MONITORING, SAMPLING AND ANALYSIS FOR AMBIENT AIR QUALITY, SURFACE WATER QUALITY AND GROUND WATER QUALITY IN CRITICALLY/SEVERELY/OTHER POLLUTED AREAS

PIMPRI CHINCHWAD

Pre-Monsoon (April 2025 – June 2025)

MAHARASHTRA POLLUTION CONTROL BOARD

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Index

ABBREVIATIONS

APHA	American Public Health Association
ASTM	American Society for Testing and Materials
BIS	Bureau of Indian Standards
BLQ	Below the Limit of Quantification
CAAQMS	Continuous Ambient Air Quality Monitoring Station
CEMS	Continuous Emission Monitoring System
CEPI	Comprehensive Environmental Pollution Index
CETP	Common Effluent Treatment Plant
CPA	Critically Polluted Area
CPCB	Central Pollution Control Board
EPA	Environmental Protection Act, 1986
GDP	Gross Domestic Product
MIDC	Maharashtra Industrial Development Corporation
MPCB	Maharashtra Pollution Control Board
NAAQS	National Ambient Air Quality Standard
NWMP	National Water Quality Monitoring Program
SPA	Severely Polluted Area
VOCs	Volatile Organic Compounds
WHO	World Health Organisation
ZLD	Zero Liquid Discharge

1. Executive Summary

Pimpri-Chinchwad was monitored for Ambient Air Quality, Ground and Surface Water quality. Based on the data collected by monitoring, a Comprehensive Environmental Pollution Index (CEPI) Score [as per latest directions 120 of Letter No. B-29012/ESS (CPA)/2015-16 dated 26th April 2016 of Central Pollution Control Board (CPCB)] was calculated. Maharashtra Pollution Control Board (MPCB) has carried out monitoring at CPCB location with the additional location of samplings for ambient air, surface and ground water in consideration with the previous CEPI monitoring and covering the entire CEPI Impact Zone. The pre monsoon monitoring was carried out during the period of April 2025 to June 2025 to assess the ambient air quality, surface water quality and ground water quality.

The Ambient Air Quality stations were identified considering the upwind and cross wind direction in the CEPI impact area. Ambient Air Quality was monitored at eight locations. The concentration of all the ambient air parameters was found well within the limits prescribed in NAAQS 2009. Biochemical Oxygen Demand, Fluoride, Total Kjeldahl Nitrogen and Iron is found above the standard limits in few locations in surface water monitoring. Land index is represented by groundwater in the CEPI. Ground water parameters were found to be within the permissible limits, except BOD, Total Phosphate, Total Kjeldahl Nitrogen and Iron is found above the standard limits in few locations.

Based on the study conducted by CPCB during the period January 2018, the CEPI score of Pimpri-Chinchwad region as per the revised guidelines of CEPI (2016) was 52.16 (Air Index–52, Water Index-6.25 and Land Index–5.25). However, the present study reports aggregated CEPI score of Pimpri-Chinchwad region of pre-monsoon season (June, 2025), the present CEPI score is 49.30 (Air Index–18.75, Water Index- 46.88 and Land Index–24.25). The CEPI score is the combination of A, B, C and D factors. Here, C factor represents the health data and D factor represents the initiatives taken by MPCB in the past few years to mitigate the pollution. The regional office of MPCB has taken various initiatives like installation of CAAQMS, CETPs, etc. in the past few years to control and mitigate the air and water pollutants. This has contributed to the factor D, hence reducing the CEPI score of the region over the years.

2. Introduction

The industrial sector plays a critical role in driving national economic development by enhancing production, generating fixed investments, boosting exports, creating employment opportunities, and improving capacity utilization. As a key engine of economic progress, industries contribute significantly to government revenue, international trade, and the provision of social services. The sector's growth rate has a direct influence on a country's overall economic performance. As of the 2024 World GDP Ranking, India is recognized as the fifth-largest economy in the world. Notably, several Sustainable Development Goals (SDGs) emphasize economic growth, particularly Goal 8 (Decent Work and Economic Growth) and Goal 9 (Industry, Innovation, and Infrastructure).

However, alongside these economic benefits, industrial activities have considerable negative environmental consequences. The discharge of untreated industrial wastewater has contaminated drinking water sources with hazardous substances, posing severe threats to human, animal, and aquatic life. Air pollution resulting from industrial emissions is linked to numerous respiratory and cardiovascular diseases, especially among children, contributing to higher infant mortality rates and long-term health issues. According to the World Health Organization (WHO), environmental pollution is responsible for approximately 9 million premature deaths annually, with over 90% of the global population exposed to air pollution levels that exceed WHO safety guidelines. Additionally, nearly 2 billion people consume drinking water contaminated with fecal matter, leading to outbreaks of infectious diseases such as cholera and dysentery.

The impact on flora and fauna is equally alarming. Industrial pollution has led to habitat destruction, loss of biodiversity, and the disruption of ecosystems. Toxic pollutants can cause genetic mutations, reproductive failures, and behavioral changes in wildlife, endangering entire species. Plants exposed to polluted air and water can experience stunted growth, reduced photosynthesis, and increased susceptibility to diseases, which ultimately affects food security and ecosystem stability.

The impact on biodiversity is equally concerning. Industrial pollution has caused significant habitat destruction, loss of species, and disruption of ecosystems. Toxic emissions can lead to genetic mutations, reproductive issues, and behavioral changes in wildlife, pushing some species toward extinction. Vegetation exposed to polluted environments suffers from stunted growth, decreased photosynthetic activity, and heightened vulnerability to diseases—ultimately threatening food security and ecological balance. To counter these adverse effects, strong environmental policies are essential. Such policies provide a regulatory framework for industries and individuals, enforced by governmental bodies through monitoring, penalties for violations, and mandatory environmental impact assessments. Conservation strategies are vital for protecting biodiversity, and policies must be periodically revised to address new environmental challenges. A holistic approach—comprising strict regulations, international cooperation, modern monitoring tools, and sustainable practices adopted by industries and governments—is crucial to preserve natural resources and ensure a sustainable future.

Simultaneously, the Comprehensive Environmental Pollution Index (CEPI) has emerged as a beacon of assessment and action in India's environmental landscape. Introduced as a standardized methodology for evaluating and addressing pollution in industrial clusters across the nation, the CEPI represents a significant step towards achieving the delicate balance between economic growth and environmental sustainability. Developed through collaborative efforts between environmental scientists, regulatory authorities, and community stakeholders, the CEPI serves as a vital instrument for identifying, prioritizing, and mitigating pollution in industrial areas. By systematically monitoring, sampling, and analyzing pollution parameters such as ambient air quality, surface water quality, and groundwater quality, the CEPI empowers policymakers and regulators to make informed decisions and allocate resources effectively.

In Maharashtra, where industrial activities drive economic growth and employment opportunities, the importance of the CEPI cannot be overstated. Through strategic monitoring, sampling and analysis efforts, the CEPI aims to provide a comprehensive assessment of pollution levels and their impacts on environmental health in critically, severely, and other polluted industrial areas across the state.

Moreover, the application of the CEPI extends beyond mere assessment, serving as a catalyst for targeted interventions and regulatory enforcement in polluted industrial areas. By identifying pollution hotspots and vulnerable communities, the CEPI enables authorities to implement remedial measures, enforce pollution control norms, and monitor progress towards environmental sustainability.

This report explores the methodology, findings, and implications of both the CEPI assessment and the monitoring, sampling, and analysis of ambient air quality, surface water quality, and groundwater quality in the polluted industrial areas of Pimpri Chinchwad, Maharashtra. Situated on the north western limits of Pune, Maharashtra, Pimpri Chinchwad has experienced rapid industrial growth since its industrialization began in 1954. It has become a key hub for major Indian automobile companies, including Kinetic Engineering, Tata Motors, Mahindra & Mahindra Ltd., and Bajaj Auto, among others. In addition to the automobile sector, the region has seen significant growth in the software and IT industries.

The report is based on the revised CEPI version from 2016, which evaluates environmental quality through the dimensions of air, water, and land. The Comprehensive Environmental Pollution Index (CEPI) is a calculated value that characterizes environmental conditions at a given location, using a framework that assesses sources, pathways, and receptors. The CEPI reports play a crucial role in guiding targeted interventions, regulatory enforcement, and community engagement, all aimed at reducing pollution and protecting public health in the region. Despite ongoing challenges, the CEPI action plans provide a roadmap for addressing environmental issues and promoting sustainable development in Pimpri Chinchwad.

3. Scope of Work

The major scope of work includes:

I. The scope of the present study is to perform three (3) rounds of "Monitoring, Sampling and Analysis for Ambient Air Quality, VOCs in Ambient Air, Surface Water Quality & Ground Water Quality in selected Pollution Industrial Areas (PIAs) of Pimpri-Chinchwad, Maharashtra" with a gap of one or two days. The analysis of the collected samples was carried out by the standard methods (CPCB, BIS, APHA, USEPA).

II. To Collect health-related data in the CEPI region.

III. To calculate the Comprehensive Environmental Pollution Index (CEPI) Score as per Revised CEPI-2016 issued by Central Pollution Control Board (CPCB).

The sampling details and frequency of sampling in Ambient Air, VOCs, Surface Water and Ground Water are given in Table 3.1 and Table 3.2 respectively.

Table 3.1 Sampling Details of Pimpri-Chinchwad

Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
Ambient Air Quality	08	**08**	PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3, O_3, C_6H_6, CO, BaP, Pb, Ni, As
Volatile Organic Compounds (VOCs)	02	**02**	Dichloromethane, Chloroform, Carbon Tetrachloride, Trichloroethylene, Bromodichloromethane, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,3-Dichlorobenzene, 1,2-Dichlorobenzene, 1,2-Dibromo-3-Chloropropane, Naphthalene, Bromobenzene,1,2,4-Trimethylbenzene, 2-Chlorotoluene, Tert-Butylbenzene, SEC-Butylbenzene, P-Isopropyl toluene, M-Xylene, P-Xylene, Styrene, Cumene 1,2,3-Trichloropropane, N-Propyl benzene, Dibromochloromethane, 1,2-Dibromoethane, Chlorobenzene, 1,1,1,2-Tetrachloroethane, Ethylbenzene, 1,1-Dichloropropylene, 1,2-Dichloroethane, 1,2-Dichloropropane, Trans-1,3-Dichloropropene, CIS 1,3-Dichloropropene, 1,1,2-Trichloroethane, Tetrachloroethylene, 1,3,5-Trimethylbenzene, N-Butylbenzene, 1,2,3-Trichlorobenzene, Hexachlorobutadiene, 1,2,4-Trichlorobenzene, 2,2-Dichloropropane, Dibromo methane, Toluene, O-Xylene, Bromoform,

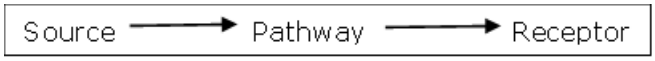
Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
			1,1,2,2-Tetrachloroethane, 4-Chlorotoluene, 1,1-Dichloroethylene, Trans-1,2-Dichloroethylene, 1,1-Dichloroethane, CIS-1,2-Dichloroethylene, Bromochloromethane, 1,1,1-Trichloroethane
Water Quality Monitoring	**Surface water** 06	**06**	**(i) Simple Parameters** Sanitary Survey, General Appearance, Colour, Smell, Transparency and Ecological **(ii) Regular Monitoring Parameters** pH, O & G, Suspended Solids, DO, COD, BOD, TDS, Electrical Conductivity, Total Dissolved Solids, Nitrite–Nitrogen, Nitrate-Nitrogen, (NO_2+NO_3) total nitrogen, Free Ammonia, Total Residual Chlorine, Cyanide, Fluoride, Chloride, Sulphate, Sulphides, Total Hardness, Dissolved Phosphates, SAR, Total Coliforms, Faecal Coliform **(iii) Special Parameters** Total Phosphorous, TKN, Total Ammonia (NH_4+NH_3)-Nitrogen, Phenols, Surface Active Agents, Anionic detergents, Organo-Chlorine Pesticides, PAH, PCB and PCT, Zinc, Nickel, Copper, Hexa-valent Chromium, Chromium (Total), Arsenic (Total), Lead, Cadmium, Mercury, Manganese, Iron, Vanadium, Selenium, Boron **(iv) Bio-assay (zebra Fish)** Test – For specified samples only.
	Ground water 06	**06**	

Table 3.2 Frequency of Sampling

	Parameter	Round of Sampling	Frequency in Each Round
A	**Ambient Air Quality Monitoring**		
1.	Particulate Matter (size less than 10 µm) or PM_{10}	03	3 Shifts of 8 hrs each
2.	Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	03	1 Shift of 24 hrs
3.	Sulphur Dioxide (SO_2)	03	6 Shifts of 4 hrs each
4.	Nitrogen Dioxide (NO_2)	03	6 Shifts of 4 hrs each
5.	Ammonia (NH_3)	03	6 Shifts of 4 hrs each
6.	Ozone (O_3)	03	24 Shifts of 1 hr each
7.	Benzene (C_6H_6)	03	1 Shifts of 24 hrs
8.	Carbon Monoxide (CO)	03	24 Shifts of 1 hr each
9.	Benzo (a) Pyrene (BaP) – particulate phase only	03	3 Shifts of 8 hrs each
10.	Lead (Pb)	03	3 Shifts of 8 hrs each
11.	Arsenic (As)	03	3 Shifts of 8 hrs each
12.	Nickel (Ni)	03	3 Shifts of 8 hrs each
B	**Volatile Organic Compounds (VOCs)**		
	As mentioned in Table 3.1	03	3 Shifts of 24 hrs each
C	**Ground Water**		
	As mentioned in Table 3.1	03	01 sample at each round
D	**Surface Water**		
	As mentioned in Table 3.1	03	01 sample at each round

4. Methodology

The present report is based on the revised Comprehensive Environmental Pollution Index (CEPI) version 2016. The index captures the various dimensions of the environment including air, water and land. Comprehensive Environmental Pollution Index (CEPI) is a rational number, which is used to characterize the environmental quality at a given location. It is three-step process based on the algorithm:



Ambient air stations, Surface water locations and Ground water locations were decided by the respective regional officers. The sampling was done in 3 rounds with an interval of one or two days at each location. Sampling has been done at the potential polluted areas so as to arrive at the CEPI. This will further help the authorities to monitor the areas in order to improve the current status of their environmental components such as air and water quality data, ecological damage and visual environmental conditions.

Methodology for sampling, preservation and analysis have been done according to the CPCB/ EPA/ APHA/ IS/ ASTM standard methods for the samples.

5. Air Environment

For studying the Air Environment of Pimpri-Chinchwad area, monitoring stations were identified considering the upwind and cross wind direction and all 12 parameters as per the notification of National Ambient Air Quality Standards (NAAQS) were carried out.

**Kindly note: Volatile Organic Compounds (VOCs) concentration is not detected in most of the Air samples collected; hence it is not shown in the graphs.*

In Pimpri-Chinchwad eight locations have been monitored of checking the Ambient Air Quality (AAQ). The concentration of all the ambient air parameters was found well within the limits prescribed by NAAQS.

Table 5.1 Details of Sampling Location of Ambient Air Quality Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Thergaon Near Puduji Industries	18°62'20.21"N	73°72'27.37"E	19.05.2025	21.05.2025	23.05.2025
2.	Akurdi Near Force Motor	18°65'13.19"N	73°78'37.25"E	19.05.2025	21.05.2025	23.05.2025
3.	MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall	18°64'10.96"N	73°81'97.94"E	19.05.2025	21.05.2025	23.05.2025
4.	Pimpri Chinchwad Municipal Corporation	18°62'83.79"N	73°80'33.78"E	19.05.2025	21.05.2025	23.05.2025
5.	MIDC Bhosari Near Amphenol Area Pune	18°61'10.96"N	73°80'33.78"E	20.05.2025	22.05.2025	24.05.2025
6.	Moshi Municipal Solid Waste Disposal Site	18°65'77.29"N	73°85'75.64"E	20.05.2025	22.05.2025	24.05.2025
7.	Charoli Moshi Crusher Area	18°65'79.49"N	73°86'49.35"E	20.05.2025	22.05.2025	24.05.2025
8.	Moshi RR Scrap	18°68'03.20"N	73°83'55.38"E	20.05.2025	22.05.2025	24.05.2025

Table 5.2 Details of Sampling Location of Volatile Organic Compounds (VOCs) Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	MIDC Bhosari Near Amphenol Area Pune	18°61'10.96"N	73°80'33.78"E	20.05.2025	22.05.2025	24.05.2025
2.	Moshi Municipal Solid Waste Disposal Site	18°65'77.29"N	73°85'75.64"E	20.05.2025	22.05.2025	24.05.2025

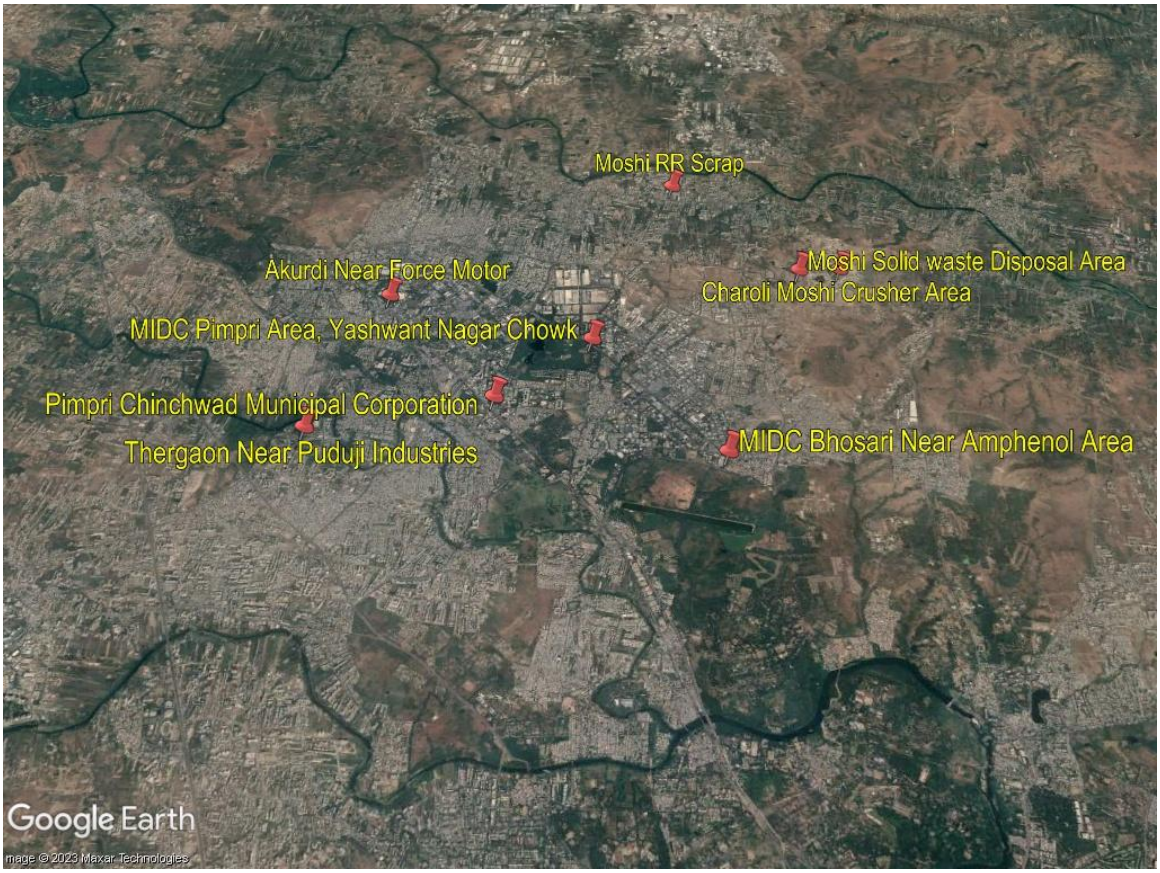


Fig: Geographical Locations of Ambient Air Quality Monitoring

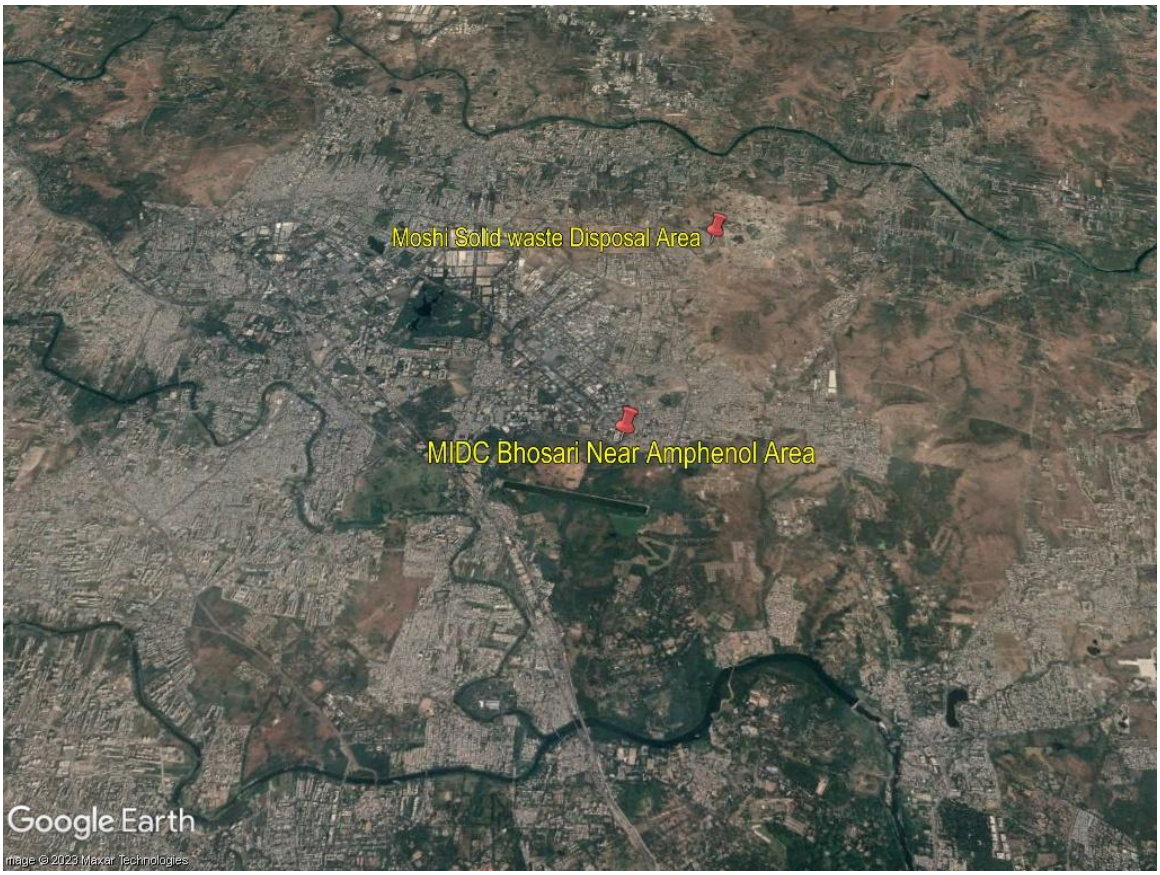


Fig: Geographical Locations of VOCs Monitoring

Table 5.3 Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Thergaon Near Puduji Industries	Akurdi Near Force Motor	Pimpri Chinchwad Municipal Corporation	MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
Sulphur Dioxide (SO_2)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	45	26	38	31
Particulate Matter (size less than 10 µm) or PM_{10}	$\mu g/m^3$	47	49	51	47
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	$\mu g/m^3$	13	12	13	11
Ozone (O_3)	$\mu g/m^3$	BLQ	BLQ	29	BLQ
Lead (Pb)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1 h)	mg/m^3	1.40	1.47	1.43	1.36

Parameters	Unit	Results			
		Thergaon Near Puduji Industries	Akurdi Near Force Motor	Pimpri Chinchwad Municipal Corporation	MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
Carbon Monoxide (CO) (8 h)	mg/m^3	1.50	1.74	1.59	1.64
Ammonia (NH_3)	$\mu g/m^3$	35.5	BLQ	30.5	29.9
Benzene (C_6H_6)	ng/m^3	1.83	1.63	1.71	1.68
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m^3	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m^3	BLQ	BLQ	BLQ	BLQ
Nickel (Ni)	ng/m^3	BLQ	BLQ	BLQ	BLQ

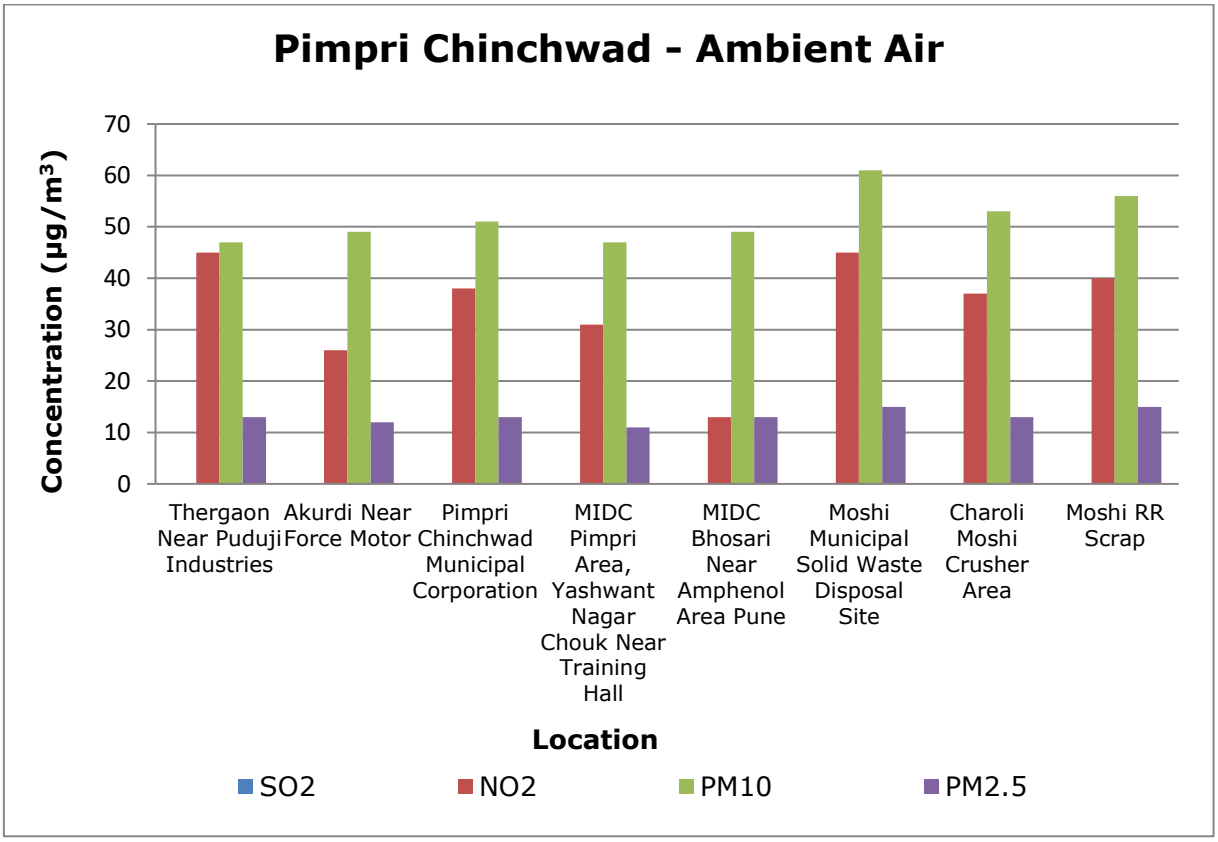
Parameters	Unit	Results			
		MIDC Bhosari Near Amphenol Area Pune	Moshi Municipal Solid Waste Disposal Site	Charoli Moshi Crusher Area	Moshi RR Scrap
Sulphur Dioxide (SO_2)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	13	45	37	40
Particulate Matter (size less than 10 µm) or PM_{10}	$\mu g/m^3$	49	61	53	56
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	$\mu g/m^3$	13	15	13	15
Ozone (O_3)	$\mu g/m^3$	BLQ	34	52	53
Lead (Pb)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1 h)	mg/m^3	1.42	1.39	1.42	1.40
Carbon Monoxide (CO) (8 h)	mg/m^3	1.65	1.53	1.70	1.56
Ammonia (NH_3)	$\mu g/m^3$	32.8	39.0	43.6	41.1
Benzene (C_6H_6)	$\mu g/m^3$	1.86	1.75	1.72	1.66
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m^3	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m^3	BLQ	BLQ	BLQ	BLQ
Nickel (Ni)	ng/m^3	BLQ	BLQ	BLQ	BLQ

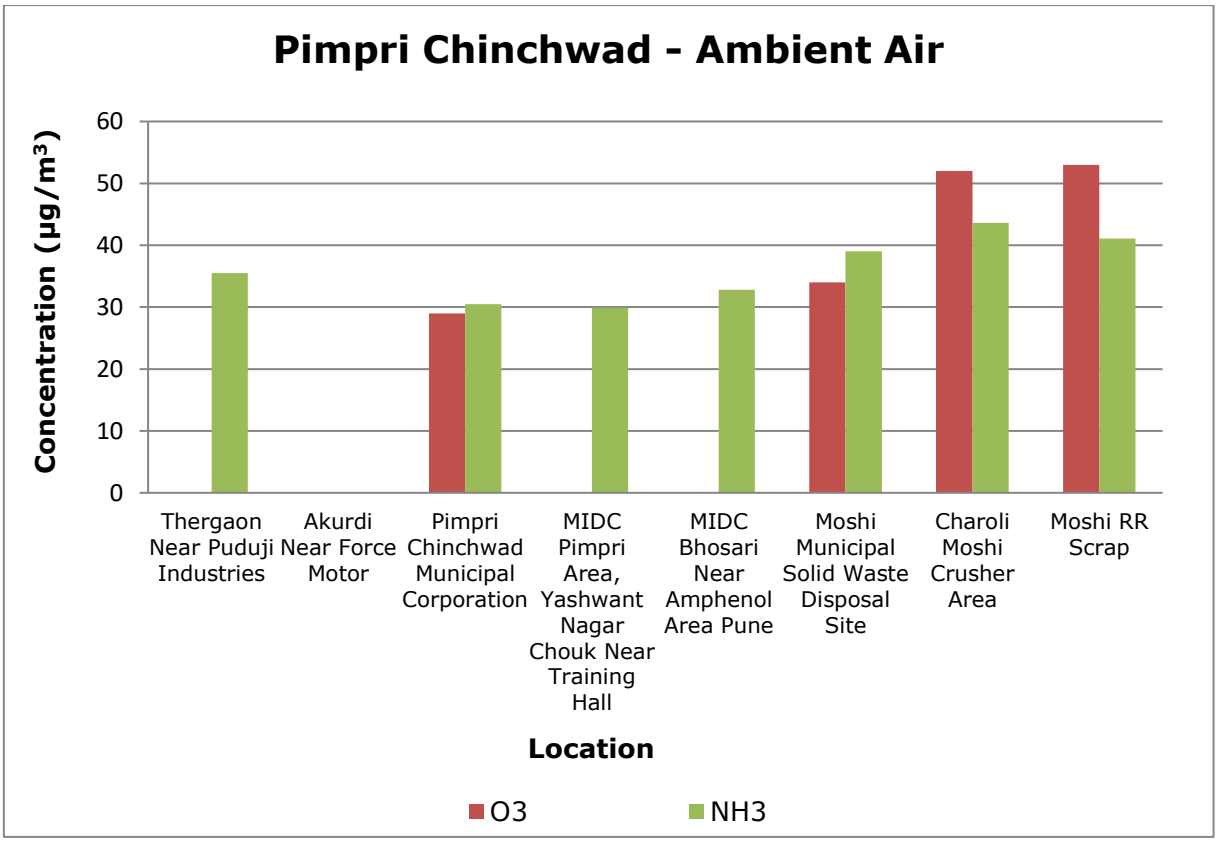
Table 5.4 Volatile Organic Compounds (VOCs) in Ambient Air Results

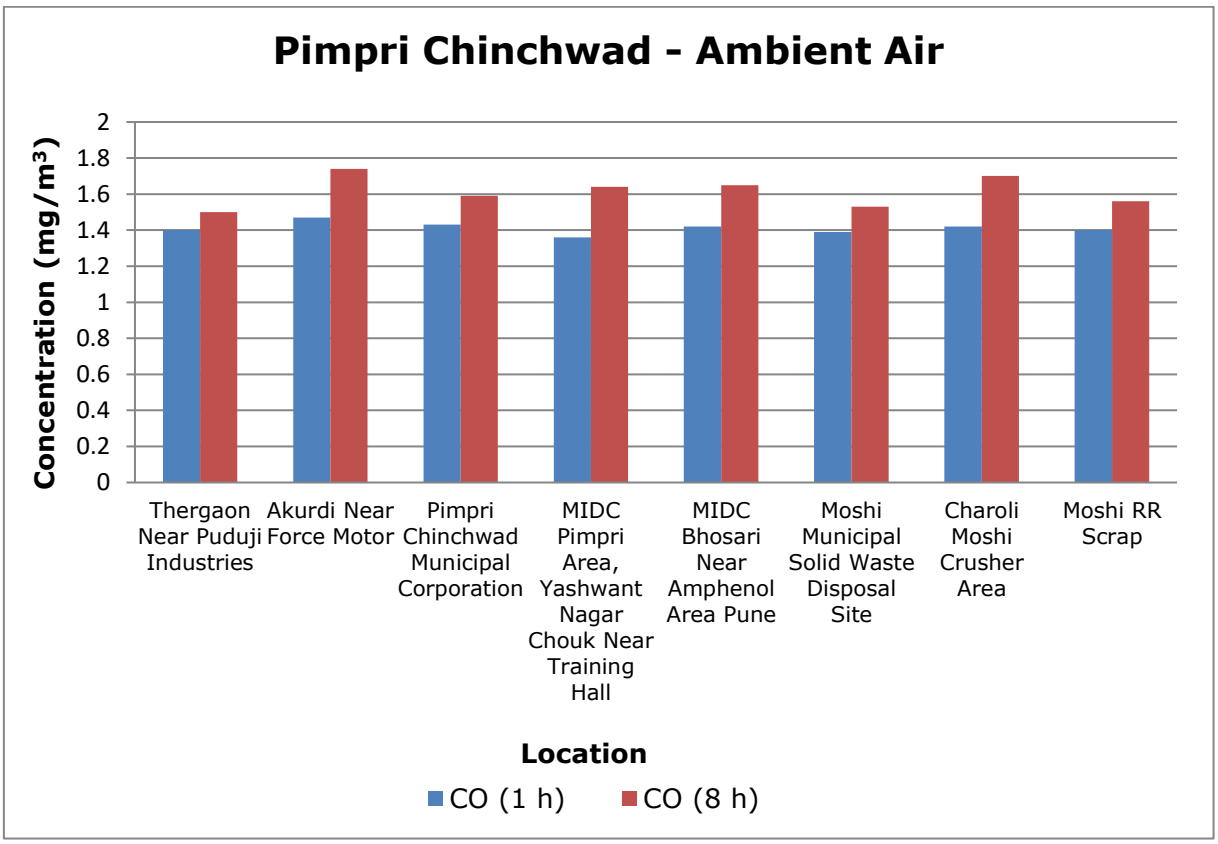
Parameters	Unit	Results	
		MIDC Bhosari Near Amphenol Area Pune	Moshi Municipal Solid Waste Disposal Site
Dichloromethane	µg/m³	0.81	BLQ
Chloroform	µg/m³	BLQ	BLQ
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Naphthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	BLQ	BLQ
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	BLQ	BLQ

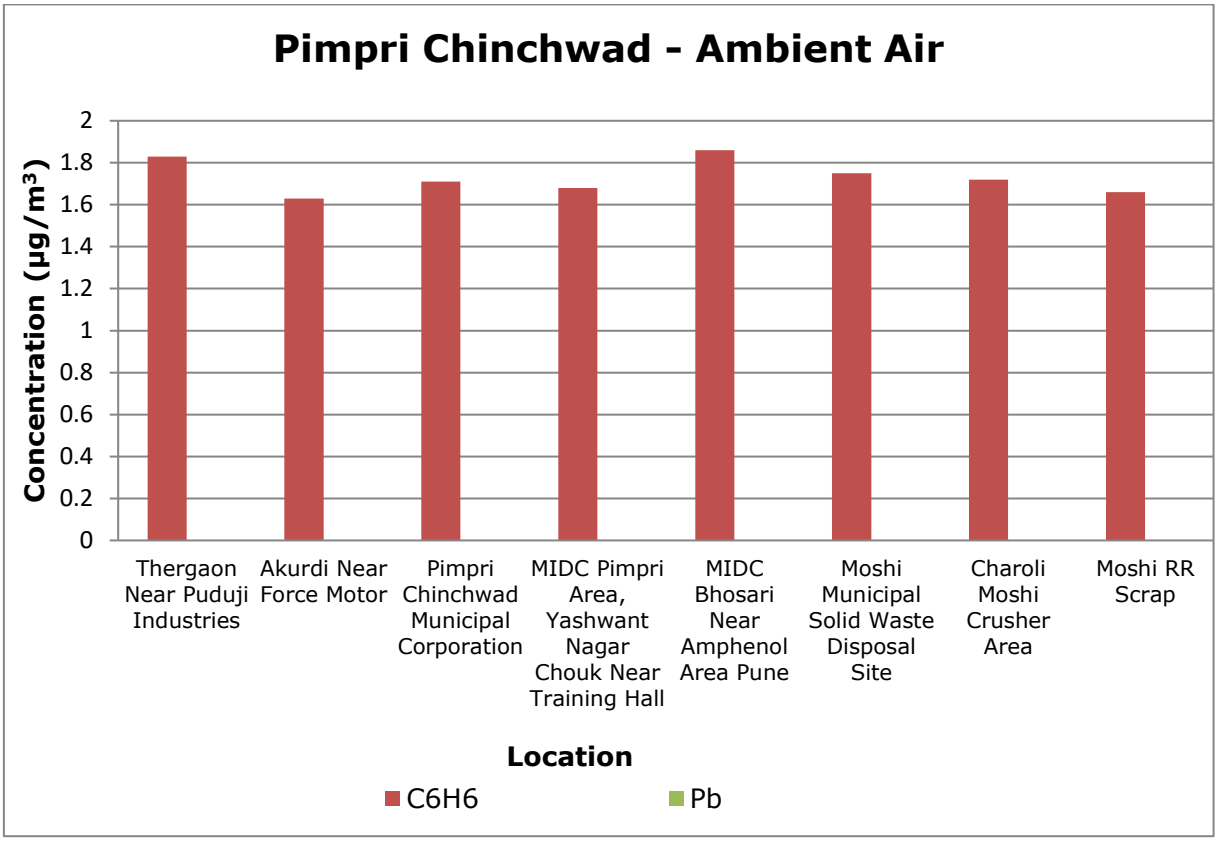
Parameters	Unit	Results	
		MIDC Bhosari Near Amphenol Area Pune	Moshi Municipal Solid Waste Disposal Site
1,2-Dichloropropane	µg/m³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	µg/m³	BLQ	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	BLQ	BLQ
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	BLQ	BLQ
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromoethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.52	0.65
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

Graphs - Ambient Air Quality Monitoring






Pimpri Chinchwad - Ambient Air
Concentration (mg/m³)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Thergaon Near Puduji Industries
Akurdi Near Force Motor
Pimpri Chinchwad Municipal Corporation
MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
MIDC Bhosari Near Amphenol Area Pune
Moshi Municipal Solid Waste Disposal Site
Charoli Moshi Crusher Area
Moshi RR Scrap
Location
CO (1 h)
CO (8 h)


Pimpri Chinchwad - Ambient Air
Concentration (µg/m³)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Thergaon Near Puduji Industries
Akurdi Near Force Motor
Pimpri Chinchwad Municipal Corporation
MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall
MIDC Bhosari Near Amphenol Area Pune
Moshi Municipal Solid Waste Disposal Site
Charoli Moshi Crusher Area
Moshi RR Scrap
Location
C6H6
Pb

WATER ENVIRONMENT

6. Water Environment

For studying the water environment of Pimpri-Chinchwad area, six samples of Surface water were collected from different industries.

- All six water samples collected are found acceptable in sanitary survey, smell and Colour is observed in acceptable limit.
- General parameters like pH, Electrical Conductivity, Suspended Solids and Total Dissolved solids. are also observed well within the limits in all the samples.
- In fish bioassay 100% survival of fishes was not observed in single location out of six locations.
- All metals like Nickel, Hexavalent Chromium (Cr^{6+}), Total Chromium, Total Arsenic, Lead, Cadmium, Mercury, Vanadium, Zinc, Selenium, etc. are also observed either below the limit of quantification or below their standard limits.
- Parameters like Cyanide, Sulphide, Fluoride, Total Ammonia and Phenolic compounds are found within acceptable limit.
- BOD, Fluoride, Total Kjeldahl Nitrogen and Iron observed above the standard limits.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are also observed below the detectable limit in all the studied samples.

Table 6.1 Details of Sampling Location of Surface Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Pawana River-Chinchwad	18°62'42.41"N	73°76'88.62"E	19.05.2025	21.05.2025	23.05.2025
2.	Pawana River-Ravet	18°64'08.31"N	73°74'72.67"E	19.05.2025	21.05.2025	23.05.2025
3.	Indrayani River - Chikhali	18°65'51.44"N	73°81'87.27"E	19.05.2025	21.05.2025	23.05.2025
4.	Indrayani River – Moshi Bridge	18°68'84.5"N	73°84'56.27"E	19.05.2025	21.05.2025	23.05.2025
5.	Pawana River-Pimpri	18°62'32.06"N	73°78'85.44"E	19.05.2025	21.05.2025	23.05.2025
6.	Pawana River-Kasarwadi	18°60'21.78"N	73°82'17.1"E	19.05.2025	21.05.2025	23.05.2025

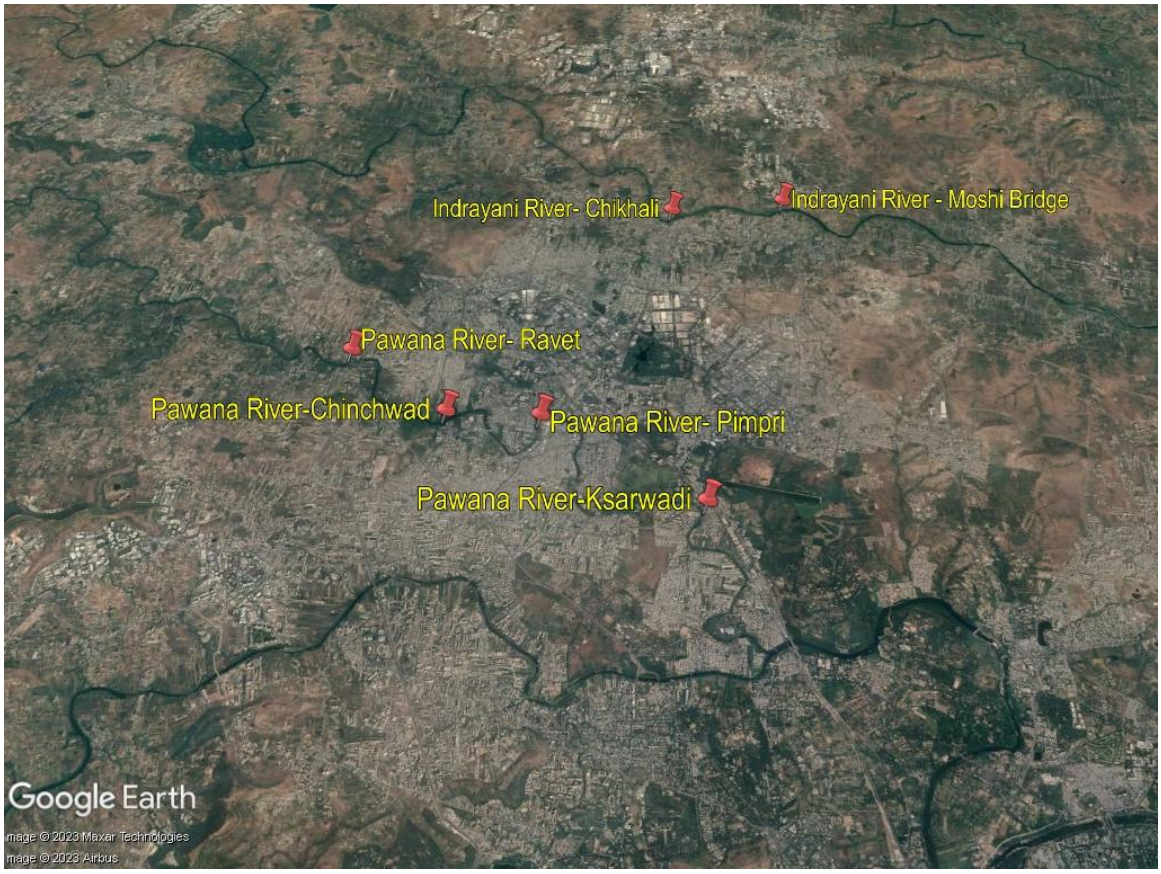


Fig: Geographical Locations of Surface Water Sampling

Table 6.2 Results of Surface Water

Parameters	Unit	Results		
		Pawana River- Chinchwad	**Pawana River- Ravet**	**Indrayani River- Chikhali**
Sanitary Survey	-	Generally clean neighbourhood	Generally clean neighbourhood	Generally Clean neighbourhood
General Appearance	-	Floating Matter Evident	No Floating Matter Evident	Floating Matter Evident
Transparency	m	0.7	1.3	0.7
Temperature	^{o}C	26	27	27
Colour	Hazen	1	1	2
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	5.58	7.56	7.55
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	28	36	28
Total Dissolved Solids	mg/L	177	110	198
Dissolved Oxygen (% Saturation)	%	60	57	58
Chemical Oxygen Demand	mg/L	47	65	40

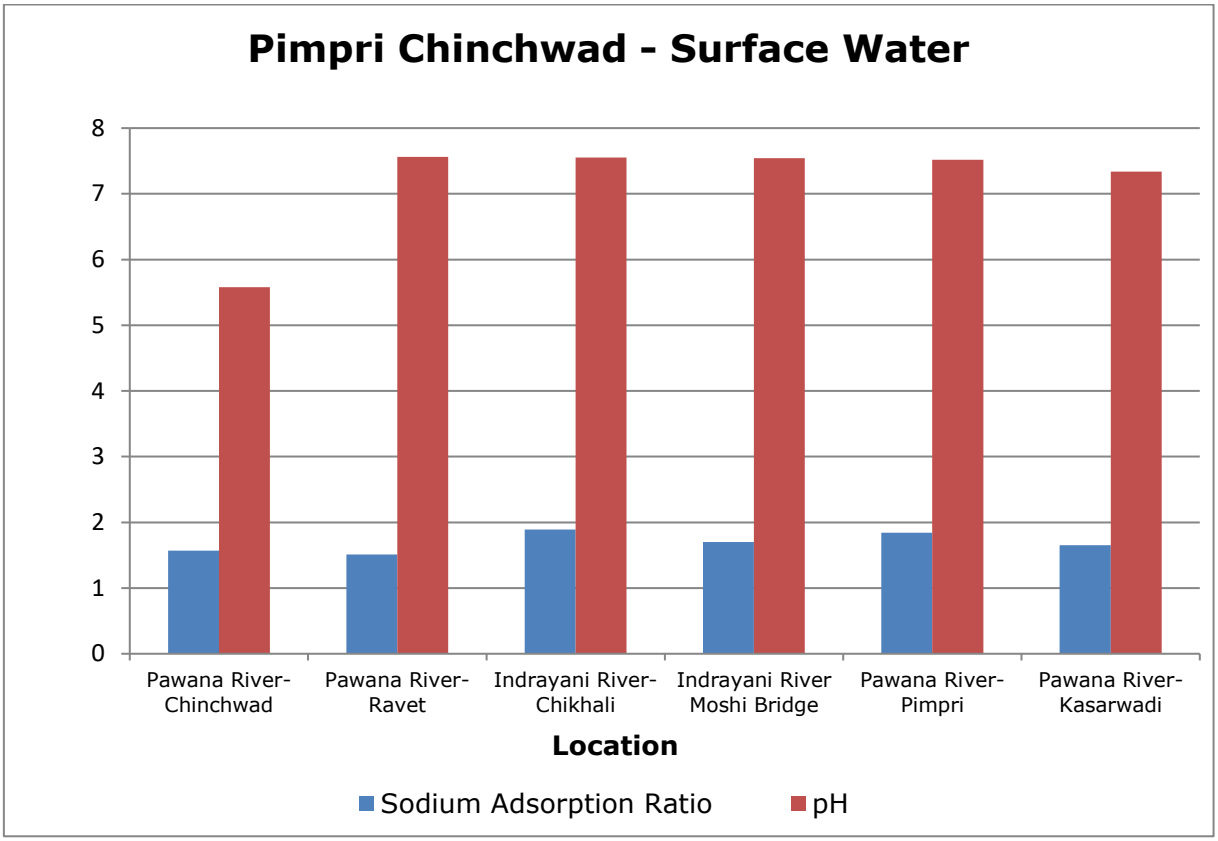
Parameters	Unit	Results		
		Pawana River- Chinchwad	Pawana River- Ravet	Indrayani River- Chikhali
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	13	18	11
Electrical Conductivity (at 25°C)	µmho/cm	318	197	353
Nitrite Nitrogen	mg/L	0.15	0.13	0.28
Nitrate Nitrogen	mg/L	1.16	1.39	2.20
(NO_2 + NO_3)-Nitrogen	mg/L	1.31	1.51	2.48
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Free Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.6	1.19	0.69
Sulphide (as S^{2-})	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	BLQ	BLQ	BLQ
Sodium Adsorption Ratio	-	1.57	1.51	1.89
Total Coliforms	MPN Index/ 100 ml	134	5413	430
Faecal Coliforms	MPN Index/ 100 ml	60	608	276
Total Phosphate (as P)	mg/L	BLQ	BLQ	BLQ
Total Kjeldahl Nitrogen (as N)	mg/L	1.34	1.96	4.21
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.43	0.61	0.21
Total Nitrogen	mg/L	2.65	3.47	6.66
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	BLQ	0.0038	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	BLQ	0.016	0.016
Copper (as Cu)	mg/L	BLQ	0.038	0.023
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.039	0.042	0.050
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.019	0.017	0.013
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ

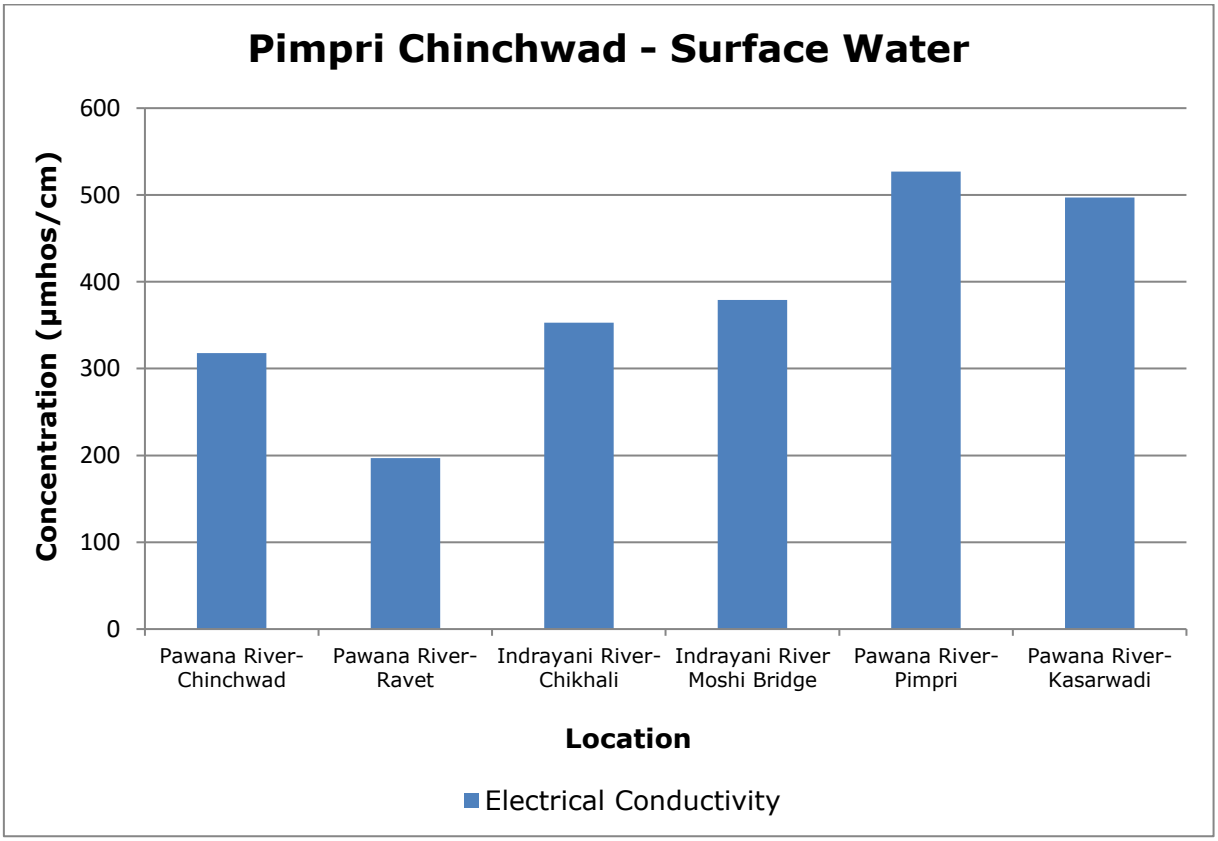
Parameters	Unit	Results		
		Pawana River- Chinchwad	Pawana River- Ravet	Indrayani River- Chikhali
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.037	BLQ	BLQ
Iron (as Fe)	mg/L	0.158	0.154	0.329
Vanadium (as V)	mg/L	0.018	0.012	0.012
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	93	97	97

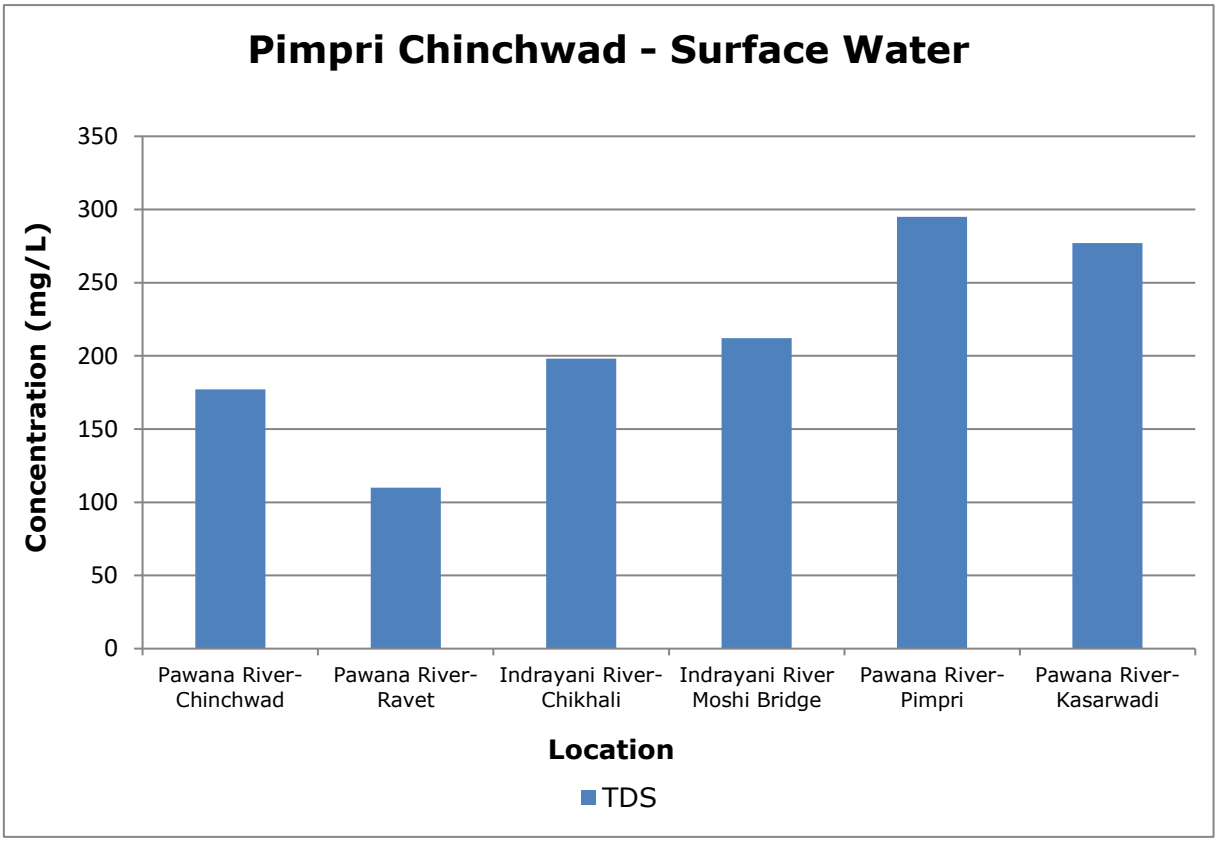
Parameters	Unit	Results		
		Indrayani River – Moshi Bridge	Pawana River- Pimpri	Pawana River- Kasarwadi
Sanitary Survey	-	Generally Clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident
Transparency	m	0.5	0.4	0.4
Temperature	^oC	27	27	27
Colour	Hazen	1	3	3
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.54	7.52	7.34
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	31	38	49
Total Dissolved Solids	mg/L	212	295	277
Dissolved Oxygen (% Saturation)	%	59	59	62
Chemical Oxygen Demand	mg/L	51	57	51
Biochemical Oxygen Demand (3 days, 27^oC)	mg/L	13	15	13
Electrical Conductivity (at 25^oC)	µmho/cm	379	527	497
Nitrite Nitrogen	mg/L	0.26	0.43	0.35
Nitrate Nitrogen	mg/L	2.30	1.89	1.91
(NO_2 + NO_3)-Nitrogen	mg/L	2.47	2.17	2.15
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Free Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.83	0.52	1.81
Sulphide (as S^{2-})	mg/L	BLQ	BLQ	BLQ

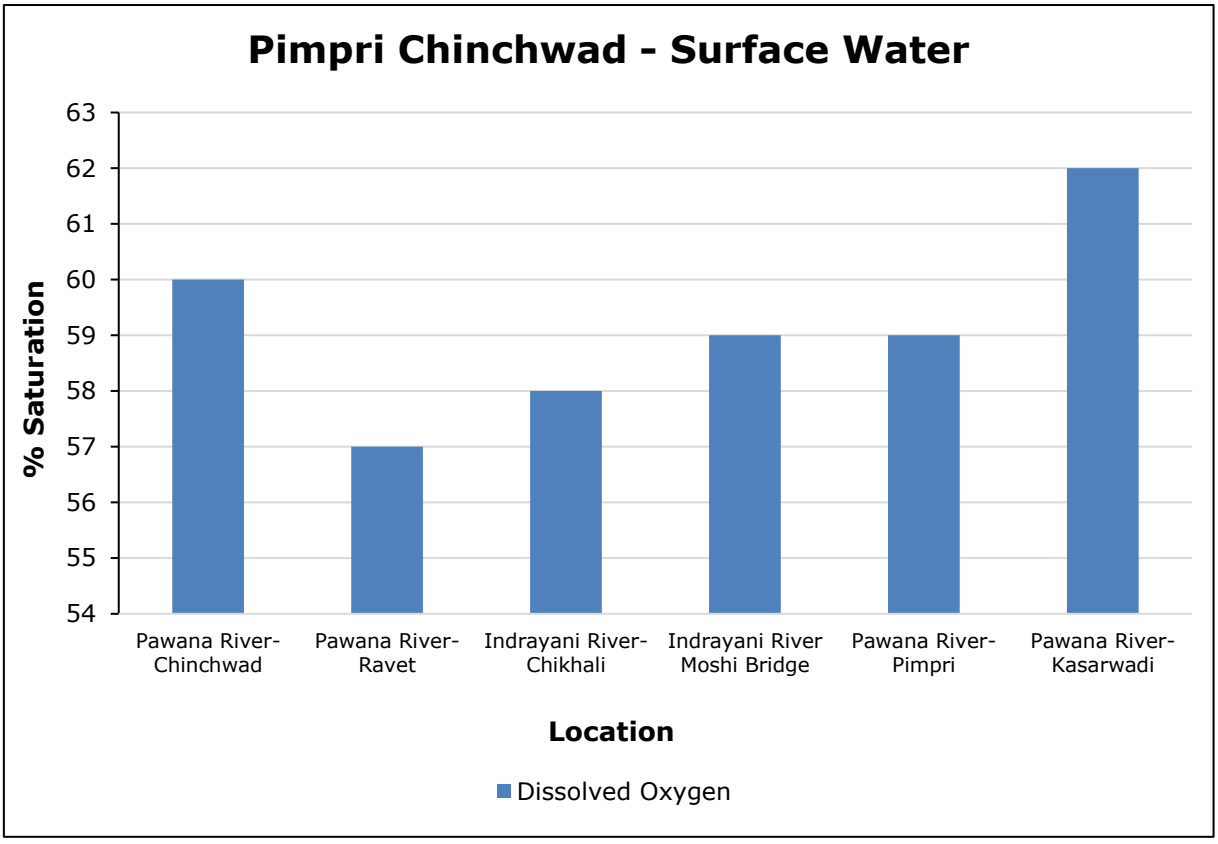
Parameters	Unit	Results		
		Indrayani River – Moshi Bridge	Pawana River- Pimpri	Pawana River- Kasarwadi
Dissolved Phosphate (as P)	mg/L	BLQ	0.12	BLQ
Sodium Adsorption Ratio	-	1.70	1.84	1.65
Total Coliforms	MPN Index/ 100 ml	1278	1297	830
Faecal Coliforms	MPN Index/ 100 ml	90	471	543
Total Phosphate (as P)	mg/L	BLQ	0.19	0.13
Total Kjeldahl Nitrogen (as N)	mg/L	3.39	1.15	2.05
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.13	BLQ	0.73
Total Nitrogen	mg/L	8.33	3.32	4.20
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	µg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	mg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	0.0017	0.0019	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.18	0.11
Nickel (as Ni)	mg/L	0.021	0.038	0.031
Copper (as Cu)	mg/L	0.024	0.078	0.037
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.055	0.055	0.066
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.011	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.068	0.122	0.081
Iron (as Fe)	mg/L	0.448	0.723	0.435
Vanadium (as V)	mg/L	0.013	0.012	0.014
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	0.11	BLQ
Bioassay Test on fish	% survival	90	90	83

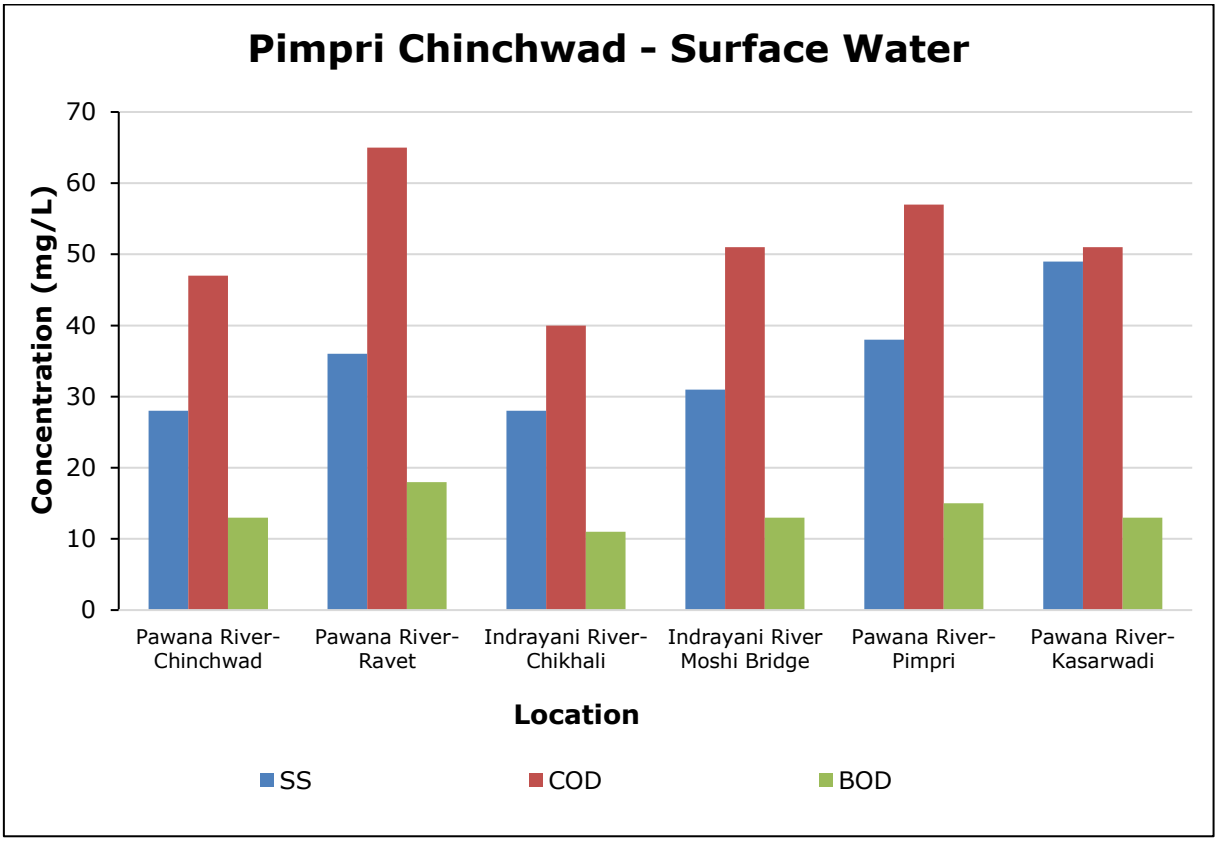
Graphs - Surface Water Quality

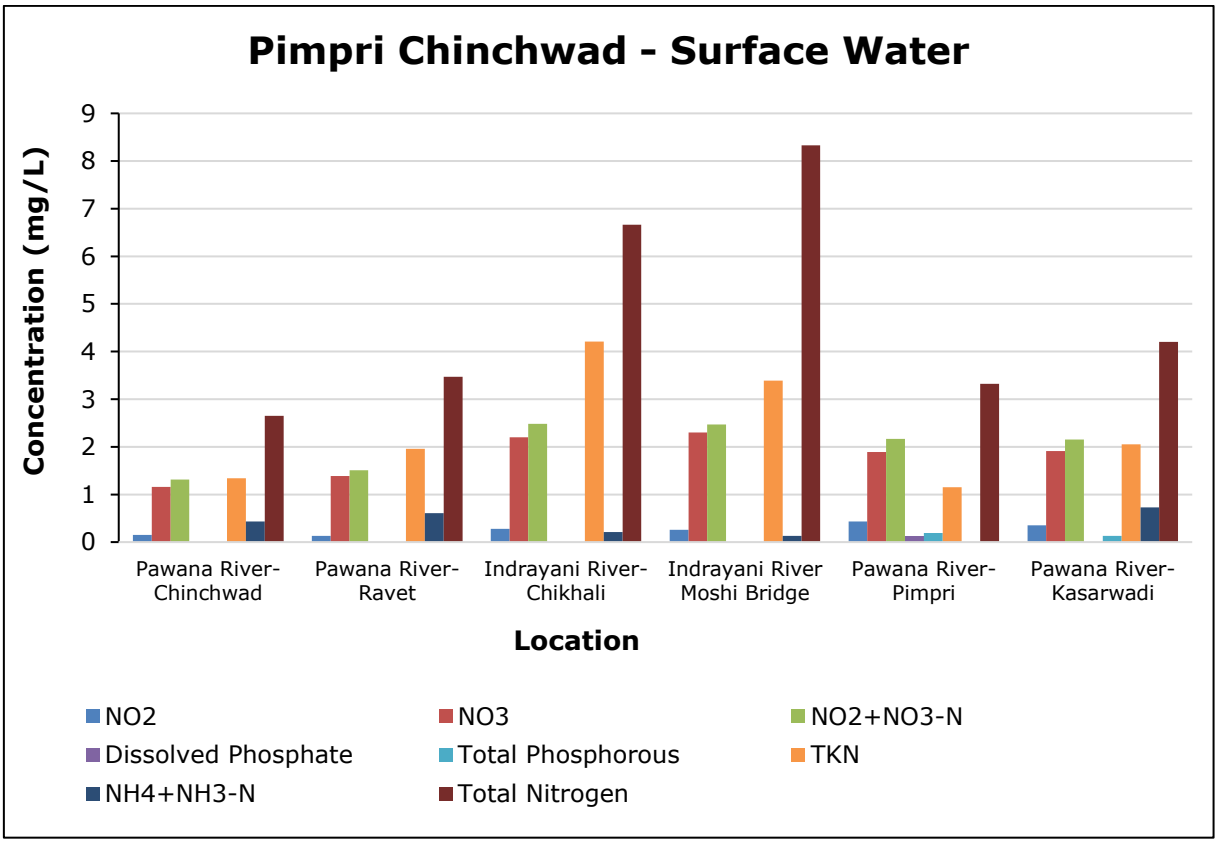


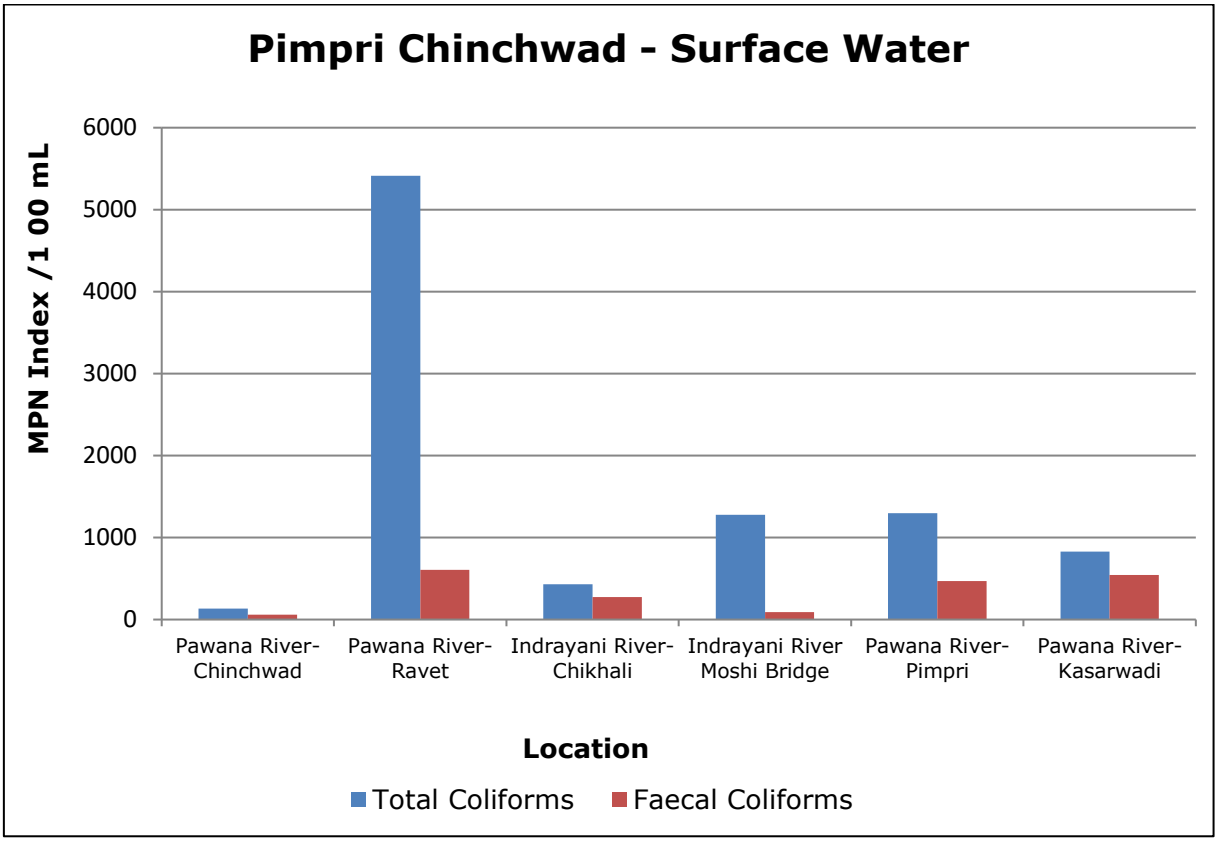


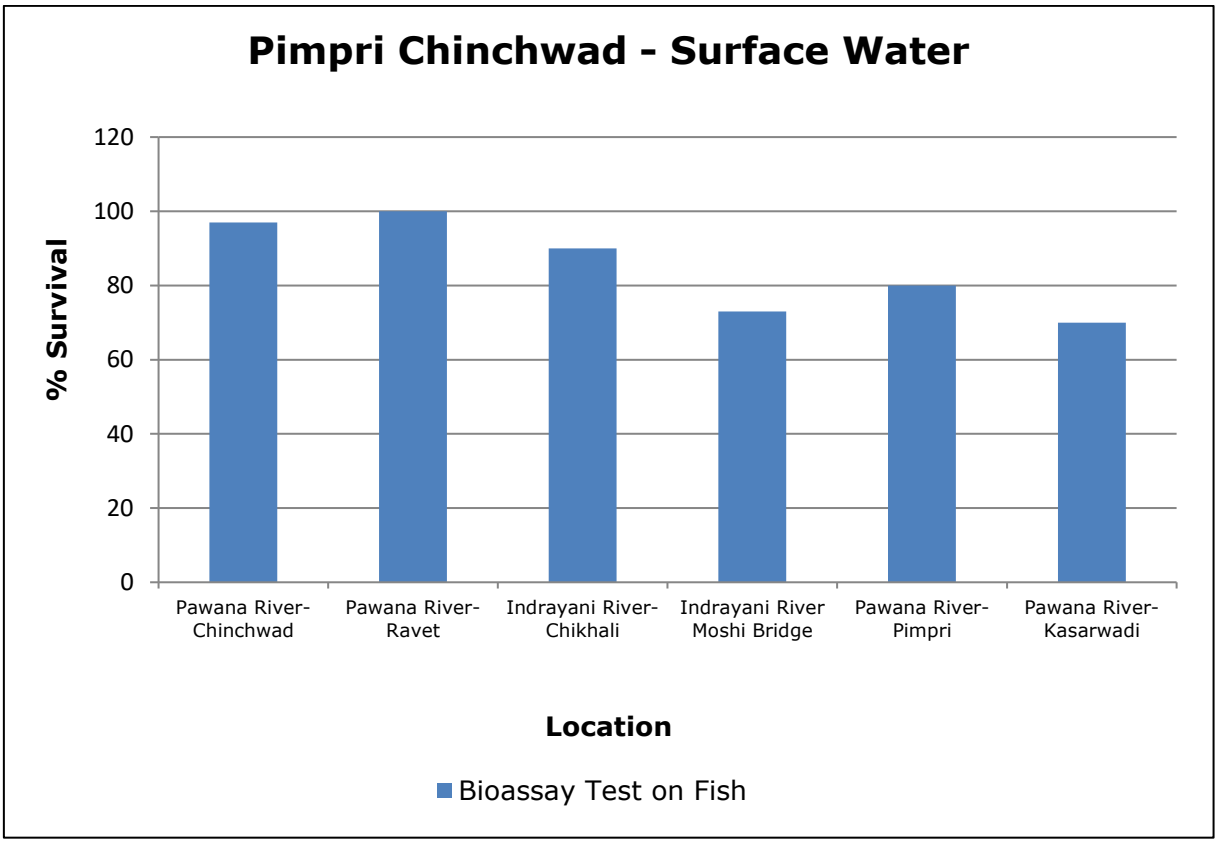

Pimpri Chinchwad - Surface Water
Concentration (mg/L)
350
300
250
200
150
100
50
0
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
TDS


Pimpri Chinchwad - Surface Water
% Saturation
63
62
61
60
59
58
57
56
55
54
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
Dissolved Oxygen


Pimpri Chinchwad - Surface Water
Concentration (mg/L)
70
60
50
40
30
20
10
0
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
SS
COD
BOD


Pimpri Chinchwad - Surface Water
Concentration (mg/L)
9
8
7
6
5
4
3
2
1
0
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
NO2
NO3
NO2+NO3-N
Dissolved Phosphate
Total Phosphorous
TKN
NH4+NH3-N
Total Nitrogen


Pimpri Chinchwad - Surface Water
MPN Index /1 00 mL
6000
5000
4000
3000
2000
1000
0
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
Total Coliforms
Faecal Coliforms


Pimpri Chinchwad - Surface Water
% Survival
120
100
80
60
40
20
0
Pawana River-Chinchwad
Pawana River-Ravet
Indrayani River-Chikhali
Indrayani River Moshi Bridge
Pawana River-Pimpri
Pawana River-Kasarwadi
Location
Bioassay Test on Fish

LAND ENVIRONMENT

7. Land Environment

For studying the land Environment of Pimpri-Chinchwad area, 6 ground water samples were collected from Borewell, Open well and Hand pump.

- All the water samples collected are found acceptable in general appearance, colour and smell.
- General parameters like pH, Suspended Solids, Total Dissolved Solids and COD are also observed well within the limits in all the collected samples.
- Concentration of BOD is found higher than the standard limits in four samples out of six water samples collected.
- In fish bioassay 100% survival of fishes was observed in three samples out of six samples collected.
- All metals like Zinc, Arsenic, Nickel, Copper, Total Chromium, Lead, Cadmium, Mercury, Selenium, etc. are also observed either below the limit of quantification or below their standard limits.
- Parameters like Hexavalent Chromium (Cr^{6+}) Total Residual Chlorine, Cyanide, Fluoride, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds also meet the criteria as prescribed by CPCB.
- Concentration of Total Phosphate, Total Kjeldahl Nitrogen and Iron is found higher than the standard limits in few water samples.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the detectable limit in all studied samples.

Table 7.1 Details of Sampling Location of Ground Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Patil Niwas Near Keshav Nagar School Chinchwad Gaon	18°62'47.65"N	73°78'13.17"E	19.05.2025	21.05.2025	23.05.2025
2.	Rohit Park-I Tapkir Nagar Kalewadi	18°61'04.59"N	73°78'63.11"E	19.05.2025	21.05.2025	23.05.2025
3.	Near Kashiba Shinde Sabhagruha Pimprigaon	18°61'05.16"N	73°79'74.63"E	19.05.2025	21.05.2025	23.05.2025

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
4.	Near Saritakunj Building Kasadwadi	18°60'15.7"N	73°82'18.63"E	19.05.2025	21.05.2025	23.05.2025
5.	Sai Dham Landewadi Bhosari	18°61'97.68"N	73°84'34.23"E	19.05.2025	21.05.2025	23.05.2025
6.	Gandharve Nagari Moshi	18°66'06.2"N	73°84'94.91"E	19.05.2025	21.05.2025	23.05.2025

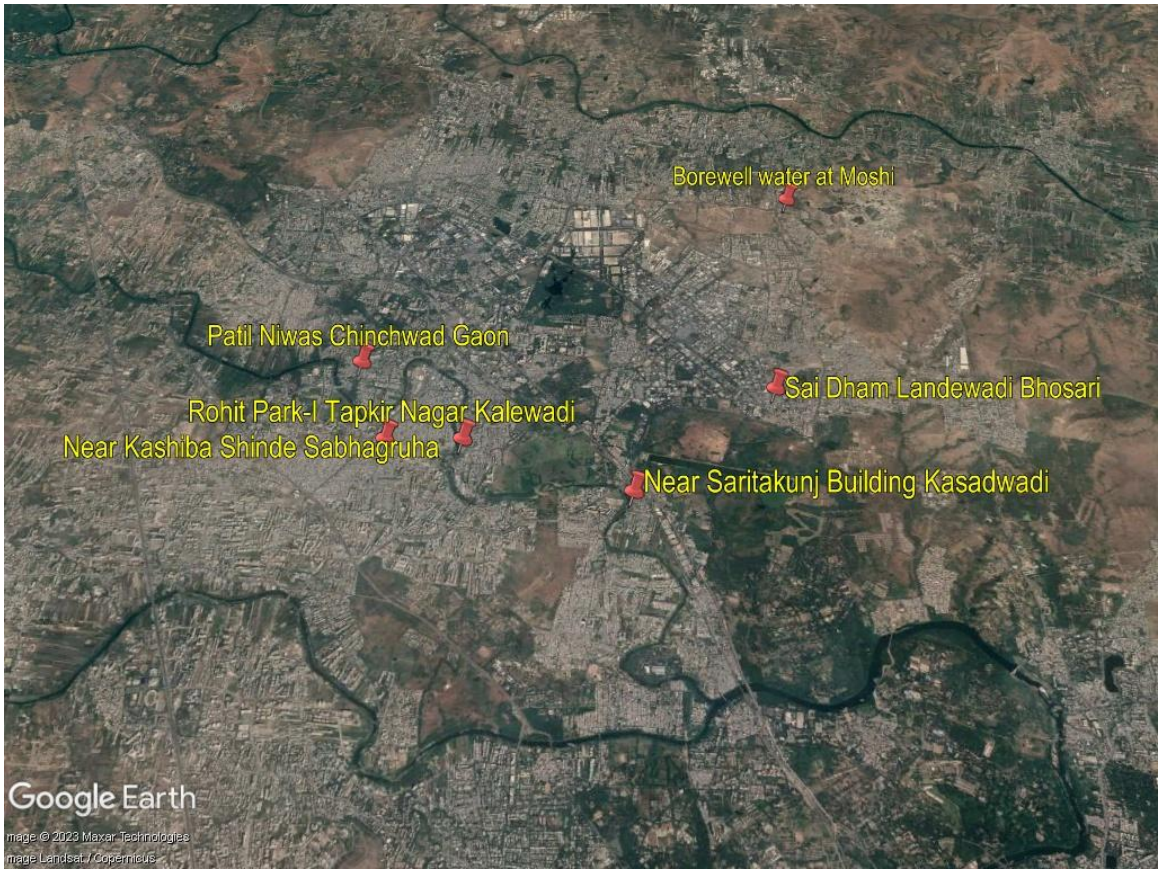


Fig: Geographical Locations of Ground Water Sampling

Table 7.2 Results of Ground Water

Parameters	Unit	Results		
		Patil Niwas Near Keshav Nagar School Chinchwad Gaon	Rohit Park-I Tapkir Nagar Kalewadi	Near Kashiba Shinde Sabhagruha Pimprigaon
Sanitary Survey	-	Generally clean neighborhood	Generally clean neighborhood	Generally clean neighborhood

Parameters	Unit	Results		
		Patil Niwas Near Keshav Nagar School Chinchwad Gaon	**Rohit Park-I Tapkir Nagar Kalewadi**	**Near Kashiba Shinde Sabhagruha Pimprigaon**
General Appearance	-	No floating matter	No floating matter	No floating matter
Transparency	M	0.2	0.2	0.2
Temperature	^{o}C	26	26	27
Colour	Hazen	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.73	7.71	7.93
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	11	7	11
Total Dissolved Solids	mg/L	408	406	533
Chemical Oxygen Demand	mg/L	30	22	36
Biochemical Oxygen Demand (3 days, 27^{o}C)	mg/L	8	6	10
Electrical Conductivity (at 25 ^{o}C)	µmhos/cm	729	725	953
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	BLQ	BLQ
Nitrate Nitrogen (as NO_3)	mg/L	1.01	1.64	2.63
(NO_2 + NO_3)-Nitrogen	mg/L	1.01	1.64	2.64
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.49	0.49	0.53
Sulphide (as S^{2-})	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.1	0.11	0.13
Sodium Adsorption Ratio	-	1.62	0.89	1.36
Total Coliforms	MPN Index/100 ml	<1.8	20	4.5
Faecal Coliforms	MPN Index/100 ml	<1.8	13	4.5
Total Phosphate (as P)	mg/L	0.19	0.18	0.23
Total Kjeldahl Nitrogen	mg/L	2.42	1.91	2.12
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	BLQ	BLQ
Total Nitrogen	mg/L	3.39	3.54	4.78
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ

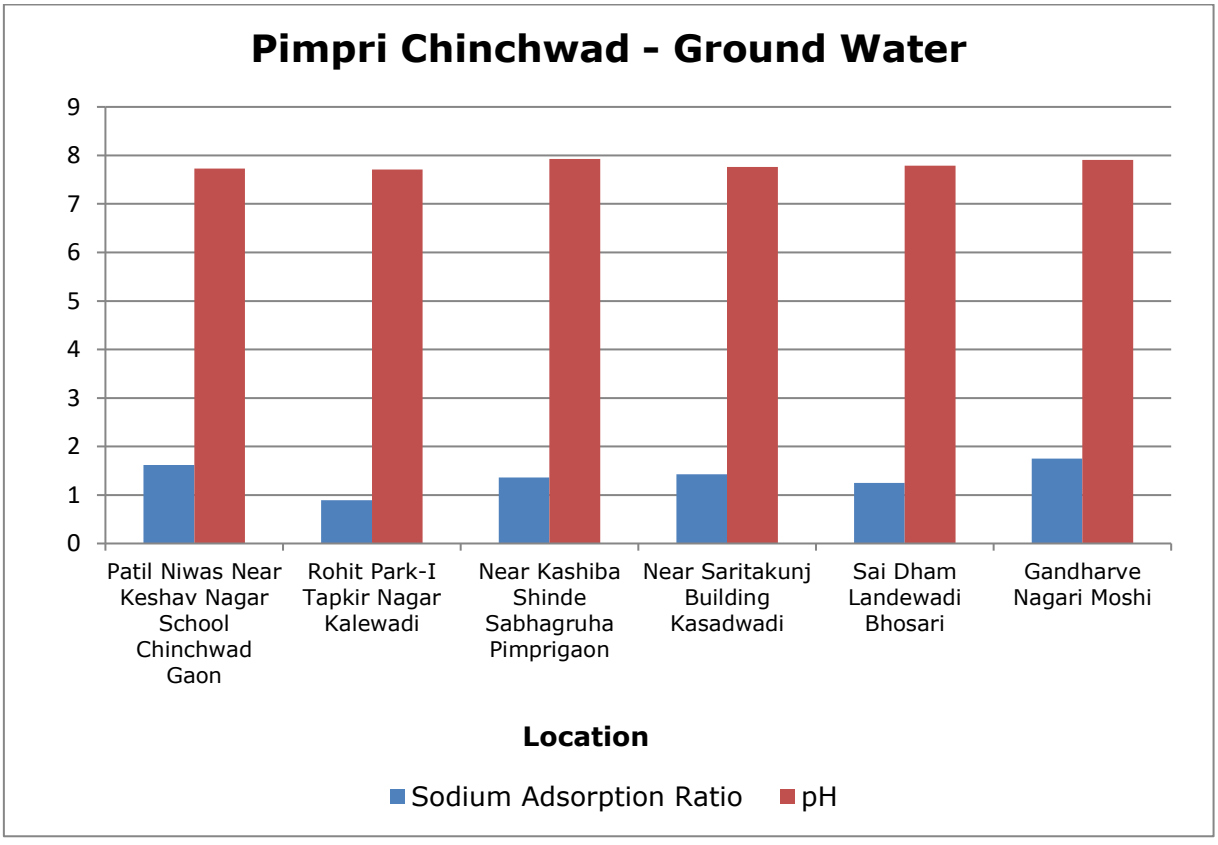
Parameters	Unit	Results		
		Patil Niwas Near Keshav Nagar School Chinchwad Gaon	Rohit Park-I Tapkir Nagar Kalewadi	Near Kashiba Shinde Sabhagruha Pimprigaon
Anionic Detergents (as MBAS, Calculated as LAS, mol.wt. 288.38)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	0.125
Nickel (as Ni)	mg/L	0.0155	0.0175	0.021
Copper (as Cu)	mg/L	0.13	BLQ	0.022
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.023	0.0235	0.034
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.009	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.029	0.026	0.190
Iron (as Fe)	mg/L	0.226	0.150	0.203
Vanadium (as V)	mg/L	BLQ	0.046	0.059
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	0.147
Bioassay Test on fish	% survival	97	100	100

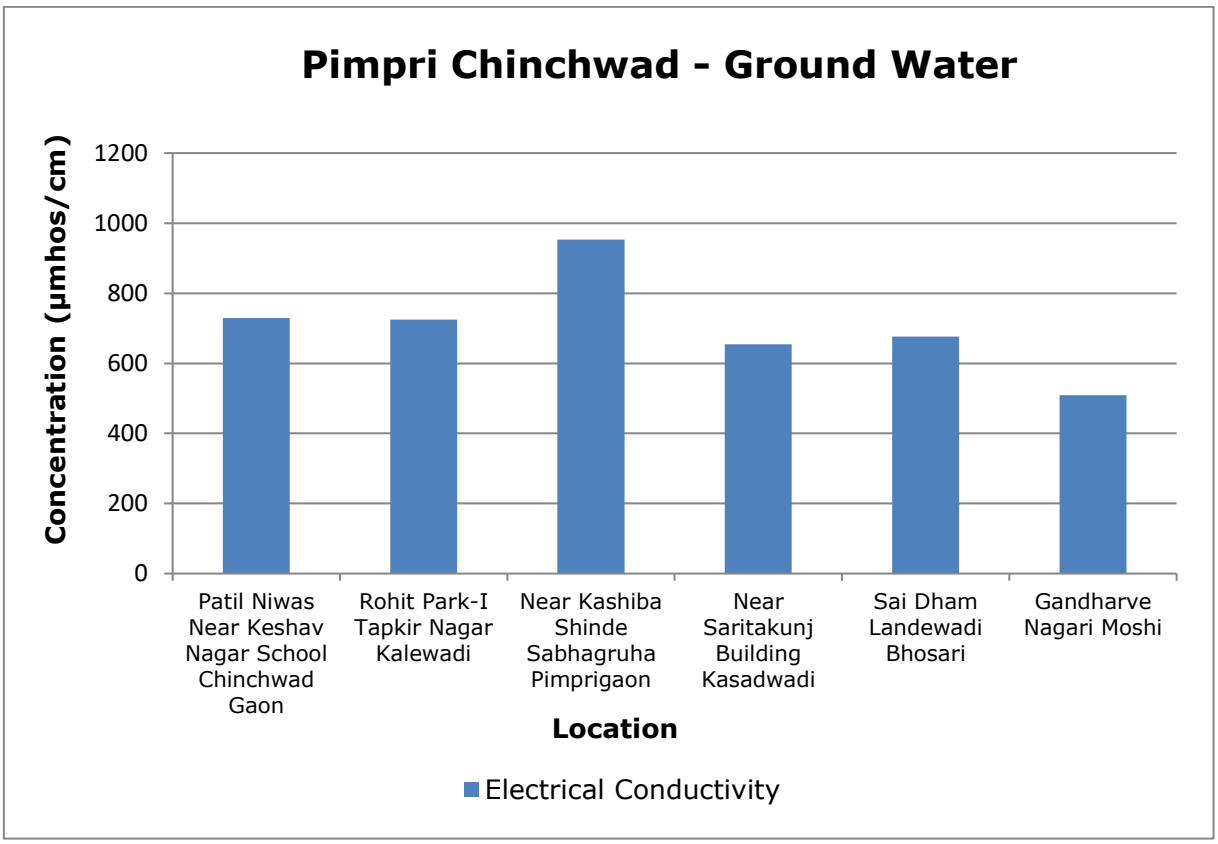
Parameters	Unit	Results		
		Near Saritakunj Building Kasadwadi	Sai Dham Landewadi Bhosari	Gandharve Nagari Moshi
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	No floating matter	No floating matter	No floating Matter
Transparency	M	Not Applicable	Not Applicable	Not Applicable
Temperature	^{o}C	26	26	27
Colour	Hazen	3	2	2
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.76	7.79	7.91

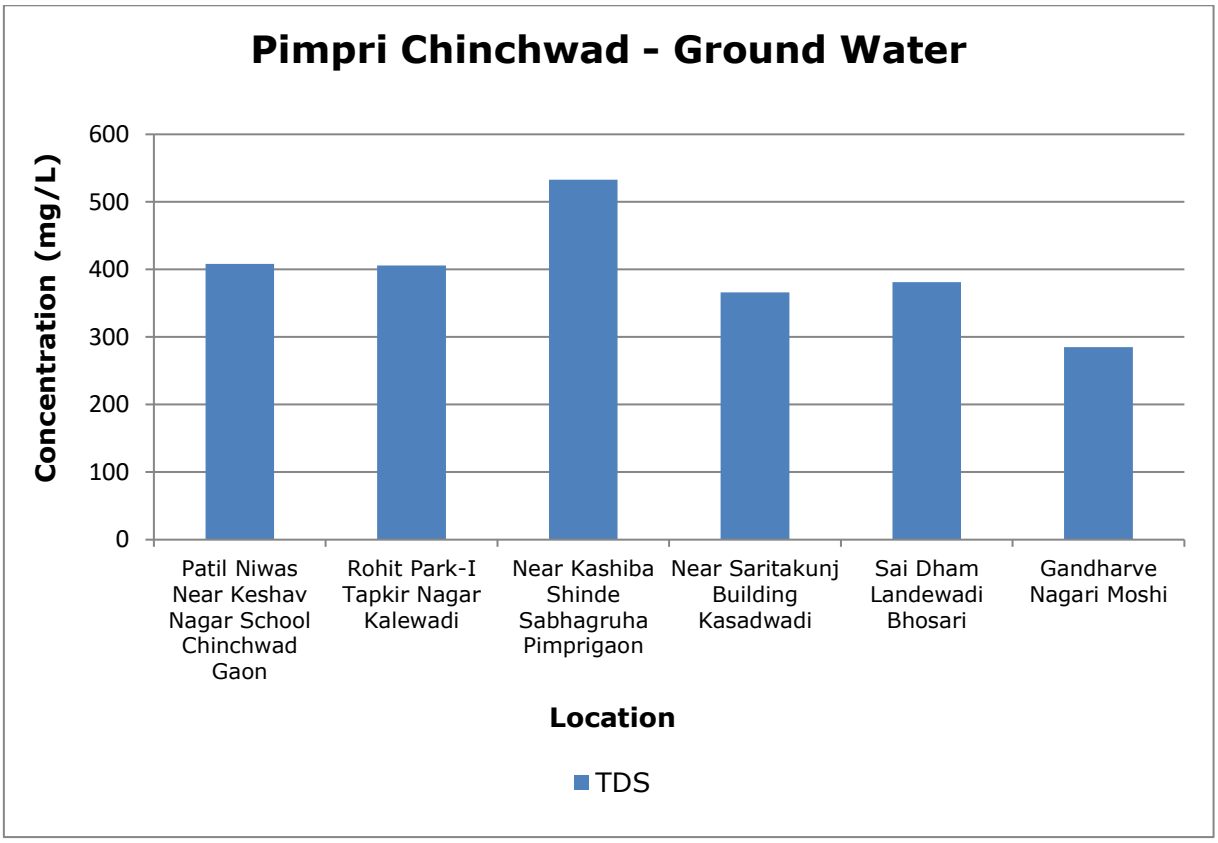
Parameters	Unit	Results		
		Near Saritakunj Building Kasadwadi	Sai Dham Landewadi Bhosari	Gandharve Nagari Moshi
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	43	40	37
Total Dissolved Solids	mg/L	366	381	285
Chemical Oxygen Demand	mg/L	34	48	41
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	9	12	11
Electrical Conductivity (at 25 °C)	µmhos/cm	654	676	509
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	0.27	BLQ
Nitrate Nitrogen (as NO_3)	mg/L	0.25	1.37	0.87
(NO_2 + NO_3)-Nitrogen	mg/L	0.26	1.46	0.87
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.00	1.11	0.22
Sulphide (as S^{2-})	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.15	0.26	BLQ
Sodium Adsorption Ratio	-	1.43	1.25	1.75
Total Coliforms	MPN Index/100 ml	46	8007	23
Faecal Coliforms	MPN Index/100 ml	2	4607	13
Total Phosphate (as P)	mg/L	0.235	0.47	BLQ
Total Kjeldahl Nitrogen	mg/L	0.52	0.86	0.78
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.42	0.315	0.14
Total Nitrogen	mg/L	BLQ	2.32	1.65
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS, Calculated as LAS, mol.wt. 288.38)	µg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	mg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (PAH)	mg/L	0.00324	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	0.017	0.014	0.020
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ

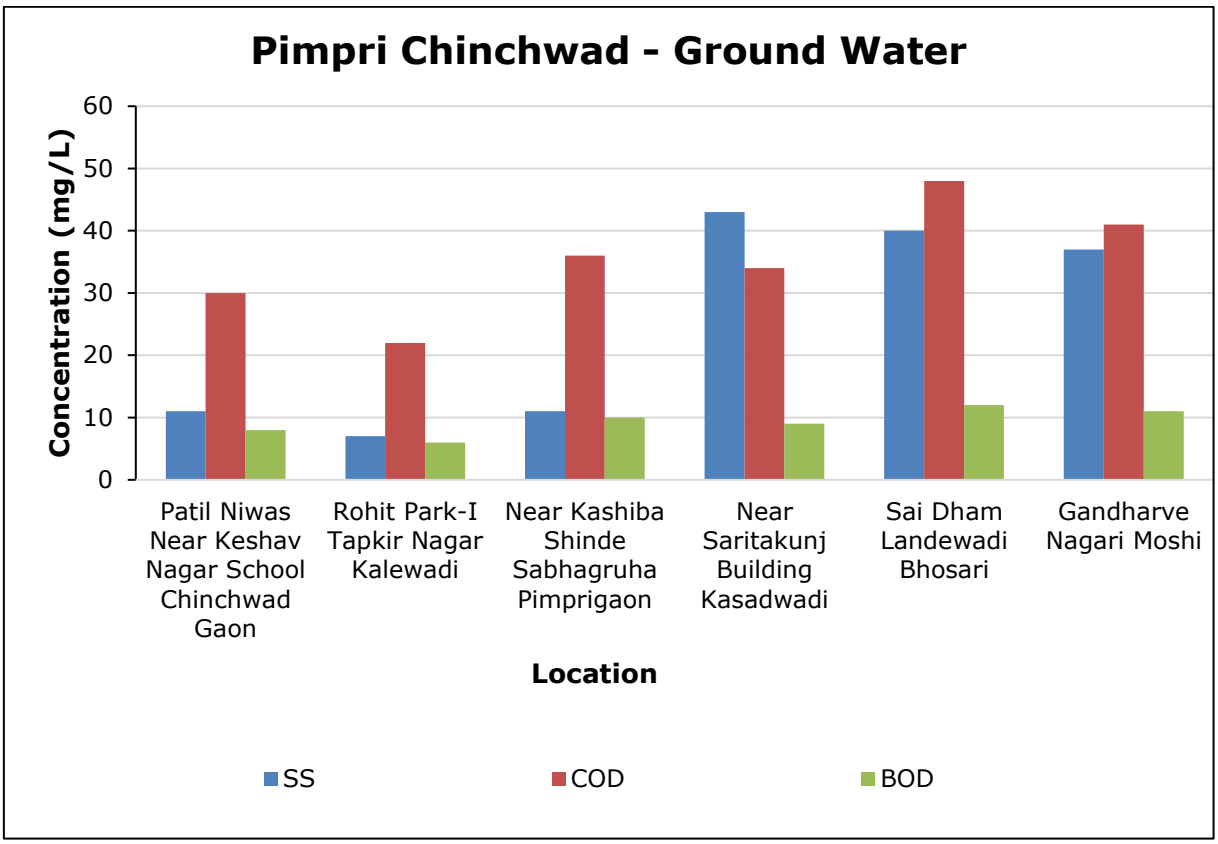
Parameters	Unit	Results		
		Near Saritakunj Building Kasadwadi	Sai Dham Landewadi Bhosari	Gandharve Nagari Moshi
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.037	0.037	0.046
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.01	0.027	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.356	0.027	BLQ
Iron (as Fe)	mg/L	0.814	0.184	0.148
Vanadium (as V)	mg/L	0.016	0.021	0.023
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	100	90	97

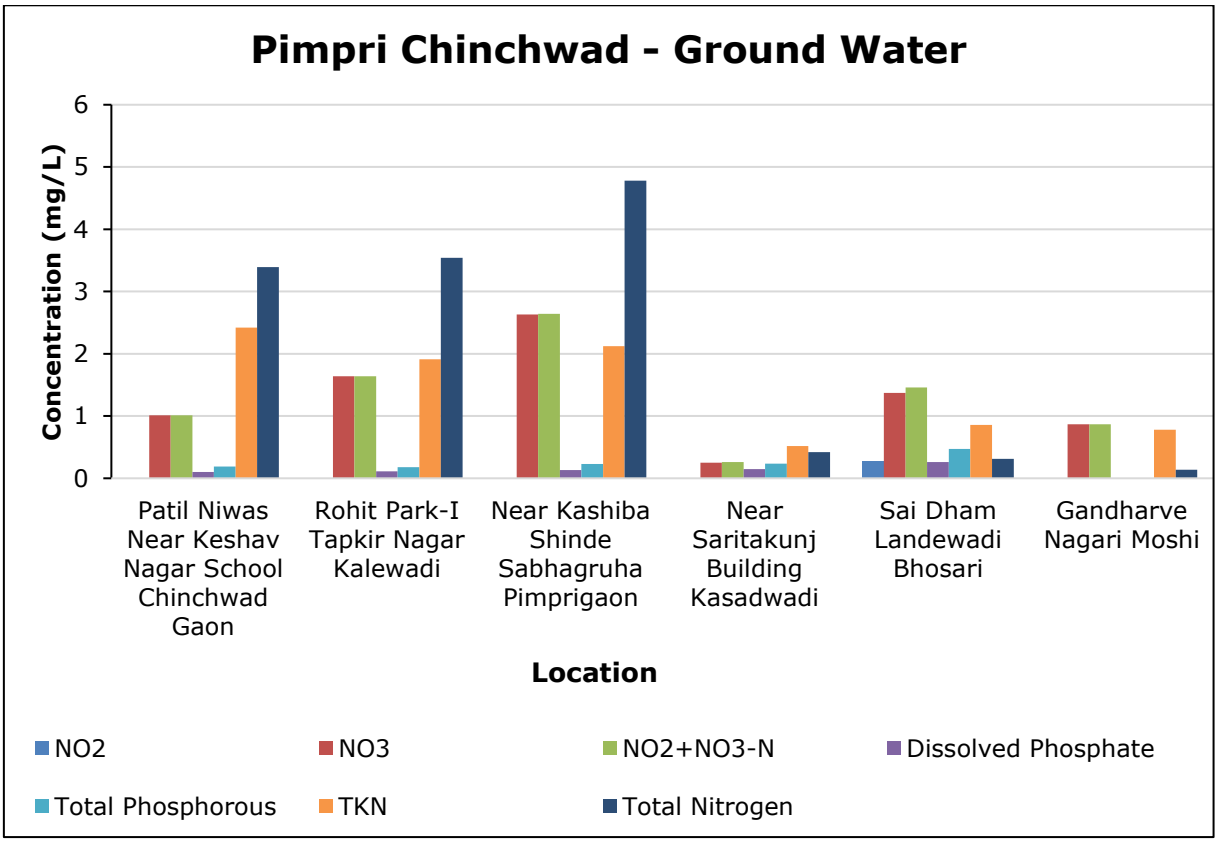
Graphs - Ground Water Quality

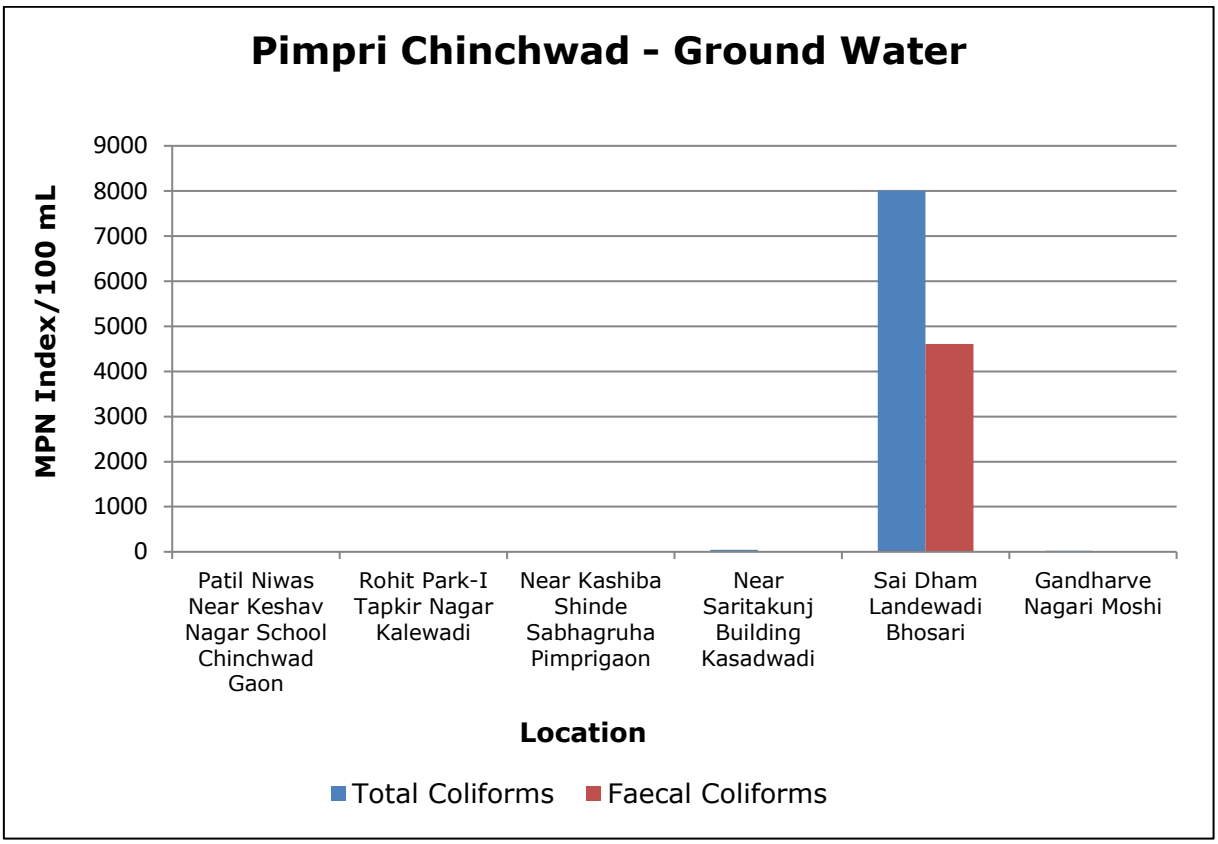


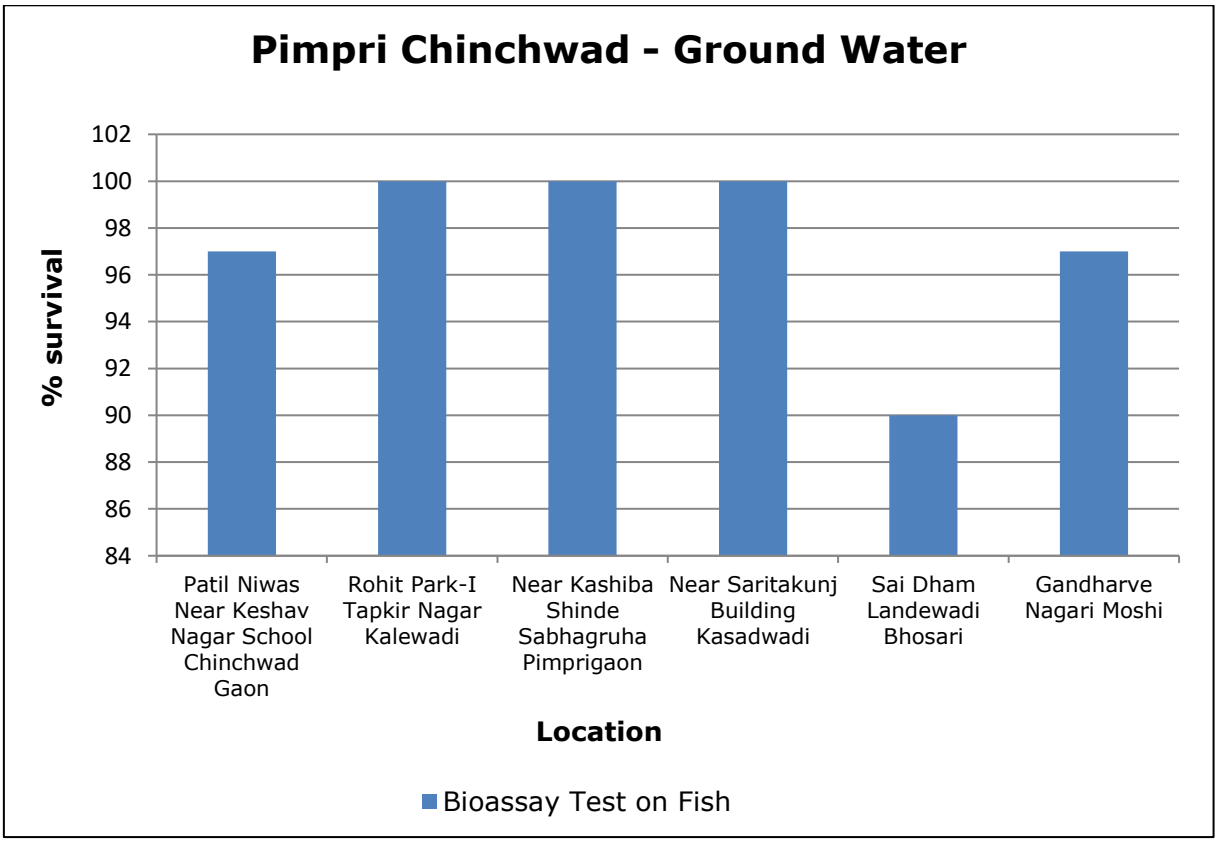

Pimpri Chinchwad - Ground Water
Concentration (µmhos/cm)
1200
1000
800
600
400
200
0
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
Electrical Conductivity


Pimpri Chinchwad - Ground Water
Concentration (mg/L)
600
500
400
300
200
100
0
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
TDS


Pimpri Chinchwad - Ground Water
Concentration (mg/L)
60
50
40
30
20
10
0
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
SS
COD
BOD


Pimpri Chinchwad - Ground Water
Concentration (mg/L)
6
5
4
3
2
1
0
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
NO2
NO3
NO2+NO3-N
Dissolved Phosphate
Total Phosphorous
TKN
Total Nitrogen


Pimpri Chinchwad - Ground Water
MPN Index/100 mL
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
Total Coliforms
Faecal Coliforms


Pimpri Chinchwad - Ground Water
% survival
102
100
98
96
94
92
90
88
86
84
Patil Niwas Near Keshav Nagar School Chinchwad Gaon
Rohit Park-I Tapkir Nagar Kalewadi
Near Kashiba Shinde Sabhagruha Pimprigaon
Near Saritakunj Building Kasadwadi
Sai Dham Landewadi Bhosari
Gandharve Nagari Moshi
Location
Bioassay Test on Fish

8. Health Related Data

C: Receptor

Table 10.1 Details of Component C

Component C (Impact on Human Health) 10	
Main - 10	
% increase in cases	**Marks**
<5%	0
5-10%	5
>10%	10

- % increase is evaluated based on the total no. of cases recorded during two consecutive years.
- For Air Environment, total no. of cases related to Asthma, Bronchitis, Cancer, Acute respiratory infections etc. are to be considered.
- For surface water/ ground water Environment, cases related to Gastroenteritis, Diarrhoea, renal (kidney) malfunction, cancer etc are to be considered.
- For the above evaluation, the previous 5 years records of 3-5 major hospitals of the area shall be considered.

Annexure – I Health Related Data enclosed.

9. CEPI Score

Comprehensive Environmental Pollution Index (CEPI) is intended to act as early warning tool which helps in categorization of industrial clusters/ areas in terms of priority of needing attention. The CEPI score have been calculated based on CPCB Letter No. B-29012/ESS (CPA)/2015-16 dated 26th April 2016. The scoring system involves an algorithm that considers the basic selection criteria. It is proposed to develop the CEPI based on Sources of pollution, real time observed values of the pollutants in the ambient air, surface water and ground water in & around the industrial cluster and health related statistics.

Table 8.1 CEPI score of the Pre monsoon season 2025

	A1	A2	A	B	C	D	CEPI
Air Index	3.5	2.5	8.75	0	10	0	**18.75**
Water Index	2.75	2.5	6.875	30	10	0	**46.88**
Land Index	1.5	2.5	3.75	10.5	10	0	**24.25**
						Aggregated CEPI	**49.30**

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI score June 2025	18.75	46.88	24.25	**49.30**
CEPI score March 2024	18.75	46.25	33.25	**49.60**
CEPI score June 2024	18.75	46.88	15.00	**48.37**
CEPI score March 2024	20.25	29.63	21.50	**32.69**
CEPI score June 2023	9.88	46.25	34.00	**48.06**
CEPI score March 2023	19.9	36.3	43.8	**47.9**
CEPI score June 2021	17.5	34.9	43.8	**47.2**
CEPI Score March 2021	20.5	34.9	32.6	**39.3**
CEPI score March 2020	43.1	7.5	38.1	**44.7**

	Air Index	Water Index	Land Index	CEPI
CEPI score June 2019	33.1	30.2	30.5	**39.26**
CEPI score March 2019	36.3	32.9	29.2	**42.4**
CEPI score June 2018	37	25.15	26.99	**40.82**
CEPI score March 2018	34.45	37.4	36.91	**43.49**
CPCB CEPI score March 2018	52	6.25	5.25	**52.16**

CEPI score calculation:

Ambient Air Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
PM_{10}	B	2	Moderate	
$PM_{2.5}$	B	0.5		
Benzene	C	1		
		3.5	**2.5**	**8.75**

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF Value (6) [(6)=(4)/(5)x(3)]	SNLF score (B)	
PM_{10}	63.00	100	0.63	0	8	0.00	L	0
$PM_{2.5}$	16.13	60	0.27	0	8	0.00	L	0
Benzene	2.44	5	0.49	0	8	0.00	L	0
B score = (B1+B2+B3)							**B**	**0**

C	**10**	**>10 %**
D	**0**	**A-A-A**

Air CEPI Score	**(A+B+C+D)**	**18.75**

Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
BOD	B	2	Moderate	
Zn	A	0.25		

TP	B	0.5						
		2.75	**2.5**	**6.875**				
Pollutant	**Avg (1)**	**Std (2)**	**EF (3) [(3)=(1)/(2)]**	**No. of samples Exceeding (4)**	**Total no. of samples (5)**	**SNLF Value (6) [(6)=(4)/(5)x(3)]**	**SNLF score (B)**	
BOD	13.83	8	1.73	6	6	1.73	C	30
Zn	0.05	0.3	0.16	0	6	0.00	L	0
TP	0.05	0.3	0.18	0	6	0.00	L	0
B score = (B1+B2+B3)							**B**	**30**

C	**10**	**>10%**
D	**0**	**A-A-A**

Water CEPI Score	**(A+B+C+D)**	**46.88**

Ground Water Quality Analysis Report

Pollutant	**Group**	**A1**	**A2**	**A (A1 X A2)**
Fe	A	1	Moderate	
F	A	0.25		
TDS	A	0.25		
		1.5	**2.5**	**3.25**

Pollutant	**Avg (1)**	**Std (2)**	**EF (3) [(3)=(1)/(2)]**	**No. of samples Exceeding (4)**	**Total no. of samples (5)**	**SNLF Value (6) [(6)=(4)/(5)x(3)]**	**SNLF score (B)**	
Fe	0.29	0.3	0.96	1	6	0.16	M	10.5
F	0.64	1.5	0.43	0	6	0.00	L	0
TDS	396.50	2000	0.20	0	6	0.00	L	0
B score = (B1+B2+B3)							**B**	**10.5**

C	**10**	**>10%**
D	**0**	**A-A-A**

Land CEPI Score	**(A+B+C+D)**	**24.25**

Water CEPI Score (im) **46.88**

Land CEPI Score (i2) **24.25**

Air CEPI Score (i3) **18.75**

Aggregated CEPI Score = **im + {(100-im)*i2/100)*i3/100)}**
where, im = maximum sub index; and i2 and i3 are sub indices for other media

CEPI Score = **49.30**

10. Conclusion

Ambient Air Quality

- The AAQ stations were identified in the CEPI impact area to cover both upwind and crosswind directions and AAQ survey was conducted.
- All air quality parameters are observed well within the limits as per NAAQS, 2009.
- Concentration of PM10 is observed in the range of 47 µg/m^3 to 61 µg/m^3 and PM2.5 in the range of 11 µg/m^3 to 15 µg/m^3 at the studied locations.
- In the CEPI score calculated for Air Environment by CPCB in March 2018, PM10 and PM2.5 have exceeded which may also be due to the vehicular emissions.

Surface Water Quality

- There is marginal increase observed in the BOD and COD as compared to the previous CEPI report for month of March 2025.
- All the industries in the Pimpri-Chinchwad region are either reusing / recycling the treated trade effluent for internal process or gardening or are disposing of as per consent norms.

Ground Water Quality

- Ground water samples were collected from different Bore well in the region.
- Concentration of BOD, Total Phosphate, Total Kjeldahl Nitrogen and Iron an is found higher than the standard limits in few water samples.
- In the CEPI score calculated for Land Environment by CPCB in March 2018 also there is no critical pollutant exceeding in any water sample collected.

CEPI Score

- The CEPI Score pre monsoon season is 49.30.
- It seems that there is slightly decrease in the CEPI score compared to the CEPI score of June 2025.
- In comparison with the CEPI score March 2025 a marginal increase in water index and marginal decrease observed Land Index.
- The present study is the compilation of Pre-monsoon season, which shows an increase in health impact of Ambient Air and water, hence resulted in higher CEPI score in comparison to the previous year.

11. Efforts taken by MPCB to control and reduce Environmental Pollution Index

- Drive against open burning of biomass, crop residue, garbage, leaves, etc.: Follow up with PCMC authority for not to allow open burning of biomass garbage.
- **Organic Waste Compost machines**: All construction project have provided organic waste compost machines for treatment of wet waste.
- **Waste collection and segregation centres**:
  - ✓ **Domestic Solid Waste**: PCMC has provided door to door waste collection and segregation facility for residential area.
  - ✓ **Industrial Non-Hazardous Waste**: Recyclable waste is sent to authorized waste recyclers and other waste collected by corporations.
  - ✓ **Hazardous Waste:** Industrial hazardous waste sent to common hazardous treatment and disposal facility by industries.
- **Construction of Common Effluent Treatment plant (CETP)**: A committee of all functional agencies (reg PMC, MIDC, MPCB, PMRDA, Zilla Parishad and all Municipal Councils) has been constituted under the chairmanship of Commissioner, Pimpri Chinchwad Municipal Corporation. Accordingly necessary survey of river from its source to its confluence and work of preparation of detailed projects report (DPR) is in process. The project report is being prepared by collecting information about all the industries in Pimpri Chinchwad Municipal Corporation as well as Talegaon, Chakan and Hinjewadi areas. It is propose to provide 1 MLD capacity CETP for electroplating industry, 2 MLD capacity CETP for other industries as well as 20 MLD (4 x 5 MLD) STP.

  1.
- **Installation of CEMS installed for Air and Water in Large and Medium scale RED category industries**: 03 no.
- **Online Monitoring systems**:

  2. Installation of CEMS installed for Air and Water in large and Medium scale RED category industries – 0.3 nos.
  3. Two NAMP station are operated by Pune University, Pune located at
     1) Pimpri Chinchwad Municipal Corporation
     2) Maratha Chamber of Commerce Building
  4. In jurisdiction of SRO-PC three sites of CAAQMS in operation
     1) Rose Garden, Gavali matha, PCMC
     2) Jagtap Daity, Pimple Nilakh, PCMC
     3) Chh. Shivaji Maharaj Statue, PCMC
  5. MPCB has proposed additional 2.0 no of CAAQMS stations in PCMC area.

  MPCB has installed real time noise monitoring stations. 4 nos. in PCMC area.
- Arrangement of scientific collection and treatment of sewage generated: Domestic effluent generation is 359 MLD, out of which 305 MLD is treated by 19 nos. of STP located at various locations. Due to lack of drainage network 54 MLD domestic effluent dispose in river Pawna, Mula

& Indrayani. PCMC has propose 9 no of STPs of total capacity 126 MLD, out of which installed work of 4 nos. of STPs of capacity 47 MLD are in progress.

- Installation of CAAQMS station: 3 no of CAAQM stations provided at Rose Garden, Gavali Matha, Bhosari, PCMC garden, Jagtap Dairy, Pimple Nilakh and Chhatrapati Shivaji Maharaj Garden Dange Chowk, Pune and all in CAAQM stations are in operation for monitoring of air quality.
- Number of CAAQMS proposed for future : 2 nos.
- Establishment of Monitoring stations under National Water Quality Monitoring Programme (NWMP) are 06.
- Steps are taken for industrial area/other units to recycle 100% treated effluent to achieve zero liquid discharge (ZLD): MPCB is issuing consents to the industries with a condition to provide zero liquid discharge condition. i.e. 100% treated water for the secondary purpose and with a condition to use clean fuel for processing as LPG, CNG, electricity. Also issued directions to all industries for Retrofitting of Emission Control Device (RECD) for in use Diesel operated internal combustion engines for generator set.
- Steps taken to reduce dust emission:
    1) Hon'ble Chairman, MPCB has issued direction u/s of 5 of the EPA, 1986 to PCMC on 02.11.2023 for improvement of air quality in the city by implementation of Grated Response Action Plan (GRAP). Also, PCMC has developed the Graded Response Action Plan (GRAP) for city with specific measures based on AQI range along with fine for violations.
    2) Regular survey of air pollution causing industries like RMC and stone crusher is carried out and legal actions are taken on various industries. As per guidelines compliances are verified regularly carried out.
    3) PCMC is also implementing guidelines at various construction sites to reduce air pollution.
    4) PCMC is implementing various activities to control air pollution under the National Clean Air Program (NCAP) Under NCAP-fund of Rs. 172.97 crore has been sanctioned and PCMC has submitted details of activity proposed under NCAP as electric & CNG bus, installation of electric charging stations, provision of water fountains, Biomass plant, road washers machins, construction of roads, installation of air purifier, C&D waste plant, cannon dust suppression systems, rooftop solar system, electric crematorium, installation of CAAQMS and mobile van.
    5) During Ganesh festival, awareness and follow up with PCMC to provide artificial pond for idol immersion and total ban on idol immersion into river water. Noise monitoring during Ganesh Festival at Ganesh Mandals.

Continuous Ambient Air Quality Monitoring Station

Ambient Air Quality Monitoring Van

PIMPRI-CHINCHWAD: Mechanized Road Sweeper [40 km in one shift]

Cycle Track

470 Nos. of E-Buses [20% of Fleet] have travelled for more than 4 Crore kms, resulting in an overall CO_2 reduction of more than 7000 tonnes. India's Largest E-bus depot is in Pune

12. Photographs

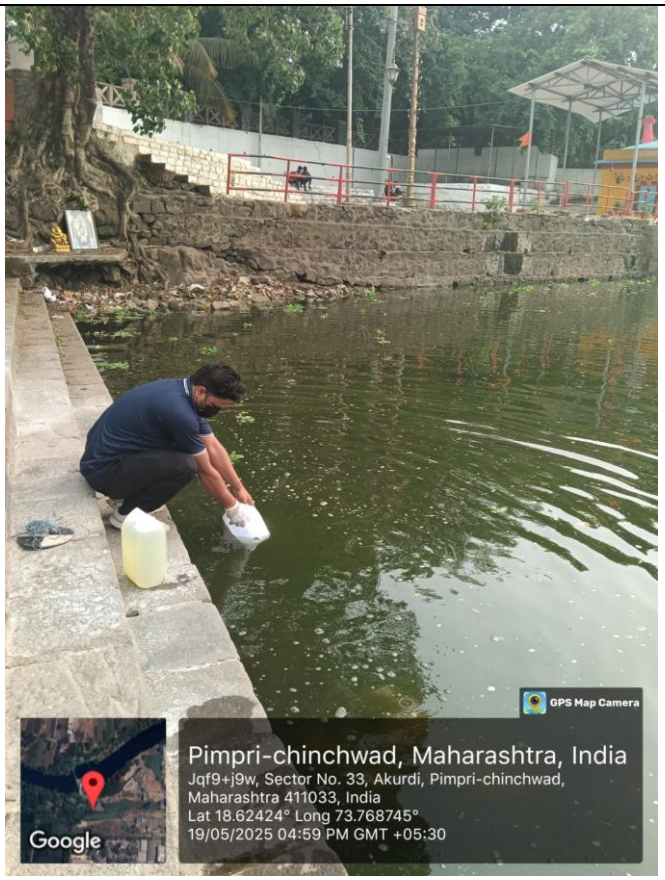
Ambient Air Sampling at Pimpri Chinchwad Municipal Corporation

Ambient Air Sampling at Thergaon Near Puduji Industries

Ambient Air Sampling at MIDC Pimpri Area, Yashwant Nagar Chouk Near Training Hall

Ambient Air Sampling at Akurdi Near Force Motor

Surface water sampling at Pawana River- Chinchwad



Surface water sampling at Pawana River- Ravet

Surface water sampling at Indrayani River- Chikhali

Surface water sampling at Indrayani River – Moshi Bridge

Surface water sampling at Pawana River- Ksarwadi

Ground water Sampling at Gandharve Nagari Moshi

Ground water Sampling at Patil Niwas Near Keshav Nagar School Chinchwad Gaon	Ground water Sampling at Rohit Park-I Tapkir Nagar Kalewadi
	
Ground water Sampling at Sai Dham Landewadi Bhosari	**Ground water Sampling at Near Saritakunj Building Kasarwadi**

Annexure – I Health Related Data

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Pre-monsoon Season (April 2024- June 2024) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	PIMPRI-CHINCHWAD
Name of the major health center/ organization	Akurdi Hospital
Name and designation of the Contact person	Dr. Balasaheb. Hodgar. (9922501316)
Address	H.B.P.Prabhakar.M. Kute Hospital, Akurdi

S No.	Diseases	No. of Patients Reported	
		Year 2023	Year 2024
AIRBORNE DISEASES			
1.	Asthma	25	1700
2.	Acute Respiratory Infection	5425	6238
3.	Bronchitis	51	1255
4.	Cancer	Nil	Nil
WATERBORNE DISEASES			
1.	Gastroenteritis	144	286
2.	Diarrhea	501	606
3.	Renal diseases	Nil	164
4.	Cancer	Nil	Nil

Date:
10/2/25

Signature

जेष्ठ वैद्यकिय अधिकारी (वर्ग)
ह.ब.प. प्रभाकर मल्हारराव कुटे
मेमोरीअल हॉस्पिटल

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Pre-monsoon Season (April 2024- June 2024) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	PIMPRI-CHINCHWAD
Name of the major health center/ organization	Niramay Hospital, Chinchwad
Name and designation of the Contact person	DR. Sofiya Shaikh CEO
Address	Niramaya Hospital, chinchwad station.

S No.	Diseases	No. of Patients Reported	
		Year 2023 JAN to Dec	Year 2024 JAN to Dec
AIRBORNE DISEASES			
1.	Asthma	27	8
2.	Acute Respiratory Infection	64	39
3.	Bronchitis	96	81
4.	Cancer	156	152
WATERBORNE DISEASES			
1.	Gastroenteritis	159	338
2.	Diarrhea	02	01
3.	Renal diseases	43	68
4.	Cancer	-	—

Date: 21/02/2025

Sofiya
Signature
Dr. Sofiya Shaikh
Dr. Sofiya Shaikh
Chief Executive Officer
Niramaya Hospitals Pvt. Ltd.
CEO
Niramaya Hospital

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Pre-monsoon Season (April 2024- June 2024) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	PIMPRI-CHINCHWAD
Name of the major health center/ organization	Yashwantrao Chavan Memorial Hospital
Name and designation of the Contact person	Dr. Rajendra Wabale, Dean of PGI YCMH
Address	PGI YCMH, Sant Tukaram Nagar, Pimpri-411018

S No.	Diseases	No. of Patients Reported	
		Year 2023(Jan-Dec)	Year 2024(Jan-Dec)
AIRBORNE DISEASES			
1.	Asthma	213	360
2.	Acute Respiratory Infection	692	730
3.	Bronchitis	243	1400
4.	Cancer	460	409
WATERBORNE DISEASES			
1.	Gastroenteritis	603	523
2.	Diarrhea	273	104
3.	Renal diseases	630	969
4.	Cancer	19	16

Date: 14-02-2025

14.2.25.
Signature
DEAN
PG Institute
PCMC's Y.C.M. Hospit
Pimpri, Pune-411 01