

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

CHEMBUR

Pre-Monsoon (April 2023 to June 2023)



Maharashtra Pollution Control Board

Kalptaru Point, Sion East, Mumbai – 400 022

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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 Pre - Monsoon monitoring was carried out during the period of April 2023 to June 2023 to verify the Ambient Air Quality, Surface water and Groundwater.

The Ambient Air Quality stations were identified considering the upwind and cross-wind 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 43.4 of June 2023. According to the present study result, the Environmental Pollution Index (EPI) score of Pre-Monsoon in Ambient Air is calculated as 21.50, Surface Water as 40.0, and Ground Water as 26.0. Hence, Chembur's Comprehensive Environmental Pollution Index (CEPI) score for the Pre-monsoon 2023 is 43.4.

2. Introduction

Industries play a pivotal role in a country's economic development, contributing to GDP growth, job creation, and technological advancement. However, in recent years, the environmental pollution caused by industries has emerged as a formidable challenge for authorities worldwide. The impact of these industrial activities on the environment is severe, affecting the quality of the water we drink, the air we breathe, and the soil that nurtures our plants. Industries releasing untreated wastewater have contaminated drinking water with hazardous substances, posing risks to human, animal, and aquatic life. Exposure to air pollutants has been linked to various respiratory and cardiovascular diseases, particularly in early human life, leading to infant mortality or chronic health issues in adulthood. According to the World Health Organization (WHO), environmental pollution is responsible for an estimated 9 million premature deaths worldwide each year. It also estimates that over 90% of the global population is exposed to air pollution levels that exceed WHO guidelines, causing serious health risks. Around 2 billion people worldwide use drinking water contaminated with faeces leading to infectious diseases such as cholera and dysentery.

Hence, addressing these pollution sources is crucial to achieving significant environmental and health benefits. Additionally, the widespread nature of industrial pollution requires extensive monitoring systems and resources to collect reliable data and assess the full extent of the environmental impacts. The complexities associated with monitoring and identifying pollution sources make it a daunting task for authorities to develop targeted strategies and enforce regulations effectively. Striking a balance between economic growth and environmental protection requires delicate negotiations and innovative policy approaches. Overcoming these challenges demands robust regulatory frameworks, international collaboration, advanced monitoring technologies, and a commitment to sustainable practices from industries and governments alike.

In view of this, Central Pollution Control Board (CPCB) has evolved the concept of the Comprehensive Environmental Pollution Index (CEPI) during 2009-10 as a tool for comprehensive environmental assessment of prominent industrial clusters and formulation of remedial Action Plans for the identified critically polluted areas. Later in 2016, the revised concept of CEPI was formulated by eliminating the subjective factors but retaining the factors which are monitorable CEPI bridges the perceptive gap between experts, public, and government departments by simplifying the complexity of environmental issues. It aims at categorizing critically polluted industrial areas based on scientific criteria, so as to ascertain various dimensions of pollution. This is a combined framework used to evaluate the impacts caused by industrial clusters on the nearby environment, as a numerical value.

The present CEPI study includes areas under Chembur. Chembur has been facing pollution problems and was recently ranked 46th in a list of the most polluted industrial clusters in India. Studies in Chembur have also found high levels of Copper, Chromium, Calcium, Arsenic and Mercury in ground water. Effluents from oil refineries, fertilizer plants and reactors located in Chembur are also said to have polluted sea water in Thane Creek and affected marine life. The main problem is the uncontrolled release of ammonia and nitrous oxides from the Rastriya chemical fertiliser complex.

Although ammonia is easy to scrub, the problem seems to be due to improper operation of pollution control equipment and/or operation of the urea/ammonia complex way beyond the design capacity without augmentation of pollution control equipment. Measurement of ammonia /NO_x levels is the best way to establish this by constant ambient air analysis. The Deonar dumping ground in Deonar has caused health issues for the residents of Chembur. In 2008, around 40 residents of Chembur went on a hunger strike to protest against the frequent fires and smoke. Again in 2012, the residents complained to the Brihanmumbai Municipal Corporation on the smoke coming out of the dumping ground, which has been affecting asthma patients.

The present report is also based on the revised CEPI version 2016. The results of the application of the Comprehensive Environmental Pollution Index (CEPI) to selected industrial clusters or areas are presented in this report. The main objective of the study is to identify polluted industrial clusters or areas in order to take concerted action and to centrally monitor them at the national level to improve the current status of their environmental components such as air and water quality data, ecological damage, and visual environmental conditions. The index captures the various dimensions of environment including air, water and land. Comprehensive Environmental Pollution Index (CEPI), which is a rational number to characterize the environmental quality at a given location following the algorithm of source, pathway and receptor have been developed.

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 ₆ H 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, Napthalene, 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-

Sampling Criteria	Total Sites	Monitoring Parameters
		Dichloroethylene, Bromochloromethane, 1,1,1-Trichloroethane
Water Quality Monitoring	Surface water - 06	<p>(i) Simple Parameters</p> <p>Sanitary Survey, General Appearance, Colour, Smell, Transparency and Ecological</p> <p>(ii) Regular Monitoring Parameters</p> <p>pH, O & G, Suspended Solids, DO, COD, BOD, TDS, Electrical Conductivity, Total Dissolved Solids, Nitrite-Nitrogen, Nitrate-Nitrogen, (NO₂+NO₃) total nitrogen, Free Ammonia, Total Residual Chlorine, Cyanide, Fluoride, Chloride, Sulphate, Sulphides, Total Hardness, Dissolved Phosphates, SAR, Total Coliforms, Faecal Coliform</p> <p>(iii) Special Parameters</p> <p>Total Phosphorous, TKN, Total Ammonia (NH₄+NH₃)-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</p> <p>(iv) Bio-assay (zebra Fish) Test – For specified samples only.</p>
	Ground water - 06	

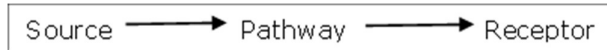
Table 3.2 Frequency of Sampling

	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

	Parameter	Round of Sampling	Frequency in Each Round
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 ₆ H 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	22.05.2023	24.05.2023	26.05.2023
2.	Ambapada Gaon	19°0'43.92"N	72°53'25.70"E	22.05.2023	24.05.2023	26.05.2023
3.	Nearby RCF main plant	19°2'5.62"N	72°53'31.98"E	22.05.2023	24.05.2023	26.05.2023
4.	BPCL sports club	19°1'44.07"N	72°53'43.66"E	22.05.2023	24.05.2023	26.05.2023
5.	HPCL Refinery Main Gate	19°1'11.79"N	72°53'49.63"E	22.05.2023	24.05.2023	26.05.2023
6.	Tata Power Colony	19°2'20.46"N	72°53'59.23"E	22.05.2023	24.05.2023	26.05.2023
7.	Eversmile Building	19°0'55.47"N	72°53'12.80"E	22.05.2023	24.05.2023	26.05.2023
8.	Near main gate Pepsico	19°1'12.26"N	72°53'59.12"E	22.05.2023	24.05.2023	26.05.2023

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

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Nearby RCF main plant	19°2'5.62"N	72°53'31.98"E	22.05.2023	24.05.2023	26.05.2023
2.	BPCL sports club	19°1'44.07"N	72°53'43.66"E	22.05.2023	24.05.2023	26.05.2023



Fig: Geographical Locations of Ambient Air Quality Monitoring

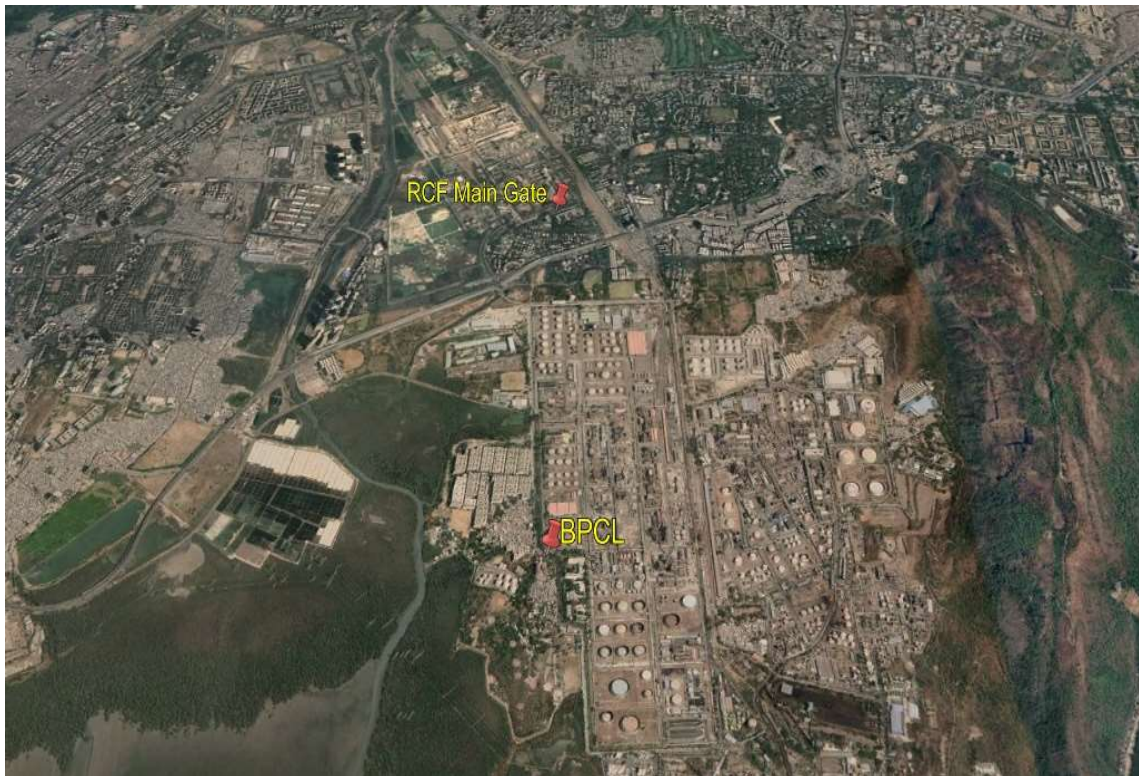


Fig: Geographical Locations of VOCs Monitoring

Table 5.3 Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Near main gate BPCL	Ambapada Gaon	Nearby RCF main plant	BPCL sports club
Sulphur Dioxide (SO ₂)	µg/m ³	68.54	84.08	81.16	80.07
Nitrogen Dioxide (NO ₂)	µg/m ³	25.50	6.61	BLQ	BLQ
Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	68	50	61	83
Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	18	14	18	22
Ozone (O ₃)	µg/m ³	82.17	264.00	37.90	26.00
Lead (Pb)	µg/m ³	0.03	0.04	0.05	0.08
Carbon Monoxide (CO) (1h)	mg/m ³	1.30	1.18	1.54	1.54
Carbon Monoxide (CO) (8h)	mg/m ³	1.87	1.50	1.70	1.79
Ammonia (NH ₃)	µg/m ³	34.65	59.30	49.35	58.65
Benzene (C ₆ H ₆)	µg/m ³	3.06	2.84	3.26	2.45
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m ³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m ³	0.54	0.49	0.93	0.92
Nickel (Ni)	ng/m ³	BLQ	BLQ	4.86	4.62

Parameters	Unit	Results			
		HPCL Refinery Main Gate	Tata Power Colony	Eversmile Building	Near main gate Pepsico
Sulphur Dioxide (SO ₂)	µg/m ³	90.88	233.00	33.00	BLQ
Nitrogen Dioxide (NO ₂)	µg/m ³	8.57	36.00	BLQ	41.30
Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	80	89	87	80
Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	23	23	22	20
Ozone (O ₃)	µg/m ³	91.10	BLQ	BLQ	76.70
Lead (Pb)	µg/m ³	0.36	0.05	0.05	0.07

Parameters	Unit	Results			
		HPCL Refinery Main Gate	Tata Power Colony	Eversmile Building	Near main gate Pepsico
Carbon Monoxide (CO) (1h)	mg/m ³	1.22	1.33	1.43	0.98
Carbon Monoxide (CO) (8 h)	mg/m ³	1.75	1.54	1.80	1.41
Ammonia (NH ₃)	µg/m ³	65.45	36.30	34.13	50.35
Benzene (C ₆ H ₆)	µg/m ³	2.95	2.43	2.72	2.52
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m ³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m ³	2.43	0.86	0.61	0.80
Nickel (Ni)	ng/m ³	18.30	BLQ	4.40	BLQ

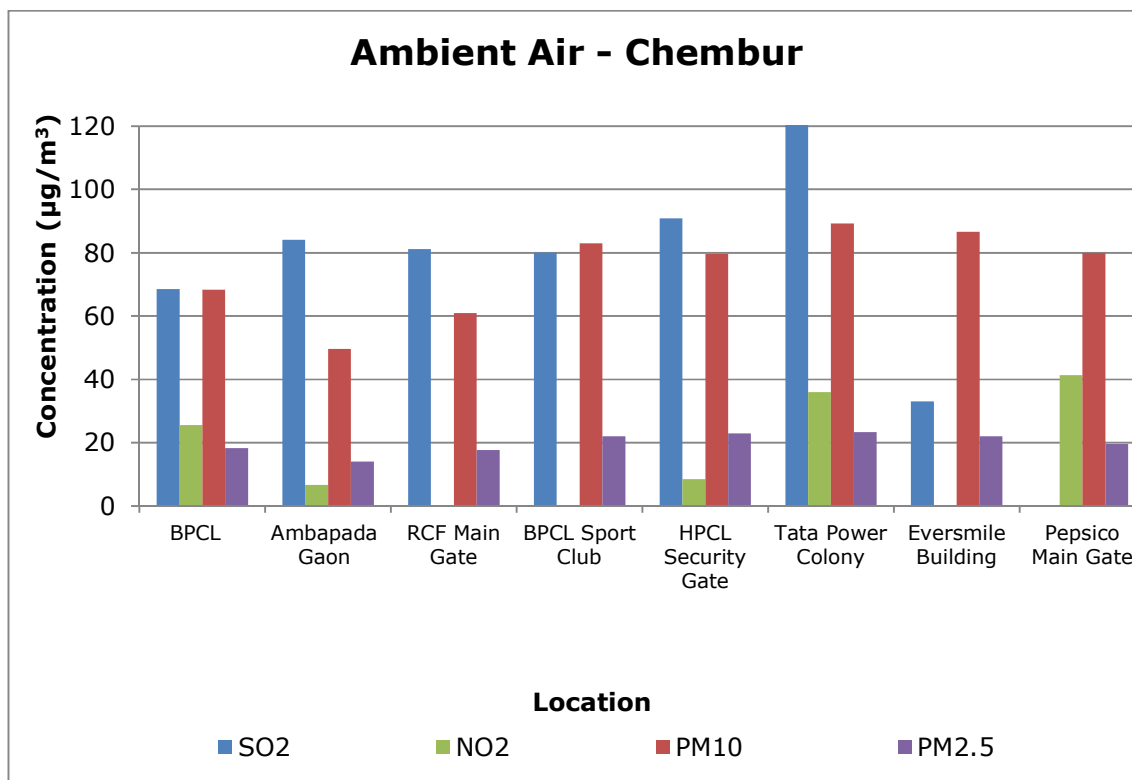
Table 5.4 Volatile Organic Compounds (VOCs) in Ambient Air Results

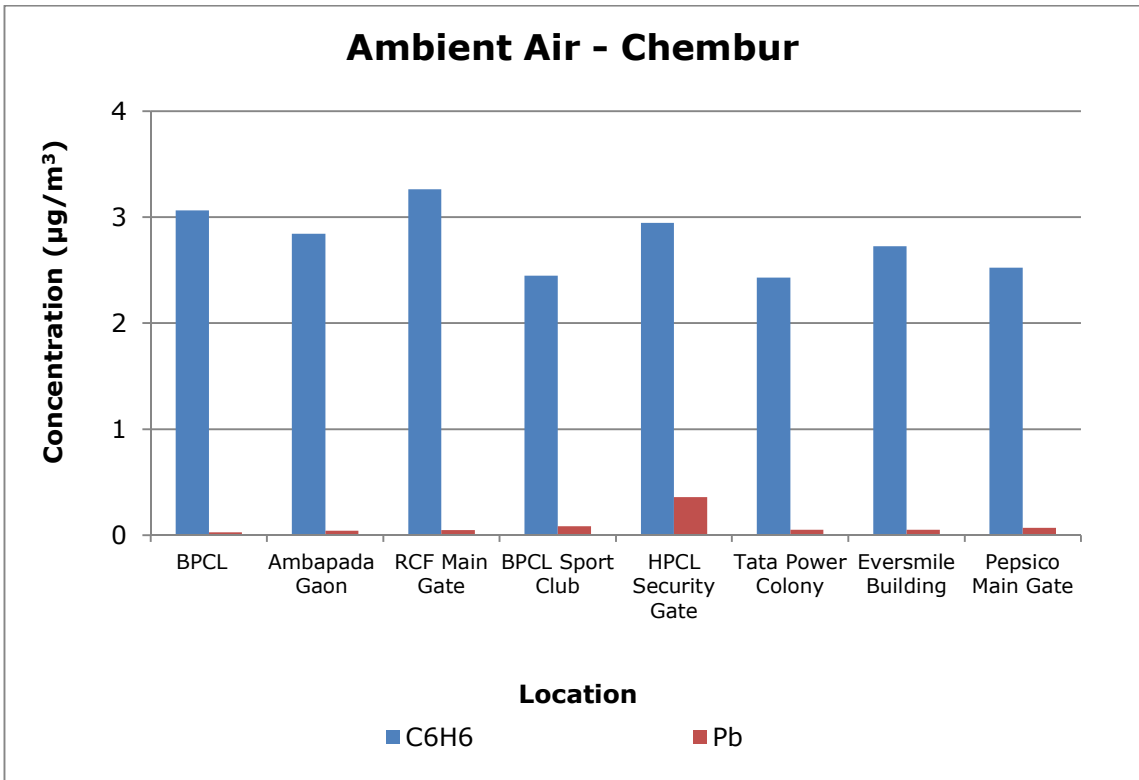
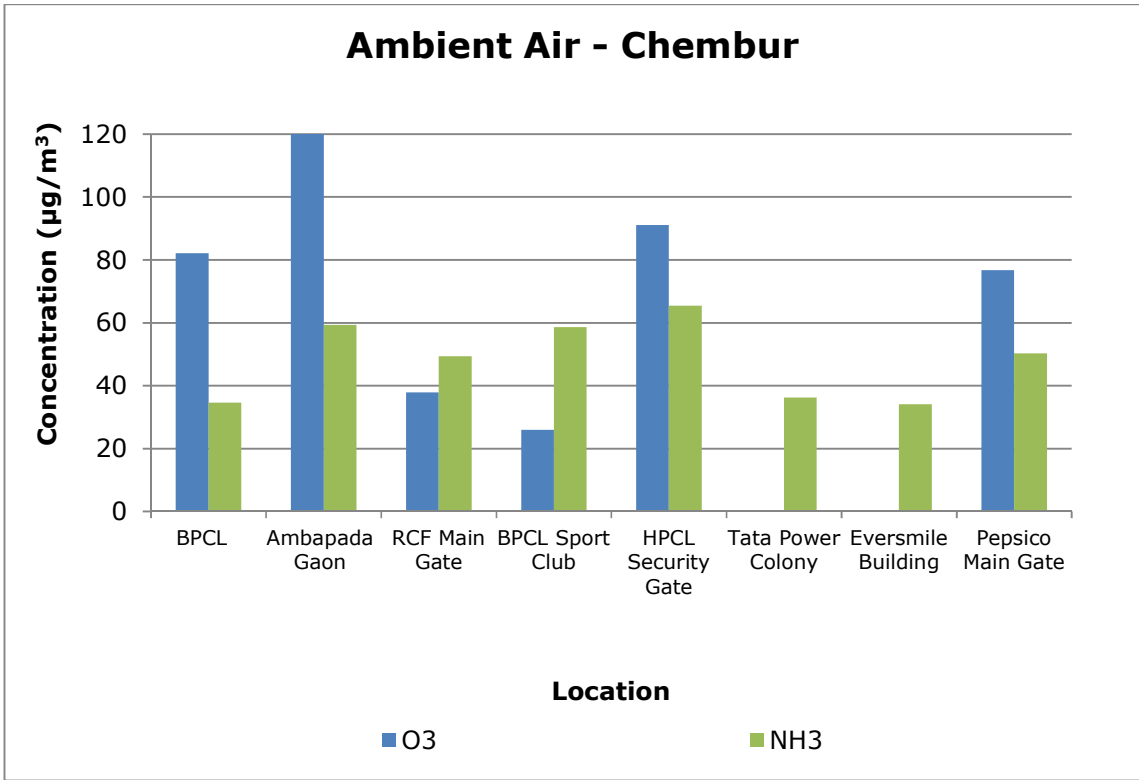
Parameters	Unit	Results	
		Nearby RCF main plant	BPCL sports club
Dichloromethane	µg/m ³	0.80	4.88
Chloroform	µg/m ³	0.52	1.57
Carbon Tetrachloride	µg/m ³	1.06	65.40
Trichloroethylene	µg/m ³	1.05	0.68
Bromodichloromethane	µg/m ³	BLQ	1.66
1,3-Dichloropropane	µg/m ³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m ³	19.00	BLQ
1,3-Dichlorobenzene	µg/m ³	BLQ	21.30
1,2-Dichlorobenzene	µg/m ³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m ³	BLQ	BLQ
Naphthalene	µg/m ³	BLQ	BLQ
Bromobenzene	µg/m ³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m ³	9.05	9.39
2-Chlorotoluene	µg/m ³	BLQ	BLQ
Tert-Butylbenzene	µg/m ³	BLQ	BLQ

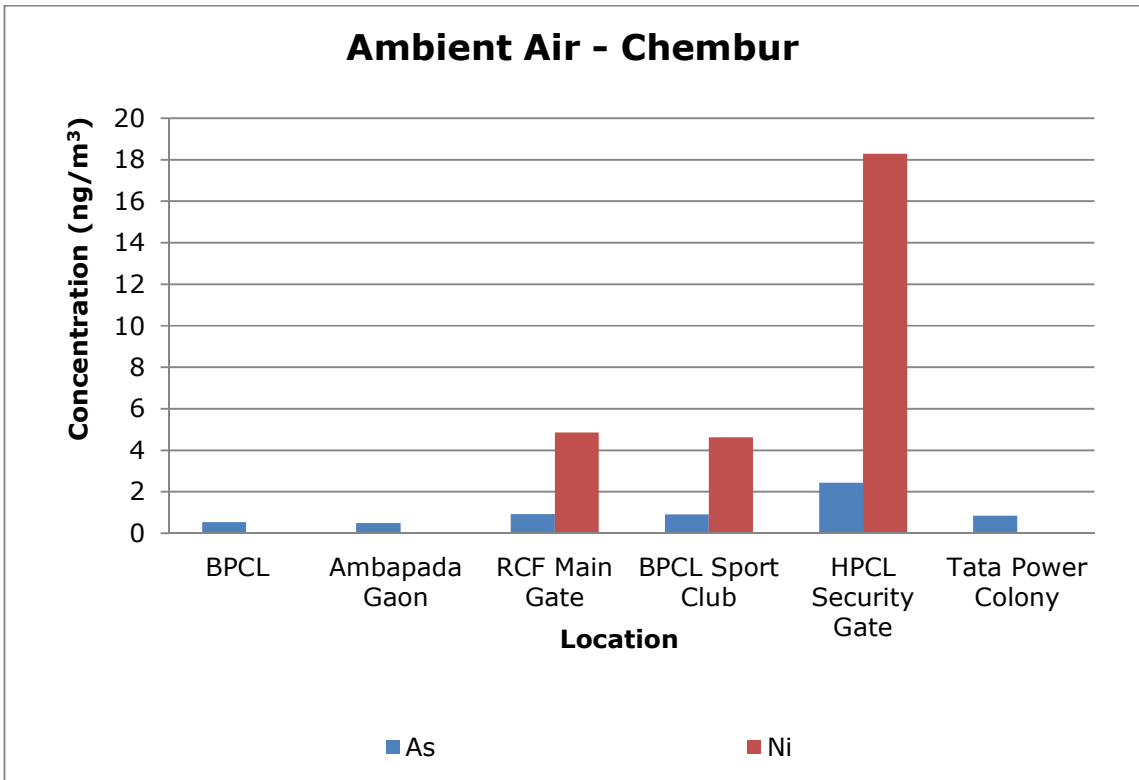
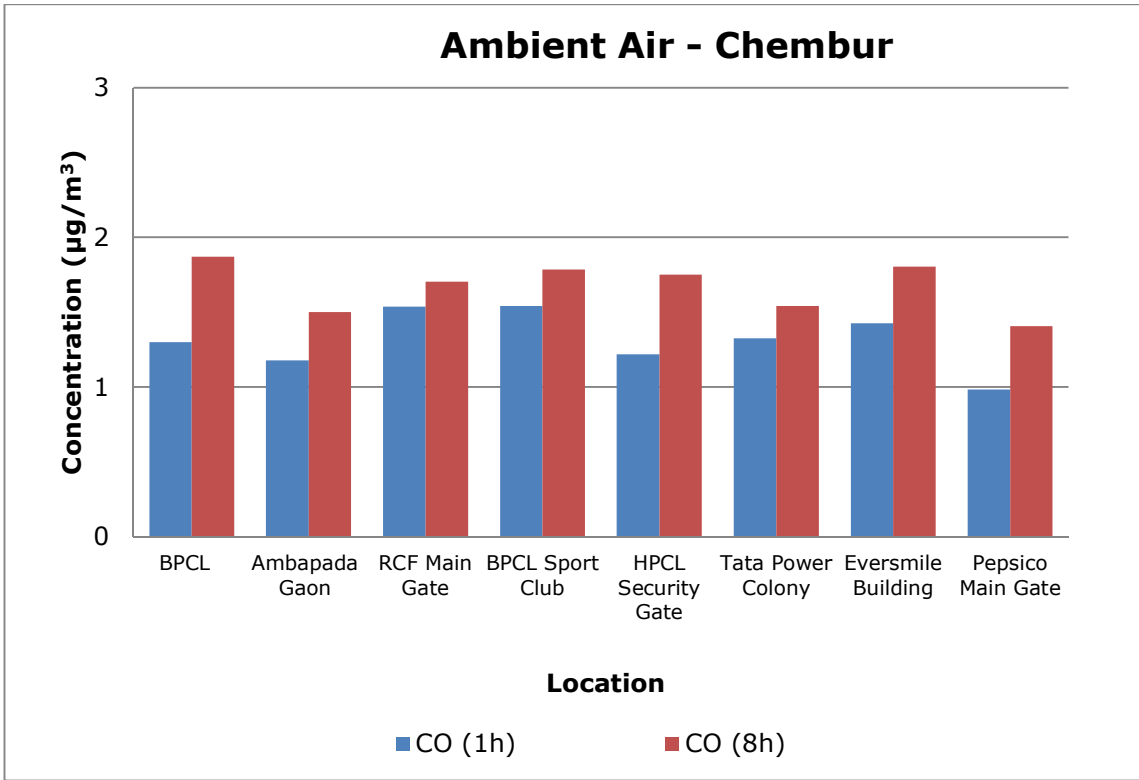
Parameters	Unit	Results	
		Nearby RCF main plant	BPCL sports club
SEC-Butylbenzene	µg/m ³	BLQ	BLQ
P-Isopropyltoluene	µg/m ³	16.90	5.95
M-Xylene	µg/m ³	BLQ	BLQ
P-Xylene	µg/m ³	10.05	4.79
Styrene	µg/m ³	BLQ	BLQ
Cumene	µg/m ³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m ³	BLQ	BLQ
N-Propylbenzene	µg/m ³	21.65	11.00
Dibromochloromethane	µg/m ³	BLQ	BLQ
1,2-Dibromoethane	µg/m ³	BLQ	BLQ
Chlorobenzene	µg/m ³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m ³	BLQ	BLQ
Ethylbenzene	µg/m ³	10.42	6.99
1,1-Dichloropropylene	µg/m ³	1.14	BLQ
1,2-Dichloroethane	µg/m ³	5.23	4.19
1,2-Dichloropropane	µg/m ³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m ³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m ³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m ³	BLQ	BLQ
Tetrachloroethylene	µg/m ³	7.65	2.05
1,3,5-Trimethylbenzene	µg/m ³	BLQ	BLQ
N-Butylbenzene	µg/m ³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m ³	BLQ	BLQ
Hexachlorobutadiene	µg/m ³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m ³	BLQ	BLQ
2,2-Dichloropropane	µg/m ³	1.39	BLQ
Dibromomethane	µg/m ³	BLQ	BLQ
Toluene	µg/m ³	3.70	9.69

Parameters	Unit	Results	
		Nearby RCF main plant	BPCL sports club
O-Xylene	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
Bromoform	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
1,1,2,2-Tetrachloroethane	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
4-Chlorotoluene	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
1,1-Dichloroethylene	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
Trans-1,2-Dichloroethylene	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
1,1-Dichloroethane	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
CIS-1,2-Dichloroethylene	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
Bromochloromethane	$\mu\text{g}/\text{m}^3$	BLQ	BLQ
1,1,1-Trichloroethane	$\mu\text{g}/\text{m}^3$	BLQ	BLQ

Graphs - Ambient Air Quality Monitoring of Chembur







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 as well as middle stream) and Creek water is found to exceed the permissible limit.
- pH and suspended solids are well within the limits of all six samples collected.
- BOD and COD were found to exceed the acceptable limit in all the water samples.
- 100% survival in Fish Bioassay was observed in 4 out of 6 samples collected.
- All metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr⁶⁺) 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	23.05.2023	25.05.2023	27.05.2023
2.	Downstream near Mahul Jetty	19°0'50.64"N	72°53'5.91"E	23.05.2023	25.05.2023	27.05.2023
3.	Mahul jetty Middle stream	19°1'14.62"N	72°52'44.20"E	23.05.2023	25.05.2023	27.05.2023
4.	Pond water from Cherry Talab near Chembur police station	19°3'3.23"N	72°53'34.25"E	23.05.2023	25.05.2023	27.05.2023
5.	Ghatla pond water	19°3'21.11"N	72°54'22.40"E	23.05.2023	25.05.2023	27.05.2023
6.	Creek water near Ajmera Chembur	19°1'44.59"N	72°52'43.00"E	23.05.2023	25.05.2023	27.05.2023



Fig: Geographical Locations of Surface Water Sampling

Table 6.2 Results of Surface Water

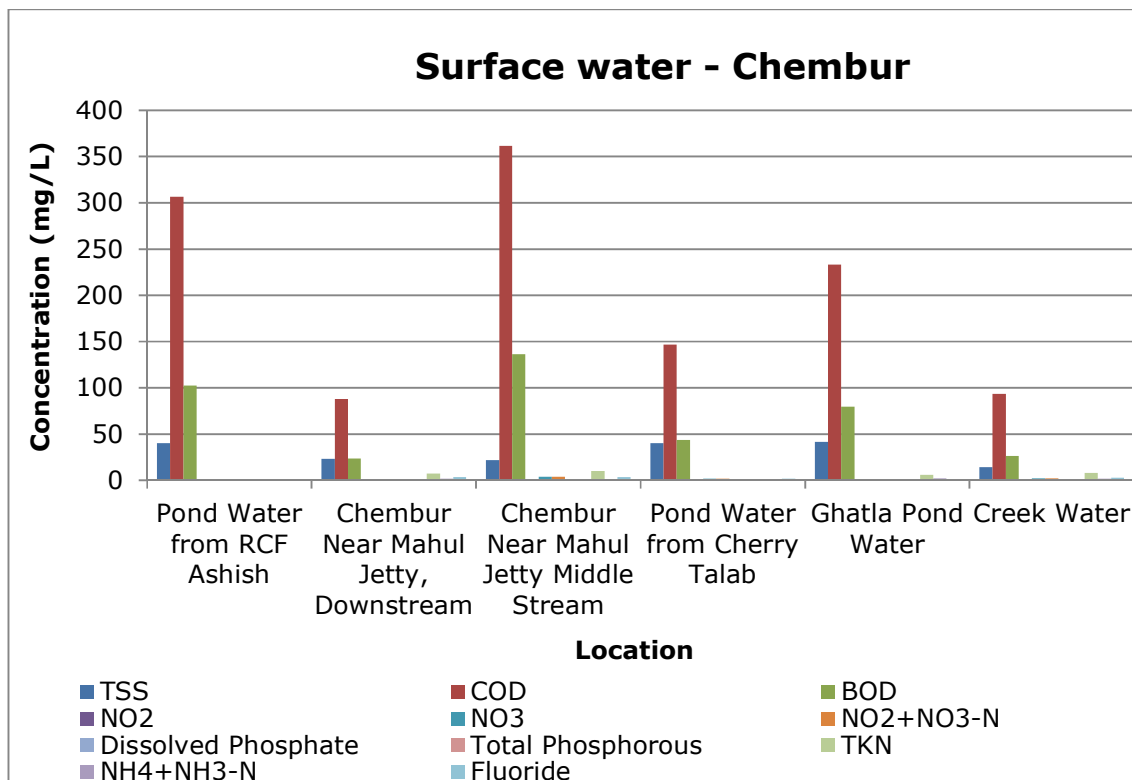
Parameters	Unit	Results					
		Pond water from RCF Ashish	Downstream near Mahul Jetty	Mahul jetty Middle stream	Pond water from Cherry Talab near Chembur police station	Ghatla pond water	Creek water near Ajmera Chembur
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Very clean neighbourhood and catchment	Very clean neighbourhood and catchment	Reasonably Clean neighbourhood
General Appearance	-	No Floating matter	No Floating matter	floating matter Evident	No floating matter	No floating matter	No Floating matter
Transparency	m	0.167	0.233	0.167	0.233	0.267	0.100
Temperature	°C	31	31	4	32	31	32
Colour	Hazen	4	2	3	2	3	2
Smell	-	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
pH	-	7.050	6.990	7.023	7.090	7.170	7.177

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
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	40	23	22	40	41	14
Total Dissolved Solids	mg/L	384	7493	7923	1398	389	3580
Dissolved Oxygen (% Saturation)	%	42.000	38.000	40.000	42.333	35.000	50.667
Chemical Oxygen Demand	mg/L	307	88	362	147	233	93
Biochemical Oxygen Demand (3 days,27°C)	mg/L	103	23	136	44	80	26
Electrical Conductivity (at 25 °C)	µmho/cm	683	13003	13737	2487	693	6253
Nitrite Nitrogen (as NO ₂)	mg/L	0.060	0.020	BLQ	0.050	0.020	0.060
Nitrate Nitrogen (as NO ₃)	mg/L	1.050	1.250	3.600	1.565	1.120	1.973
(NO ₂ + NO ₃)-Nitrogen	mg/L	1.055	1.250	3.600	1.595	1.130	1.993
Free Ammonia (as NH ₃ -N)	mg/L	BLQ	BLQ	0.130	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.240	0.230	0.240	BLQ	0.237	0.250
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.633	3.200	3.367	1.767	0.567	2.733
Sulphide (as H ₂ S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.260	0.880	0.860	0.165	0.197	0.980
Sodium Adsorption Ratio	-	0.817	14.567	16.037	3.337	1.267	12.345

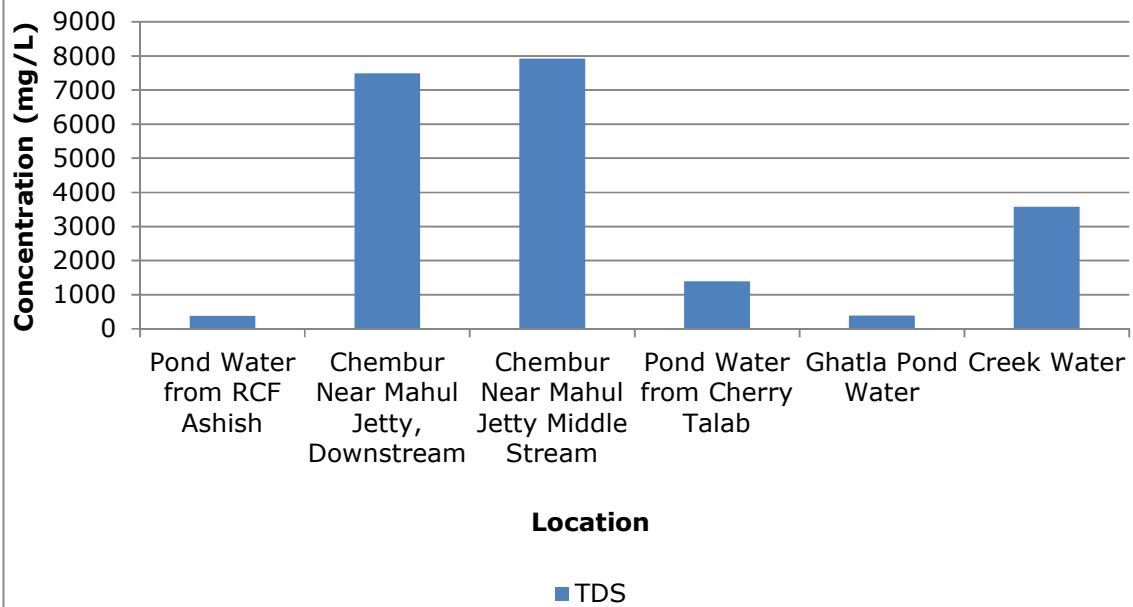
Parameters	Unit	Results					
		Pond water from RCF Ashish	Downstream near Mahul Jetty	Mahul jetty Middle stream	Pond water from Cherry Talab near Chembur police station	Ghatla pond water	Creek water near Ajmera Chembur
Total Coliforms	MPN Index/100 ml	767	1140	660	413	216	865
Faecal Coliforms	MPN Index/100 ml	137	67	467	193	98	467
Total Phosphate (as P)	mg/L	0.383	1.063	0.993	0.207	0.260	1.060
Total Kjeldahl Nitrogen (as N)	mg/L	1.400	7.080	10.287	1.120	5.787	8.027
Total Ammonia (NH ₄ +NH ₃)-Nitrogen	mg/L	0.700	1.690	0.520	0.497	2.030	1.767
Total Nitrogen	mg/L	1.820	8.113	12.950	2.397	6.800	10.037
Phenols (as C ₆ H ₅ OH)	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	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.093	0.054	BLQ	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	0.015	0.016	0.015	BLQ	BLQ	0.022
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	0.058	0.028	0.022	0.033	BLQ	0.044
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ	BLQ	0.005	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
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	0.018
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	0.224	0.333	0.273	0.172	BLQ	0.087
Iron (as Fe)	mg/L	0.595	0.231	0.286	0.105	0.084	0.441
Vanadium (as V)	mg/L	0.031	0.015	0.068	BLQ	0.033	0.027
Selenium (as Se)	mg/L	0.012	0.014	0.009	0.015	0.007	0.010
Boron (as B)	mg/L	BLQ	0.834	0.669	BLQ	BLQ	0.958
Bioassay Test on fish	% survival	100	67	100	67	100	100

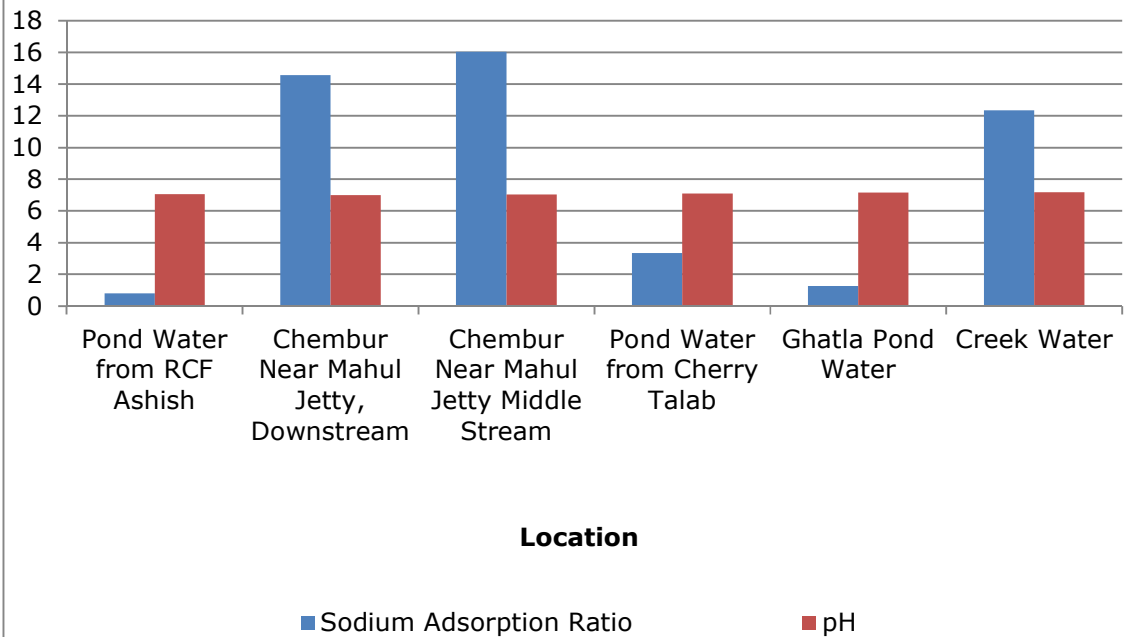
Graphs - Surface Water Quality of Chembur

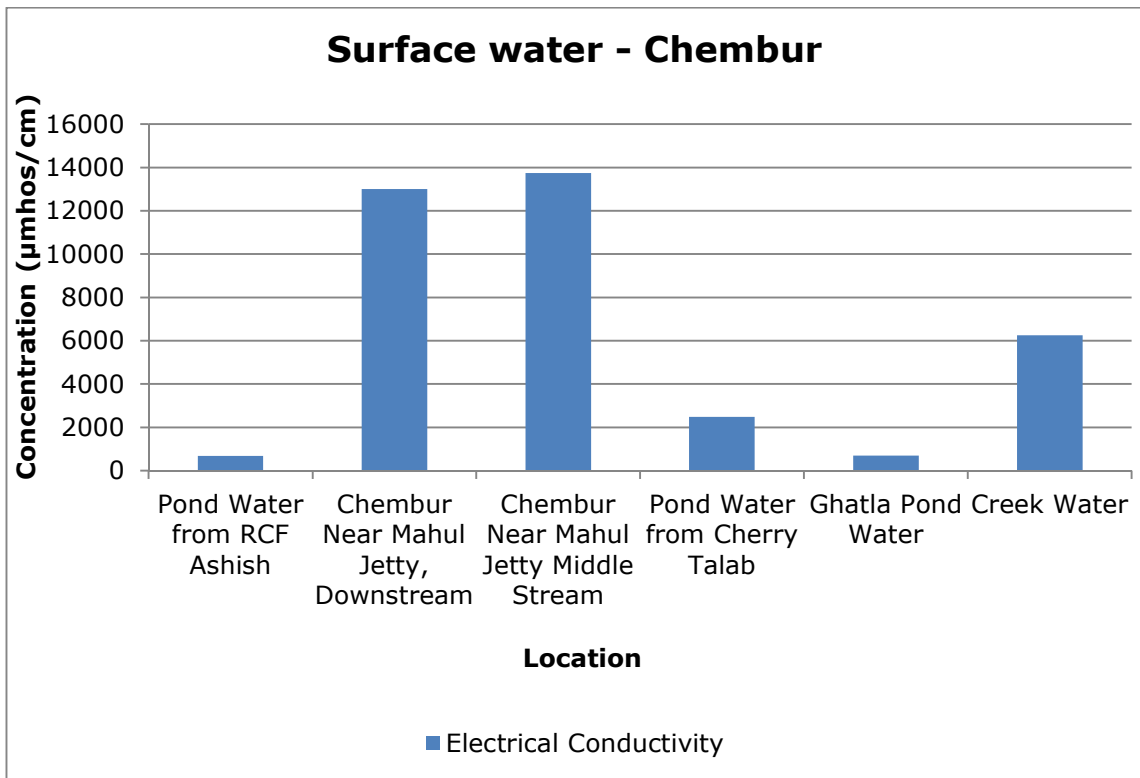
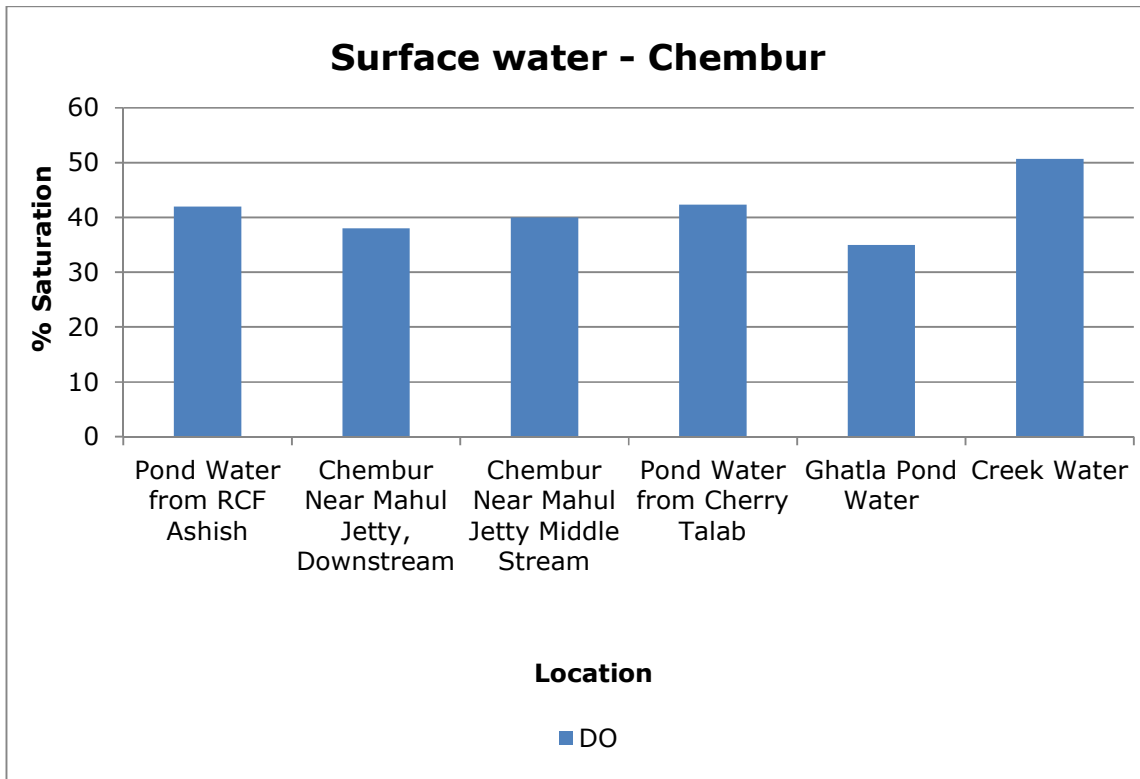


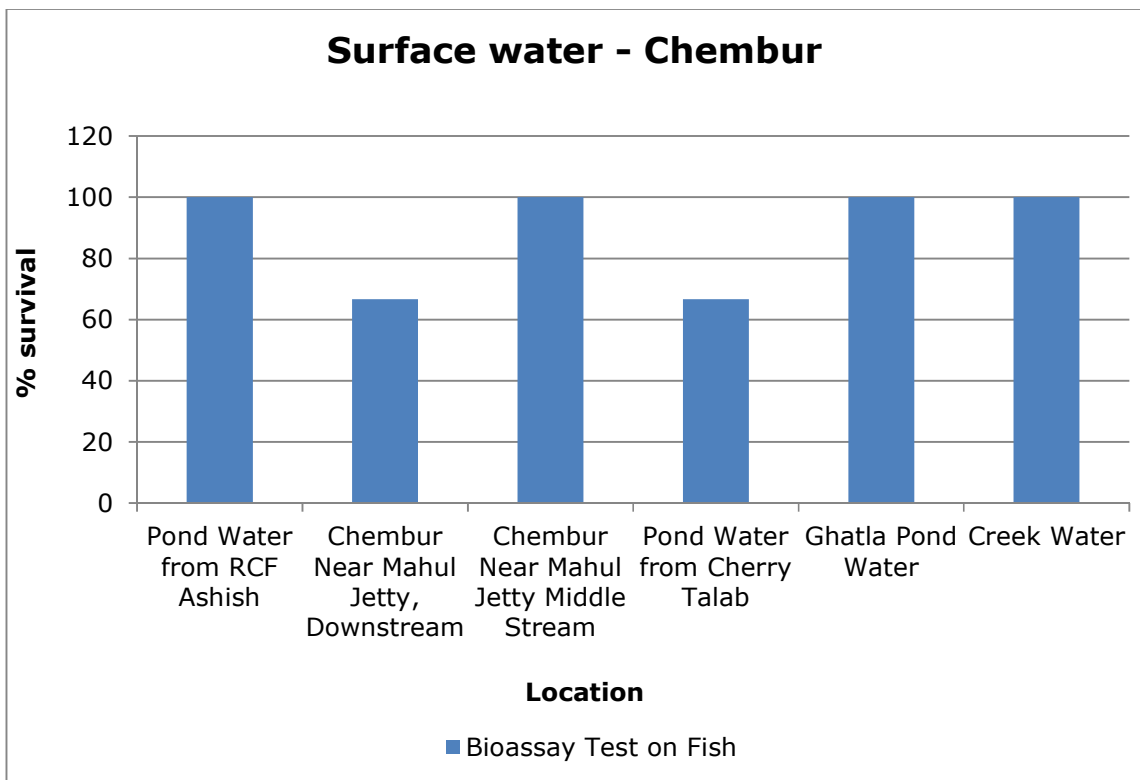
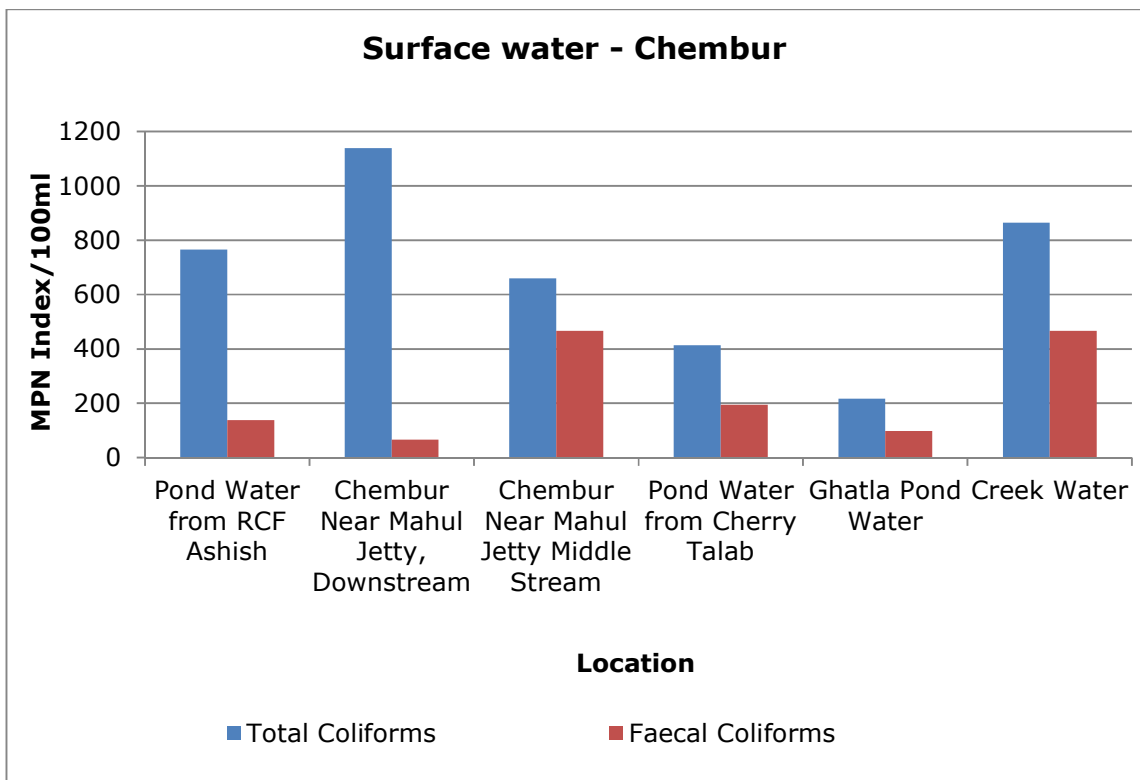
Surface water - Chembur



Surface water - Chembur







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 was also observed within the acceptable limits in all six water samples.
- 100% survival was achieved in Fish Bioassay in five water samples. Well water at Prayag nagar is observed with 93.33% fish Survival.
- All metals like Arsenic, Nickel, Copper, Iron, Hexavalent Chromium (Cr⁶⁺) 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	23.05.2023	25.05.2023	27.05.2023
2.	Well water at Prayag Nagar	19°1'11.10"N	72°54'31.93"E	23.05.2023	25.05.2023	27.05.2023
3.	Well water at Prayag Nagar Tabela	19°1'29.20"N	72°54'24.65"E	23.05.2023	25.05.2023	27.05.2023
4.	Well water at Laxmi Nagar	19°1'46.72"N	72°53'44.31"E	23.05.2023	25.05.2023	27.05.2023
5.	Well water at Ambapada	19°1'7.96"N	72°53'20.72"E	23.05.2023	25.05.2023	27.05.2023
6.	Well water Mahul Village	19°0'52.00"N	72°53'10.95"E	23.05.2023	25.05.2023	27.05.2023

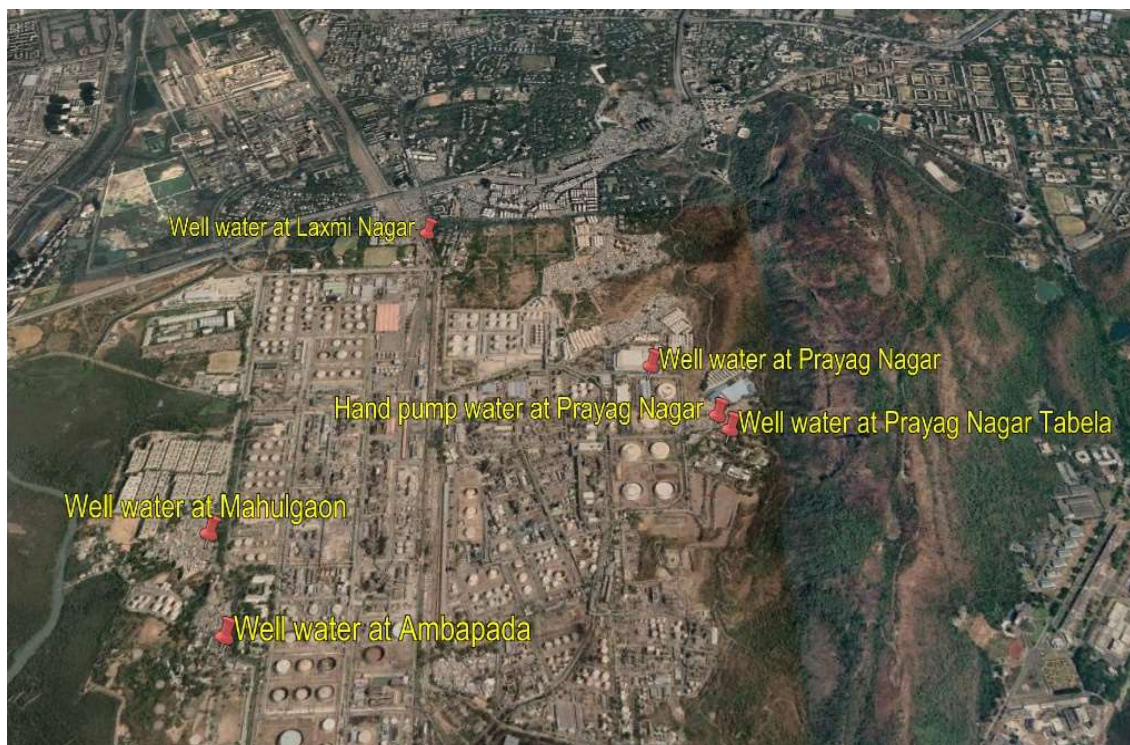


Fig: Geographical Locations of Ground Water Sampling

Table 7.2 Results of Ground Water

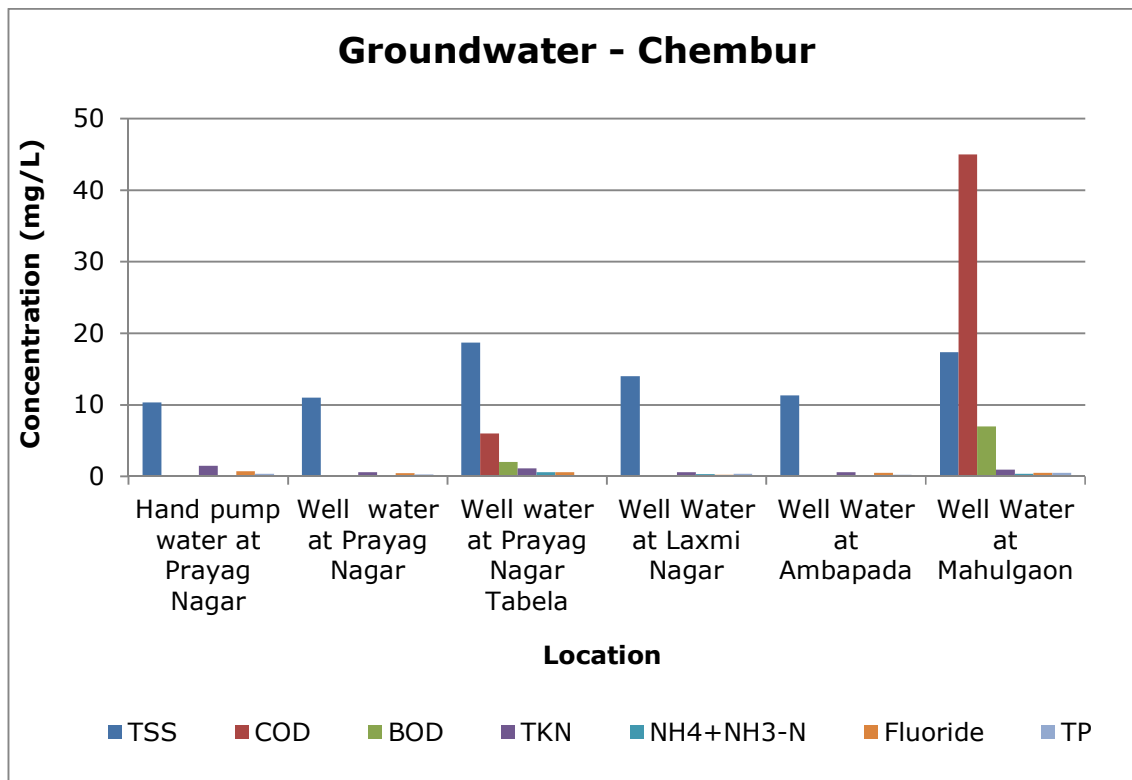
Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	Well water at Prayag Nagar	Well water at Prayag Nagar Tabela	Well water at Laxmi Nagar	Well water at Ambapada	Well water Mahul Village
Sanitary Survey		Very Clean neighborhood and Catchment	Very Clean neighborhood and Catchment	Very Clean neighborhood and Catchment	Reasonably clean neighborhood	Very Clean neighborhood and Catchment	Very Clean neighborhood and Catchment
General Appearance		No Floating matter	No Floating matter	No Floating matter	No Floating matter	No Floating matter	No Floating matter
Transparency	m	NA	NA	NA	NA	NA	NA
Temperature	°C	32	31	32	32	32	31
Colour	Hazen	1	1	1	1	1	17
Smell	-	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
pH	-	7.020	7.077	7.060	7.033	7.123	7.247
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	10	11	19	14	11	17

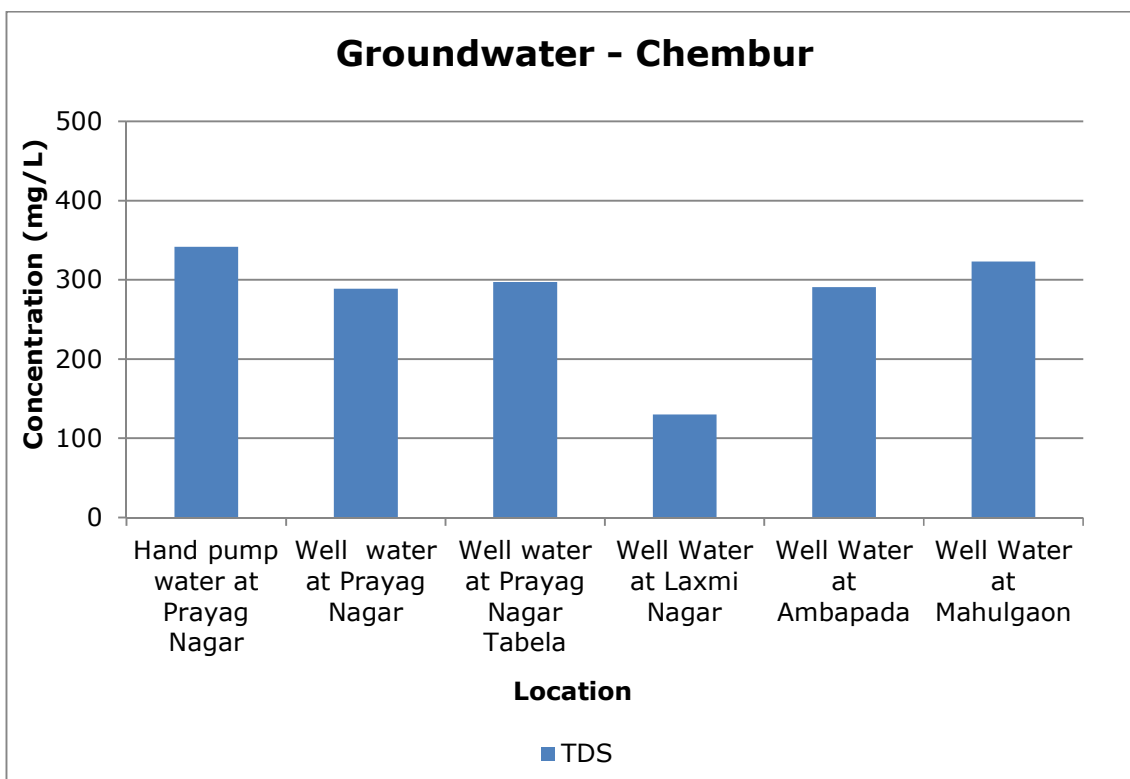
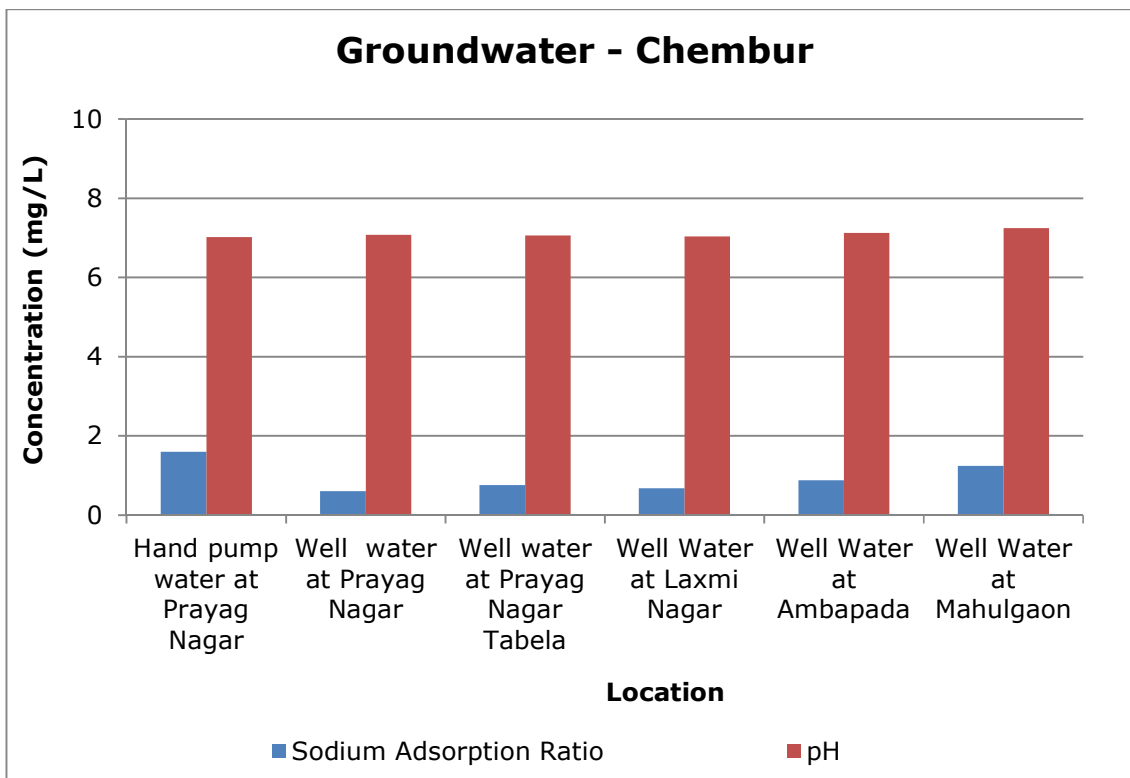
Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	Well water at Prayag Nagar	Well water at Prayag Nagar Tabela	Well water at Laxmi Nagar	Well water at Ambapada	Well water Mahul Village
Total Dissolved Solids	mg/L	342	289	297	130	291	323
Chemical Oxygen Demand	mg/L	BLQ	BLQ	6	BLQ	BLQ	45
Biochemical Oxygen Demand (3 days,27°C)	mg/L	BLQ	BLQ	2	BLQ	BLQ	7
Electrical Conductivity (at 25 °C)	µmho/cm	609	514	561	230	517	576
Nitrite Nitrogen (as NO ₂)	mg/L	0.060	0.185	0.030	0.050	0.065	0.090
Nitrate Nitrogen (as NO ₃)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
(NO ₂ + NO ₃)-Nitrogen	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Free Ammonia (as NH ₃ -N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.230	0.300	0.280	0.230	0.240	0.245
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.733	0.433	0.567	0.233	0.467	0.467
Sulphide (as H ₂ S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.220	0.203	0.145	0.330	0.180	0.220
Sodium Adsorption Ratio	-	1.603	0.607	0.753	0.683	0.880	1.240
Total Coliforms	MPN Index/100 ml	61	545	975	241	580	233
Faecal Coliforms	MPN Index/100 ml	7	654	910	197	105	48
Total Phosphate (as P)	mg/L	0.350	0.270	0.205	0.360	0.240	0.465
Total Kjeldahl Nitrogen (as N)	mg/L	1.493	0.560	1.120	0.560	0.560	0.933

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	0.140	0.200	0.570	0.295	0.195	0.340
Total Nitrogen	mg/L	1.763	0.647	1.030	0.613	0.637	1.180
Phenols (as C ₆ H ₅ OH)	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	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.728	0.120	0.713	0.054	BLQ	BLQ
Nickel (as Ni)	mg/L	0.041	0.017	0.015	0.027	0.102	0.013
Copper (as Cu)	mg/L	0.024	0.021	0.046	0.020	BLQ	BLQ
Hexavalent Chromium (as Cr ⁶⁺)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.080	0.027	0.033	0.050	0.034	0.026
Total Arsenic (as As)	mg/L	BLQ	0.007	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ	0.015	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	0.114	0.057	0.156	0.121	0.255	0.028
Iron (as Fe)	mg/L	0.434	1.414	0.353	0.451	0.181	0.222
Vanadium (as V)	mg/L	0.037	0.044	0.046	0.039	0.040	0.037
Selenium (as Se)	mg/L	0.013	0.009	0.009	BLQ	0.006	BLQ

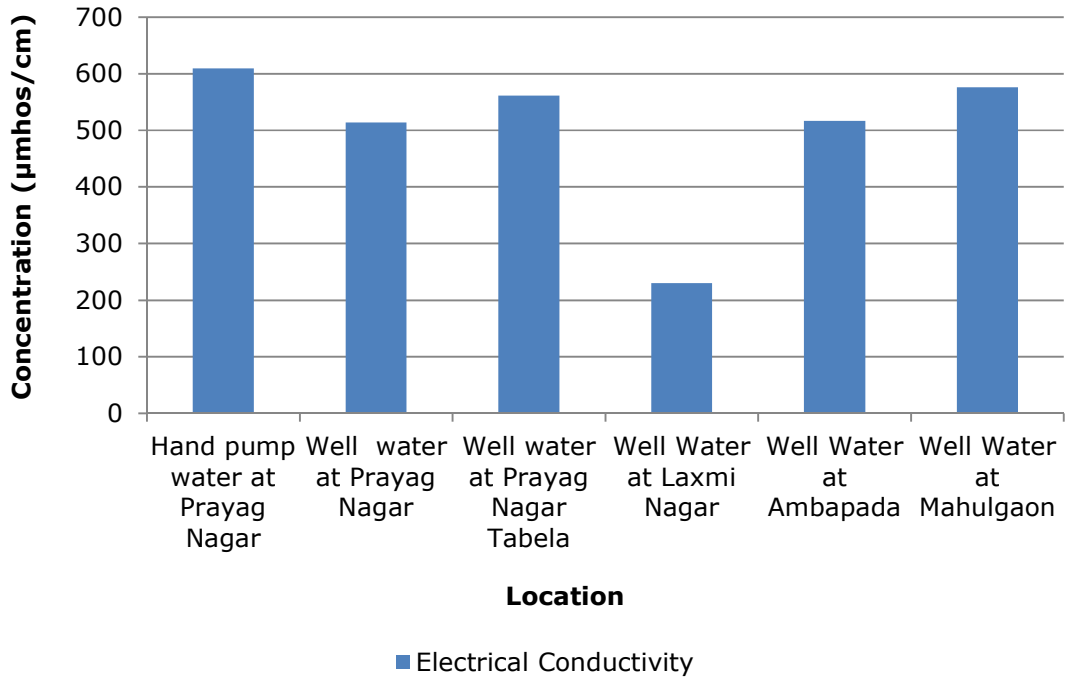
Parameters	Unit	Results					
		Hand pump water at Prayag Nagar	Well water at Prayag Nagar	Well water at Prayag Nagar Tabela	Well water at Laxmi Nagar	Well water at Ambapada	Well water Mahul Village
Boron (as B)	mg/L	BLQ	BLQ	0.283	BLQ	0.182	0.102
Bioassay Test on fish	% survival	100	93	100	100	100	100

Graphs - Ground water quality of Chembur

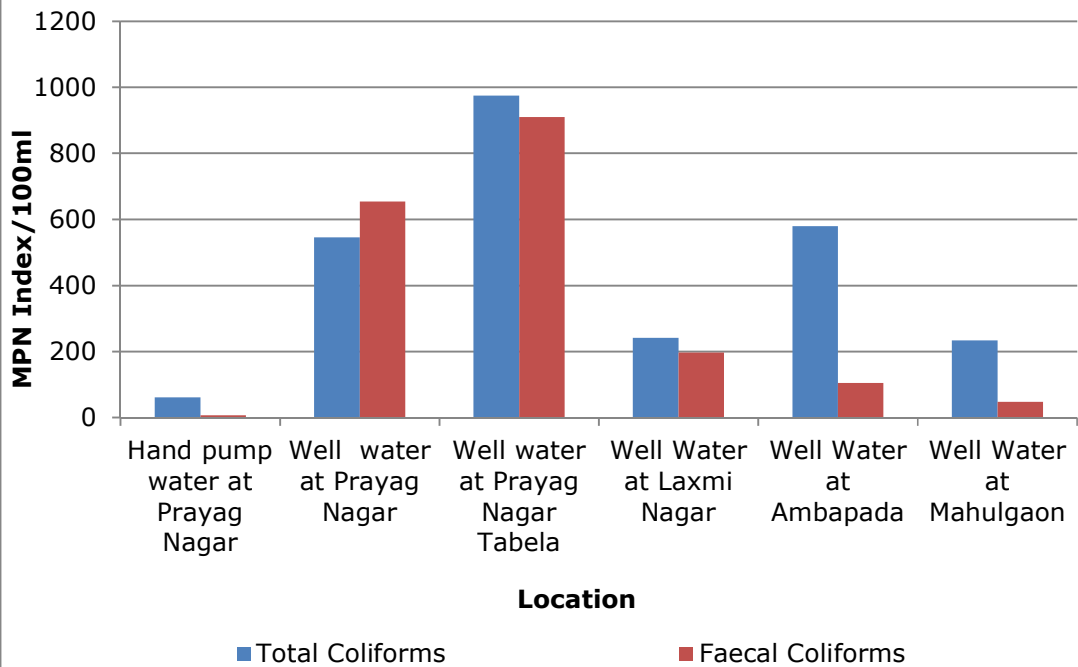




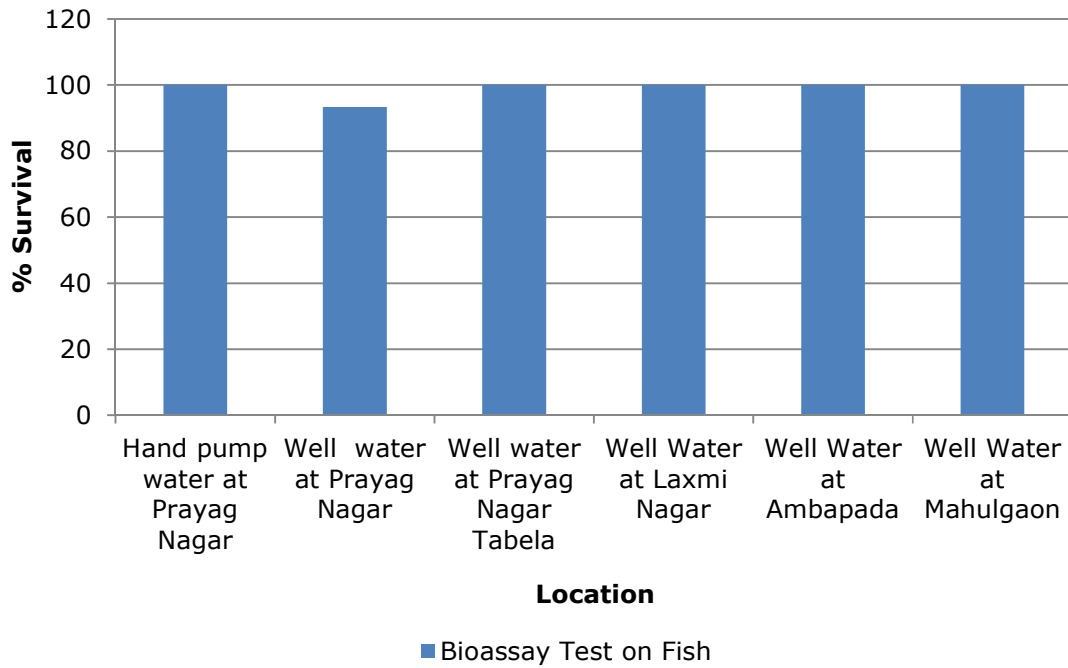
Groundwater - Chembur



Groundwater - Chembur



Groundwater - Chembur



8. Health Related Data

C: Receptor

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

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

Annexure – I Health Related Data enclosed

9. CEPI Score

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

Table 8.1 CEPI score of the Pre - Monsoon season 2023

	A1	A2	A	B	C	D	CEPI
Air Index	2.75	4	11	0.5	10	0	21.5
Water Index	1.5	4	6	24	10	0	40.0
Land Index	2.5	4	10	6	10	0	26.0
Aggregated CEPI							43.4

Water Environment Pollution Index (EPI) is highest with 40.0 followed by Land Environment Pollution Index (EPI) with 26.0 EPI. The reason for the increase in Water EPI is due to the exceedance of Total Dissolved Solids in three surface water samples collected. Total dissolved solids are usually comprised of inorganic salts and a small portion of organic matter.

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI Score June 2023	21.50	40.00	26.00	43.4
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
CEPI score March 2019	35.50	24.75	42.50	42.28
CEPI score June 2018	36	39.88	30.25	44.1

	Air Index	Water Index	Land Index	CEPI
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 43.4. This time CEPI score is observed lower than the CPCB CEPI score March 2018 which was 54.67.

CEPI Score Calculations:

Ambient Air Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
PM ₁₀	B	2	Large	
PM _{2.5}	B	0.5		
NO ₂	A	0.25		
		2.75	4	11

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF Value (6) [(6)=(4)/(5) x(3)]	SNLF score (B)	
PM ₁₀	74.71	100	0.75	0	8	0.00	L	0.5
PM _{2.5}	20.00	60	0.33	0	8	0.00	L	0
NO ₂	23.60	80	0.30	0	8	0.00	L	0
B score = (B1+B2+B3)							B	0.5

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

Air CEPI	(A+B+C+D)	21.5
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Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
TDS	A	1	Large	
(NO ₂ + NO ₃)-N	A	0.25		
Zn	A	0.25		
		1.5	4	6

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/ (2)]	No. of samples Exceedin g (4)	Total no. of sample s (5)	SNLF Value (6) [(6)=(4)/(5)x (3)]	SNLF score (B)	
TDS	3527	2000	1.76	3	6	0.88	H	21
(NO ₂ + NO ₃)-N	1.77	15	0.12	0	6	0.00	L	0
Zn	0.74	0.3	2.45	2	6	0.82	M	3
B score = (B1+B2+B3)							B	24

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

Water CEPI	(A+B+C+D)	40.0
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Ground Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
Se	B	2	Large	
TDS	A	0.25		
Fluoride	A	0.25		
		2.5	4	10.0

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)	
Se	0.01	0.01	0.90	0	6	0.00	L	6
TDS	278.67	2000	0.14	0	6	0.00	L	0
Fluoride	0.48	1.5	0.32	0	6	0.00	L	0
B score = (B1+B2+B3)							B	6

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

Land CEPI	(A+B+C+D)	26.0
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Water CEPI Score (im) 40.00

Land CEPI Score (i2) 26.00

Air CEPI Score (i3) 21.50

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 43.4

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, PM₁₀ and PM_{2.5} have exceeded which may also be due to the vehicular emissions.

Surface Water Quality

- Higher concentration of Total Dissolved Solids was observed in the surface water samples collected. Total dissolved solids are usually comprised of inorganic salts and a small portion of organic matter. The types of inorganic salts that dissolve in the water include sulfates, potassium, calcium, magnesium, chlorides, and bicarbonates. which may be due to increase in microbial activity, poor agricultural practices, leaking septic systems or discharges from sewage treatment plants.
- 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.
- All parameters were observed well within the limits.

CEPI Score

- The CEPI Score Pre - Monsoon season is 43.4.
- 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 21% decrease in CEPI score is observed from 54.67 of the CPCB score of March 2018 to 43.4 in June 2023.

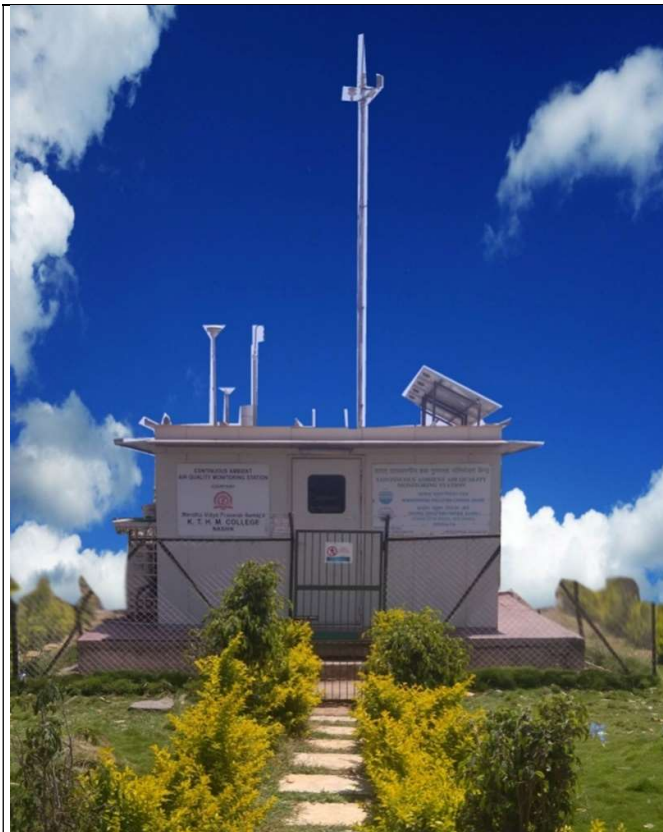
11. Efforts Taken by MPCB to Control and Reduce Environmental Pollution Index

- 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 sel 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 Quality Monitoring at BPCL Sports Club



Volatile Organic Compounds (VOCs) sampling in Ambient Air at BPCL



Ambient Air Quality Monitoring at Ambapada gaon



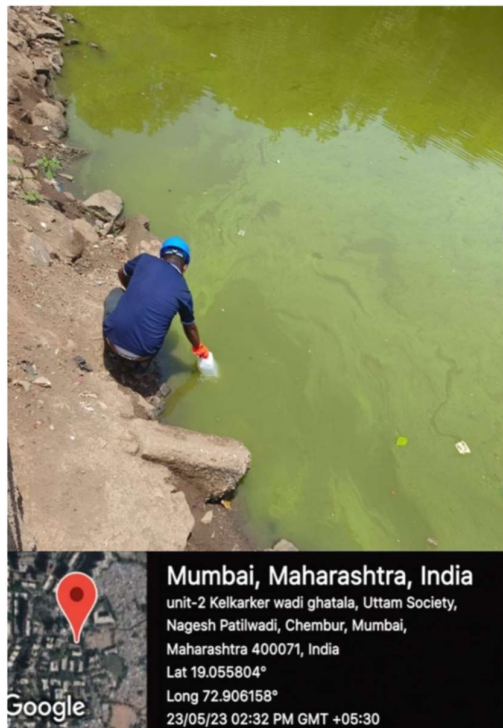
Volatile Organic Compounds (VOCs) sampling in Ambient Air at RCF Main gate



Surface water sampling at Creek water at Ajmera



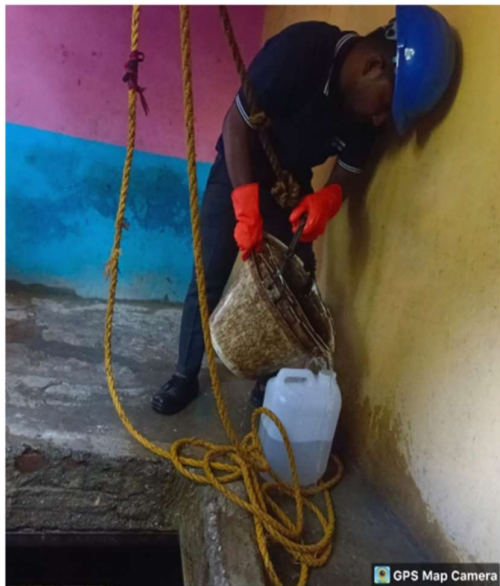
Surface water sampling at Pond Water Cherry Talav



Surface water sampling at Pond water Ghatla



Surface water sampling at Mahul Jetty



GPS Map Camera
Mumbai, Maharashtra, India
2W95+PF4, Prayag Nagar, Mahul, Trombay, Mumbai,
Maharashtra 400071, India
Lat 19.018738°
Long 72.909389°
23/05/23 02:28 PM GMT +05:30
Google

Groundwater sampling at Prayag nagar



GPS Map Camera
Mumbai, Maharashtra, India
2V5R+WGX, Ambapada, Mahul, Trombay, Mumbai,
Maharashtra 400074, India
Lat 19.010342°
Long 72.891301°
23/05/23 01:59 PM GMT +05:30
Google

Groundwater sampling at Ambapada



GPS Map Camera
Mumbai, Maharashtra, India
400074, Mahul Village, Ambapada, Mahul, Trombay,
Mumbai, Maharashtra 400074, India
Lat 19.014372°
Long 72.889983°
23/05/23 02:48 PM GMT +05:30
Google

Groundwater sampling at Mahul Village



GPS Map Camera
Mumbai, Maharashtra, India
Opp Koyana Colony, Near Bus Stop, Behind Shivsena Office, Shankar
Devel, MG Road, Vasi Naka, Chembur, Koyana Colony, S V Patel Nagar,
Chembur, Mumbai, Maharashtra 400074, India
Lat 19.029329°
Long 72.896494°
23/05/23 12:30 PM GMT +05:30
Google

Groundwater sampling at Laxmi nagar

Annexure – I Health Related Data

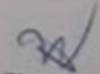
HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Study by
Maharashtra Pollution Control Board (MPCB)

Name of the Polluted Industrial Area (PIA)	MUMBAI
Name of the major health center/ organization	Surana Sethia Hospital
Name and designation of the Contact person	
Address	Chembur

S No.	Diseases	No. of Patients Reported	
		2022 (Jan-Dec)	2021 (Jan-Dec)
AIRBORNE DISEASES			
1.	Asthma	85	09
2.	Acute Respiratory Infection	39	16
3.	Bronchitis	16	09
4.	Cancer	NA	NA
WATERBORNE DISEASES			
1.	Gastroenteritis	69	NA
2.	Diarrhea	04	NA
3.	Renal diseases	04	08
4.	Cancer	NA	NA

Date:


 Signature



HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Study by
Maharashtra Pollution Control Board (MPCB)

Name of the Polluted Industrial Area (PIA)	MUMBAI
Name of the major health center/ organization	Sai Hospital
Name and designation of the Contact person	25264201
Address	SGB Vikas Shree Chembur Gramesh Co-OP Hsg. SGB HD Sion Trombay Road Chembur - 400074.

S No.	Diseases	No. of Patients Reported	
		2022 (Jan-Dec)	2021 (Jan-Dec)
AIRBORNE DISEASES			
1.	Asthma	56	52
2.	Acute Respiratory Infection	50	250
3.	Bronchitis	15	12
4.	Cancer	135	12
WATERBORNE DISEASES			
5.	Gastroenteritis	48	25
6.	Diarrhea	28	18
7.	Renal diseases	55	28
8.	Cancer	12	8

Date:

