Monitoring, Sampling and Analysis for Ambient Air Quality, Surface Water Quality and Ground Water Quality in Critically/Severely/Other Polluted Areas

CHEMBUR

Post-Monsoon (December 2024 - February 2025)

MAHARASHTRA

LiFE Lifestyle for Environment

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

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ABBREVIATIONS

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

1. Executive Summary

The Chembur CEPI area 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 the CPCB location with the additional locations of samplings for ambient air, surface and groundwater in consideration with the previous CEPI monitoring and covering the entire CEPI Impact Zone. The Post - Monsoon monitoring was carried out during the period of December 2024 to February 2025 to verify the Ambient Air Quality, Surface water and Groundwater.

The Ambient Air Quality stations were identified considering the upwind and crosswind direction in the CEPI impact area. All 12 parameters of NAAQS are well within the limit prescribed. The surface water of Chembur is contaminated as the domestic wastewater drain is also connected with the surface water and hence the quality of surface water could not compare with IS 10500:2012 drinking water standards. In groundwater, the concentrations of all parameters are well within the limit.

Based on the study conducted by CPCB in January 2018, the CEPI score of Chembur region (as per the revised CEPI guidelines 2016) was 54.67 (Ambient Air–52.25, Water-50.75, Land–10). The concentrations of PM10 and PM2.5 in the CEPI score of CPCB were the main contributors to the increase in the score, and this is primarily due to the AAQM stations installed near the roadside where the majority of vehicular movements occur, causing PM10 and PM2.5 concentrations to be further apart from industrial emission sources.

The Maharashtra Pollution Control Board has made several steps to reduce the CPCB CEPI Score of 54.67 of 2018 to 48.8 of March 2025. According to the present study result, the Environmental Pollution Index (EPI) score of Post-Monsoon in Ambient Air is calculated as 16.0, Surface Water as 20.0, and Ground Water as 46.0. Hence, Chembur's Comprehensive Environmental Pollution Index (CEPI) score for the Post-monsoon 2025 is 48.8.

2. Introduction

The industrial sector remains a pivotal force in driving a nation's economic growth, significantly contributing to increased production, fixed investment, exports, employment, and capacity utilization. Industries serve as engines of economic development, bolstering government revenue, international trade, social services, and job creation. The growth rate of the industrial sector directly impacts the overall economic growth of a country. Consequently, industries are essential for achieving economic goals and prosperity. According to the World GDP Ranking 2024, India stands as the fifth-largest economy globally. Several Sustainable Development Goals (SDGs) focus on growth, including Decent Work and Economic Growth (Goal 8) and Industry, Innovation, and Infrastructure (Goal 9).

Despite these economic benefits, industrial activities have a profound negative impact on the environment, affecting water, air, and soil quality. Industries discharging untreated wastewater have contaminated drinking water with hazardous substances, posing severe risks to human, animal, and aquatic life. Air pollution from industrial emissions is linked to a range of respiratory and cardiovascular diseases, particularly affecting children and leading to increased rates of infant mortality and chronic health issues in adulthood. According to the World Health Organization (WHO), environmental pollution is responsible for approximately 9 million premature deaths annually. Over 90% of the global population is exposed to air pollution levels exceeding WHO guidelines, posing serious health risks. Furthermore, around 2 billion people use drinking water contaminated with faces, leading to infectious diseases such as cholera and dysentery.

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

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 analysing 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.

Chembur, a major industrial hub in Mumbai, has been facing severe environmental challenges due to industrial pollution and inadequate waste management. Ranked 46th among India's most polluted industrial clusters, the area has been the subject of various environmental assessments, including the Comprehensive Environmental Pollution Index (CEPI) and monitoring studies on air, surface water, and groundwater quality. These studies have revealed high concentrations of heavy metals such as copper, chromium, calcium, arsenic, and mercury in groundwater, raising concerns about contamination and public health risks.

Industrial effluents from oil refineries, fertilizer plants, and reactors have significantly polluted Thane Creek, disrupting marine ecosystems. A major contributor to air pollution in the region is the uncontrolled release of ammonia and nitrous oxides from the Rastriya Chemical Fertiliser complex, attributed to inadequate pollution control measures and overburdened equipment. Regular monitoring of ambient ammonia and NOx levels is essential to assess and address this issue effectively. Another critical environmental concern in Chembur is the Deonar dumping ground, which has long been a source of air pollution, leading to respiratory illnesses among residents. Repeated protests and complaints from the community highlight the urgent need for sustainable waste management solutions.

This report follows the revised CEPI framework (2016), which evaluates environmental quality by analysing air, water, and land pollution. CEPI assessments provide a comprehensive approach to identifying pollution hotspots, enforcing regulations, and implementing targeted interventions. Despite ongoing challenges, these initiatives offer hope for a cleaner, healthier, and more sustainable future for Chembur.

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 Chembur, 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 Mahad

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

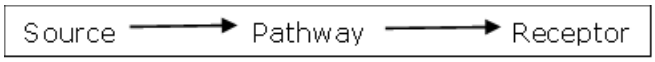
Sampling Criteria	Total Sites	Monitoring Parameters
		CIS-1,2-Dichloroethylene, Bromochloromethane, 1,1,1-Trichloroethane
Water Quality Monitoring	**Surface water - 06**	**(i) Simple Parameters** Sanitary Survey, General Appearance, Colour, Smell, Transparency and Ecological **(ii) Regular Monitoring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

Table 3.2 Frequency of Sampling

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

4. Methodology

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



Ambient air stations, Surface water locations and Groundwater 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 potentially 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.

AIR ENVIRONMENT

5. Air Environment

For studying the Air Environment of Chembur area, monitoring stations were identified considering the upwind and crosswind direction and all 12 parameters as per the notification of National Ambient Air Quality Standards (NAAQS, 2009) were carried out.

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

In Chembur, eight locations have been monitored of checking the AAQ. All 12 parameters are observed well within the limits at all 8 locations monitored. Volatile Organic

Table 5.1 Details of Sampling Location of Ambient Air Quality Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Near main gate BPCL	19°1'13.62"N	72°53'49.59"E	27.01.2025	29.01.2025	31.01.2025
2.	Ambapada Gaon	19°0'43.92"N	72°53'25.70"E	27.01.2025	29.01.2025	31.01.2025
3.	Nearby RCF main plant	19°2'5.62"N	72°53'31.98"E	27.01.2025	29.01.2025	31.01.2025
4.	BPCL sports club	19°1'44.07"N	72°53'43.66"E	27.01.2025	29.01.2025	31.01.2025
5.	HPCL Refinery Main Gate	19°1'11.79"N	72°53'49.63"E	27.01.2025	29.01.2025	31.01.2025
6.	Tata Power Colony	19°2'20.46"N	72°53'59.23"E	27.01.2025	29.01.2025	31.01.2025
7.	Ever smile Building	19°0'55.47"N	72°53'12.80"E	27.01.2025	29.01.2025	31.01.2025
8.	Near main gate PepsiCo	19°1'12.26"N	72°53'59.12"E	27.01.2025	29.01.2025	31.01.2025

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

	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Nearby RCF main plant	19°2'5.62"N	72°53'31.98"E	27.01.2025	29.01.2025	31.01.2025
2.	BPCL sports club	19°1'44.07" N	72°53'43.66"E	27.01.2025	29.01.2025	31.01.2025

Fig: Geographical Locations of Ambient Air Quality Monitoring

Fig: Geographical Locations of VOCs Monitoring

Table 5.3 Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Near main gate BPCL	Amba pada Gaon	Near by RCF main plant	BPCL sports club
Sulphur Dioxide (SO_2)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	35.40	40.35	17.30	17.65
Particulate Matter (size less than 10 µm) or PM_{10}	$\mu g/m^3$	43	41	41	39
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	$\mu g/m^3$	13	12	12	11
Ozone (O_3)	$\mu g/m^3$	BLQ	74.80	BLQ	BLQ
Lead (Pb)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1h)	mg/m^3	1.41	1.51	1.45	1.51
Carbon Monoxide (CO) (8h)	mg/m^3	1.59	1.62	1.79	1.69

Parameters	Unit	Results			
		Near main gate BPCL	Amba pada Gaon	Near by RCF main plant	BPCL sports club
Ammonia (NH_3)	µg/m³	BLQ	55.25	156.00	71.40
Benzene (C_6H_6)	µg/m³	1.86	1.79	2.31	1.81
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	4.78	3.87	3.15	3.41
Nickel (Ni)	ng/m³	67.57	89.75	67.40	67.87

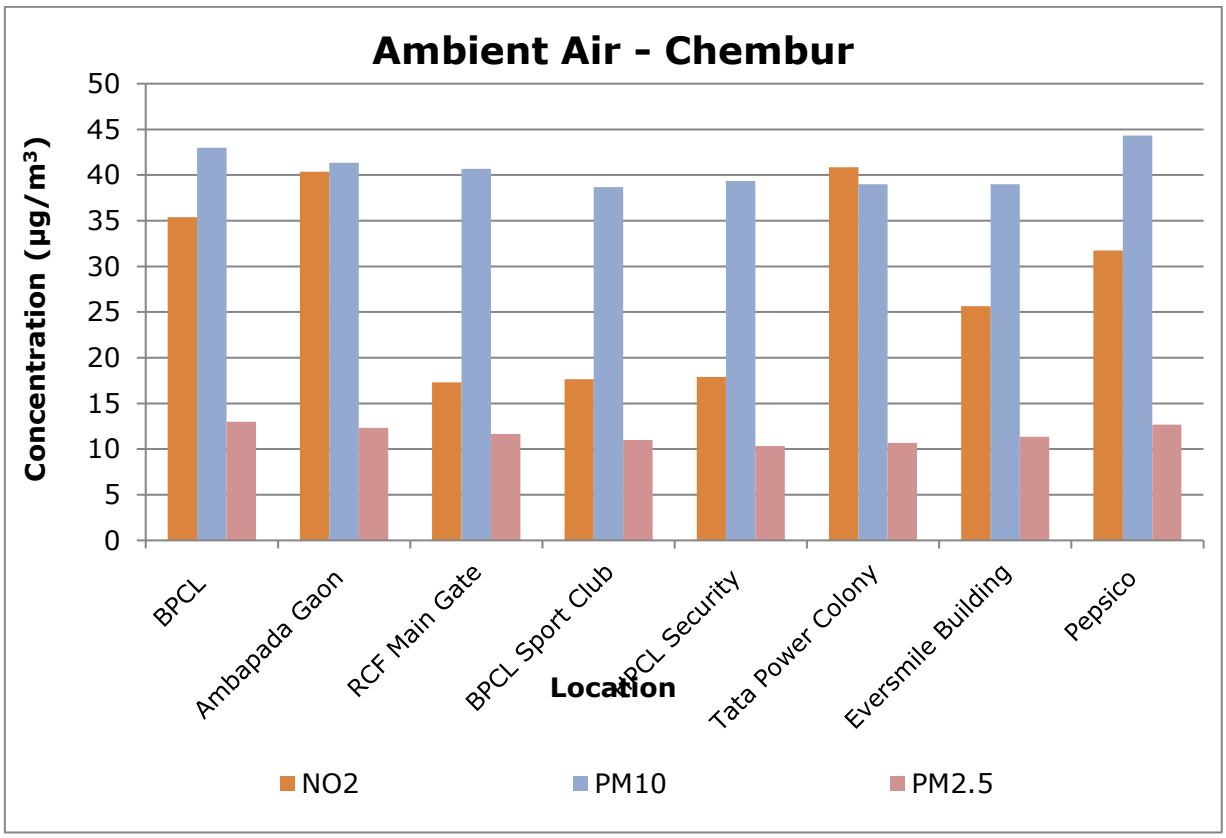
Parameters	Unit	Results			
		HPCL Refinery Main Gate	Tata Power Colony	Ever smile Building	Near main gate PepsiCo
Sulphur Dioxide (SO_2)	µg/m³	BLQ	BLQ	BLQ	BLQ
Nitrogen Dioxide (NO_2)	µg/m³	17.90	40.85	25.63	31.73
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	39	39	39	44
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	10	11	11	13
Ozone (O_3)	µg/m³	68.20	47.55	BLQ	47.30
Lead (Pb)	µg/m³	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1h)	mg/m³	1.42	1.36	1.46	1.48
Carbon Monoxide (CO) (8 h)	mg/m³	1.76	1.70	1.74	1.61
Ammonia (NH_3)	µg/m³	23.20	77.15	59.00	48.40
Benzene (C_6H_6)	µg/m³	1.81	1.92	2.00	2.00
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	3.49	3.47	3.49	4.65
Nickel (Ni)	ng/m³	45.50	14.95	109.00	75.95

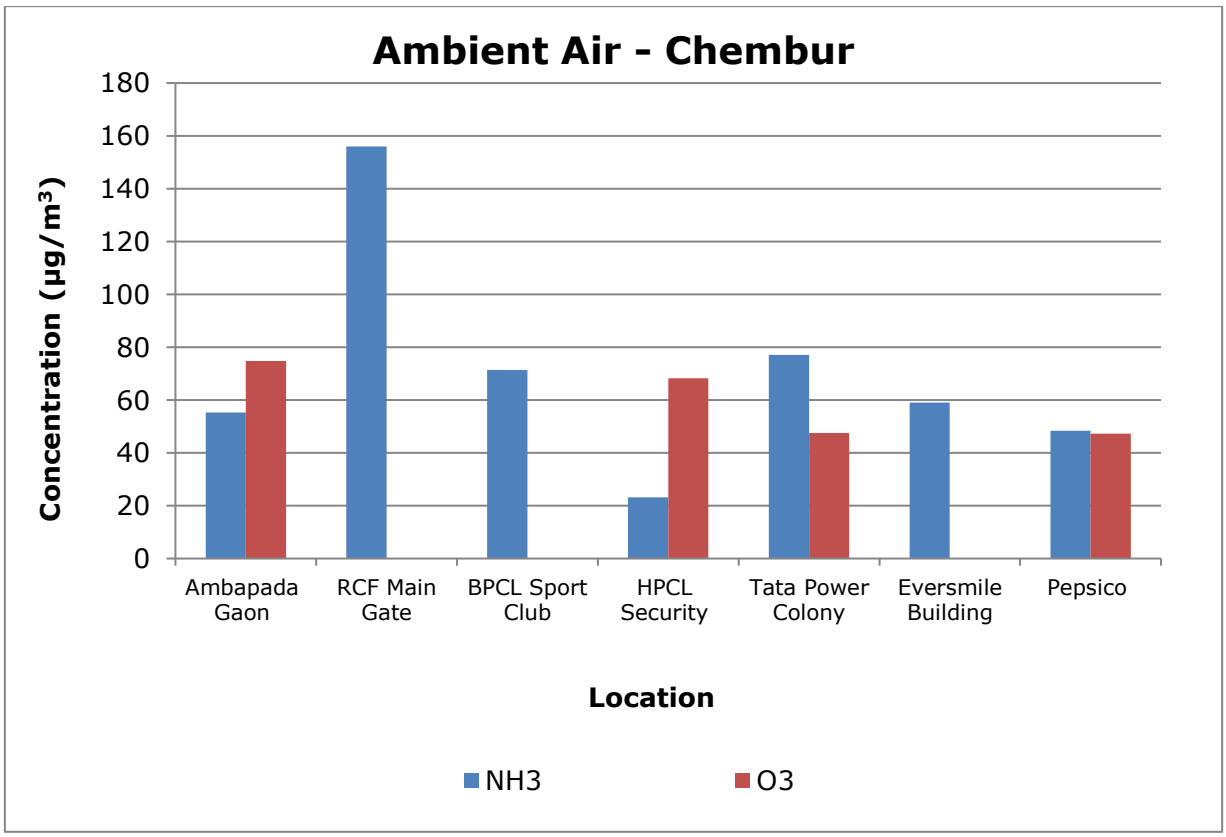
Table 5.4 Volatile Organic Compounds (VOCs) in Ambient Air Results

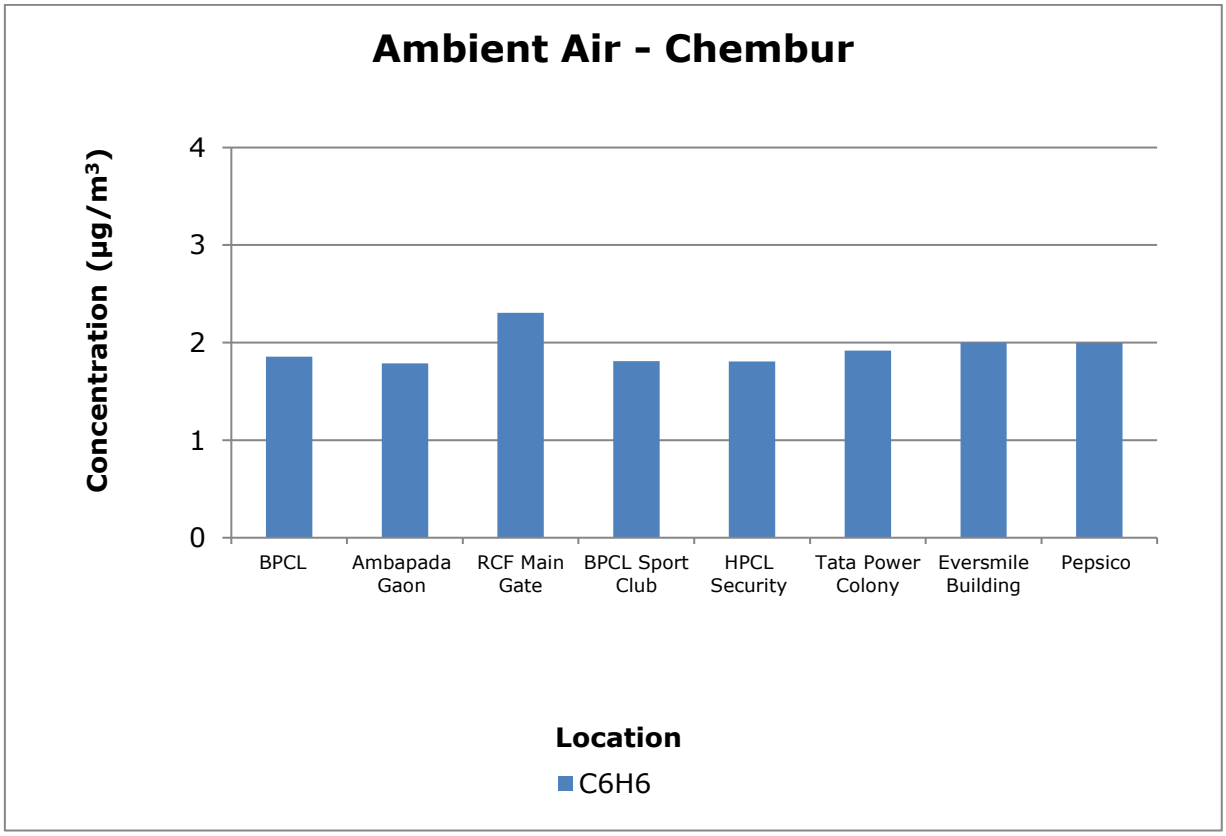
Parameters	Unit	Results	
		Nearby RCF main plant	BPCL sports club
Chloroform	µg/m³	BLQ	0.70
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Naphthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	BLQ	BLQ

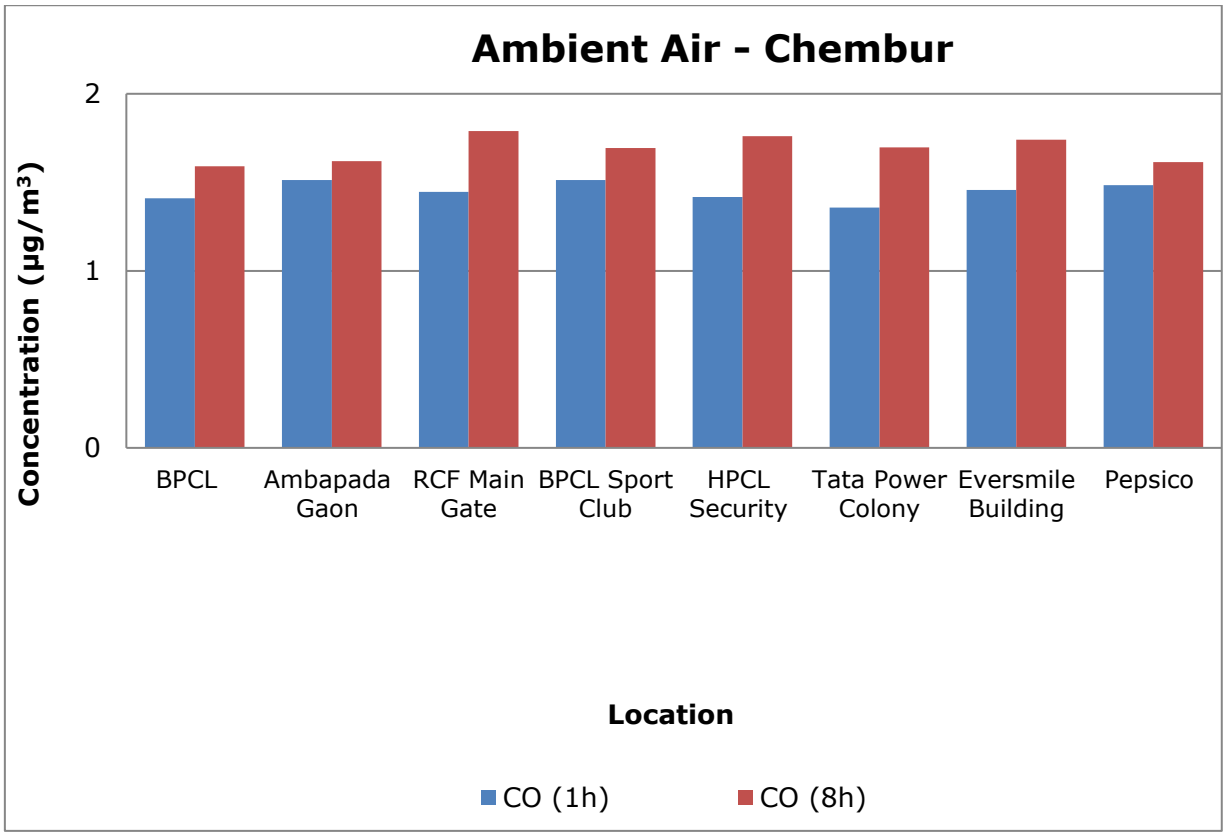
Parameters	Unit	Results	
		Nearby RCF main plant	BPCL sports club
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	0.59	0.93
1,2-Dichloropropane	µg/m³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	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
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.76	0.82
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

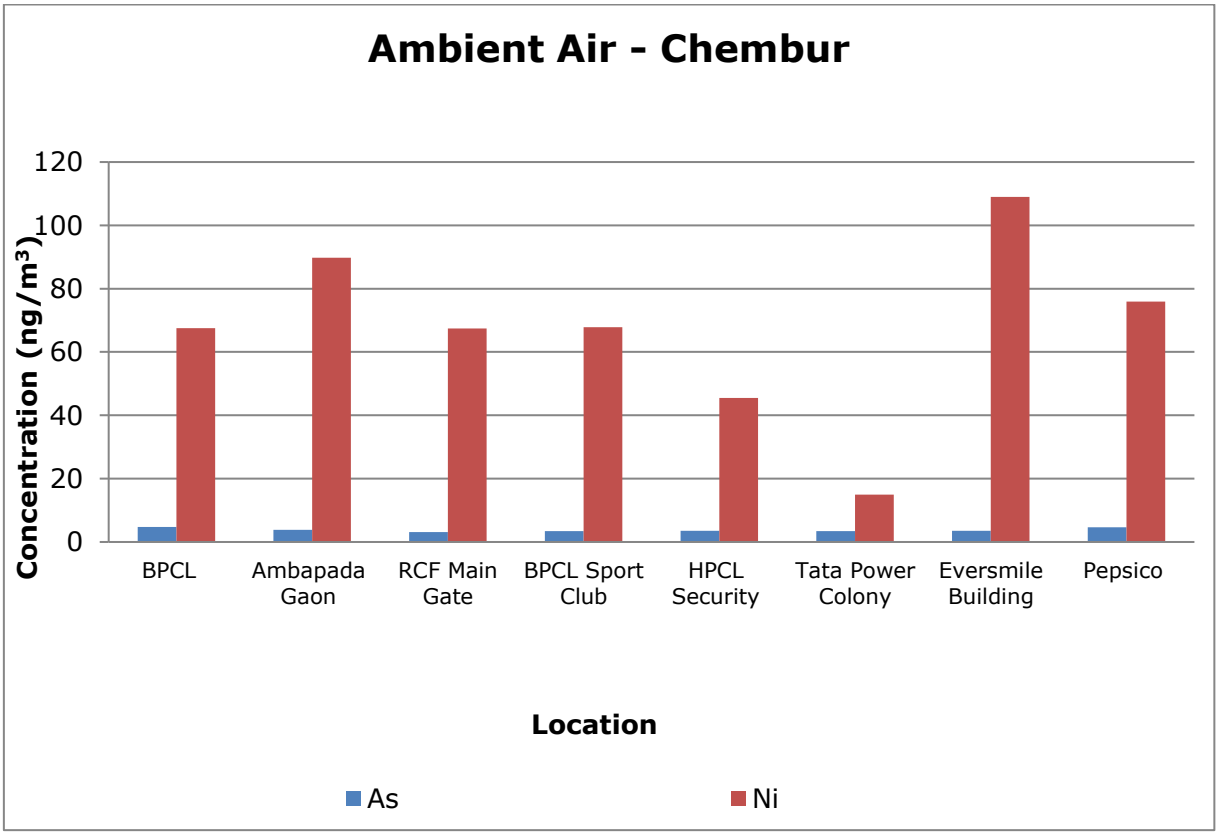
Graphs - Ambient Air Quality Monitoring of Chembur






Ambient Air - Chembur
Concentration (µg/m³)
4
3
2
1
0
BPCL
Ambapada Gaon
RCF Main Gate
BPCL Sport Club
HPCL Security
Tata Power Colony
Eversmile Building
Pepsico
Location
C6H6


Ambient Air - Chembur
Concentration (µg/m³)
2
1
0
BPCL
Ambapada Gaon
RCF Main Gate
BPCL Sport Club
HPCL Security
Tata Power Colony
Eversmile Building
Pepsico
Location
CO (1h)
CO (8h)


Ambient Air - Chembur
120
100
80
60
40
20
0
Concentration (ng/m³)
BPCL
Ambapada Gaon
RCF Main Gate
BPCL Sport Club
HPCL Security
Tata Power Colony
Eversmile Building
Pepsico
Location
As
Ni

WATER ENVIRONMENT

6. Water Environment

For studying the Water Environment of Chembur area, surface water was collected from Nallah, Lake, and River and CETP outlet. A total of 6 samples were collected from the Chembur region.

- All six water samples collected are acceptable in general appearance, colour and transparency. The smell was agreeable in all six samples collected.
- Total Dissolved Solids in surface water of Mahul Jetty (downstream) is found to exceed the permissible limit.
- pH and suspended solids are well within the limits of all six samples collected.
- BOD concentration of Ghatla pond water is found to exceed the acceptable limit.
- Fish bioassay results showed a survival rate ranging from 60% to 87% in the collected samples.
- All metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr^{6+}) etc. are observed either below the limit of quantification (BLQ) or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds also met the criteria as prescribed by CPCB.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all 6 samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all 6 samples collected.

Table 6.1 Details of Sampling Location of Surface Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Pond water from RCF Ashish	19°2'14.62"N	72°54'17.54"E	27.01.2025	29.01.2025	31.01.2025
2.	Downstream near Mahul Jetty	19°0'50.64"N	72°53'5.91"E	27.01.2025	29.01.2025	31.01.2025
3.	Mahul jetty Middle stream	19°1'14.62"N	72°52'44.20"E	27.01.2025	29.01.2025	31.01.2025
4.	Pond water from Cherry Talab near Chembur police station	19°3'3.23"N	72°53'34.25"E	27.01.2025	29.01.2025	31.01.2025

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
5.	Ghatla pond water	19°3'21.11"N	72°54'22.40"E	27.01.2025	29.01.2025	31.01.2025
6.	Creek water near Ajmera Chembur	19°1'44.59"N	72°52'43.00"E	27.01.2025	29.01.2025	31.01.2025

Fig: Geographical Locations of Surface Water Sampling

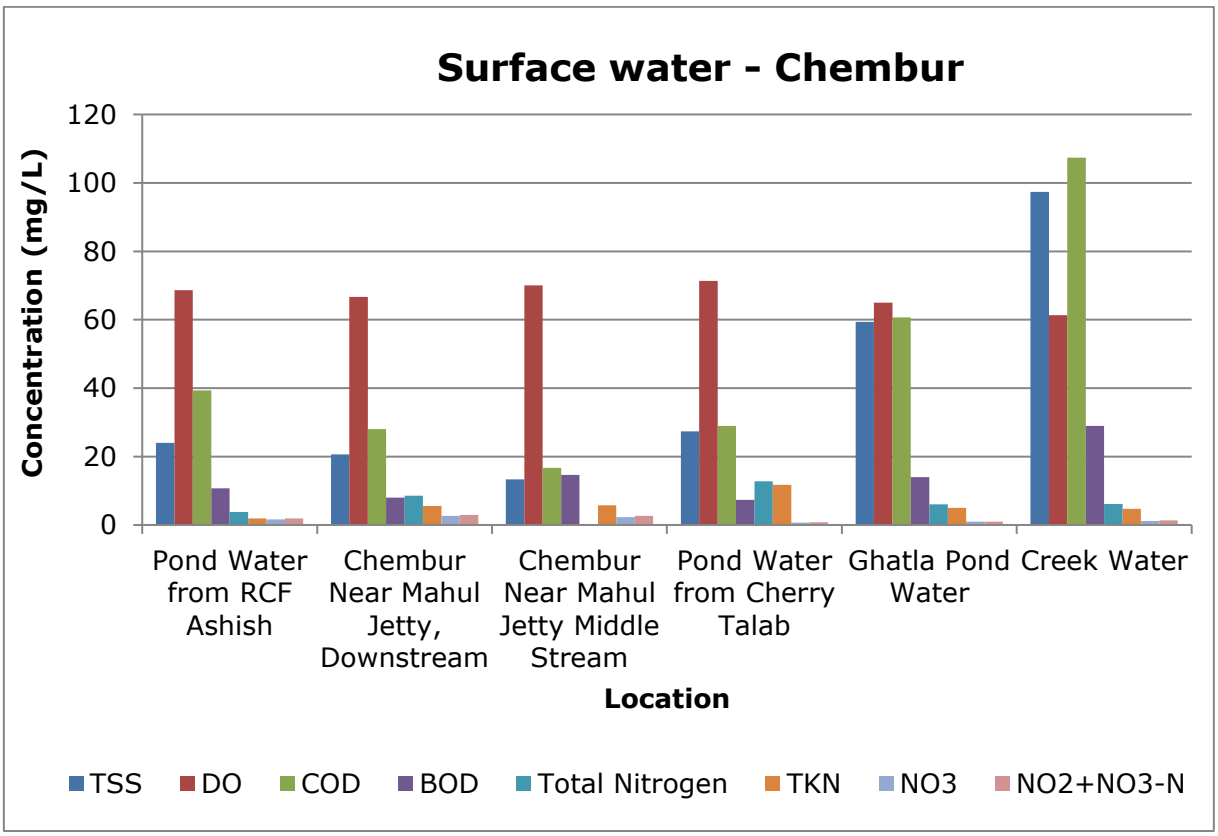
Table 6.2 Results of Surface Water

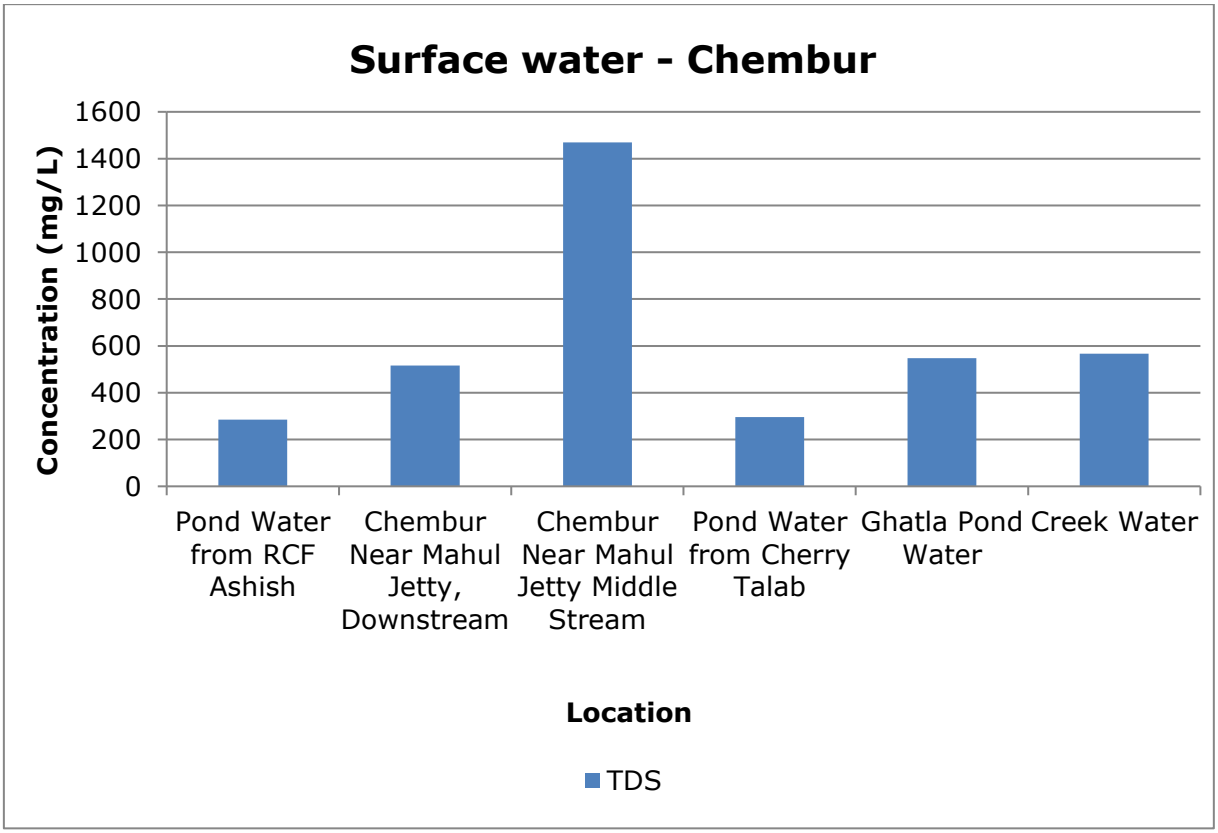
Parameters	Unit	Results					
		Pond water from RCF Ashish	**Downstream near Mahul Jetty**	**Mahul jetty Middle stream**	**Pond water from Cherry Talab near Chembur police station**	**Ghatla pond water**	**Creek water near Ajmera Chembur**
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably Clean neighbourhood	Reasonably Clean neighbourhood
General Appearance	-	No Floating matter	No Floating matter	No Floating matter	No floating matter	No Floating matter	No Floating matter
Transparency	m	0.20	0.27	0.80	0.30	0.23	0.13
Temperature	^oC	27	26	27	27	27	27
Colour	Hazen	1	1	1	2	1	3
Smell	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
pH	-	7.82	7.76	7.80	8.10	8.09	7.98
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	24.00	20.67	13.33	27.33	59.33	97.33
Total Dissolved Solids	mg/L	285	517	1469	295	547	566
Dissolved Oxygen (% Saturation)	%	69	67	70	71	65	61
Chemical Oxygen Demand	mg/L	39	28	17	29	61	107
Biochemical Oxygen Demand (3 days,27^oC)	mg/L	11	8	15	7	14	29
Electrical Conductivity (at 25 ^oC)	µmho/cm	510	924	2624	525	976	1011
Nitrite Nitrogen (as NO_2)	mg/L	0.54	0.35	0.32	0.14	0.05	0.30
Nitrate Nitrogen (as NO_3)	mg/L	1.59	2.63	2.33	0.71	0.95	1.19
(NO_2 + NO_3)-Nitrogen	mg/L	1.95	2.97	2.65	0.81	0.98	1.39

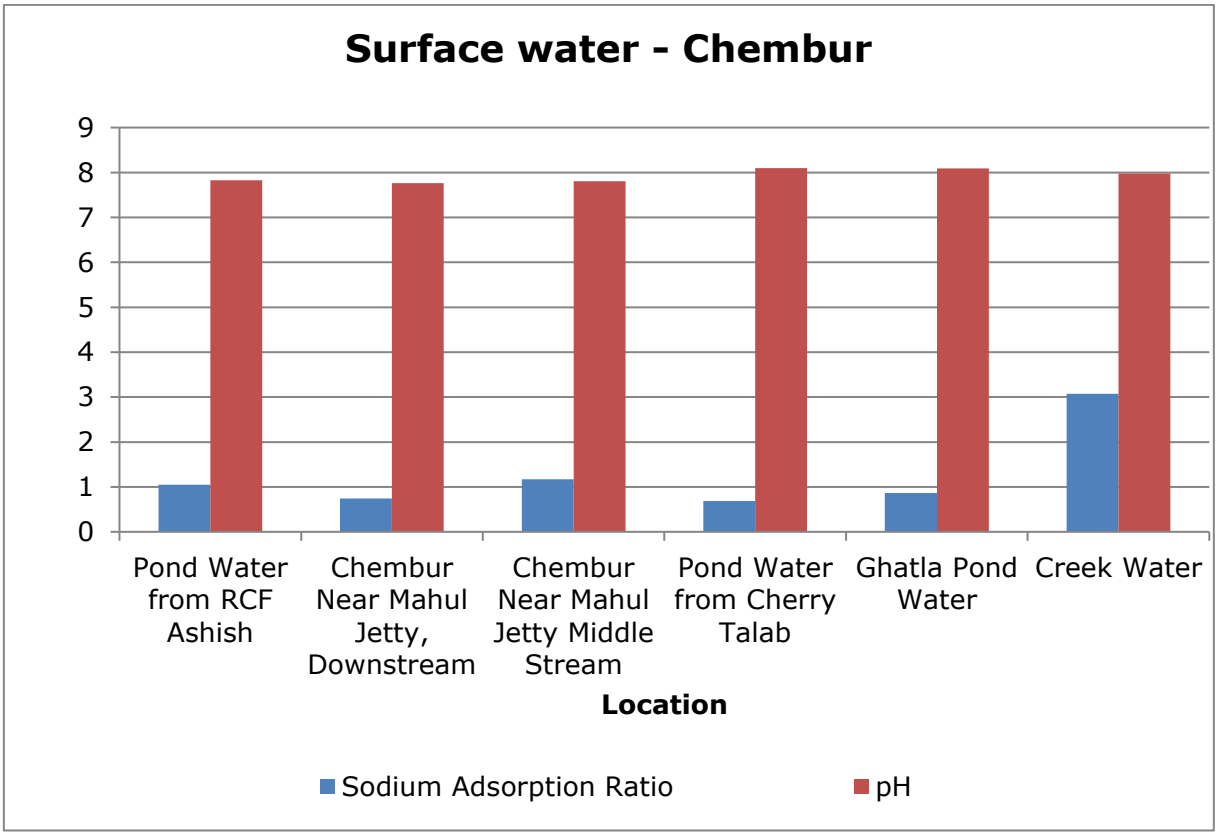
Parameters	Unit	Results					
		Pond water from RCF Ashish	Downstream near Mahul Jetty	Mahul jetty Middle stream	Pond water from Cherry Talab near Chembur police station	Ghatla pond water	Creek water near Ajmera Chembur
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.43	0.72	0.61	0.48	0.52	0.38
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	BLQ	0.12	0.20	0.23	0.2	0.13
Sodium Adsorption Ratio	-	1.05	0.74	1.17	0.68	0.86	3.07
Total Coliforms	MPN Index/ 100 ml	220	707	1160	647	1600	1600
Faecal Coliforms	MPN Index/ 100 ml	94	406	202	74	1082	657
Total Phosphate (as P)	mg/L	0.17	0.18	0.30	0.28	0.2	0.19
Total Kjeldahl Nitrogen (as N)	mg/L	1.88	5.56	5.71	11.70	5.04	4.70
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.285	BLQ	BLQ	0.14	0.11	0.945
Total Nitrogen	mg/L	3.823333333	8.52	BLQ	12.73	6.02	6.08
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ

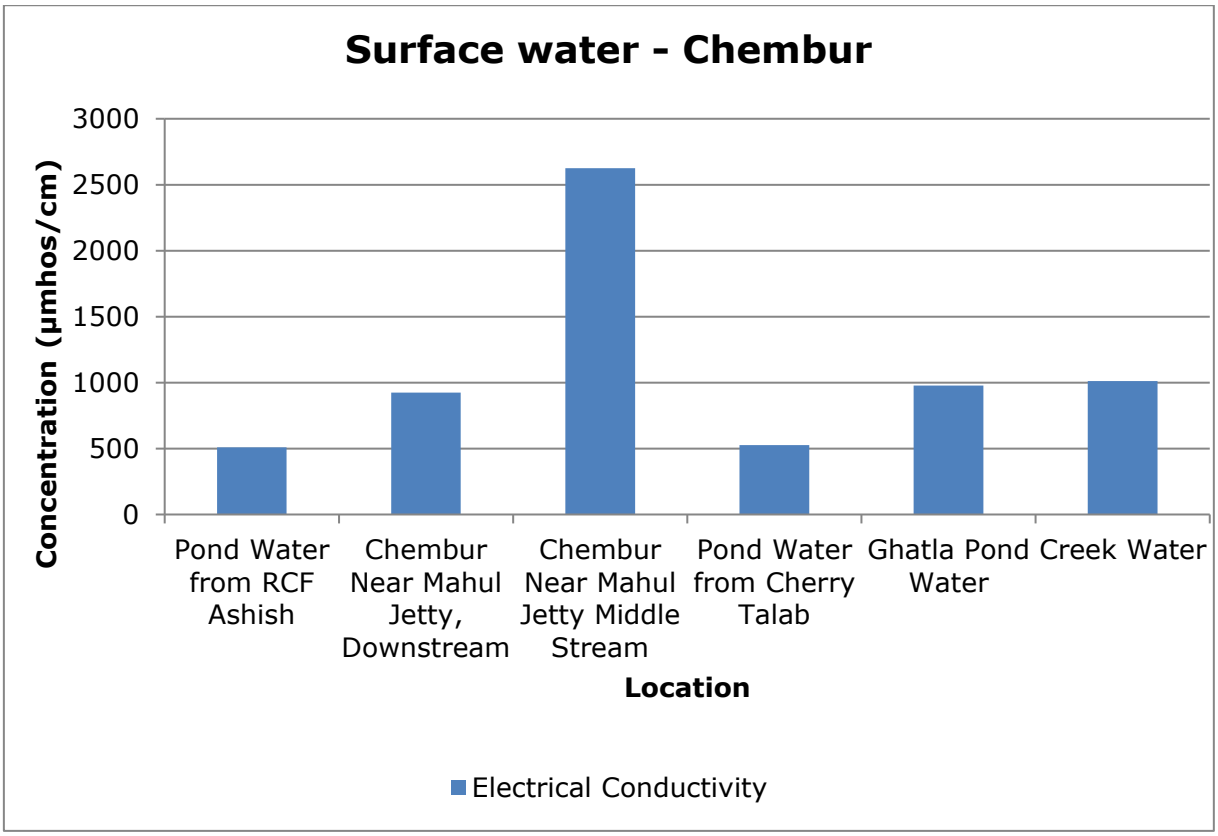
Parameters	Unit	Results					
		Pond water from RCF Ashish	Downstream near Mahul Jetty	Mahul jetty Middle stream	Pond water from Cherry Talab near Chembur police station	Ghatla pond water	Creek water near Ajmera Chembur
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	0.00	0.00	0.00	0.00	0.00	0.00
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	0.10
Nickel (as Ni)	mg/L	0.02	0.03	0.03	0.03	0.02	0.02
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.07	0.10	0.12	0.09	0.10	0.08
Total Arsenic (as Ar)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	0.01	BLQ	0.01	0.02	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.32	0.12	0.09	0.23	0.57	0.12
Iron (as Fe)	mg/L	0.54	0.40	0.43	0.42	0.76	0.77
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	0.25	0.11	BLQ	0.11	BLQ
Bioassay Test on fish	% survival	70	80	80	80	87	60

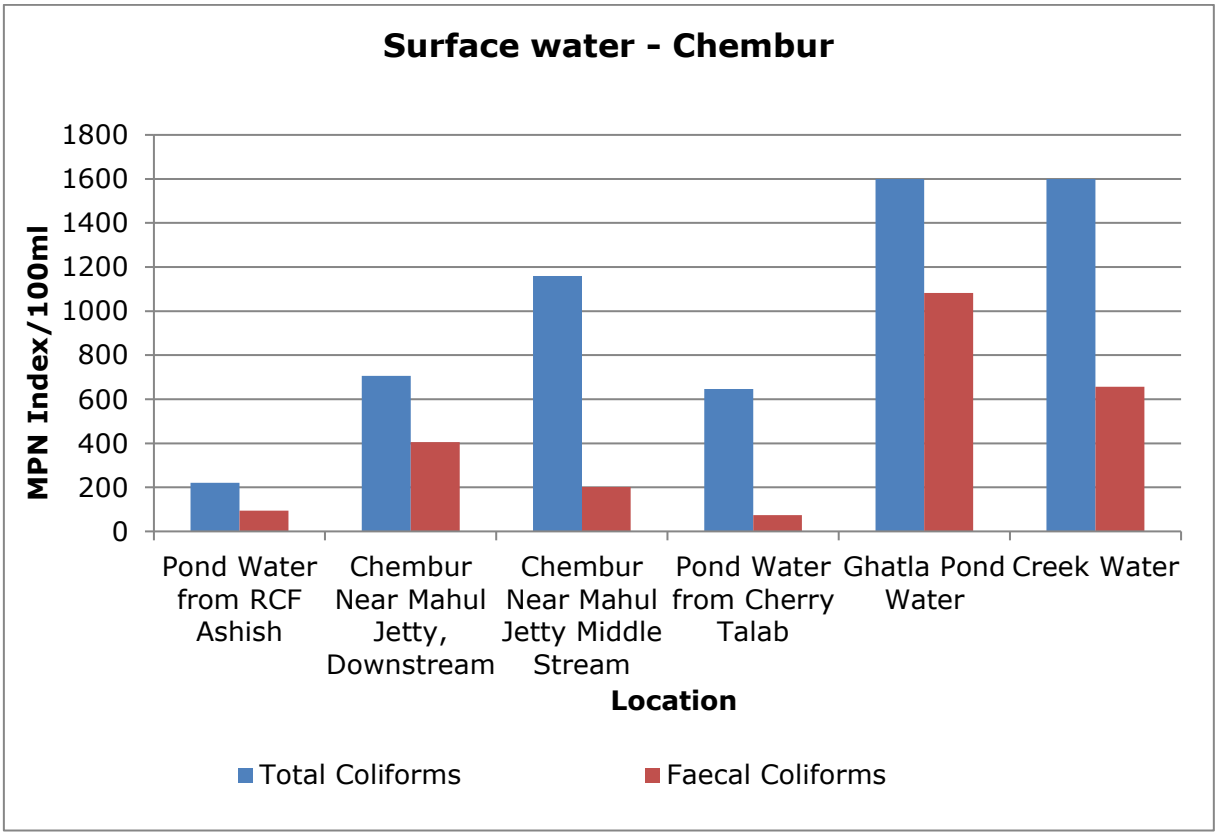
Graphs - Surface Water Quality of Chembur

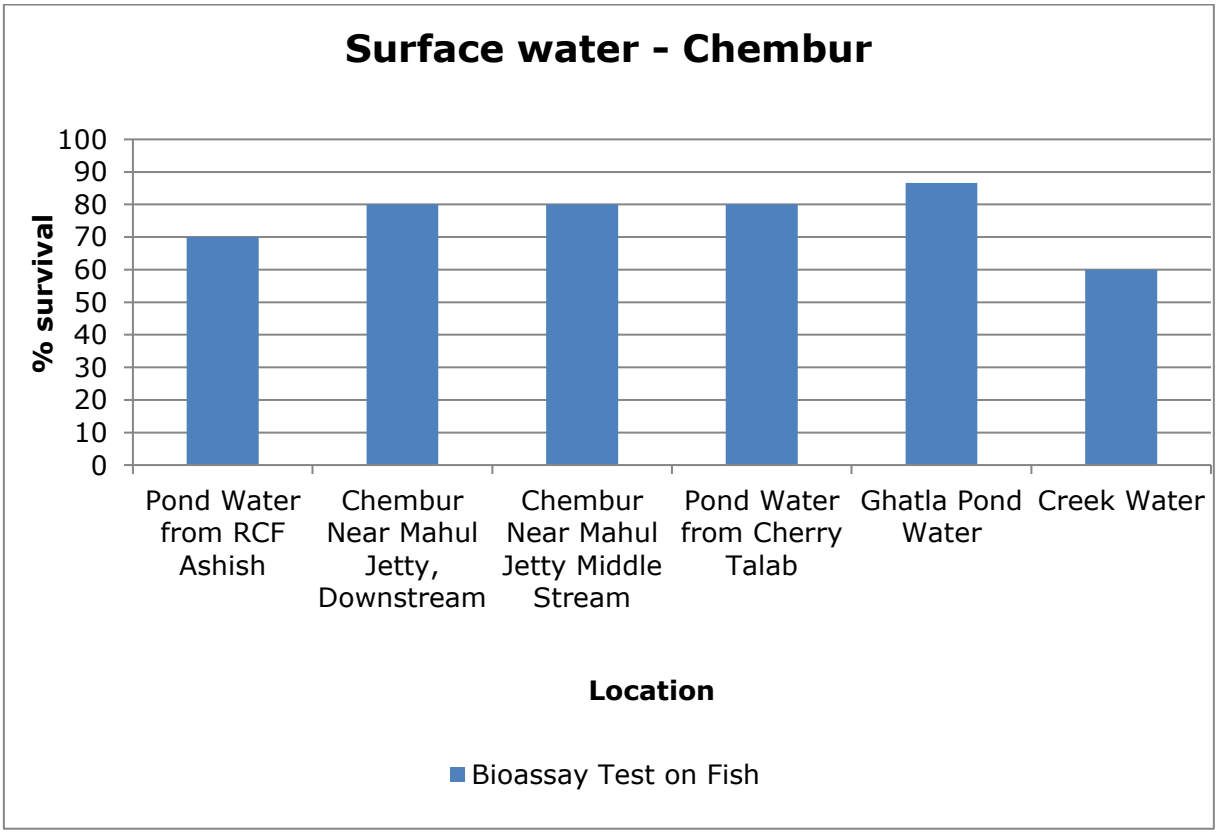





Surface water - Chembur
9
8
7
6
5
4
3
2
1
0
Pond Water from RCF Ashish
Chembur Near Mahul Jetty, Downstream
Chembur Near Mahul Jetty Middle Stream
Pond Water from Cherry Talab
Ghatla Pond Water
Creek Water
Location
Sodium Adsorption Ratio
pH


Surface water - Chembur
Concentration (µmhos/cm)
3000
2500
2000
1500
1000
500
0
Pond Water from RCF Ashish
Chembur Near Mahul Jetty, Downstream
Chembur Near Mahul Jetty Middle Stream
Pond Water from Cherry Talab
Ghatla Pond Water
Creek Water
Location
Electrical Conductivity


Surface water - Chembur
MPN Index/100ml
1800
1600
1400
1200
1000
800
600
400
200
0
Pond Water from RCF Ashish
Chembur Near Mahul Jetty, Downstream
Chembur Near Mahul Jetty Middle Stream
Pond Water from Cherry Talab
Ghatla Pond Water
Creek Water
Location
Total Coliforms
Faecal Coliforms


Surface water - Chembur
% survival
100
90
80
70
60
50
40
30
20
10
0
Pond Water from RCF Ashish
Chembur Near Mahul Jetty, Downstream
Chembur Near Mahul Jetty Middle Stream
Pond Water from Cherry Talab
Ghatla Pond Water
Creek Water
Location
Bioassay Test on Fish

LAND ENVIRONMENT

7. Land Environment

For studying the land Environment of Chembur area, ground water was collected from Bore well. A total of 6 samples were collected.

- All six water samples collected are acceptable in general appearance, colour and smell.
- pH, suspended solids, BOD, and COD were also well within the limits in all three samples collected.
- Electrical conductivity of Well water Mahul Village was high 324µmhos/cm.
- survival rate of 77% to 87% was achieved in the fish bioassay across all water samples.
- All metals like Arsenic, Nickel, Copper, Iron, Hexavalent Chromium (Cr^{6+}) etc. were observed either below the limit of quantification (BLQ) or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Fluoride, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds also met the criteria as prescribed by CPCB.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were below the detectable limit in all six samples collected.
- Organo Chlorine Pesticides are also below the limit of quantification in all six samples collected.

Table 7.1 Details of Sampling Location of Ground Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Hand pump water at Prayag Nagar	19°1'4.89"N	72°54'33.94"E	27.01.2025	29.01.2025	31.01.2025
2.	Well water at Prayag Nagar	19°1'11.10"N	72°54'31.93"E	27.01.2025	29.01.2025	31.01.2025
3.	Well water at Prayag Nagar Tabela	19°1'29.20"N	72°54'24.65"E	27.01.2025	29.01.2025	31.01.2025
4.	Well water at Laxmi Nagar	19°1'46.72"N	72°53'44.31"E	27.01.2025	29.01.2025	31.01.2025
5.	Well water at Ambapada	19°1'7.96"N	72°53'20.72"E	27.01.2025	29.01.2025	31.01.2025
6.	Well water Mahul Village	19°0'52.00"N	72°53'10.95"E	27.01.2025	29.01.2025	31.01.2025

Fig: Geographical Locations of Ground Water Sampling

Table 7.2 Results of Ground Water

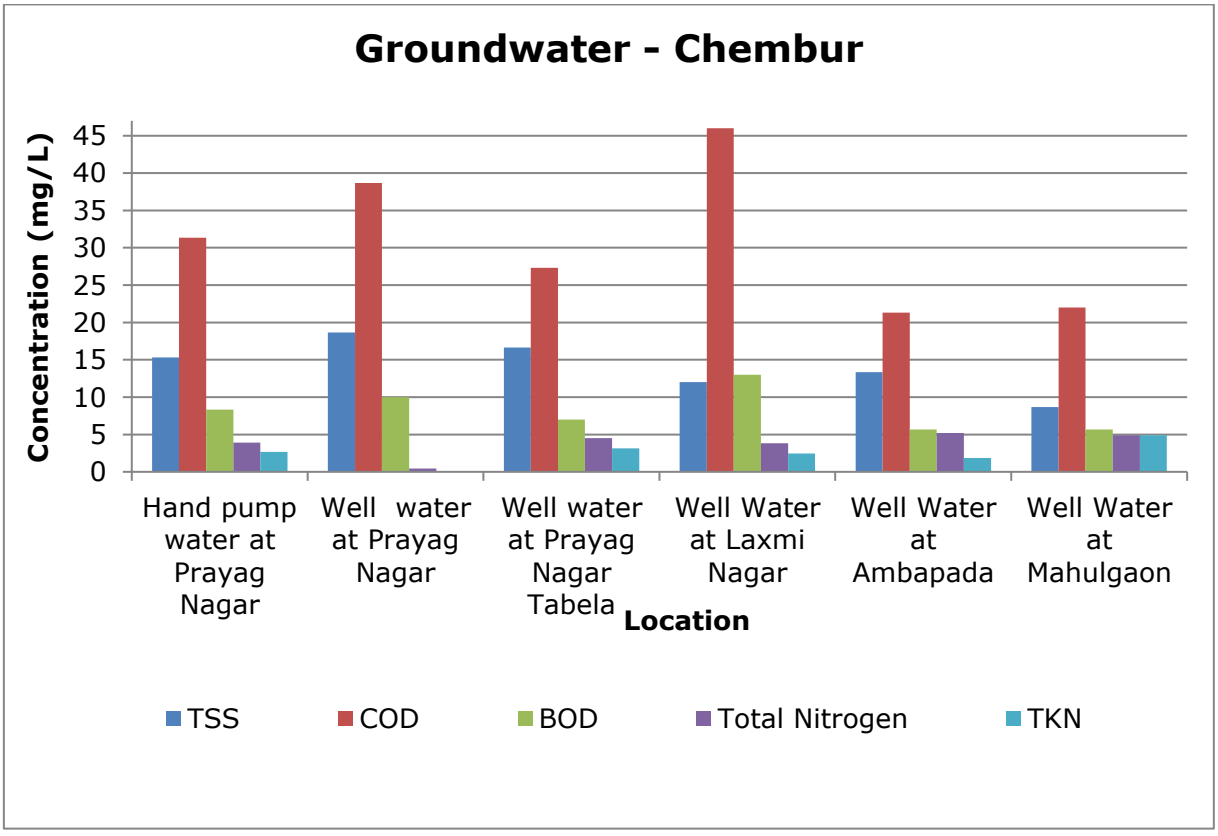
Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	**Well water at Prayag Nagar**	**Well water at Prayag Nagar Tabela**	**Well water at Laxmi Nagar**	**Well water at Ambapada**	**Well water Mahul Village**
Sanitary Survey		Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance		No Floating matter	No Floating matter	No Floating matter	No Floating matter	No Floating matter	No Floating matter
Transparency	m	NA	0.37	0.33	0.17	0.13	0.37
Temperature	°C	29	28	26	27	28	27
Colour	Hazen	1	1	1	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
pH	-	8.07	7.89	7.85	7.87	8.11	8.15
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	15.33	18.67	16.67	12.00	13.33	8.67

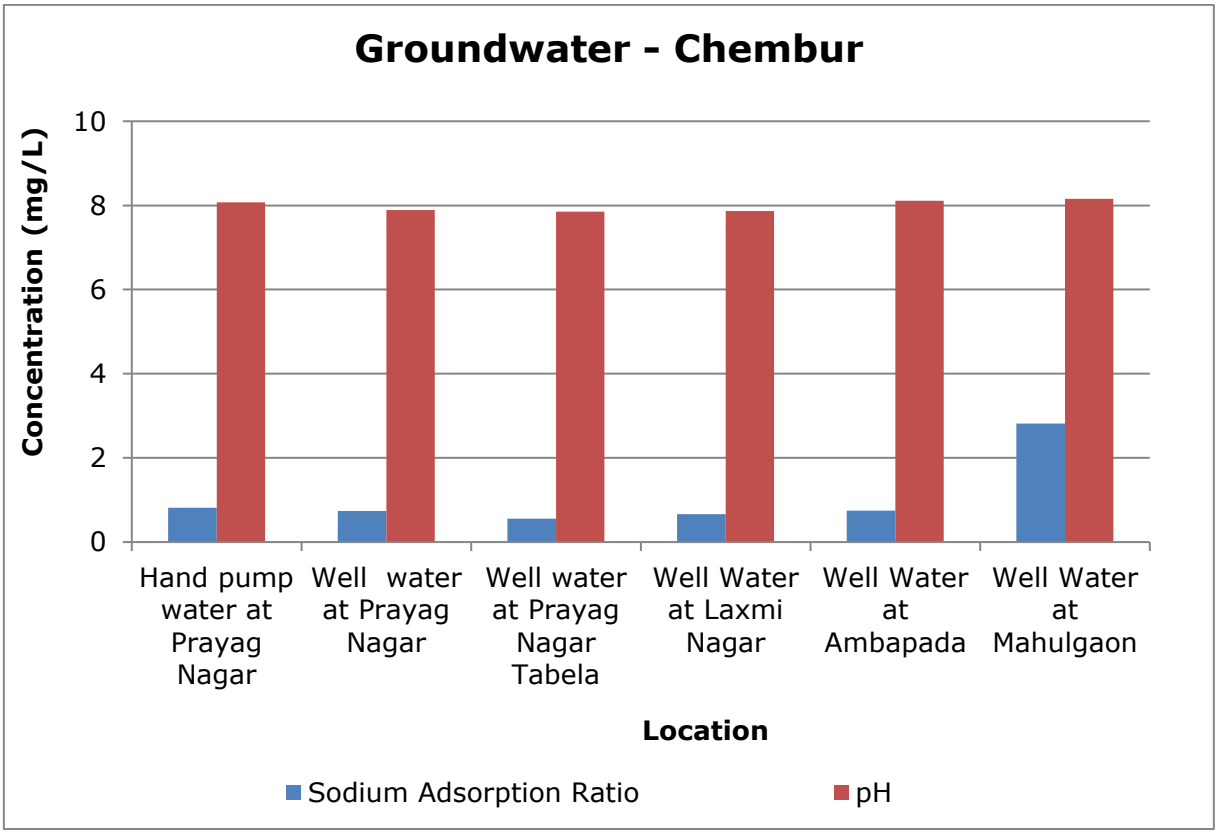
Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	Well water at Prayag Nagar	Well water at Prayag Nagar Tabela	Well water at Laxmi Nagar	Well water at Ambapada	Well water Mahul Village
Total Dissolved Solids	mg/L	150	51	158	141	149	181
Chemical Oxygen Demand	mg/L	31	39	27	46	21	22
Biochemical Oxygen Demand (3 days,27°C)	mg/L	8	10	7	13	6	6
Electrical Conductivity (at 25 °C)	µmho/cm	268	91	282	253	265	324
Nitrite Nitrogen (as NO_2)	mg/L	0.04	0.03	0.05	0.04	BLQ	BLQ
Nitrate Nitrogen (as NO_3)	mg/L	0.37	0.42	1.31	1.31	1.66	BLQ
(NO_2 + NO_3)-Nitrogen	mg/L	0.41	0.45	1.36	1.35	1.66	BLQ
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	BLQ	0.44	0.40	0.41	0.44	BLQ
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	BLQ	BLQ	BLQ	BLQ	0.11	0.14
Sodium Adsorption Ratio	-	0.82	0.74	0.55	0.66	0.74	2.82
Total Coliforms	MPN Index/ 100 ml	76.5	<1.8	33	<1.8	240	22
Faecal Coliforms	MPN Index/ 100 ml	20.9	<1.8	17	<1.8	120	11
Total Phosphate (as P)	mg/L	0.17	BLQ	0.14	0.19	0.25	0.27

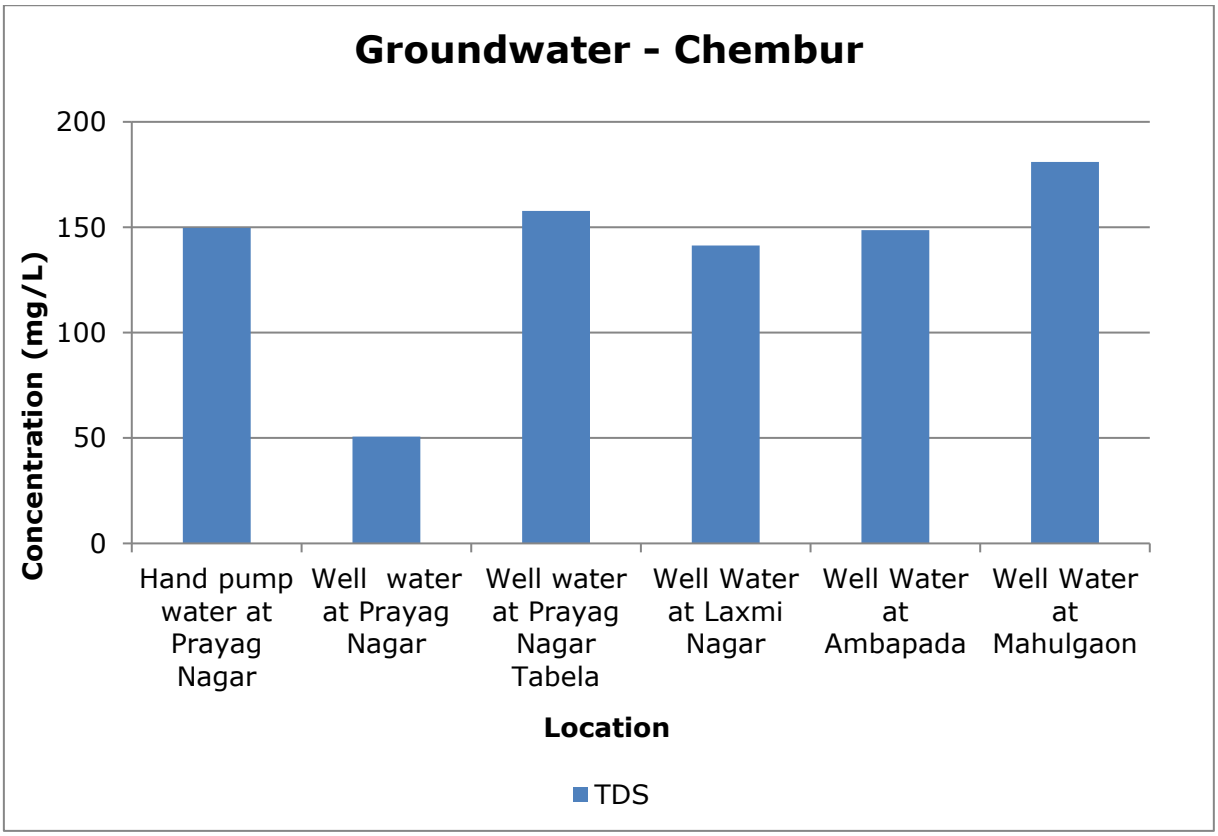
Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	Well water at Prayag Nagar	Well water at Prayag Nagar Tabela	Well water at Laxmi Nagar	Well water at Ambapada	Well water Mahul Village
Total Kjeldahl Nitrogen (as N)	mg/L	2.68	BLQ	3.13	2.46	1.845	4.92
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Nitrogen	mg/L	3.9	0.5	4.5	3.8	5.2	4.9
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	BLQ	BLQ	0.00011	0.00016
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.17	0.19	0.10	0.11	0.11	0.13
Nickel (as Ni)	mg/L	0.02	0.02	0.02	0.02	0.02	0.03
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.08	0.10	0.09	0.06	0.09	0.11
Total Arsenic (as Ar)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.01	0.02	BLQ	0.01	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.02	0.03	0.04	0.08	0.04	0.05
Iron (as Fe)	mg/L	0.42	0.41	0.34	0.44	0.41	0.45

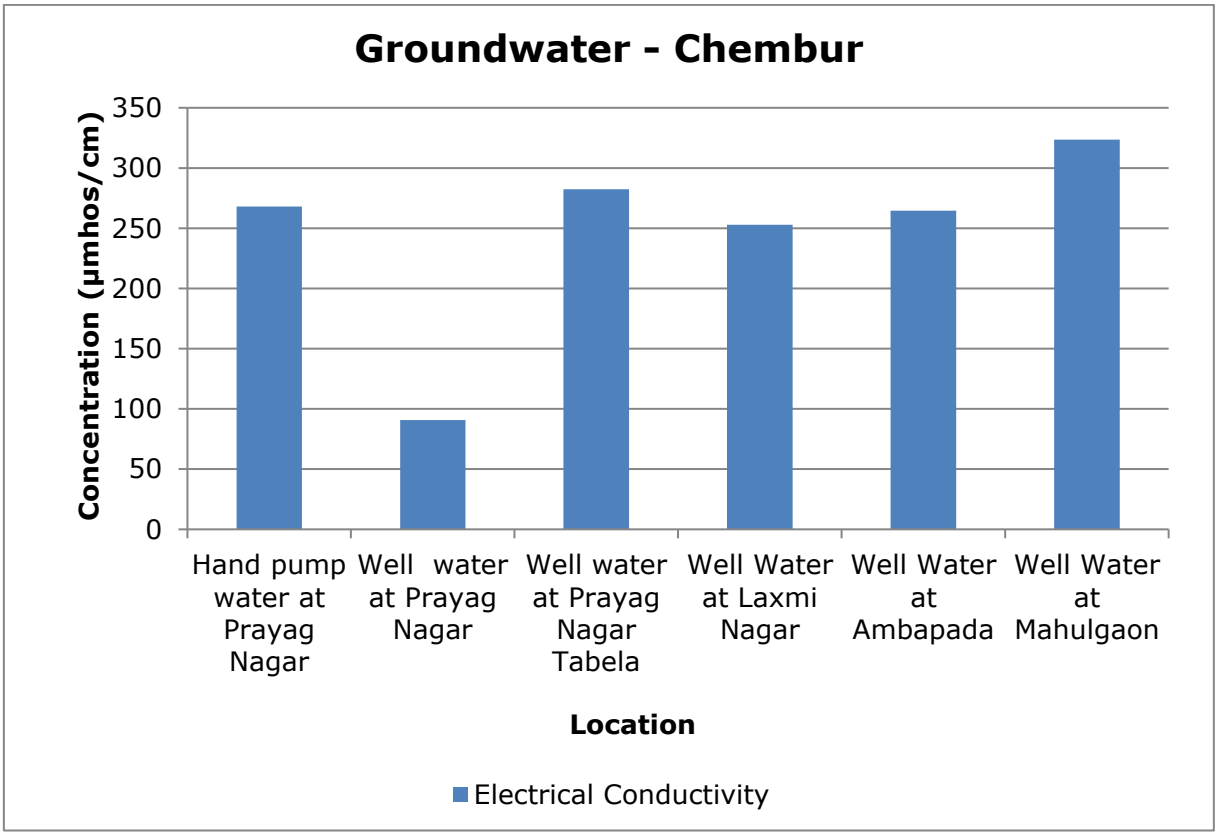
Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	Well water at Prayag Nagar	Well water at Prayag Nagar Tabela	Well water at Laxmi Nagar	Well water at Ambapada	Well water Mahul Village
Vanadium (as V)	mg/L	BLQ	0.01	0.03	0.04	0.02	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	0.276	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	80	77	80	87	80	87

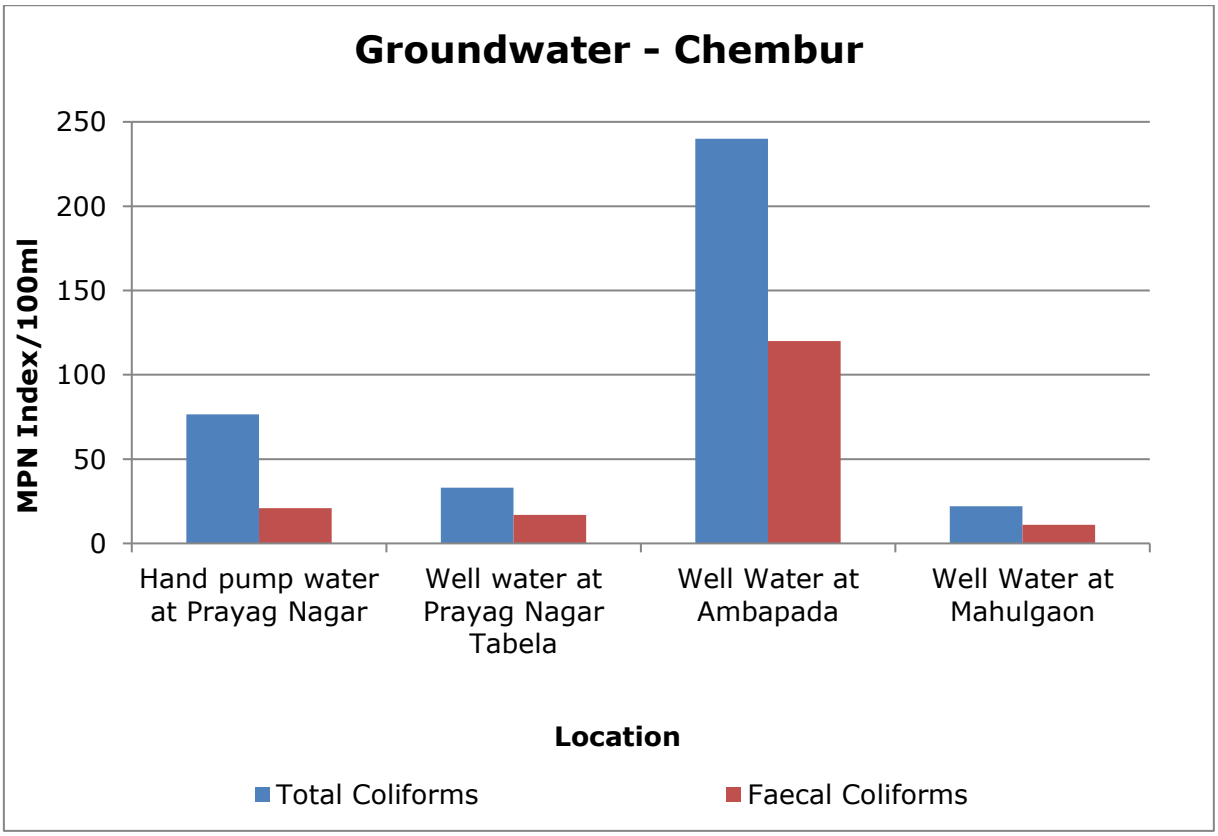
Graphs - Ground water quality of Chembur

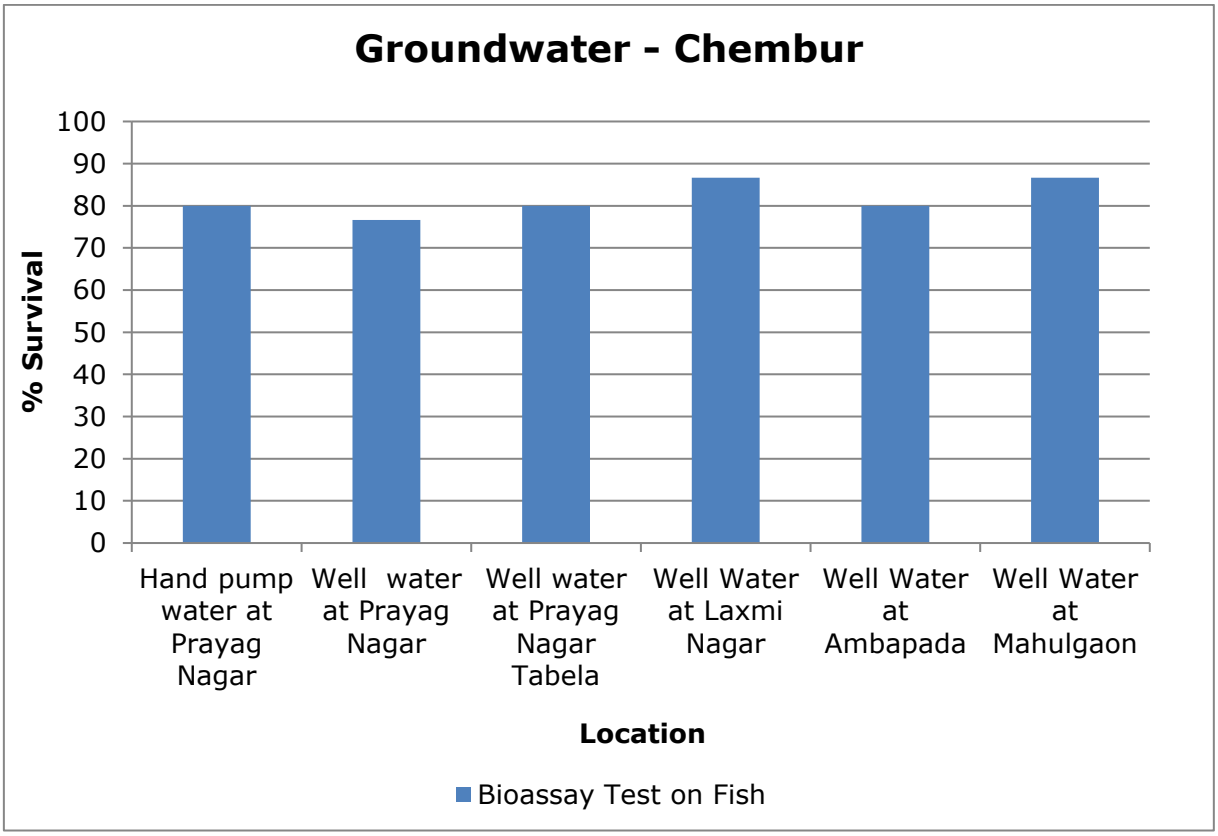



Groundwater - Chembur
Concentration (mg/L)
10
8
6
4
2
0
Hand pump water at Prayag Nagar
Well water at Prayag Nagar
Well water at Prayag Nagar Tabela
Well Water at Laxmi Nagar
Well Water at Ambapada
Well Water at Mahulgaon
Location
Sodium Adsorption Ratio
pH


Groundwater - Chembur
Concentration (mg/L)
200
150
100
50
0
Hand pump water at Prayag Nagar
Well water at Prayag Nagar
Well water at Prayag Nagar Tabela
Well Water at Laxmi Nagar
Well Water at Ambapada
Well Water at Mahulgaon
Location
TDS


Groundwater - Chembur
Concentration (µmhos/cm)
350
300
250
200
150
100
50
0
Hand pump water at Prayag Nagar
Well water at Prayag Nagar
Well water at Prayag Nagar Tabela
Well Water at Laxmi Nagar
Well Water at Ambapada
Well Water at Mahulgaon
Location
Electrical Conductivity


Groundwater - Chembur
MPN Index/100ml
250
200
150
100
50
0
Hand pump water at Prayag Nagar
Well water at Prayag Nagar Tabela
Well Water at Ambapada
Well Water at Mahulgaon
Location
Total Coliforms
Faecal Coliforms


Groundwater - Chembur
100
90
80
70
60
50
40
30
20
10
0
% Survival
Hand pump water at Prayag Nagar
Well water at Prayag Nagar
Well water at Prayag Nagar Tabela
Well Water at Laxmi Nagar
Well Water at Ambapada
Well Water at Mahulgaon
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 causes 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 Post - Monsoon season 2025

	A1	A2	A	B	C	D	CEPI
Air Index	4	4	16	0	0	0	**16.00**
Water Index	2.5	4	10	0	0	0	**20.00**
Land Index	1.5	4	6	30	0	0	**46.00**
						Aggregated CEPI	**48.80**

The CEPI score observed in the present study is 48.80. Land Environment Pollution Index (EPI) is highest with 46.00 followed by air and water Environment Pollution Index (EPI) with 26.00 and 20.00 EPI respectively.

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI score March 2025	26.00	20.00	46.00	**48.80**
CEPI Score June 2024	16.00	19.75	44.50	**46.30**
CEPI Score March 2024	26.50	40.00	10.00	**41.60**
CEPI Score June 2023	21.50	40.00	26.00	**43.40**
CEPI Score March 2023	21.00	38.50	28.00	**42.12**
CEPI score June 2021	24.30	29.80	26.00	**39.40**
CEPI Score March 2021	20.00	47.00	15.00	**48.60**
CEPI score March 2020	44.80	18.80	21.00	**47.00**
CEPI score June 2019	30.60	40.30	39.38	**41.60**

	Air Index	Water Index	Land Index	CEPI
CEPI score March 2019	35.50	24.75	42.50	**42.28**
CEPI score June 2018	36	39.88	30.25	**44.1**
CEPI score March 2018	38.8	32.3	31.72	**45.07**
CPCB CEPI score March 2018	52.25	50.75	10	**54.67**

The result shows that CEPI score of present report is 48.80. This time CEPI score is observed lower than the CPCB CEPI score March 2018 which was 54.67.

CEPI Score Calculations:

Chembur, Maharashtra - CEPI - March 2025

Ambient Air Analysis report

Pollutant	**Group**	**A1**	**A2**	**A (A1 X A2)**
As	C	3	Large	
$PM_{2.5}$	B	0.5		
PM_{10}	B	0.5		
		4	**4**	**16**

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)**	
As	3.79	6	0.63	0	8	0.00	L	0
$PM_{2.5}$	12.00	60	0.20	0	8	0.00	L	0
PM_{10}	40.67	100	0.41	0	8	0.00	L	0
B score = (B1+B2+B3)							**B**	**0**

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

Air CEPI	**(A+B+C+D)**	**16.0**

Water Quality Analysis report

Pollutant	**Group**	**A1**	**A2**	**A (A1 X A2)**
TP	B	2	Large	

TN	A	0.25		
Total Ammonia	A	0.25		
		2.5	**4**	**10**

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	0.73	0.3	2.43	0	6	0.00	L	0
TN	0.50	15	0.03	0	6	0.00	L	0
Total Ammonia	0.25	1.5	0.17	0	6	0.00	L	0
B score = (B1+B2+B3)							**B**	**0**

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

Water CEPI	**(A+B+C+D)**	**20.0**

Ground Water Quality Analysis report

Pollutant	**Group**	**A1**	**A2**	**A (A1 X A2)**
Fe	A	1	Large	
TDS	A	0.25		
F	A	0.25		
		1.5	**4**	**6**

Pollutant	**Avg (1)**	**Std (2)**	**EF (3) [(3)=(1)/(2)]**	**No. of samples Exceeding (4)**	**Total no. of samples (5)**	**SNLF Value (6) [(6)=(4)/(5)x(3)]**	**SNLF score (B)**	
Fe	0.41	0.3	1.37	6	6	1.37	C	30
TDS	138.17	2000	0.07	0	6	0.00	L	0
F	0.42	1.5	0.28	0	6	0.00	L	0
B score = (B1+B2+B3)							**B**	**30**

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

Land CEPI	**(A+B+C+D)**	**46.0**

Land CEPI Score (im)	**46.0**
Water CEPI Score (i2)	**20.0**
Air CEPI Score (i3)	**16.00**
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	**48.80**

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 parameters are well within the limits as per NAAQS, 2009.
- In the CEPI score calculated for Air Environment by CPCB in March 2018, PM_{10} and $PM_{2.5}$ have exceeded which may also be due to the vehicular emissions.

Surface Water Quality

- All the parameters of Surface water sampling are observed within the acceptable limit
- All the industries in Chembur region are either reusing the treated trade effluent as sewage in their process or gardening or are disposed into Sea.

Ground Water Quality

- Ground water samples were collected from different Bore wells in the region.
- Iron concentration is observed higher than the permissible limit in most of the ground water samples, which may be from natural geological processes and industrial pollution, particularly from mining and manufacturing activities. This can cause health issues such as gastrointestinal problems and organ damage, environmental damage like soil degradation and harm to aquatic life, and practical problems such as staining, unpleasant taste, and increased maintenance costs for water infrastructure.
- All other parameters were observed well within the limits.

CEPI Score

- The CEPI Score Post - Monsoon season is 48.8.
- In comparison with the CEPI Score of March 2018, there is a decrease in the overall CEPI score.
- Collective efforts of MPCB, administration and environmental organizations have finally paid off and pollution levels in Chembur are on the decline.
- The present study is the compilation of Post - Monsoon season, which results in dilution of environmental samples resulting in lower pollution load, hence also affects the total score.
- In conclusion, approximately 11% decrease in CEPI score is observed from 54.67 of the CPCB score of March 2018 to 48.80 in March 2025.

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

- Various directions were issued to concerned industries and stakeholders as well as continuous follow-up is taken for the implementation and compliance with directions and action plans.
- Specified & Implemented G.S.R. Std. 186 (E) dated 18th March 2008
- Special measures taken like covering all ETPs, reduction in LDAR (1500), upgradation in filling Gantries (extended arm with vapour control system), stock gauges, nitrogen blanketing, transporting products through pipelines (90%- BPCL and 93% HPCL), Bottom filling arrangements (PESO approved), restricted parking areas and tree plantation
- All 13 petrol pumps in the Chembur area have installed the vapour collection unit.
- Recently in the month of February 2020 and March 2020 MPC Board carried out VOC Monitoring to M/s. Glens Innovation Lab Pvt. Ltd. Chennai to know the status of VOCs in the Mahul Ambapada area in comparison with previous monitoring. The analysis reports showed that the concentration of main VOC parameters is less as compared to the concentration of VOCs monitored in 2019, which indicates an improvement in air quality.
- **Nitrogen blanketing**
    - It is related to BPCL only and they have completed all 5 tanks (Benzene storage-3 and Toluene Storage- 2), with internal floating roof and double seal completed.
- **Usage of bottom loading Tankers in all 04 industries**

  Bottom Lorry loading facility has been completed in all industries and started loading into some tankers, which will be done on priority.

  a) M/S BPCL: The Bottom Lorry loading facility has been completed and started the loading of Benzene tankers with the Bottom loading facility.
  b) M/S HPCL: The facility of bottom loading will be provided in the expansion phase. The tanker loading facility will be coming along with the expansion project.
  c) M/s. Aegis already using the bottom loading facility for LPG filling tankers. Recently completed bottom loading facility at Gantry No. 01 for 10 points and Gantry No 02 for 05 points and started operation from 14.12.2020
  d) M/s. Sealord Container, at present handling Ethanol and Methanol. They are having bottom loading facility for loading Gantry at 5 points for 12 points and started bottom loading activity from 20.12.2020.

- **Parking and regulations of traffic movement in the Mahul-Ambapada area**

- No parking zones were declared by the police Authority and started its implementation by imposing penalties. Also, MPC Board directed all four industries to submit the proposal for tanker / trucks movement to avoid traffic congestion and resolve the roadside parking problem and also explore the possibility of regulating time slot truck/ tanker movement by using a mobile app.

- **Tree Plantation in open space to be done by the industries**
    - Around 17,000 trees are planted in last one year.

- **Shifting the storage and handling of LAB (Linear Alkyl / Benzene being the organic product)**
    - M/s Sea Lord Container has shifted the storage and handling of LAB to their sister concern unit i.e. M/s. Aegis Logistics Ltd from 12.11.2020.

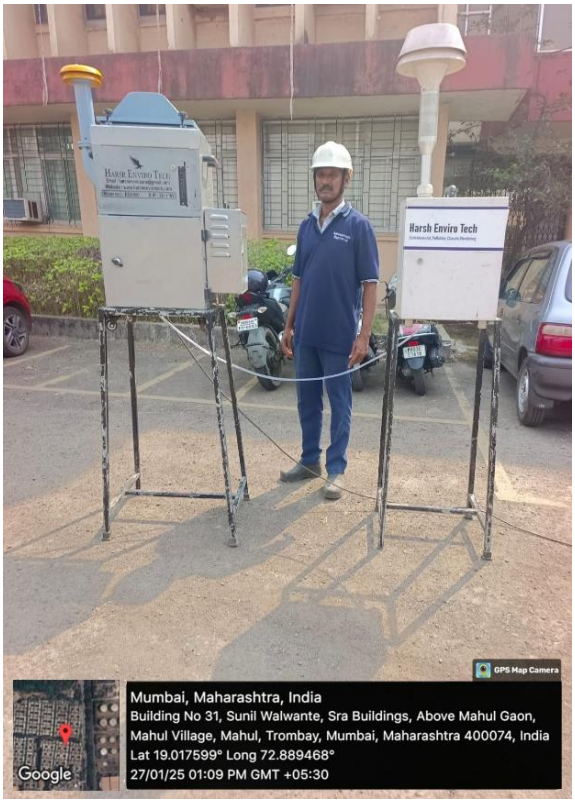
Continuous Ambient Air Quality Monitoring Station (CAAQMS)	**Ambient Air Quality Monitoring (AAQM)Van**

12. Photographs

Ambient Air Sampling at Polichem Limited/PepsiCo

Ambient Air Sampling at Port Trust Rd, Ambapada

Ambient Air Sampling Tata power colony

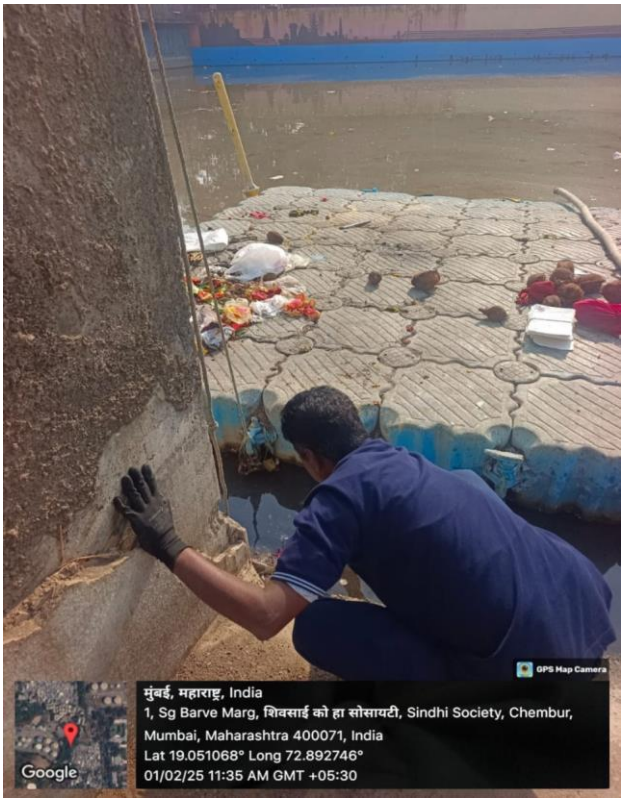


Ambient Air Sampling at Ever smile Building

Surface water sampling at Mahul Jetty

Surface water sampling at Madh Jetty

Surface water sampling at Ghatla pond Water



Surface water sampling at Cherry talab near Chembur police station

Groundwater sampling at Prayag Nagar

Groundwater sampling at Prayag nagar Mahul, Trombay Mumbai

Groundwater sampling at Vasai naka Chembur

Groundwater sampling at Ambapada

Annexure – I Health Related Data

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)

Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	CHEMBUR
Name of the major health center/ organization	Sai Hospital
Name and designation of the Contact person	Padma Joseph
Address	SGG, Vikas Shree, Vinayak Co-op Soc Ltd, Sion Trombay Road Chembur 71.

S No.	Diseases	No. of Patients Reported	
		Year 2023	Year 2024
AIRBORNE DISEASES			
1.	Asthma	75	83
2.	Acute Respiratory Infection	113	48
3.	Bronchitis	53	66
4.	Cancer	120	150
WATERBORNE DISEASES			
1.	Gastroenteritis	37	40
2.	Diarrhea	21	39
3.	Renal diseases	44	-
4.	Cancer	69	81

Date:

SAI HOSPITAL Regn No. 761424027 Chembur

Signature

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)

Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	CHEMBUR
Name of the major health center/ organization	Susharut Hospital
Name and designation of the Contact person	DR. SUMEET. S. DUBEY
Address	

S No.	Diseases	No. of Patients Reported	
		Year 2023	Year 2024
AIRBORNE DISEASES			
1.	Asthma	18	35
2.	Acute Respiratory Infection	28	30
3.	Bronchitis	08	2
4.	Cancer	39	20
WATERBORNE DISEASES			
1.	Gastroenteritis	80	140
2.	Diarrhea	45	86
3.	Renal diseases	181	292
4.	Cancer	58	140

Date: 07/2/25

Signature

SUSHRUT HOSPITAL

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)

Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	CHEMBUR
Name of the major health center/ organization	Mangal Anand Hospital
Name and designation of the Contact person	SR Rupali / Sister Snehasa
Address	H&S Co-op Hsg Soc Sion Trombay Rd Chembur Mumbai 71

S No.	Diseases	No. of Patients Reported	
		Year 2023	Year 2024
AIRBORNE DISEASES			
1.	Asthma	NIL	NIL
2.	Acute Respiratory Infection	NIL	NIL
3.	Bronchitis	NIL	NIL
4.	Cancer	NIL	NIL
WATERBORNE DISEASES			
1.	Gastroenteritis	NIL	NIL
2.	Diarrhea	NIL	NIL
3.	Renal diseases	NIL	NIL
4.	Cancer	NIL	NIL

Date: 01/02/25

Signature

MANGAL ANAND HOSPITAL
48, Swastik Park, Chembur
Mumbai – 400 071

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI)

Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	CHEMBUR
Name of the major health center/ organization	**Zen Hospital**
Name and designation of the Contact person	Ms. Aakanksha Jadhav
Address	425, 10th Road, Chembur (E) 400071.

S No.	Diseases	No. of Patients Reported	
		Year 2023	Year 2024
AIRBORNE DISEASES			
1.	Asthma	49	50
2.	Acute Respiratory Infection	81	99
3.	Bronchitis	49	50
4.	Cancer	NA	NA
WATERBORNE DISEASES			
1.	Gastroenteritis	2385	2505
2.	Diarrhea	2385	2505
3.	Renal diseases	90	110
4.	Cancer	NA	NA

Date: 06/02/2025

V.R. MEDICARE PVT. LTD. MUMBAI

Signature