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

CHANDRAPUR

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
CCMC	Chandrapur City Municipal Corporation
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

The Chandrapur CEPI area including MIDC Chandrapur, MIDC Tadali, MIDC Ballarpur and MIDC Ghugus was monitored for Ambient Air Quality, Ground and Surface Waters quality and CEPI Score was calculated based on the Latest directions 120 of Letter No. B-29012/ESS (CPA)/2015-16 dated 26th April 2016 of Central Pollution Control Board (CPCB). 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 sixteen locations. The concentration of all 12 Parameters is well within the limit prescribed by NAAQS at the locations Except PM10 parameter exceed at one location out of 16 locations. In the surface water of Chandrapur CEPI region, the concentration of BOD, Fluoride, Total Phosphate, Total Kjheldahi Nitrogen and Iron have exceeded in some of the samples collected. In ground water also, the concentration of BOD, Fluoride, Total Phosphate, Total Kjheldahi Nitrogen and Iron is high in some of the samples collected.

The CEPI score is the combination of A (Source), B (Pathway), C (Impact on Human Health) and D (Additional High-Risk Element) factors. The Maharashtra Pollution Control Board has worked on controlling and mitigating the air and water pollution with installation of CAAQMS, CETPs, online VOC Analysers etc.

The Maharashtra Pollution Control Board has taken various initiatives in reducing the CPCB CEPI Score of 76.41 of 2018 to 61.27 of June 2025. Based on the study results from April 2025 to June 2025 the CEPI score as per the revised CEPI 2016, the CEPI index of Pre Monsoon - Ambient Air is 27.00, Surface Water is 55.25 and Ground Water is 45.25. The overall CEPI score for Chandrapur area for the pre monsoon 2025 is 60.72.

The analysis of the aggregated CEPI score shows that the pollution in Chandrapur industrial clusters has reduced in the last four years. Approximately 20.54 % decrease in CEPI score is observed from 76.41 (CPCB CEPI score) in 2018 to 60.72 in June 2025.

2. Introduction

The industrial sector plays a critical role in shaping a nation's economic trajectory, contributing substantially to increased production, capital investment, exports, employment generation, and capacity utilization. As engines of economic advancement, industries bolster government revenue, strengthen international trade, support social infrastructure, and create jobs. The sector's growth rate is closely aligned with the overall economic development of a country. As per the World GDP Ranking 2024, India has secured its position as the fifth-largest economy globally. Moreover, several Sustainable Development Goals (SDGs), notably Goal 8 (Decent Work and Economic Growth) and Goal 9 (Industry, Innovation, and Infrastructure), emphasize the importance of sustainable industrial growth.

However, the environmental costs of industrialization are significant. Industrial activities have severely degraded the quality of air, water, and soil. The discharge of untreated industrial effluents has contaminated vital drinking water sources with hazardous chemicals, posing critical risks to human health, animals, and aquatic ecosystems. Air pollutants released from industrial emissions are major contributors to respiratory and cardiovascular illnesses, especially among children, resulting in higher infant mortality rates and long-term health complications. According to the World Health Organization (WHO), environmental pollution accounts for nearly 9 million premature deaths globally each year. Over 90% of the world's population is exposed to air pollution levels that exceed WHO safety thresholds. Additionally, around 2 billion people rely on drinking water contaminated with fecal matter, leading to widespread outbreaks of waterborne diseases such as cholera and dysentery.

The ecological consequences are equally dire. Industrial pollution has led to widespread habitat destruction, biodiversity loss, and the breakdown of natural ecosystems. The release of toxic substances into the environment can result in genetic abnormalities, reproductive dysfunction, and behavioral changes in wildlife, threatening the survival of entire species. Vegetation exposed to polluted environments often exhibits stunted growth, diminished photosynthetic capacity, and increased vulnerability to disease—ultimately impacting food security and ecological balance.

To mitigate these adverse effects, robust environmental policies are essential. These policies set forth rules for industries and individuals, enforced by government agencies. Key aspects include monitoring pollution levels, imposing fines or penalties on violators and conducting environmental impact assessments for proposed projects. Conservation measures are crucial for protecting biodiversity and policies must be regularly updated to address emerging challenges. A comprehensive approach, including robust regulatory frameworks, international collaboration, advanced monitoring technologies and a commitment to sustainable practices from industries and governments, is vital for safeguarding our natural resources and promoting sustainability.

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 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 MIDC Chandrapur, MIDC Tadali, MIDC Ballarpur, and MIDC Ghugus in Chandrapur, Maharashtra. Chandrapur district is notable for its super thermal power station and its extensive coal reserves in the Wardha Valley Coalfield. The district is also home to significant limestone deposits, which are crucial for cement production. Despite these industrial activities, Chandrapur city is ranked among the top 10 cleanest cities in India and second in Maharashtra, according to the Cleanliness Index issued by the Ministry of Housing and Urban Affairs.

This report is based on the revised CEPI version of 2016, which evaluates various environmental factors such as air, water, and land quality. The Comprehensive Environmental Pollution Index (CEPI) is a numerical value that represents environmental quality at a given location, using the source-pathway-receptor model. The CEPI reports serve as critical tools for targeted interventions, regulatory enforcement, and community engagement to reduce pollution and protect public health. While environmental challenges persist, the CEPI action plans continue to guide efforts for sustainable development and pollution mitigation in Chandrapur.

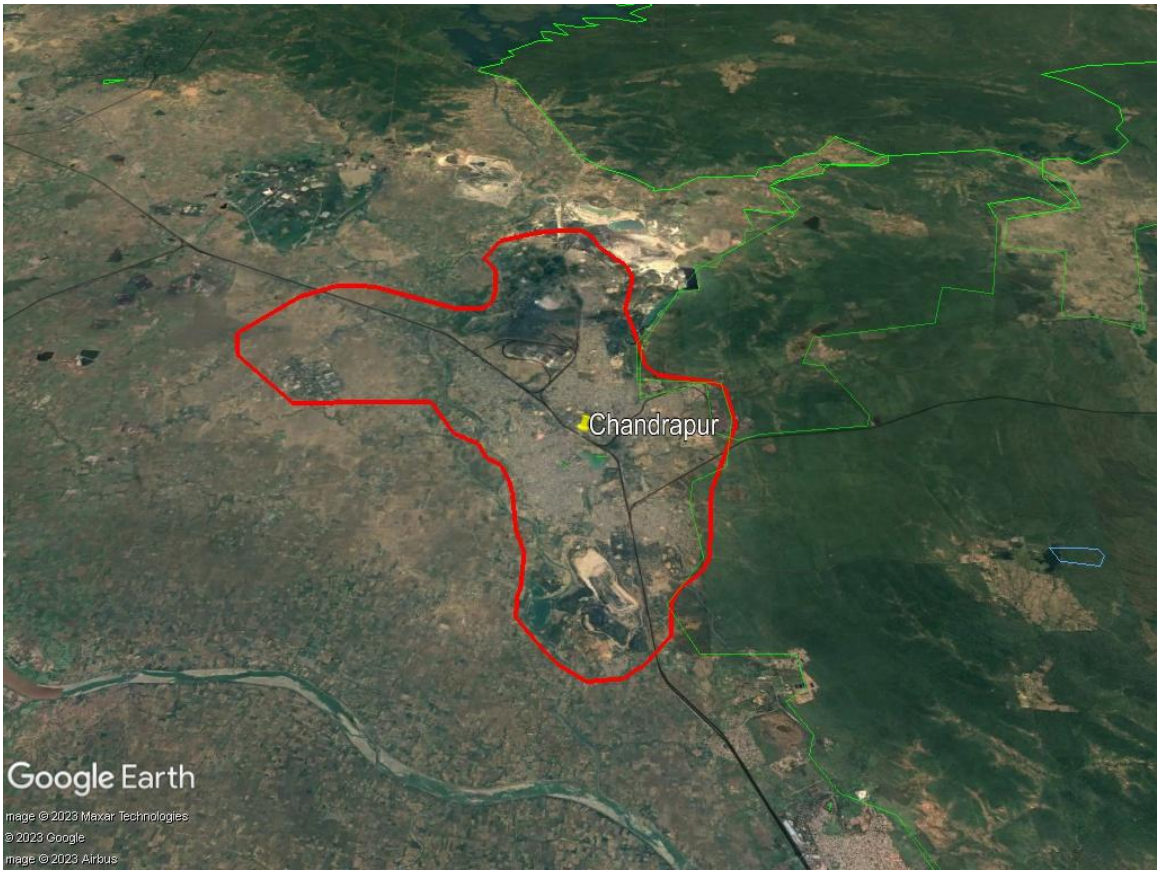


Fig. Chandrapur region CEPI monitoring zone

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 Chandrapur, 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 Chandrapur

Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
Ambient Air Quality	• MIDC Tadali-04 • MIDC Chandrapur-04 • MIDC Ghugus -04 • MIDC Ballarpur -04	**16**	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)	• MIDC Tadali-02 • MIDC Chandrapur-02 • MIDC Ghugus -02 • MIDC Ballarpur -02	**08**	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-

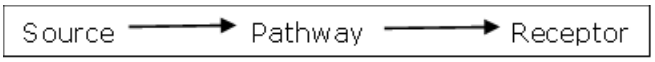
Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
			Trimethylbenzene, N-Butylbenzene, 1,2,3-Trichlorobenzene, Hexachlorobutadiene, 1,2,4-Trichlorobenzene, 2,2-Dichloropropane, Dibromo methane, Toluene, O-Xylene, Bromoform, 1,1,2,2-Tetrachloroethane, 4-Chlorotoluene, 1,1-Dichloroethylene, Trans-1,2-Dichloroethylene, 1,1-Dichloroethane, CIS-1,2-Dichloroethylene, Bromochloromethane, 1,1,1-Trichloroethane
Water Quality Monitoring	**Surface water** • MIDC Tadali-03 • MIDC Chandrapur-03 • MIDC Ghugus -03 • MIDC Ballarpur -03	**12**	**(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) Bioassay (zebra Fish)** Test – For specified samples only.
	Groundwater • MIDC Tadali-03 • MIDC Chandrapur-03 • MIDC Ghugus -03 • MIDC Ballarpur -03	**12**	

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 h each
2.	Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	03	1 Shift of 24 h
3.	Sulphur Dioxide (SO_2)	03	6 Shifts of 4 h each
4.	Nitrogen Dioxide (NO_2)	03	6 Shifts of 4 h each
5.	Ammonia (NH_3)	03	6 Shifts of 4 h each
6.	Ozone (O_3)	03	24 Shifts of 1 h each
7.	Benzene (C_6H_6)	03	1 Shifts of 24 h
8.	Carbon Monoxide (CO)	03	24 Shifts of 1 h each
9.	Benzo (a) Pyrene (BaP) – particulate phase only	03	3 Shifts of 8 h each
10.	Lead (Pb)	03	3 Shifts of 8 h each
11.	Arsenic (As)	03	3 Shifts of 8 h each
12.	Nickel (Ni)	03	3 Shifts of 8 h each
B	**Volatile Organic Compounds (VOCs)**		
	As mentioned in Table 3.1	03	3 Shifts of 24 h 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.

AIR ENVIRONMENT

5. Air Environment

For studying the Air Environment of Chandrapur 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.*

1. **Tadali:** In Tadali four locations have been monitored of checking the AAQ. All 12 parameters monitored as per NAAQS are observed well within the limits in all four locations.

Table 5.1 MIDC Tadali - 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.	Boundary Wall of Dhariwal Infrastructure Ltd.	20°01'01.3"N	79°11'57.9"E	19.05.2025	21.05.2025	23.05.2025
2.	NAMP Growth Centre	20°59'15.8"N	79°11'08.7"E	19.05.2025	21.05.2025	23.05.2025
3.	Near Chaman Metalic Boundary Wall	19° 00'50.9"N	79°11'05.0"E	19.05.2025	21.05.2025	23.05.2025
4.	MIDC WTP Building	20°01'04.3"N	79°11'34.9"E	19.05.2025	21.05.2025	23.05.2025

Table 5.2 MIDC Tadali - 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.	Boundary Wall of Dhariwal Infrastructure Ltd.	20° 01'01.3"N	79°11'57.9"E	19.05.2025	21.05.2025	23.05.2025
2.	NAMP Growth Centre	20°59'15.8"N	79°11'08.7"E	19.05.2025	21.05.2025	23.05.2025

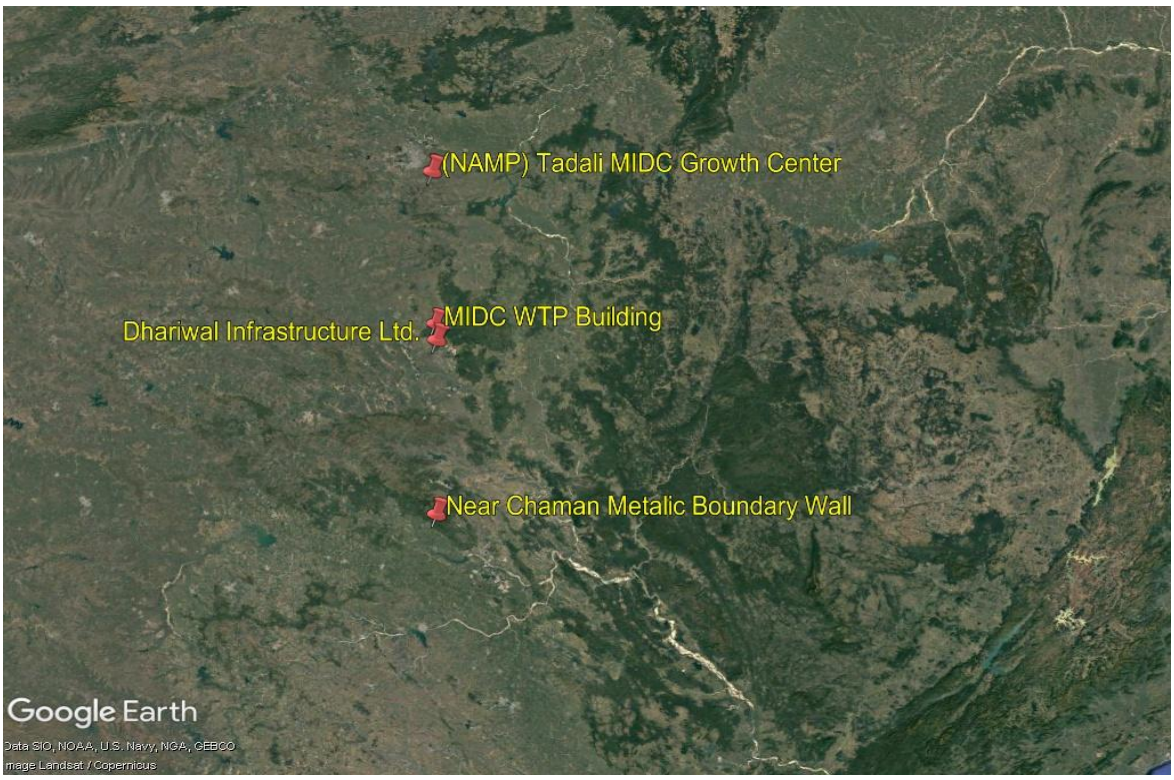


Fig. Geographical Locations of Ambient Air Quality Monitoring MIDC Tadali

Fig. Geographical Locations of VOCs Monitoring MIDC Tadali

Table 5.3 MIDC Tadali – Results of Ambient Air Quality Monitoring

Parameters	Unit	Results			
		Boundary Wall of Dhariwal Infrastructure Ltd.	NAMP Growth Centre	Near Chaman Metalic Boundary Wall	MIDC WTP Building
Sulphur Dioxide (SO_2)	µg/m³	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	µg/m³	39.4	42.5	37.7	32.2
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	42	84	46	42
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	12	23	12	12
Ozone (O_3)	µg/m³	21.5	30.4	27.6	25.7
Lead (Pb)	µg/m³	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1 h)	mg/m³	1.2	1.2	1.1	1.2
Carbon Monoxide (CO) (8 h)	mg/m³	1.5	1.6	1.5	1.5
Ammonia (NH_3)	µg/m³	24.8	29.6	33.3	26.1
Benzene (C_6H_6)	µg/m³	1.7	1.8	1.8	1.8
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	BLQ	BLQ	0.4	BLQ
Nickel (Ni)	ng/m³	BLQ	3.4	3.6	BLQ

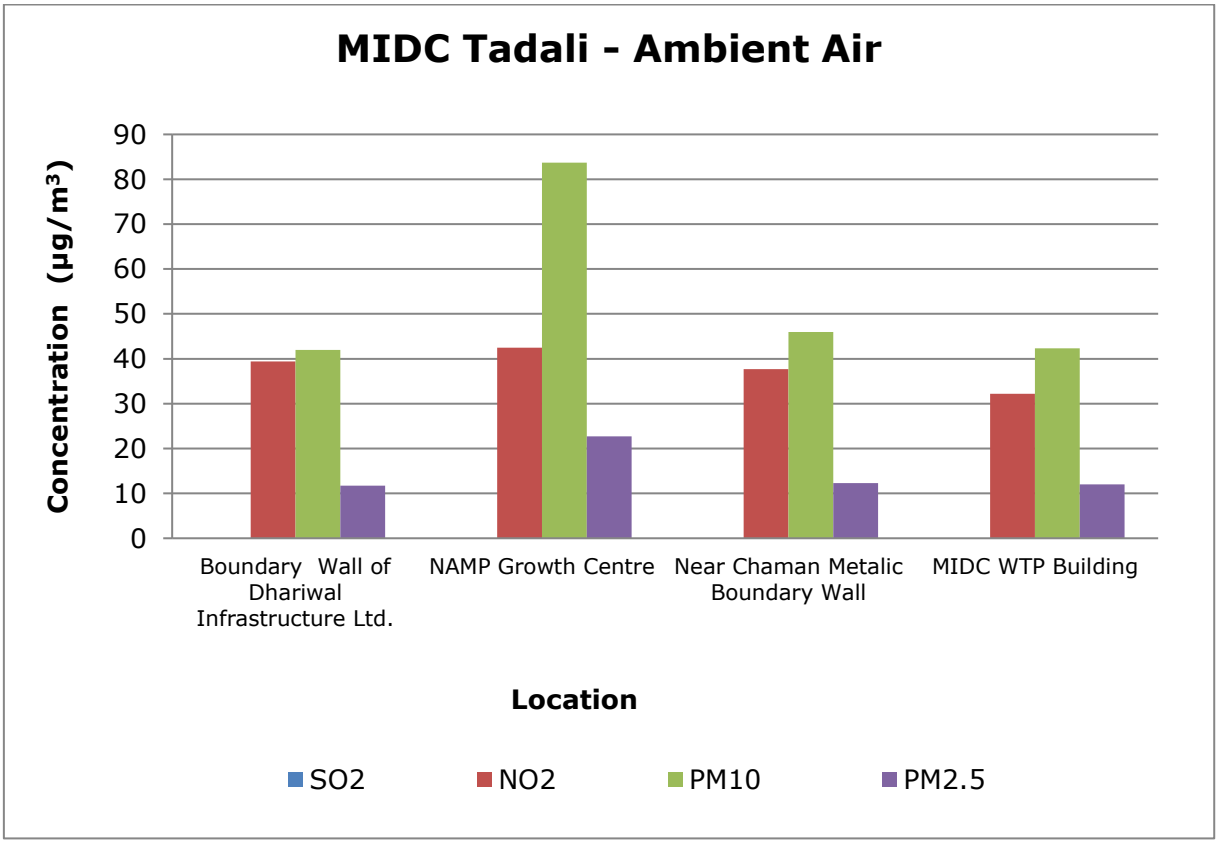
Table 5.4 MIDC Tadali - Volatile Organic Compounds (VOCs) in Ambient Air Results

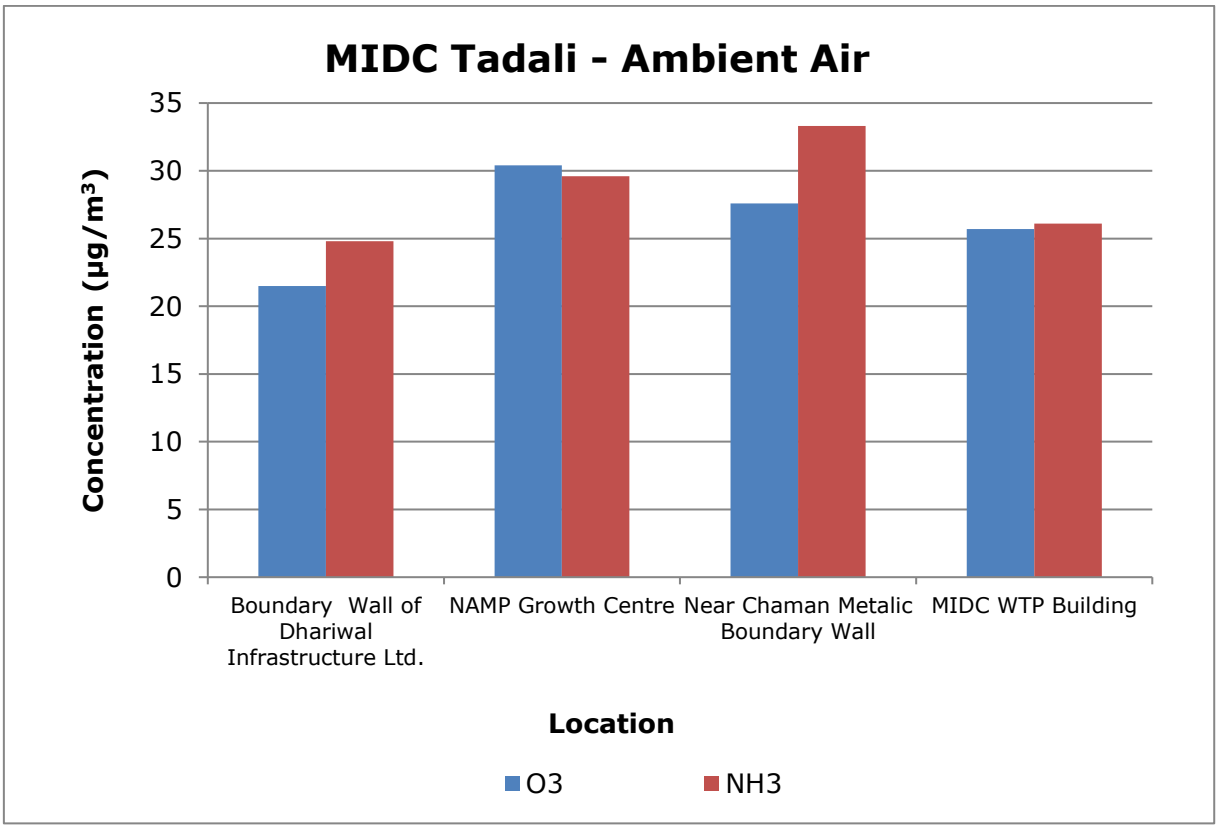
Parameters	Unit	Results	
		Boundary Wall of Dhariwal Infrastructure Ltd.	NAMP Growth Centre
Dichloromethane	µg/m³	0.85	0.64
Chloroform	µg/m³	1.65	BLQ
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ

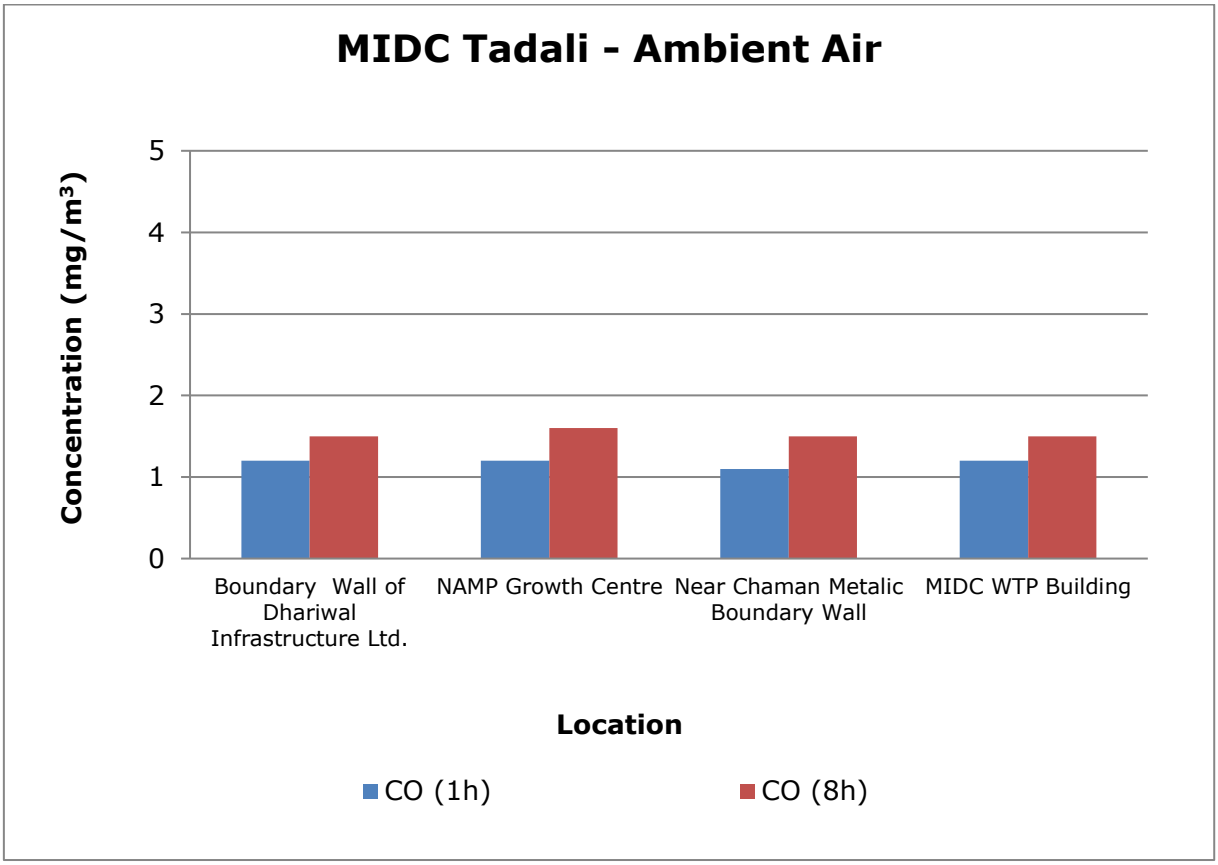
Parameters	Unit	Results	
		Boundary Wall of Dhariwal Infrastructure Ltd.	NAMP Growth Centre
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Napthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	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	0.80	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	0.61	BLQ
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

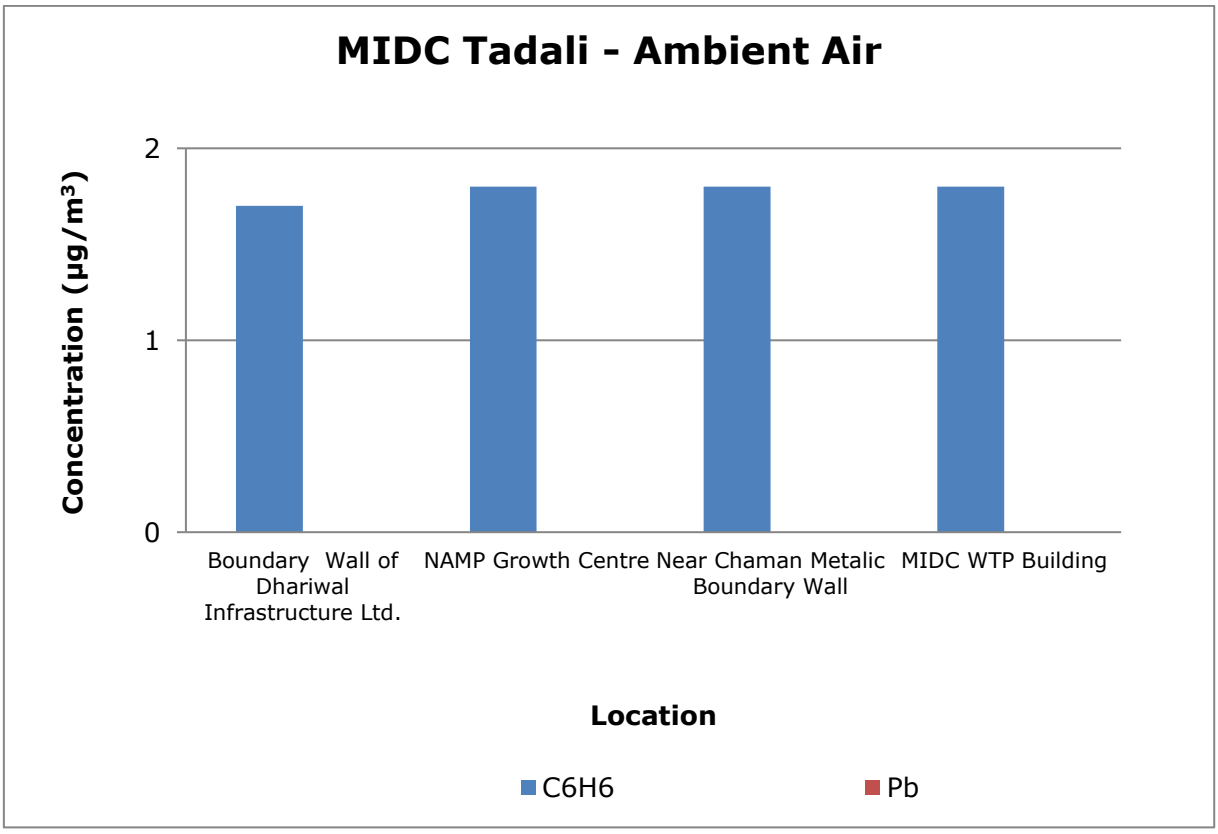
Parameters	Unit	Results	
		Boundary Wall of Dhariwal Infrastructure Ltd.	NAMP Growth Centre
1,2,4-Trichlorobenzene	µg/m³	BLQ	BLQ
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.89	0.52
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
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

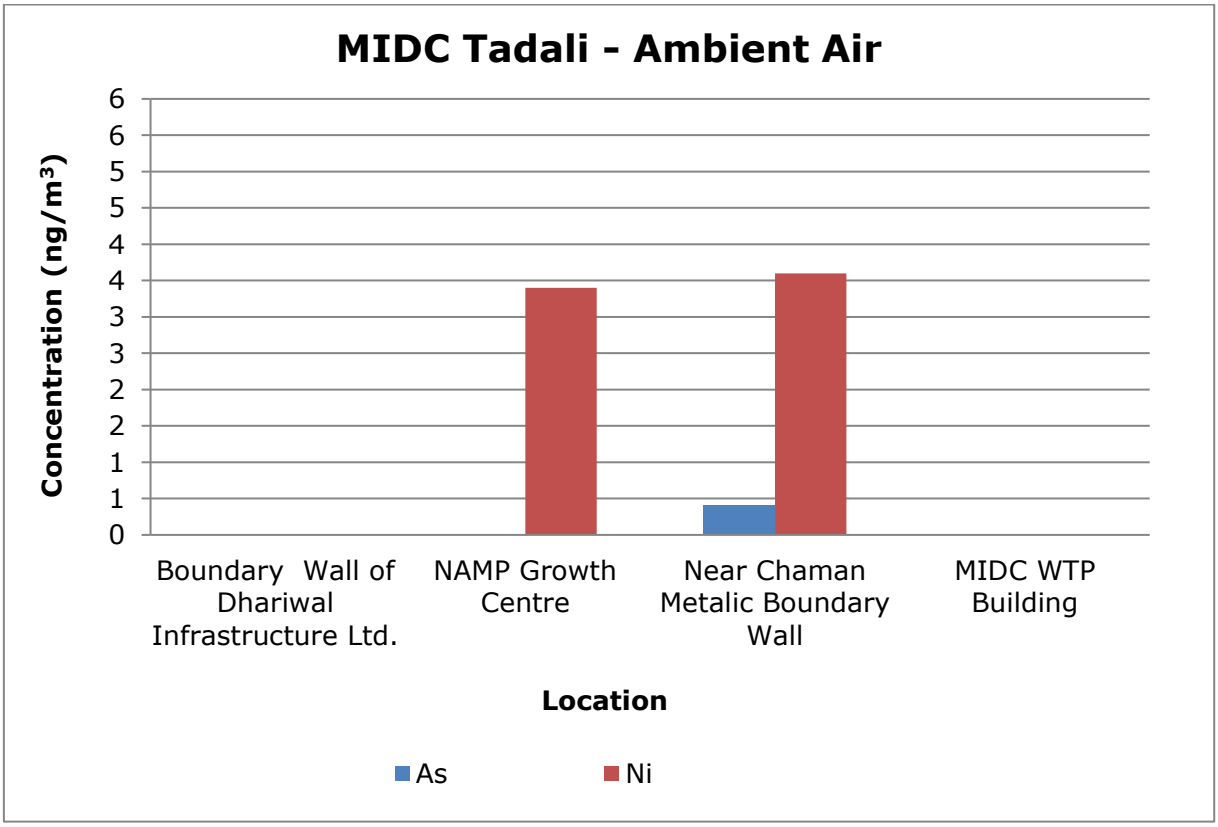
Graphs - Ambient Air Quality Monitoring of Tadali






MIDC Tadali - Ambient Air
Concentration (mg/m³)
5
4
3
2
1
0
Boundary Wall of Dhariwal Infrastructure Ltd.
NAMP Growth Centre
Near Chaman Metalic Boundary Wall
MIDC WTP Building
Location
CO (1h)
CO (8h)


MIDC Tadali - Ambient Air
Concentration (µg/m³)
2
1
0
Boundary Wall of Dhariwal Infrastructure Ltd.
NAMP Growth Centre
Near Chaman Metalic Boundary Wall
MIDC WTP Building
Location
C6H6
Pb


MIDC Tadali - Ambient Air
Concentration (ng/m³)
6
6
5
5
4
4
3
3
2
2
1
1
0
Boundary Wall of Dhariwal Infrastructure Ltd.
NAMP Growth Centre
Near Chaman Metalic Boundary Wall
MIDC WTP Building
Location
As
Ni

2. **MIDC Chandrapur:** In MIDC Chandrapur, at all 4 locations monitored for 12 parameters are well within the limit prescribed as per the NAAQS.

Table 5.5 MIDC Chandrapur – 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.	Behind Earth Green Tech Pvt. Ltd., MIDC Chandrapur	19°58'46.8"N	79°13'53.6"E	19.05.2025	21.05.2025	23.05.2025
2.	Multi Organics, Chandrapur MIDC	19°58'51.5"N	79°13'55.4"E	19.05.2025	21.05.2025	23.05.2025
3.	Opposite Super Hygienic CBMW Site	19°58'19.2"N	79°14'21.4"E	19.05.2025	21.05.2025	23.05.2025
4.	Near HPCL, MIDC Chandrapur	19°59'12.7"N	79°15'36.3"E	19.05.2025	21.05.2025	23.05.2025

Table 5.6 MIDC Chandrapur - 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.	Multi Organics, Chandrapur MIDC	19°58'51.5"N	79°13'55.4"E	19.05.2025	21.05.2025	23.05.2025
2.	Opposite Super Hygienic CBMW Site	19°58'19.2"N	79°14'21.4"E	19.05.2025	21.05.2025	23.05.2025

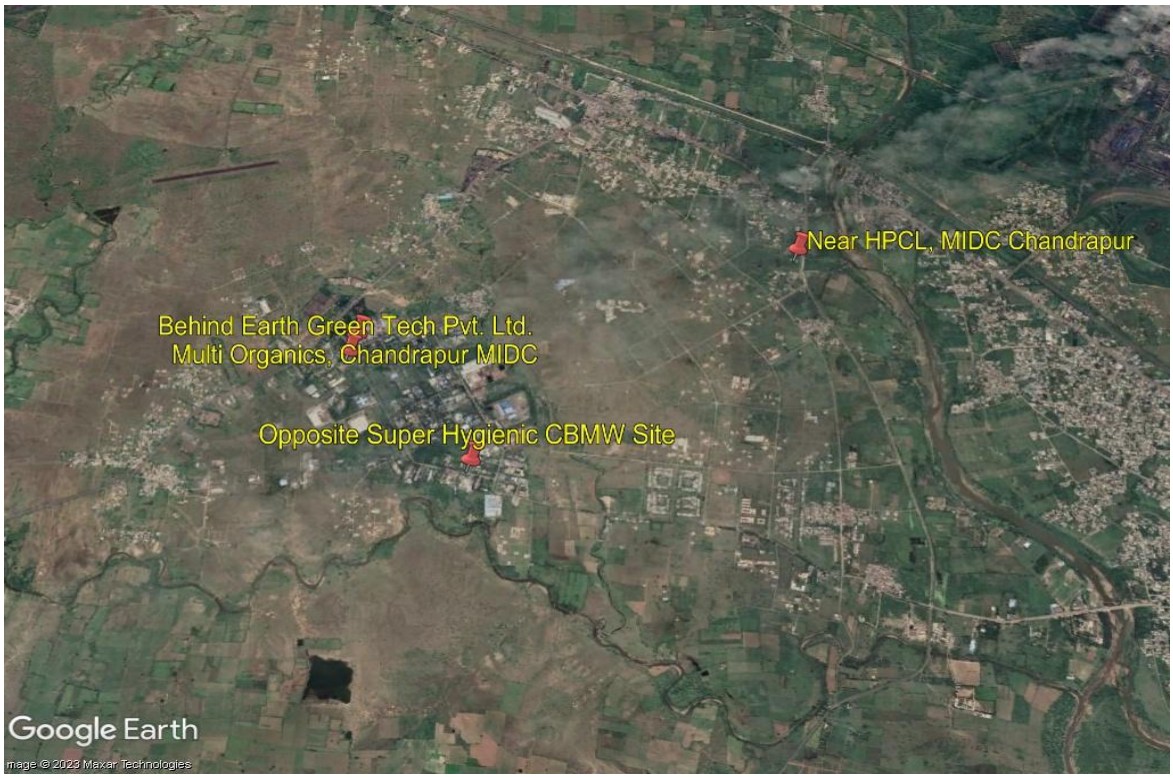


Fig. Geographical Locations of Ambient Air Quality Monitoring MIDC Chandrapur

Fig. Geographical Locations of VOCs Monitoring MIDC Chandrapur

Table 5.7 MIDC Chandrapur – Results of Ambient Air Quality Monitoring

Parameters	Unit	Results			
		Behind Earth Green Tech Pvt. Ltd.	Multi Organics	Opposite Super Hygienic CBMW Site	Near HPCL
Sulphur Dioxide (SO_2)	µg/m³	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	µg/m³	46.9	46.5	48.8	52.0
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	48	49	45	38
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	13	13	13	11
Ozone (O_3)	µg/m³	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	µg/m³	BLQ	BLQ	0.024	BLQ
Carbon Monoxide (CO) (1 h)	mg/m³	1.4	1.3	1.3	1.4
Carbon Monoxide (CO) (8 h)	mg/m³	1.5	1.5	1.7	1.5
Ammonia (NH_3)	µg/m³	53.3	44.8	39.7	44.8
Benzene (C_6H_6)	µg/m³	1.7	1.8	1.7	1.7
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	BLQ	0.4	0.3	BLQ
Nickel (Ni)	ng/m³	5.0	5.0	4.2	4.5

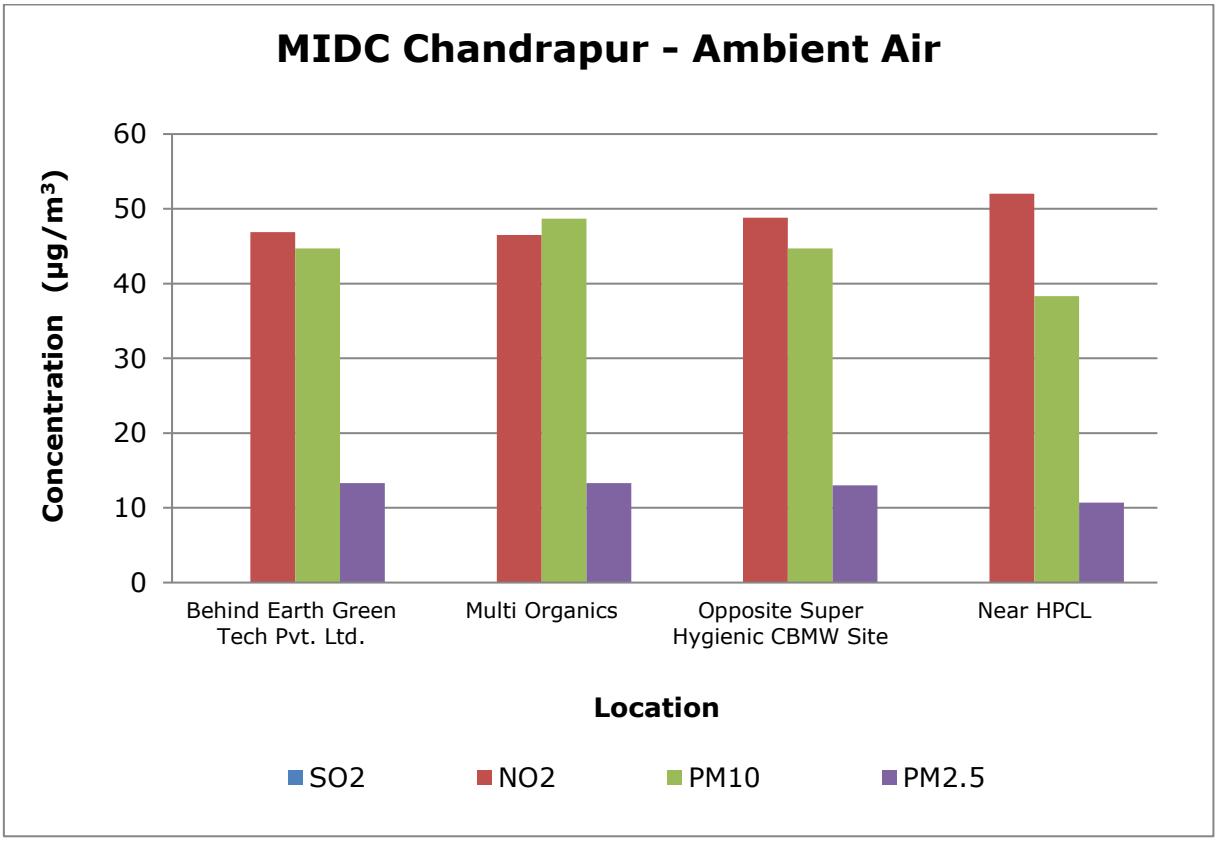
Table 5.8 MIDC Chandrapur - Volatile Organic Compounds (VOCs) in Ambient Air Results

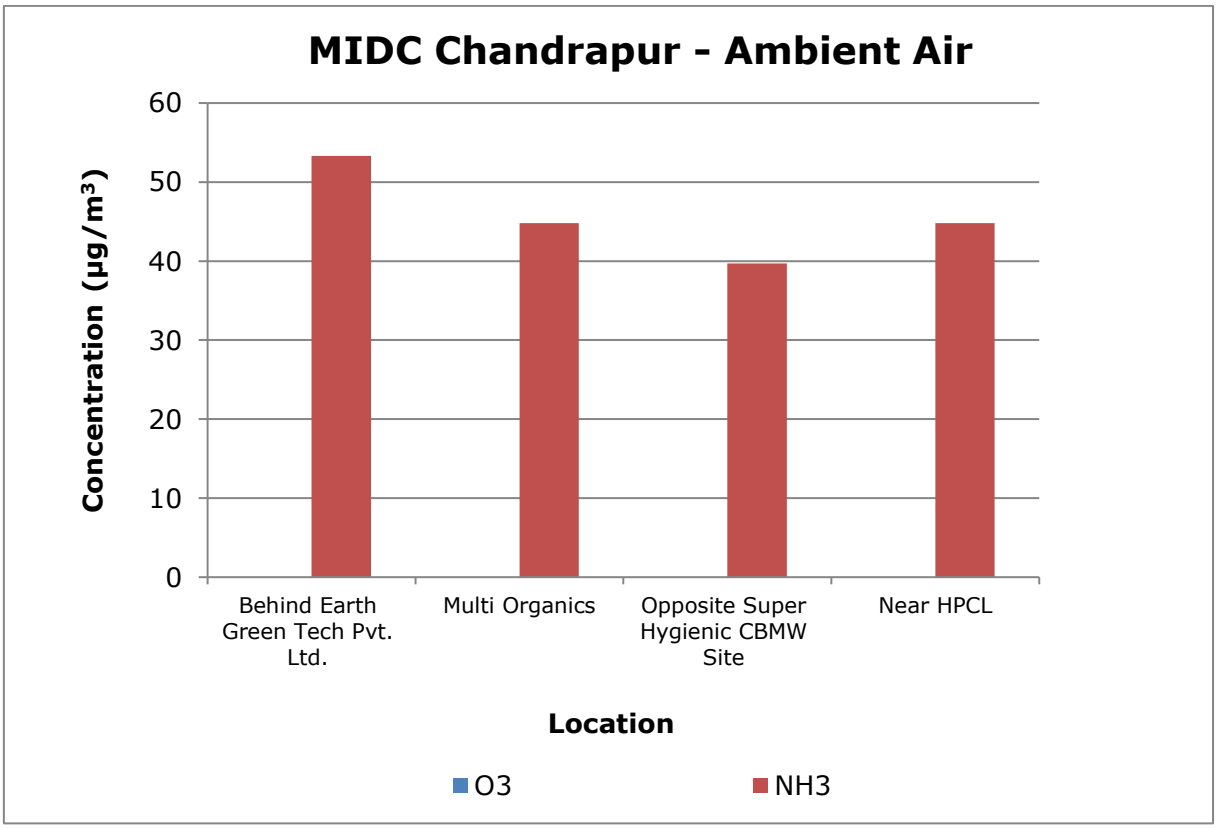
Parameters	Unit	Results	
		Multi Organics	Opposite Super Hygienic CBMW Site
Dichloromethane	µg/m³	0.67	0.64
Chloroform	µg/m³	BLQ	BLQ
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ

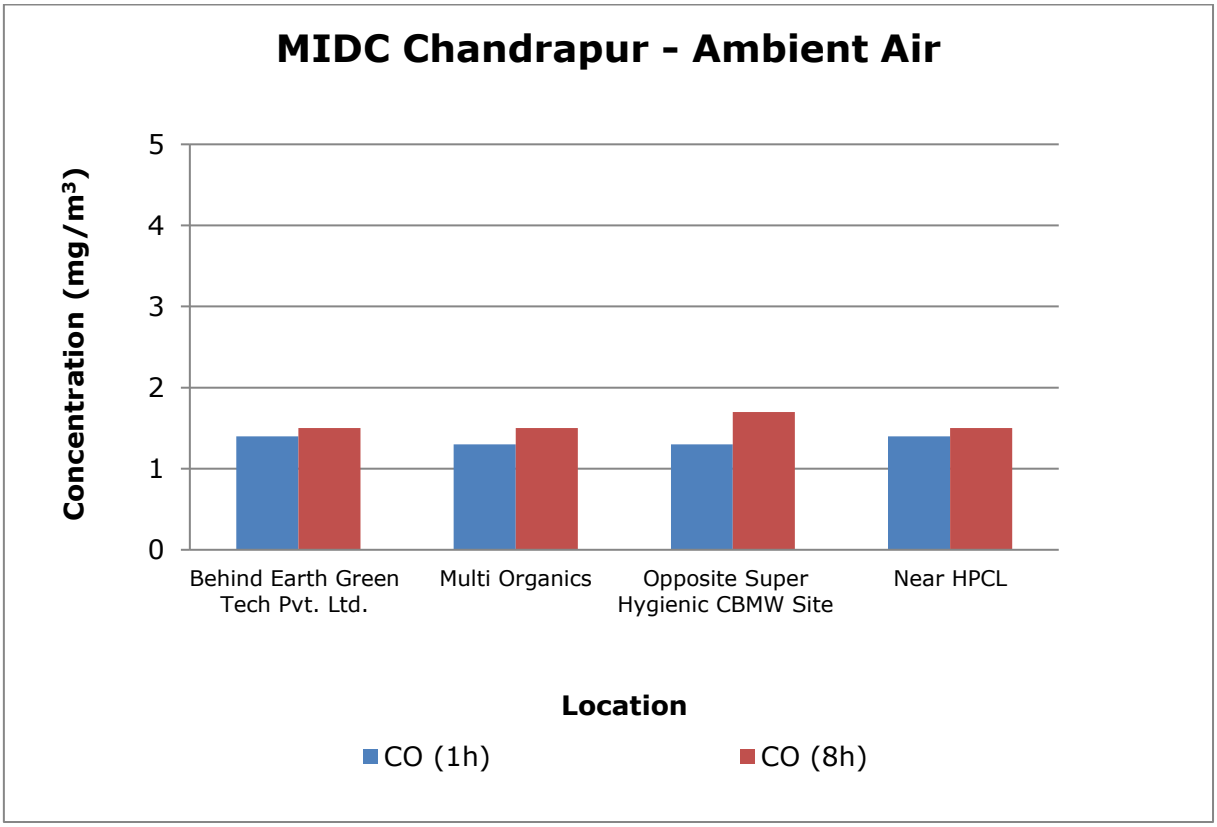
Parameters	Unit	Results	
		Multi Organics	Opposite Super Hygienic CBMW Site
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Napthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	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
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

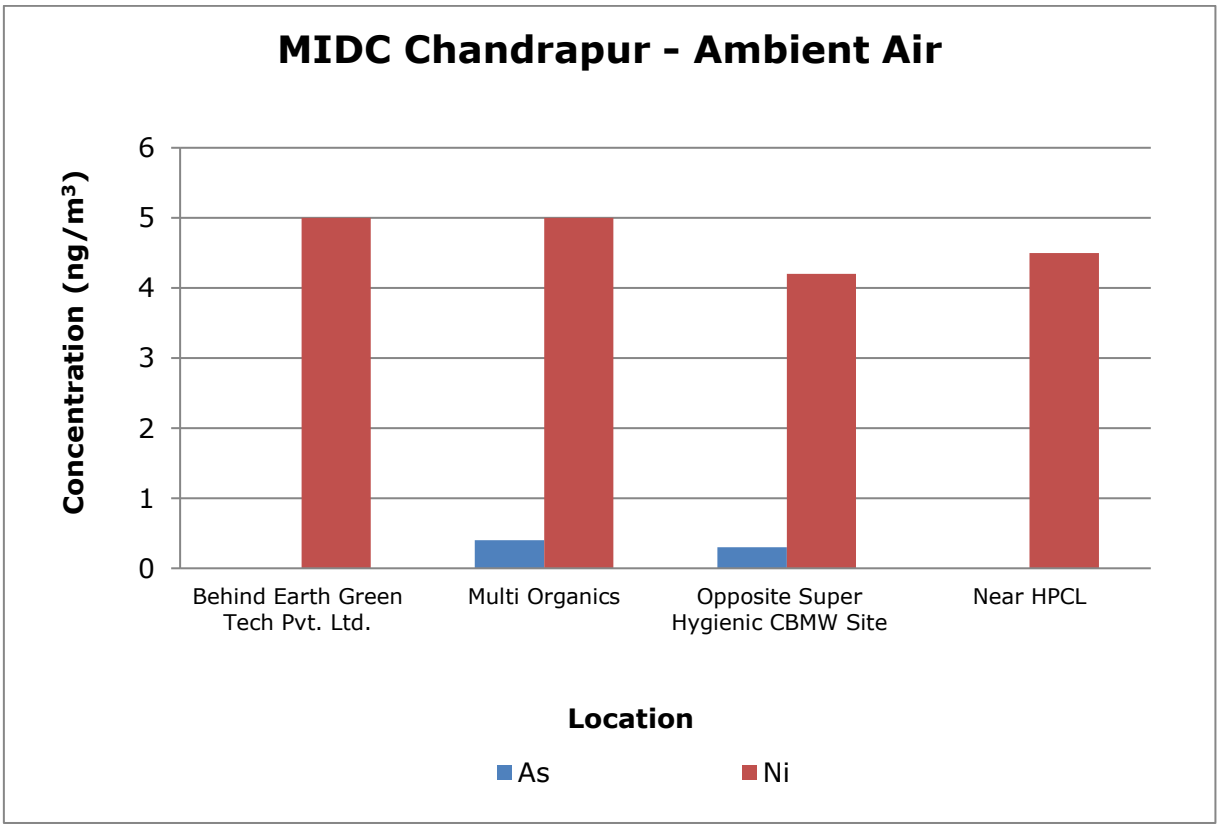
Parameters	Unit	Results	
		Multi Organics	Opposite Super Hygienic CBMW Site
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	BLQ	0.63
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	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 of MIDC Chandrapur






MIDC Chandrapur - Ambient Air
Concentration (mg/m³)
5
4
3
2
1
0
Behind Earth Green Tech Pvt. Ltd.
Multi Organics
Opposite Super Hygienic CBMW Site
Near HPCL
Location
CO (1h)
CO (8h)


MIDC Chandrapur - Ambient Air
Concentration (ng/m³)
6
5
4
3
2
1
0
Behind Earth Green Tech Pvt. Ltd.
Multi Organics
Opposite Super Hygienic CBMW Site
Near HPCL
Location
As
Ni

3. **MIDC Ghugus:** In MIDC Ghugus also all 4 locations monitored for 12 parameters are well within the limit prescribed as per the NAAQS except PM10 exceeds at one location out of four locations.

Table 5.9 MIDC Ghugus – 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.	Terrace of Transit Hostel Rajiv Colony WCL Ghugus Area	19°05'06.22''N	79°66'12.8''E	12.05.2025	14.05.2025	16.05.2025
2.	WTP Water Supply Tank, Ghugus	19°56'26.8''N	79°07'13.0''E	12.05.2025	14.05.2025	16.05.2025
3.	(NAMP) Near Gram Panchayat Ghugus	19°56'22.8''N	79°06'50.9''E	12.05.2025	14.05.2025	16.05.2025
4.	Guest House of ACC Cement	19°55'41.4''N	79°06'45.3''E	12.05.2025	14.05.2025	16.05.2025

Table 5.10 MIDC Ghugus - 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.	Terrace of Transit Hostel Rajiv Colony WCL Ghugus Area	19°05'06.22''N	79°66'12.8''E	12.05.2025	14.05.2025	16.05.2025
2.	Guest House of ACC Cement	19°55'41.4''N	79°06'45.3''E	12.05.2025	14.05.2025	16.05.2025

Fig. Geographical Locations of Ambient Air Quality Monitoring MIDC Ghugus

Fig. Geographical Locations of VOCs MIDC Ghugus

Table 5.11 MIDC Ghugus – Results of Ambient Air Quality Monitoring

Parameters	Unit	Results			
		Terrace of Transit Hostel Rajiv Colony WCL Ghugus Area	WTP Water Supply Tank, Ghugus	(NAMP) Near Gram Panchayat Ghugus	Guest House of ACC Cement
Sulphur Dioxide (SO_2)	µg/m³	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	µg/m³	24.4	20.1	23.5	21.0
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	91	72	115	63
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	23	19	28	17
Ozone (O_3)	µg/m³	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	µg/m³	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1 h)	mg/m³	1.2	1.4	1.3	1.1
Carbon Monoxide (CO) (8 h)	mg/m³	1.5	1.6	1.6	1.5
Ammonia (NH_3)	µg/m³	40.4	33.8	31.3	34.8
Benzene (C_6H_6)	µg/m³	1.8	1.7	1.9	1.8
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	BLQ	0.5	0.7	BLQ
Nickel (Ni)	ng/m³	BLQ	BLQ	BLQ	BLQ

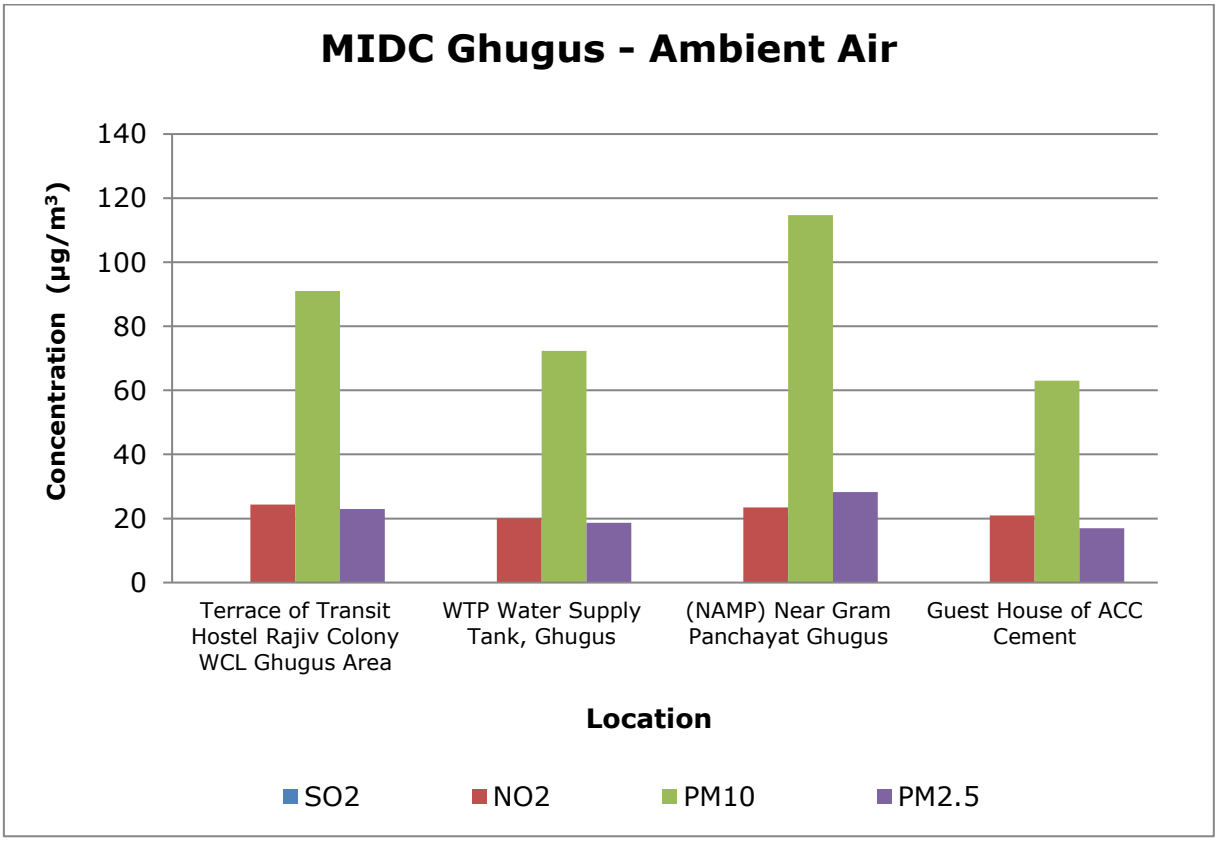
Table 5.12 MIDC Ghugus - Volatile Organic Compounds (VOCs) in Ambient Air Results

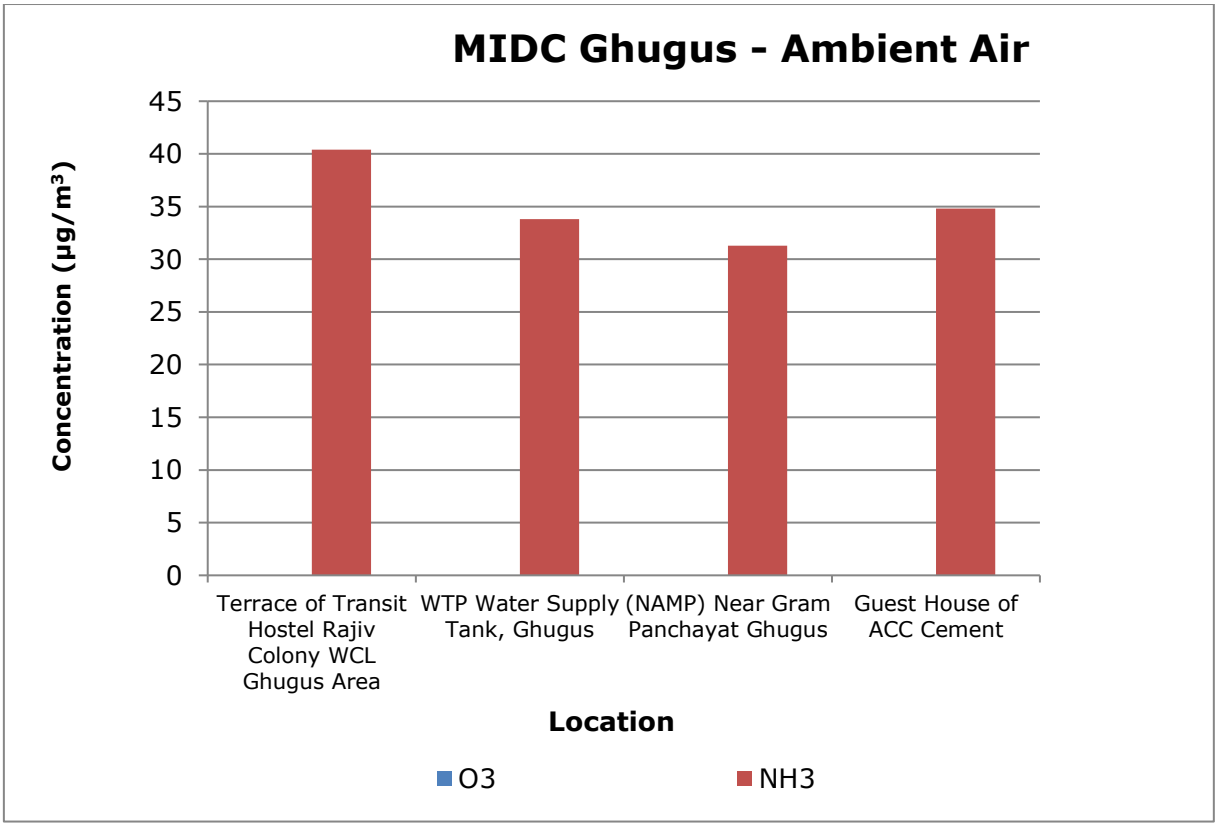
Parameters	Unit	Results	
		Terrace of Transit Hostel Rajiv Colony WCL Ghugus Area	Guest House of ACC Cement
Dichloromethane	µg/m³	0.84	0.62
Chloroform	µg/m³	0.84	BLQ
Carbon Tetrachloride	µg/m³	0.75	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ

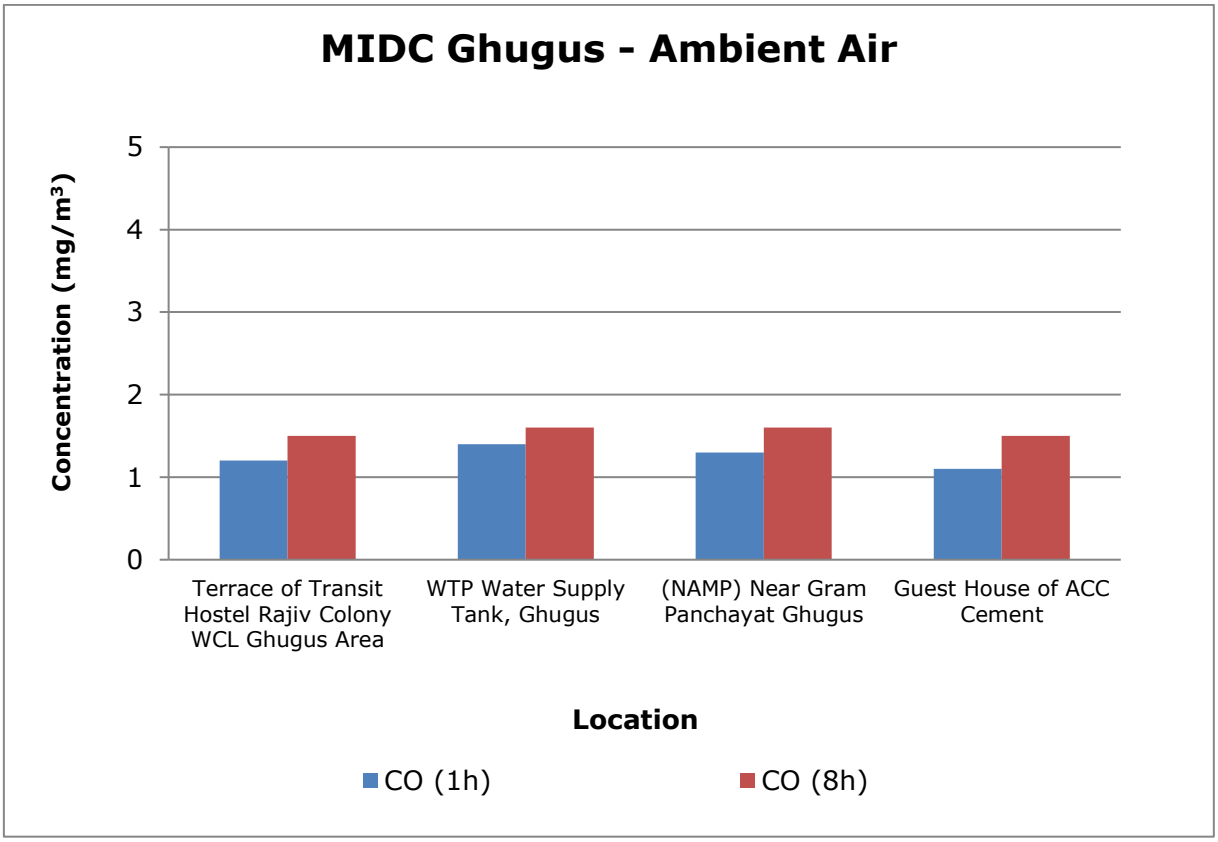
Parameters	Unit	Results	
		Terrace of Transit Hostel Rajiv Colony WCL Ghugus Area	Guest House of ACC Cement
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Napthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	0.59	BLQ
P-Xylene	µg/m³	0.63	1.29
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	0.57	BLQ
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	0.57	BLQ
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

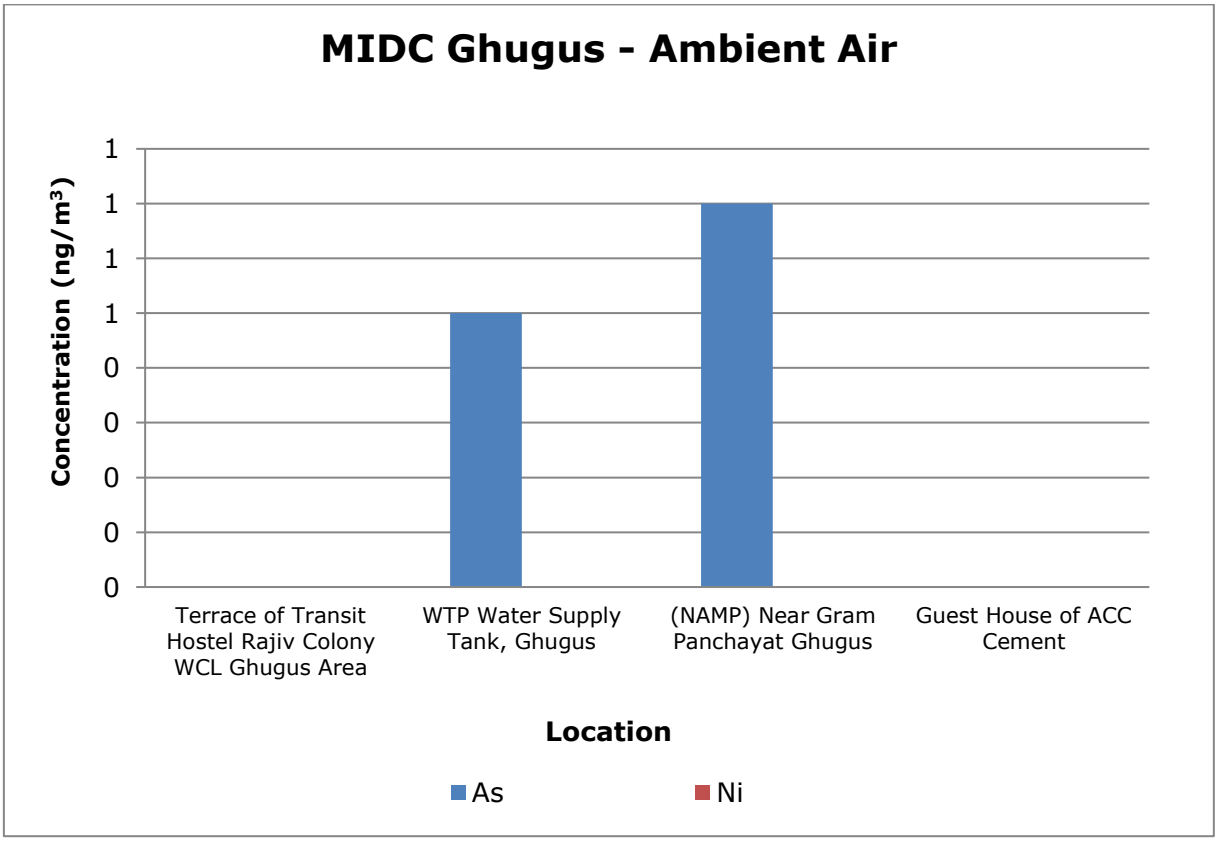
Parameters	Unit	Results	
		Terrace of Transit Hostel Rajiv Colony WCL Ghugus Area	Guest House of ACC Cement
1,2,4-Trichlorobenzene	µg/m³	BLQ	BLQ
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.94	0.73
O-Xylene	µg/m³	0.54	BLQ
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	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 of MIDC Ghugus






MIDC Ghugus - Ambient Air
Concentration (mg/m³)
5
4
3
2
1
0
Terrace of Transit Hostel Rajiv Colony WCL Ghugus Area
WTP Water Supply Tank, Ghugus
(NAMP) Near Gram Panchayat Ghugus
Guest House of ACC Cement
Location
CO (1h)
CO (8h)


MIDC Ghugus - Ambient Air
Concentration (ng/m³)
1
1
1
1
0
0
0
0
0
Terrace of Transit Hostel Rajiv Colony WCL Ghugus Area
WTP Water Supply Tank, Ghugus
(NAMP) Near Gram Panchayat Ghugus
Guest House of ACC Cement
Location
As
Ni

4. **MIDC Ballarpur:** In MIDC Ballarpur also all 4 locations monitored for 12 parameters are well within the limit prescribed as per the NAAQS.

Table 5.13 MIDC Ballarpur – 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.	Ram Mandir, Near BILT Mangal Karyalaya, Ballarpur	19°52'17.0''N	79°20'38.8''E	12.05.2025	14.05.2025	16.05.2025
2.	Estate Office, BILT Colony, Ballarpur	19°52'07.9''N	79°20'22.8''E	12.05.2025	14.05.2025	16.05.2025
3.	(NAMP) Nagar Parishad Ballarpur	19°51'03.3''N	79°21'04.3''E	12.05.2025	14.05.2025	16.05.2025
4.	WCL Office, Ballarpur on Sasti Road	19°50'23.2''N	79°20'49.0''E	12.05.2025	14.05.2025	16.05.2025

Table 5.14 MIDC Ballarpur - 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.	Estate Office, BILT Colony, Ballarpur	19°52'07.9''N	79°20'22.8''E	12.05.2025	14.05.2025	16.05.2025
2.	(NAMP) Nagar Parishad Ballarpur	19°52'08.2''N	79°20'17.8''E	12.05.2025	14.05.2025	16.05.2025

Fig. Geographical Locations of Ambient Air Quality Monitoring MIDC Ballarpur

Fig. Geographical Locations of VOCs Monitoring MIDC Ballarpur

Table 5.15 MIDC Ballarpur – Details of Sampling Location of Ambient Air Quality Monitoring

Parameters	Unit	Results			
		Ram Mandir, Near BILT Mangal Karyalaya, Ballarpur	Estate Office, BILT Colony, Ballarpur	(NAMP) Nagar Parishad Ballarpur	WCL Office, Ballarpur on Sasti Road
Sulphur Dioxide (SO_2)	µg/m^3	7.27	11.3	12.6	13.7
Nitrogen Dioxide (NO_2)	µg/m^3	16.5	22.9	19.9	15.0
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m^3	74	79	60	56
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m^3	19	21	16	13
Ozone (O_3)	µg/m^3	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	µg/m^3	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1 h)	mg/m^3	1.2	1.3	1.3	1.3
Carbon Monoxide (CO) (8 h)	mg/m^3	1.4	1.5	1.5	1.6
Ammonia (NH_3)	µg/m^3	40.0	41.1	34.2	34.5
Benzene (C_6H_6)	µg/m^3	1.8	1.7	1.7	1.9
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	3.2	BLQ

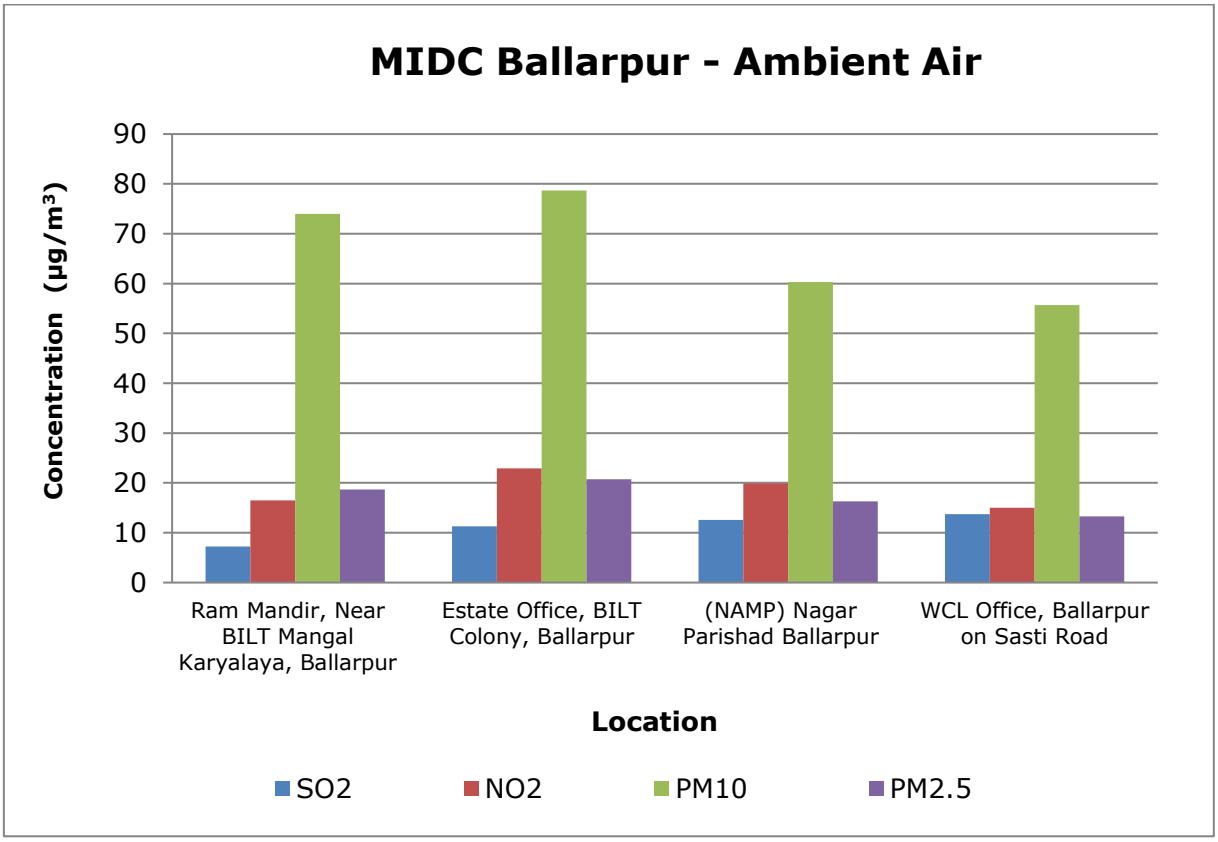
Table 5.16 MIDC Ballarpur - Volatile Organic Compounds (VOCs) in Ambient Air Results

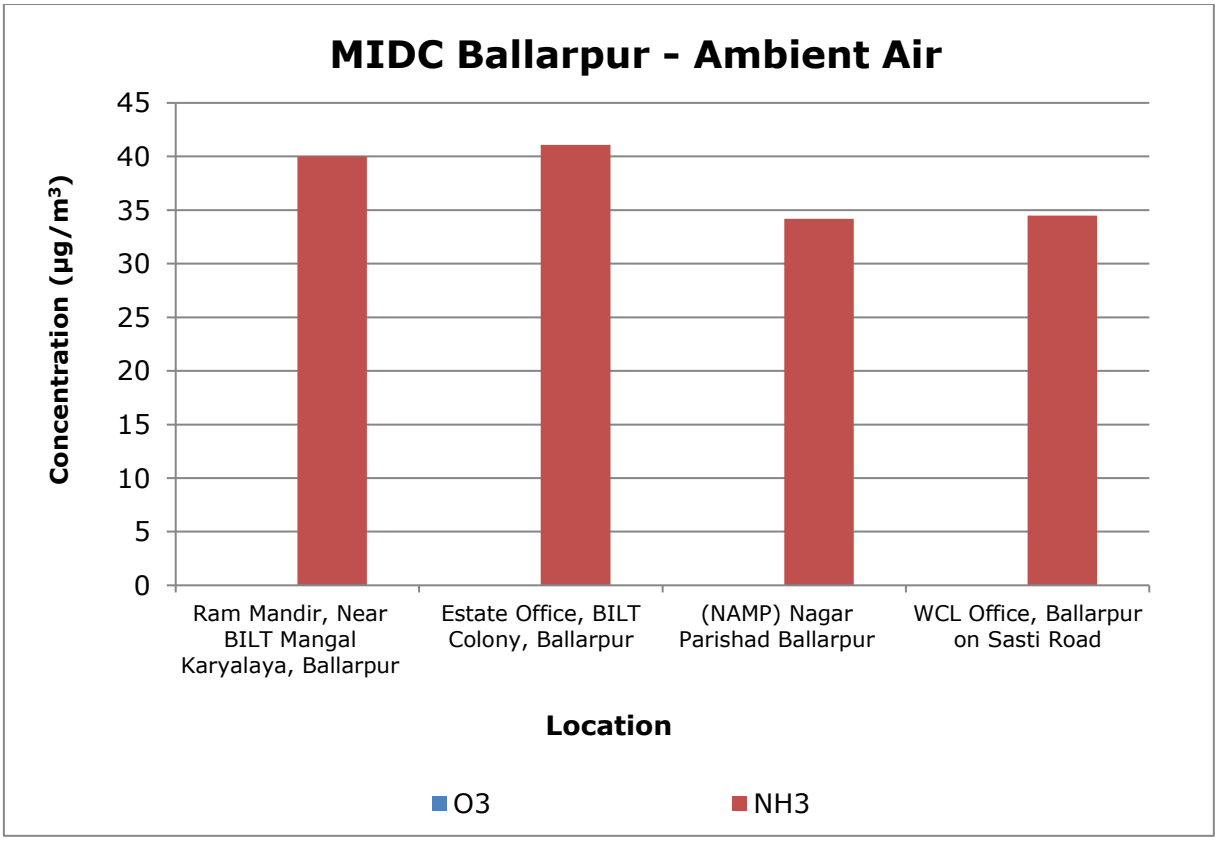
Parameters	Unit	Results	
		Estate Office, BILT Colony, Ballarpur	(NAMP) Nagar Parishad Ballarpur
Dichloromethane	µg/m³	0.85	0.64
Chloroform	µg/m³	1.65	BLQ
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ

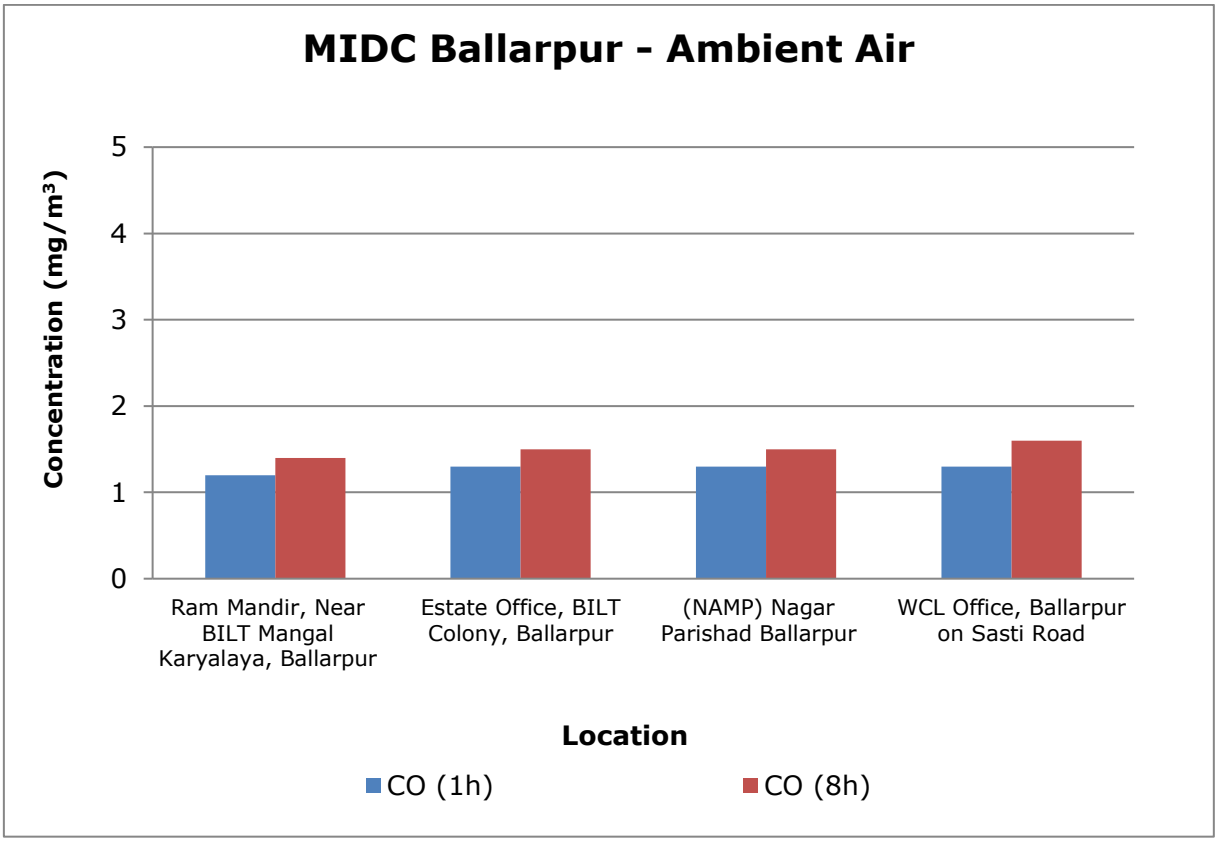
Parameters	Unit	Results	
		Estate Office, BILT Colony, Ballarpur	(NAMP) Nagar Parishad Ballarpur
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Napthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	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	0.80	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	0.61	BLQ
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

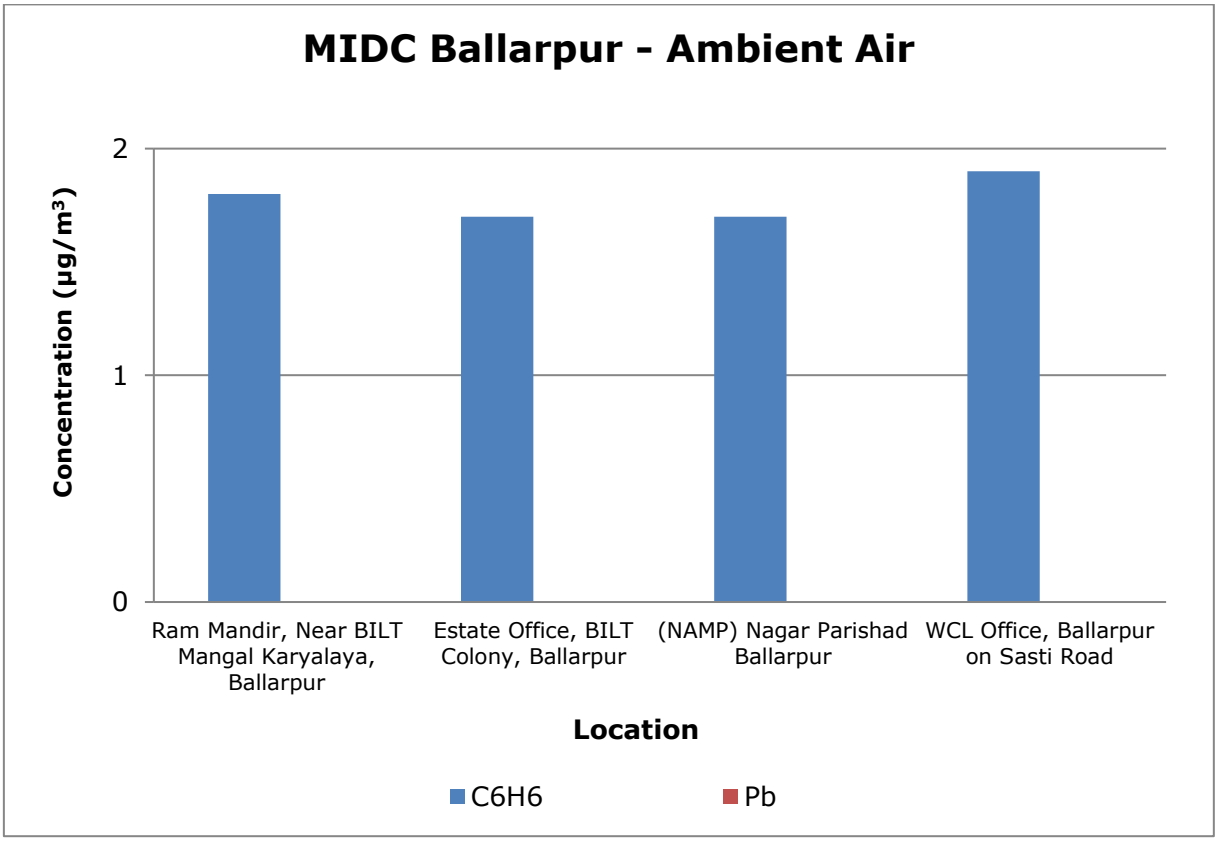
Parameters	Unit	Results	
		Estate Office, BILT Colony, Ballarpur	(NAMP) Nagar Parishad Ballarpur
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.89	0.521
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
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

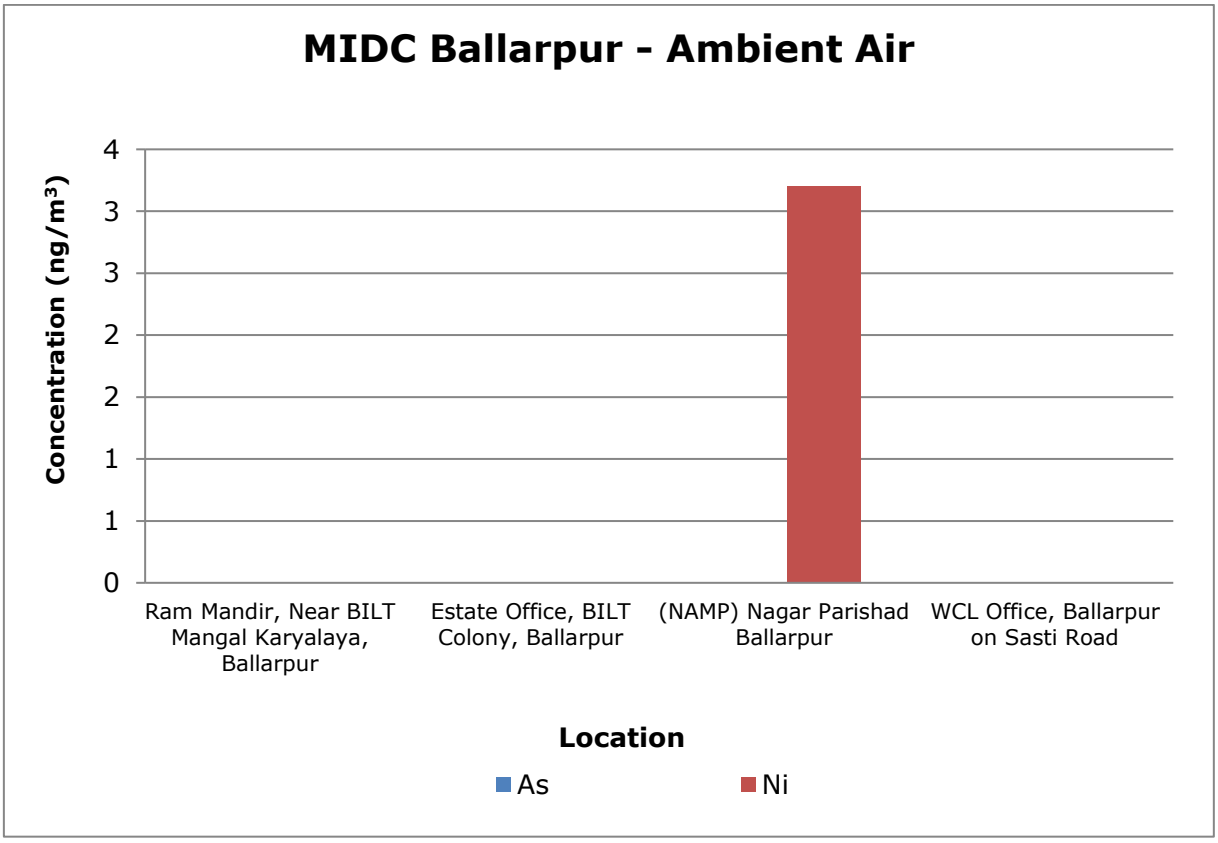
Graphs - Ambient Air Quality Monitoring of MIDC Ballarpur






MIDC Ballarpur - Ambient Air
Concentration (mg/m³)
5
4
3
2
1
0
Ram Mandir, Near BILT Mangal Karyalaya, Ballarpur
Estate Office, BILT Colony, Ballarpur
(NAMP) Nagar Parishad Ballarpur
WCL Office, Ballarpur on Sasti Road
Location
CO (1h)
CO (8h)


MIDC Ballarpur - Ambient Air
Concentration (µg/m³)
2
1
0
Ram Mandir, Near BILT Mangal Karyalaya, Ballarpur
Estate Office, BILT Colony, Ballarpur
(NAMP) Nagar Parishad Ballarpur
WCL Office, Ballarpur on Sasti Road
Location
C6H6
Pb


MIDC Ballarpur - Ambient Air
Concentration (ng/m³)
4
3
3
2
2
1
1
0
Ram Mandir, Near BILT Mangal Karyalaya, Ballarpur
Estate Office, BILT Colony, Ballarpur
(NAMP) Nagar Parishad Ballarpur
WCL Office, Ballarpur on Sasti Road
Location
As
Ni

WATER ENVIRONMENT

6. Water Environment

For studying the water Environment of Chandrapur area, surface water was collected from Nallah, Lake and River. A total of 17 samples were collected from MIDC Chandrapur, MIDC Tadali, MIDC Ballarpur and MIDC Ghugus.

1. **MIDC Tadali:** from MIDC Tadali also four surface water samples are collected.

- All Four water samples collected are acceptable in sanitary survey, colour, smell and transparency.
- Total Dissolved Solids, Suspended Solids and pH also well within the limits at all four samples collected.
- 100% survival was not achieved in Fish Bioassay in all four samples.
- Metals like Zinc, Nickel, Copper, Hexavalent Chromium (Cr^{6+}), Total Chromium, Total Arsenic, Lead, Cadmium, etc. are observed either below limit of quantification or below their standard limits.
- Iron observed above their standard limits at all four location.
- Parameters like Free Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Fluoride and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- The concentration of Total Phosphate and Total Kjeldahl Nitrogen exceeded prescribed limit.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all three samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all three samples collected.

Table 6.1 MIDC Tadali – 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.	Tadali Village Lake	20°01’48.0’’N	79°11’21.8’’E	20.05.2025	22.05.2025	24.05.2025
2.	Nallah adjacent to Grace Industries	20°00’28.1’’N	79° 11’11.1’’E	20.05.2025	22.05.2025	24.05.2025
3.	Raw Water of MIDC WTP	20°00’26.6”N	79°11’11.3”E	20.05.2025	22.05.2025	24.05.2025
4.	Morva Village Lake	20°00’49.0”N	79°13’35.7”E	20.05.2025	22.05.2025	24.05.2025

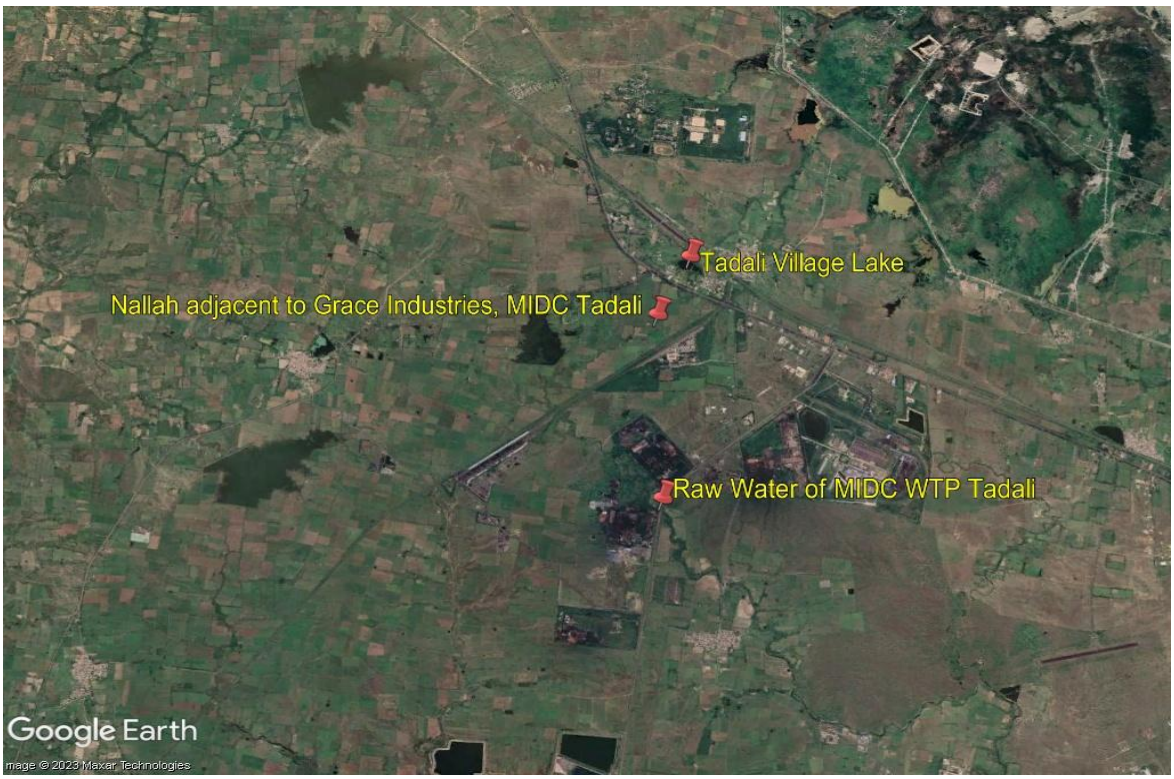


Fig. Geographical Locations of Surface Water Sampling MIDC Tadali

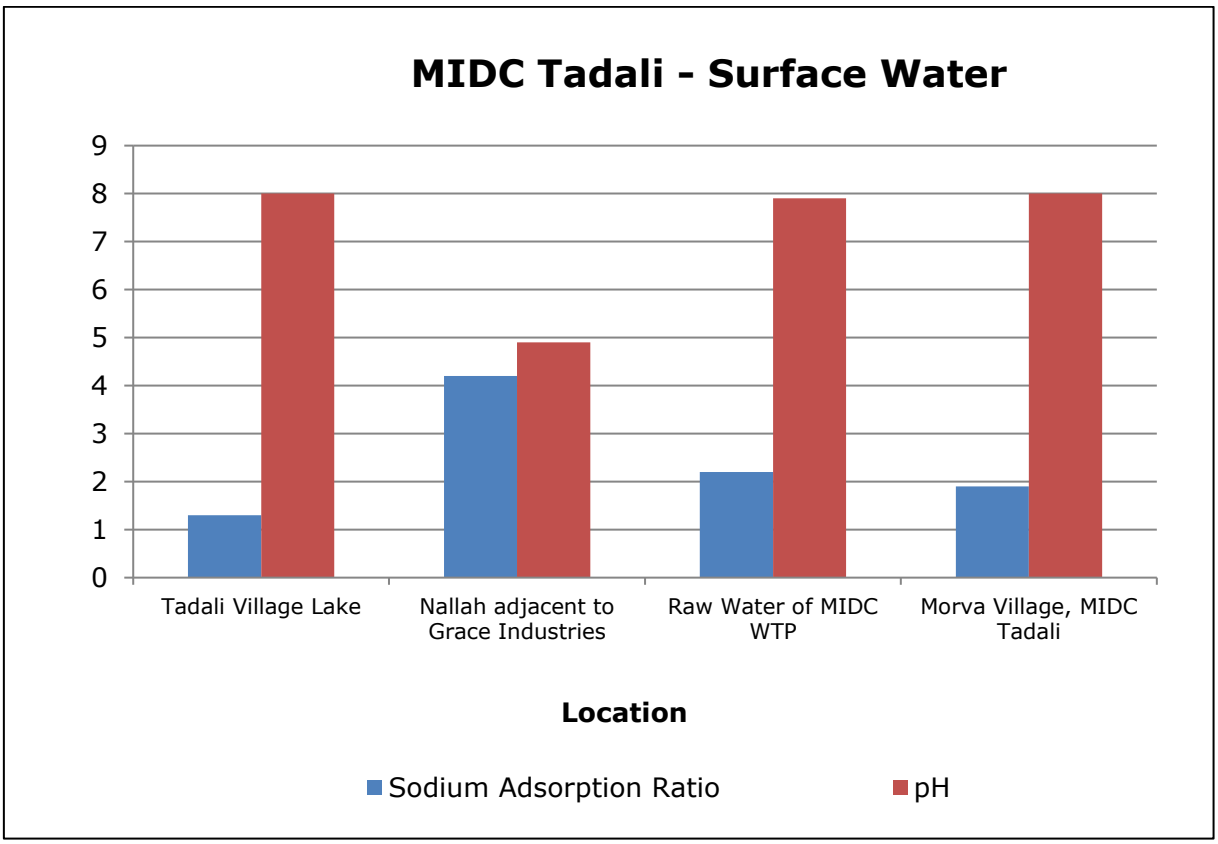
Table 6.2 MIDC Tadali – Results of Surface Water

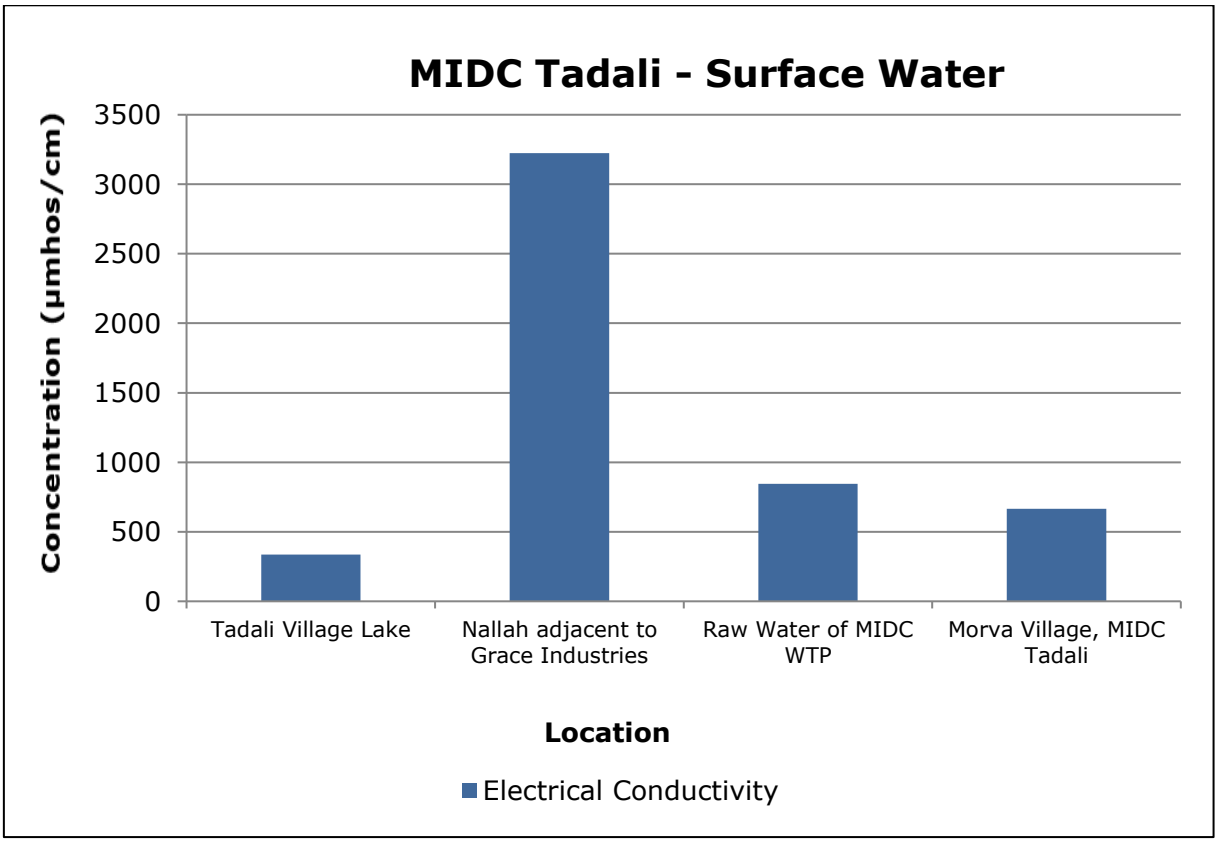
Parameters	Unit	Results			
		Tadali Village Lake	Nallah adjacent to Grace Industries	Raw Water of MIDC WTP	Morva Village
Sanitary Survey	-	Reasonably Clean Neighbourhood	Reasonably Clean Neighbourhood	Very Clean Neighbourhood and Catchment	Reasonably Clean Neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident
Transparency	m	0.2	0.2	0.0	0.3
Temperature	°C	27	27	27	27
Colour	Hazen	2	2	1	1
Odour	-	Agreeable	Agreeable	Agreeable	Agreeable
pH	-	8.0	4.9	7.9	8.0
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	29	33	39	37
Total Dissolved Solids	mg/L	188	1571	473	372
Dissolved Oxygen (% Saturation)	%	52	51	61	56
Chemical Oxygen Demand	mg/L	67	69	45	46

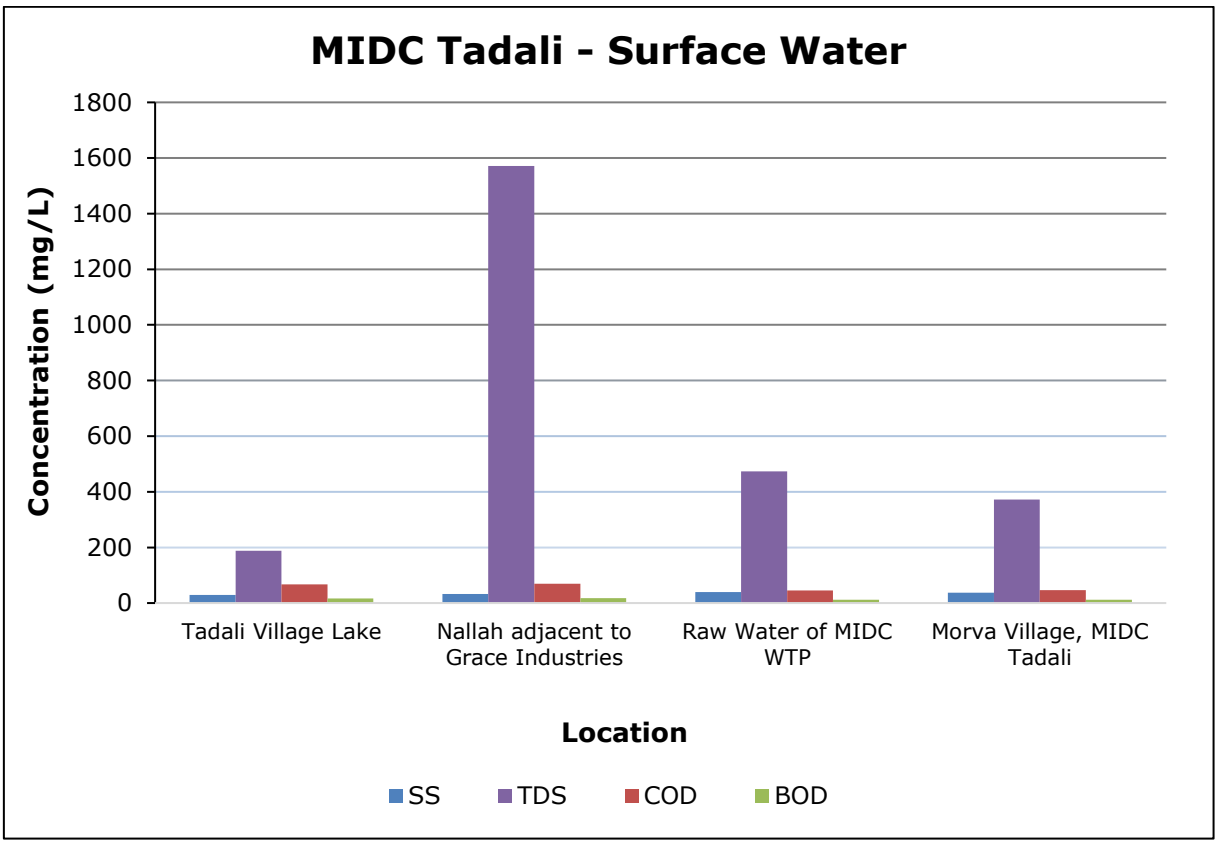
Parameters	Unit	Results			
		Tadali Village Lake	Nallah adjacent to Grace Industries	Raw Water of MIDC WTP	Morva Village
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	16	18	12	12
Electrical Conductivity (at 25°C)	µmhos/cm	336	3224	846	666
Nitrite Nitrogen	mg/L	0.16	0.04	BLQ	0.04
Nitrate Nitrogen	mg/L	0.9	2.0	0.5	2.0
(NO_2+ NO_3)-Nitrogen	mg/L	1.0	2.0	0.5	2.1
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ
Free Residual Chlorine	mg/L	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.3	1.1	0.3	0.9
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	BLQ	0.8	0.2	0.2
Sodium Adsorption Ratio	-	1.3	4.2	2.2	1.9
Total Coliforms	MPN Index/ 100 ml	5720	1402	148	1147
Faecal Coliforms	MPN Index/ 100 ml	388	170	19	136
Total Phosphate (as P)	mg/L	BLQ	1.3	0.4	0.2
Total Kjeldahl Nitrogen (as N)	mg/L	1.0	1.3	0.8	5.9
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	0.1	BLQ	0.6
Total Nitrogen	mg/L	2.0	3.4	1.6	7.5
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	mg/L	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	0.000086	0.0027	BLQ	0.0001
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	0.0001	BLQ
Zinc (as Zn)	mg/L	0.07	0.31	0.13	0.11
Nickel (as Ni)	mg/L	0.01	0.02	0.02	0.03
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ	BLQ

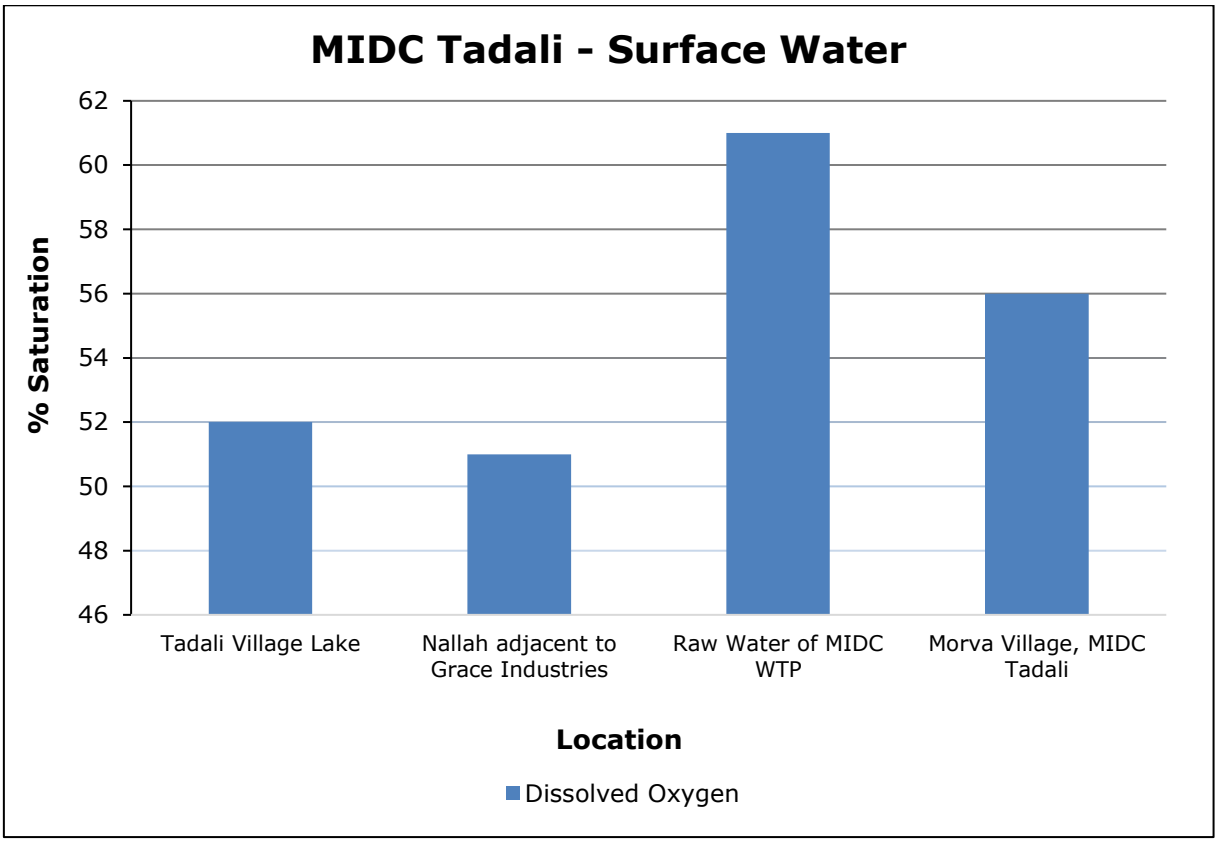
Parameters	Unit	Results			
		Tadali Village Lake	Nallah adjacent to Grace Industries	Raw Water of MIDC WTP	Morva Village
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.05	0.04	0.04	0.04
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.011	0.011	0.014	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.06	0.35	0.025	0.023
Iron (as Fe)	mg/L	0.4	1.6	0.2	0.3
Vanadium (as V)	mg/L	BLQ	BLQ	0.013	0.011
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	0.3	BLQ	0.2
Bioassay Test on fish	% survival	87	77	97	93

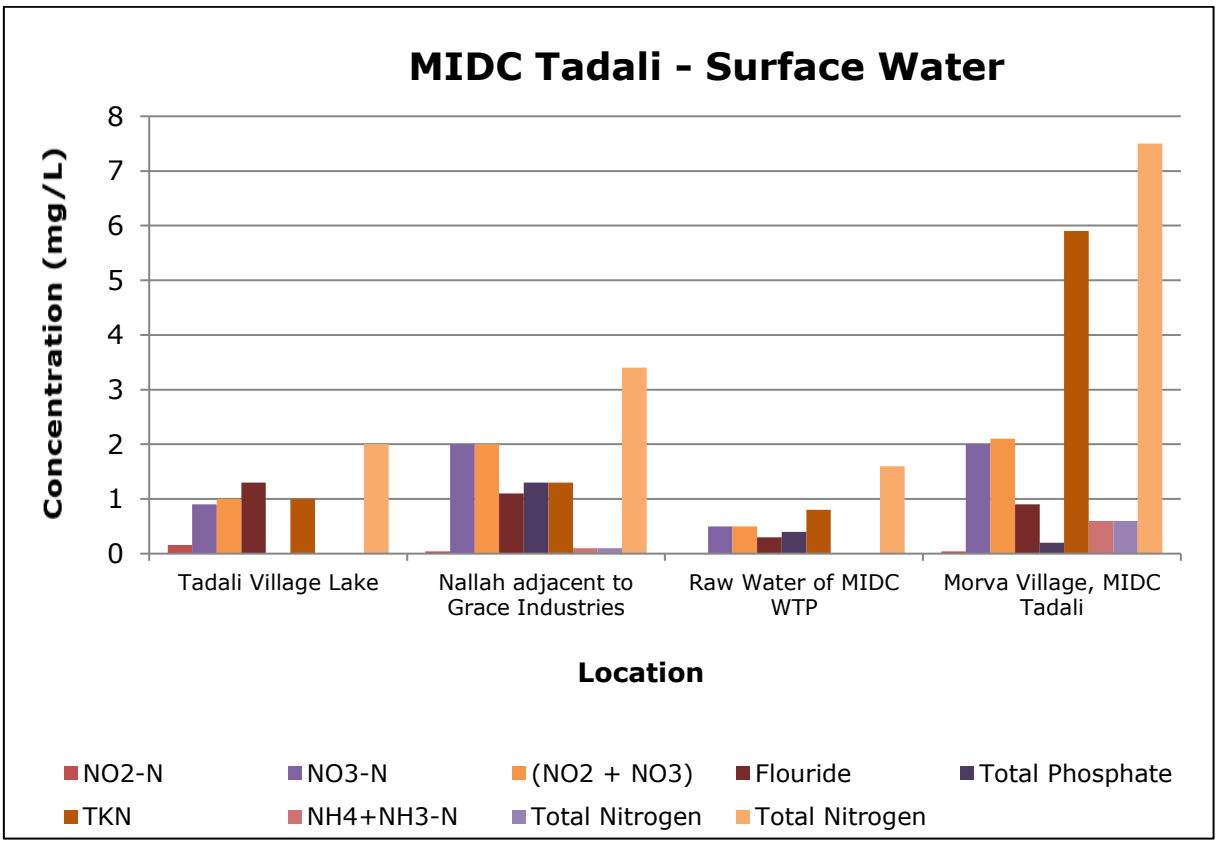
Graphs - Surface Water Quality of MIDC Tadali

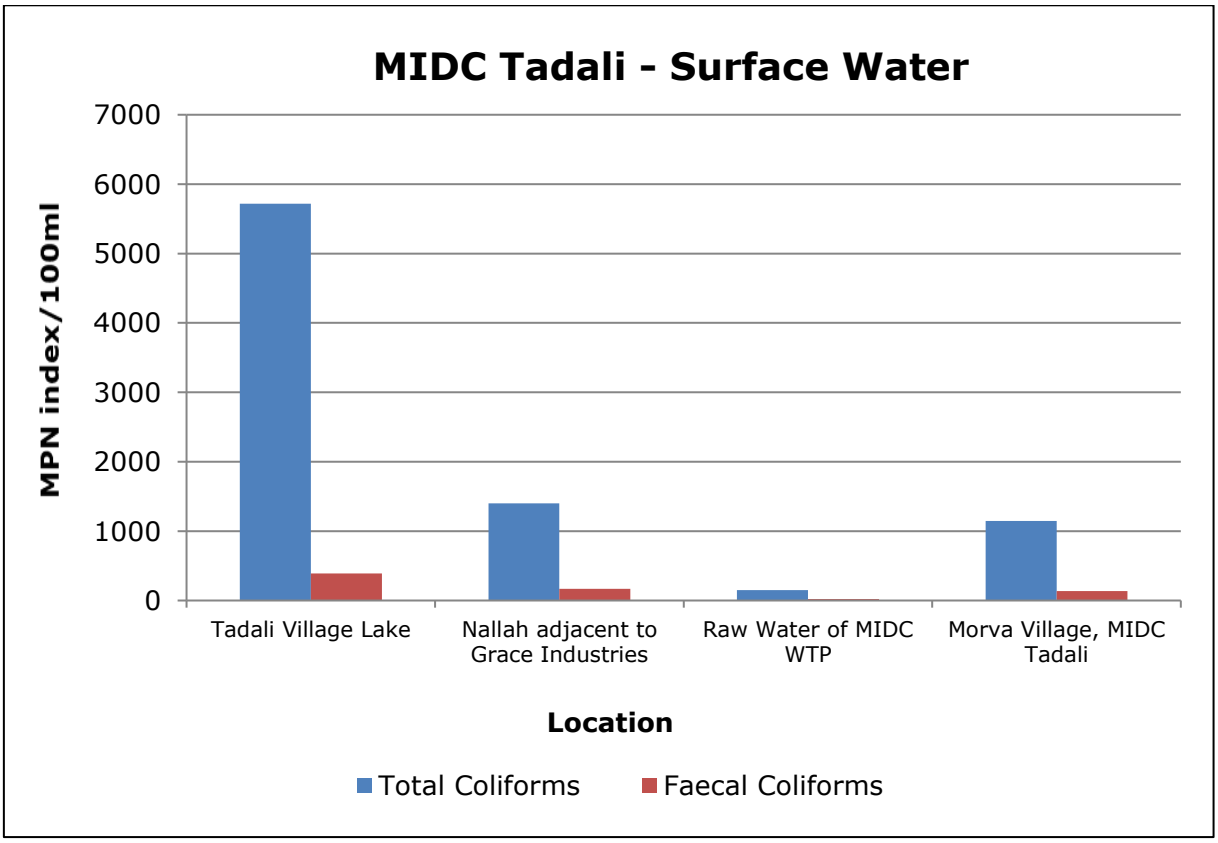


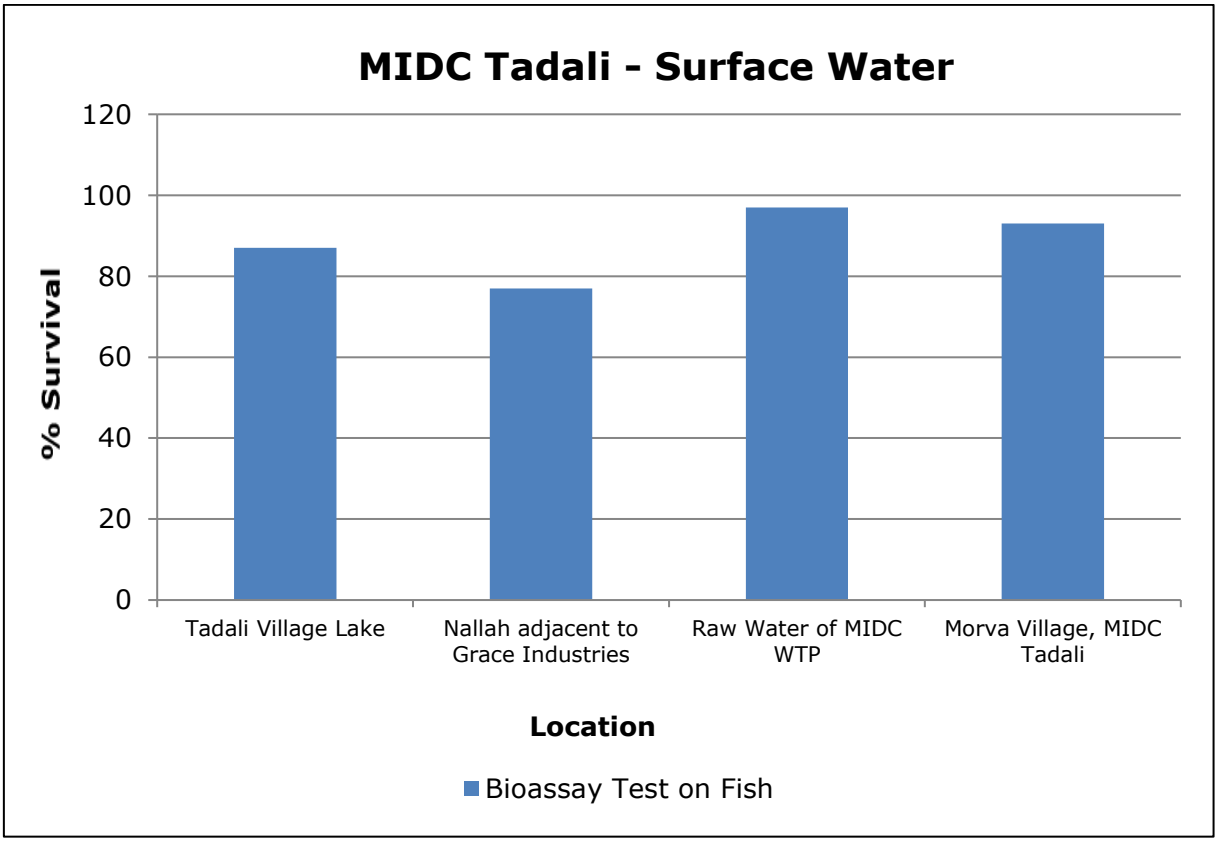



MIDC Tadali - Surface Water
Concentration (mg/L)
1800
1600
1400
1200
1000
800
600
400
200
0
Tadali Village Lake
Nallah adjacent to Grace Industries
Raw Water of MIDC WTP
Morva Village, MIDC Tadali
Location
SS
TDS
COD
BOD


MIDC Tadali - Surface Water
% Saturation
62
60
58
56
54
52
50
48
46
Tadali Village Lake
Nallah adjacent to Grace Industries
Raw Water of MIDC WTP
Morva Village, MIDC Tadali
Location
Dissolved Oxygen


MIDC Tadali - Surface Water
Concentration (mg/L)
8
7
6
5
4
3
2
1
0
Tadali Village Lake
Nallah adjacent to Grace Industries
Raw Water of MIDC WTP
Morva Village, MIDC Tadali
Location
NO2-N
NO3-N
(NO2 + NO3)
Flouride
Total Phosphate
TKN
NH4+NH3-N
Total Nitrogen
Total Nitrogen


MIDC Tadali - Surface Water
MPN index/100ml
7000
6000
5000
4000
3000
2000
1000
0
Tadali Village Lake
Nallah adjacent to Grace Industries
Raw Water of MIDC WTP
Morva Village, MIDC Tadali
Location
Total Coliforms
Faecal Coliforms


MIDC Tadali - Surface Water
120
100
80
60
40
20
0
% Survival
Tadali Village Lake
Nallah adjacent to Grace Industries
Raw Water of MIDC WTP
Morva Village, MIDC Tadali
Location
Bioassay Test on Fish

2. **MIDC Chandrapur:** Three surface water samples are collected from MIDC Chandrapur region.

- All three water samples collected are acceptable in sanitary survey, colour, smell and transparency.
- pH, Electrical Conductivity, Suspended Solids and Total Dissolved Solids are also well within the limits at all three samples collected.
- 100% survival was achieved in one sample out of three samples collected for Fish Bioassay.
- Metals like Hexavalent Chromium (Cr^{6+}), Total Chromium, Total Arsenic, Cadmium, Copper, Lead, Zink, Nickel, Manganese, Iron, etc. are observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- Total Phosphate and Total Kjeldahl Nitrogen exceeded prescribed limit at all locations.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all three samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all three samples collected.

Table 6.3 MIDC Chandrapur – 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.	Nallah Opposite Manidhari Industry	19°58’46.5’’N	79°13’57.7’’E	20.05.2025	22.05.2025	24.05.2025
2.	Nallah Near Gagangiri Village	19°58’03.5’’N	79°14’50.5’’E	20.05.2025	22.05.2025	24.05.2025
3.	Nallah at Dhanora Bridge	19°57’37.1’’N	79°15’40.5’’E	20.05.2025	22.05.2025	24.05.2025

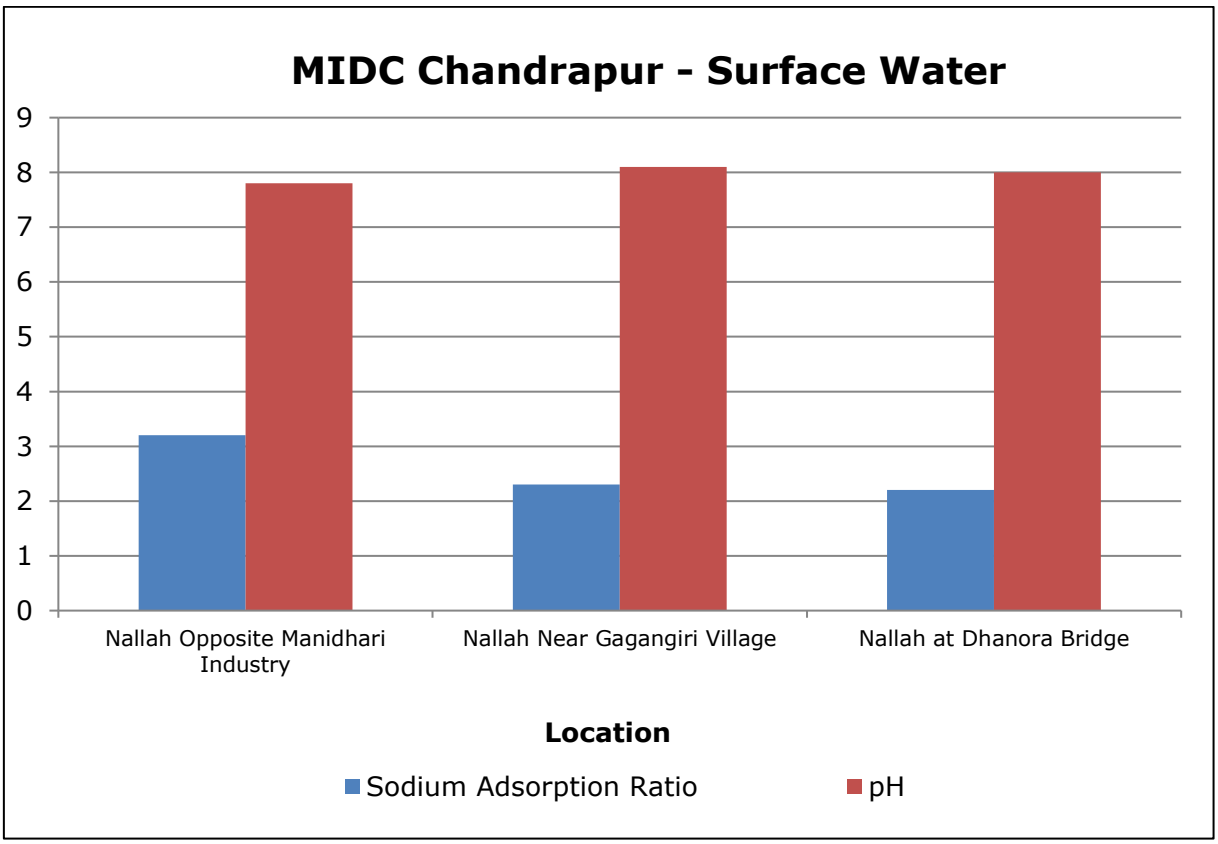
Fig. Geographical Locations of Surface Water Sampling MIDC Chandrapur

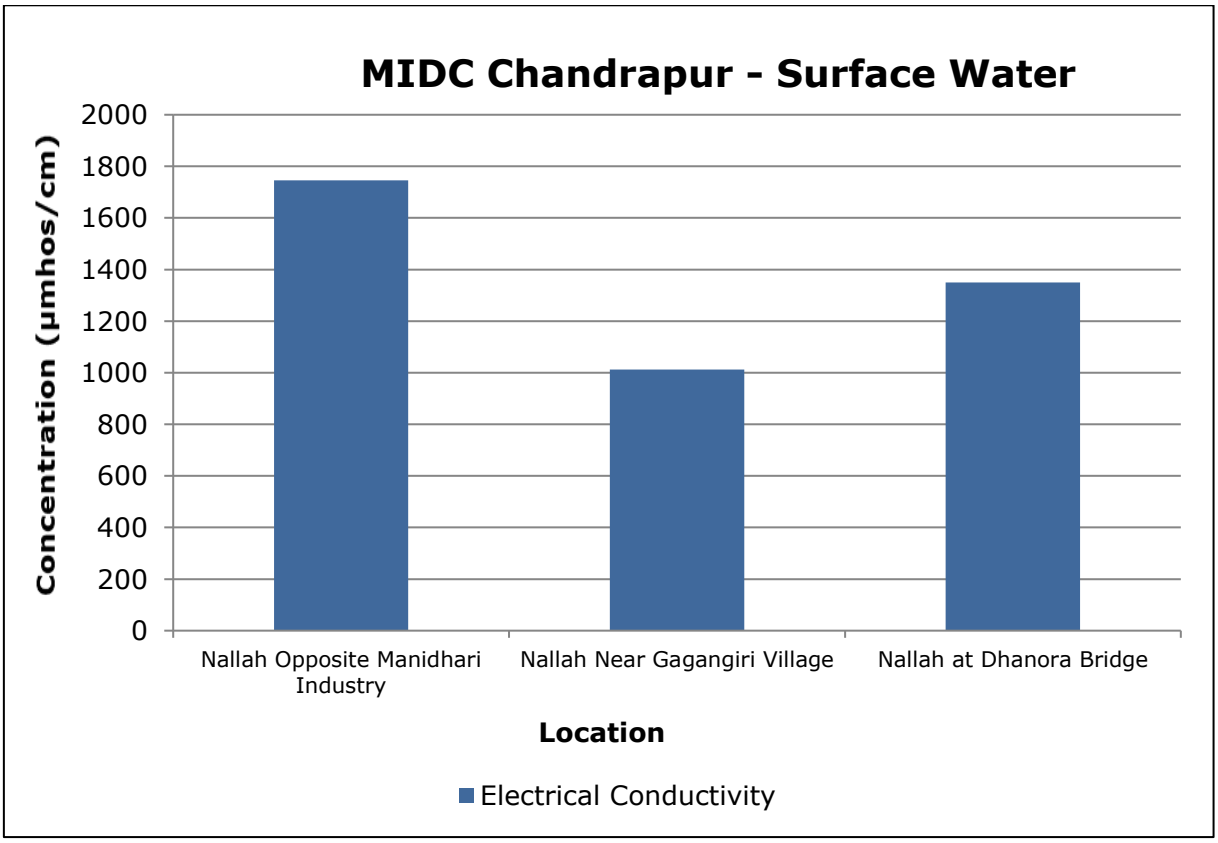
Table 6.4 MIDC Chandrapur – Results of Surface Water

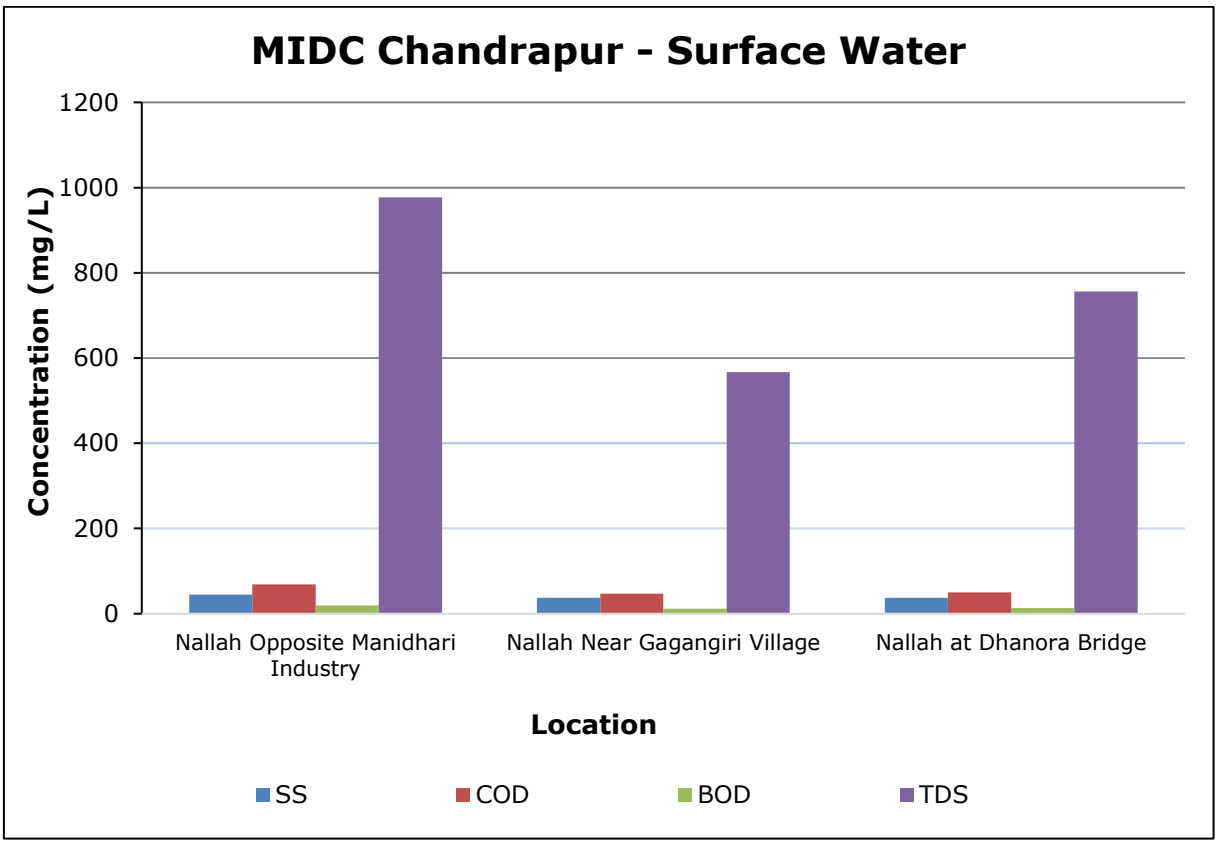
Parameters	Unit	Results		
		Nallah Opposite Manidhari Industry	Nallah Near Gagangiri Village	Nallah at Dhanora Bridge
Sanitary Survey	-	Generally Clean Neighbourhood	Generally Clean Neighbourhood	Generally Clean Neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident
Transparency	m	0.1	0.1	0.2
Temperature	^oC	27	27	26
Colour	Hazen	6	1	1
Odour	-	Agreeable	Agreeable	Agreeable
pH	-	7.8	8.1	8.0
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	45	37	37
Total Dissolved Solids	mg/L	977	567	756
Dissolved Oxygen (% Saturation)	%	51	58	54
Chemical Oxygen Demand	mg/L	69	47	50
Biochemical Oxygen Demand (3 days, 27^oC)	mg/L	19	12	13
Electrical Conductivity (at 25^oC)	µmhos/cm	1746	1012	1350
Nitrite Nitrogen	mg/L	0.76	0.09	0.06
Nitrate Nitrogen	mg/L	6.3	3.6	2.7
(NO_2+ NO_3)-Nitrogen	mg/L	7.1	3.7	2.7
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	1.5	1.4	0.7
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.4	0.2	0.4
Sodium Adsorption Ratio	-	3.2	2.3	2.2
Total Coliforms	MPN Index/ 100 ml	5947	5666	5720
Faecal Coliforms	MPN Index/ 100 ml	320	141	1578
Total Phosphate (as P)	mg/L	0.6	0.4	0.6
Total Kjeldahl Nitrogen (as N)	mg/L	13	9.3	4.7
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.4	0.5	0.2

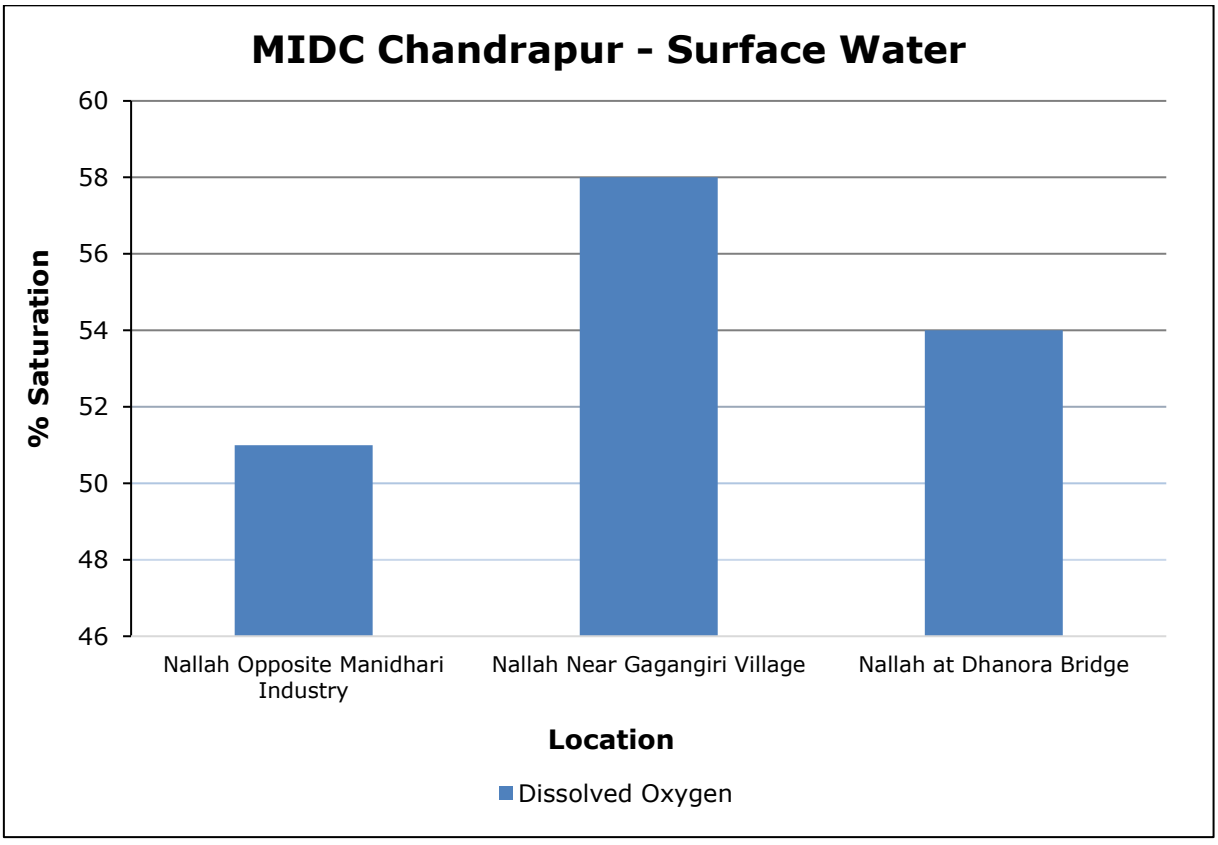
Parameters	Unit	Results		
		Nallah Opposite Manidhari Industry	Nallah Near Gagangiri Village	Nallah at Dhanora Bridge
Total Nitrogen	mg/L	20	13	7.4
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	0.0022	0.0018	0.0014
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.14	0.09	0.11
Nickel (as Ni)	mg/L	0.03	0.02	0.01
Copper (as Cu)	mg/L	0.031	BLQ	0.022
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.04	0.04	0.04
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	0.009	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.15	0.04	0.08
Iron (as Fe)	mg/L	0.34	0.28	0.16
Vanadium (as V)	mg/L	0.02	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	0.3	0.2	0.3
Bioassay Test on fish	% survival	90	100	93

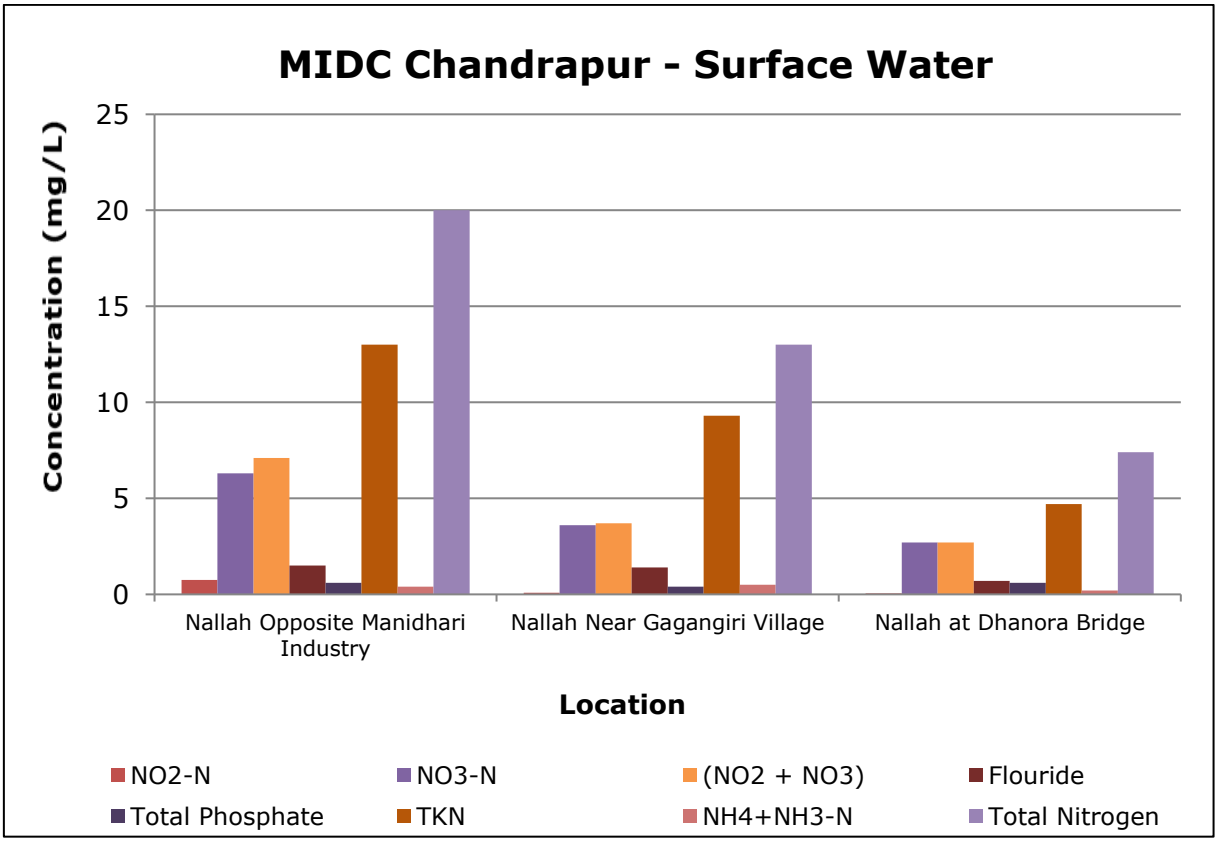
Graphs - Surface Water Quality of MIDC Chandrapur

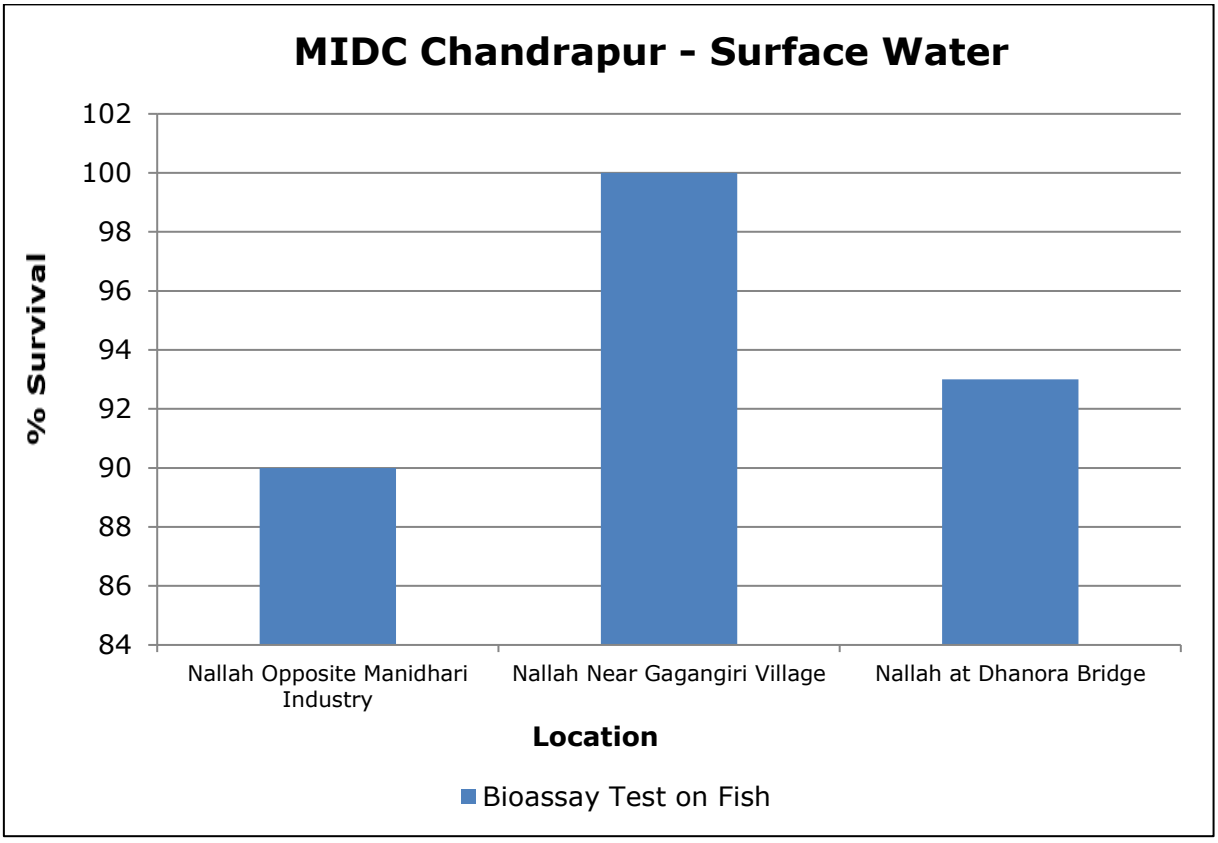





MIDC Chandrapur - Surface Water
Concentration (mg/L)
1200
1000
800
600
400
200
0
Nallah Opposite Manidhari Industry
Nallah Near Gagangiri Village
Nallah at Dhanora Bridge
Location
SS
COD
BOD
TDS


MIDC Chandrapur - Surface Water
% Saturation
60
58
56
54
52
50
48
46
Nallah Opposite Manidhari Industry
Nallah Near Gagangiri Village
Nallah at Dhanora Bridge
Location
Dissolved Oxygen


MIDC Chandrapur - Surface Water
Concentration (mg/L)
25
20
15
10
5
0
Nallah Opposite Manidhari Industry
Nallah Near Gagangiri Village
Nallah at Dhanora Bridge
Location
NO2-N
NO3-N
(NO2 + NO3)
Flouride
Total Phosphate
TKN
NH4+NH3-N
Total Nitrogen


MIDC Chandrapur - Surface Water
% Survival
102
100
98
96
94
92
90
88
86
84
Nallah Opposite Manidhari Industry
Nallah Near Gagangiri Village
Nallah at Dhanora Bridge
Location
Bioassay Test on Fish

3. **MIDC Ghugus:** Five Surface water samples are collected from MIDC Ghugus.

- All five water samples collected are acceptable in sanitary survey, colour and smell.
- pH, Electrical Conductivity, Suspended Solids and Total Dissolved Solids are also well within the limits at all five samples collected.
- 100% survival was not achieved in Fish Bioassay test at all locations.
- Metals like Zinc, Nickel, Copper, Arsenic, Hexavalent Chromium (Cr^{6+}), Lead, Cadmium, Manganese, Selenium, etc. are observed either below the limit of quantification or below their standard limits.
- BOD, Total Phosphate, Fluoride and Iron is observed above the standard limits at few locations.
- Parameters like Total Residual Chlorine, Total Kjeldahl Nitrogen, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all five samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all five samples collected.

Table 6.5 MIDC Ghugus – 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.	Wardha river Near WCL WTP Ghugus OCM	19°57’25.8’’N	79°06’11.4’’E	13.05.2025	15.05.2025	17.05.2025
2.	Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM	19°57’23.3’’N	79°06’14.5’’E	13.05.2025	15.05.2025	17.05.2025
3.	(NWMP) Wardha River behind ACC plant	19°54’16.7’’N	79°06’54.9’’E	13.05.2025	15.05.2025	17.05.2025
4.	Nallah at Usgaon, Shengaon road	19°55’18.5’’N	79°07’57.5’’E	13.05.2025	15.05.2025	17.05.2025
5.	Nallah Water down site of ACC Colony.	19°55’42.3’’N	79°06’54.7’’E	13.05.2025	15.05.2025	17.05.2025

Fig. Geographical Locations of Surface Water Sampling MIDC Ghugus

Table 6.6 MIDC Ghugus – Results of Surface Water

Parameters	**Unit**	**Results**		
		Wardha river Near WCL WTP Ghugus OCM	**Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM**	**(NWMP) Wardha River behind ACC plant**
Sanitary Survey	-	Generally Clean Neighbourhood	Reasonably clean Neighbourhood	Generally Clean Neighbourhood
General Appearance	-	No Floating Matter	Floating matter Evident	Floating Matter Evident
Transparency	m	0.3	0.2	0.2
Temperature	^{o}C	29	28	28
Colour	Hazen	1	2	2
Odour	-	Agreeable	Agreeable	Agreeable
pH	-	8.2	8.0	8.0
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	16	23	21
Total Dissolved Solids	mg/L	510	733	524
Dissolved Oxygen (% Saturation)	%	68	51	60
Chemical Oxygen Demand	mg/L	31	145	52

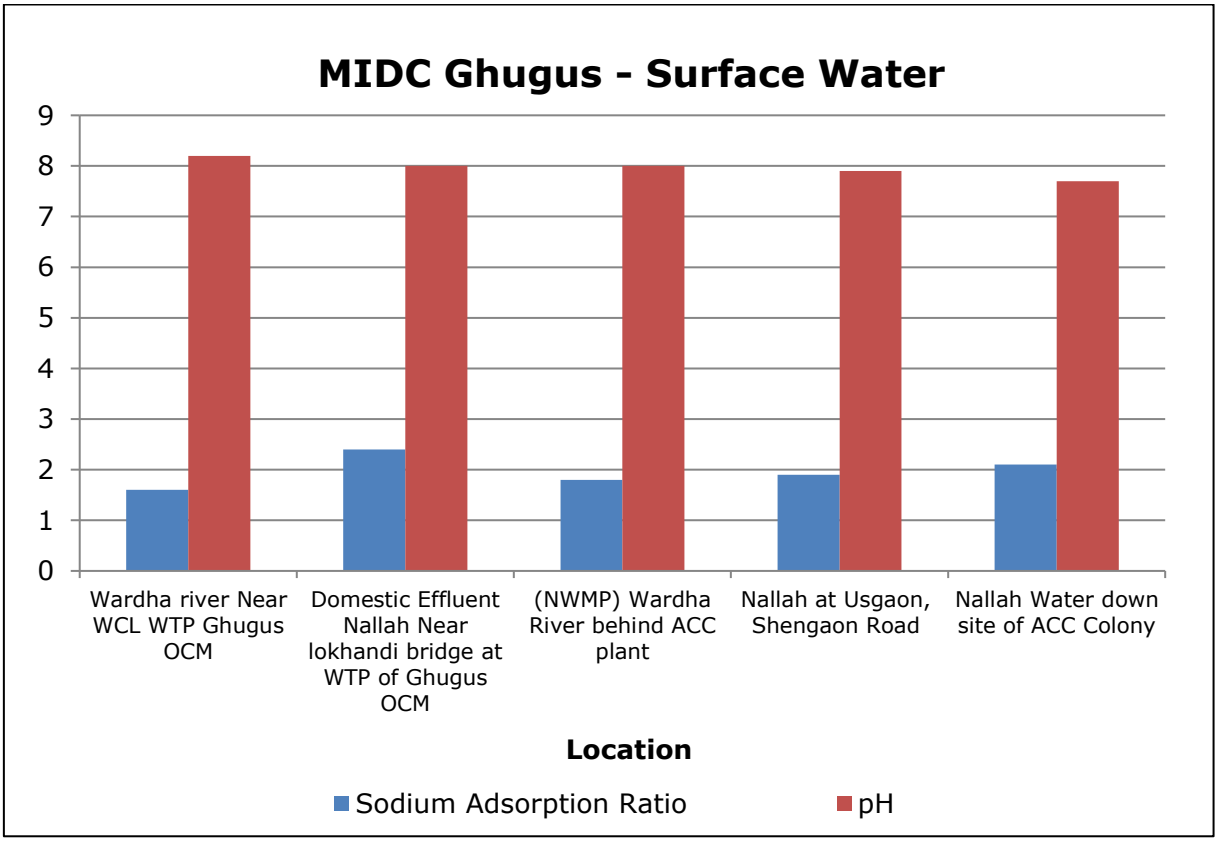
Parameters	Unit	Results		
		Wardha river Near WCL WTP Ghugus OCM	Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM	(NWMP) Wardha River behind ACC plant
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	8	49	14
Electrical Conductivity (at 25°C)	µmhos/cm	912	1309	937
Nitrite Nitrogen	mg/L	BLQ	0.10	BLQ
Nitrate Nitrogen	mg/L	0.5	1.1	0.4
(NO_2+ NO_3)-Nitrogen	mg/L	0.5	1.2	0.4
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	1.8	1.7	1.6
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.2	0.6	0.2
Sodium Adsorption Ratio	-	1.6	2.4	1.8
Total Coliforms	MPN Index/ 100 ml	530	183	5540
Faecal Coliforms	MPN Index/ 100 ml	107	98	205
Total Phosphate (as P)	mg/L	0.4	1.0	0.2
Total Kjeldahl Nitrogen (as N)	mg/L	0.6	2.1	0.7
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	0.1	0.2
Total Nitrogen	mg/L	1.1	3.3	2.0
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 (as PAH)	mg/L	0.0001	BLQ	0.0001
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.25	BLQ	BLQ
Nickel (as Ni)	mg/L	0.03	BLQ	0.01
Copper (as Cu)	mg/L	0.054	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.08	BLQ	0.02
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.012	BLQ	BLQ

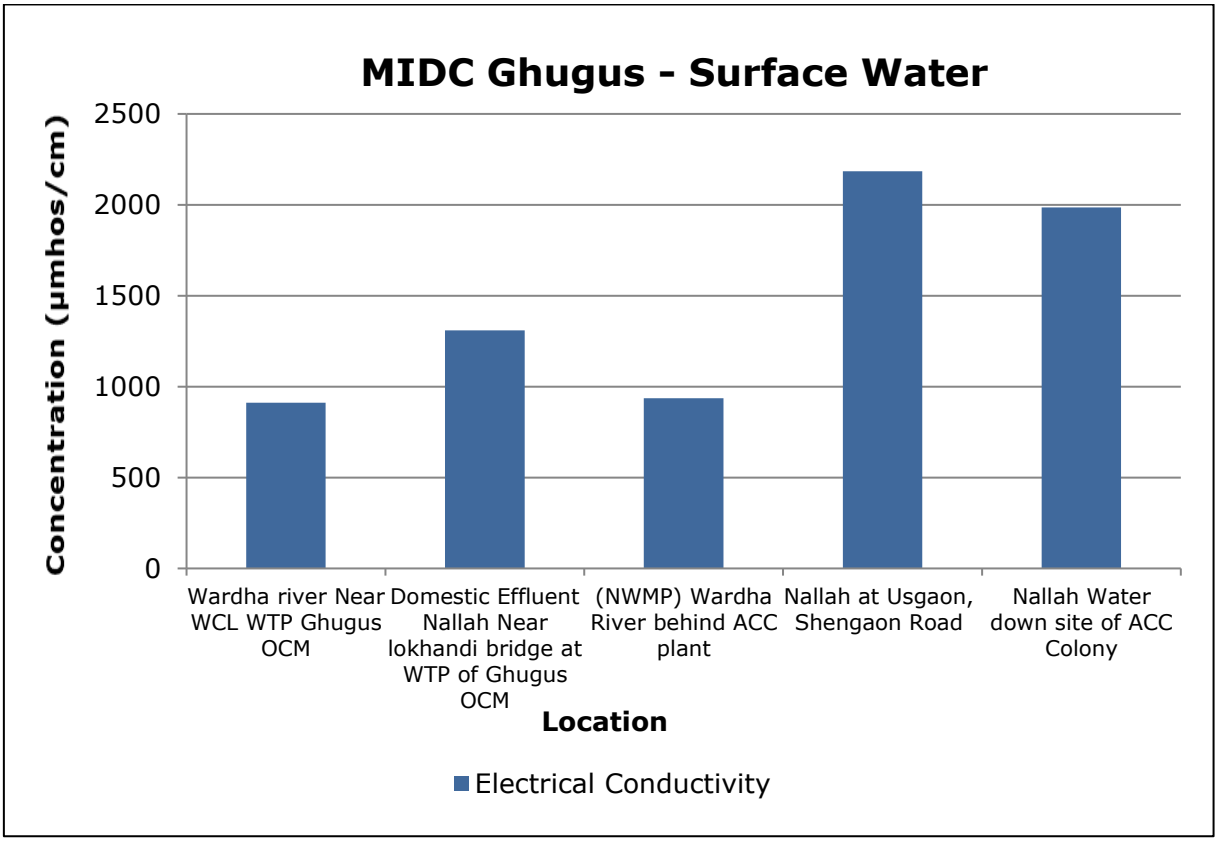
Parameters	Unit	Results		
		Wardha river Near WCL WTP Ghugus OCM	Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM	(NWMP) Wardha River behind ACC plant
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.022	BLQ	BLQ
Iron (as Fe)	mg/L	0.47	BLQ	0.11
Vanadium (as V)	mg/L	0.02	BLQ	0.04
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	97	87	93

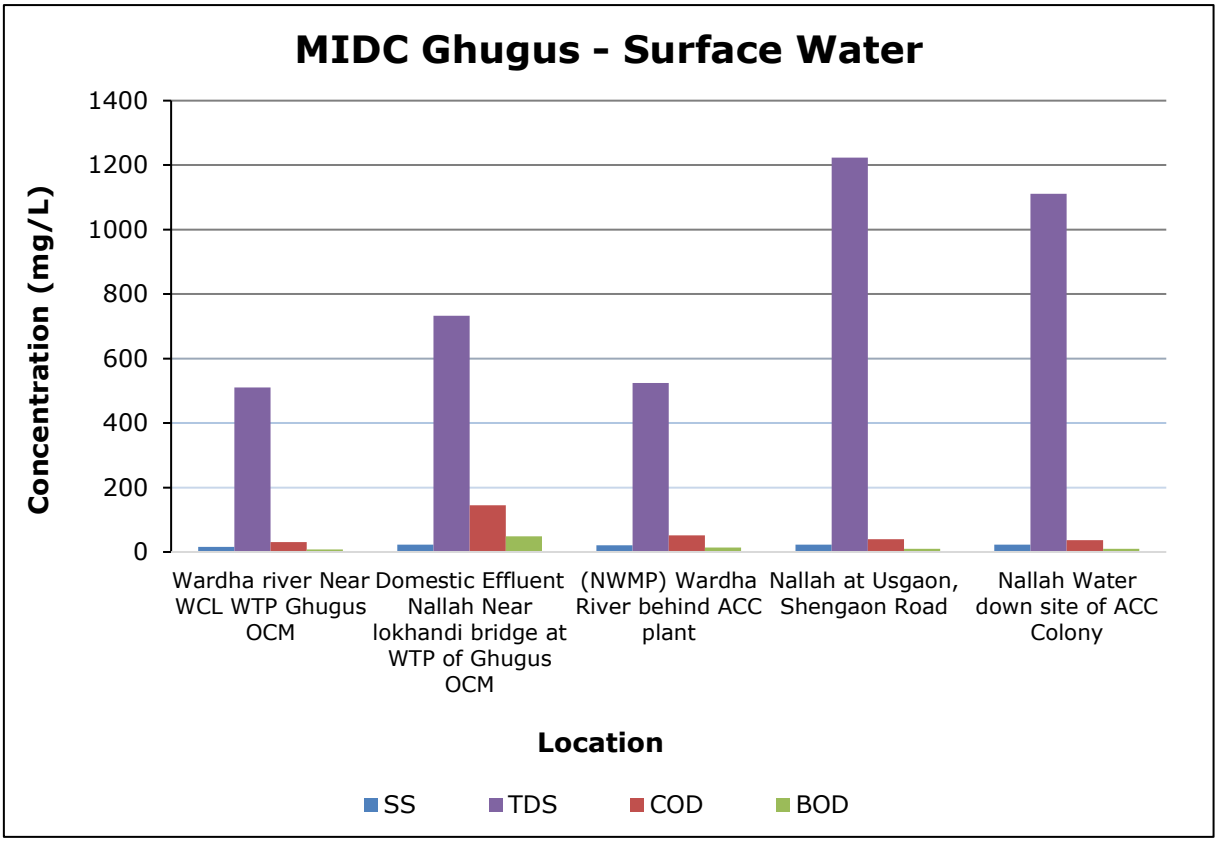
Parameters	Unit	Result	
		Nallah at Usgaon, Shengaon Road	Nallah Water down site of ACC Colony
Sanitary Survey	-	Reasonably clean Neighbourhood	Reasonably clean Neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident
Transparency	m	0.2	0.2
Temperature	^{o}C	29	29
Colour	Hazen	1	1
Odour	-	Agreeable	Agreeable
pH	-	7.9	7.7
Oil & Grease	mg/L	BLQ	BLQ
Total Suspended Solids	mg/L	23	23
Total Dissolved Solids	mg/L	1223	1111
Dissolved Oxygen (% Saturation)	%	61	66
Chemical Oxygen Demand	mg/L	40	37
Biochemical Oxygen Demand (3 days, 27^{o}C)	mg/L	10	10
Electrical Conductivity (at 25^{o}C)	µmhos/cm	2184	1986
Nitrite Nitrogen	mg/L	0.03	BLQ
Nitrate Nitrogen	mg/L	0.4	0.5
(NO_2+ NO_3)-Nitrogen	mg/L	0.4	0.5
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ
Free Residual Chlorine	mg/L	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ

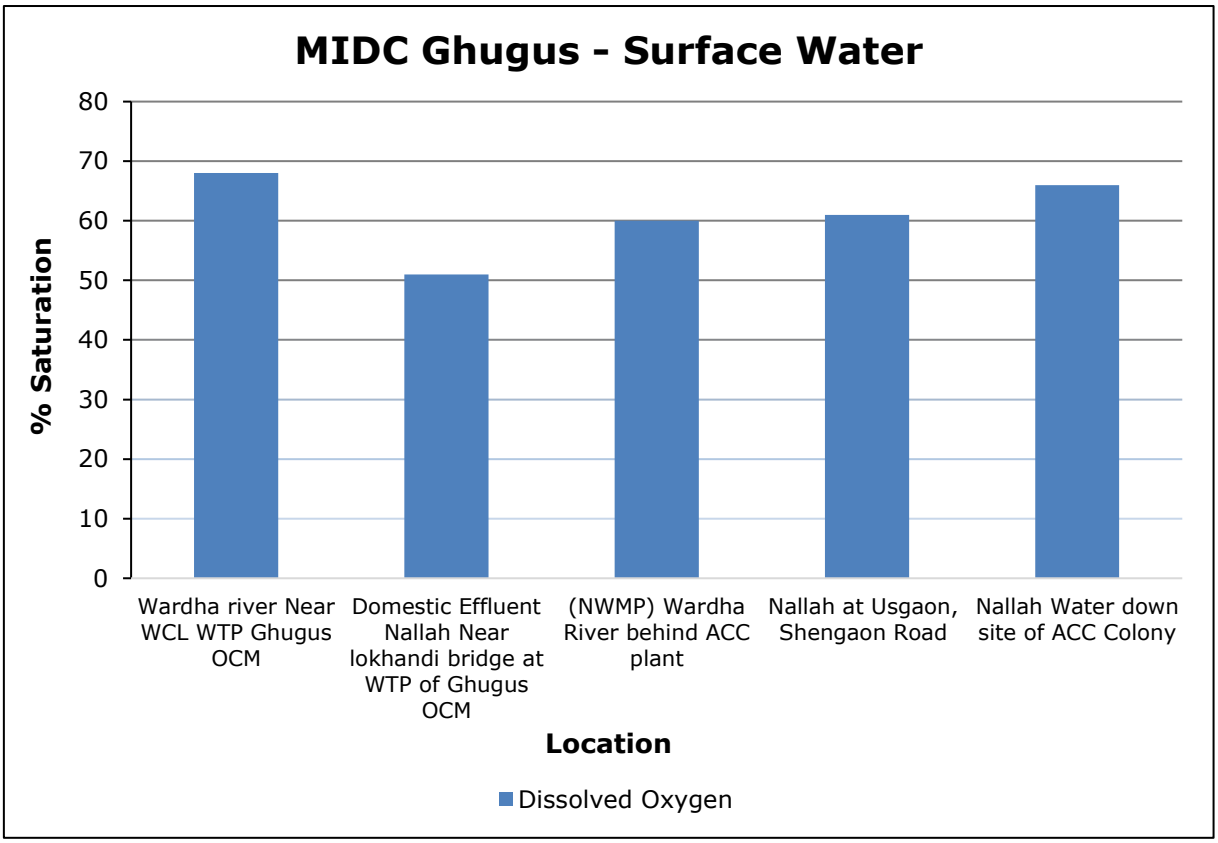
Parameters	Unit	Result	
		Nallah at Usgaon, Shengaon Road	Nallah Water down site of ACC Colony
Fluoride (as F)	mg/L	2.3	2.7
Sulphide (as H_2S)	mg/L	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.7	0.6
Sodium Adsorption Ratio	-	1.9	2.1
Total Coliforms	MPN Index/ 100 ml	630	3273
Faecal Coliforms	MPN Index/ 100 ml	335	310
Total Phosphate (as P)	mg/L	0.9	0.8
Total Kjeldahl Nitrogen (as N)	mg/L	0.6	1.2
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.2	0.2
Total Nitrogen	mg/L	1.4	1.7
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ
Anionic Detergents (as MBAS)	mg/L	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	0.0001
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.06
Nickel (as Ni)	mg/L	BLQ	0.03
Copper (as Cu)	mg/L	BLQ	0.030
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	0.06
Total Arsenic (as As)	mg/L	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ
Manganese (as Mn)	mg/L	BLQ	0.05
Iron (as Fe)	mg/L	BLQ	0.30
Vanadium (as V)	mg/L	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ
Bioassay Test on fish	% survival	93	93

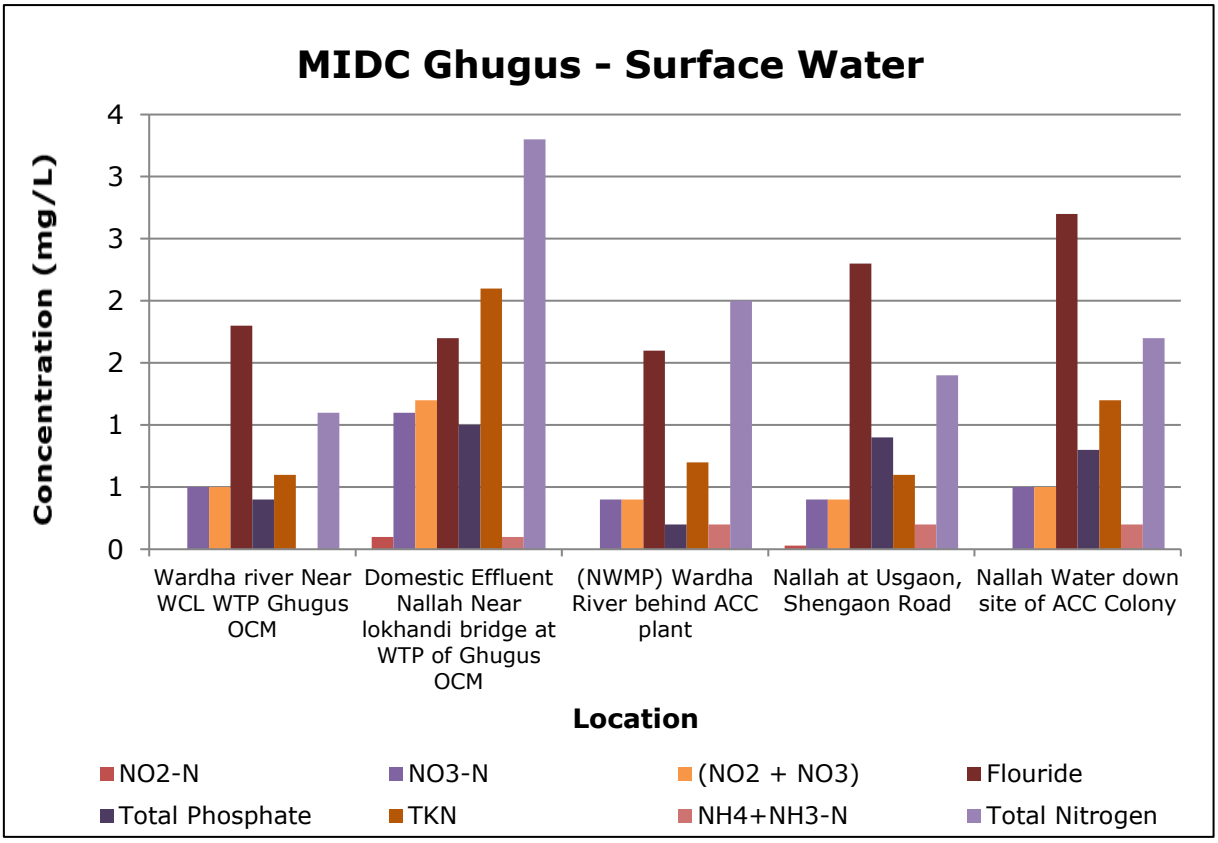
Graphs - Surface Water Quality of MIDC Ghugus

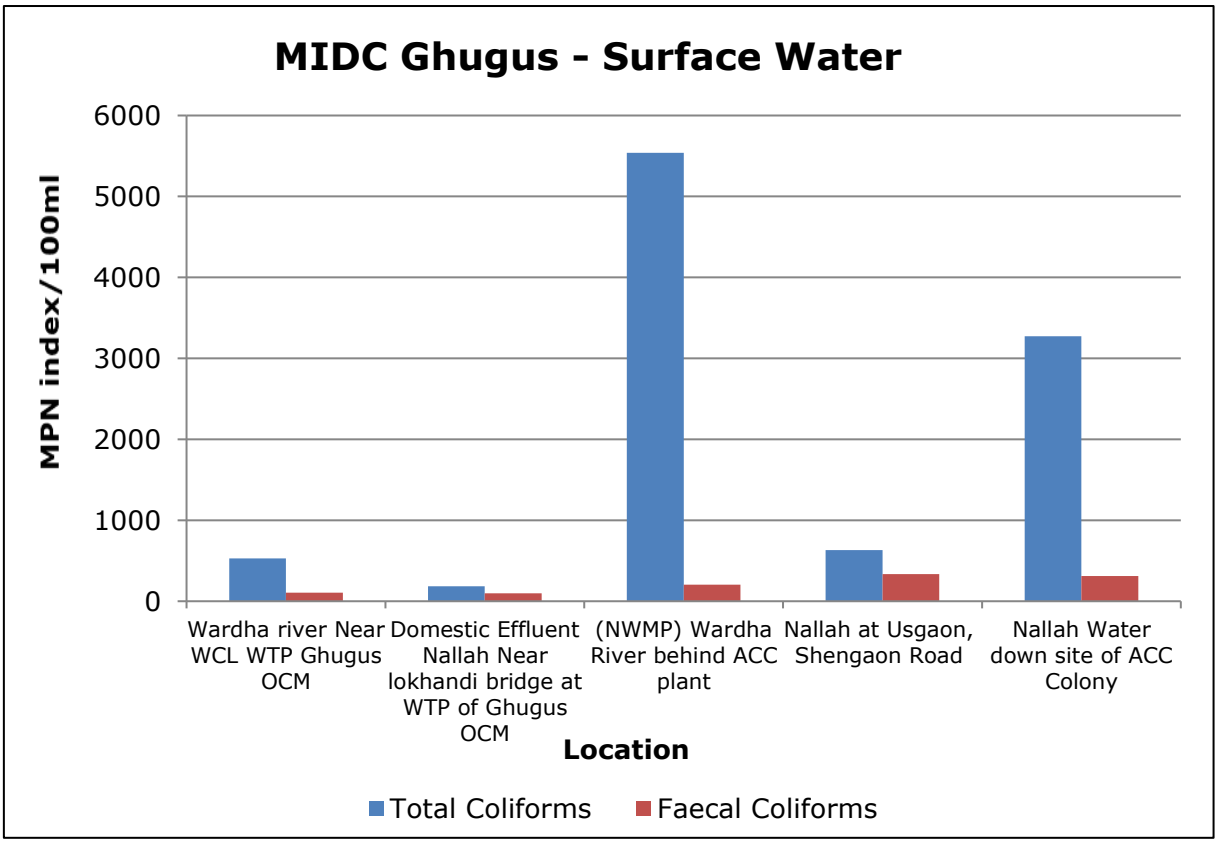


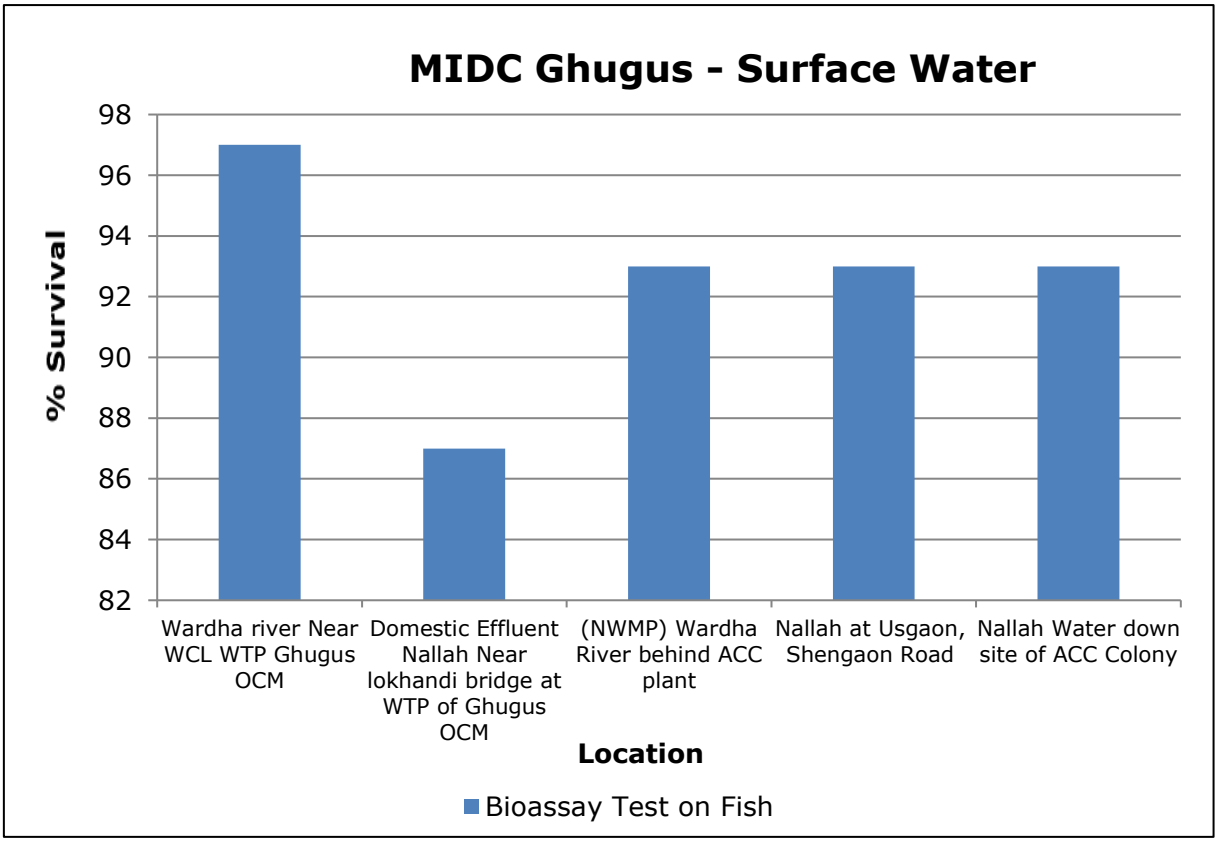



MIDC Ghugus - Surface Water
Concentration (mg/L)
1400
1200
1000
800
600
400
200
0
Wardha river Near WCL WTP Ghugus OCM
Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM
(NWMP) Wardha River behind ACC plant
Nallah at Usgaon, Shengaon Road
Nallah Water down site of ACC Colony
Location
SS
TDS
COD
BOD


MIDC Ghugus - Surface Water
% Saturation
80
70
60
50
40
30
20
10
0
Wardha river Near WCL WTP Ghugus OCM
Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM
(NWMP) Wardha River behind ACC plant
Nallah at Usgaon, Shengaon Road
Nallah Water down site of ACC Colony
Location
Dissolved Oxygen


MIDC Ghugus - Surface Water
Concentration (mg/L)
4
3
3
2
2
1
1
0
Wardha river Near WCL WTP Ghugus OCM
Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM
(NWMP) Wardha River behind ACC plant
Nallah at Usgaon, Shengaon Road
Nallah Water down site of ACC Colony
Location
NO2-N
NO3-N
(NO2 + NO3)
Flouride
Total Phosphate
TKN
NH4+NH3-N
Total Nitrogen


MIDC Ghugus - Surface Water
MPN index/100ml
6000
5000
4000
3000
2000
1000
0
Wardha river Near WCL WTP Ghugus OCM
Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM
(NWMP) Wardha River behind ACC plant
Nallah at Usgaon, Shengaon Road
Nallah Water down site of ACC Colony
Location
Total Coliforms
Faecal Coliforms


MIDC Ghugus - Surface Water
% Survival
98
96
94
92
90
88
86
84
82
Wardha river Near WCL WTP Ghugus OCM
Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM
(NWMP) Wardha River behind ACC plant
Nallah at Usgaon, Shengaon Road
Nallah Water down site of ACC Colony
Location
Bioassay Test on Fish

4. **MIDC Ballarpur:** Six Surface water samples are collected from MIDC Ballarpur.

- All six water samples collected are acceptable in sanitary survey, colour, smell and transparency.
- pH, Electrical conductivity, Suspended Solids and Total Dissolved Solids are also well within the limits at all six samples collected.
- 100% survival was achieved in Fish Bioassay test in two locations out of six locations.
- Metals like Hexavalent Chromium (Cr^{6+}), Total Arsenic, Zinc, Copper, Total Chromium, Iron, etc. are observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen, Total Phosphate and Phenolic compounds also meet the criteria as prescribed by CPCB.
- The concentration of Total Phosphate and Total Kjeldahl Nitrogen exceeded at few locations.
- BOD and Fluoride exceeds at one location out of 6 locations.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all six samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all six samples collected.

Table 6.7 MIDC Ballarpur – 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.	Nallah Near Petrol Pump at Ballarpur Bamni Road	19°50’41.4’’N	79°21’29.1’’E	13.05.2025	15.05.2025	17.05.2025
2.	Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins	19°51’11.8’’N	79°20’45.8’’E	13.05.2025	15.05.2025	17.05.2025
3.	Wardha River upstream at Ballarpur	19°51’10.5’’N	79°20’20.3’’E	13.05.2025	15.05.2025	17.05.2025
4.	(NWMP) Wardha River downstream, Near Rajura Bridge	19°48’52.8’’N	79°22’39.2’’E	13.05.2025	15.05.2025	17.05.2025
5.	Nallah Near MSW Municipal Corporation, Near Railway line	19°50’23.5’’N	79°21’23.9’’E	13.05.2025	15.05.2025	17.05.2025

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
6.	Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump	19°51'26.5"N	79°20'45.1"E	13.05.2025	15.05.2025	17.05.2025

Fig. Geographical Locations of Surface Water Sampling MIDC Ballarpur

Table 6.8 MIDC Ballarpur – Results of Surface Water

Parameters	Unit	Results		
		Nallah Near Petrol Pump at Ballarpur Bamni Road	Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins	Wardha River upstream at Ballarpur
Sanitary Survey	-	Generally Clean Neighbourhood	Generally Clean Neighbourhood	Generally Clean Neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident
Transparency	m	0.1	0.1	0.3
Temperature	°C	31	29	29
Colour	Hazen	2	1	1
Odour	-	Not Agreeable	Agreeable	Not Agreeable

Parameters	Unit	Results		
		Nallah Near Petrol Pump at Ballarpur Bamni Road	Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins	Wardha River upstream at Ballarpur
pH	-	7.3	7.6	7.9
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	31	25	27
Total Dissolved Solids	mg/L	1453	376	433
Dissolved Oxygen (% Saturation)	%	48	67	68
Chemical Oxygen Demand	mg/L	88	28	34
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	27	7	9
Electrical Conductivity (at 25°C)	µmhos/cm	2597	673	774
Nitrite Nitrogen	mg/L	0.26	0.05	0.07
Nitrate Nitrogen	mg/L	4.7	1.4	0.7
(NO_2+ NO_3)-Nitrogen	mg/L	4.8	1.4	0.8
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	1.6	1.6	1.7
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.4	BLQ	0.2
Sodium Adsorption Ratio	-	3.2	1.4	1.9
Total Coliforms	MPN Index/ 100 ml	1600	920	1247
Faecal Coliforms	MPN Index/ 100 ml	19	472	615
Total Phosphate (as P)	mg/L	1.2	0.2	0.3
Total Kjeldahl Nitrogen (as N)	mg/L	10.4	2.5	1.3
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	1.5	0.6	0.6
Total Nitrogen	mg/L	15.2	3.9	2.0
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 (as PAH)	mg/L	0.0001	0.0001	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.15	BLQ	BLQ

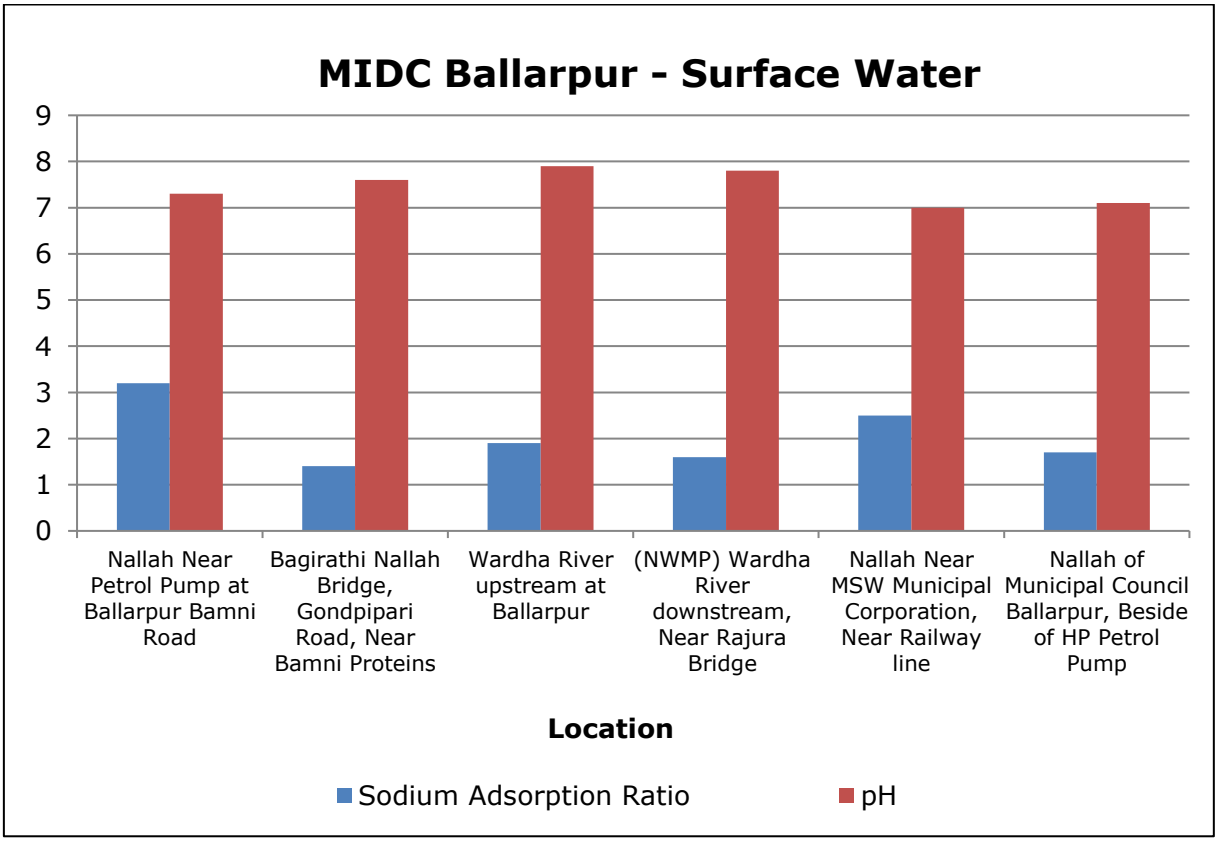
Parameters	Unit	Results		
		Nallah Near Petrol Pump at Ballarpur Bamni Road	Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins	Wardha River upstream at Ballarpur
Nickel (as Ni)	mg/L	0.02	0.02	0.02
Copper (as Cu)	mg/L	0.03	BLQ	0.03
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.05	0.06	0.06
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.10	BLQ	0.07
Iron (as Fe)	mg/L	0.2	0.2	0.2
Vanadium (as V)	mg/L	0.013	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	0.1	BLQ	0.1
Bioassay Test on fish	% survival	70	100	100

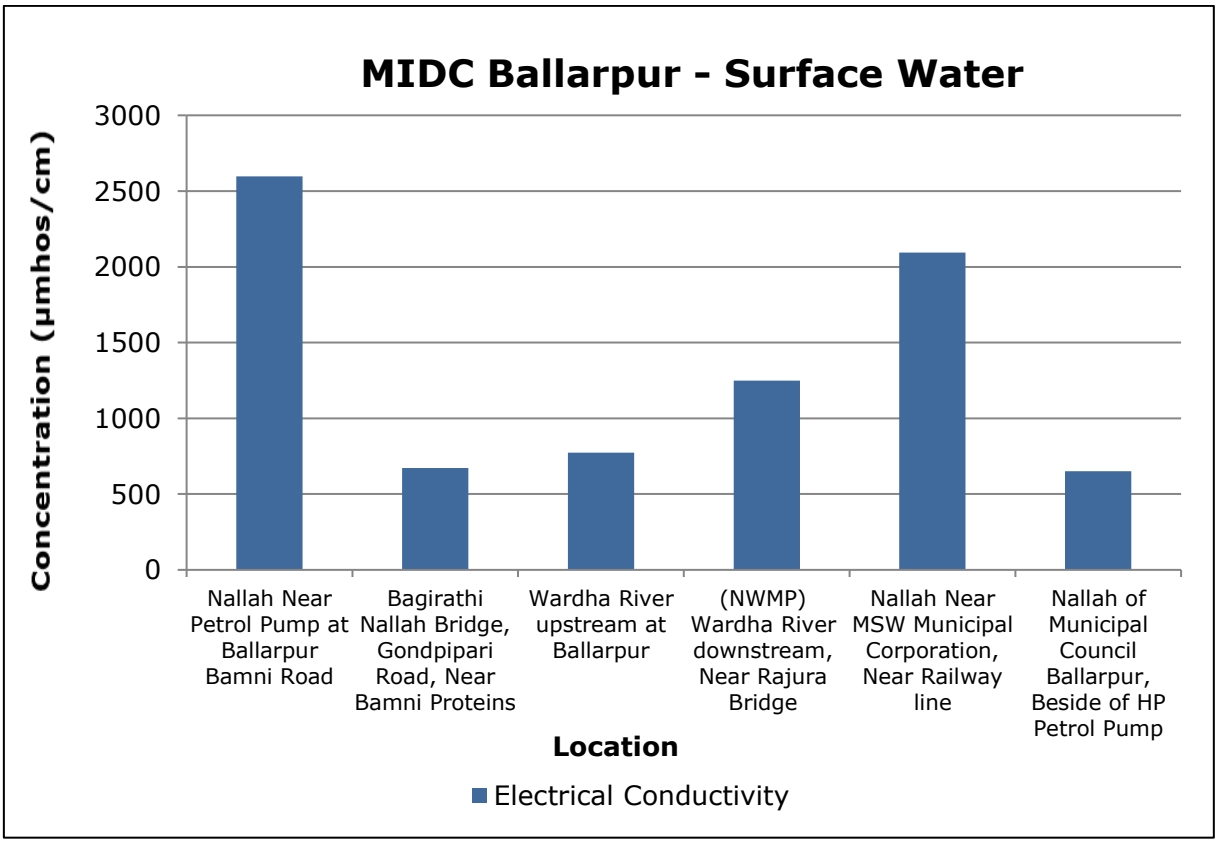
Parameters	Unit	Results		
		(NWMP) Wardha River downstream, Near Rajura Bridge	Nallah Near MSW Municipal Corporation, Near Railway line	Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump
Sanitary Survey	-	Generally Clean Neighbourhood	Generally Clean Neighbourhood	Generally Clean Neighbourhood
General Appearance	-	Floating Matter Evident	Floating Matter Evident	Floating Matter Evident
Transparency	m	0.4	0.2	0.1
Temperature	^oC	30	31	29
Colour	Hazen	1	2	1
Odour	-	Not Agreeable	Not Agreeable	Not Agreeable
pH	-	7.8	7.0	7.1
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	16	40	33
Total Dissolved Solids	mg/L	699	1173	363
Dissolved Oxygen (% Saturation)	%	57	57	61

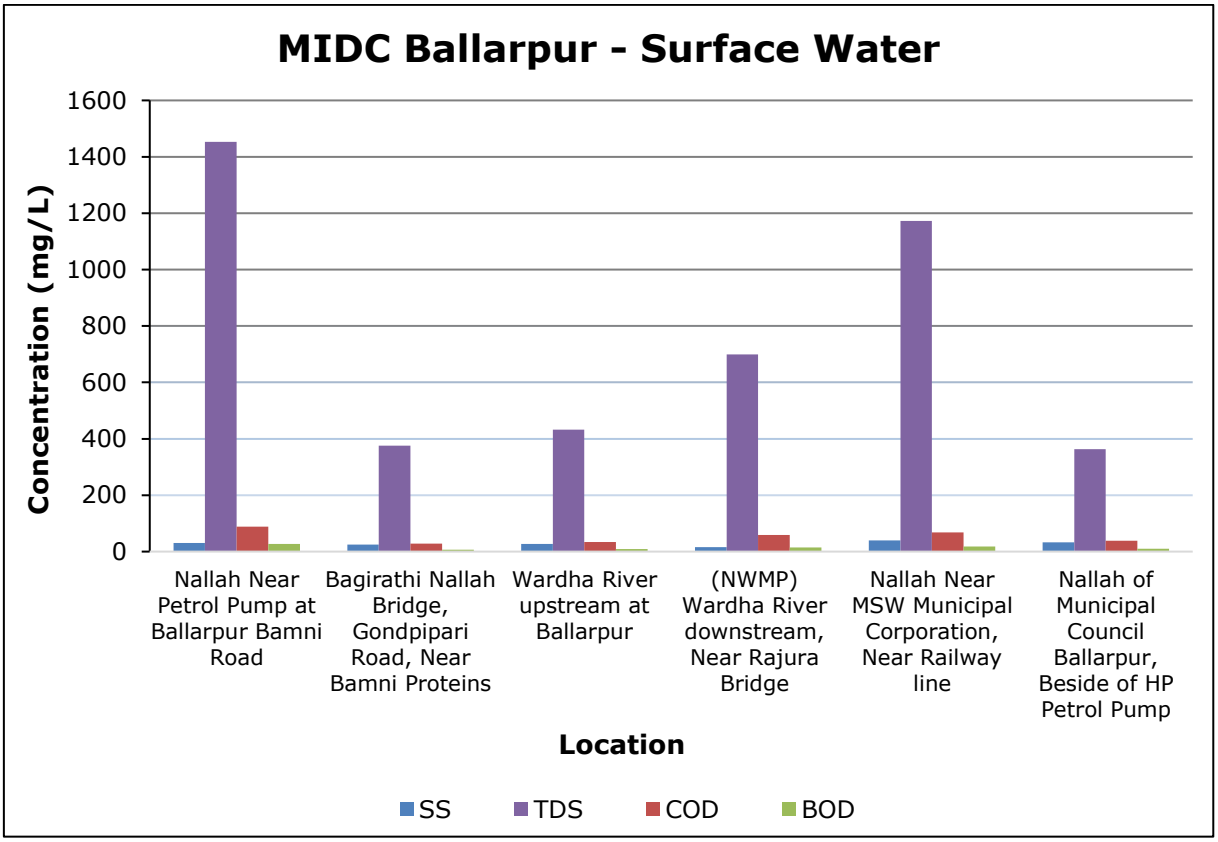
Parameters	Unit	Results		
		(NWMP) Wardha River downstream, Near Rajura Bridge	Nallah Near MSW Municipal Corporation, Near Railway line	Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump
Chemical Oxygen Demand	mg/L	59	68	38
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	15	18	10
Electrical Conductivity (at 25°C)	µmhos/cm	1249	2095	650
Nitrite Nitrogen	mg/L	0.05	0.03	0.19
Nitrate Nitrogen	mg/L	1.4	4.5	1.5
(NO_2+ NO_3)-Nitrogen	mg/L	1.5	4.5	1.7
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	1.4	1.2	1.3
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.3	0.4	0.1
Sodium Adsorption Ratio	-	1.6	2.5	1.7
Total Coliforms	MPN Index/ 100 ml	549	767	5947
Faecal Coliforms	MPN Index/ 100 ml	28	249	1093
Total Phosphate (as P)	mg/L	0.7	0.7	0.2
Total Kjeldahl Nitrogen (as N)	mg/L	2.7	13.3	3.2
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	0.5	0.6
Total Nitrogen	mg/L	4.2	17.8	4.9
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 (as PAH)	mg/L	0.0001	0.0002	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.06	0.11	BLQ
Nickel (as Ni)	mg/L	0.02	0.02	BLQ
Copper (as Cu)	mg/L	BLQ	0.06	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.03	0.05	BLQ
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ

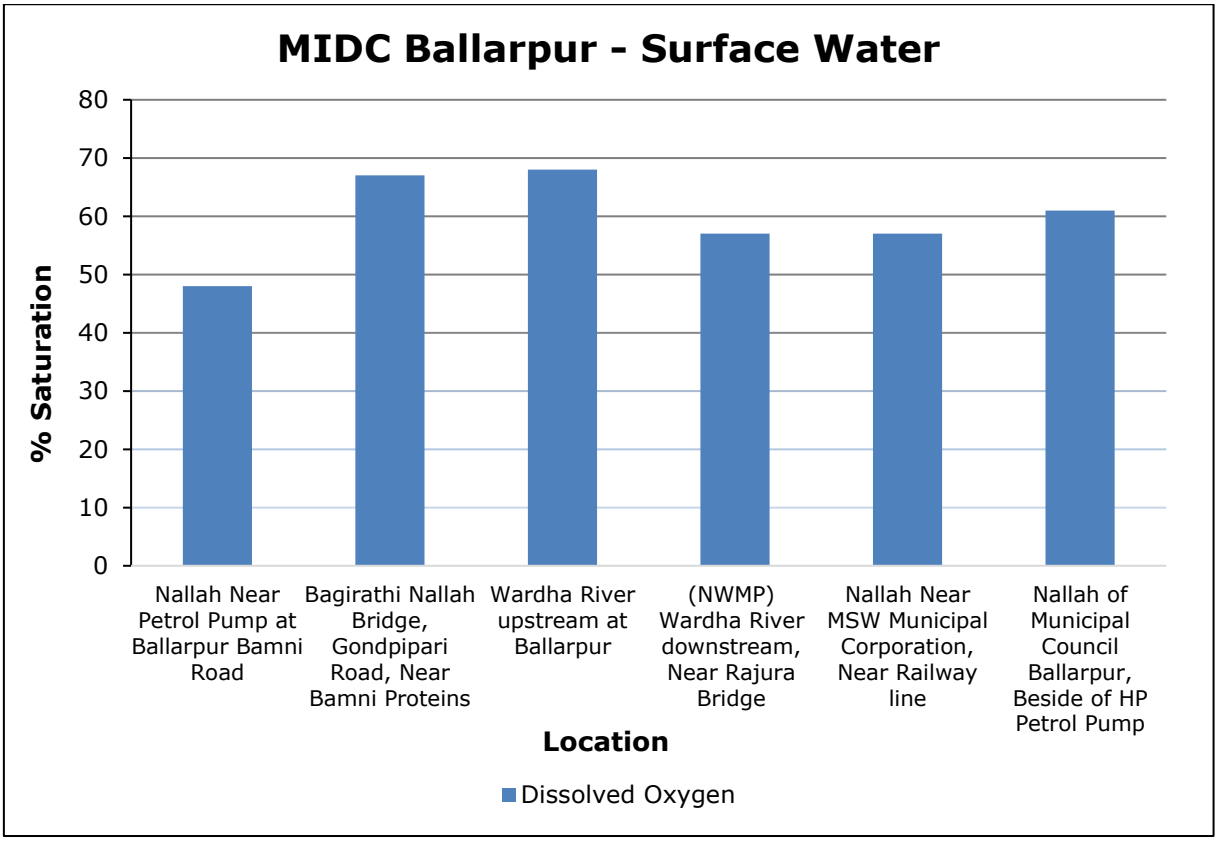
Parameters	Unit	Results		
		(NWMP) Wardha River downstream, Near Rajura Bridge	Nallah Near MSW Municipal Corporation, Near Railway line	Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump
Lead (as Pb)	mg/L	BLQ	0.010	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.04	0.06	BLQ
Iron (as Fe)	mg/L	0.3	0.3	0.1
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	0.2	0.1	BLQ
Bioassay Test on fish	% survival	87	90	97

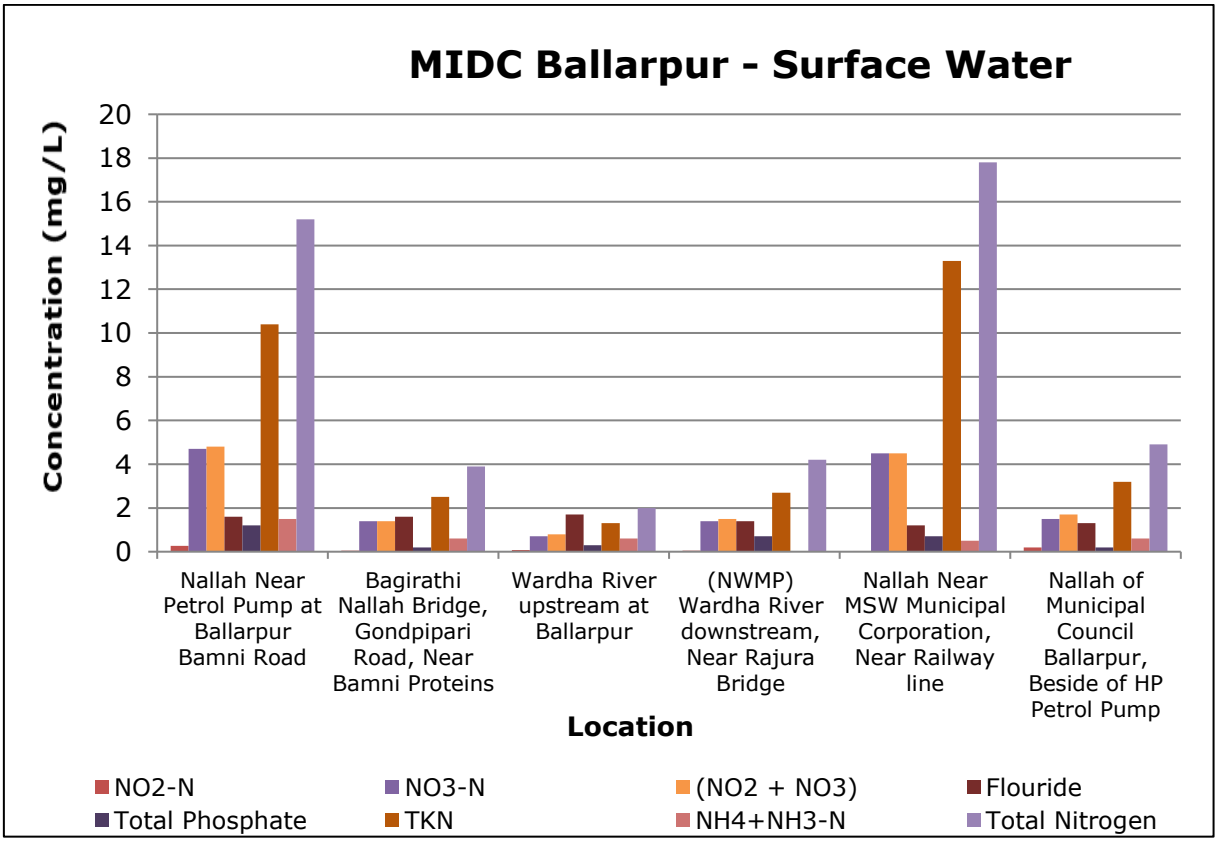
Graphs - Surface water Quality of MIDC Ballarpur

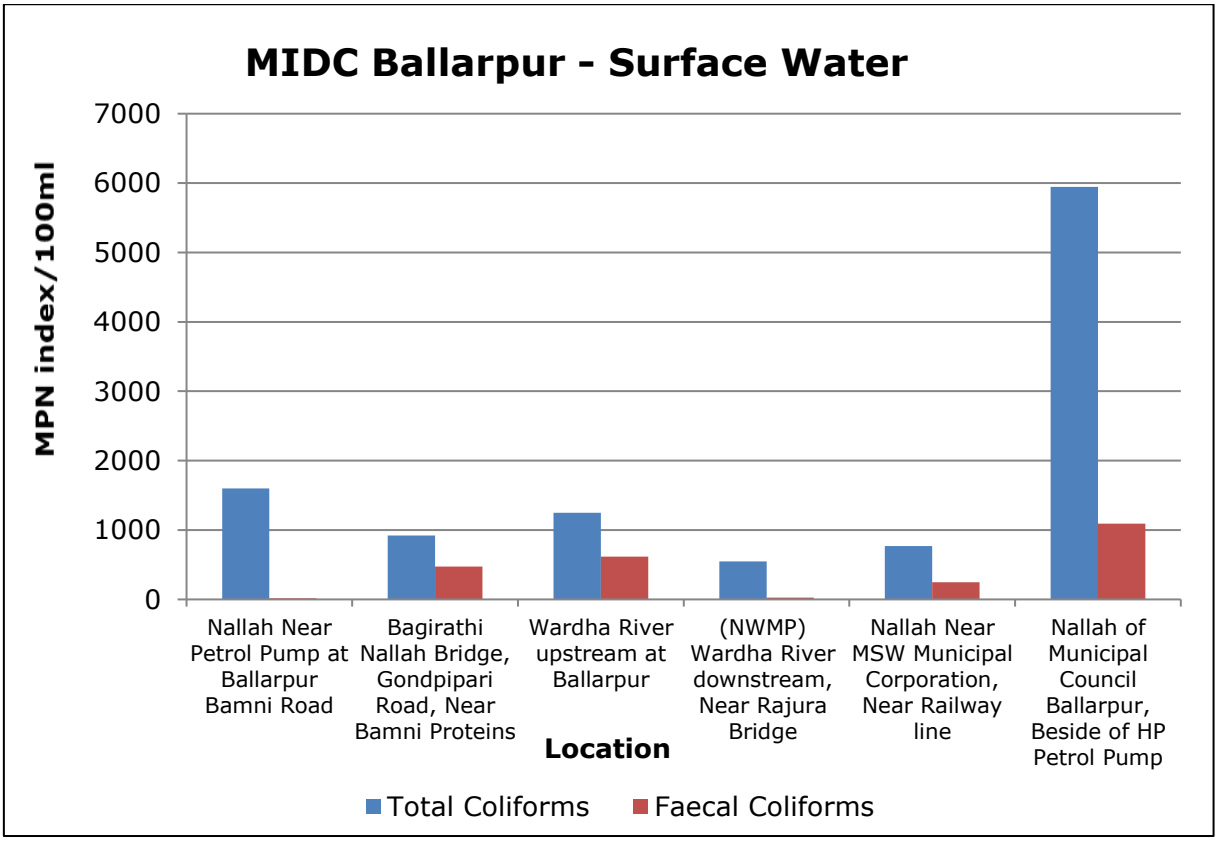


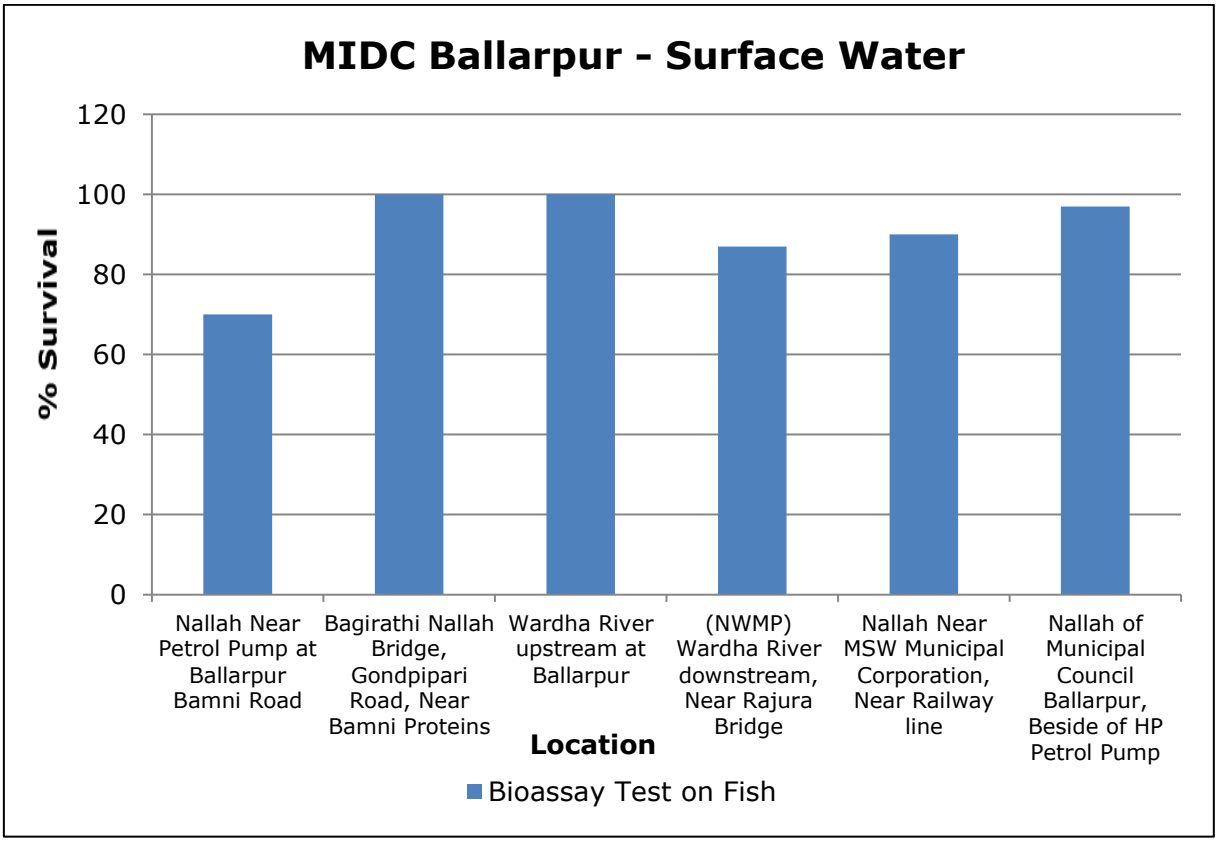



MIDC Ballarpur - Surface Water
Concentration (mg/L)
1600
1400
1200
1000
800
600
400
200
0
Nallah Near Petrol Pump at Ballarpur Bamni Road
Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins
Wardha River upstream at Ballarpur
(NWMP) Wardha River downstream, Near Rajura Bridge
Nallah Near MSW Municipal Corporation, Near Railway line
Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump
Location
SS
TDS
COD
BOD


MIDC Ballarpur - Surface Water
% Saturation
80
70
60
50
40
30
20
10
0
Nallah Near Petrol Pump at Ballarpur Bamni Road
Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins
Wardha River upstream at Ballarpur
(NWMP) Wardha River downstream, Near Rajura Bridge
Nallah Near MSW Municipal Corporation, Near Railway line
Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump
Location
Dissolved Oxygen


MIDC Ballarpur - Surface Water
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
Nallah Near Petrol Pump at Ballarpur Bamni Road
Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins
Wardha River upstream at Ballarpur
(NWMP) Wardha River downstream, Near Rajura Bridge
Nallah Near MSW Municipal Corporation, Near Railway line
Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump
Location
NO2-N
NO3-N
(NO2 + NO3)
Flouride
Total Phosphate
TKN
NH4+NH3-N
Total Nitrogen


MIDC Ballarpur - Surface Water
MPN index/100ml
7000
6000
5000
4000
3000
2000
1000
0
Nallah Near Petrol Pump at Ballarpur Bamni Road
Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins
Wardha River upstream at Ballarpur
(NWMP) Wardha River downstream, Near Rajura Bridge
Nallah Near MSW Municipal Corporation, Near Railway line
Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump
Location
Total Coliforms
Faecal Coliforms


MIDC Ballarpur - Surface Water
% Survival
120
100
80
60
40
20
0
Nallah Near Petrol Pump at Ballarpur Bamni Road
Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins
Wardha River upstream at Ballarpur
(NWMP) Wardha River downstream, Near Rajura Bridge
Nallah Near MSW Municipal Corporation, Near Railway line
Nallah of Municipal Council Ballarpur, Beside of HP Petrol Pump
Location
Bioassay Test on Fish

LAND ENVIRONMENT

7. Land Environment

For studying the land Environment of Chandrapur area, ground water was collected from Bore well. Dug well, and Hand Pump. A total of 12 samples were collected from MIDC Chandrapur, MIDC Tadali, MIDC Ballarpur and MIDC Ghugus.

1. **MIDC Tadali:** From MIDC Tadali also three ground water samples are collected.

- All three water samples collected are acceptable in general appearance, colour, smell and transparency.
- pH, Suspended Solids and Total Dissolved Solids are also well within the limits at all three samples collected.
- 100% survival was not achieved in Fish Bioassay in all three locations.
- Metals like Zinc, Nickel, Copper, Hexavalent Chromium (Cr^{6+}), Total Chromium, Total Arsenic, Zinc, Nickel, Copper, Iron, etc. are observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Fluoride, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- BOD exceeds in all three locations.
- Total Phosphate exceeds in two locations out of three locations.
- Fluoride and Total Kjeldahl Nitrogen exceeds in all three locations.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all three samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all three samples collected.

Table 7.1 MIDC Tadali – 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.	Yerur village (Bore well water)	19°59'46.1"N	79°11'28.7"E	20.05.2025	22.05.2025	24.05.2025
2.	Near Tadali Lake Janata School (Dug well water)	20°01'48.4"N	79°11'22.1"E	20.05.2025	22.05.2025	24.05.2025
3.	Yerur Village (Dug well Water)	19°59'46.9"N	79°11'28.0"E	20.05.2025	22.05.2025	24.05.2025

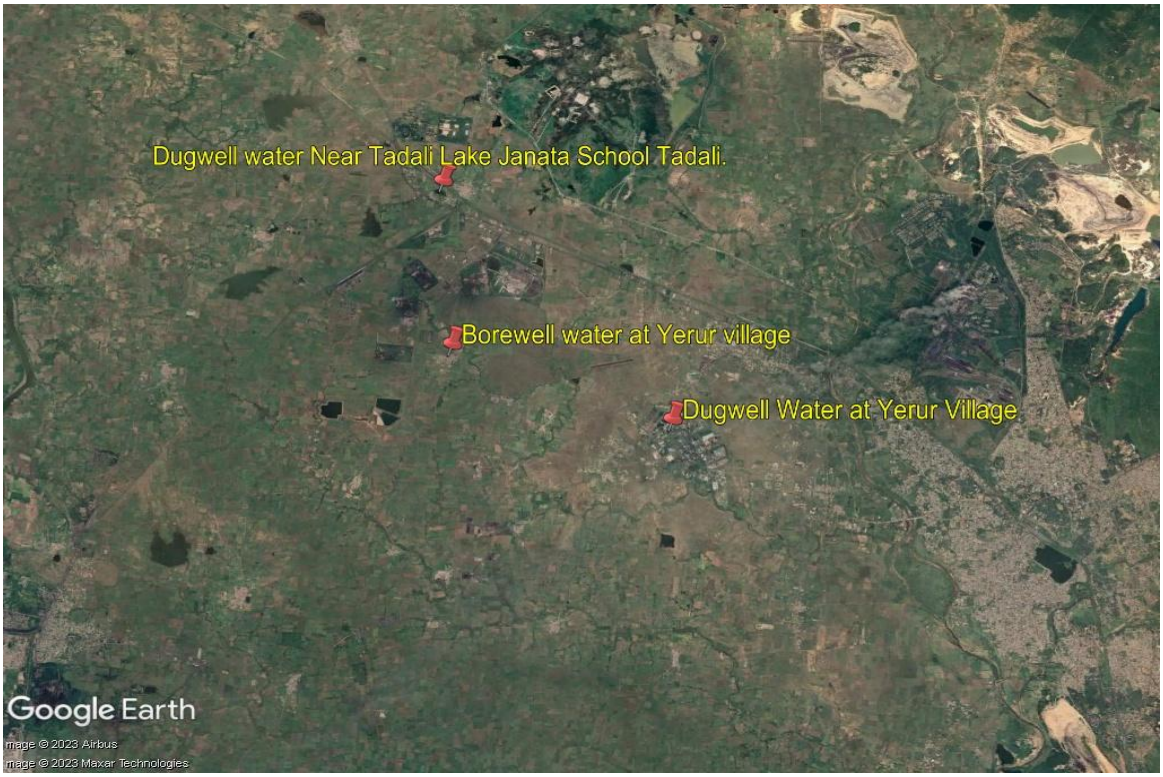


Fig. Geographical Locations of Ground Water Sampling MIDC Tadali

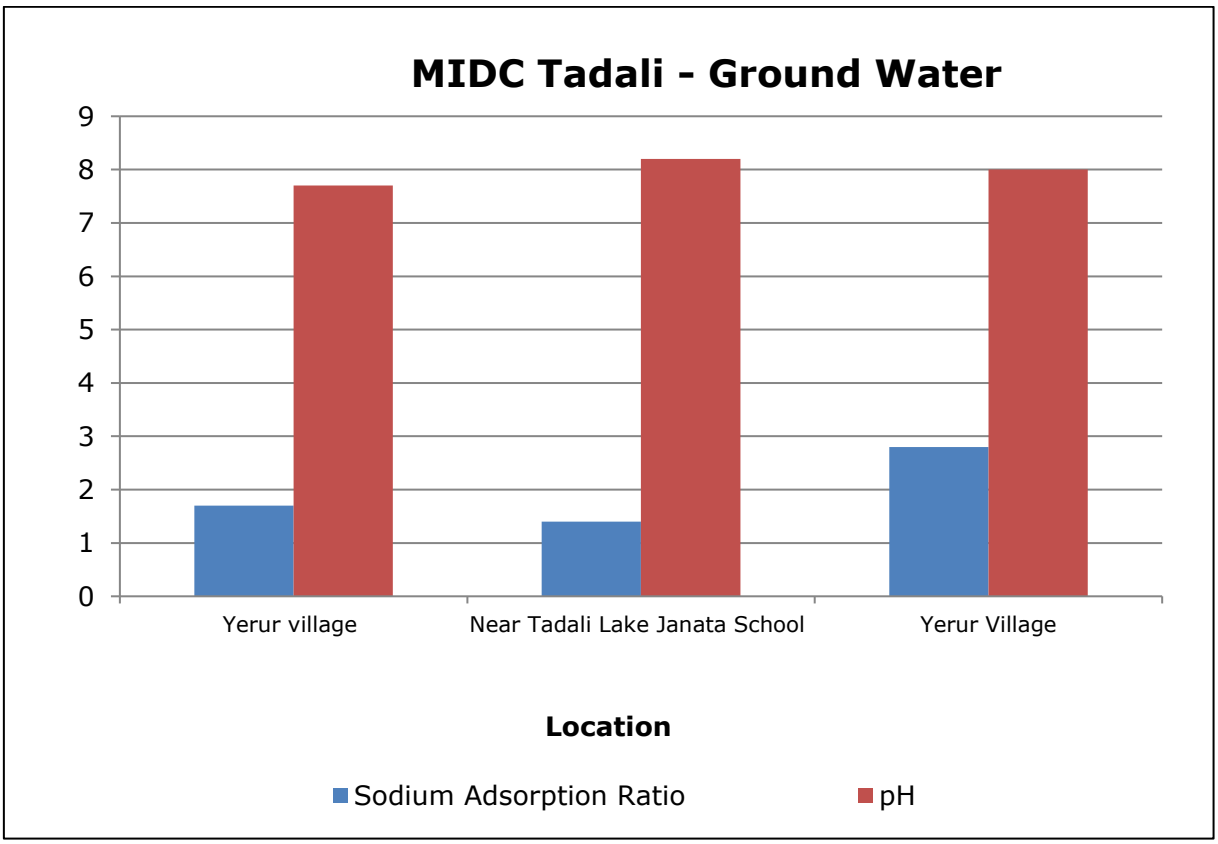
Table 7.2 MIDC Tadali – Details of Sampling Location of Ground Water

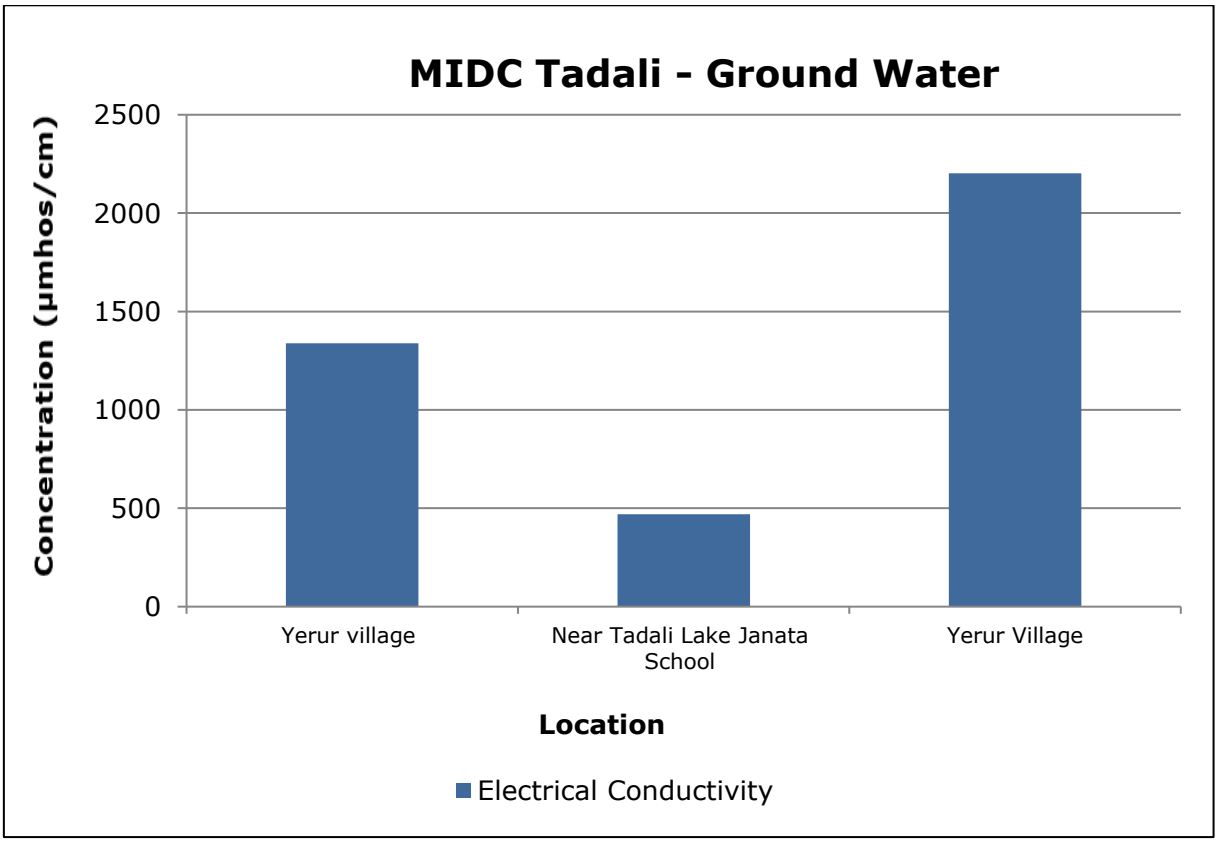
Parameters	Unit	Results		
		Yerur village (Bore well water)	Near Tadali Lake Janata School (Dug well water)	Yerur Village (Dug well Water)
Sanitary Survey	-	Generally Clean neighbourhood	Generally Clean neighbourhood	Generally Clean neighbourhood
General Appearance	-	No floating matter	No floating matter	No floating matter
Transparency	m	Not Applicable	0.3	0.5
Temperature	°C	29	27	28
Colour	Hazen	2	1	1
Odour	-	Agreeable	Agreeable	Agreeable
pH	-	7.7	8.2	8.0
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	51	50	43
Total Dissolved Solids	mg/L	749	262	1233
Chemical Oxygen Demand	mg/L	65	56	92
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	15	15	29
Electrical Conductivity (at 25°C)	µmhos/cm	1338	470	2203
Nitrite Nitrogen	mg/L	0.08	BLQ	0.03

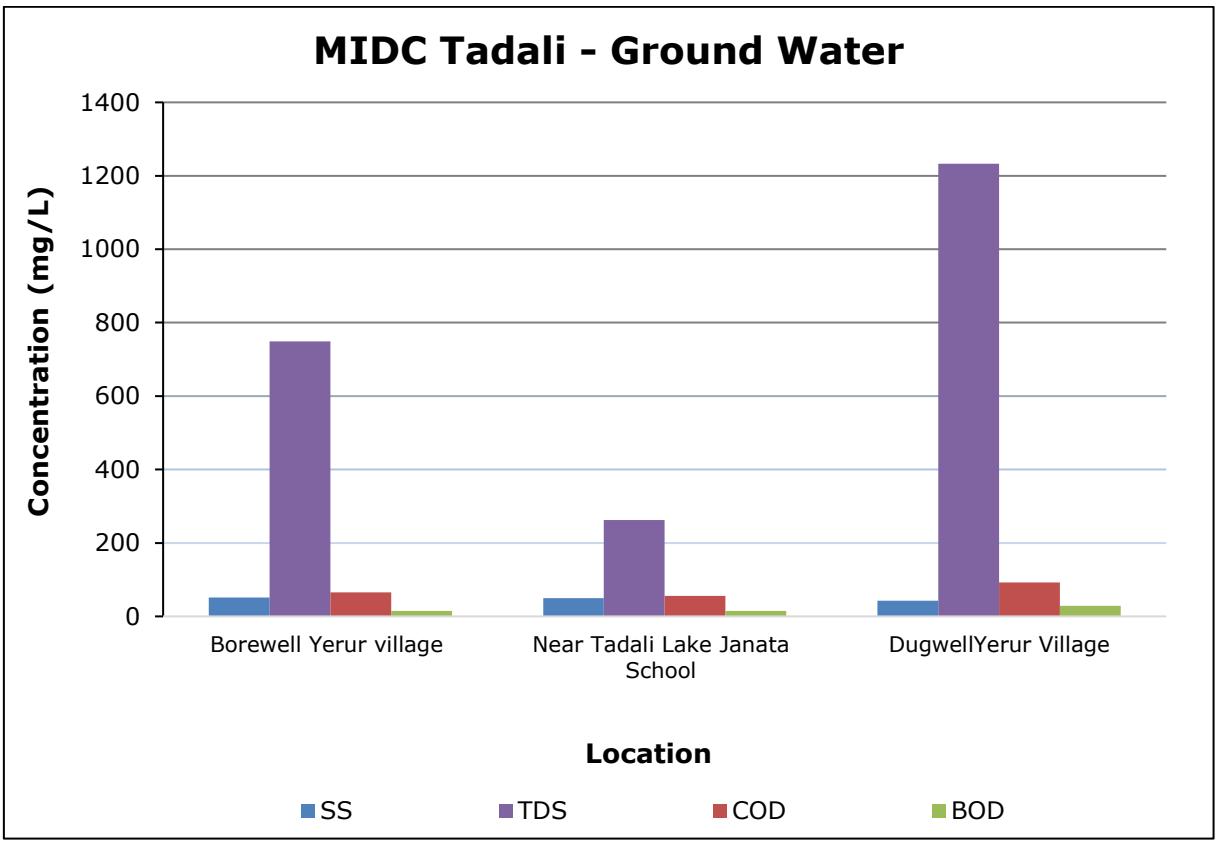
Parameters	Unit	Results		
		Yerur village (Bore well water)	Near Tadali Lake Janata School (Dug well water)	Yerur Village (Dug well Water)
Nitrate Nitrogen	mg/L	5.1	0.2	3.5
(NO_2+ NO_3)-Nitrogen	mg/L	5.2	0.2	3.5
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.9	BLQ	1.8
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.3	BLQ	0.6
Sodium Adsorption Ratio	-	1.7	1.4	2.8
Total Coliforms	MPN Index/ 100 ml	131	32	440
Faecal Coliforms	MPN Index/ 100 ml	27	9	191
Total Phosphate (as P)	mg/L	0.5	0.1	0.9
Total Kjeldahl Nitrogen (as N)	mg/L	12.5	0.6	8.9
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.2	0.9	0.5
Total Nitrogen	mg/L	17.6	1.2	12.4
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 (as PAH)	mg/L	0.00257	BLQ	0.00265
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.067	0.052	BLQ
Nickel (as Ni)	mg/L	0.013	0.013	0.014
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.039	0.037	0.038
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	0.011	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.04	0.03	0.02
Iron (as Fe)	mg/L	0.42	0.15	0.11
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ

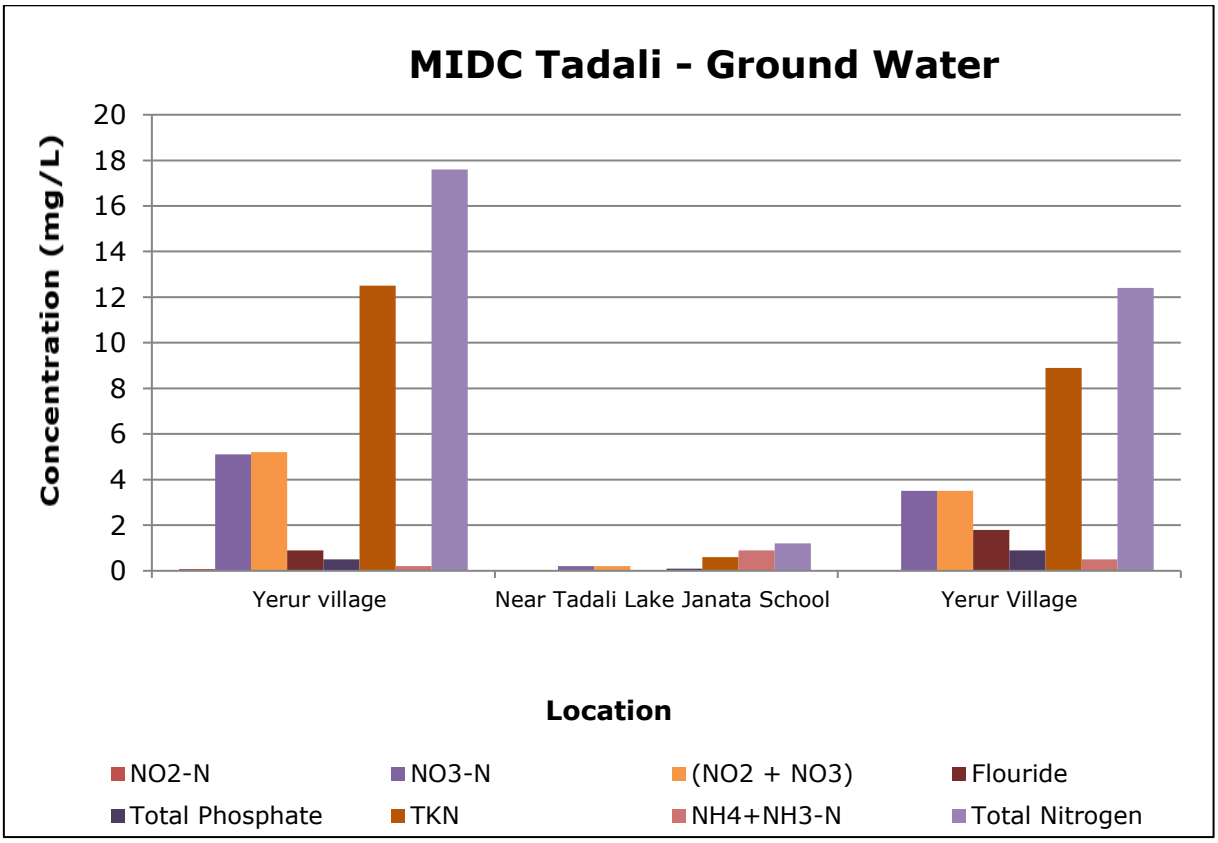
Parameters	Unit	Results		
		Yerur village (Bore well water)	Near Tadali Lake Janata School (Dug well water)	Yerur Village (Dug well Water)
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	0.5	BLQ	0.40
Bioassay Test on fish	% survival	83	90	80

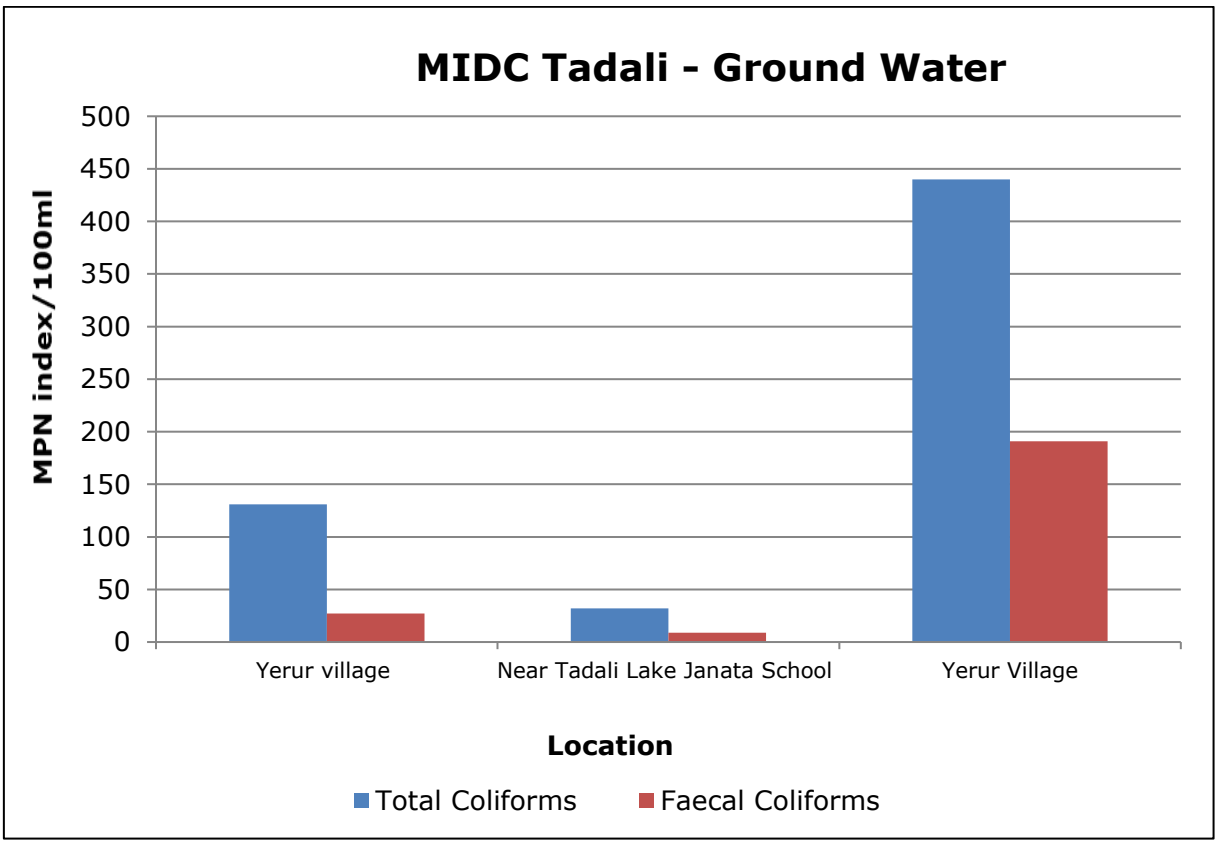
Graphs - Ground Water Quality of MIDC Tadali

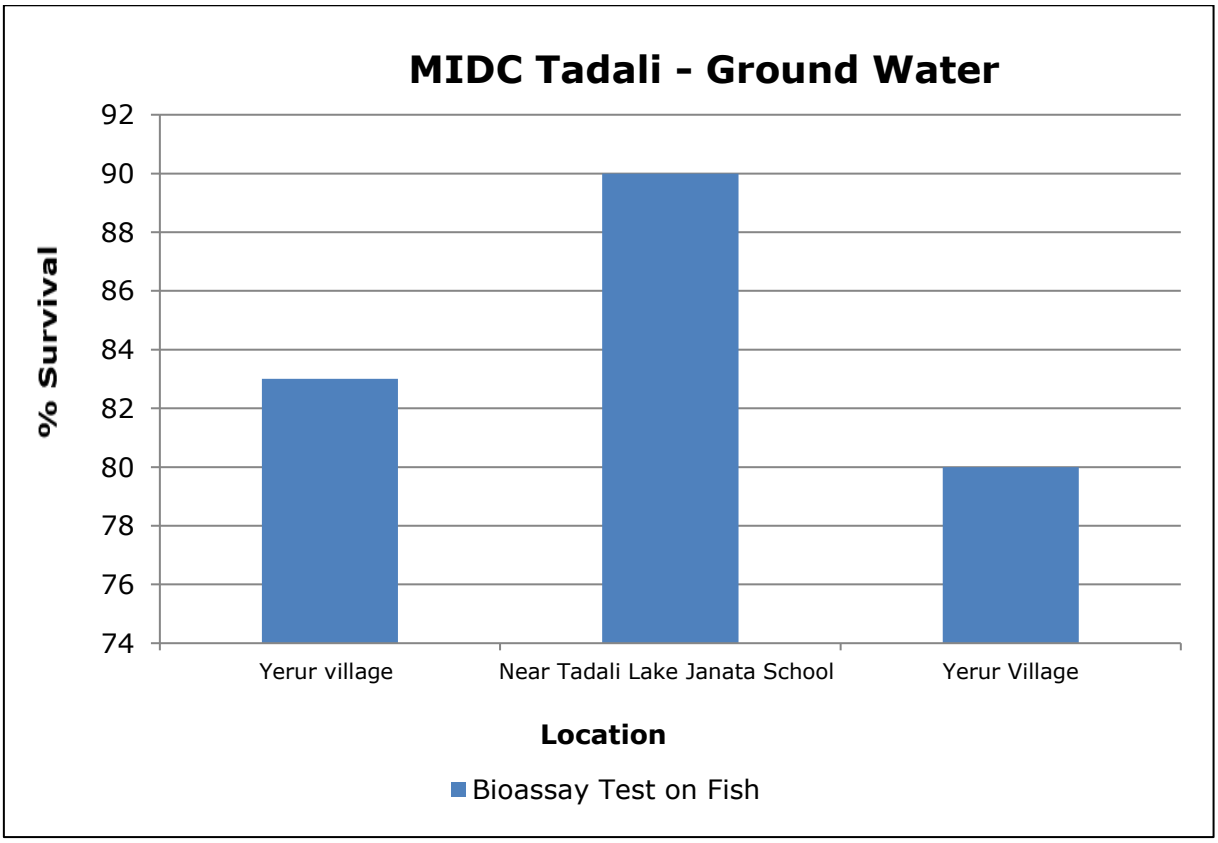





MIDC Tadali - Ground Water
Concentration (mg/L)
1400
1200
1000
800
600
400
200
0
Borewell Yerur village
Near Tadali Lake Janata School
DugwellYerur Village
Location
SS
TDS
COD
BOD


MIDC Tadali - Ground Water
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
Yerur village
Near Tadali Lake Janata School
Yerur Village
Location
NO2-N
NO3-N
(NO2 + NO3)
Flouride
Total Phosphate
TKN
NH4+NH3-N
Total Nitrogen


MIDC Tadali - Ground Water
MPN index/100ml
500
450
400
350
300
250
200
150
100
50
0
Yerur village
Near Tadali Lake Janata School
Yerur Village
Location
Total Coliforms
Faecal Coliforms


MIDC Tadali - Ground Water
% Survival
92
90
88
86
84
82
80
78
76
74
Yerur village
Near Tadali Lake Janata School
Yerur Village
Location
Bioassay Test on Fish

2. **<u>MIDC Chandrapur:</u>** Three ground water samples are collected from MIDC Chandrapur region.

- All three water samples collected are acceptable in general appearance, colour, smell and transparency.
- pH, Suspended Solids, Electrical conductivity and Total Dissolved Solids are also well within the limits at all three samples collected.
- 100% survival was achieved in Fish Bioassay in one location out of three locations.
- Metals like Arsenic, Nickel, Hexavalent Chromium (Cr^{6+}) etc. are observed either below detection limit or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Phosphate, Total Ammonical Nitrogen and Phenolic compounds also meet the criteria as prescribed by CPCB.
- BOD, Total Kjeldahl Nitrogen and Iron exceeds at two locations out of three locations.
- Total Phosphate exceeds at one location out of three locations.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all three samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all three samples collected.

Table 7.3 MIDC Chandrapur – 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.	Gagangiri Village (Dug well Water)	19°58’07.8’’N	79°14’53.8’’E	20.05.2025	22.05.2025	24.05.2025
2.	Mahada Colony (Hand Pump water)	19°58’13.4’’N	79°15’02.7’’E	20.05.2025	22.05.2025	24.05.2025
3.	Near Datala Grampanchayat (Hand Pump water)	19°58’8.8’’N	79°5’40.6’’E	20.05.2025	22.05.2025	24.05.2025

Fig. Geographical Locations of Ground Water Sampling MIDC Chandrapur

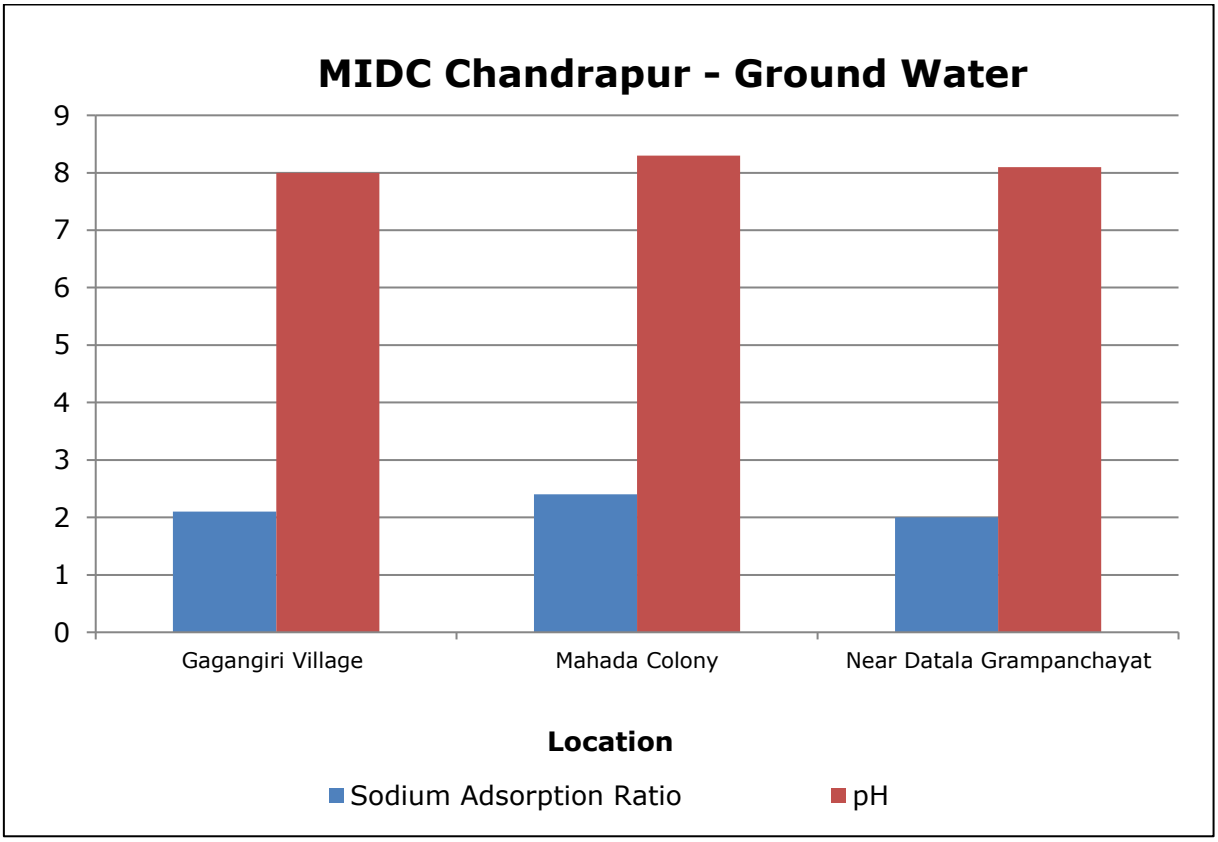
Table 7.4 MIDC Chandrapur – Details of Sampling Location of Ground Water

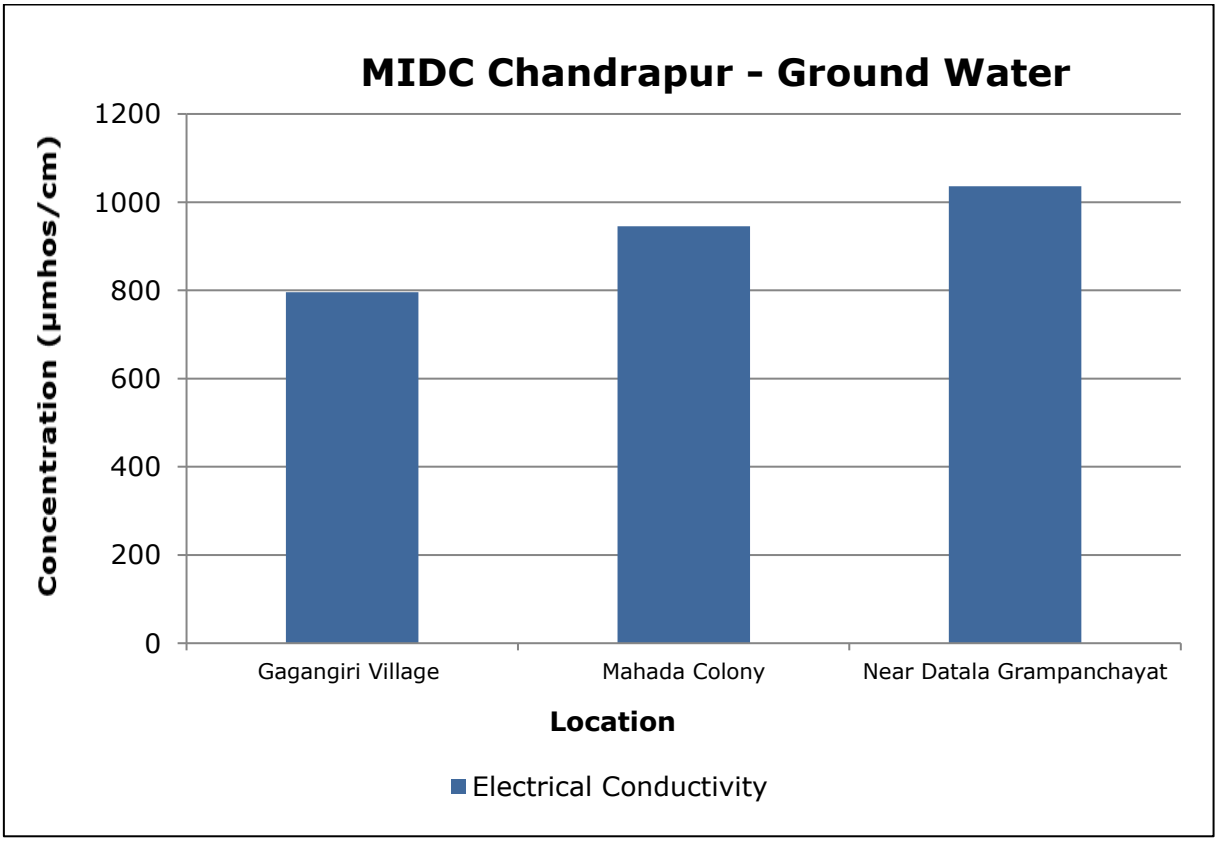
Parameters	Unit	Results		
		Gagangiri Village (Dug well Water)	Mahada Colony (Hand Pump water)	Near Datala Grampanchayat (Hand Pump water)
Sanitary Survey	-	Very Clean neighbourhood and catchment	Very Clean neighbourhood and catchment	Very Clean neighbourhood and catchment
General Appearance	-	No floating matter	Not Applicable	Not Applicable
Transparency	m	0.1	Not Applicable	Not Applicable
Temperature	°C	27	28	28
Colour	Hazen	1	1	1
Odour	-	Agreeable	Agreeable	Agreeable
pH	-	8.0	8.3	8.1
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	27	31	35
Total Dissolved Solids	mg/L	445	529	579
Chemical Oxygen Demand	mg/L	35	35	45
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	8	8	12
Electrical Conductivity (at 25°C)	µmhos/cm	796	945	1036

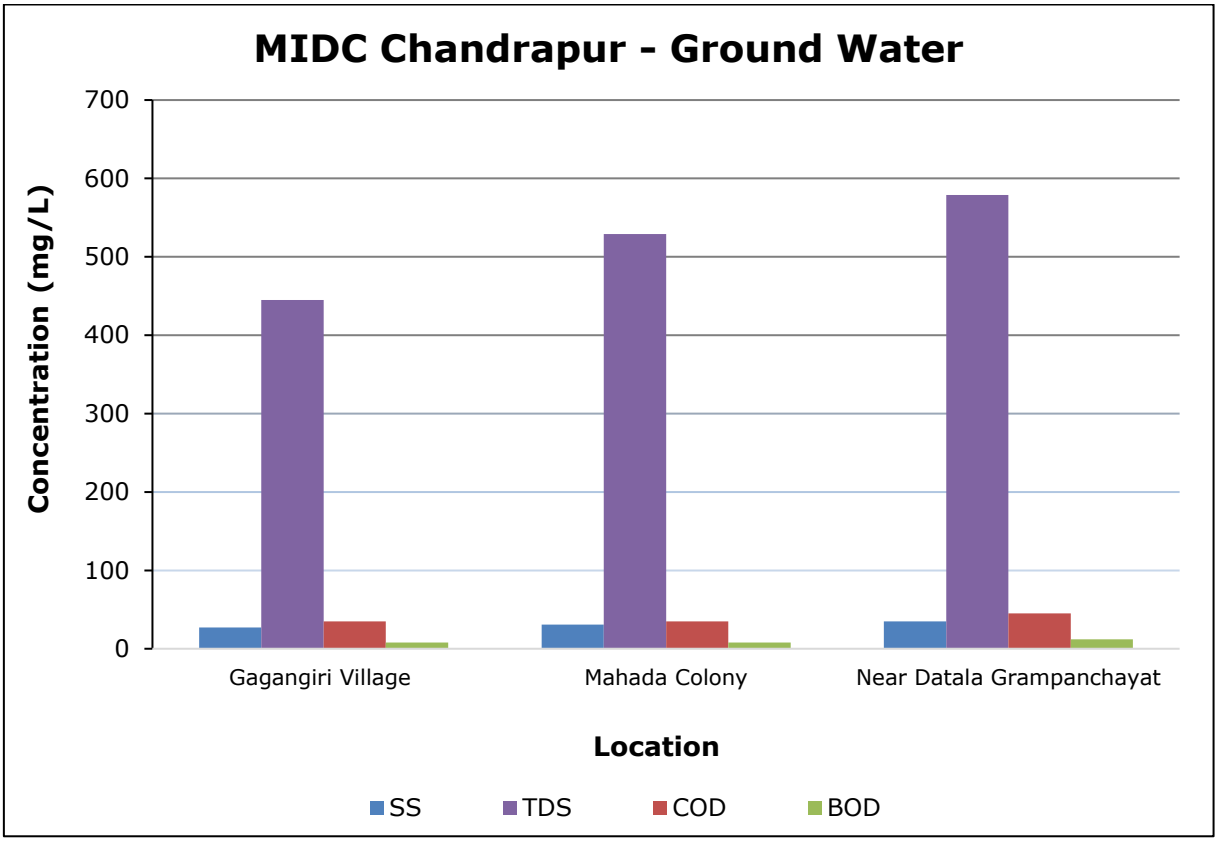
Parameters	Unit	Results		
		Gagangiri Village (Dug well Water)	Mahada Colony (Hand Pump water)	Near Datala Grampanchayat (Hand Pump water)
Nitrite Nitrogen	mg/L	0.02	0.02	BLQ
Nitrate Nitrogen	mg/L	0.3	2.7	4.4
(NO_2+ NO_3)-Nitrogen	mg/L	0.3	2.7	4.4
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.0	2.5	1.6
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.2	0.2	0.2
Sodium Adsorption Ratio	-	2.1	2.4	2.0
Total Coliforms	MPN Index/ 100 ml	277	3643	730
Faecal Coliforms	MPN Index/ 100 ml	240	608	198
Total Phosphate (as P)	mg/L	0.3	0.3	0.4
Total Kjeldahl Nitrogen (as N)	mg/L	0.3	3.9	8.8
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.2	BLQ	0.8
Total Nitrogen	mg/L	BLQ	7.6	13.2
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 (as PAH)	mg/L	BLQ	0.00098	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.17	0.12
Nickel (as Ni)	mg/L	0.0125	0.014	0.016
Copper (as Cu)	mg/L	BLQ	0.112	0.139
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.0465	0.042	0.037
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	0.0135
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.03	BLQ	BLQ
Iron (as Fe)	mg/L	0.15	0.49	0.33

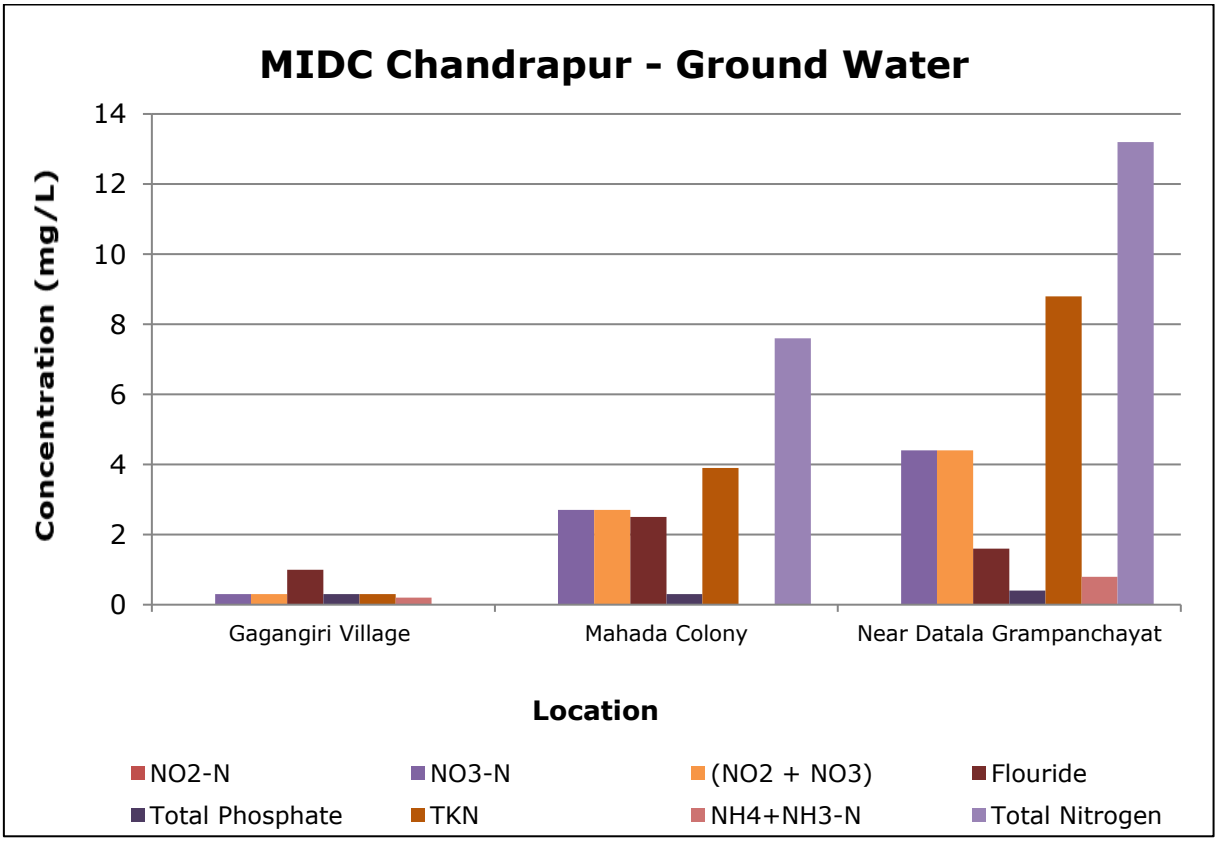
Parameters	Unit	Results		
		Gagangiri Village (Dug well Water)	Mahada Colony (Hand Pump water)	Near Datala Grampanchayat (Hand Pump water)
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	0.257	0.281
Bioassay Test on fish	% survival	97	100	97

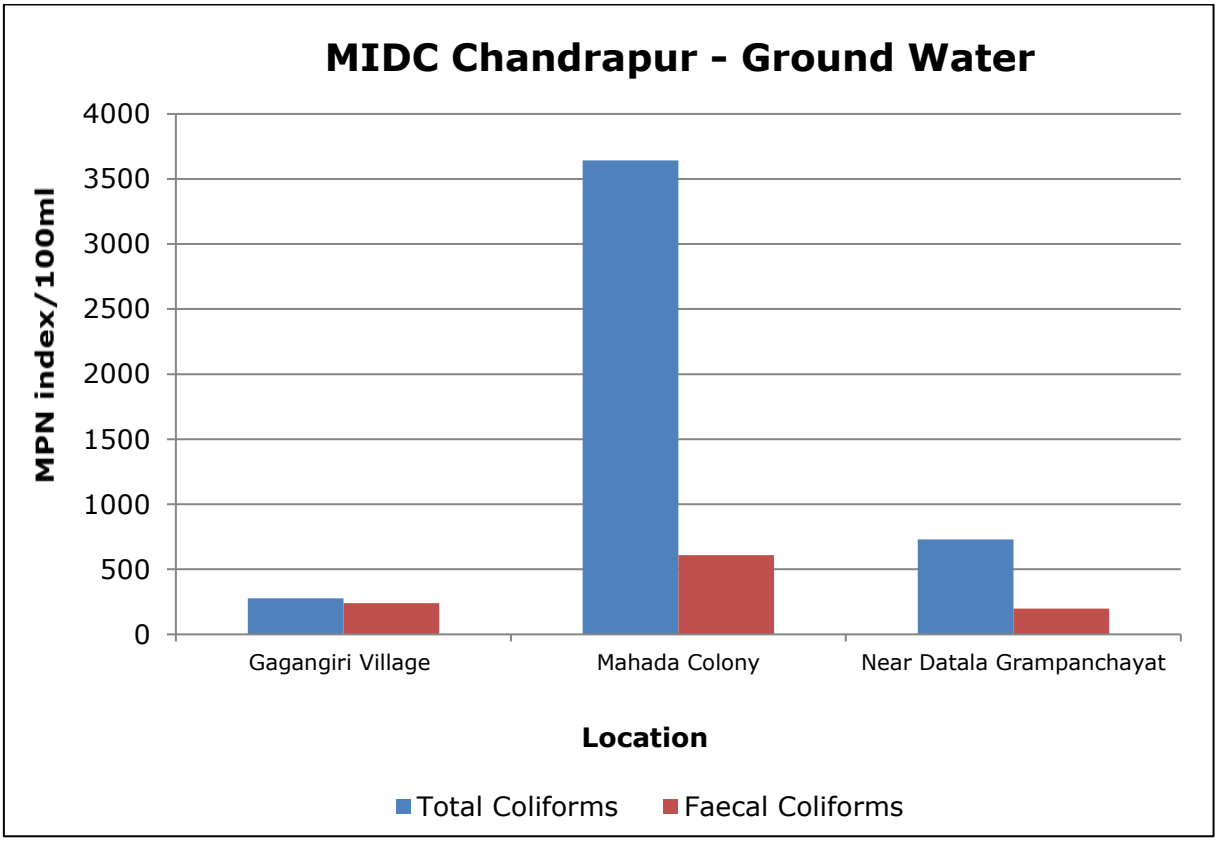
Graphs - Ground water Quality of MIDC Chandrapur

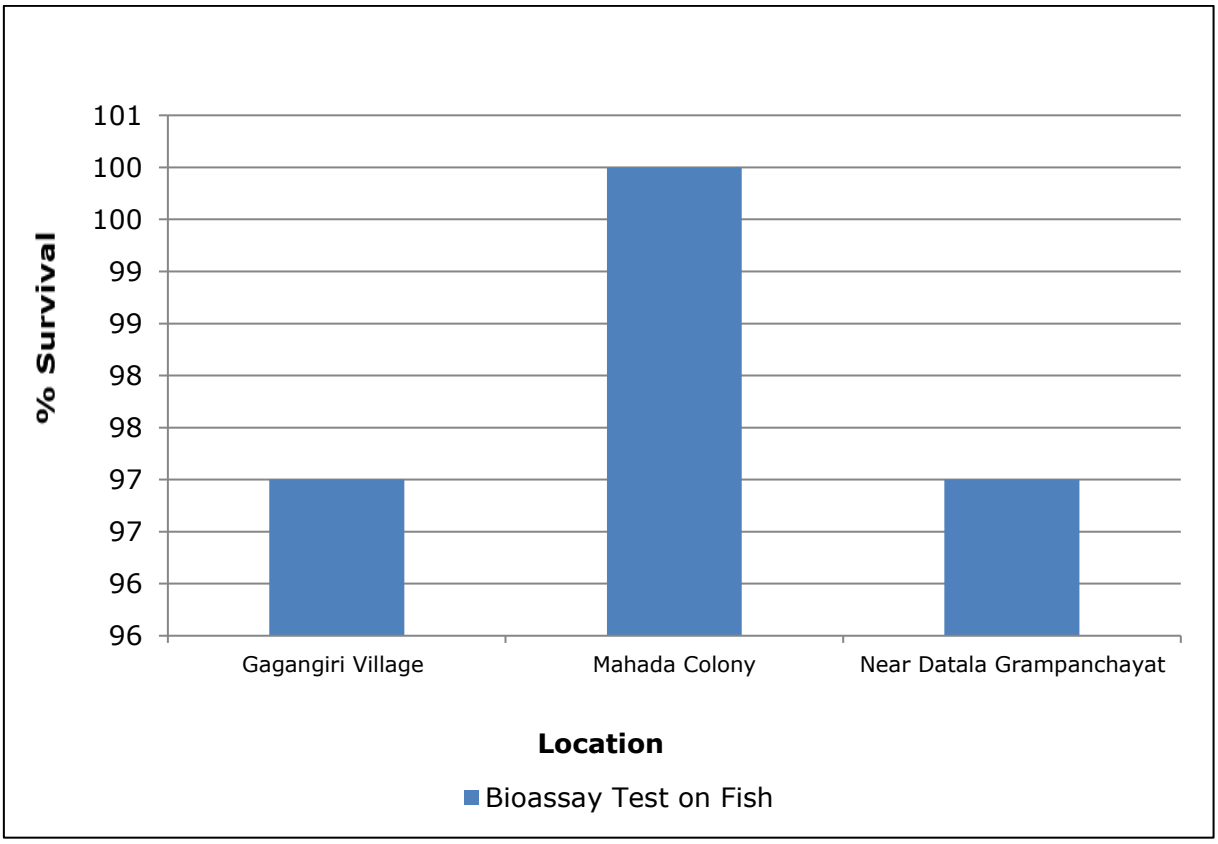





MIDC Chandrapur - Ground Water
Concentration (mg/L)
700
600
500
400
300
200
100
0
Gagangiri Village
Mahada Colony
Near Datala Grampanchayat
Location
SS
TDS
COD
BOD


MIDC Chandrapur - Ground Water
Concentration (mg/L)
14
12
10
8
6
4
2
0
Gagangiri Village
Mahada Colony
Near Datala Grampanchayat
Location
NO2-N
NO3-N
(NO2 + NO3)
Flouride
Total Phosphate
TKN
NH4+NH3-N
Total Nitrogen


MIDC Chandrapur - Ground Water
MPN index/100ml
4000
3500
3000
2500
2000
1500
1000
500
0
Gagangiri Village
Mahada Colony
Near Datala Grampanchayat
Location
Total Coliforms
Faecal Coliforms


% Survival
101
100
100
99
99
98
98
97
97
96
96
Gagangiri Village
Mahada Colony
Near Datala Grampanchayat
Location
Bioassay Test on Fish

3. **MIDC Ghugus:** Three ground water samples are collected from MIDC Ghugus.

- All three water samples collected are acceptable in general appearance, colour and smell.
- pH, Suspended Solids, Electrical Conductivity and BOD are also well within the limits at all three locations.
- 100% survival was achieved in Fish Bioassay observed at one location out of three locations.
- Metals like Copper, Hexavalent Chromium, Selenium, Zinc, Nickel, Total Chromium, Iron etc. are observed either below the limit quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Fluoride, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- Total Phosphate, Fluoride and Total Kjeldahl Nitrogen exceeded standard limit at all three locations.
- BOD exceeded standard limit at two locations out of three locations.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all three samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all three samples collected.

Table 7.5 MIDC Ghugus – 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.	Tukdoji Nagar Ghugus Village (Hand Pump Water)	19°56’20.6’’N	79°07’11.3’’E	13.05.2025	15.05.2025	17.05.2025
2.	Nakoda Village (Bore Well Water)	19° 54’57.9’’N	79°06’42.1’’E	13.05.2025	15.05.2025	17.05.2025
3.	Usgaon Village (Dug Well Water)	19°54’45.3’N	79°07’36.4’’E	13.05.2025	15.05.2025	17.05.2025

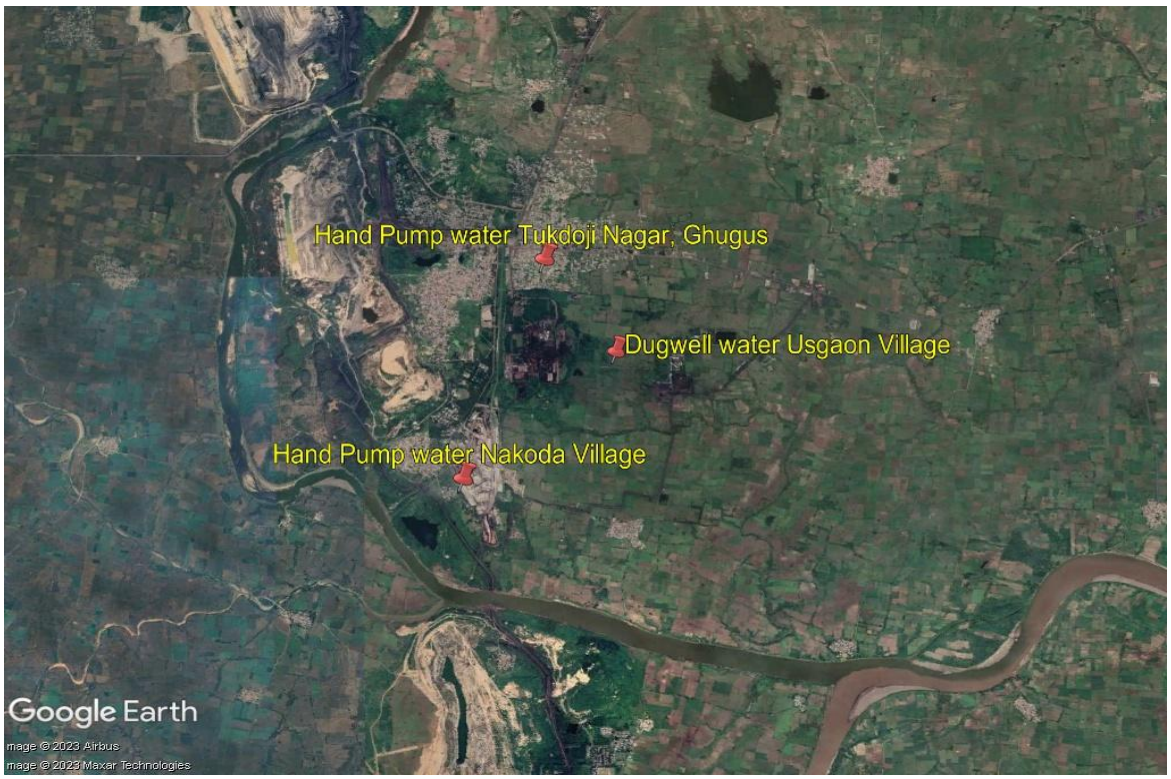


Fig. Geographical Locations of Ground Water Sampling MIDC Ghugus

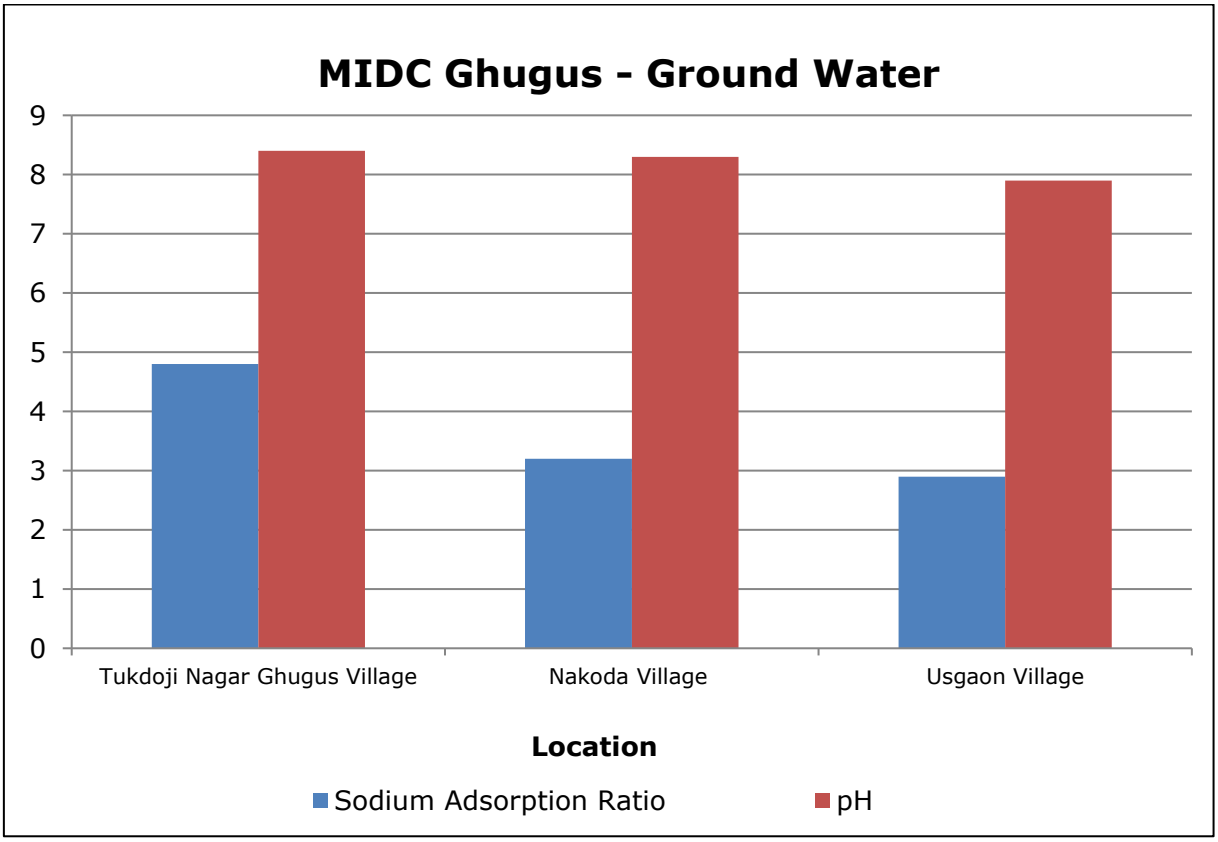
Table 7.6 MIDC Ghugus – Details of Sampling Location of Ground Water

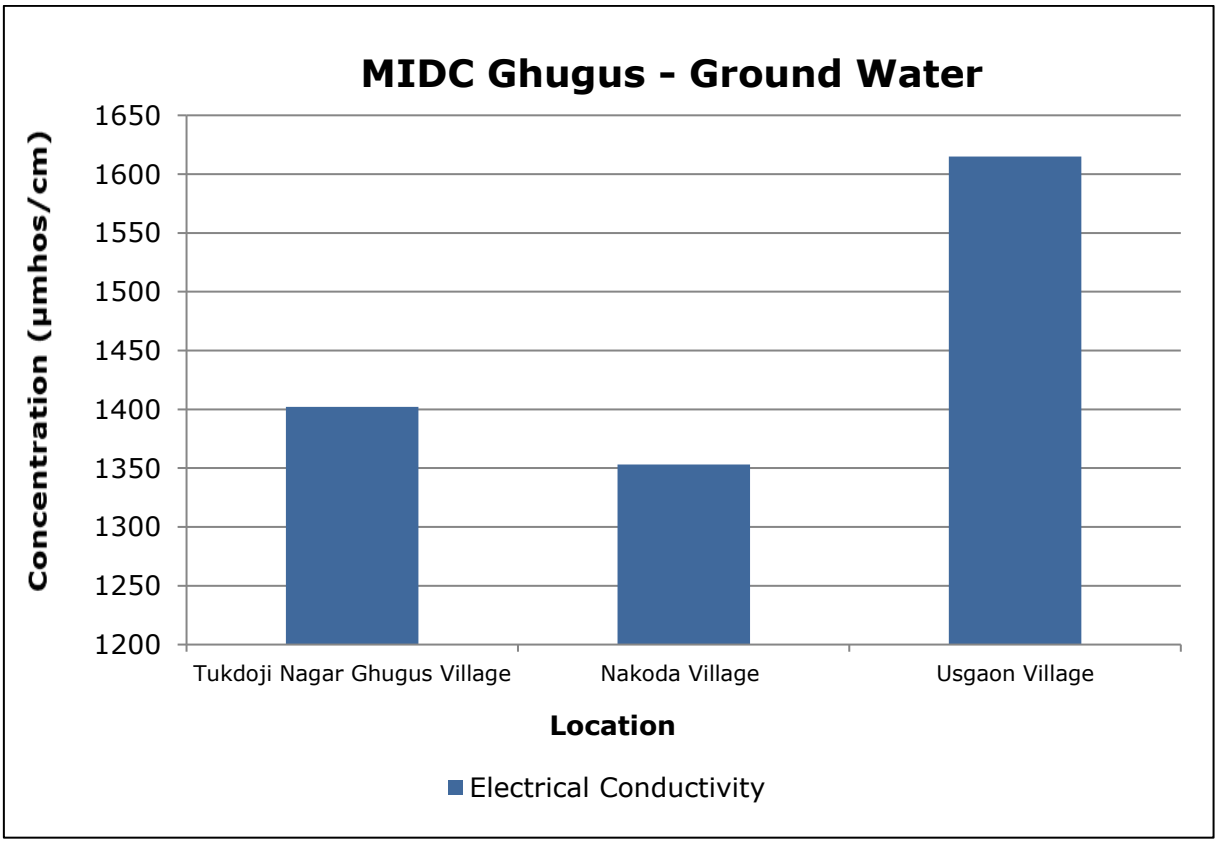
Parameters	Unit	Results		
		Tukdoji Nagar Ghugus Village (Hand Pump Water)	Nakoda Village (Bore Well Water)	Usgaon Village (Dug Well Water)
Sanitary Survey	-	Generally Clean neighbourhood	Reasonably Clean neighbourhood	Generally Clean neighbourhood
General Appearance	-	Not Applicable	Not Applicable	No floating matter
Transparency	m	Not Applicable	Not Applicable	0.4
Temperature	°C	30	29	28
Colour	Hazen	1	1	1
Odour	-	Agreeable	Agreeable	Agreeable
pH	-	8.4	8.3	7.9
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	18	35	21
Total Dissolved Solids	mg/L	691	754	900
Chemical Oxygen Demand	mg/L	58	37	25
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	16	10	6
Electrical Conductivity (at 25°C)	µmhos/cm	1402	1353	1615
Nitrite Nitrogen	mg/L	0.55	1.41	0.04

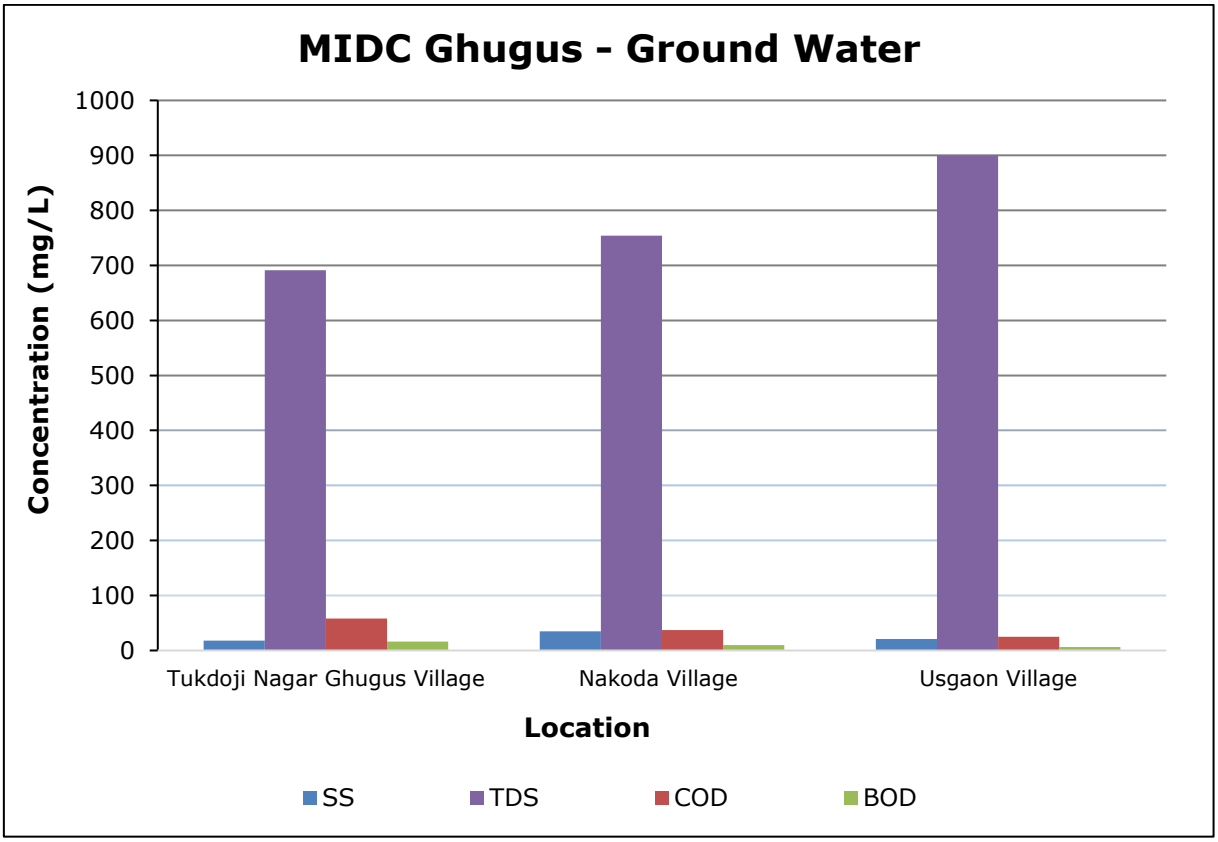
Parameters	Unit	Results		
		Tukdoji Nagar Ghugus Village (Hand Pump Water)	Nakoda Village (Bore Well Water)	Usgaon Village (Dug Well Water)
Nitrate Nitrogen	mg/L	1.5	3.5	5.9
(NO_2+ NO_3)-Nitrogen	mg/L	2.0	4.0	6.0
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	2.7	2.1	1.7
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.3	0.2	0.3
Sodium Adsorption Ratio	-	4.8	3.2	2.9
Total Coliforms	MPN Index/ 100 ml	<1.8	13	6173
Faecal Coliforms	MPN Index/ 100 ml	<1.8	<1.8	643
Total Phosphate (as P)	mg/L	0.6	0.4	0.4
Total Kjeldahl Nitrogen (as N)	mg/L	4.0	9.0	20.3
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.2	0.3	0.3
Total Nitrogen	mg/L	6.0	13.0	26.2
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 (as PAH)	mg/L	BLQ	0.000081	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	BLQ	0.019	0.021
Copper (as Cu)	mg/L	BLQ	0.023	0.028
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	0.054	0.07
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	BLQ	0.06	0.07
Iron (as Fe)	mg/L	BLQ	0.16	0.21
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ

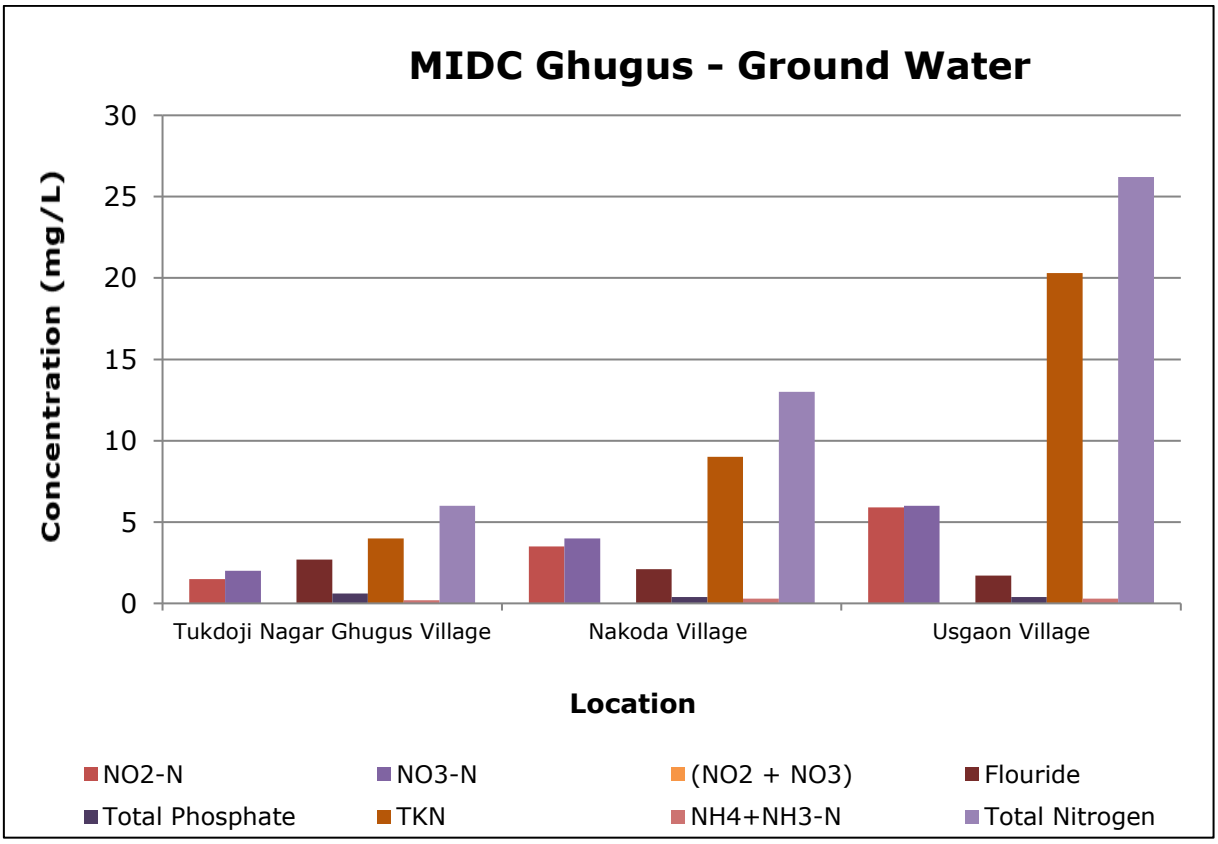
Parameters	Unit	Results		
		Tukdoji Nagar Ghugus Village (Hand Pump Water)	Nakoda Village (Bore Well Water)	Usgaon Village (Dug Well Water)
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	80	97	100

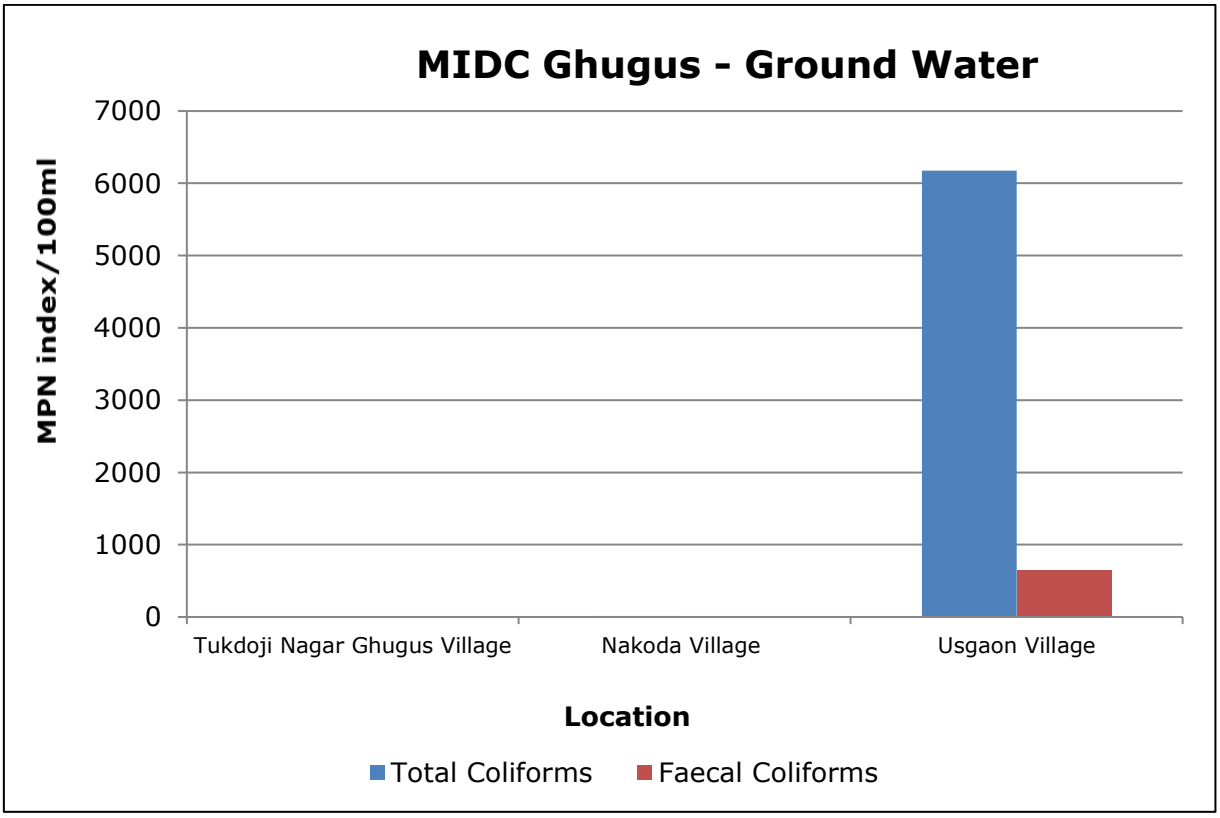
Graphs - Ground water Quality of MIDC Ghugus

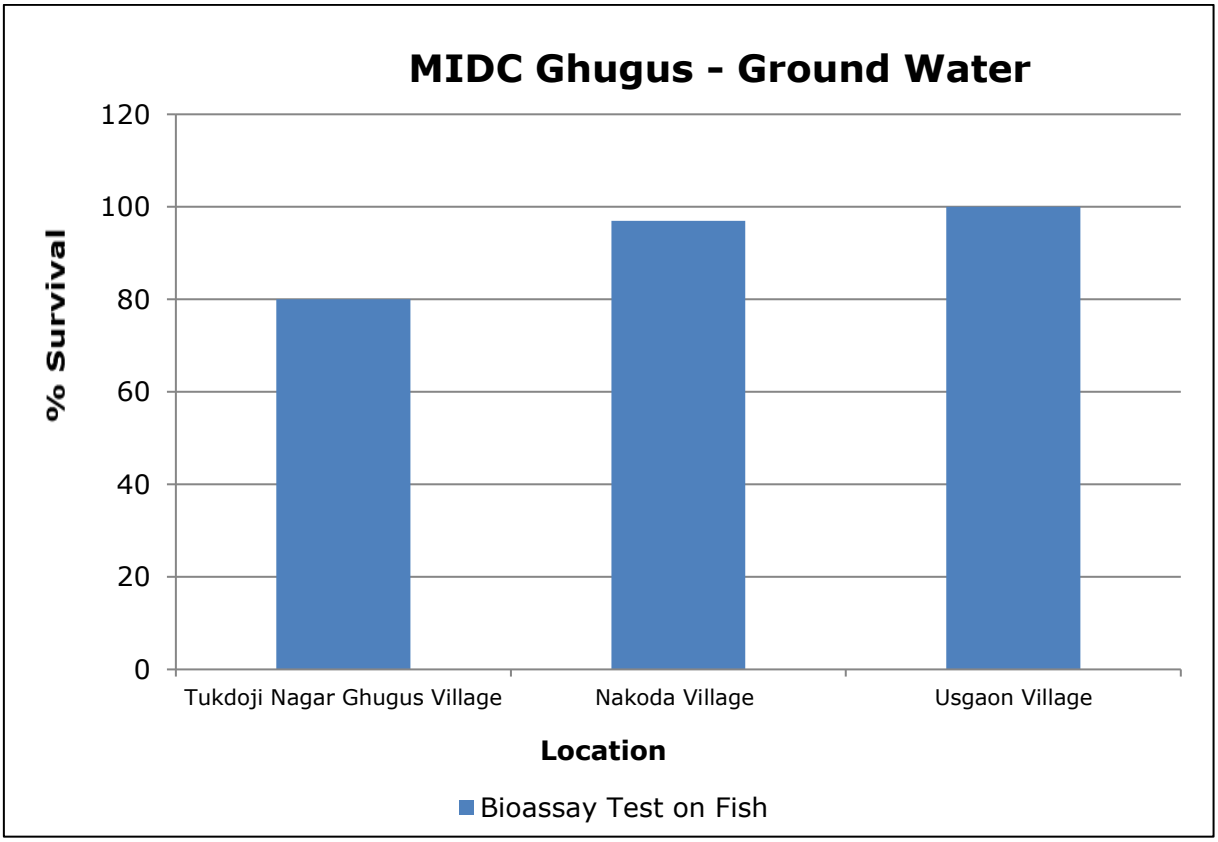





MIDC Ghugus - Ground Water
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
Tukdoji Nagar Ghugus Village
Nakoda Village
Usgaon Village
Location
SS
TDS
COD
BOD


MIDC Ghugus - Ground Water
Concentration (mg/L)
30
25
20
15
10
5
0
Tukdoji Nagar Ghugus Village
Nakoda Village
Usgaon Village
Location
NO2-N
NO3-N
(NO2 + NO3)
Flouride
Total Phosphate
TKN
NH4+NH3-N
Total Nitrogen


MIDC Ghugus - Ground Water
MPN index/100ml
7000
6000
5000
4000
3000
2000
1000
0
Tukdoji Nagar Ghugus Village
Nakoda Village
Usgaon Village
Location
Total Coliforms
Faecal Coliforms


MIDC Ghugus - Ground Water
% Survival
120
100
80
60
40
20
0
Tukdoji Nagar Ghugus Village
Nakoda Village
Usgaon Village
Location
Bioassay Test on Fish

4. **MIDC Ballarpur:** Three ground water samples are collected from MIDC Ballarpur.

- All three water samples collected are acceptable in general appearance, colour and smell.
- pH, Suspended Solids, Total Dissolved Solids, Electrical Conductivity and BOD are also well within the limits at all three locations.
- 100% survival of Fish Bioassay was achieved at two locations out of three locations.
- Metals like Zinc, Nickel, Copper, Hexavalent Chromium, Total Chromium, Arsenic, Zinc, Nickel, Copper, Iron, etc. are observed either below detection limit or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Fluoride, Sulphide, Dissolved Phosphate, Total Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- Fluoride and Total Phosphate exceeds in one location out of three locations.
- Total Kjeldahl Nitrogen exceeds at in two locations out of three locations.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all three samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all three samples collected.

Table 7.7 MIDC Ballarpur – 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.	Gramin Rugnalaya (Bore Well Water)	19°51’11.6’’N	79°20’58.0’’E	13.05.2025	15.05.2025	17.05.2025
2.	Near Fire Station (Bore Well Water)	19°51’11.8’’N	79°20’45.8’’E	13.05.2025	15.05.2025	17.05.2025
3.	Visapur Village (Bore well Water)	19°53’13.7’’N	79°19’49.7’’E	13.05.2025	15.05.2025	17.05.2025

Fig. Geographical Locations of Ground Water Sampling MIDC Ballarpur

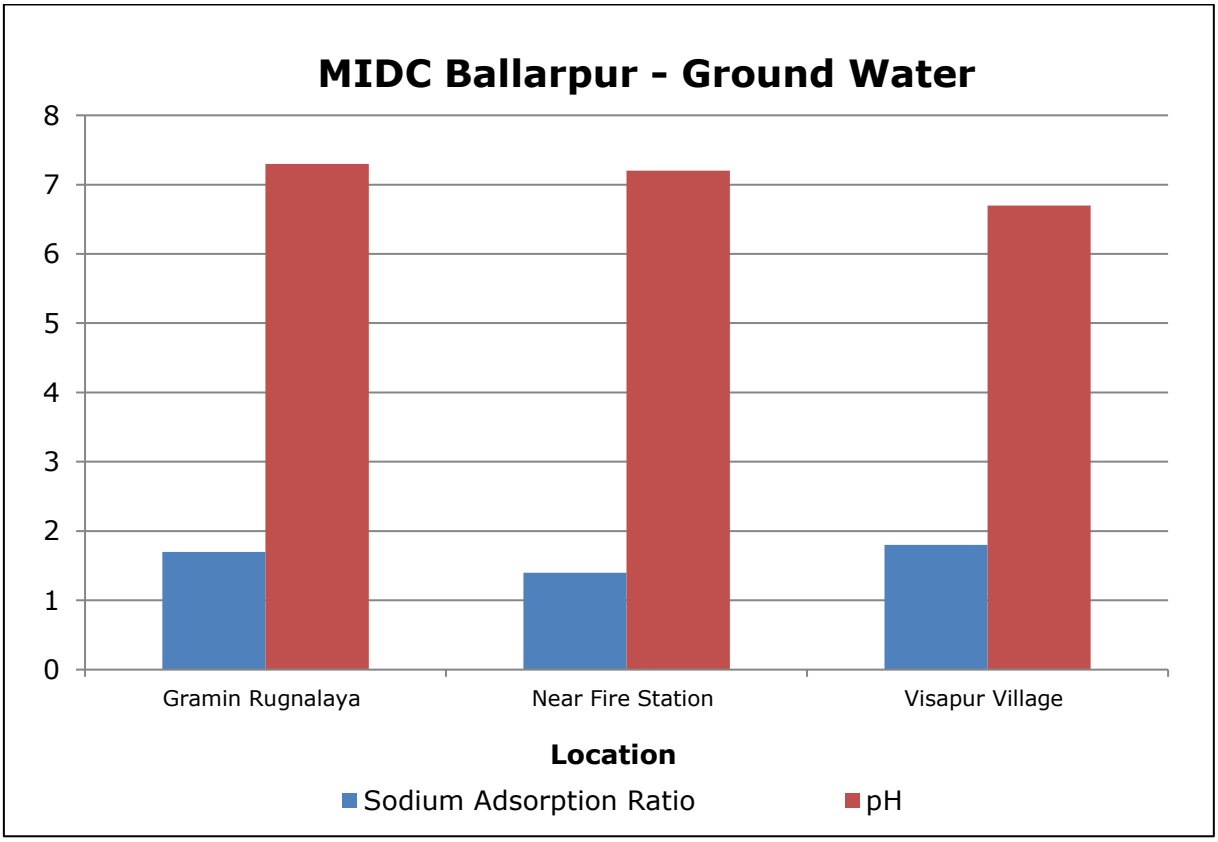
Table 7.8 MIDC Ballarpur – Details of Sampling Location of Ground Water

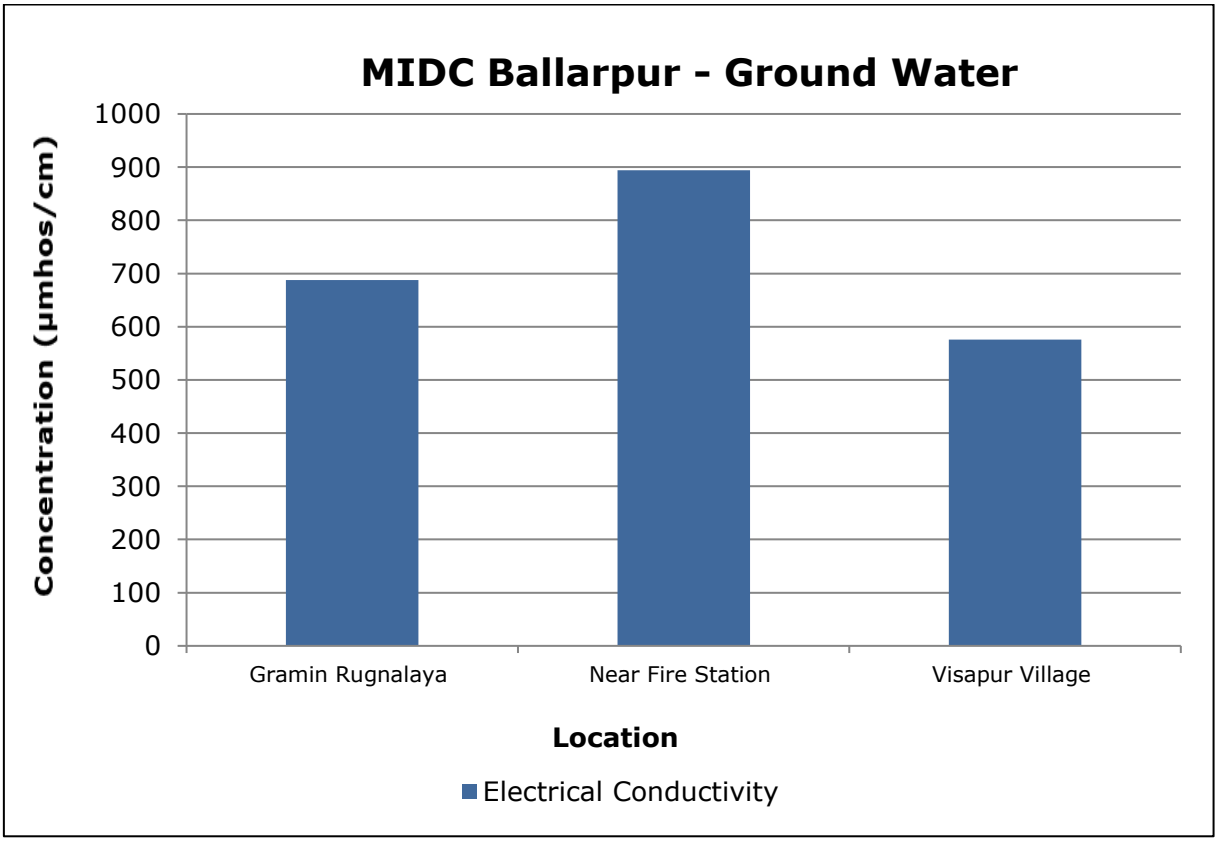
Parameters	Unit	Results		
		Gramin Rugnalaya (Bore Well Water)	Near Fire Station (Bore Well Water)	Visapur Village (Bore well Water)
Sanitary Survey	-	Very Clean neighbourhood and catchment	Very Clean neighbourhood and catchment	Very Clean neighbourhood and catchment
General Appearance	-	Not Applicable	Not Applicable	Not Applicable
Transparency	m	Not Applicable	Not Applicable	Not Applicable
Temperature	°C	29	29	29
Colour	Hazen	1	1	1
Odour	-	Agreeable	Agreeable	Agreeable
pH	-	7.3	7.2	6.7
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Total Suspended Solids	mg/L	27	21	21
Total Dissolved Solids	mg/L	385	500	321
Chemical Oxygen Demand	mg/L	27	20	16
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	7	5	5
Electrical Conductivity (at 25°C)	µmhos/cm	688	894	576
Nitrite Nitrogen	mg/L	BLQ	0.05	0.14
Nitrate Nitrogen	mg/L	2.2	2.2	2.1

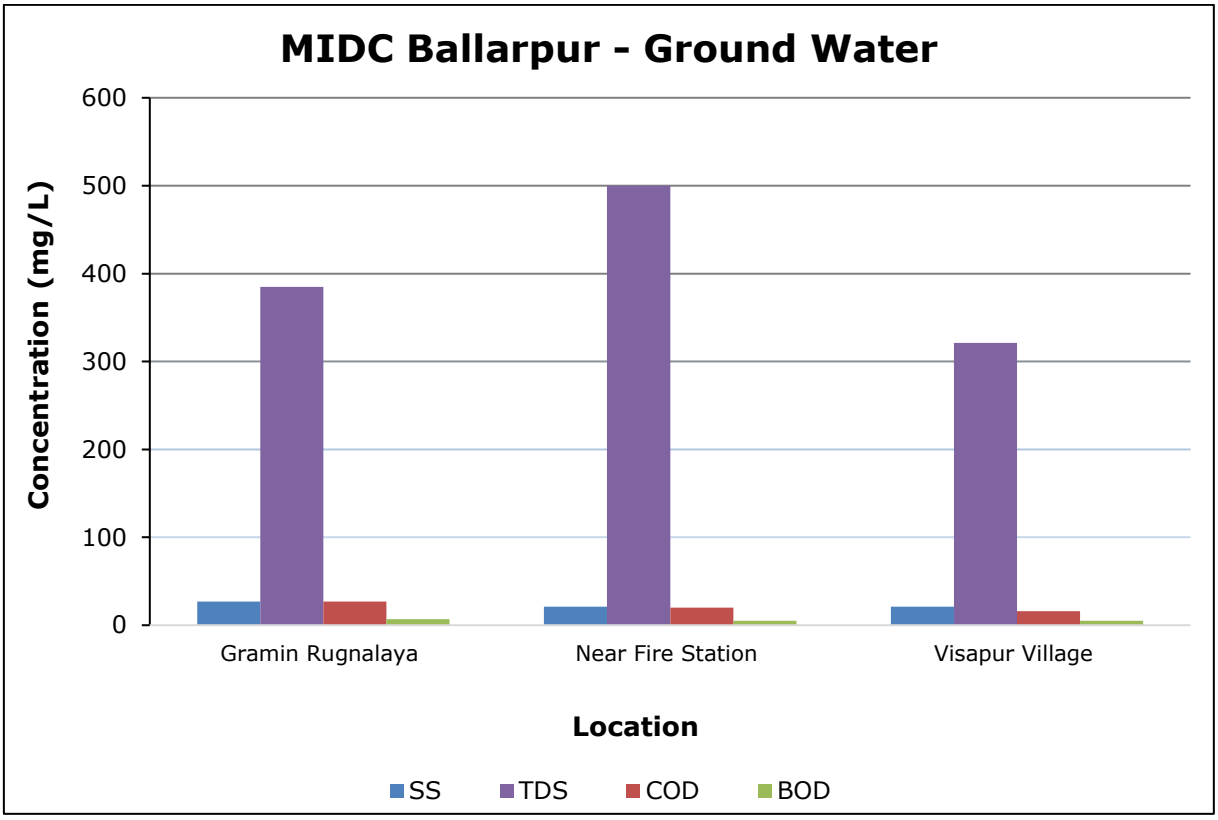
Parameters	Unit	Results		
		Gramin Rugnalaya (Bore Well Water)	Near Fire Station (Bore Well Water)	Visapur Village (Bore well Water)
(NO_2+ NO_3)-Nitrogen	mg/L	2.2	2.2	2.2
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.3	1.6	1.1
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.4	0.2	0.2
Sodium Adsorption Ratio	-	1.7	1.4	1.8
Total Coliforms	MPN Index/ 100 ml	23	825	15
Faecal Coliforms	MPN Index/ 100 ml	18	22	15
Total Phosphate (as P)	mg/L	0.7	0.3	0.3
Total Kjeldahl Nitrogen (as N)	mg/L	6.0	4.6	2.8
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.4	0.9	0.5
Total Nitrogen	mg/L	8.2	6.8	5.0
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 (as PAH)	mg/L	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	BLQ	BLQ	BLQ
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	BLQ	BLQ	BLQ
Iron (as Fe)	mg/L	BLQ	BLQ	BLQ
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ

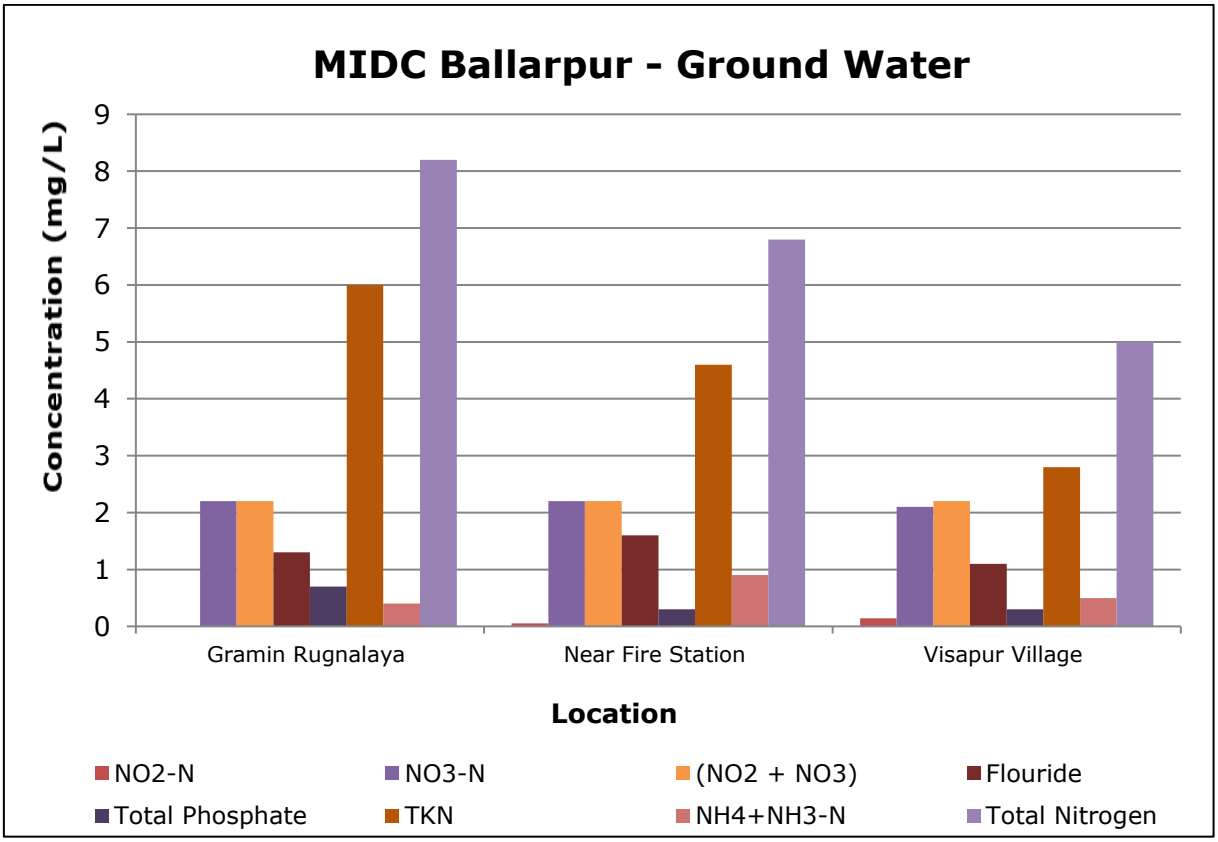
Parameters	Unit	Results		
		Gramin Rugnalaya (Bore Well Water)	Near Fire Station (Bore Well Water)	Visapur Village (Bore well Water)
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	97	100	100

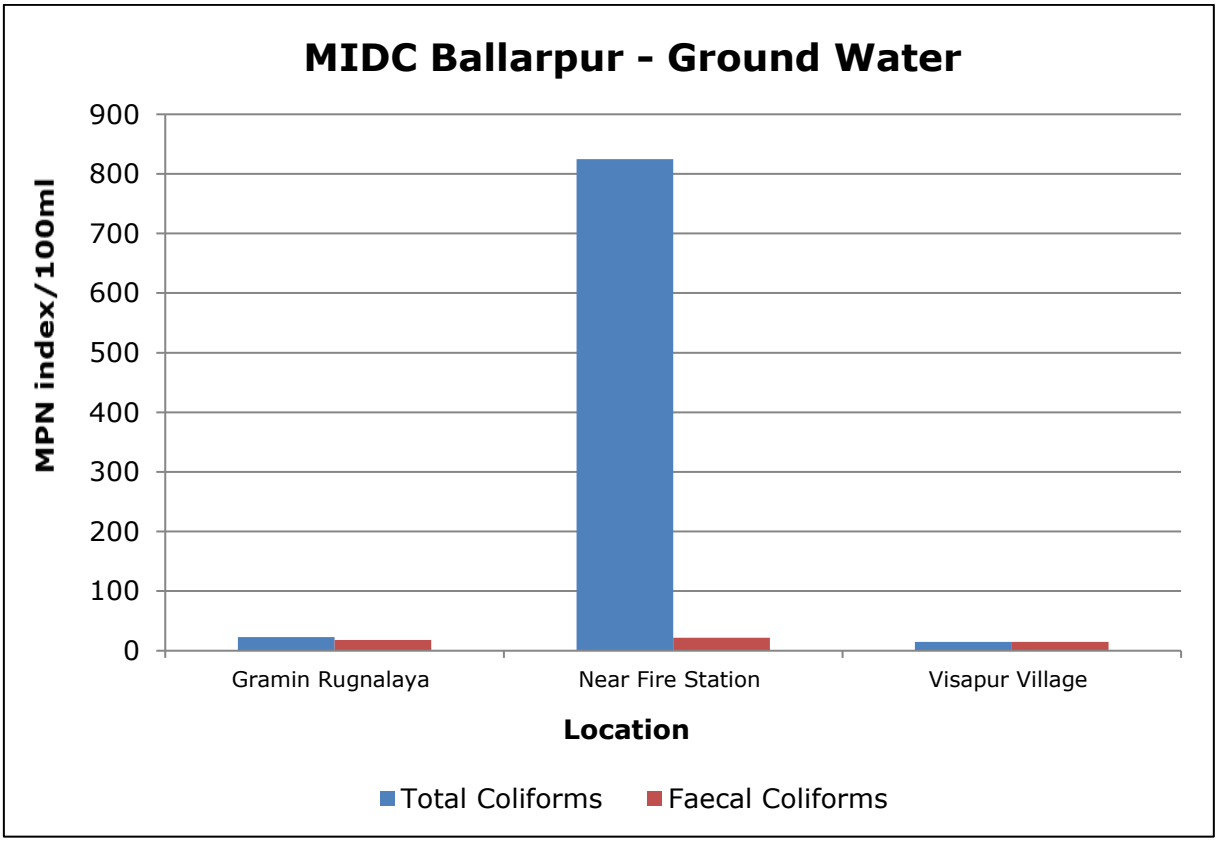
Graphs - Ground water Quality of MIDC Ballarpur

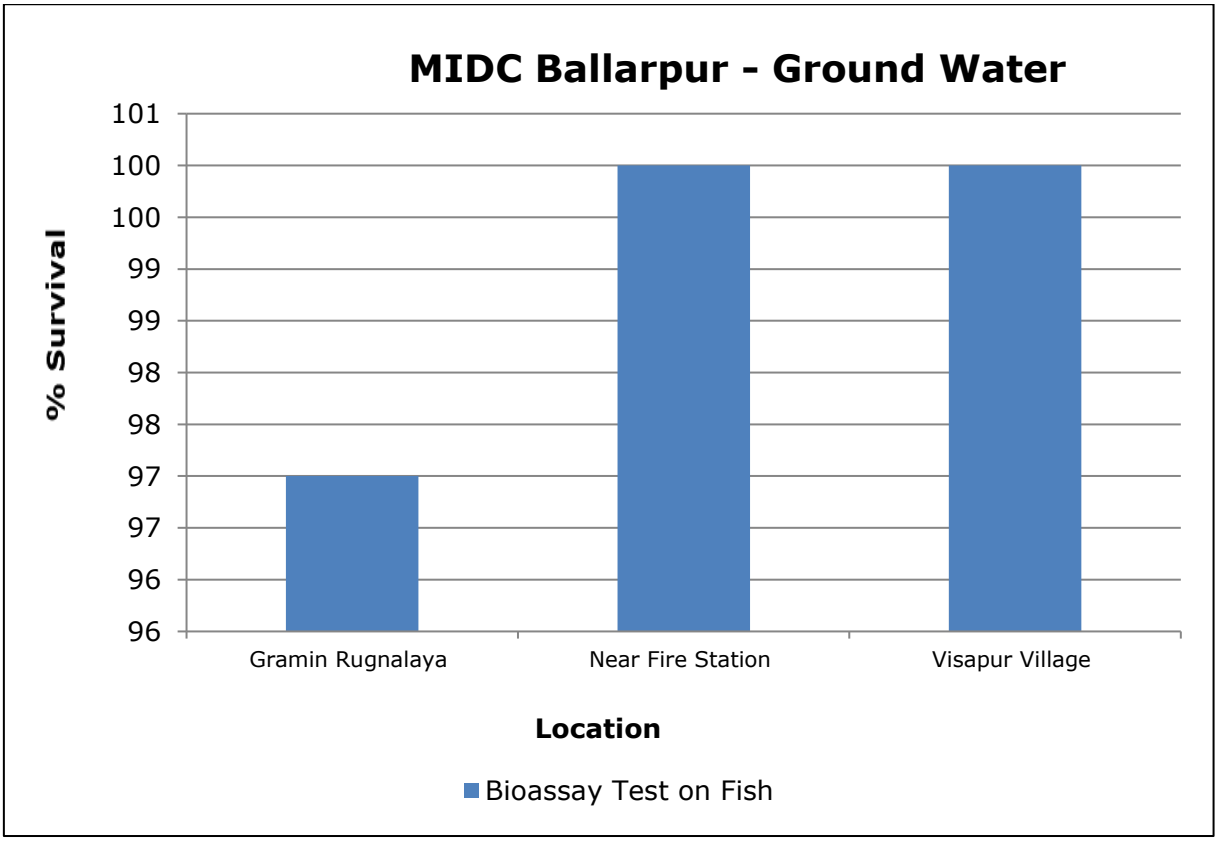





MIDC Ballarpur - Ground Water
Concentration (mg/L)
600
500
400
300
200
100
0
Gramin Rugnalaya
Near Fire Station
Visapur Village
Location
SS
TDS
COD
BOD


MIDC Ballarpur - Ground Water
Concentration (mg/L)
9
8
7
6
5
4
3
2
1
0
Gramin Rugnalaya
Near Fire Station
Visapur Village
Location
NO2-N
NO3-N
(NO2 + NO3)
Flouride
Total Phosphate
TKN
NH4+NH3-N
Total Nitrogen


MIDC Ballarpur - Ground Water
MPN index/100ml
900
800
700
600
500
400
300
200
100
0
Gramin Rugnalaya
Near Fire Station
Visapur Village
Location
Total Coliforms
Faecal Coliforms


MIDC Ballarpur - Ground Water
% Survival
101
100
100
99
99
98
98
97
97
96
96
Gramin Rugnalaya
Near Fire Station
Visapur Village
Location
Bioassay Test on Fish

8. Health Related Data

C: Receptor

Component C (Impact on Human Health)	
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	8.25	0	10	27.00
Water Index	2.5	2.5	6.25	39	0	10	55.25
Land Index	25	2.5	6.25	29	0	10	45.25
						Aggregated CEPI	**60.72**

Water Index is highest with 55.25 The reason for increase in water index is due to the exceedance of concentration of BOD, Fluoride, Total Phosphate and Total Kjeldahl Nitrogen which has exceeded at few samples collected. The Land Index EPI is 45.25 and the concentration of and Air EPI is 27.00.

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI score June 2025	27.00	55.25	45.25	**60.72**
CEPI score March 2025	36.00	44.13	53.88	**61.21**
CEPI score June 2024	26.50	55.00	56.50	**62.84**
CEPI score March 2024	41.00	53.13	53.50	**63.63**
CEPI score June 2023	26.88	51.75	60.88	**66.32**
CEPI score March 2023	38.10	59.30	41.90	**65.76**
CEPI score June 2021	22.00	57.30	59.00	**64.20**
CEPI Score March 2021	54.30	43.50	42.30	**62.70**
CEPI score March 2020	65.00	22.00	21.00	**66.60**

CEPI score June 2019	37.07	51.10	54.40	**54.56**
CEPI score March 2019	44.50	48.90	47.10	**57.28**
CEPI score June 2018	41.32	40.58	44.36	**51.88**
CEPI score March 2018	46.80	49.20	56.90	**61.69**
CPCB CEPI score March 2018	75.00	23.75	23.75	**76.41**

The result shows that CEPI score of the present report is 61.27. The present study is the compilation of pre monsoon season, which also affects the score value. This time CEPI is observed lower than the CPCB CEPI score March 2018 which was 76.41.

CEPI score calculation:

Ambient Air Analysis Report

Pollutant	**Group**	**A1**	**A2**	**A (A1 X A2)**
PM_{10}	B	2	Moderate	
CO	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}	62.69	100	0.63	1	16	0.04	M	8.25
CO	1.26	2	0.63	0	16	0.00	L	0
Benzene	1.77	5	0.35	0	16	0.00	L	0
B score = (B1+B2+B3)							**B**	**8.25**

C	**0**	**< 5 %**
D	**10**	**A-A-IA**

Air CEPI Score	**(A+B+C+D)**	**27.00**

Water Quality Analysis Report

Pollutant	**Group**	**A1**	**A2**	**A (A1 X A2)**
BOD	B	2	Moderate	
TKN	A	0.25		
Fe	A	0.25		
		2.5	**2.5**	**6.25**

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)	
BOD	15.500	8	1.94	16	18	1.72	H	30
TKN	4.140	3	1.38	7	18	0.54	H	5.25
Fe	0.30	0.3	1.00	4	18	0.22	M	3.75
B score = (B1+B2+B3)							**B**	**39**

C	**0**	**< 5 %**
D	**10**	**A-IA-A**

Water CEPI Score	**(A+B+C+D)**	**55.25**

Ground Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
TP	B	2	Moderate	
F	A	0.25		
Fe	A	0.25		
		2.5	**2.5**	**6.25**

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)	
TP	0.43	0.3	1.43	7	12	0.84	H	20.25
F	1.530	15	1.02	7	12	0.60	H	5.5
Fe	0.17	0.3	0.57	3	12	0.14	M	3.255
B score = (B1+B2+B3)							**B**	**29**

C	**0**	**< 5 %**
D	**10**	**A-IA-A**

Land CEPI Score	**(A+B+C+D)**	**45.25**

Water CEPI Score (im) **55.25**

Land CEPI Score (i2) **45.25**

Air CEPI Score (i3) **27.00**

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 = **60.72**

10. Conclusion

Ambient Air Quality

- The AAQ stations were identified in the CEPI impact area to cover both upwind and cross wind directions and AAQ survey was conducted.
- All 16 parameters are well within the limits as per NAAQS at all locations except PM_{10} exceeding at 1 location.
- In the CEPI score calculated for Air environment by CPCB in March 2018, the concentration of PM10 and PM2.5 has exceeded at all studied locations, which contributed to air index (75.00). However, in the present report, concentration of both PM10 and PM2.5 are found below permissible levels except parameter PM_{10} at 1 location exceeded resulted, hence increase air index (27.00) comparing with last CEPI score.

Surface Water Quality

- Higher concentration of BOD, Fluoride, Iron, Total Phosphate and Total Kjeldahl Nitrogen was observed in the surface water samples collected which may be due to domestic wastewater, sewerage, other localized activities.
- All the industries in Chandrapur region are either reusing the treated trade effluent as sewage in their process or gardening.

Ground Water Quality

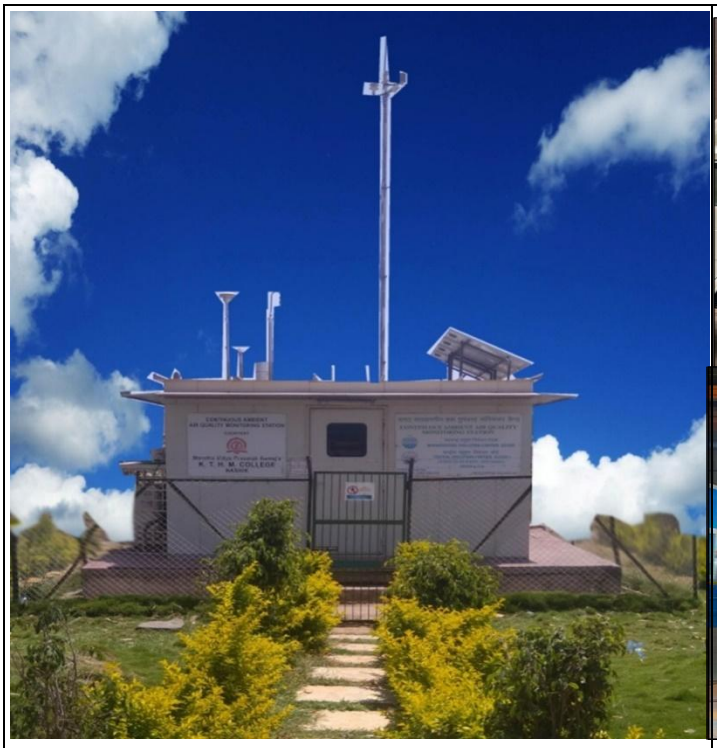
- Ground water samples were collected from different Dug well, well and Bore well in the region.
- Higher concentration of BOD, Fluoride, Total Phosphate, Total Kjeldahl Nitrogen and Iron was observed in the ground water samples collected.
- In the CEPI score calculated for Land Environment by CPCB in March 2018 also there is no critical pollutant exceeding in any water sample collected.

CEPI Score

- The CEPI Score pre monsoon season is 60.72.
- When CEPI Score is 61.21 of March 2025 is compared, a decrease in the Land Index and Air Index and increase in Water Index are found to get slightly increase in June 2025.
- Collective efforts of MPCB, administration and environmental organizations have finally paid off and pollution levels in Chandrapur are on the decline.
- An effort taken to reduce the pollution level is represented in factor D in CEPI Calculation, which also affects the overall CEPI score.
- In CEPI score of CPCB 2018, Air index is higher as compared to the present (June, 2025) indices. However, water index (55.25) and land index (45.25) of present CEPI is higher than the water (23.75) and land CEPI (23.75) calculated by CPCB in 2018.
- As per the CPCB, CEPI calculation revised in 2016, Health statistics represented by Receptor C in CEPI Calculation, also plays an important role.
- Efforts taken to reduce the pollution level is represents factor D in CEPI Calculation, which also affects the overall CEPI score.
- The present study is the compilation of pre-monsoon season, which results in dilution of environmental samples resulting in lower pollution load, hence also affects the total score.
- In conclusion, approximately 19.81 % decrease in CEPI score is observed from 76.41 (CPCB CEPI score) in 2018 to 60.72 in June 2025.

11. Efforts taken by MPCB to Control and Reduce Environmental Pollution Index

- Drive against open burning of bio-mass, crop residue, garbage, leaves, etc. Awareness programme/campaign conducted regularly during World Environment Day.
- **Waste collection and segregation centres**:
  - ✓ **Domestic Solid Waste**: CCMC has provided waste collection and segregation facility at source for residential areas.
  - ✓ **Industrial Non-Hazardous Waste:** Recyclable waste is sent to authorized waste recycler and other waste collected by corporation.
  - ✓ **Hazardous waste:** Industrial hazardous waste is sent to common hazardous treatment and disposal facility by industries.
- **Installation of CEMS installed for Air and Water in Large and Medium scale RED category industries**: All large and medium scale 10 nos. of red category industries of CEPI Area have installed CEMS for air monitoring.
- Arrangement of scientific collection and treatment of sewage generated: CCMC has constructed sewer line of 141 km in Chandrapur city for collection of entire sewage generated in Chandrapur city. Remaining work of 36 km is under progress.
- Installation of CAAQMS station: CAAQMS is installed at 02 locations namely at Udyog Bhavan and at MIDC Chandrapur.
- Establishment of monitoring stations under National Water Quality Monitoring Programme (NWMP): There are 5 NWMP stations in critically polluted area of Chandrapur namely at Wardha River upstream of AAC Ghuggus, Wardha river downstream of ACC Ghuggus, Wardha river at Rajura bridge, upstream of Erai river and downstream of Erai river.
- Steps are taken for industrial area/other units to recycle 100% treated effluent to achieve zero liquid discharge (ZLD): M/s Multi Organics Pvt.Ltd. has provided ZLD system for recycling of entire treated effluent into the process.
- Steps taken to reduce dust emission: All the industries in Chandrapur CEPI area has installed adequate air pollution control systems for dust suppression inside the plant periphery. WCL mines have installed water sprinklers and mist type fogging systems for dust suppression in mine areas.
- Tree plantation in last one year (2024-2025): 10000 approximately.
- Other initiatives taken to control and reduce pollution in air, surface water and groundwater in last one year (2024-2025):
  a) Regular cleaning of roads, traffic diversion and signals shall be installed by corporation.
  b) Road sweeping machine provided.
  c) Tree plantation drive in nearby MIDC areas.
  d) Continuous Ambient Air Monitoring Mobile Van provided for monitoring of air quality in around Chandrapur industrial areas.
  e) Cleaning and deepening of Ramala Lake & Erai River.
  f) Installation of display boards at prominent locations for creating awareness regarding air pollution in the city.



Continuous Ambient Air Quality Monitoring Station

Ambient Air Quality Monitoring Van

Dust Suppression Vehicle

Public Awareness Programs

Mechanical Sweeper Machine

12. Photographs

MIDC Tadali-Ambient Air Sampling at Near Chaman Metallic Boundary Wall

MIDC Tadali-Ambient Air Sampling at MIDC WTP Building

MIDC Chandrapur - Ambient Air Sampling at Opposite Super Hygienic CBMW Site

MIDC Chandrapur - Ambient Air Sampling at Multi Organics

MIDC Ghugus - Ambient Air Sampling at Terrace of Transit Hostel Rajiv Colony WCL

MIDC Ghugus - Ambient Air Sampling at WTP Water Supply Tank

MIDC Ghugus - Ambient Air Sampling at (NAMP) Near Gram Panchayat

MIDC Ghugus - Ambient Air Sampling at Guest House of ACC Cement

MIDC Ballarpur - Ambient Air Sampling at WCL Office, Ballarpur on Sasti Road

MIDC Ballarpur - Ambient Air Sampling at Estate Office, BILT Colony

MIDC Tadali – Surface Water Sampling at Tadali Village Lake

MIDC Tadali – Surface Water Sampling at Nallah adjacent to Grace Industries

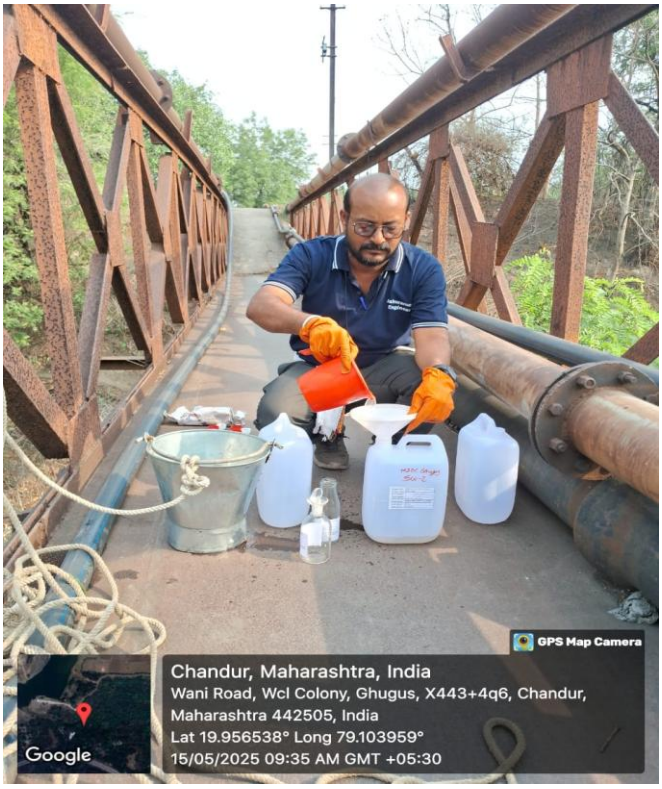
MIDC Tadali – Surface Water Sampling at Raw Water of MIDC WTP

MIDC Chandrapur – Surface Water Sampling at Nallah Opposite Manidhari Industry

MIDC Chandrapur – Surface Water Sampling at Nallah Near Gagangiri Village

MIDC Chandrapur – Surface Water Sampling at Nallah at Dhanora Bridge

MIDC Ghugus – Surface Water Sampling at Wardha river Near WCL WTP Ghugus OCM



MIDC Ghugus – Surface Water Sampling at Domestic Effluent Nallah Near lokhandi bridge at WTP of Ghugus OCM

MIDC Ghugus – Surface Water Sampling at (NWMP) Wardha River behind ACC plant

MIDC Ballarpur – Surface Water Sampling at Nallah Near Petrol Pump at Ballarpur Bamni Road

MIDC Ballarpur – Surface Water Sampling at Bagirathi Nallah Bridge, Gondpipari Road, Near Bamni Proteins

MIDC Ballarpur – Surface Water Sampling at Wardha River upstream

MIDC Tadali – Ground Water Sampling at Yerur village (Bore well water)

MIDC Tadali – Ground Water Sampling at Near Tadali Lake Janata School (Dug well water)

MIDC Tadali – Ground Water Sampling at Yerur Village (Dug well Water)

MIDC Chandrapur – Ground Water Sampling at Gagangiri Village (Dug well Water)

MIDC Chandrapur – Ground Water Sampling at Mahada Colony (Hand Pump water)

MIDC Chandrapur – Ground Water Sampling at Near Datala Grampanchayat (Hand Pump water)

MIDC Ghugus – Ground Water Sampling at Tukdoji Nagar Ghugus Village (Hand Pump Water)

MIDC Ghugus – Ground Water Sampling at Nakoda Village (Bore Well Water)

MIDC Ghugus – Ground Water Sampling at Usgaon Village (Dug Well Water)

MIDC Ballarpur – Ground Water Sampling at Gramin Rugnalaya (Bore Well Water)

	
MIDC Ballarpur – Ground Water Sampling at Near Fire Station (Bore Well Water)	**MIDC Ballarpur – Ground Water Sampling at Visapur Village (Bore well Water)**

Annexure – I Health Related Data

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Post-monsoon Season (December 2024 - February 2025) Study by Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	CHANDRAPUR
Name of the major health center/ organization	Bilt Hospital
Name and designation of the Contact person	Dr. Nitin V. Bhalerao , C:M.O
Address BGPPL Hospital	Ballarpur, Tal.: Ballarpur, Dist.: Chandrapur

S No.	Diseases	No. of Patients Reported	
		JAN-DEC (2023)	JAN-DEC (2024)
AIRBORNE DISEASES			
1.	Asthma	01	01
2.	Acute Respiratory Infection	52	49
3.	Bronchitis	07	06
4.	Cancer	Nil	Nil
WATERBORNE DISEASES			
1.	Gastroenteritis	29	27
2.	Diarrhea	43	39
3.	Renal diseases	Nil	Nil
4.	Cancer	Nil	Nil

Date: 24/01/2025

Signature
Dr. Nitin V. Bhalerao
MBBS, PGEDH, AFIH
Reg. No. 074041
Chief Medical Officer
BGPPL Hospital, Ballarpur

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Post-monsoon Season (December 2024- February 2025) Study by Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	CHANDRAPUR
Name of the major health center/ organization	CHL Multi-Speciality Hospital & Research Center
Name and designation of the Contact person	
Address	Opposite Adarsh Petrol Pump, Sarkar Nagar, Mul Road, Chandrapur, Tal. & Dist.: Chandrapur

S No.	Diseases	No. of Patients Reported	
		JAN-DEC (2023)	JAN-DEC (2024)
AIRBORNE DISEASES			
1.	Asthma	16	4
2.	Acute Respiratory Infection	208	70
3.	Bronchitis	32	10
4.	Cancer	8	0
WATERBORNE DISEASES			
1.	Gastroenteritis	71	36
2.	Diarrhea	73	35
3.	Renal diseases	135	53
4.	Cancer	8	0

Date: 25/01/2025

CHL Multi-Speciality Hospital & Research Centre Reg. 132

Signature

DR. ROHAN V. AINCHWAR
M.D. (Medicine); D.M. (Cardiology)
MMC Reg.No.2004/03/2011

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Post-monsoon Season (December 2024- February 2025) Study by Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	CHANDRAPUR
Name of the major health center/ organization	Government Medical College
Name and designation of the Contact person	
Address	Ram Nagar, T.B. Hospital Premises, In front of Dr. Ambedkar College, Tal. & Dist.: Chandrapur

S No.	Diseases	No. of Patients Reported	
		JAN-DEC (2023)	JAN-DEC (2024)
AIRBORNE DISEASES			
1.	Asthma	367	368
2.	Acute Respiratory Infection	7817	3035
3.	Bronchitis	260	101
4.	Cancer	149	282
WATERBORNE DISEASES			
1.	Gastroenteritis	2104	1951
2.	Diarrhea	1016	390
3.	Renal diseases	6232	6259
4.	Cancer	149	282

Date:

Signature

अधिसेविका
शासकिय वैद्यकीय महाविद्यालय व रुग्णालय
चंद्रपूर

Medical Superintendent
Govt. Medical College & Hospital
Chandrapur.

HEALTHSTATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)
Post-monsoon Season (December 2024- February 2025) Study by
Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Nameof thePollutedIndustrialArea(PIA)	CHANDRAPUR
Nameofthemajorhealthcenter/organization	WCL, Rajiv Ratan Central Hospital ,Ghugus
NameanddesignationoftheContactperson	Dr.D.C.ANAND,Area Medical Officer
Address	WCL, Wani Area, PO: Ghugus, Tal. & Dist.: Chandrapur 442505.

SNo.	Diseases	No.ofPatients Reported	
		JAN-DEC (2023)	JAN-DEC (2024)
AIRBORNE DISEASES			
1.	Asthma	36	39
2.	AcuteRespiratoryInfection	1672	1680
3.	Bronchitis	375	900
4.	Cancer	01	03
WATERBORNE DISEASES			
1.	Gastroenteritis	1447	1700
2.	Diarrhea	12	42
3.	Renaldiseases	32	26
4.	Cancer	00	01

Date:

Signature

क्षेत्रीय चिकित्सा अधिकारी
राजीव रतन केंद्रीय चिकित्सालय,घ
Area Medical Officer
Rajiv Ratan Central Hospital,

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Post-monsoon Season (December 2024- February 2025) Study by Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	**CHANDRAPUR**
Name of the major health center/ organization	**Rural Hospital, Ballarpur**
Name and designation of the Contact person	
Address	**Ballarpur, Tal.: Ballarpur, Dist.: Chandrapur**

S No.	Diseases	No. of Patients Reported	
		JAN-DEC (2023)	JAN-DEC (2024)
AIRBORNE DISEASES			
1.	Asthma	16	111
2.	Acute Respiratory Infection	0	0
3.	Bronchitis	0	1
4.	Cancer	7	0
WATERBORNE DISEASES			
1.	Gastroenteritis	168	273
2.	Diarrhea	26	71
3.	Renal diseases	0	1
4.	Cancer	0	0

Date:

Signature

Medical Officer
Rural Hospital, Ballarpur
Dist. Chandrapur