION MEASURES	Use of energy efficient construction materials to achieve the desired thermal comfort should be incorporated. The desired level of R and U factors to be achieved. U factor for the top roof should not exceed 0.4 watt/ sq. m / degree centigrade with appropriate modifications of specifications and building ecologies
	PPs Submission: Complied All efforts are made to achieve R and U factor by selecting suitable building Material.	Date: 30/05/2025
28	GREENBELT	The green belt design along the periphery of the plot shall be planned to achieve a density of atleast 1000 tree/ acres of land. The open spaces inside the plot should be suitably landscaped with plants of indigenous variety
	PPs Submission: Complied Tree plantation programme is being implemented as per Govt. of Maharashtras township guidelines. We have planted more than 35000 trees so far, for the future plantation we have 25000 nos. of plants at our Nursery. Annexure no 22 Central Green and Temple of environment at Amanora.	Date: 30/05/2025
29	MISCELLANEOUS	To avoid traffic congestion, the proposed design of the main road within the premises should be modified as recommended during the EAC meeting.

	PPs Submission: Complied EACs recommendations have been implemented in the road plan. The cycle track and pathways are provided along the road side within the township. To promote cycle in township we have tied up with Yulu cycle station where citizen can rent cycle for travelling this avoids congestion as cycle path is separate and also helps in control of air pollution. See Annexure No 23 Pathways and cycle stations at Amanora photo.	Date: 30/05/2025
30	Risk Mitigation and Disaster Management	Disaster Management Plan based on Risk Assessment study should be followed
	PPs Submission: Complied Integrated Disaster Management Plan is being developed with in consultation with local bodies. At present Amanora has developed own fire station in the Township to take care of fire emergency.	Date: 30/05/2025
31	AIR QUALITY MONITORING AND PRESERVATION	DG sets emissions should conform to EPA norms. Flue gas should be monitored from SPM, SOx and NOx. Public transportation deployed should conform to EURO- III norms
	PPs Submission: Complied We are monitoring DG sets fortnightly basis and results are within limit Refer Annexure No. 05. At present there is no public transportation in the project area. In the first phase of operation we are using CNG operated buses and battery operated vehicles for transportation inside the township. Township has a separate environment corpus, which will be used to measure and promote environment friendly atmosphere. Please refer Annexure No 5 for DG monitoring reports.	Date: 30/05/2025
32	MISCELLANEOUS	Back up supply as well as public transportation system proposed for the project should be based on Natural Gas / Cleaner fuel subject to their availability
	PPs Submission: Complied As mentioned above we are using CNG operated buses and Battery operated vehicles within the township. Presently 4 Battery vehicles and 1 CNG operated vehicle is operational in the township. Also we have provided sharing cycles at various locations which are used by Citizens for small distance travelling. Also we have recently launched Battery operated cycles for citizens. Also we distributed 11 cycles in EHS department for operators. We have also provided battery charging station at two points so as to promote Electrical vehicles in township. Also we have our own electric vehicles in township for office use. See Annexure No 24 Battery and electric operated vehicles at Amanora photo.	Date: 30/05/2025
33	ENERGY PRESERVATION MEASURES	Project proponent should resort to solar energy at least for street lighting and water heating for commercial complexes and residential areas
	PPs Submission: Complied Yes, we are using solar energy for street lighting and water heating in various sectors. At present solar energy plant 110 KW and 50 KW is installed at Sewage treatment plant 1 and 2 respectively also 50 KW at WTP Amanora. One pilot plant of Wind and Solar Hybrid power generation plant is operational. Same plants will be used in 50 Green Bungalows plots in our townships. These entire 50 Plots are Eco Friendly which run on 50 percentage Renewable Energy of the Total Electricity Consumption i. e. only 50 percentage Dependence on Electricity supplied from the State Electricity Board. The Interconnecting Street Lighting is solely powered by Solar Energy. Green Energy will be generated for the Bungalow Plot owners by using Solar Wind Hybrid Power Generation system. In addition to above, we have installed Solar PV pannel bus shelters withinh the township. The lighting of the bus station is operated on the Solar PV pannel. See Annexure no 25 STP2 Solar panels installed photo.	Date: 30/05/2025

General Conditions

Sr.No.	Condition Type	Condition Details

1	MISCELLANEOUS	The environmental safeguards contained in the EIA report should be implemented in letter and spirit

PPs Submission: Complied The safeguards contained in the EIA report done by NEERI are implemented. We are doing the environmental monitoring and evaluation study by NEERI, Nagpur in comparison with EIA report. We have done environmental monitoring and evaluation study by NEERI, Delhi on January 2018 and May 2018. This audit report had submitted separately to MoEF and CC office Nagpur on CD. This time we did Environmental evaluation Audit in February 2023 and May 2023 monitoring from NEERI. See Annexure no 26 Neeri report letter	Date: 30/05/2025

2	MISCELLANEOUS	All the conditions, liabilities and legal provisions contained in the EC shall be equally applicable to the successor management of the project in the event of the project proponent transferring the ownership, maintenance or management of the project to any other entity

PPs Submission: Complied Provisions will be followed adhered to.	Date: 30/05/2025

3	MISCELLANEOUS	Provision should be made for the supply of kerosene or cooking gas/ pressure cookers to the labourers during construction phase

PPs Submission: Complied Provision of kerosene or cooking gas is made by the contractors to the labours and monitored by us.	Date: 30/05/2025

4	MISCELLANEOUS	All the laborers to be engaged for construction works should be screened for health and adequately treated before the issue of work permits

PPs Submission: Complied Regular health checkup is organized for all laborers working on the site. Any ailment found during the health check up is immediately taken care of. Health checkup and awareness camp on Malaria, Chikanguniya, Dengue and other diseases were organized with the help of Health Department, Pune Municipal Corporation. We have tie up with the Nobel Hospital for any emergency. Presently one OPD unit is operation in the township for taking care of working staff and Citizens. Frequently there is Sanitization of labour camp, construction material and Equipment	Date: 30/05/2025

5	MISCELLANEOUS	The project proponent should make financial provision in the total budget of the project for implementation of the suggested safeguard measures

PPs Submission: Complied Adequate provision has been made. In fact, Environment department has its Annual Budget for the implementation of environmental safeguard and Environment Management Plan. See Annexure no - 27-EMP expenditure from October 2024 to March 2025.	Date: 30/05/2025

6	Statutory compliance	Six monthly monitoring reports should be submitted to the Ministry and its Regional Office, Bhopal

PPs Submission: Complied Last Six monthly monitoring report for the period April 2024 to September 2024 was sent to Ministry of Environment, Forest and Climate Change, Regional Office, Nagpur in Dec 2024 online on parivesh portal and report was sent on mail to respective offices. See Annexure No 28 Email Copies of report sent to Respective Offices.	Date: 30/05/2025

7	Statutory compliance	Officials from the Regional Office of MoEF, Bhopal who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents/ data by the

		project proponents during their inspection. A complete set of all the documents submitted to MoEF should be forwarded to the CCF, Regional Office of MoEF, Bhopal.
PPs Submission: Complied 1.First Mr. M. S. Daware inspected the project on 28th March 2008. 2. Secondly Mr. A. K. Rana, Chief Conservator of Forest and Mr. M.S. Dawre, Additional Secretary inspected the project area on 21st August 2010. All relevant documents are submitted and forwarded to CCF, Regional Office, Bhopal. 3. Third time Mr. Suresh Kumar Adapa, Scientist E inspected the project area on 21st January 2022. See Annexure no 29 MoEF and CC visit report City Corporation Ltd.		Date: 30/05/2025
8	Statutory compliance	The responsibility of implementation of environmental safeguard rests fully with the Project Proponent, i.e. City Corporation Limited
PPs Submission: Complied CCL is responsible for implementing environmental safeguards		Date: 30/05/2025
9	Statutory compliance	In case of any changes in the scope of the project, the project would require a fresh appraisal by this Ministry
PPs Submission: Complied So far no changes in the scope of the project are envisaged.		Date: 30/05/2025
10	Statutory compliance	The Ministry reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including revoking of the environment clearance under the provisions of the Environmental (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner
PPs Submission: Complied Effective implementation of the suggested safeguard measures is ensured. The implementation of the environmental safeguards is done on the guidelines of MoEF.		Date: 30/05/2025
11	Statutory compliance	A copy of the environmental clearance letter would be marked to the local NGO(s) if any from whom suggestion/ representation were received at the time of public hearing
PPs Submission: Complied A copy of the environmental clearance letter given to the local NGOs. See Annexure No 30 Copy of environmental clearance letter given to NGOs		Date: 30/05/2025
12	Statutory compliance	A copy of the environmental clearance letter should be displayed at the MoEF's regional office, Bhopal and the Office of the Maharashtra State Pollution Control Board, Mumbai
PPs Submission: Complied Copy of the environmental clearance letter was sent to the office of MPCB for display. See Annexure No 31 Copy of environmental clearance letter given to MPCB		Date: 30/05/2025
13	Statutory compliance	The project proponent should advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded environmental clearance and copies of clearances letters are available with the Maharashtra State Pollution Control Board, Mumbai and may also be seen on the website of the Ministry of Environment and Forests at http:/www/envfor.nic.in. The Advertisement should be made within 7 days from the day of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of this

		Ministry at Bhopal

PPs Submission: Complied Advertisement in local newspaper was given informing that the project has been accorded environmental clearance and copies of clearance letters are available with MPCB, Mumbai. See Annexure No 32 Advertisement in local newspaper.	Date: 30/05/2025

14	Statutory compliance	These stipulations would be enforced among others under the provisions of water (Prevention and Control of Pollution) Act, 1974, the Air (prevention and Control of Pollution) Act, 1981, the Environment (Protection) act, 1986, the Public Liability (insurance Act, 1991 and EIA Notification 1994 including the amendments

PPs Submission: Complied noted	Date: 30/05/2025

15	Statutory compliance	The project proponent should acknowledge the receipt of the environment clearance letter and convey their concurrence to the conditions stipulated above within 15 days from the date of issue of this letter. In case there is no response from the proponent, it would be deemed to have been agreed to

PPs Submission: Complied The project proponent had acknowledged the receipt of the environment clearance letter. See Annexure No 33 Receipt of EC letter.	Date: 30/05/2025

Visit Remarks

Last Site Visit Report Date:	21/01/2022
Additional Remarks:	City Corporation Limiteds Amanora Park Township project obtained the Environmental clearance (EC) on 27.10.2005 from MoEF, Govt. of India under EIA Notification 1994. As EC issued under EIA Notification 1994, there is validity period for Commencement of the Construction within Five years which we have complied. Validity period of Environmental Clearance concept introduced by EIA Notification 2006 published on 14.09.2006. So we have suo moto approached to SEAC and SEIAA for clarification. We had presented our case in 51th SEAC III meeting and 106th SEIAA meeting and it was consented by SEIAA that no revalidation is required for the EC issued under EIA notification 1994. As per MoEFs notification dated 21.08.2013 given clarification about validity of Environmental Clearance issued under EIA Notification 1994 that No revalidation is required for the ECs issued under EIA notification 1994. As per SEIAA suggestion and MoEF and CC notification dated 26th November 2018 regarding the submission of Six Monthly Compliance report we are following the same and also sou motto doing Environmental Evaluation Audit every FIVE years from National Environment Engineering and Research Institute (NEERI). Previous audits done and reports submitted to your office for audit year April 2013, November 2019 and now in March 2024. This years Final report enclosing for your record.

Note: This acknowledgement is as per the details submitted by project proponent. In no way is this document to be

considered as conclusion on any action on the compliance of the project. This is strictly for the project proponent's reference purpose.

भारत सरकार
GOVERNMENT OF INDIA
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
MINISTRY OF ENVIRONMENT, FORESTS
& CLIMATE CHANGE

Integrated Regional Office
Ground Floor, East Wing
New Secretariat Building
Civil Lines, Nagpur - 440001
E-mail: apcfcentral-ngp-mef@gov.in

F No: 16-2/2005 (ENV)/ 9422

Date: 02.03.2022

To,

The Member Secretary, SEIAA
Environment Department,
Govt.of Maharashtra,
Mantralaya, Mumbai,
Maharashtra

Sub: Environmental clearance granted for Amanora Park Town of M/s City Corporation Limited located at Hadapsar, Pune, Maharashtra

Ref. MoEF letter no. J-12011/22/2005/IA (CtE) dated 27.10.2005

Madam,

I am directed to invite your kind attention on the above subject and letter under reference. Monitoring report of compliance status of conditions stipulated Environmental clearance granted for Amanora Park Town of M/s. City Corporation Limited located at Hadapsar, Pune, Maharashtra is enclosed herewith. Site inspection has been carried out on 21.01.2022. Following observations were made during the site inspection:

Ministry vide letter dated 27.10.2005 granted environmental clearance for the construction of township project under EIA Notification 1994. During the site inspection it was observed that 49 towers were constructed and occupied. Construction was in progress in 8 towers. 3 STPs of total capacity 3400 CMD were provided. STPs were provided with primary, secondary and tertiary systems. Biogas plant of 3000 kg/day was installed. As per the information provided, a quantity of 2400 kg of food waste is treated every day generating 180 cu.m. bio gas. The bio gas is used to meet partial requirement of canteen fuel & generate electricity for running solid waste management facilities. OWC was provided. Dry waste is disposed of through SWACH NGO. Solar energy plant is installed at biogas plant for supply hot water. One pilot plant of Wind & Solar (Hybrid) power generation plant is operational. It is proposed to use this technology for 50 Green Bungalows plots. Solar PV panels were installed for the bus stops. During the site inspection, it was observed that green belt was developed in and around the project area. As per the information provided, green

belt was developed over an area of 192981 sq.m. with the plantation of 9181 no.s of saplings. Regular audit of compliance status of conditions is carried out through NEERI, Nagpur. Overall compliance status found to be good.

This issues with the approval of Regional Officer/DDGF(C), IRO, MoEF&CC, Nagpur.

04/03/2020

Suresh Kumar Adapa
Scientist 'E'

Encl: as above

Copy to:

1. The Additional Director (Monitoring Cell), Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, Aliganj, Jorbagh Road, New Delhi-110003
2. M/s. The Chief Operating Officer, M/s. City Corporation Limited, City Chambers, FC Road, Pune-411004

04/03/20

Suresh Kumar Adapa
Scientist 'E'

Point No. 23: Monitoring Data Sheet.

Monitoring the Implementation of Environmental Safeguards
Ministry of Environment, Forest & Climate Change,
Integrated Regional Office, Nagpur
Monitoring Report - Part – I-
DATA SHEET

Sr.	Description	Details
1	Project type :River-valley/mining /Industry/Thermal/Nuclear/other (specify)	Residential & Commercial Township
2	Name of the Project	AMANORA PARK TOWN
3	Clearance letter(s)/OM and Date	J-12011/22/2005/IA (CIE) dtd. 27.10.2005 and *Revalidation letter No SEIAA-2017/CR-04/TC-3 dated 22nd February 2017.*
4	Location	
	a) District(s)	Pune
	b) State(s)	Maharashtra
	c) Latitude	73 degree 56 minutes
	d) Longitude	18 degree 31 minutes
5	Address of correspondence	
	a) Address of concerned Project Chief Executive (with pin code & telephone/telex/fax numbers)	J. K. Bhosale Director, Amanora Park Town Sadesatranali village, Amanora- Magarpatta road, Hadapsar, Pune 28. Maharashtra State Phone 020-6764 0044,
	b) Address of Executive Project Engineer/Manager (with pin code/fax numbers)	Amit Saste GM - Environment & Safety, Amanora Park Town, Sadesatranali village, Amanora- Magarpatta road, Hadapsar, Pune 28. Maharashtra State Phone 020-30410000,
6	Salient features	
	a) of the Project	Please Refer **Annexure No 1** below this table
	b) of the Environmental Management Plan	Please Refer **Annexure No 2** below this table

Sr.	Description	Details
7	Breakup of the project area	
	a) submergence area : forest & non-forest	N.A
	b) Others	
	a. Total Plot area	1253017 Sq. M approved out of Total 1926289 Sq. M. plot area.
	b. Built-up area (Including road)	1925296 Sq. M plot (3274691.3 Sq. M FSI)
	c. Open space available	192981 Sq. M at present.
	d. Green belt area	As above
8	Breakup of the project affected population with enumeration of those losing houses/dwelling unit only agricultural land only, both dwelling units & agricultural land & landless laborers	N.A
	a) SC, ST / Adivasis	N.A.
	b) Others (Please indicate whether these figures are based on any scientific and systematic survey carried out or only provisional figures, if a survey is carried out give details and years of survey)	

<table>
<tr><th>Sr.</th><th>Description</th><th>Details</th></tr>
<tr><td>9</td><td>Financial details:</td><td></td></tr>
<tr><td></td><td>a) Project cost as originally planned and subsequent revised estimates and the year of price reference.</td><td>CCL has estimated the total cost of the project at Rs. 4289.36Crores when completed. The composition of the same is as under.
<table>
<tr><th>Project cost</th><th>Amount (In crores)</th></tr>
<tr><td>Land cost</td><td>648.34</td></tr>
<tr><td>Construction cost</td><td>2799.65</td></tr>
<tr><td>Infrastructure, plantation& other cost</td><td>430.91</td></tr>
<tr><td>Marketing & Advertising expenses, Overheads & brokerage</td><td>345.90</td></tr>
<tr><td>Financial charges</td><td>64.56</td></tr>
<tr><td>Total</td><td>4289.36</td></tr>
</table></td></tr>
<tr><td></td><td>b) Allocation made for environmental management plans with item wise and year wise break-up</td><td>Allocation made for environmental management plansand will be implemented as per Project development.
<table>
<tr><th>Sr.</th><th>Heads</th><th>Allocation (Capex in lakh)</th></tr>
<tr><td>1</td><td>Plantation & Environmental Monitoring</td><td>150</td></tr>
<tr><td>2</td><td>Solid waste Management - Operation &Monitoring</td><td>250</td></tr>
<tr><td>3</td><td>Sewage Treatment Plant – Operation & Monitoring</td><td>350</td></tr>
<tr><td>4</td><td>Human resources</td><td>Nil</td></tr>
<tr><td>5</td><td>Vehicle /Transportation for EHS dept</td><td>50</td></tr>
<tr><td></td><td>Total</td><td>800</td></tr>
</table></td></tr>
<tr><td>9</td><td>c) Benefit cost ratio/Internal rated of Return and the year of assessment</td><td>NA</td></tr>
<tr><td></td><td>d) Whether (c) includes the cost of environmental management as shown in the above</td><td>Yes</td></tr>
</table>

<table>
<tr><th>Sr.</th><th>Description</th><th>Details</th></tr>
<tr><td>9</td><td>e) Actual expenditure incurred on the project so far</td><td>About Rs. 1400 Cr expenditure incurred on project& is going on as per development of project.</td></tr>
<tr><td></td><td>f) Actual expenditure incurred on the environmental management plans so far</td><td>Actual expenditure made for environmental management plans with item wise for period of December 2020 to May 2021. We are monthly monitor the expenditure v/s Budgeted.
<table>
<tr><th>Sr.</th><th>Heads</th><th>Actual Expenditure in Dec 20 to May 21</th></tr>
<tr><td>1</td><td>Plantation & Environmental Monitoring</td><td>135000</td></tr>
<tr><td>2</td><td>Solid waste Management - Operation &Monitoring</td><td>2852896</td></tr>
<tr><td>3</td><td>Sewage Treatment Plant – Operation & Monitoring</td><td>2074560</td></tr>
<tr><td>4</td><td>Human resources</td><td>3000000</td></tr>
<tr><td>5</td><td>Vehicle /Transportation for EHS dept</td><td>150000</td></tr>
<tr><td></td><td>Total</td><td>50,62,456</td></tr>
</table></td></tr>
<tr><td>10</td><td>Forest land requirement</td><td></td></tr>
<tr><td></td><td>a) The status of approval for diversion of forest land for non-forestry use</td><td>N.A</td></tr>
<tr><td></td><td>b) The status of clearing felling</td><td>N.A</td></tr>
<tr><td></td><td>c)The status of compensatory</td><td>N.A</td></tr>
<tr><td></td><td>d) Afforestation, if any</td><td>N.A</td></tr>
<tr><td></td><td>e) Comments on the viability & sustainability of compensatory afforestation programme in the light of actual field experience so far</td><td>N.A</td></tr>
<tr><td>11</td><td>The status of clear felling in non-forest area (such as submergence area of reservoir, approach rods), if any with quantitative information</td><td>N.A</td></tr>
</table>

Sr.	Description	Details
12	Status of construction	
	a) Date commencement (Actual and/or planned)	2006
	b) Date of completion (Actual and/or planned)	2035
13	Reasons for the delay if the project is yet to start	N. A
14	Dates of site visits	
	a) The dates on which the project was monitored by the Regional office on previous occasions, if any	21st August 2010
	b) Date of site visit for this monitoring report	21st August 2010
15	Details of correspondence with project authorities for obtaining action plans/information on status of compliance to safeguards other than the routine letters for logistic support for site visits) (The first monitoring report may contain the details of all the letters issued so far, but the later reports may cover only the letters issued subsequently)	Environmental Clearance letter No. J-12011/22/2005/IA (CIE) dt. 27.10.2005 received from MoEF. Revalidation of EC up to completion of the project by SEIAA, Maharashtra vide letter no SEIAA-2017/CR-04/TC-3 dated 22nd February 2017 as EC issued under EIA Notification 1994 & MOEF Notification dated 21.08.2013. See Annexure 4.

Compliance status of conditions stipulated in environmental clearance granted for Amanora Park Town of M/s. City Corporation Limited located at Hadapsar, Pune, Maharashtra granted by MoEF vide letter no. J-12011/22/2005/IA (CIE) dated 27.10.2005

Specific Conditions:

Construction Phase:

S.No.	Condition	Compliance Status
	Provisions of Environmental Management System (ISO 14001) should be implemented right from the construction phase that will include maintaining required sanitary and hygienic measures through out the construction phase. Provision of drinking water, waste water disposal and solid waste management should be ensured for labour camps.	Complying with. During the site inspection, it was observed that the project is certified with ISO 14001. Copy of the certificate is enclosed as **Annexure-1**. Temporary accommodation was provided for construction labor. Treated drinking water, toilets were provided. Sewage generated in the labor camp is sent to STP. Solid waste generated at the labor camp and construction area is segregated. Bio degradable waste is sent to common solid waste treatment area of the project.
ii)	During peak construction phase, about 6000 workers will be deployed. Adequate drinking water and sanitary facilities should be provided. The safe disposal of waste water and solid wastes generated during the construction phase should be ensured.	
iii)	The average water requirement during construction phase has been estimated to be 0.25 MLD. Water usage during construction should be optimized to avoid any wastage	Complying with As per the water consumption data, the water requirement for construction was observed to be within 0.25 MLD. Ready mix concrete, curing agents are used for construction. PP submitted that treated sewage is used for construction activities. It was also informed that Hydro Pneumatic System (HPS) was provided for water distribution in residential sectors. PP submitted that awareness was created among the residents to reduce the water consumption from the standard norm of 135 LPCD to 110 LPCD. Treated sewage of quantity 2100 CMD is used for flushing and gardening.
iv)	All the top soil excavated during construction activities should be stored for use in horticulture/ landscape development within the project site	PP submitted that the top soil was utilized in the landscaping and green belt development.
v)	Disposal of muck including excavated material during construction phase should not create any adverse effects on the neighboring communities and disposed off taking the necessary precautions for general safety and health aspects	As per the information provided, construction waste and excavated material was utilized for leveling of the site. PP submitted that as the project area is big, entire excavated material was utilized within the project site.
vi)	Diesel generator sets used during construction phase should have acoustic enclosures and should conform to EPA rules prescribe for air and noise emission	Complying with. Occupied buildings: 28 no.s of DG sets with acoustic enclosures were provided. Stacks of height ranging from

	standard	2.5 meters to 4.8 meters were provided. **Construction activity** 4 no.s of DG sets with acoustic enclosures were provided. Stacks of height 3.5 meters were provided for each DG set Stack emissions and noise levels were monitored through MoEF&CC recognized laboratory. As per the monitoring data, the emission and noise levels found to be confirming to prescribed standards.
vii)	Vehicle/ equipment deployed during construction phase should be in good condition and should conform to applicable air and noise emission standards. Construction vehicle should be operated non peak hours	**Complied** During the site inspection, it was observed that the vehicles transporting construction material were checked for PUC. Vehicles were operated only during non-peak hours. Ambient air quality and noise levels were monitored through MoEF&CC recognized laboratory. As per the monitoring data, the air quality and noise levels found to be confirming to prescribed standards.
viii)	Ambient noise levels should conform to residential standards both during day and night. Only limited necessary construction should be done during night time. Fortnightly monitoring of ambient air quality (SPM, SO2 and NOx) and equivalent noise levels should be ensured during construction phase	
ix)	Construction spoils including bituminous material and other hazardous materials including oil from construction equipments must not be allowed to contaminate water courses and the dumpsites for such material must be secured so that they should not leach into the ground water. If necessary, oil trap should be installed where there is deployment of heavy materials	PP shall not generate any hazardous waste during construction. Used oil is the only hazardous waste generated from the project. No bituminous material was used in the project.
x)	Regular supervision of the above and other measures should be in place all through the construction phase so as to avoid disturbance to the surroundings	**Complying with.** Environment management cell was established with 4 qualified Engineers and supporting staff for looking after the environment infrastructure installed at the project
xi)	Use of energy efficient construction materials to achieve the desired thermal comfort should be incorporated. Use of fly ash bricks should be explored to the maximum extent possible	**Complying with.** As per the information provided, fly ash bricks were used in construction along with the usage of fly ash in ready mixed concrete. In addition to fly ash, GGBS was also used in construction. It was informed that the project is certified Green Building.
xii)	Areas around the sewage treatment plant should be properly covered with vegetation to avoid any impact on the receptors nearby	**Complying with.** During the site inspection, it was observed that green belt was developed around the STP and the STP area separated from the nearby buildings and in open area.
xiii)	Construction should conform to the	The Structural Engineer, M/s. TS Sane

	requirements of local seismic regulations. The project proponent should obtain permission for the plans and designs including structural design, standard and specifications from concerned authority	Associates, Pune certified the structural stability of the buildings. Copy is enclosed as **Annexure-2**
xiv)	All mandatory approvals and permissions as required from Air port Authority, Director of Explosives and Fire Department etc should be obtained	Ministry of Defense granted permission vide letter dated 29.03.2007 Fire NOC was obtained from Govt. of Maharashtra vide letter no. 261/FA dated 09.04.2007. Copies are enclosed as **Annexure-3**.
xv)	Green belt development should be initiated right from construction stage itself	**Complying with** During the site inspection, it was observed that green belt was developed in and around the project area. As per the information provided, green belt was developed over an area of 192981 sq.m with the plantation of 9181 no.s of saplings. Photographs of plantation are enclosed as **Annexure-4**. Medicinal plants were planted near the integrated solid waste management area.
xvi)	Natural drainage should not be obstructed by proposed construction activity	**PP agreed to comply with.** During the site inspection it was observed that the landscaping was done on both sides of the nallah passing through the township area. No nallah was diverted for the project activity
xvii)	All the measures for the control of environmental pollution should be provided before commissioning of project	**Complying with.** During the site inspection, it was observed that 49 no.s of towers were occupied. 3 STPs of total capacity 3400 CMD were provided. Biogas plant of 3000 kg/day was installed. As per the information provided, a quantity of 2400 kg of food waste is treated every day generating 180 cu.m. bio gas. The bio gas is used to meet partial requirement of canteen fuel & generate electricity for running solid waste management facilities. OWC was provided. Dry waste is disposed of through SWACH NGO.

Operation Phase:

S. No.	Condition	Compliance Status
i)	The installation of sewage treatment plant (STP) should be certified by an independent expert and should submit in this regard to the Ministry before the project is commissioned for operation	**Complying with.** 3 STPs of total capacity 3400 CMD were provided. M/s. Thermax certified the STPs. MPCB granted consent to operate (part) for the completed and occupied buildings.
ii)	A scheme should be framed for recycling and reuse of water waste generated from the project. At least 40% of the total water requirement should be met from waste water recycling and rain water harvesting	As per the information provided, total water requirement for the occupied buildings and construction activity is 5200 KLD. Out of which 2100 KLD is sourced from treated wastewater.

iii)	Proper system for rain water harvesting should be provided. The rain water harvesting should be designed in the consultation with the irrigation Dept., Govt. of Maharashtra. Necessary study like existing contour, drainage should be studied before designing rain water harvesting	Recharge pits, dug wells and collection tanks were provided. As per the information provided, 20% of gardening requirement is met from the collected rain water.
iv)	Sewage Treatment Plant with a capacity of 7.6 MLD has been designed to treat the waste water from the commercial and residential complex. As proposed, the waste water will be treated to tertiary level and after treatment, reused for flushing of toilets and gardening. Discharge of treated sewage shall conform to EP rules prescribed for air and emission standards as per CPCB guidelines exhaust will be taken 4 meters above the roof top.	**PP agreed to comply with.** 3 STPs of total capacity 3400 CMD were provided. STPs were provided with primary, secondary and tertiary systems. Chlorination system was provided for the disinfection. As per the information provided, treated wastewater is used for flushing, gardening. PP submitted that additional STPs will be provided for the buildings to be constructed/under construction.
v)	The sludge generated from Sewage Treatment Plant should be used as manure	**Complying with.** Sludge generated from the STPs is dried and utilized as manure.
vi)	Noise barriers will be provided at appropriate locations so as to ensure that the noise levels do not exceed the prescribed standards. DG sets should be provided with necessary acoustic enclosures as per CPCB norms.	**Complying with.** Green belt was developed in and around the project area. Ambient noise levels were monitored at 18 locations through MoEF&CC recognized laboratory. As per the monitoring data, the noise levels found to be confirming to prescribed standards. Acoustic enclosures were provided for the DG sets.
vii)	The solid waste generated should be properly collected, segregated, treated and disposed off as per Municipal Solid Waste Rules. The project proponent should ensure disposal of waste by making suitable arrangement with PMC or by means of outsourcing and if either of this not possible, the project proponent should develop properly engineered facility for its disposal	The compliance status is already provided above.
viii)	The project proponent should obtain authorization from Maharashtra State Pollution Control Board for waste oil/ used oil generation from DG sets and shall be handed as per provisions of Hazardous Waste (Management and Handling Rules)	**Complying with.** MPCB granted authorization for handling of hazardous waste. As per the authorization, used oil is the only hazardous waste generated from the project. Used oil is disposed of through authorized vendors. Copy of hazardous waste returns for FY 2020-21 is enclosed as **Annexure-5**.
xix)	Incremental pollution loads on the ambient air quality, noise and water quality should be periodically monitored after commissioning of the project. The ambient air quality should be monthly at	**Complying with.** Ambient air quality and noise levels were monitored through MoEF&CC recognized laboratories at 12 and 18 locations respectively.

	ambient air quality should be monthly at least at one location inside the project site for SPM, SO2, and NOx. The noise level should be monitored at two locations monthly for equivalent noise levels.	laboratories at 12 and 18 locations respectively. As per the monitoring data, the air quality and noise levels found to be confirming to prescribed standards.
xx)	Use of energy efficient construction materials to achieve the desired thermal comfort should be incorporated. The desired level of R and U factors to be achieved. U factor for the top roof should not exceed 0.4 watt/ sq. m / degree centigrade with appropriate modifications of specifications and building ecologies	Compliance status pertaining to energy efficient construction material is already provided above. PP submitted that all efforts were made to achieve R & U factor by selecting suitable building Material.
xxi)	The green belt design along the periphery of the plot shall be planned to achieve a density of at least 1000 tree/ acres of land. The open spaces inside the plot should be suitably landscaped with plants of indigenous variety	Compliance status is already provided above.
xxii)	To avoid traffic congestion, the proposed design of the main road within the premises should be modified as recommended during the EAC meeting.	As per the information provided, 30 meters wide roads were provided for entry and exit from the project. Internal roads of widths 12 m, 18 m and 26 meters were provided.
xxiii)	Disaster Management Plan based on Risk Assessment study should be followed.	PP agreed to comply with. During the site inspection, it was observed that disaster management plan is available. As per the information provided, mock drill are carried out once in 6 months.
xxiv)	DG sets emissions should conform to EPA norms. Flue gas should be monitored from SPM, SOx and NOx. Public transportation deployed should conform to EURO- III norms	Compliance status is already provided above.
xxv)	Back up supply as well as public transportation system proposed for the project should be based on Natural Gas / Cleaner fuel subject to their availability	Complying with. 4 no.s of bus were provided for internal transportation. The busses were CNG and battery operated.
xxvi)	Project proponent should resort to solar energy at least for street lighting and water heating for commercial complexes and residential areas	Complying with. During the site inspection, it was observed that common area lighting, hot water systems were provided based on solar energy. Solar energy plant is installed at biogas plant for supply hot water. One pilot plant of Wind & Solar (Hybrid) power generation plant is operational. It is proposed to use this technology for 50 Green Bungalows plots. Solar PV panels were installed for the bus stops.

General Conditions:

S.No.	Condition	Compliance Status
1	The environmental safeguards contained in the FIA report should be implemented in letter and spirit	**Complying with.** The details of environmental safeguards installed at the project were already provided above. The project is carrying out periodical assessment of implementation of environmental safeguards through NEERI. Last assessment was carried out in 2018.
2	All the conditions, liabilities and legal provisions contained in the EC shall be equally applicable to the successor management of the project in the event of the project proponent transferring the ownership, maintenance or management of the project to any other entity	**PP agreed upon.** During the site inspection, it was observed that the project was managed by M/s. City Corporation Limited.
3	Provision should be made for the supply of kerosene or cooking gas/ pressure cookers to the laborer during construction phase	During the site inspection, it was observed that cooking gas was provided for construction labor.
4	All the laborers to be engaged for construction works should be screened for health and adequately treated before the issue of work permits	**Complying with.** As per the information provided, pre employment medical examination was carried out for all the workers.
5	The project proponent should make financial provision in the total budget of the project for implementation of the suggested safeguard measures	**Complying with.** During the site inspection, PP submitted that budget is allocated annually for environment protection measures. As per the information provided, an amount of Rs. 50 lakhs is spent every six months for operation and maintenance of environment infrastructure.
6	Six monthly monitoring reports should be submitted to the Ministry and its Regional Office, Bhopal	**Complying with.** PP submitted the six monthly compliance reports regularly.
7	Officials from the Regional Office of MoEF, Bhopal who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents/ data by the project proponents during their inspection. A complete set of all the documents submitted to MoEF should be forwarded to the CCF, Regional Office of MoEF, Bhopal.	**PP agreed upon**
8	The responsibility of implementation of environmental safeguard rests fully with the Project Proponent, i.e City Corporation Limited	**PP agreed upon.** During the site inspection, it was observed that environment infrastructure was looked after by

9	In case of any changes in the scope of the project, the project would require a fresh appraisal by this Ministry	PP agreed upon.
10	The Ministry reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including revoking of the environment clearance under the provisions of the Environmental (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner	PP agreed to comply with.
11	A copy of the environmental clearance letter would be marked to the local NGO(s) if any from whom suggestion/ representation were received at the time of public hearing	As per the information provided, PP submitted copy of EC to local authority
12	A copy of the environmental clearance letter should be displayed at the MoEF's regional office, Bhopal and the Office of the Maharashtra State Pollution Control Board, Mumbai	This doesn't pertain to project.
13	The project proponent should advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded environmental clearance and copies of clearances letters are available with the Maharashtra State Pollution Control Board Mumbai and may also be seen on the website of the Ministry of Environment and Forests at http:/www/envfor.nic.in. The Advertisement should be made within 7 days from the day of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at Bhopal	Advertisement was made as per the stipulation
14	These stipulations would be enforced among others under the provisions of water (Prevention and Control of Pollution) Act, 1974, the Air (prevention and Control of Pollution) Act, 1981, the Environment (Protection) act, 1986, the Public Liability (insurance Act, 1991 and EIA Notification 1994 including the amendments	MPCB granted renewal of consent to operate for the occupied buildings.

(सुरेश कुमार अदलखा)
Scientist 'E'
(Suresh Kumar Adalpa)
वैज्ञानिक-ई/Scientist-E
पर्यावरण, वन एवं जलवायु परिवर्तन, मंत्रालय
Ministry of Environment Forest and Climate Change
एकीकृत क्षेत्रीय कार्यालय, नागपुर-440 001
Integrated Regional Office, Nagpur-440 001

Summary Note

1. **Implementation of Conditions:**
Site inspection has been carried out on 21.01.2022. Ministry vide letter dated 27.10.2005 granted environmental clearance for the construction of township project under EIA Notification 1994. During the site inspection it was observed that 49 towers were constructed and occupied. Construction was in progress in 8 towers. 3 STPs of total capacity 3400 CMD were provided. STPs were provided with primary, secondary and tertiary systems. Biogas plant of 3000 kg/day was installed. As per the information provided, a quantity of 2400 kg of food waste is treated every day generating 180 cu.m. bio gas. The bio gas is used to meet partial requirement of canteen fuel & generate electricity for running solid waste management facilities. OWC was provided. Dry waste is disposed of through SWACH NGO. Solar energy plant is installed at biogas plant for supply hot water. One pilot plant of Wind & Solar (Hybrid) power generation plant is operational. It is proposed to use this technology for 50 Green Bungalows plots. Solar PV panels were installed for the bus stops. During the site inspection, it was observed that green belt was developed in and around the project area. As per the information provided, green belt was developed over an area of 192981 sq.m. with the plantation of 9181 no.s of saplings. Regular audit of compliance status of conditions is carried out through NEERI, Nagpur. Overall compliance status found to be good.

2. **Review w.r.t to MOEFs letter dated 30.5.2012:**

The above mentioned report is prepared after site visit on 21.01.2022 for the expansion/amendment of environmental clearance granted for the construction of township project at Hadapsar Pune, Maharashtra. Compliance status is based on the observations made during site inspection.

3. **Court Cases and show cause/closure notices:**
No information pertaining to court cases, show cause/closure notices was provided.

MPCB granted renewal of consent to operate for occupied buildings.

(सुरेश कुमार अडापा) Scientist 'E'
(Suresh Kumar Adapa)
वैज्ञानिक-ई/Scientist-E
पर्यावरण, वन एवं जलवायु परिवर्तन, मंत्रालय
Ministry of Environment, Forest and Climate Change
एकीकृत क्षेत्रीय कार्यालय, नागपुर-440 001
Integrated Regional Office, Nagpur-440 001

15/29

ANNEXURE-2

Point No 1: ISO 14001:2015 Certificate.

UKcert

Certification & Inspection

Certificate of Registration

This is to certify that the

Environmental Management System

of

CITY CORPORATION LTD.

at

AMANORA PARK TOWN, AMANORA - MAGARPATTA ROAD, HADAPSAR,
PUNE- 411028, INDIA

has been independently assessed and is
compliant with the requirements of:

ISO 14001:2015

For the following scope of activities:

PROVISION OF CONSTRUCTION SERVICES

Certificate Number: UQ - 2022021514

Validity of this certificate can be verified at www.ukcertifications.org.uk/verify

Date of Certification	12th January 2021
1st Surveillance Audit Due	11th January 2022
2nd Surveillance Audit Due	11th January 2023
Certificate Expiry	11th January 2024

Authorised Signatory

ANNEXURE - L

k. Certificate from Structural Consultant

Y. S. SANE ASSOCIATES
STRUCTURAL CONSULTANTS
SAI CHAMBERS, 16, PUNE-MUMBAI ROAD,
WAKDEWADI, PUNE : 411 003.
TEL.: 91 - 20 - 65449100 ■ FAX : 91 - 20 - 25510006
E-mail : sanesso@eth.net

TCN/2007-2008/1450

March 29, 2008

CERTIFICATE

TO WHOMSOEVER IT MAY CONCERN

Subject: Proposed development at Amanora Park Town, Hadapsar, Pune.

This is to certify that our designs have been based on following Indian Standard Codes of Practice and shall render the buildings safe and stable.

1. IS – 456 – 2000 – Code of Practice for Plain & Reinforced Concrete Structure.
2. IS – 875 – 1987 – Code of Practice for Design Loads.
3. IS – 1893 – 2002 – Criteria for Earthquake Resistant Design of Structure.

Validity of this certificate is subject to observance of Standard Engineering Construction Practices, conforming to relevant Indian Standard Codes of Practice.

FOR Y. S. SANE ASSOCIATES

(U. M. JOSHI)
PARTNER
STRUCTURAL ENGINEER
LIC No. 20

MUMBAI OFFICE : ATHARVA HOUSE, E WING, INDRAYANI COMPLEX, J K SAWANT MARG, DADAR (W), MUMBAI - 28.
TEL. : 91 - 22 - 24313943, 24324274

ANNEXURE-3

h. NOC from Ministry of Defense

Air HQ/[illegible]/13/JPC-CLU(1)/
Dy.No.140/F/2007/D(Air-II)
Government of India
Ministry of Defence

New Delhi, the 29th March, 2007.

To

M/s City Corporation Ltd.,
City Chambers, 917/19A F[illegible] Road,
Shivajinagar,
Pune – 411 004, (India)

Subject : Issue of 'NOC' for construction of residential-cum-commercial township called 'Amanora Park Town' covering villages Sadhesatranali and Malwadi near Hadapsar, Pune.

Sir,

I am directed to refer to your letter No. L/CCL/APT/AAI-064 dated 9.10.06 on the above subject and to say that Air HQ has no objection from security angle for construction of residential-cum-commercial township called 'Amanora Park Town' covering villages Sadhesatranali and Malwadi near Hadapsar, Pune by M/s City Corporation Ltd. subject to the following conditions:-

(a) Height of the building should not exceed more than 105 meters.

(b) Provision of standard obstruction markings during the day and obstruction light markings during the night. The obstruction lights are to be put on during night and poor visibility.

(c) Proper garbage disposal plan as per the undertaking given by the company must be implemented so as to avoid bird hazard.

(d) The commencement, completion of construction of the residential-cum-commercial township and provision of obstruction markings and lights should be intimated to AOC, Air Force Station, Pune.

2. You are also requested to obtain No Objection from other concerned Government Organizations/Agencies as required.

Yours faithfully,

(S.K. Jha)
Secretary to the Govt. of India

18/29

j. NOC from Fire Advisor

GOVERNMENT OF MAHARASHTRA

No. 261 /FA
Tel. No. 2613 20 30
Tel. Fax No. 2613 88 65

OFFICE OF THE FIRE ADVISER
State Fire Training Centre
Vidyanagari, Hans Bhugra Marg
Santacruz (East), Mumbai 400 098

Date: 09/04/2007

M/s. City Corporation Ltd.
City Corporation Limited,
City Chambers, 917/19A,
F.C. Road
Pune-411 004.

Kind Attention : Mr. J. K. Bhosale

Sub: Grant of Provisional No Objection Certificate for Highrise Residential Buildings in R-2 Sector, Town Center in A-TC Sector & School building in A-S-1 Sector, as per the 1st revised sanction master layout of M/s. City Corporation Ltd., Pune's Amanora Park Town at Hadapsar, Pune.

Ref: 1. Para 5.1 (i) of Special Township Policy sanctioned by Govt. in Urban Development Deptt. Under notification No. TPS-1804/ Pune R.P.DCR/ UD-13 Dated 18/11/2005.
1. Your application dated 02/03/2007 for grant of provisional approval of highrise residential building in R-2 sector as per revised sanctioned master layout.
2. Your application No. CCL/JKB/03/07/ Dated 05/03/2007.
3. Your letter No. CCL/JKB/04/07 Dated 10/04/2007.

Dear Sir,

This has reference to the above, you have submitted an application along with the drawings for grant of "Provisional No-Objection Certificate" for your proposed high rise residential buildings in R Sector, Town Center in A-TC Sector & School building in A-S-1 Sector, of Amanora Park Town at Hadapsar Pune. This office has "No Objection (Provisional)" for your proposed 10 Nos. of residential buildings having: Basement + Ground floor stilt and 18 to 22 Upper Floors having height 76.00 to 86.00 meters and Town Center building is less then 15 meters and School Building is of 18 meter height.

CITY CORPORATION LTD. HADAPSAR RECEIVED 10/4/07

10!

19/29

As per the provisions of Maharashtra Fire Prevention and Life Safety Measures Act 2006 you are requested to pay the following fire protection fund fees the details are as under :

Sr. No.	Details	Total Area in Sq. Meters	Rate per Sq. Meter	Total Amount In Rupees
1.	Residential Block Tower A B & C	1,07,060.00	Rs. 12/-	Rs.12,84,960/-
2.	Town Centre	6,676.93	Rs.07/-	Rs.00,46,153/-
3.	School Building	8783.00	Rs.08/-	Rs.00,70,264/-
			TOTAL	Rs.14,03,377/-

After payment of the above fees the Provisional No Objection Certificate will be issued to you for the above buildings.

This is for favour of information and further needful please.

Thanking you,

Yours faithfully,

(M. V. Deshmukh)
Director & Fire Advisor
To Govt. of Maharashtra

D.A. As Above.

Copy Submitted to Principal Secretary , UD-II for favour of information please.

Copy f.w.c's to Collector Pune for information please.

20/29

Greenbelt Development at Amanora

The Amanora has been planned with modern urban design concepts including SMART city concepts, which gives all that is desired from an integrated planned township by **M/s Mani Choufla from Delhi**.

'Amanora Park Town' not only encourages but also creates a sense of places through its Urban Design and Master Planning and benefits the entire community that it will create. The concept is based on the human palm which has been the main source of inspiration for various civilizations and religious communities. The 'palm design' remains an efficient pattern of distribution and augmentation of resources which efficiently spreads out the resources in a pre-determined manner.

The center of the palm is the heart of the project and houses the Center green while the depression of the palm holds the man-made lake. The central 25 acre green radiates throughout the property through its green fingers, which for visual connection and spread their innate qualities dispersing them with the rest of the township. The lifeline of the palm is the stream which runs from south to north. Through a series of cascading water bodies which propagate their goodness across the township, the development open out into a natural depression creating a delightful experience.

The entrance boulevard spanning a 1 km drive the gateway and Amanora Market city is representative of the Thumb. Each property opens into a green area; all 5 come together like the 5 fingers and taper into the central green forming a continuous network that congregate into the main green. All of the above stated, comprise the 70 acres of open landscaped spaces that act as the lungs of the Township.

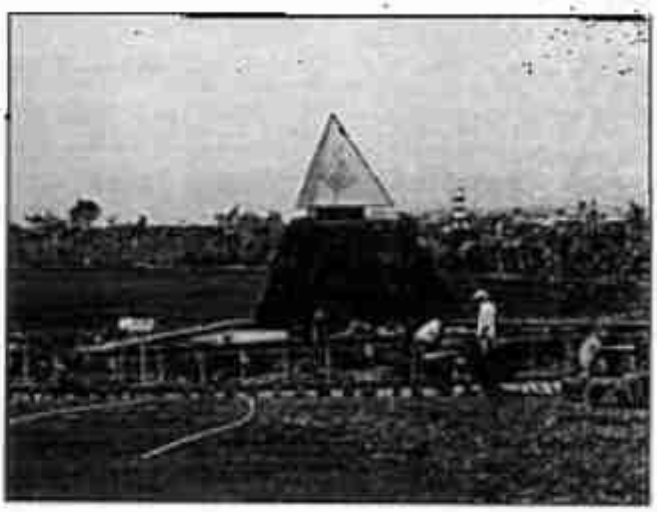


Photo 1: 20 Acre Central Green with Environment Temple

Photo 2 : Road Side Plantation

Photo 3 : Landscape garden in Sectors & Road sides plantation with malden.

In present land use 192981 Sq. M open landscape area is planed & developed.

A. Status of Plant Species in the Township is continued to increase the plantation.

Sr. No.	Plant Species	Nos of Saplings
1.	Acasia	28
2.	Alstoniascholaris	465
3.	Areca palm	29
4.	Ashoka	15
5.	Audumber	9
6.	Badam	58
7.	Bahunia Species	440
8.	Bakul	115
9.	Bamboo/Golden	101
10.	Bel	1
11.	Bottle palm	11
12.	*Brussiaactinophyalla*	1
13.	Cassia	16
14.	*Cassia fistula*	201
15.	Casurina	1589
16.	Caesalpinia	83
17.	Chafa	552
18.	Cherry	4
19.	Christmas tree	30
20.	Citrus	5
21.	Coconut	55
22.	Cordiasabastina	156
23.	Dalimb	2
24.	Dabergiasissoo	1
25.	Fanas	9
26.	Ficusbenghalensis	6
27.	Ficusblackiana	694
28.	Ficusreligiosa	4
29.	Ficusyellow	6
30.	Filicium	38
31.	Foxtail palm	281
32.	Golden Bottle Brush	6

Sr. No.	Plant Species	Nos of

Sr. No.	Plant Species	Nos of Saplings
34.	Green Bottle Brush	164
35.	Gulmohor	102
36.	Jacaranda	62
37.	Jacaranda	6
38.	Jamun	10
39.	Kadamba	7
40.	Kadipatta	1
41.	Kadunecm	101
42.	Karanj	4
43.	Khaya	12
44.	Kigelia	126
45.	Langcstromia	432
46.	Magnolia champaka	6
47.	Mangifcraindica	5
48.	Mango	9
49.	Manilkarazapota	8
50.	Markhamia	0
51.	Millingtonia	532
52.	Mohgani	7
53.	Mujkunj	57
54.	Nilgiri	27
55.	Nyctanthusarbortristis	3
56.	Palas	3
57.	Pangara	44
58.	Parijatak	44
59.	*Parkinsonia*	6
60.	Peltaphorum	649
61.	Phonix Palm	4
62.	Phyllanthusemblica	1
63.	Pimple	5
64.	Plumeria	101
65.	Plumeria Alba	50
66.	Plumeria Dwarf Singapuri	9
67.	Plumeriapudica	73
68.	Plumeria (Red)	25

Sr. No.	Plant Species	Nos
70.	Putranjiva	7
71.	Rain Tree	6
72.	Rubber Tree	2
73.	Senegalia catechu	1
74.	Silver Oak	470
75.	Sita Ashok	150
76.	Sitaphul	2
77.	Spathodia	182
78.	Sterclixfoietda	35
79.	Sterculiaalata	65
80.	SupariPalm	17
81.	Syzygiumcumini	4
82.	Tabebuia	302
83.	*Tamarindusindica*	6
84	Tecoma	10
85.	Terminaliamentallis	68
86.	Thevatia	116
87.	Thrinaxradiata	8
88.	Umbrella tree	4
89.	Vilaiti Chinch	1
	Total	**9181**

B. List of Shrubs

Sr. No.	Plant Common Name	Scientific Name	Family
1.	Acalypha	Acalypha	Euphorbiaceae
2.	Agave	Agave americana	Verbenaceae
3.	Bougainvillea	Bougainvillea spectabilis	Nyctaginaceae
4.	Bottle Brush	Callistemon citrinus	Myrtaceae
5.	Cassia	Cassia Spp.	Fabaceae
6.	Citrus	Citrus limon	Asteraceae
7.	Duranta	Durantaerecta	Rutaceae
8.	Dombia	Dombeyawallichii	Malvaceae

9.	Dwarf Gulmohar	Caesalpiniapulcherrima	Fabaceae
10.	Golden Shower	Pyrostegiavenusta	Bignoniaceae
11.	Hibiscus	Hibiscus rosa-sinensis	Verbenaceae
12.	Ixora	Ixoracoccinea	Malvaceae
13.	Juhi	Jasminumauriculatum	Oleaceae
14.	Kaner	Cascabelathevetia	Apocynaceae
15.	Lantana	Lantana camara	Verbenaceae
16.	Mogra	Jasminumsambac	Solanaceae
17.	Parthenium	Partheniumhysterophorus	Apocynaceae
18.	Pedalenthis	Euphorbia tithymaloides	Verbenaceae
19.	Pedilanthus	Euphorbia tithymaloides	Asparagaceae
20.	Raatraani	Cestrum nocturnum	Apocynaceae
21.	Rose	Rosa damascena	Euphorbiaceae
22.	Slender goldshower	Galphimiagracilis	Malpighiaceae
23.	Vilaytikikar	Parkinsoniaaculeata	Fabaceae

C. List of Herbs

Sr. No.	Plant Common Name	Scientific Name	Family
1.	Aloe	*Aloe vera*	Asteraceae
2.	Asparagus	*Asparagus officinalis*	Asparagaceae
3.	Banana	*Musa paradisiaca*	Musaceae
4.	Basil	*Ocimumtenuiflorum*	Lamiaceae
5.	Bird of Paradise	*Strelitziareginae*	Asteraceae
6.	Chlorophyttum	*Chlorophytumborivilianum*	Solanaceae
7.	Creeping Fig	*Ficuspumila*	Poaceae
8.	Curtain creeper	*Vernoniaelaeagnifolia*	Araceae

9.	Genda	*Tagetes erecta*	Asparagaceae
10.	Green Chilli	*Capsicum annuum*	Strelitziaceae
11.	Kava	*Piper methysticum*	Passifloraceae
12.	Lemon grass	*Cymbopogon citratus*	Asparagaceae
13.	Lumina	*Aglaonema Lumina*	Asparagaceae
14.	Passion Flower	*Passiflora incarnata*	Asteraceae
15.	Philodendron	*Philodendron bipinnatifidum*	Moraceae
16.	Rhoeo	*Tradescantia spathacea*	Commelinaceae
17.	Sonchus	*Sonchus oleraceus*	Araceae
18.	Spider Lilly	*Hymenocallis caribaea*	Amaryllidaceae
19.	Syngonium	*Syngonium podophyllum*	Araceae
20.	Zebra plant	*Calathea zobrina*	Marantaceae

D. List of Grasses

Sr. No.	Plant Common Name	Scientific Name	Family
1.	Cynodon (Doob Grass)	Cyanodondactylon	Poaceae
2.	Pampas Grass	Cortaderiaselloana	Poaceae
3.	Phosphyllum	Paspalumnotatum	Poaceae
4.	Ribbon Grass	Phalarisarundinacea	Poaceae
5.	Runner Grass	Stenotaphrumsecundatum	Poaceae

ANNEXURE-5

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Form 4

See rules 6(5),13(8),16(6) and 20(2) of Hazardous and other wastes 2016

FORM FOR FILING ANNUAL RETURNS

[To be submitted to state pollution control board/pollution control committee by 30th June of every year for the preceding period April to march]

Unique Application Number
MPCB-HW_ANNUAL_RETURN-0000021080

Submitted On:
23-10-2021

Submitted for Year:
April 2020 to March 2021

1. Name of the generator/operator of facility
City Corporation Limited

Address of the unit/facility
Amanora Park Town, Amanora Magarpatta Road, Hadapsar, Pune 411028.

1b. Authorization Number	Date of Issue	Date of validity of consent
Format 1.0(A) UAN No. 0000000024&CR 2102001278 & UAN No. 0000091440&CR-2102001280	Feb 23, 2021	Jan 31, 2024

2. Name of the authorised person
J. R. Bhosale

Full address of authorised person
Amanora Park Town, Amanora Magarpatta Road, Hadapsar, Pune 411028.

Telephone	Fax	Email
9783720193		amitkumar.jadia@amanora.com

3 Production during the year (product wise, wherever applicable)

Product Type *	Product Name *	Consented Quantity	Actual Quantity	UOM
OTHERS	Construction of Houses	1233006.1300	1233006.12	NA-

PART A: To be filled by hazardous waste generators

1. Total Quantity of waste generated category wise

Type of hazardous waste	Wate Name	Consented Quantity	Quantity	UOM
5.1 Used or spent oil	Used Oil from DG set set	0.600	0.4	KL/Anum

2. Quantity dispatched category wise

Type of Waste	Quantity of waste	UOM	Dispatched to	Facility Name
5.1 Used or spent oil	0	KL/Anum	0	Stored due to less quantity

3. Quantity utilised in-house, if any

Type of Waste	Name of Waste	Quantity of Waste	UOM
	NA	0	KL/Anum

4. Quantity in storage at the end of the year

Type of Waste	Name of Waste	Quantity of Waste	UOM
5.1 Used or spent oil	Used oil from DG sets	0.4	KL/Anum

GOVERNMENT OF MAHARASHTRA

Tel.No. 022-22855082
E-Mail: envgujarat@yahoo.co.in

SEAA-2017 CR 04 TC 3
Environment Department,
217 Annex Mantralaya,
Mumbai – 400 032.
Date: 28th February, 2017

To,
M/s City Corporation Limited,
"Amanora Park Town Project"
Hadapsar, Pune

Sub: Regarding Revalidation of your EC No. J.12011/22/2005-IA dated 27.10.2005, under EIA Notification, 1994.

Ref: 1. 106th meeting of SEAA
2. Amendment in Notification dated 21.08.2013
3. your letter dated 29.12.2016

Dear Sir,

With reference to the above mentioned subject you have represented that you have obtained Environment Clearance under EIA Notification 1994 you also requested for revalidation of your earlier obtained Environment Clearance to SEAC & SEIAA vide your letter dated 29.12.2016.

SEAC-III considered your proposal in their 51st meeting and recommended to SEIAA in view of Notification dated 21.08.2013 paragraph 2, 3 and 9 which are as explanatory and clarifies as below.

"the expression 'for a period of five years' shall mean" for a period of five years for commencement of the construction or operation and not five years from commencement of the construction or operation".

In view of above if you have complied with the same no further revalidation is required. You are also requested to pl. note that all the terms and conditions, stone etc mentioned in your Environment Clearance letter remains unchanged and shall be complied with. In case of failure to comply with the same, the Environment Clearance will be automatically stand cancelled.

Yours faithfully,

(Satish Gavai)
Member Secretary (SEIAA)
Environment Department

No.J-12011/22/2005/IA (CII)
Government of India
Ministry of Environment & Forests

Paryavaran Bhawan,
CGO Complex, Lodhi Road,
New Delhi-110003.
Dated: 27.10.2005

To

Shri J.K. Bhosale,
Chief Operating Officer,
City Corporation Ltd.,
City Chambers, 917/19A,
F.C. Road,
PUNE –411004.

Sub: Proposal for a Township (AMANORA) near Hadapsar, District Pune, Maharashtra

Please refer to your letters dated 23.8.05, 20.9.05 and 13.10.05 on the above-referred subject and the documents submitted for environmental clearance.

2. The above proposal was considered in the 9th EAC meeting held on 13.8.05 and 10th EAC meeting held on 6.10.05 based on the documents furnished by you and clarifications provided from time to time.

3. It is proposed to construct a township of 14000 dwellings, commercial complex, primary & secondary Schools and recreational area including sports/golf complex, amenity spaces like community centers etc. The estimated project cost is Rs.1180 crores and the period of construction is 10 years. Public hearing was held on 27.5.05 and Consent to Establish was obtained on 20.7.05.

4. Salient features of the proposed project are:

Total Project Cost:	Rs.1180 crores
Land Area	476 Acres
Period of Construction	10 Years
Rainwater harvesting	Proposed to recharge ground water aquifer
Water consumption	During construction -0.25 MLD
	During operation -13.00 MLD
Sewage Treatment Plant	7.6 MLD capacity
Solid Waste Disposal	30 Tons per day (composting, reuse & landfill)
Tree Plantation	Existing trees retained, to plant 70,000 trees.

2. the Ministry of Environment and Forests hereby accords environmental clearance (EC) as per provision of Environmental Impact Assessment Notification, 1994 and the subsequent amendment subject to strict compliance of the terms and conditions mentioned below:

PART A- SPECIFIC CONDITIONS

I. Construction Phase

i) Provisions of Environmental Management System (IS: 14001) should be implemented right from the construction phase that would include maintaining required sanitary and hygienic measures throughout the construction phase. Provision of drinking water, waste water disposal and solid waste management should be ensured for labour camps.

ii) During the peak construction phase, about 6000 workers will be deployed. Adequate drinking water and sanitary facilities should be provided. The safe disposal of wastewater and solid wastes generated during the construction phase should be ensured.

iii) The average water requirement during construction phase has been estimated to be 0.25 MLD Water usage during construction should be optimized to avoid any wastage.

iv) All the top soil excavated during construction activities should be stored for use in horticulture/landscape development within the project site.

v) Disposal of muck including excavated material during construction phase should not create any adverse effects on the neighboring communities and disposed off taking the necessary precautions for general safety and health aspects.

vi) Diesel generator sets used during construction phase should have acoustic enclosures and should conform to EPA Rules prescribe for air and noise emission standard.

vii) Vehicle/equipment deployed during construction phase should be in good condition and should conform to applicable air and noise emission standards. Construction vehicle should be operated only during non peaking hours.

viii) Ambient noise levels should conform to residential standards both during day and night. Only limited necessary construction should be done during night time. Fortnightly monitoring of ambient air quality (SPM SO2 and NOx) and equivalent noise levels should be ensured during construction phase.

..2/-

ix) Construction spoils including bituminous material and other hazardous materials including oil from construction equipments must not be allowed to contaminate water courses and the dumpsites for such material must be secured so that they should not leach into the ground water. If necessary, oil trap should be installed where there is deployment of heavy machineries.

x) Regular supervision of the above and other measures should be in place all through the construction phase so as to avoid disturbance to the surroundings.

xi) Use of energy efficient construction materials to achieve the desired thermal comfort should be incorporated. Use of fly ash bricks should be explored to the maximum extent possible.

xii) Areas around the sewage treatment plant should be properly covered with vegetation to avoid any impact on the receptors nearby.

xiii) Construction should conform to the requirements of local seismic regulations. The project proponent should obtain permission for the plans and designs including structural design, standard and specifications from concerned authority.

xiv) All mandatory approvals & permissions as required from Airport Authority, Director of Explosives and Fire Department etc should be obtained.

xv) Greenbelt development should be initiated right from construction stage itself.

xvi) Natural drainage should not be obstructed by proposed construction activity.

xvii) All the measures for the control of environmental pollution should be provided before commissioning of project.

II **Operation Phase**

i) The installation of sewage treatment plant (STP) should be certified by an independent expert and should submit in this regard to the Ministry before the project is commissioned for operation.

ii) A scheme should be framed for recycling and reuse of waste waster generated from the project. At least 40% of the total water requirement should be met from waste water recycling and rain water harvesting.

iii) Proper system for rainwater harvesting should be provided. The rain water harvesting should be designed in the consultation with the Irrigation Department, Government of Maharashtra. Necessary study like existing

contour, drainage should be studied before designing rain water harvesting.

iv) Sewage Treatment Plant with a capacity of 7.6 MLD has been designed to treat the wastewater from the commercial and residential complex. As proposed, the wastewater will be treated to tertiary level and after treatment, reused for flushing of toilets and gardening. Discharge of treated sewage shall conform to E(P) Rules prescribed for air & emission standards as per CBCB Guidelines Exhaust will be taken 4 meters above the roof top.

v) The sludge generated from Sewage Treatment Plant should be used as manure.

vi) Noise barriers will be provided at appropriate locations so as to ensure that the noise levels do not exceed the prescribed standards. DG Sets should be provided with necessary acoustic enclosures as per CBCB norms.

vii) The solid waste generated should be properly collected, segregated, treated and disposed off as per Municipal Solid Waste Rules. The project proponent should ensure disposal of waste by making suitable arrangement with PMC or by means of outsourcing and if either of this is not possible, the project proponent should develop properly engineered facility for its disposal.

viii) The project proponent should obtain authorization from Maharashtra State Pollution Control Board for waste oil/used oil generation from DG Sets and shall be handed as per provisions of Hazardous Waste (Management and Handling Rules).

ix) Incremental pollution loads on the ambient air quality, noise and water quality should be periodically monitored after commissioning of the project. The ambient air quality shooooould be monitored monthly at least at one location inside the project site for SPM, SO2 and NOx. The noise level shooooould be monitored at two locations monthly for equivalent noise levels.

x) Use of energy efficient construction materials to achieve the desired thermal comfort should be incorporated. The desired level of R and U factors to be achieved. U factor for the top roof should not exceed 0.4 Waatt/sq.m/degree centigrade with appropriate modifications of specifications and building ecologies.

xi) The green belt design along the periphery of the plot shall be planned to achieve a density of at least 1000 trees/acres of land. The open spaces inside the plot should be suitably landscaped with plants of indigenous variety. ..4/-

xiii) To avoid traffic congestion, the proposed design of the main road within the premises should be modified as recommended during the EAC meeting.

xiv) Disaster Management Plan based on Risk Assessment study should be followed.

xv) DG Sets emissions should conform to EPA norms. Flue gas should be monitored from SPM, SO and Nox. Public transportation deployed should conform to EURO-III norms.

xvi) Back up supply as well as public transportation system proposed for the project should be based on Natural Gas/Cleaner fuel subject to their availability.

xvii) The project proponent should resort to solar energy at least for street lighting and water heating for commercial complexes and residential areas.

PART-B GENERAL CONDITIONS

1. The environmental safeguards contained in the EIA Report should be implemented in letter and spirit.
2. All the conditions, liabilities and legal provisions contained in the EC shall be equally applicable to the successor management of the project in the event of the project proponent transferring the ownership, maintenance or management of the project to any other entity.
3. Provision should be made for the supply of kerosene or cooking gas/pressure cookers to the labourers during construction phase.
4. All the labourers to be engaged for construction works should be screened for health and adequately treated before the issue of work permits.
5. Financial provision should be made by the project proponent in the total budget of the project for implementation of the suggested safeguard measures.
6. Six monthly monitoring reports should be submitted to the Ministry and its Regional Office, Bhopal.
7. Officials from the Regional Office of MoEF, Bhopal who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents/data by the project proponents during their inspection. A complete set of all the documents submitted to MoEF should be forwarded to the CCF, Regional Office of MoEF, Bhopal.
8. The responsibility of implementation of environmental safeguards rests fully with the Project proponent, i.e. Sahara India Commercial Corporation Limited, Lucknow.
9. In the case of any change(s) in the scope of the project, the project would require a fresh appraisal by this Ministry.
10. The Ministry reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including revoking of the Environment clearance under the provisions of the Environment

(Protection) Act 1986, to ensure effective implementation of the suggested safeguard measures in a time-bound and satisfactory manner.

11 A copy of the environmental clearance letter would be marked to the local NGO(s) if any from whom suggestions/representation were received at the time of public hearing

12 A copy of the environmental clearance letter should be displayed at the MOEF's Regional Office, Bhopal and the Office of the Maharashtra State Pollution Control Board, Mumbai

13 The project proponent should advertise in atleast two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded environmental clearance and copies of clearance letters are available with the Maharashtra State Pollution Control Board, Mumbai and may also be seen on the website of the Ministry of Environment and Forests at http://www.envfor.nic.in. The advertisement shouldbe made within 7 days from the day of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at Bhopal

14. These stipulations would be enforced among others under the provisions of water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability Insurance Act, 1991 and EIA Notification 1994 including the amendments

15 The project proponent should acknowledge the receipt of the environmental clearance letter and convey their concurrence to the conditions stipulated above within 15 days from the date of issue of this letter. In case there is no response from the proponent, it would be deemed to have been agreed to.

(S. Shiva Kumar)
Director (IA)
Telefax:24360695

Annexure No. 7: Copy of EC send to NGO

AMANORA
PARK TOWN

City Corporation Limited
(An ISO 9001:2000 Company)
Site office, Village Sade Satara Nalli,
Hadapsar,Pune
Tel:+91 20 3041 0000,
Fax : +91 20 3041 0043

8th November 2005

To,
HARAMONY,
Healthy Awareness Regarding Mandatory Obnoxious Nuisance Yender
1046, Sadashiv Peth,
Pune – 411030.

Kind Attn:- Mr. Jayant Joshi, President.

Sub: Environmental clearance – Proposal for Township (AMANORA), near Hadapsar, Dist- Pune, Maharashtra

Ref.: Environmental clearances vide letter No. J.12011/22/2005/IA (CIE) dtd. 27.10.2005.

Dear Sir,

With reference to the abpve a copy of the above referred environmental clearances is submitted ti you as an NGO.

Thanking you.

Yours faithfully
For City Corporation Ltd., Pune

J. K. Bhosale,
Chief Operating Officer.

Encl. :a/a.

CITY CORPORATION LIMITED
AMANORA
PARK TOWN
HADAPSAR

107

Annexure No. 8: Copy of EC send to MPCB

AMANORA

City Corporation Limited
City Chambers, 917, 19A F C Road
Pune 411004 India
Tel: +91 20 25654535
Fax: +91 20 25657555

CCL/JKB/11/05/

DATE : 09.11.2005

To:

The Member Secretary,
Maharashtra State Pollution Control Board,
Kalpataru Parks,
Opp. Cine Planets,
Sion Circle, Sion (E),
Mumbai 400 022.

Sub : MoEF Clearance for Township (Amanora) near Hadapsar, Pune.

Ref. : No. J 12011/22/2005/IA (CIE) dtd. 27.10.2005.

Dear Sir,

Enclosed please find a copy of the above referred document for your records, as advised by the MoEF, Govt. of India.

Thanking you,

Yours faithfully,
For City Corporation Ltd.,

J. K. Bhosale,
Chief Operating Officer.

Encl. : a/a.

CITY CORPORATION LIMITED AMANORA PARK TOWN HADAPSAR

CITY CORPORATION LIMITED AMANORA PARK TOWN HADAPSAR

Annexure No. 9: Advertisement in newspaper regarding EC

[illegible]

प्रजासत्ताक दिन संचलन

पूर्वनिवड शिबिरात 'रासेयो'चे २० स्वयंसेवक

पुणे, दि. १५ - [illegible]

[illegible]

[illegible] Environmental Clearance (EC)

The Ministry of Environment and Forests (MoEF), Govt. of India has accorded Environmental Clearance as per provisions of Environmental Impact Assessment Notification 1994 and its subsequent amendments to M/s. City Corporation Ltd's Amanora park Township vide their consent No. J 12011/ 22/ 2005 IA (CE) dt. 27. 10. 2005. Copies of the clearance letter are available with the Maharashtra State Pollution Control Board, Mumbai and may also be seen on the web site of the ministry of Environment and forests at http://www.envfor.nic.in

Advertisement released as per MoEF's advise by:

City Corporation Ltd.
City Chambers, 917/194,
F.C. Road, Pune- 411 004

PUBLIC NOTICE

Notice is hereby given that MR. NELSON RAMSEN KORE was the owner of the property bearing Survey no. 390/2580 House no. 2123 and 2124 Gaffarbaig Street, Camp Pune admeasuring 4872 sq ft with Structure thereon as well as Land bearing Survey no. 21 Hissa no 2 of Village Kondhwa Budruk, Pune admeasuring 4 Gunthas, who died on 20/6/2000 leaving behind him his LAST WILL dated 23rd March 1994 thereby given the above said properties to his two sons and five daughters in equal proportion. My client MRS. ROHINI KAMALAKAR MANKAR of Phaltan Dist. Satara is also one of the Co owner having undivided share in the said properties of the deceased father.

My client learnt that the other Co owners namely 1. MRS KUMUDINI RAVINDRA SALVI. 2. MRS LAVINI NARAYAN PARDESHI 3. MRS. RAJANI BHASKER KALE 4. MRS NALINI ARVIND PACHARNE 5. MR SAMEUL NELSON KORE and the son MR. DANIEL NATHANIL KORE of deceased MR. NATHANIL NELSON KORE are intending and trying to sell and transfer the above said propedies including the SHARE of my client. My client has no intention to sell or transfer her share to any one including the co owners since these properties have not been divided by metes and bounds.

Public are hereby informed that except my client no person or persons have any right or authority to sell or transfer or assign the un divided share in the properties of my client. All are hereby informed that if any person or persons deals with or negotiate with the above said properties he may do so entirely at his own risk and cost the so called transaction being illegal will not be binding on my client.

Place: Pune, Dated: 19/10/2005

Akhlaque A. Shaikh, Advocate
8-3/897 Parmar Classic, Synagogue Street,
Pune 411 001

जाहीर नोटीस

[illegible]

पुणे, दि. १४/११/२००५

पी. एन. कुलकर्णी, ॲडव्होकेट

[illegible]

Daily Prabhat – 16th Nov. 2005

CITY CORPORATION AMANORA TOWN

109

Annexure No. 10: The acknowledgement receipt of EC letter

AMANORA
PARK TOWN

CITYGROUP

City Corporation Limited
City Chambers, 917/19A, F C Road
Pune - 411004, India
Tel : + 91 20 25654555
Fax : + 91 20 25657555

8th November 2005

TO,
Mr. S. Shiva Kumar
Director, IA Division,
Ministry of Environment & Forest,
Govt. of India,
CGO Complex, Lodhi Road,
New Delhi – 110003
Phone: 011 24360695

Sub: Environmental clearance – Proposal for Township (AMANORA), near Hadapsar , Dist- Pune, Maharashtra

Ref.: Environmental clearances vide letter No. J.12011/22/2005/IA (CIE) dtd. 27.10.2005.

Dear Sir,

We are in receipt of the above refried environment clearance for the the Amanora Park Town project to be developed by us.

Copy of above referred environmental clearances is enclosed here with dully acknowledged.

Thanking you.

Yours faithfully
For City Corporation Ltd., Pune

J. K. Bhosale,
Chief Operating Officer.

Encl. :a/a.

CITY CORPORATION LIMITED
AMANORA
PARK TOWN
HADAPSAR

011