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

CHEMBUR

Pre-Monsoon (April 2025 – June 2025)

MAHARASHTRA

LiFE
Lifestyle for Environment

MAHARASHTRA POLLUTION CONTROL BOARD
महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Index

ABBREVIATIONS

APHA	American Public Health Association
ASTM	American Society for Testing and Materials
BIS	Bureau of Indian Standards
BLQ	Below the Limit of Quantification
CAAQMS	Continuous Ambient Air Quality Monitoring Station
CEMS	Continuous Emission Monitoring System
CEPI	Comprehensive Environmental Pollution Index
CETP	Common Effluent Treatment Plant
CPA	Critically Polluted Area
CPCB	Central Pollution Control Board
EPA	Environmental Protection Act, 1986
GDP	Gross Domestic Product
MIDC	Maharashtra Industrial Development Corporation
MPCB	Maharashtra Pollution Control Board
NAAQS	National Ambient Air Quality Standard
NWMP	National Water Quality Monitoring Program
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 Pre - Monsoon monitoring was carried out during the period of April to June 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.

As per the study conducted by the Central Pollution Control Board (CPCB) in January 2018, the Comprehensive Environmental Pollution Index (CEPI) score for the Chembur region, calculated in accordance with the revised CEPI guidelines of 2016, was 54.67. The sub-indices were Ambient Air: 52.25, Surface Water: 50.75, and Land: 10. The major contributors to the elevated CEPI score were high concentrations of particulate matter—specifically PM10 and PM2.5. These elevated values were primarily due to the positioning of Ambient Air Quality Monitoring (AAQM) stations close to heavily trafficked roads, where vehicular emissions significantly influence air quality, rather than locations closer to industrial emission sources.

To improve the environmental quality of the region, the Maharashtra Pollution Control Board (MPCB) initiated a series of targeted interventions over the years. These included stricter enforcement of vehicular emission norms, increased frequency of street cleaning and water sprinkling to suppress dust, promotion of cleaner fuels, closure of non-compliant industrial units, and the relocation or retrofitting of polluting industries. Additionally, awareness programs for local stakeholders and coordination with urban planning bodies have helped streamline pollution control efforts.

As a result of these sustained efforts, the CEPI score of Chembur has shown measurable improvement. According to the latest assessment for the pre-monsoon season of 2025, the Environmental Pollution Index (EPI) for Ambient Air has significantly reduced to 26.0, Surface Water to 41.0, and Ground Water to 32.25. This leads to an overall CEPI score of 46.0 for the region—an appreciable decline from the 2018 level.

2. Introduction

The industrial sector continues to be a cornerstone of national economic development in 2025, driving increased production, fixed investment, exports, employment, and capacity utilization. It remains a vital engine of economic prosperity, significantly enhancing government revenue, international trade, public services, and job creation. As one of the world's fastest-growing economies, India retains its position as the fifth-largest economy globally, as per the World GDP Ranking 2024. The sector's expansion is aligned with key Sustainable Development Goals (SDGs), notably Goal 8 (Decent Work and Economic Growth) and Goal 9 (Industry, Innovation, and Infrastructure), both of which emphasize inclusive, sustainable industrialization and resilient infrastructure.

However, alongside these gains, industrial growth continues to pose significant environmental challenges. In 2025, concerns over pollution and ecosystem degradation are at the forefront of sustainable development discourse. Industries discharging untreated wastewater have severely affected water bodies, contaminating drinking water with toxic chemicals and heavy metals, endangering human, animal, and aquatic life. Air pollution from industrial emissions remains a leading public health concern, especially among children and the elderly. According to the World Health Organization (WHO), environmental pollution is still linked to nearly 9 million premature deaths each year, with over 90% of the global population exposed to air quality levels that exceed WHO safety thresholds. Additionally, nearly 2 billion people continue to consume faces-contaminated water, fuelling outbreaks of waterborne diseases like cholera, dysentery, and typhoid.

Environmental impacts extend deeply into ecosystems. Industrial pollution contributes to habitat loss, biodiversity decline, and the disruption of natural processes. Wildlife exposed to toxic pollutants often suffer from genetic mutations, reproductive failures, and behavioural disorders. Similarly, plant life experiences inhibited growth and reduced productivity due to polluted air and water, impacting food security and threatening ecosystem resilience.

To counter these escalating issues, robust and adaptive environmental governance is crucial. Regulatory policies must not only enforce compliance but also evolve in response to emerging threats. This includes stricter emissions standards, rigorous environmental impact assessments (EIAs), stronger penalties for violations, and enhanced monitoring systems. Conservation initiatives and updated frameworks are essential to safeguard biodiversity and natural resources while supporting sustainable industrial development.

One of the most effective tools in this domain is the Comprehensive Environmental Pollution Index (CEPI), a dynamic framework that assesses pollution levels in industrial clusters across India. First introduced to streamline environmental monitoring, the revised CEPI framework (2016) has gained further relevance in 2025, helping policymakers identify pollution hotspots, prioritize remediation, and allocate resources efficiently. It evaluates pollution across three domains—air, water, and land—and assigns scores based on severity, exposure, and ecological sensitivity.

In Maharashtra, where industrial growth continues to generate employment and infrastructure, the CEPI plays an instrumental role in environmental regulation. Strategic monitoring

and site-specific sampling enable a more nuanced understanding of pollution trends, enabling targeted enforcement and timely interventions.

One such example is Chembur, a key industrial hub in Mumbai, which continues to face persistent environmental stress in 2025. Ranked among the top 50 most polluted industrial clusters in India, Chembur's challenges are multifaceted ranging from industrial effluent discharge, airborne toxic emissions, to solid waste mismanagement. CEPI assessments and independent monitoring reports have flagged dangerously high levels of heavy metals—including arsenic, mercury, chromium, and copper—in groundwater, triggering alarms over long-term health risks.

Industrial activities in the area, particularly from oil refineries, fertilizer plants, and chemical reactors, have severely degraded Thane Creek, disrupting marine biodiversity. Emissions of ammonia and nitrous oxides from the Rastriya Chemicals & Fertilizers (RCF) complex remain a significant contributor to local air pollution, exacerbated by outdated equipment and poor pollution control infrastructure. Regular tracking of ambient ammonia and NOx levels is essential to formulate responsive strategies.

The Deonar dumping ground further adds to the region's environmental woes. For decades, it has been a source of persistent air pollution, contributing to respiratory illnesses, particularly during fire outbreaks. In 2025, despite several initiatives and public protests, Chembur's residents still face health hazards tied to the dumping ground, underscoring the urgency for integrated waste management solutions.

This report, based on the 2025 CEPI review methodology, seeks to provide a holistic environmental health profile of Chembur. Through comprehensive pollution mapping, stakeholder engagement, and data-driven decision-making, CEPI offers a structured pathway to mitigate environmental degradation. While challenges remain, the evolving regulatory framework, along with community advocacy and scientific assessments, signals a positive trajectory toward a cleaner, healthier, and more sustainable future for Chembur and similar industrial regions across India.

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**	Dichloromethane, Chloroform, Carbon Tetrachloride, Trichloroethylene, Bromodichloromethane, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,3-Dichlorobenzene, 1,2-Dichlorobenzene, 1,2-Dibromo-3-Chloropropane, Naphthalene, Bromobenzene,1,2,4-Trimethylbenzene, 2-Chlorotoluene, Tert-Butylbenzene, SEC-Butylbenzene, P-Isopropyl toluene, M-Xylene, P-Xylene, Styrene, Cumene 1,2,3-Trichloropropane, N-Propyl benzene, Dibromochloromethane, 1,2-Dibromoethane, Chlorobenzene, 1,1,1,2-Tetrachloroethane, Ethylbenzene, 1,1-Dichloropropylene, 1,2-Dichloroethane, 1,2-Dichloropropane, Trans-1,3-Dichloropropene, CIS 1,3-Dichloropropene, 1,1,2-Trichloroethane, Tetrachloroethylene, 1,3,5-Trimethylbenzene, N-Butylbenzene, 1,2,3-Trichlorobenzene, Hexachlorobutadiene, 1,2,4-Trichlorobenzene, 2,2-Dichloropropane, Dibromo methane, Toluene, O-Xylene, Bromoform, 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

Sampling Criteria	Total Sites	Monitoring Parameters
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
	Ground water - 06	**(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.

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.

Source ⟶ Pathway ⟶ Receptor
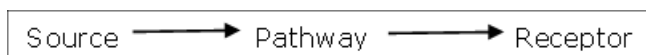
Ambient air stations, Surface water locations and Groundwater locations were decided by the respective regional officers. The sampling was done in 3 rounds with an interval of one or two days at each location. Sampling has been done at the potentially polluted areas so as to arrive at the CEPI. This 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	19.05.2025	21.05.2025	23.05.2025
2.	Ambapada Gaon	19°0'43.92"N	72°53'25.70"E	19.05.2025	21.05.2025	23.05.2025
3.	Nearby RCF main plant	19°2'5.62"N	72°53'31.98"E	19.05.2025	21.05.2025	23.05.2025
4.	BPCL sports club	19°1'44.07"N	72°53'43.66"E	19.05.2025	21.05.2025	23.05.2025
5.	HPCL Refinery Main Gate	19°1'11.79"N	72°53'49.63"E	19.05.2025	21.05.2025	23.05.2025
6.	Tata Power Colony	19°2'20.46"N	72°53'59.23"E	19.05.2025	21.05.2025	23.05.2025
7.	Ever smile Building	19°0'55.47"N	72°53'12.80"E	19.05.2025	21.05.2025	23.05.2025
8.	Near main gate PepsiCo	19°1'12.26"N	72°53'59.12"E	19.05.2025	21.05.2025	23.05.2025

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	19.05.2025	21.05.2025	23.05.2025
2.	BPCL sports club	19°1'44.07"N	72°53'43.66"E	19.05.2025	21.05.2025	23.05.2025
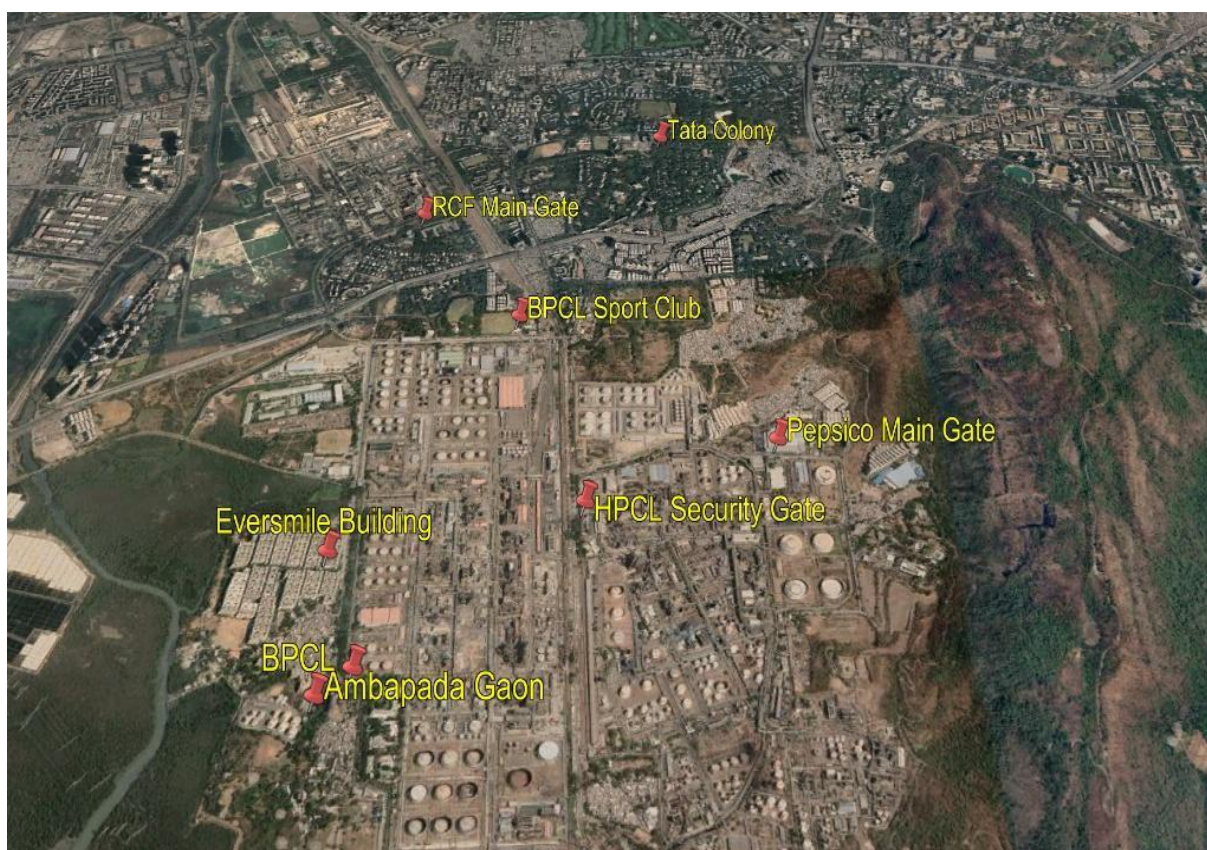
Fig: Geographical Locations of Ambient Air Quality Monitoring
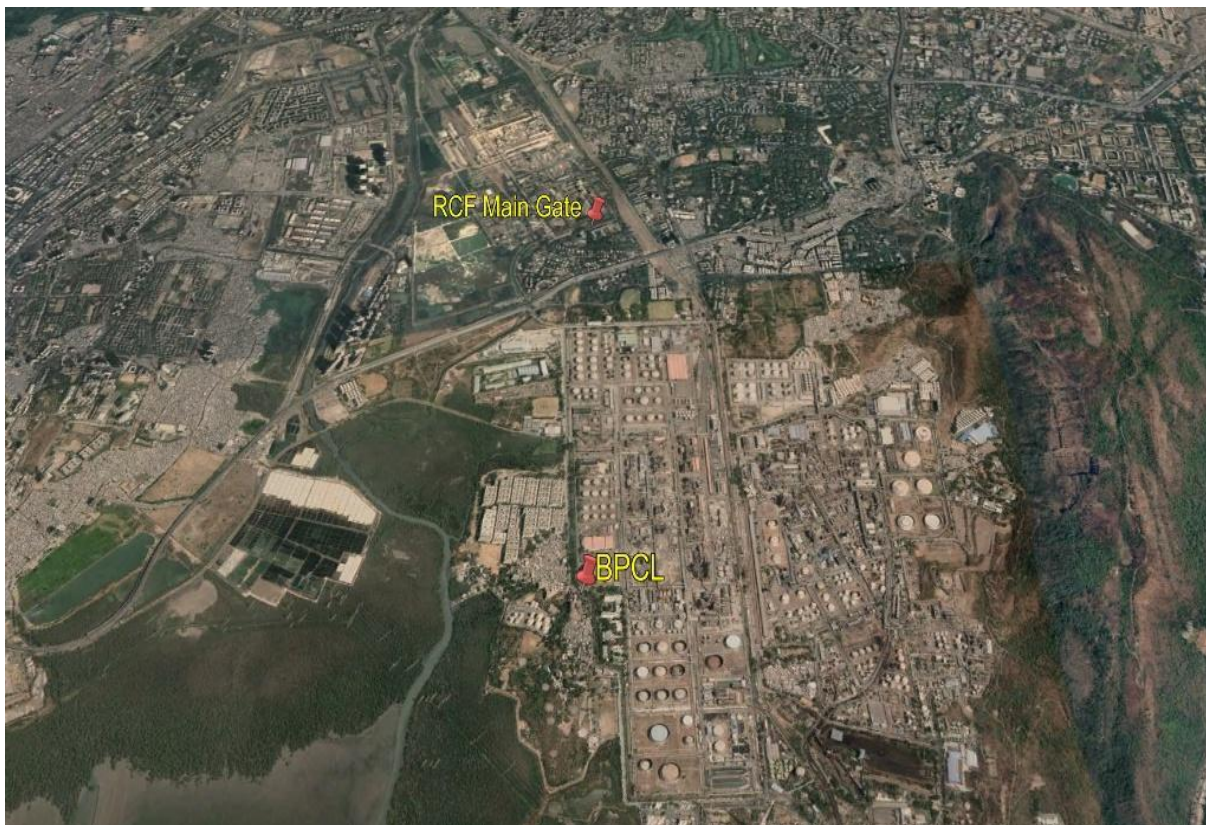
Fig: Geographical Locations of VOCs Monitoring

Table 5.3 Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Near main gate BPCL	Amba pada Gaon	Near by RCF main plant	BPCL sports club
Sulphur Dioxide (SO$_2$)	µg/m^3	14	12	11	13
Nitrogen Dioxide (NO$_2$)	µg/m^3	20	18	19	22
Particulate Matter (size less than 10 µm) or PM$_{10}$	µg/m^3	43	43	39	44
Particulate Matter (size less than 2.5 µm) or PM$_{2.5}$	µg/m^3	11	11	11	11
Ozone (O$_3$)	µg/m^3	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	µg/m^3	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1h)	mg/m^3	1.31	1.25	1.25	1.28
Carbon Monoxide (CO) (8h)	mg/m^3	1.49	1.45	1.56	1.79

Parameters	Unit	Results			
		Near main gate BPCL	Amba pada Gaon	Near by RCF main plant	BPCL sports club
Ammonia (NH_3)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Benzene (C_6H_6)	$\mu g/m^3$	1.73	1.58	1.65	1.75
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m^3	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m^3	BLQ	BLQ	BLQ	2.55
Nickel (Ni)	ng/m^3	10	9	11	8

Parameters	Unit	Results			
		HPCL Refinery Main Gate	Tata Power Colony	Ever smile Building	Near main gate PepsiCo
Sulphur Dioxide (SO_2)	$\mu g/m^3$	14	14	15	16
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	19	16	16	19
Particulate Matter (size less than 10 µm) or PM_{10}	$\mu g/m^3$	41	37	41	35
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	$\mu g/m^3$	12	11	12	10
Ozone (O_3)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Lead (Pb)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1h)	mg/m^3	1.30	1.29	1.24	1.31
Carbon Monoxide (CO) (8 h)	mg/m^3	1.57	1.51	1.58	1.46
Ammonia (NH_3)	$\mu g/m^3$	BLQ	BLQ	BLQ	BLQ
Benzene (C_6H_6)	$\mu g/m^3$	1.62	1.60	1.72	1.75
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	12	8	8	11

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

Parameters	Unit	Results	
		Nearby RCF main plant	**BPCL sports club**
Dichloromethane	µg/m³	0.53	0.61
Chloroform	µg/m³	0.509	BLQ
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Naphthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyl toluene	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-Propyl benzene	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

Parameters	Unit	Results	
		Nearby RCF main plant	BPCL sports club
Ethylbenzene	µg/m³	BLQ	BLQ
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	BLQ	0.513
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
Dibromo methane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.72	0.69
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

Ambient Air - Chembur

Ambient Air - Chembur

Ambient Air - Chembur

CO (1h)   CO (8h)

Ambient Air - Chembur

As   Ni
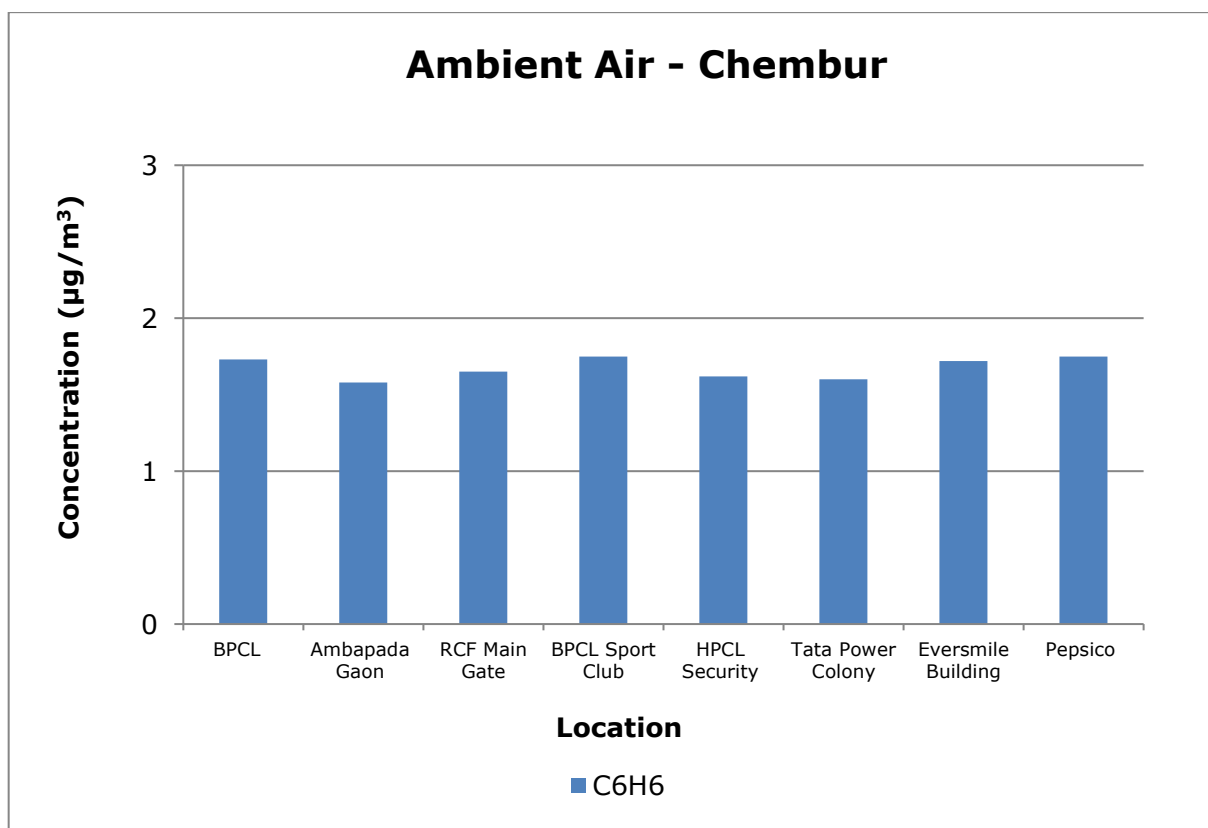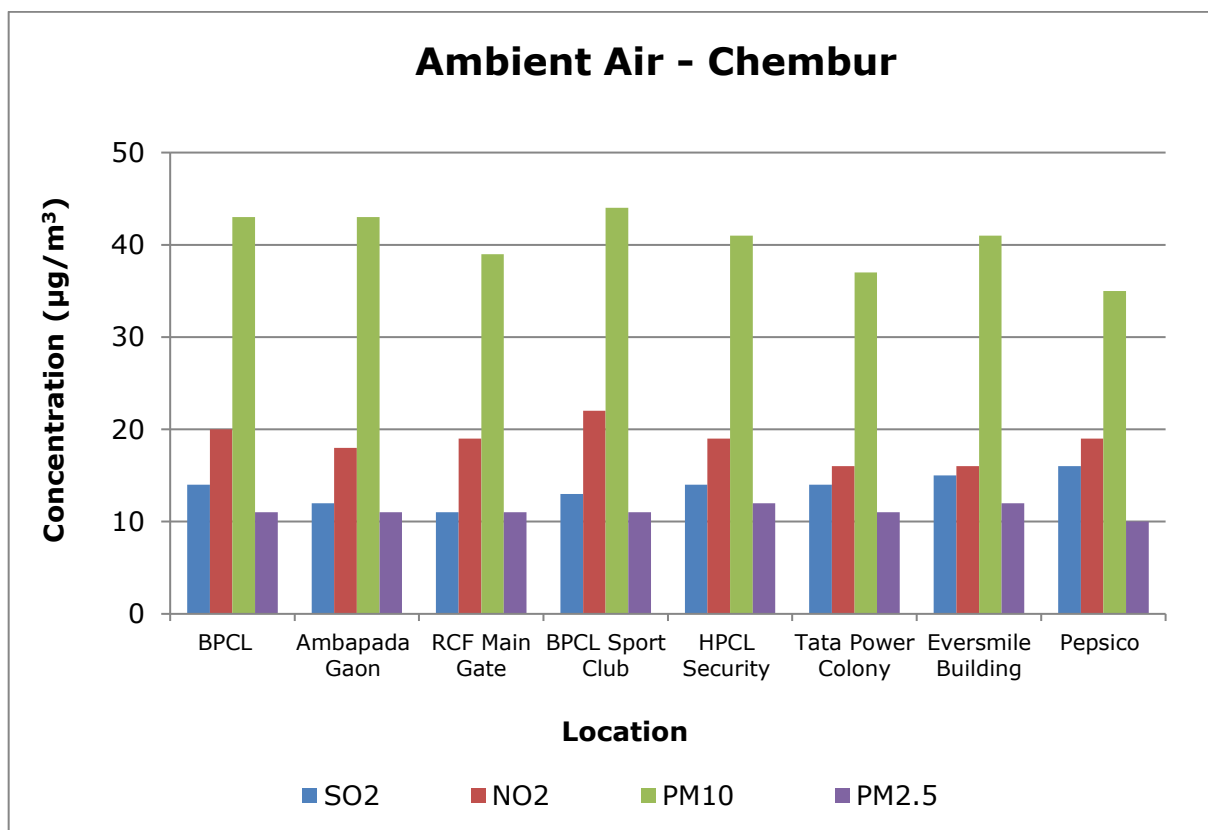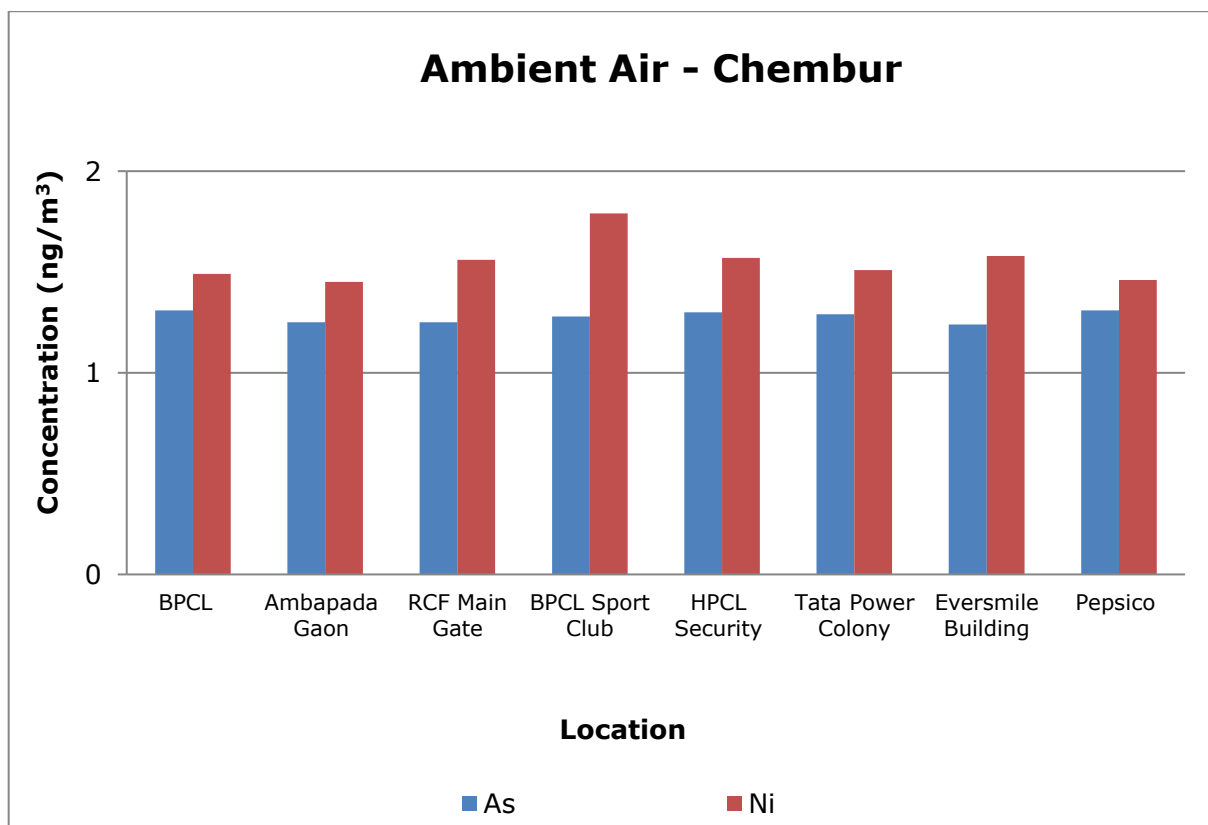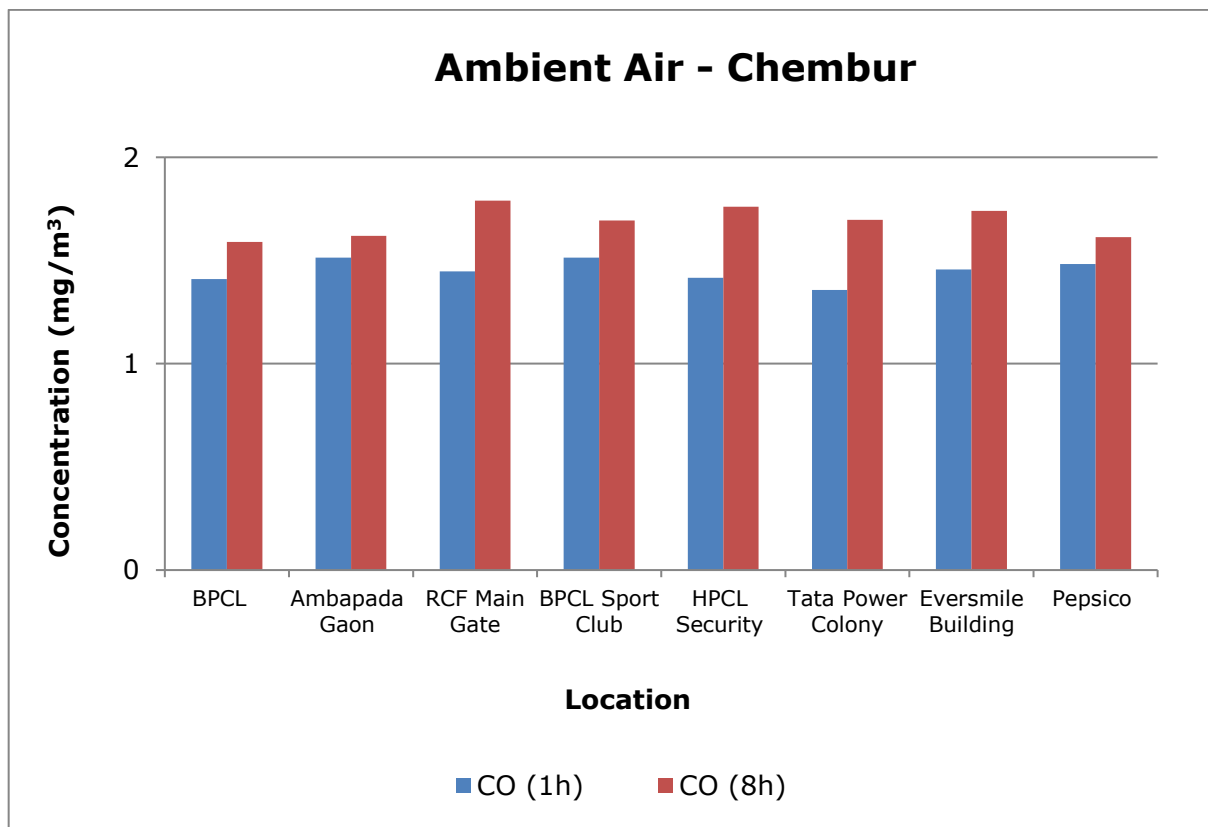
WATER ENVIRONMENT

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 all the water samples is found to within the permissible limit.

- pH and suspended solids are well within the limits of all six samples collected.

- BOD concentration is found to exceed in all six samples collected.

- Fish bioassay results showed a survival rate ranging from 83% to 100% in the collected samples. 100% fish survival is observed only in one water sample i.e. Pond water from Cherry Talab near Chembur police station.

- All metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr^{6+}) etc. are observed 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	20.06.2025	22.06.2025	24.06.2025
2.	Downstream near Mahul Jetty	19°0'50.64"N	72°53'5.91"E	20.06.2025	22.06.2025	24.06.2025
3.	Mahul jetty Middle stream	19°1'14.62"N	72°52'44.20"E	20.06.2025	22.06.2025	24.06.2025

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
4.	Pond water from Cherry Talab near Chembur police station	19°3'3.23"N	72°53'34.25"E	20.06.2025	22.06.2025	24.06.2025
5.	Ghatla pond water	19°3'21.11"N	72°54'22.40"E	20.06.2025	22.06.2025	24.06.2025
6.	Creek water near Ajmera Chembur	19°1'44.59"N	72°52'43.00"E	20.06.2025	22.06.2025	24.06.2025
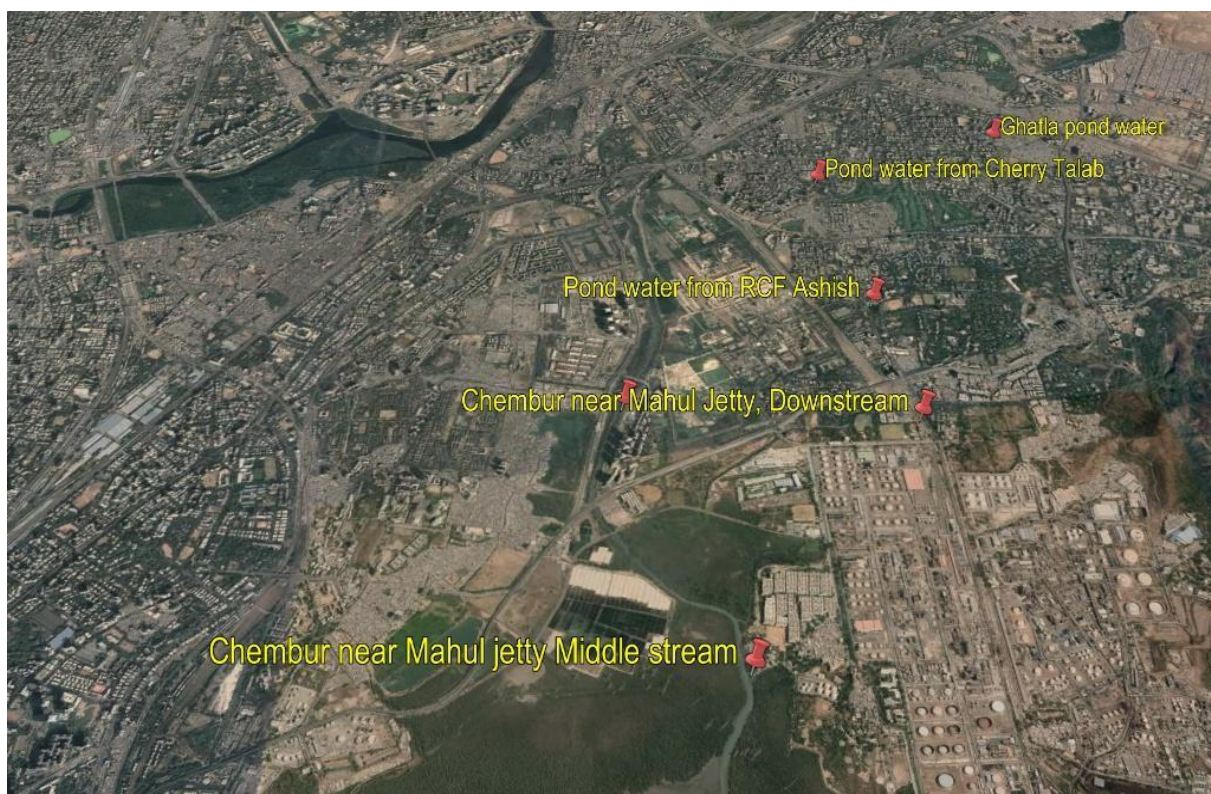
Fig: Geographical Locations of Surface Water Sampling

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	0.3	0.4	0.6	0.5	0.6	0.2
Temperature	^{o}C	27	27	28	27	28	26
Colour	Hazen	2	1	1	1	1	2
Smell	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
pH	-	7.3	7.4	7.7	7.5	7.5	7.6
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	32	29	53	41	41	46
Total Dissolved Solids	mg/L	427	920	1185	118	508	675
Dissolved Oxygen (% Saturation)	%	56	61	58	65	59	61
Chemical Oxygen Demand	mg/L	62	37	49	38	46	30
Biochemical Oxygen Demand (3 days,27°C)	mg/L	15	9	13	10	12	8
Electrical Conductivity (at 25 ^{o}C)	µmho/cm	763	1646	2118	211	907	1207
Nitrite Nitrogen (as NO_2)	mg/L	0.13	0.03	0.04	0.06	BLQ	0.02
Nitrate Nitrogen (as NO_3)	mg/L	1.27	1.08	1.18	0.43	1.68	0.37
(NO_2 + NO_3)-Nitrogen	mg/L	1.34	1.09	1.74	0.47	1.68	0.51

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	1.03	1.05	2.13	1.18	1.89	2.24
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.16	0.39	0.76	BLQ	0.58	0.52
Sodium Adsorption Ratio	-	1.9	3.9	2.9	1.6	3.0	4.7
Total Coliforms	MPN Index/ 100 ml	6400	1600	1600	5523	1600	1373
Faecal Coliforms	MPN Index/ 100 ml	520	813	975	657	394	848
Total Phosphate (as P)	mg/L	0.63	0.56	1.12	BLQ	0.83	0.91
Total Kjeldahl Nitrogen (as N)	mg/L	1.51	2.46	2.69	0.56	2.01	0.67
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	BLQ	0.23	0.32	0.54	0.13
Total Nitrogen	mg/L	2.84	7.28	4.43	1.3	3.69	1.35
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

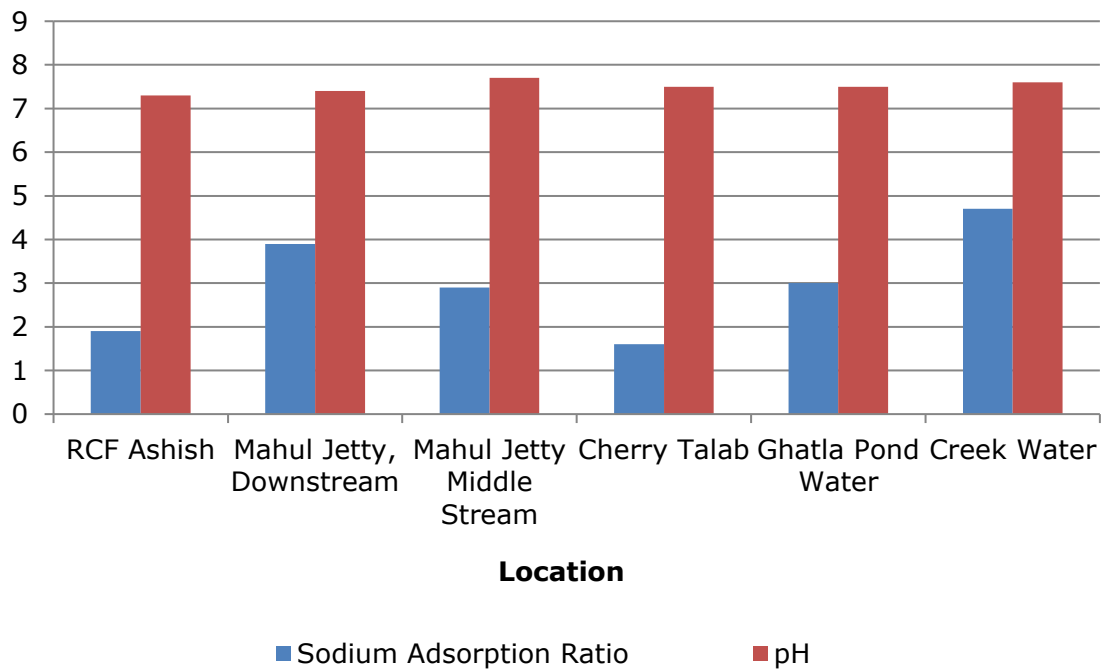| Parameters	Unit	Results					
		Pond water from RCF Ashish	Downstream near Mahul Jetty	Mahul jetty Middle stream	Pond water from Cherry Talab near Chembur police station	Ghatla pond water	Creek water near Ajmera Chembur
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.07	0.22	0.17	0.18	0.12	0.17
Nickel (as Ni)	mg/L	0.02	0.02	0.02	0.02	0.02	0.06
Copper (as Cu)	mg/L	0.02	BLQ	0.02	BLQ	0.02	0.04
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.05	0.04	0.04	0.04	0.04	0.06
Total Arsenic (as Ar)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	0.02	BLQ	0.02	0.04	BLQ	0.01
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	0.08	0.05	0.05	0.05	0.09	0.04
Iron (as Fe)	mg/L	0.23	0.28	0.38	0.29	0.22	0.47
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	0.11	0.12	0.18	BLQ	0.11	0.12
Bioassay Test on fish	% survival	83	93	97	100	90	93

Graphs - Surface Water Quality of Chembur
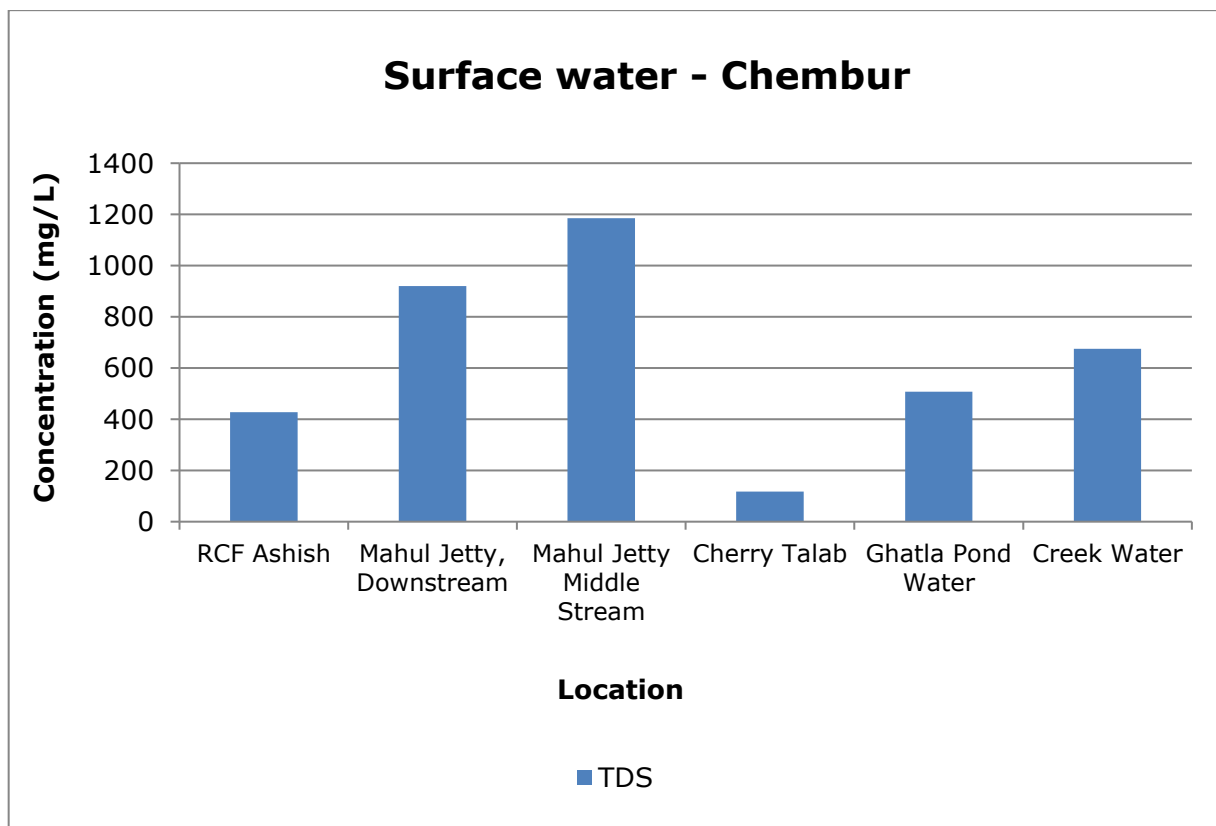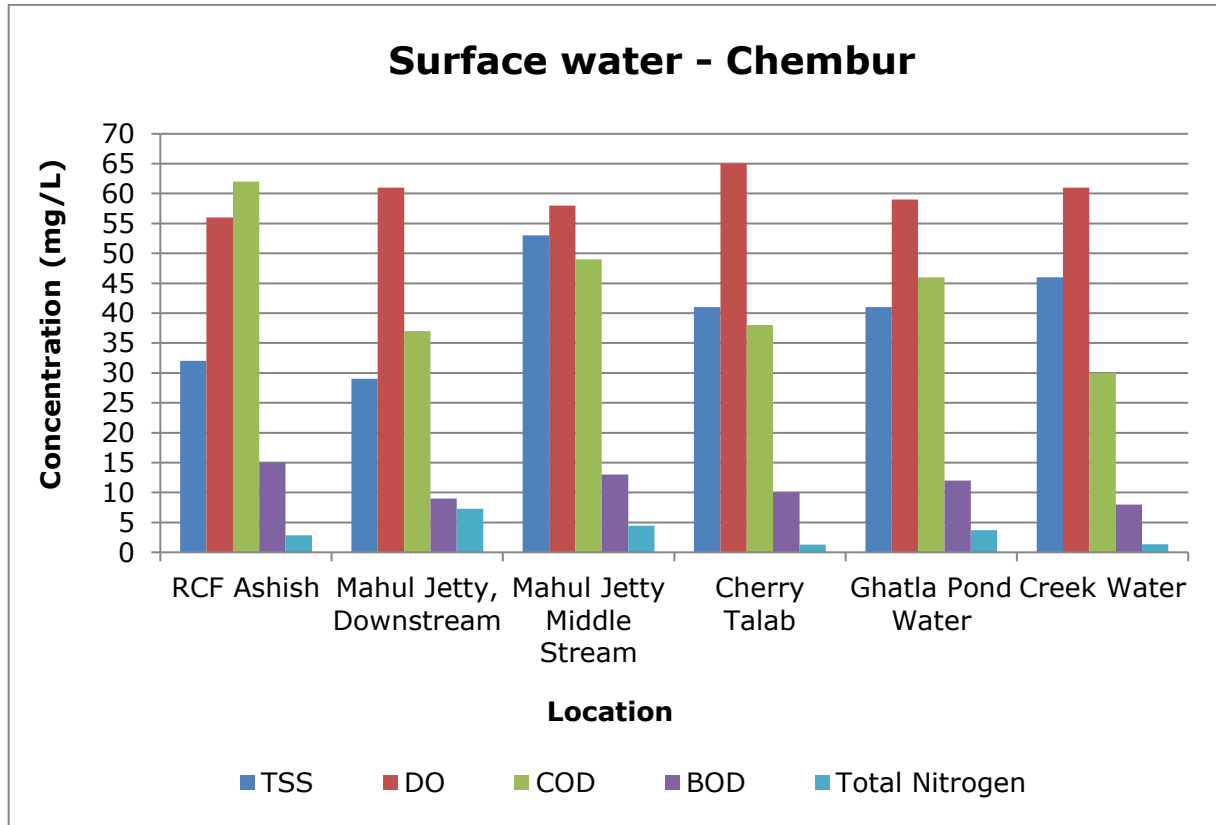
Surface water - Chembur

Bar chart showing Concentration (mg/L) on Y-axis (0 to 70) and Location on X-axis for parameters TSS, DO, COD, BOD, Total Nitrogen at locations: RCF Ashish, Mahul Jetty Downstream, Mahul Jetty Middle Stream, Cherry Talab, Ghatla Pond Water, Creek Water

Surface water - Chembur

Bar chart showing Concentration (mg/L) on Y-axis (0 to 1400) and Location on X-axis for TDS at locations: RCF Ashish, Mahul Jetty Downstream, Mahul Jetty Middle Stream, Cherry Talab, Ghatla Pond Water, Creek Water

Surface water - Chembur

Location

■ Sodium Adsorption Ratio   ■ pH

Surface water - Chembur

Concentration (μmhos/cm)

Location

■ Electrical Conductivity

Surface water - Chembur

Total Coliforms / Faecal Coliforms — MPN Index/100ml by Location (RCF Ashish, Mahul Jetty Downstream, Mahul Jetty Middle Stream, Cherry Talab, Ghatla Pond Water, Creek Water)

Surface water - Chembur

Bioassay Test on Fish — % survival by Location (RCF Ashish, Mahul Jetty Downstream, Mahul Jetty Middle Stream, Cherry Talab, Ghatla Pond Water, Creek Water)

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, and COD were also well within the limits in all samples collected.

- Fluoride concentration is found to exceed the permissible limit in two water samples i.e. Hand pump water at Prayag Nagar and Well water at Ambapada.

- A survival rate of 93% was observed in the fish bioassay for well water sample at Ambapada. All other water samples achieved 100% survival.

- Copper & Hexavalent Chromium (Cr^{6+}) etc. were observed below the limit of quantification (BLQ).

- Parameters like Total Residual Chlorine, Cyanide, Fluoride, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds also met the criteria as prescribed by CPCB.
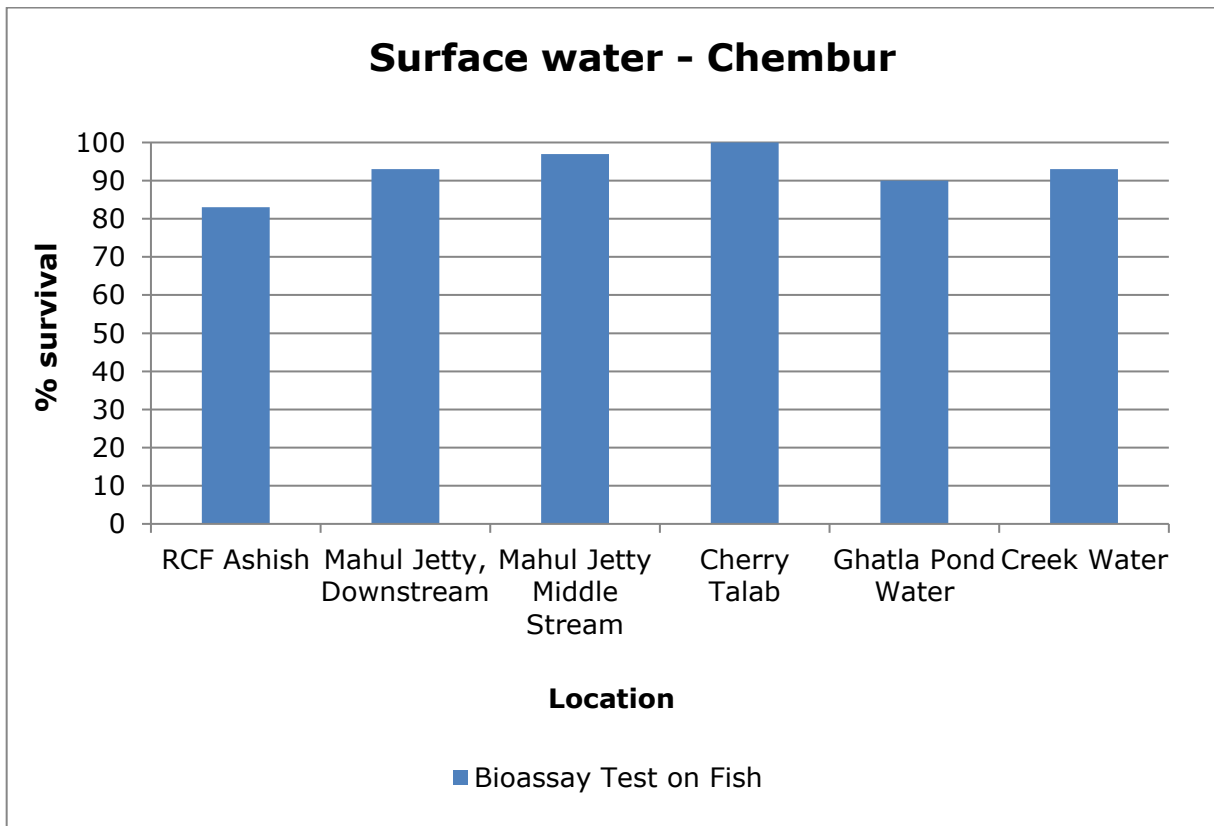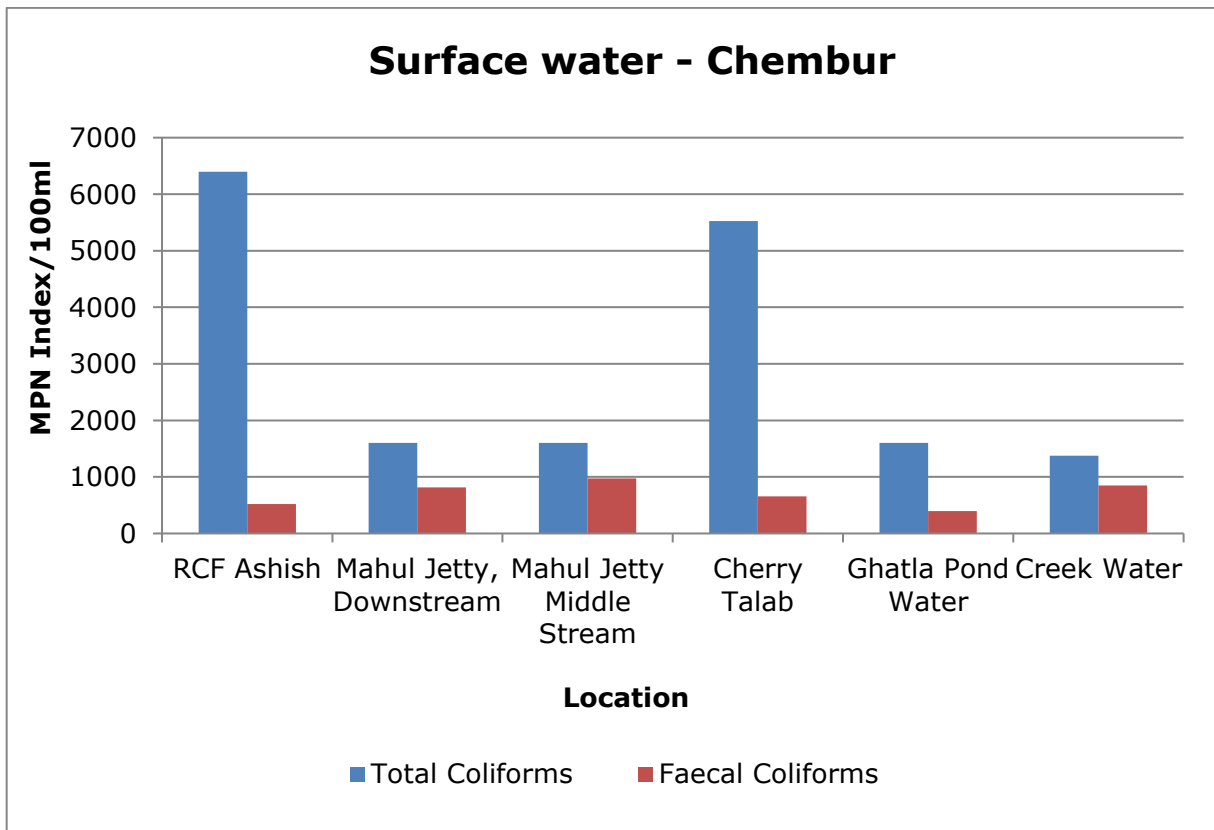
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were below the detectable limit in all six samples collected.

- 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	20.05.2025	22.05.2025	24.05.2025
2.	Well water at Prayag Nagar	19°1'11.10"N	72°54'31.93"E	20.05.2025	22.05.2025	24.05.2025
3.	Well water at Prayag Nagar Tabela	19°1'29.20"N	72°54'24.65"E	20.05.2025	22.05.2025	24.05.2025
4.	Well water at Laxmi Nagar	19°1'46.72"N	72°53'44.31"E	20.05.2025	22.05.2025	24.05.2025
5.	Well water at Ambapada	19°1'7.96"N	72°53'20.72"E	20.05.2025	22.05.2025	24.05.2025
6.	Well water Mahul Village	19°0'52.00"N	72°53'10.95"E	20.05.2025	22.05.2025	24.05.2025
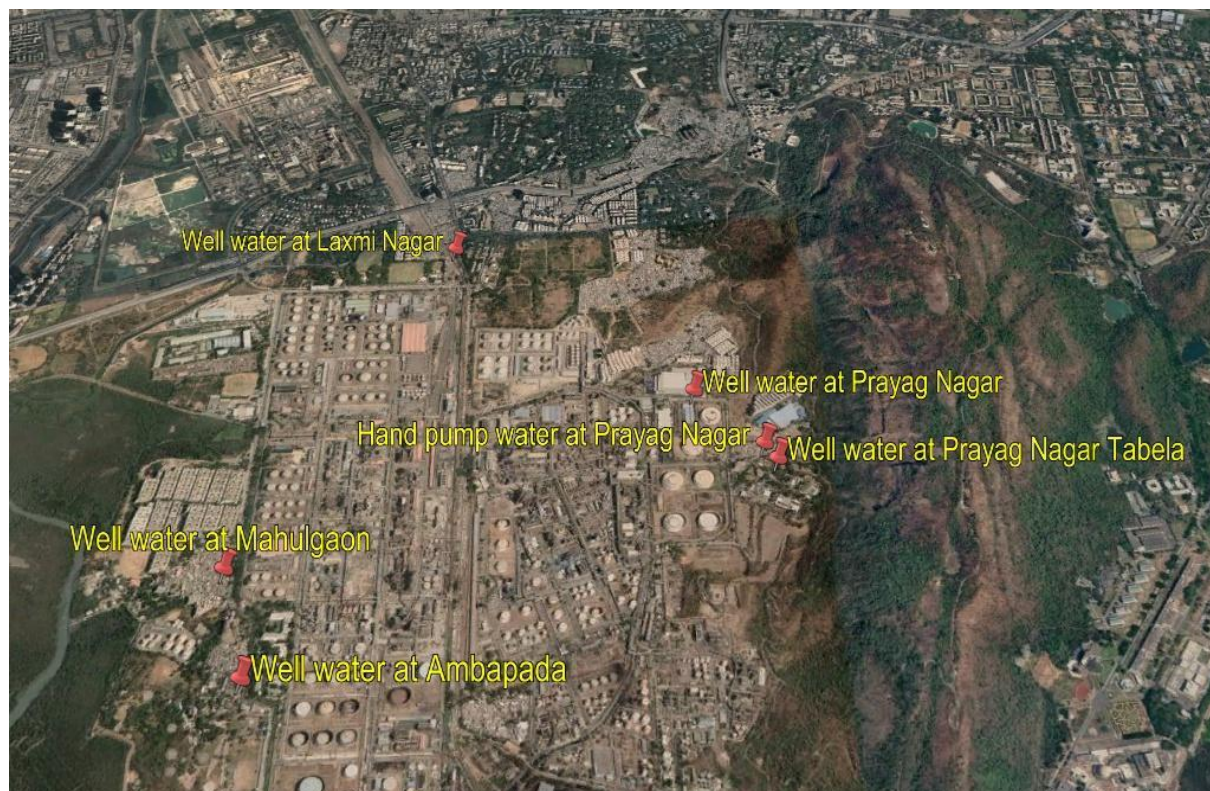
Fig: Geographical Locations of Ground Water Sampling

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	0.7	0.6	0.3	0.4	0.5
Temperature	°C	28	27	28	27	27	27
Colour	Hazen	1	1	1	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
pH	-	7.8	7.6	7.4	7.5	7.6	7.8
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	46	39	42	28	30	15
Total Dissolved Solids	mg/L	49	31	47	47	49	131

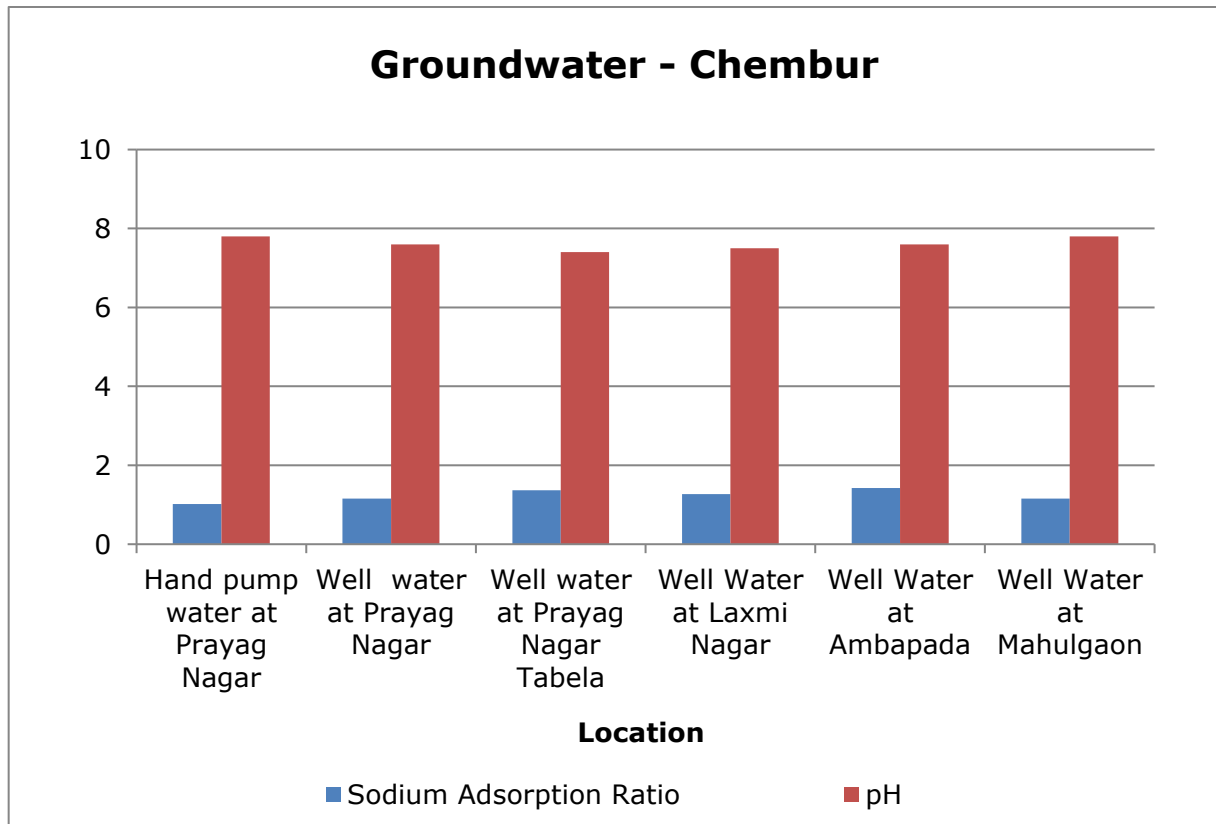| Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	Well water at Prayag Nagar	Well water at Prayag Nagar Tabela	Well water at Laxmi Nagar	Well water at Ambapada	Well water Mahul Village
Chemical Oxygen Demand	mg/L	34	29	27	29	87	24
Biochemical Oxygen Demand (3 days,27°C)	mg/L	9	7	7	8	28	6
Electrical Conductivity (at 25 °C)	µmho/cm	87	56	85	85	87	236
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	0.08
Nitrate Nitrogen (as NO_3)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	2.12
(NO_2 + NO_3)-Nitrogen	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	2.2
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	3.02	0.36	0.42	1.23	3.38	0.65
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Sodium Adsorption Ratio	-	1.02	1.16	1.37	1.27	1.42	1.16
Total Coliforms	MPN Index/100 ml	540	1600	350	1600	1600	240
Faecal Coliforms	MPN Index/100 ml	240	1600	130	920	23	240
Total Phosphate (as P)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Kjeldahl Nitrogen (as N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	3.24

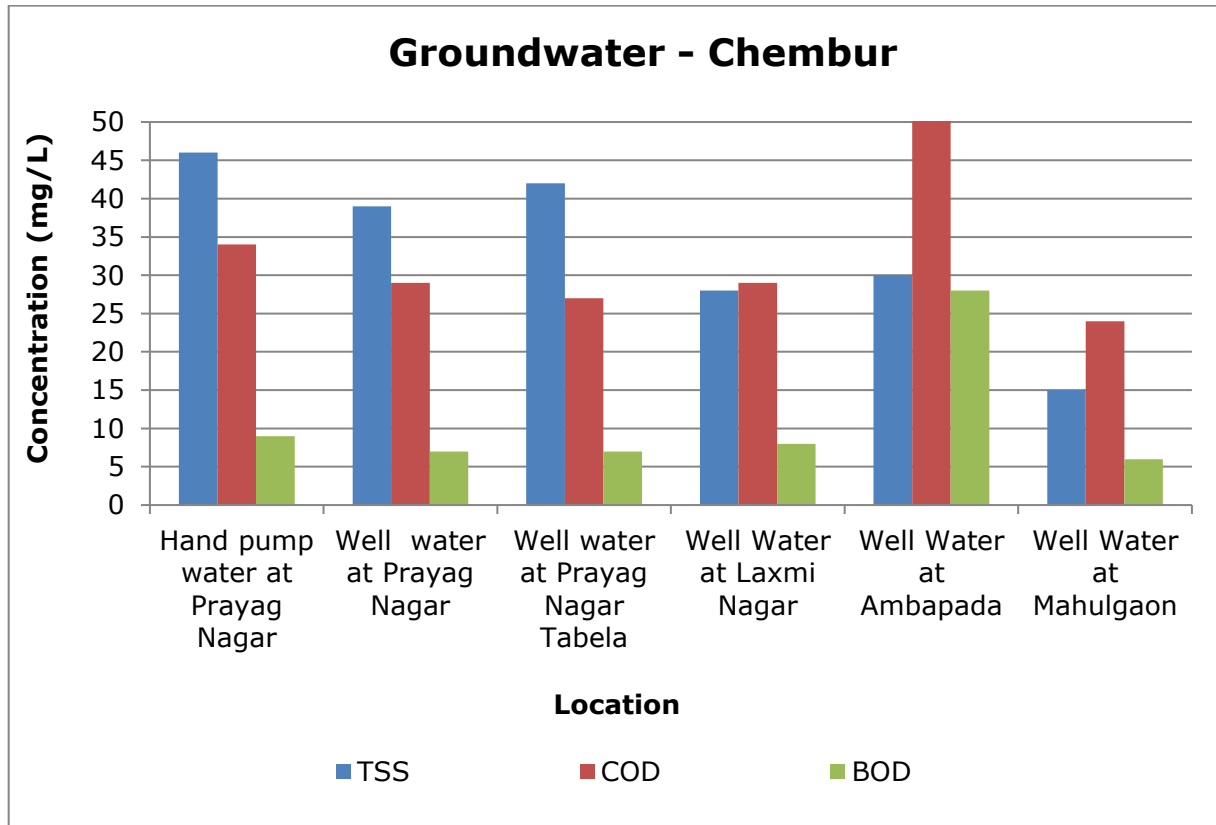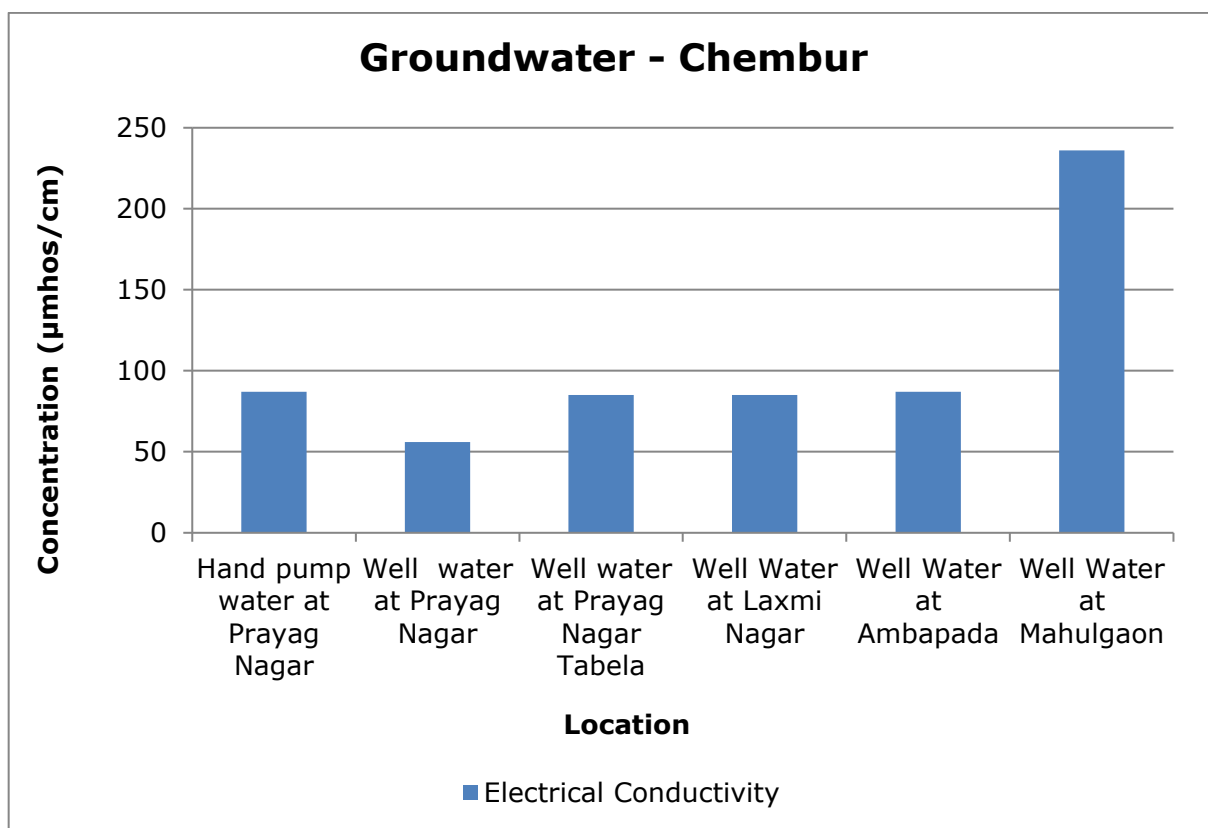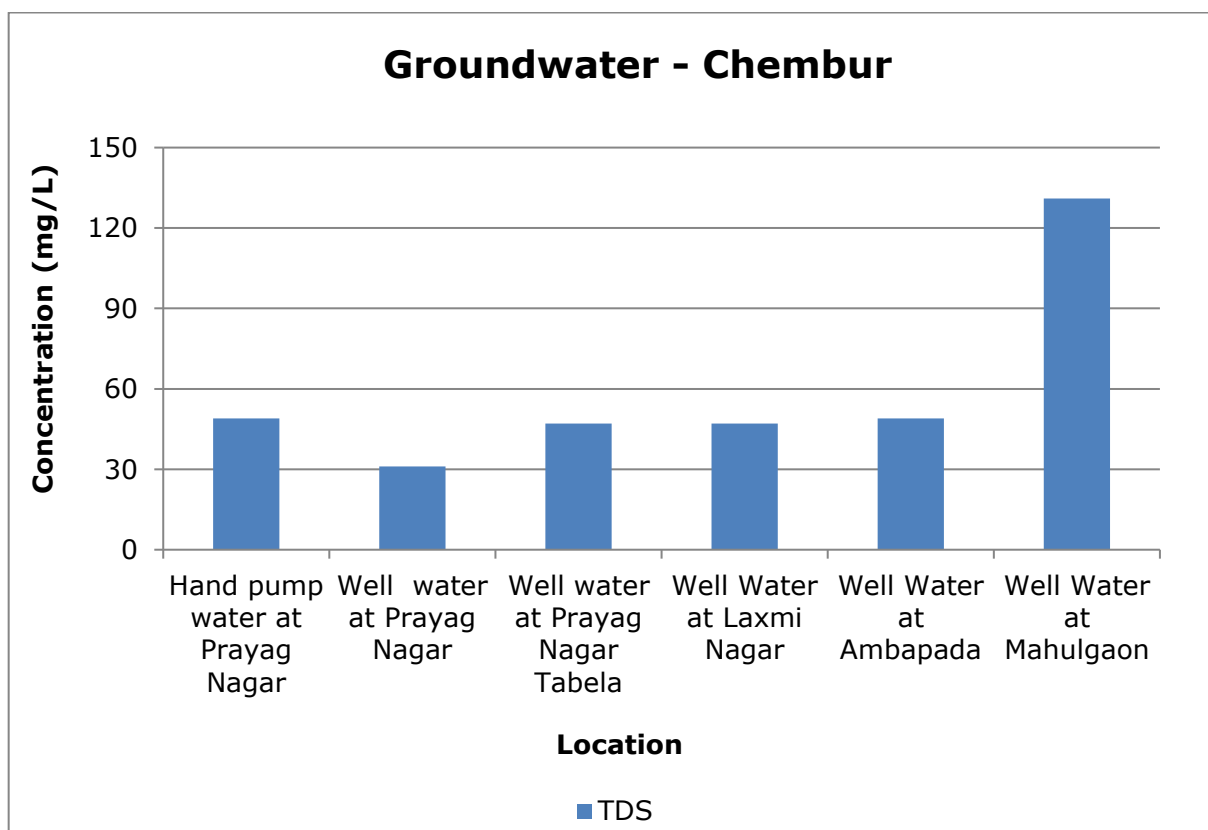| Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	Well water at Prayag Nagar	Well water at Prayag Nagar Tabela	Well water at Laxmi Nagar	Well water at Ambapada	Well water Mahul Village
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Nitrogen	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	5.44
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	BLQ	0.001765
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.16	0.21	0.25	0.19	0.21	0.20
Nickel (as Ni)	mg/L	0.01	0.02	0.02	0.01	0.02	0.02
Copper (as Cu)	mg/L	BLQ	BLQ	0.036	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.04	0.05	0.05	0.05	0.05	0.06
Total Arsenic (as Ar)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	0.03	0.01	0.026	0.012	0.017
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	BLQ	0.02	0.03	0.02	BLQ	0.03
Iron (as Fe)	mg/L	0.20	0.28	0.33	0.31	0.33	0.36
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	0.034

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
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Boron (as B)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	100	100	100	100	93	100

Groundwater - Chembur

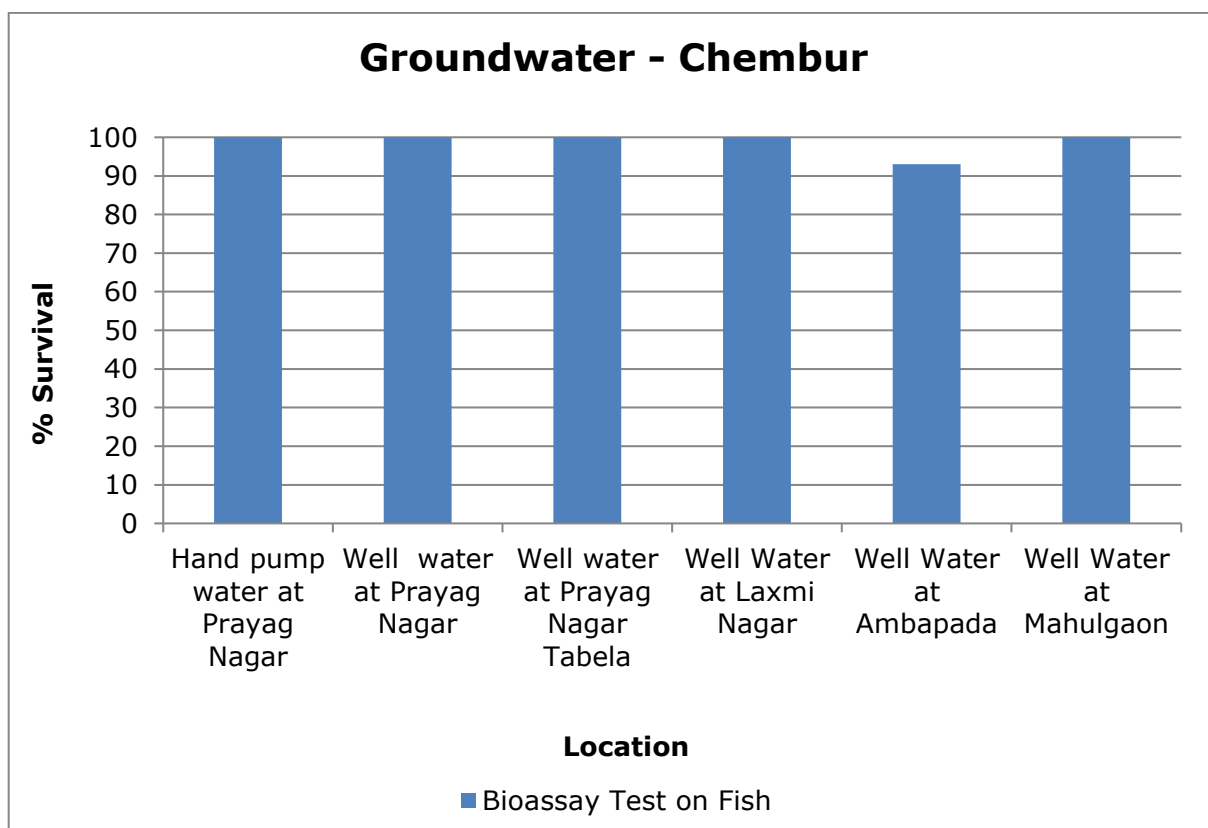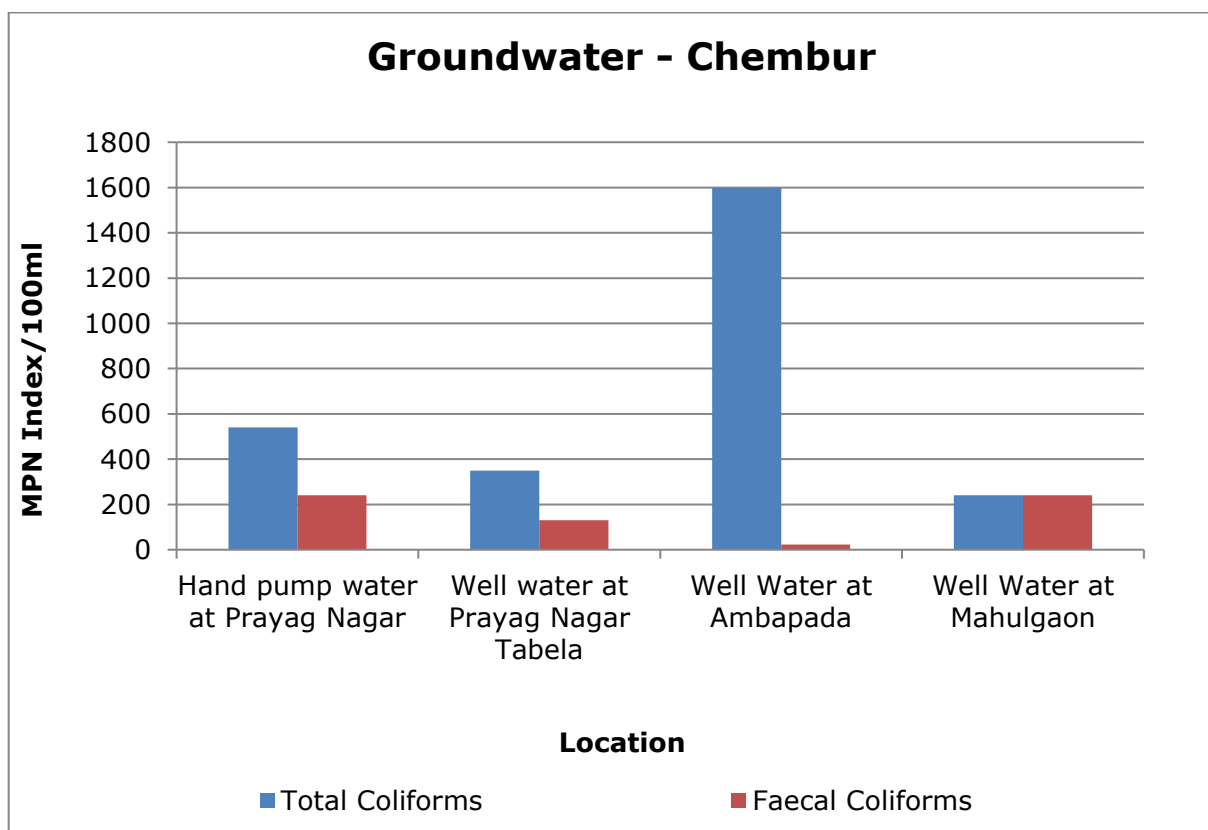Chart showing Concentration (mg/L) for TSS, COD, BOD across locations: Hand pump water at Prayag Nagar, Well water at Prayag Nagar, Well water at Prayag Nagar Tabela, Well Water at Laxmi Nagar, Well Water at Ambapada, Well Water at Mahulgaon.

Legend: TSS, COD, BOD

Groundwater - Chembur

Chart showing Sodium Adsorption Ratio and pH across locations: 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.

Legend: Sodium Adsorption Ratio, pH

Groundwater - Chembur

TDS — Concentration (mg/L) by Location:
- 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

Groundwater - Chembur

Electrical Conductivity — Concentration (µmhos/cm) by Location:
- 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

Groundwater - Chembur

MPN Index/100ml vs Location

- Total Coliforms
- Faecal Coliforms

Groundwater - Chembur

% Survival vs 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 Pre - Monsoon season 2025

	A1	A2	A	B	C	D	CEPI
Air Index	4	4	16	0	10	0	**26.00**
Water Index	2.5	4	10	21	10	0	**41.00**
Land Index	1.5	4	6	16.25	10	0	**32.25**
						Aggregated CEPI	**46.00**

The CEPI score observed in the present study is 46.00. Water Environment Pollution Index (EPI) is highest with 41.00 followed by land and air Environment Pollution Index (EPI) with 32.25 and 26.00 EPI respectively.

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI Score June 2025	26.00	41.00	32.25	**46.00**
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**

	Air Index	Water Index	Land Index	CEPI
CEPI Score June 2025	26.00	41.00	32.25	**46.00**
CEPI score March 2020	44.80	18.80	21.00	**47.00**
CEPI score June 2019	30.60	40.30	39.38	**41.60**
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 46.00. This time CEPI score is observed lower than the CPCB CEPI score March 2018 which was 54.67.

CEPI Score Calculations:

Chembur, Maharashtra - CEPI - JUNE 2025

Ambient Air Analysis report

Pollutant	Group	A1	A2	A (A1 X A2)
Benzene	C	3		
PM$_{2.5}$	B	0.5	Large	
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)	
Benzene	1.67	6	0.28	0	8	0.00	L	0
PM$_{2.5}$	11.00	60	0.18	0	8	0.00	L	0
PM$_{10}$	40.29	100	0.40	0	8	0.00	L	0
B score = (B1+B2+B3)							**B**	**0**

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

Air CEPI	**(A+B+C+D)**	**26.0**

Water Quality Analysis report

Pollutant	Group	A1	A2	A (A1 X A2)
TP	B	2		
TN	A	0.25	Large	
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	0.31	0.3	1.03	2	6	0.87	H	21
TN	3.48	15	0.23	0	6	0.00	L	0
Total Ammonia	0.31	1.5	0.21	0	6	0.00	L	0
B score = (B1+B2+B3)							B	21

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

Water CEPI	(A+B+C+D)	41.0

Ground Water Quality Analysis report

Pollutant	Group	A1	A2	A (A1 X A2)
F	A	1		
TDS	A	0.25	Large	
Fe	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	1.51	1.5	1.01	2	6	0.34	M	12.8
TDS	59.06	2000	0.03	0	6	0.00	L	0
F	0.30	0.3	1.00	1	6	0.17	M	3.5
B score = (B1+B2+B3)							B	16.3

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

Land CEPI	**(A+B+C+D)**	**32.3**

Water CEPI Score (im)   **41.0**

Land CEPI Score (i2)   **32.25**

Air CEPI Score (i3)   **26.00**

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   <u>**46.00**</u>

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.

- The air environment score in the current study is calculated as 26.00

Surface Water Quality

- All the parameters of Surface water sampling are observed within the acceptable limit, except total phosphate in 2 water samples.

- 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.

- The water environment score in the current study is calculated as 41.00

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 one 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.

- In the current study, the land environment score has been calculated as 32.25.

CEPI Score

- The CEPI Score Pre - Monsoon season is 46.0.

- 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 Pre - Monsoon season, which results in dilution of environmental samples resulting in lower pollution load, hence also affects the total score.

- In conclusion, approximately 16% decrease in CEPI score is observed from 54.67 of the CPCB score of March 2018 to 46.0 in June 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 frfom 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 Mumbai Refinery, Ambapada

Ambient Air Sampling Tata Colony Chembur

Ambient Air Sampling Kalachauki, Mahul, Chembur

Ambient Air Sampling Tata Colony

Surface water sampling Mahul Jetty

Surface water sampling Madh Jetty

Surface water sampling Ghatla pond Water

Surface water sampling Cherry talab near Chembur police station

Groundwater sampling Koyna Colony

Groundwater sampling Prayag nagar Mahul, Trombay Mumbai

Groundwater sampling koyana nagar Vasai naka Chembur

Groundwater sampling Mahul Village 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	566, Vikas Shree, vnnasu. Go.op Soc, Ltd, Sion Trobay Road chembur 71.71

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:

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

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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 Snehase
Address	48 Swastikpark Sion Bombay 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

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

Signature