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

DOMBIVALI

Pre-Monsoon (April 2024 to June 2024)

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Index

ABBREVIATIONS

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

1. Executive Summary

The Dombivali CEPI area includes MIDC Phase I and MIDC Phase II and was monitored for Ambient Air Quality, Ground and Surface Waters quality and CEPI Score was calculated based on the Latest directions 120 of Letter No. B-29012/ESS (CPA)/2015-16 dated 26th April 2016 of Central Pollution Control Board (CPCB). Maharashtra Pollution Control Board (MPCB) has carried out monitoring at CPCB location with the additional location of samplings for ambient air, surface and 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 2024 to June 2024 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. The concentration of PM_{10} and $PM_{2.5}$ are found within the limit prescribed by NAAQS, 2009. The concentration of total Kjeldahl Nitrogen and BOD is observed higher than its acceptable limit in few of the surface water samples. In Groundwater, the concentration of all the parameters is observed within the acceptable limits.

Based on the study report conducted by CPCB during the period March 2018, the CEPI score of Dombivali region as per the revised guidelines is 69.67 (Ambient Air–62, Water-63.50, Land–27.25). In the CEPI score of CPCB, the concentration of PM_{10} and $PM_{2.5}$ were the main contributors in the score. However, in the present study the concentration of PM_{10} and $PM_{2.5}$ is observed lower than the standard limit of NAAQS, 2009. In the present study, iron concentration in all the ground water samples is found to exceed the permissible limit.

Maharashtra Pollution Control Board has taken various initiatives in reducing the CPCB CEPI Score of 69.67 in 2018 to 57.6 in June 2024. This shows a decrease by almost 30% in the CEPI score in the present investigation. Based on the study as per the revised CEPI 2016, the CEPI index of Pre-monsoon - Ambient Air is 29.0, Surface Water is 46.5, and Groundwater is 51.0. The overall CEPI score for Dombivali area for the Pre-monsoon 2024 is 57.6.

2. Introduction

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

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

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

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

Simultaneously, the Comprehensive Environmental Pollution Index (CEPI) has emerged as a beacon of assessment and action in India's environmental landscape. Introduced as a standardized methodology for evaluating and addressing pollution in industrial clusters across the nation, the CEPI represents a significant step towards achieving the delicate balance between economic growth and environmental sustainability. Developed through collaborative efforts between environmental

scientists, regulatory authorities, and community stakeholders, the CEPI serves as a vital instrument for identifying, prioritizing, and mitigating pollution in industrial areas. By systematically monitoring, sampling, and analyzing pollution parameters such as ambient air quality, surface water quality, and groundwater quality, the CEPI empowers policymakers and regulators to make informed decisions and allocate resources effectively.

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

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

In the following sections, we delve into the methodology, findings, and implications of both the CEPI assessment and the Monitoring, Sampling, and Analysis for Ambient Air Quality, Surface Water Quality, and Groundwater Quality in Polluted Industrial Areas of Chembur in Mumbai, Maharashtra. The present CEPI study includes MIDC Phase I and Phase II of Dombivali. The MIDC established the Dombivali Industrial Area in 1964. In this area, industrial plots and sheds have been developed as Phase-I and II and residential and commercial plots/ area in between & surrounding Phase-I & Phase-II. Dombivali district is known for its rapid industrial growth having major industries such as Textile, chemical & Engineering in both phases.

The present report is also based on the revised CEPI version 2016. 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. The CEPI reports serve as a roadmap for targeted interventions, regulatory enforcement, and community engagement aimed at mitigating pollution and safeguarding public health in the area. Despite the persistent challenges, ongoing initiatives guided by the CEPI action plan reports offer hope for addressing environmental concerns and fostering sustainable development in Dombivali.

Fig. Dombivali Region CEPI Monitoring Zone

3. Scope of Work

The major scope of work includes:

I. The scope of the present study is to perform three (3) rounds of "Monitoring, Sampling and Analysis for Ambient Air Quality, VOCs in Ambient Air, Surface Water Quality & Groundwater Quality in selected Pollution Industrial Areas (PIAs) of Dombivali, 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 Groundwater are given in Table 3.1 and Table 3.2 respectively.

Table 3.1 Sampling Details of Dombivali

Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
Ambient Air Quality	• Phase I-04 • Phase I-04	**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)	• Phase I-02 • Phase I-02	**04**	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-Dichloroethylene, Bromochloromethane, 1,1,1-Trichloroethane

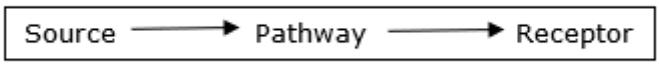
Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
Water Quality Monitoring	**Surface water** • Phase I-06 • Phase I-06	**12**	**(i) Simple Parameters** Sanitary Survey, General Appearance, Colour, Smell, Transparency and Ecological **(ii) Regular Monitoring Parameters** pH, O & G, Suspended Solids, DO, COD, BOD, TDS, Electrical Conductivity, Total Dissolved Solids, Nitrite–Nitrogen, Nitrate-Nitrogen, (NO_2+NO_3) total nitrogen, Free Ammonia, Total Residual Chlorine, Cyanide, Fluoride, Chloride, Sulphate, Sulphides, Total Hardness, Dissolved Phosphates, SAR, Total Coliforms, Faecal Coliform **(iii) Special Parameters** Total Phosphorous, TKN, Total Ammonia (NH_4+NH_3)-Nitrogen, Phenols, Surface Active Agents, Anionic detergents, Organo-Chlorine Pesticides, PAH, PCB and PCT, Zinc, Nickel, Copper, Hexa-valent Chromium, Chromium (Total), Arsenic (Total), Lead, Cadmium, Mercury, Manganese, Iron, Vanadium, Selenium, Boron **(iv) Bio-assay (zebra Fish)** Test – For specified samples only.
	Groundwater • Phase I-03 • Phase I-03	**06**	

Table 3.2 Frequency of Sampling

	Parameter	Round of Sampling	Frequency in Each Round
A	**Ambient Air Quality Monitoring**		
1.	Particulate Matter (size less than 10 µm) or PM_{10}	03	3 Shifts of 8 hrs each
2.	Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	03	1 Shift of 24 hrs
3.	Sulphur Dioxide (SO_2)	03	6 Shifts of 4 hrs each
4.	Nitrogen Dioxide (NO_2)	03	6 Shifts of 4 hrs each
5.	Ammonia (NH_3)	03	6 Shifts of 4 hrs each
6.	Ozone (O_3)	03	24 Shifts of 1 hr each
7.	Benzene (C_6H_6)	03	1 Shifts of 24 hrs
8.	Carbon Monoxide (CO)	03	24 Shifts of 1 hr each
9.	Benzo (a) Pyrene (BaP) – particulate phase only	03	3 Shifts of 8 hrs each
10.	Lead (Pb)	03	3 Shifts of 8 hrs each
11.	Arsenic (As)	03	3 Shifts of 8 hrs each
12.	Nickel (Ni)	03	3 Shifts of 8 hrs each
B	**Volatile Organic Compounds (VOCs)**		
	As mentioned in Table 3.1	03	3 Shifts of 24 hrs each
C	**Groundwater**		
	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 potential polluted areas so as to arrive at the CEPI. This will further help the authorities to monitor the areas in order to improve the current status of their environmental components such as air and water quality data, ecological damage and visual environmental conditions.

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

AIR ENVIRONMENT

5. Air Environment

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

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

1. **MIDC Phase I:** In MIDC Phase I of Dombivali four locations have been monitored for Ambient Air Quality (AAQ). The AAQ monitoring was carried out by taking samples in triplicate on 26thJune to 30th June 2024. All twelve parameters are observed well within the limits at all 4 locations monitored.

Table 5.1 Phase I - 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 Gharda Chemicals	19°13'10.45"N	73°6'50.33"E	26.06.2024	28.06.2024	30.06.2024
2.	Near main gate DEBESA CETP	19°13'0.45"N	73°6'18.07"E	26.06.2024	28.06.2024	30.06.2024
3.	Near main gate Balkrishna Industries Ltd.	19°12'36.40"N	73°6'41.92"E	26.06.2024	28.06.2024	30.06.2024
4.	Near main gate Sagar Ice & Cold Storage Pvt. Ltd.	19°12'55.54"N	73°6'26.29"E	26.06.2024	28.06.2024	30.06.2024

Table 5.2 Phase I - 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.	Near main gate Gharda Chemicals	19°13'10.45"N	73°6'50.33"E	26.06.2024	28.06.2024	30.06.2024
2.	Near main gate DEBESA CETP	19°13'0.45"N	73°6'18.07"E	26.06.2024	28.06.2024	30.06.2024

Fig. Geographical Locations of Ambient Air Quality Monitoring MIDC Dombivali Phase I

Fig. Geographical Locations of VOCs Monitoring MIDC Dombivali Phase I

Table 5.3 Phase I - Results of Ambient Air Quality Monitoring

Parameters	Unit	Results			
		Gharda Chemicals	DEBESA CETP	Balkrishna Industries Ltd.	Sagar Ice & Cold Storage Pvt. Ltd.
Sulphur Dioxide (SO_2)	µg/m³	20.24	12.7	23.1	10.4
Nitrogen Dioxide (NO_2)	µg/m³	BLQ	30.7	9.67	46.1
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	61	56	62	71
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	16	15	17	19
Ozone (O_3)	µg/m³	32.35	34.55	32.10	39.27
Lead (Pb)	µg/m³	0.28	0.20	0.43	0.44
Carbon Monoxide (CO) (1 h)	mg/m³	0.95	0.96	0.95	1.09
Carbon Monoxide (CO) (8 h)	mg/m³	1.30	1.30	1.34	1.36
Ammonia (NH_3)	µg/m³	66.65	40.93	44.30	61.20
Benzene (C_6H_6)	µg/m³	1.68	2.15	2.16	2.42
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	0.67	0.81	1.41	1.22
Nickel (Ni)	ng/m³	3.52	3.53	BLQ	BLQ

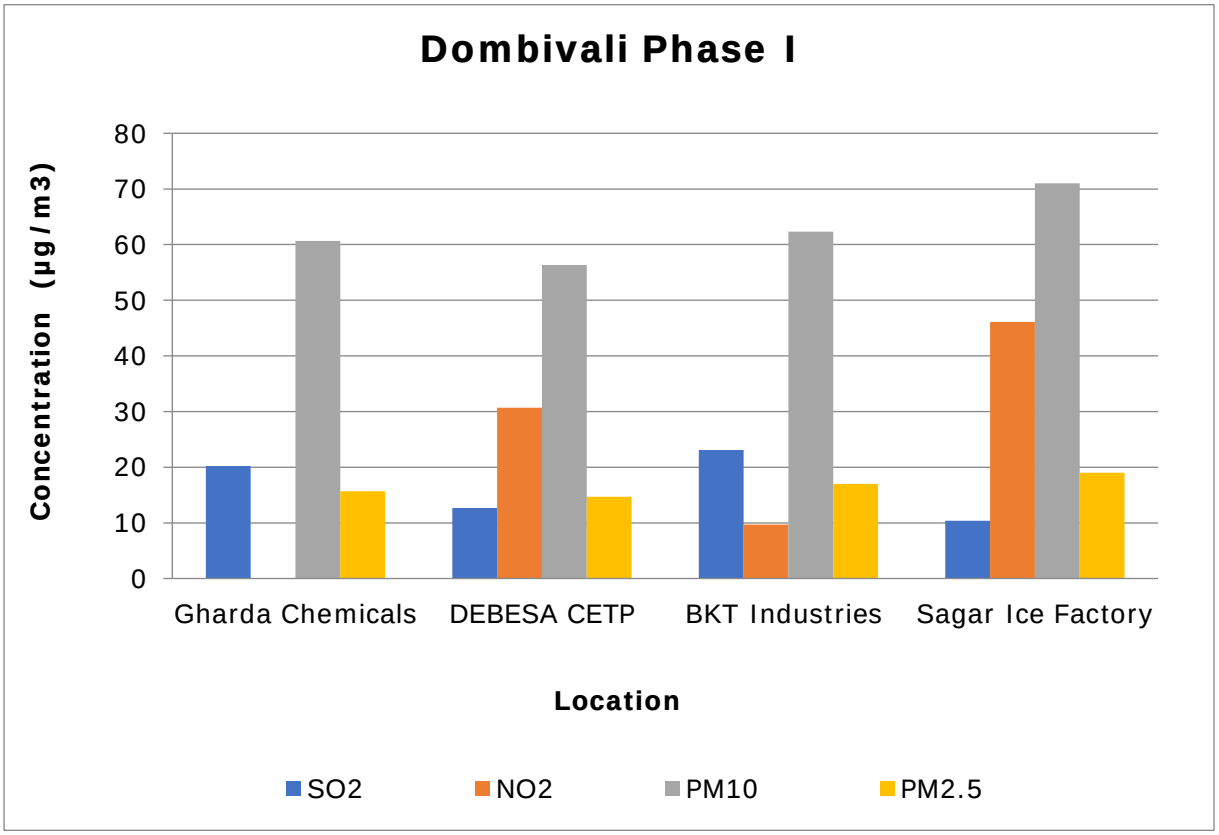
Table 5.4 Phase I - Volatile Organic Compounds (VOCs) in Ambient Air Results

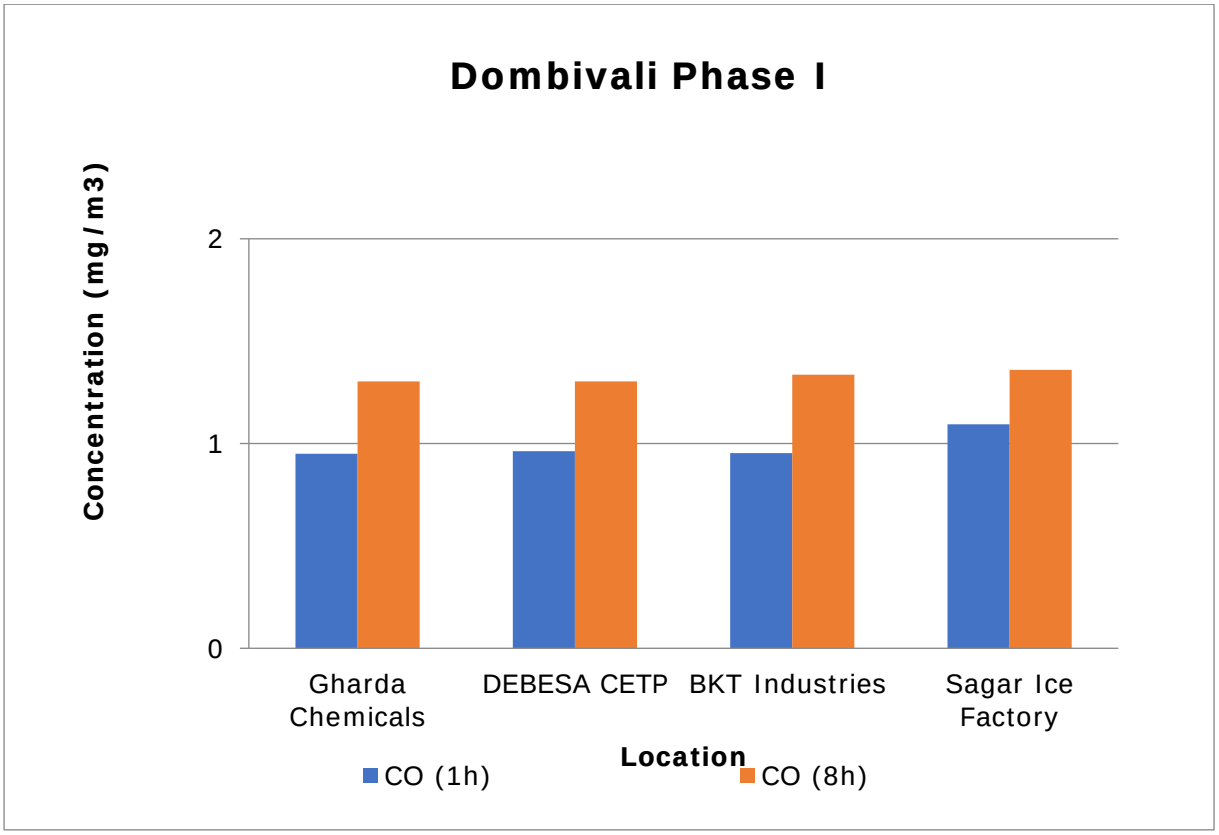
Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
Dichloromethane	µg/m³	1.42	0.77
Chloroform	µg/m³	0.59	0.54
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dichlorobenzene	µg/m³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Napthalene	µg/m³	BLQ	BLQ
Bromobenzene	µg/m³	BLQ	BLQ

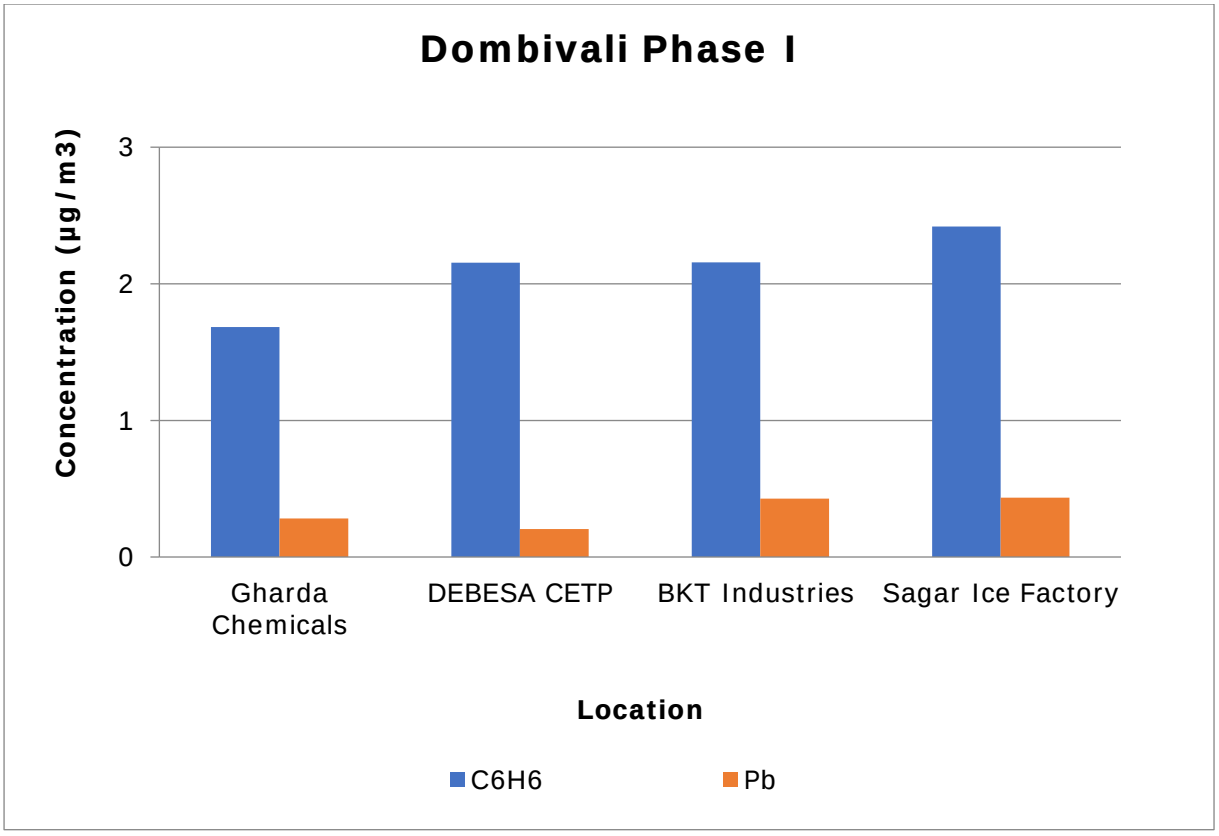
Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	0.67	0.74
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	BLQ	BLQ
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	BLQ	BLQ
1,2-Dichloropropane	µg/m³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	µg/m³	BLQ	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	BLQ	BLQ
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	BLQ	BLQ
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	2.78	3.69
O-Xylene	µg/m³	BLQ	BLQ

Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

Graphs - Ambient Air Quality of MIDC Dombivali Phase I






Dombivali Phase I
Concentration (µg/m3)
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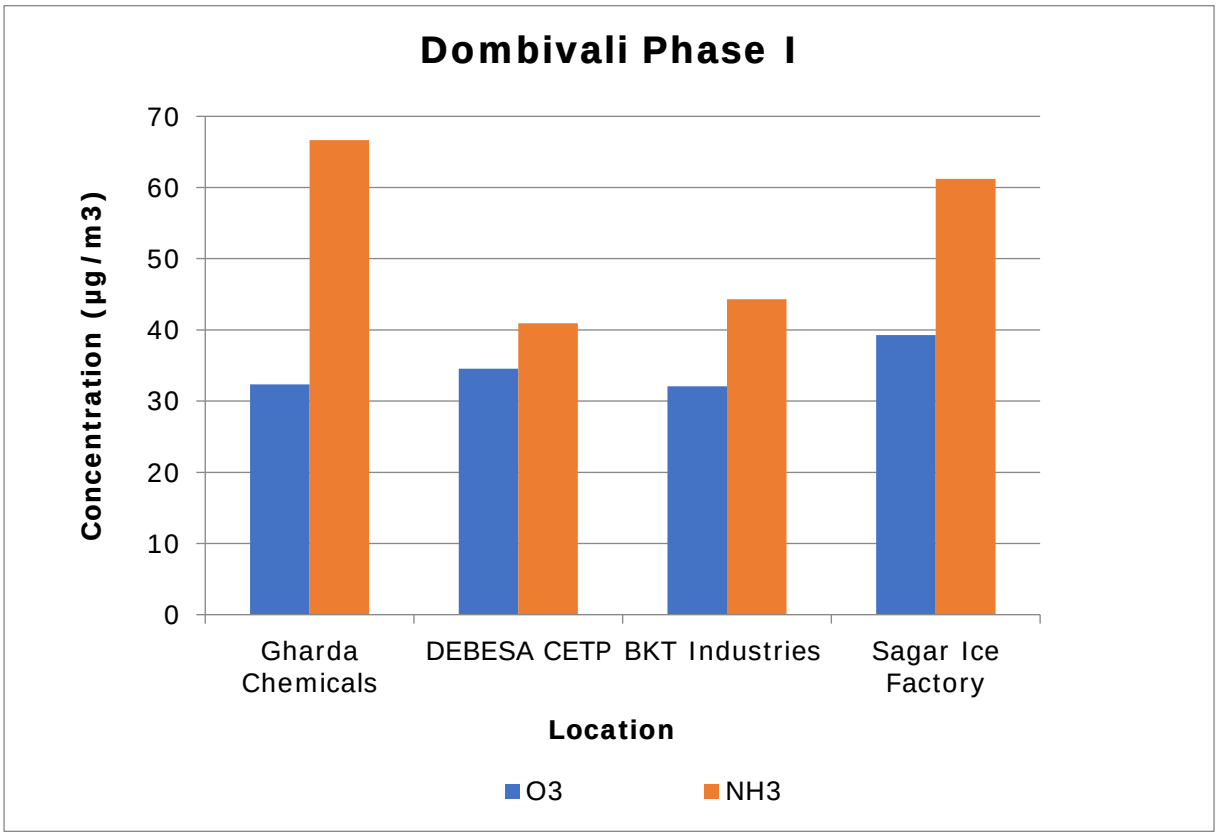
1
0
Gharda Chemicals
DEBESA CETP
BKT Industries
Sagar Ice Factory
Location
C6H6
Pb


Dombivali Phase I
Concentration (µg/m3)
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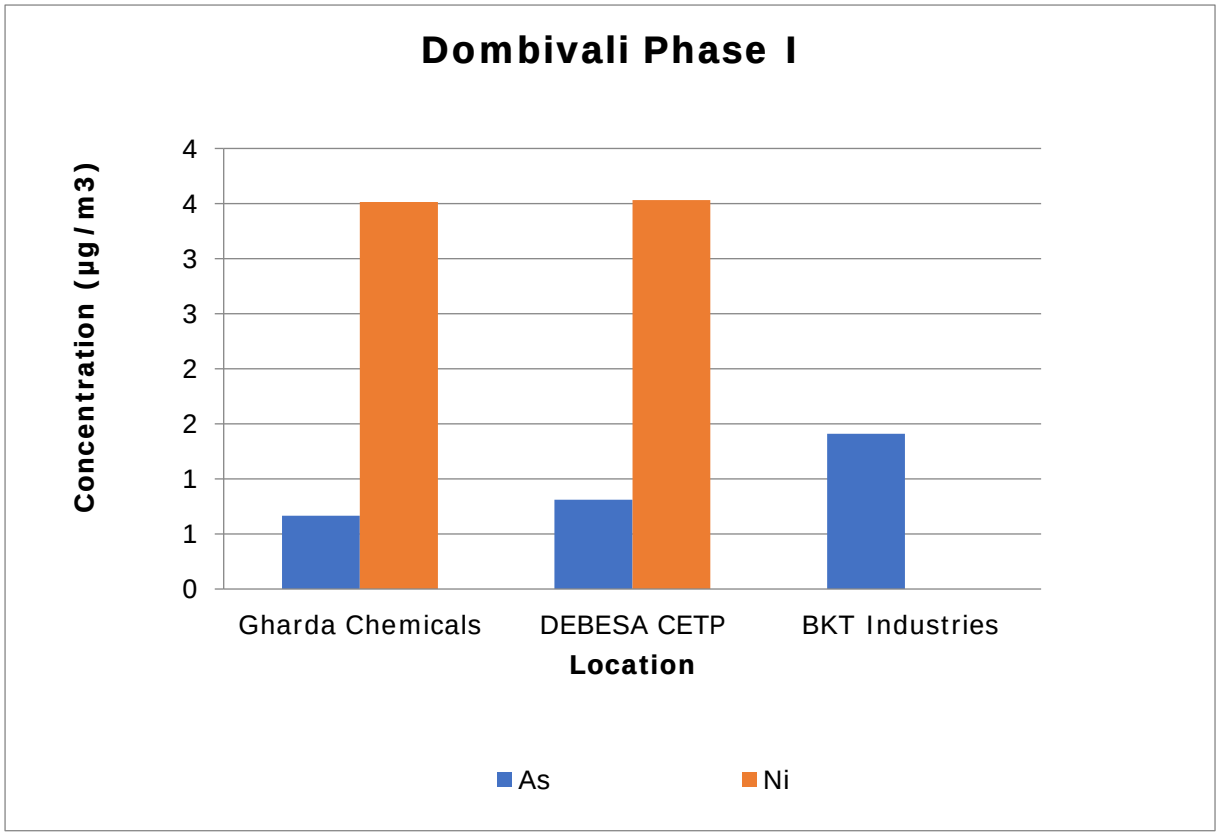
60
50
40
30
20
10
0
Gharda Chemicals
DEBESA CETP
BKT Industries
Sagar Ice Factory
Location
O3
NH3


Dombivali Phase I
Concentration (µg/m3)
4
4
3
3
2
2
1
1
0
Gharda Chemicals
DEBESA CETP
BKT Industries
Location
As
Ni

2. **MIDC Phase II:** In MIDC Phase II of Dombivali also all 4 locations monitored. Samples were taken in triplicate from 26th June to 30th June 2024. Concentration of all the parameters were found within the limits mentioned under NAAQS, 2009.

Table 5.5 Phase II - 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 Dombivali Common Effluent Treatment Plant	19°12'17.37"N	73° 5'58.34"E	26.06.2024	28.06.2024	30.06.2024
2.	Behind Connectwell Industries Pvt. Ltd.	19°11'37.12"N	73° 5'39.80"E	26.06.2024	28.06.2024	30.06.2024
3.	Near main gate Metropolitan Eximchem Ltd.	19°12'7.89"N	73° 5'56.18"E	26.06.2024	28.06.2024	30.06.2024
4.	Near main gate Apartim Equipment	19°12'22.33"N	73° 6'1.31"E	26.06.2024	28.06.2024	30.06.2024

Table 5.6 Phase II - 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.	Near main gate Dombivali Common Effluent Treatment Plant	19°12'17.37"N	73° 5'58.34"E	26.06.2024	28.06.2024	30.06.2024
2.	Behind Connectwell Industries Pvt. Ltd.	19°11'37.12"N	73° 5'39.80"E	26.06.2024	28.06.2024	30.06.2024

Fig. Geographical Locations of Ambient Air Quality Monitoring MIDC Dombivali Phase II

Fig. Geographical Locations of VOCs Monitoring MIDC Dombivali Phase II

Table 5.7 Phase II - Results of Ambient Air Quality Monitoring

Parameters	Unit	Results			
		Dombivali CETP	Connectwell Industries Pvt. Ltd.	Metropolitan Eximchem Ltd.	Apartim Equipment
Sulphur Dioxide (SO_2)	µg/m³	15.14	6.77	15.94	11.1
Nitrogen Dioxide (NO_2)	µg/m³	BLQ	29.9	BLQ	17.3
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	69	64	62	74
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	16	16	17	18
Ozone (O_3)	µg/m³	65.30	41.65	42.80	52.75
Lead (Pb)	µg/m³	1.25	0.25	0.32	1.20
Carbon Monoxide (CO) (1 h)	mg/m³	0.91	0.93	0.96	0.97
Carbon Monoxide (CO) (8 h)	mg/m³	1.37	1.43	1.56	1.49
Ammonia (NH_3)	µg/m³	45.60	43.95	44.83	64.20
Benzene (C_6H_6)	µg/m³	2.08	1.77	2.29	2.12
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	2.30	3.50	3.58	3.38
Nickel (Ni)	ng/m³	BLQ	4.30	4.00	4.60

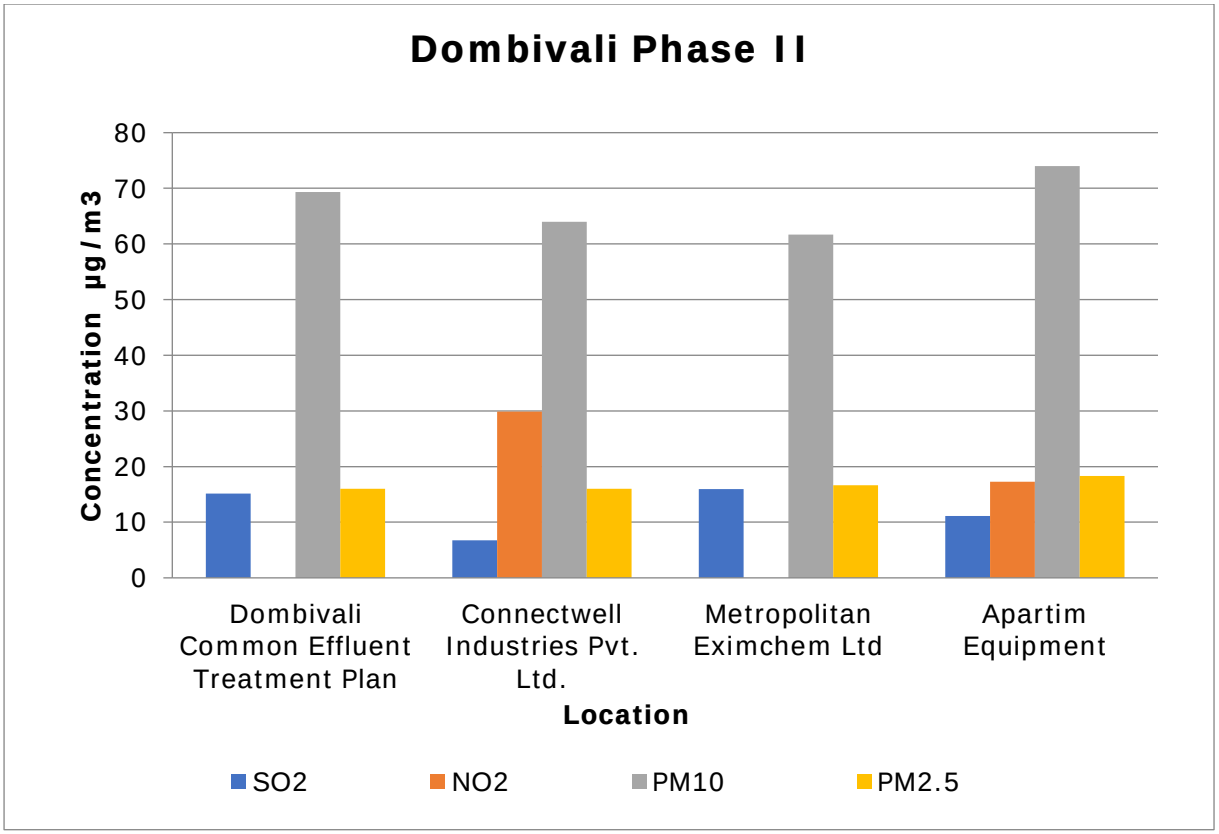
Table 5.8 Phase I - Volatile Organic Compounds (VOCs) in Ambient Air Results

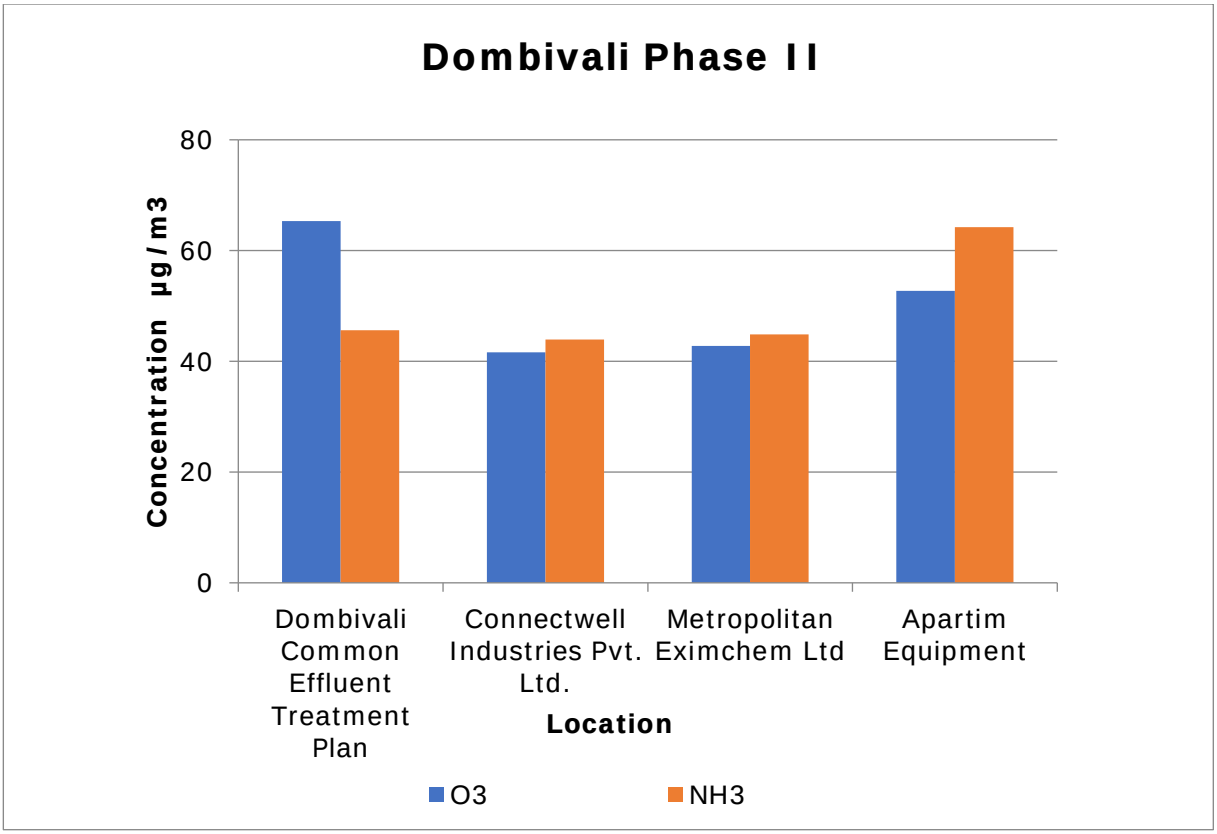
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
Dichloromethane	µg/m³	1.01	1.29
Chloroform	µg/m³	0.51	0.55
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
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

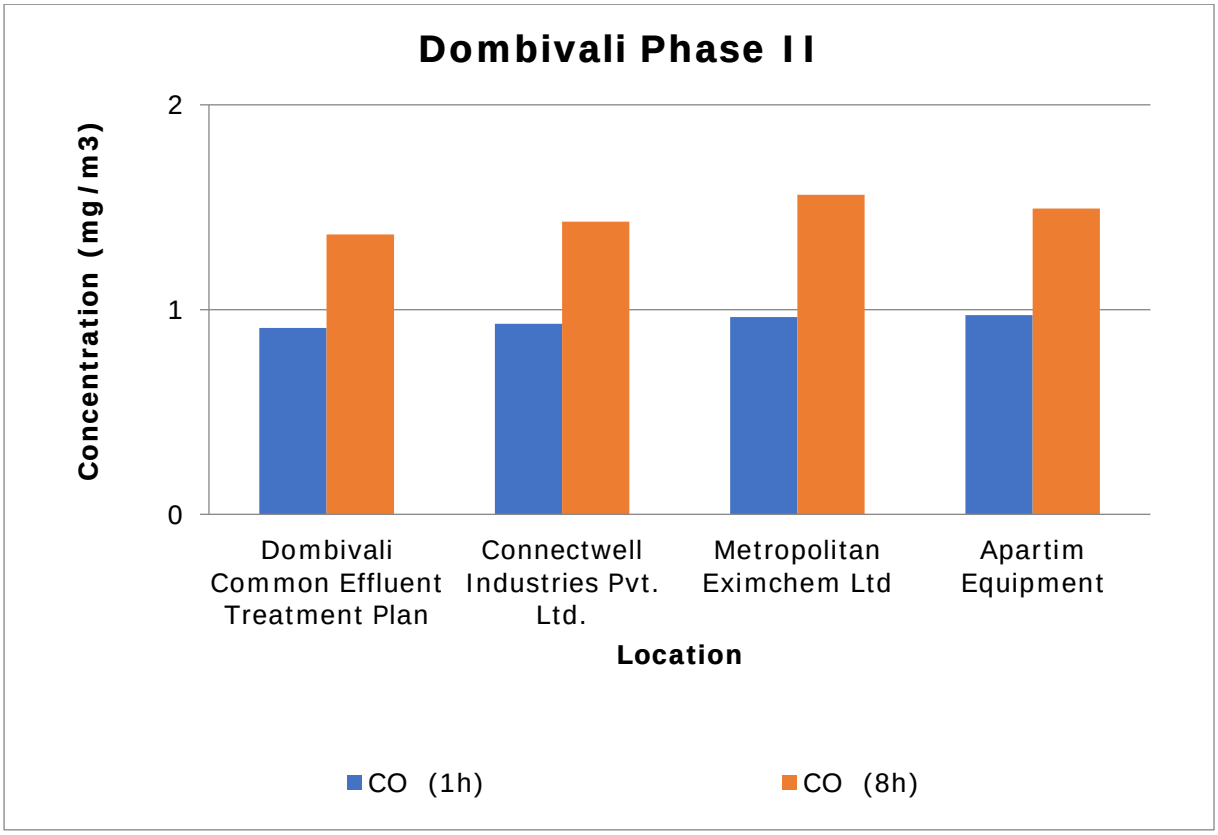
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	BLQ	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	BLQ	BLQ
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	BLQ	BLQ
1,2-Dichloropropane	µg/m³	BLQ	BLQ
Trans-1,3-Dichloropropene	µg/m³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m³	BLQ	BLQ
Tetrachloroethylene	µg/m³	BLQ	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	BLQ	BLQ
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	BLQ	BLQ
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	1.30	1.08
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ

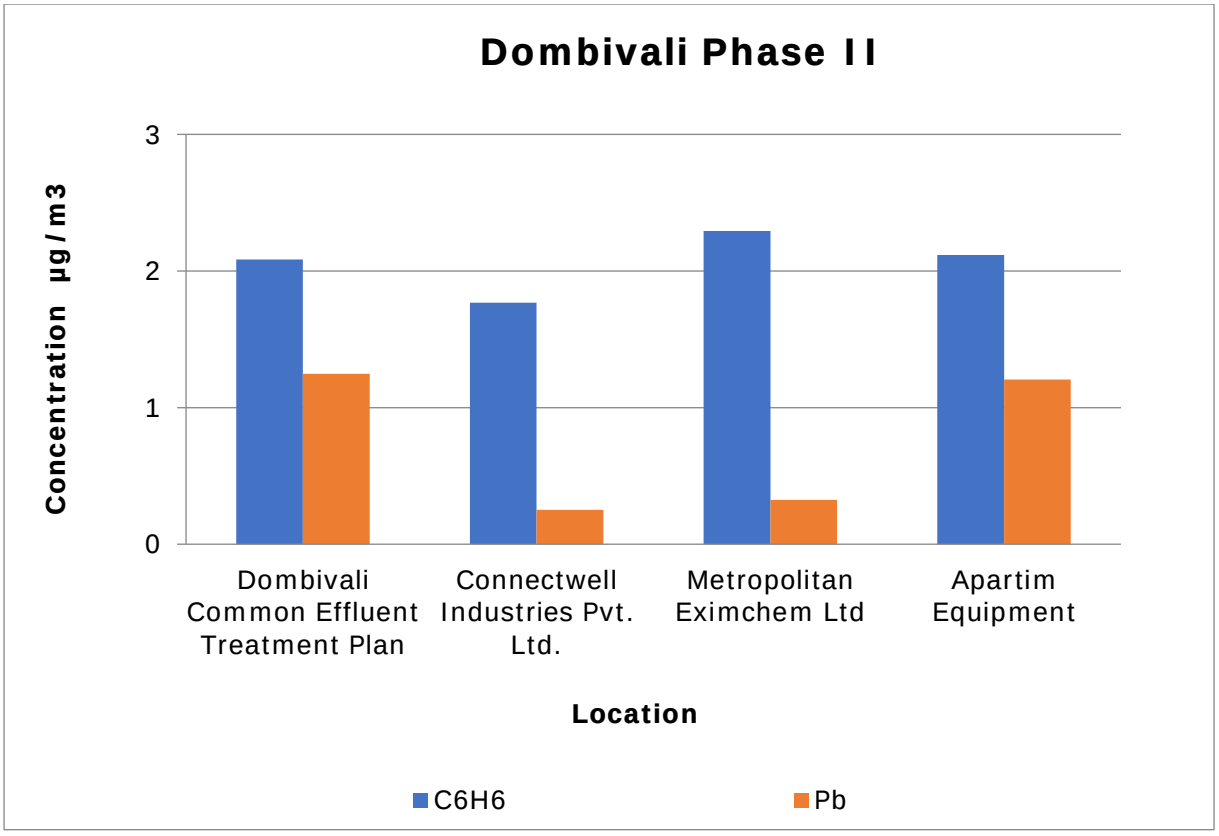
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

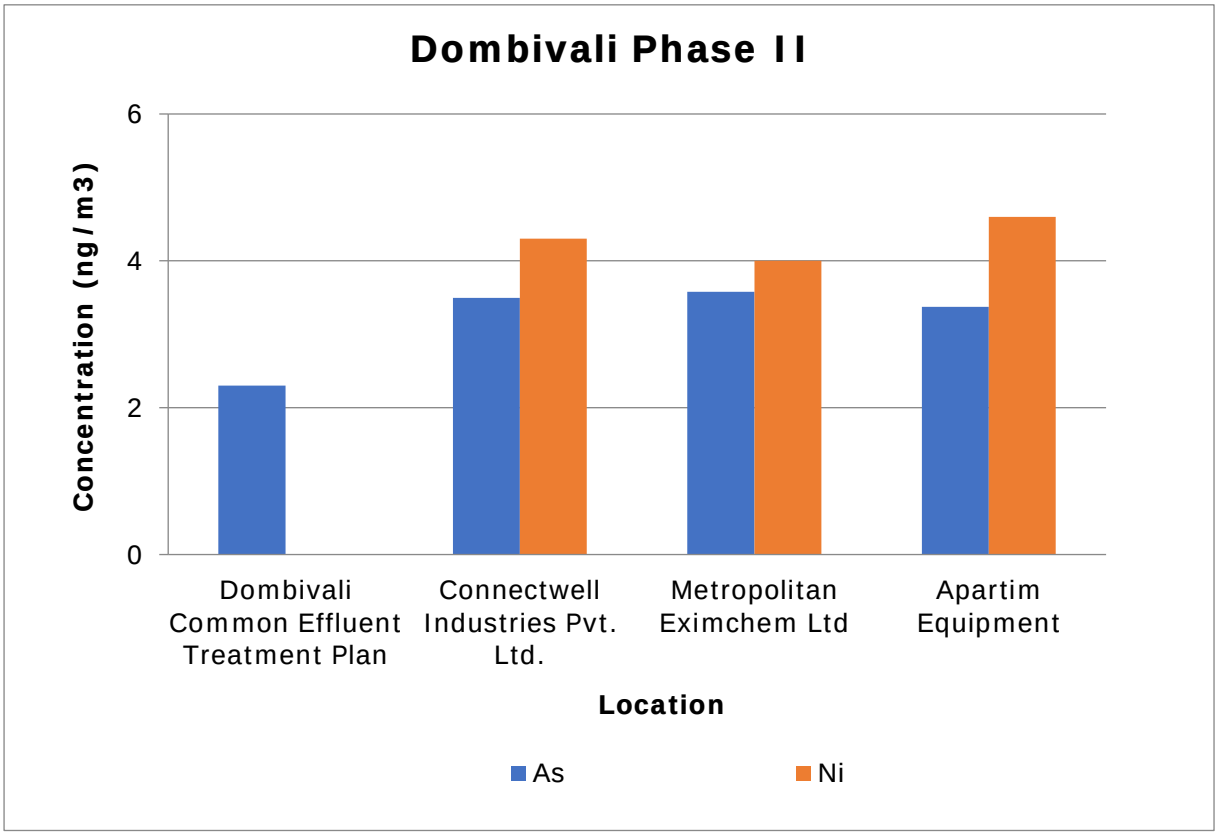
Graphs - Ambient Air Quality of MIDC Dombivali Phase II




Dombivali Phase II
Concentration µg/m3
80
60
40
20
0
Dombivali Common Effluent Treatment Plan
Connectwell Industries Pvt. Ltd.
Metropolitan Eximchem Ltd
Apartim Equipment
Location
O3
NH3


Dombivali Phase II
Concentration (mg/m3)
2
1
0
Dombivali Common Effluent Treatment Plan
Connectwell Industries Pvt. Ltd.
Metropolitan Eximchem Ltd
Apartim Equipment
Location
CO (1h)
CO (8h)


Dombivali Phase II
Concentration µg/m3
3
2
1
0
Dombivali Common Effluent Treatment Plan
Connectwell Industries Pvt. Ltd.
Metropolitan Eximchem Ltd
Apartim Equipment
Location
C6H6
Pb


Dombivali Phase II
Concentration (ng/m3)
6
4
2
0
Dombivali Common Effluent Treatment Plan
Connectwell Industries Pvt. Ltd.
Metropolitan Eximchem Ltd
Apartim Equipment
Location
As
Ni

WATER ENVIRONMENT

6. Water Environment

For studying the water Environment of Dombivali area, surface water was collected from Nallah, Lake, and River and CETP outlet. A total of 12 samples were collected from MIDC Phase I and MIDC Phase II of Dombivali.

1. **MIDC Phase I:** Six surface water samples are collected from the Dombivali MIDC Phase I region.

- No floating matter was observed in any of the water samples. The smell was agreeable in all the samples except Thakurli Talav and DEBESA CETP water samples.
- pH and suspended solids are well within the limits of all the collected samples.
- BOD and COD exceeded in the samples of Khambal Pada and Gharda Chemicals.
- 100% survival was achieved in Fish Bioassay in the water sample collected from DEBESA CETP and Krishna Alkali Pvt. Ltd.
- Concentration of all other metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr^{6+}) etc. are observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also 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 (BLQ) in all 6 samples collected.

Table 6.1 Phase I – 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.	Drain Flowing from DEBESA CETP	19°12'59.98"N	73°6'21.74"E	26.06.2024	28.06.2024	30.06.2024
2.	Near Khambal Pada	19°13'49.19"N	73°6'19.11"E	26.06.2024	28.06.2024	30.06.2024
3.	Thakurli Talav	19°13'19.42"N	73°5'57.92"E	26.06.2024	28.06.2024	30.06.2024
4.	Storm Water DEBESA CETP Nallah	19°12'58.47"N	73°6'56.60"E	26.06.2024	28.06.2024	30.06.2024
5.	Nallah nearby Gharda Chemical Ltd.	19°13'2.87"N	73°6'44.41"E	26.06.2024	28.06.2024	30.06.2024

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
6.	Nallah nearby Krishna Alkali Pvt. Ltd.	19°13'1.18"N	73°6'38.89"E	26.06.2024	28.06.2024	30.06.2024

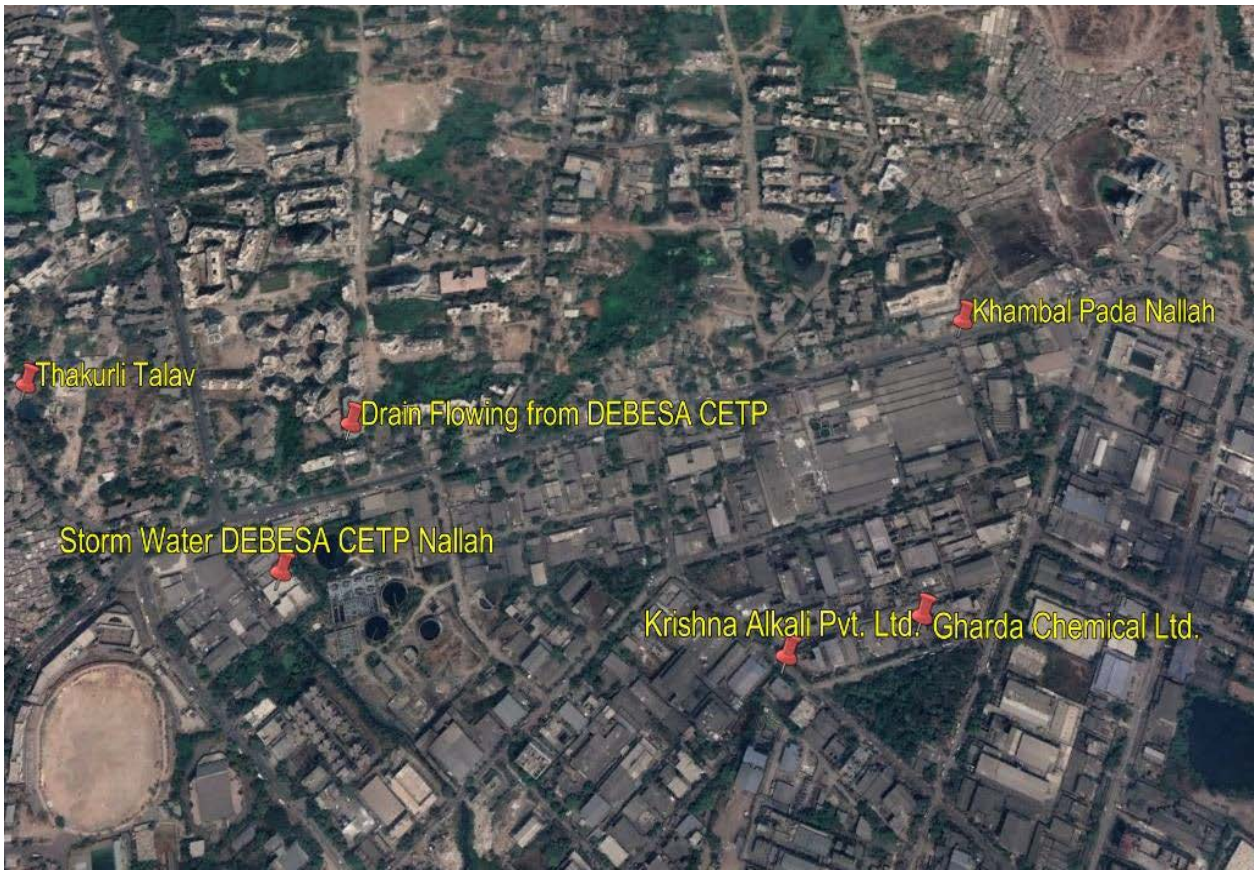


Fig. Geographical Locations of Surface Water Sampling MIDC Dombivali Phase I

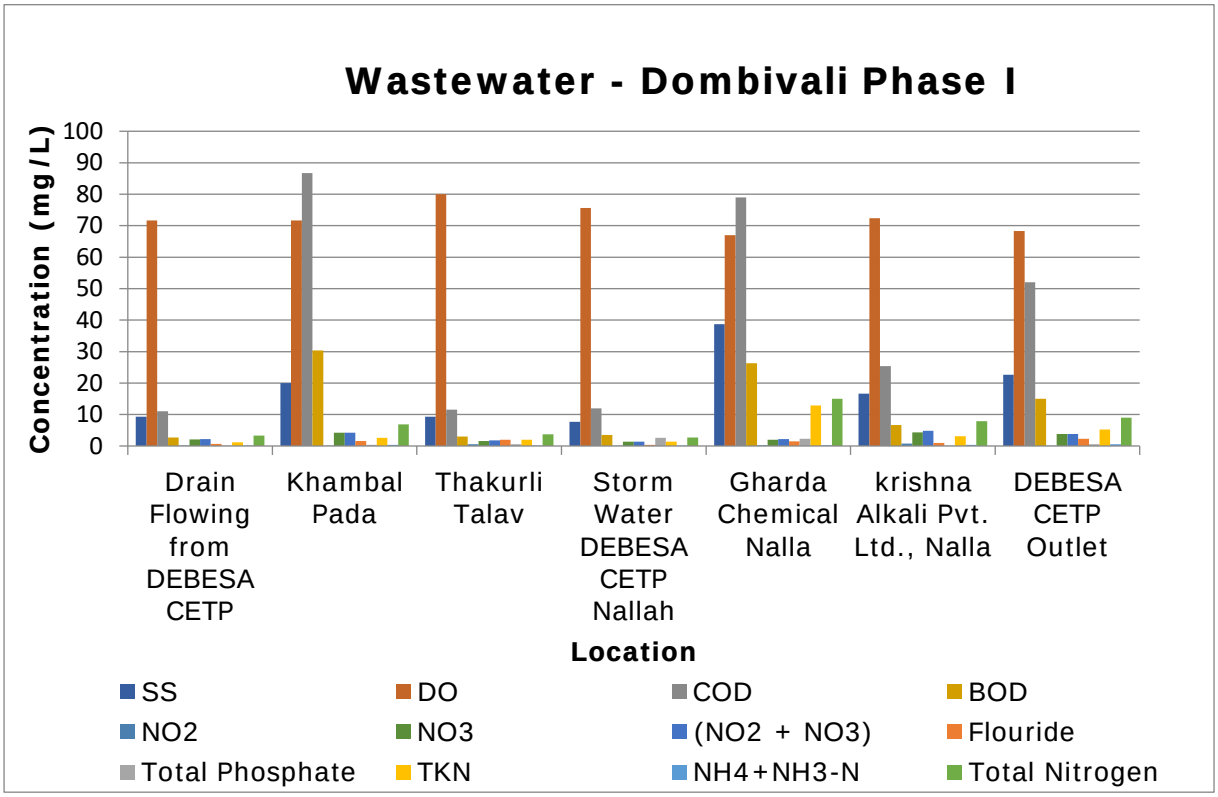
Table 6.2 Phase I – Results of Surface Water

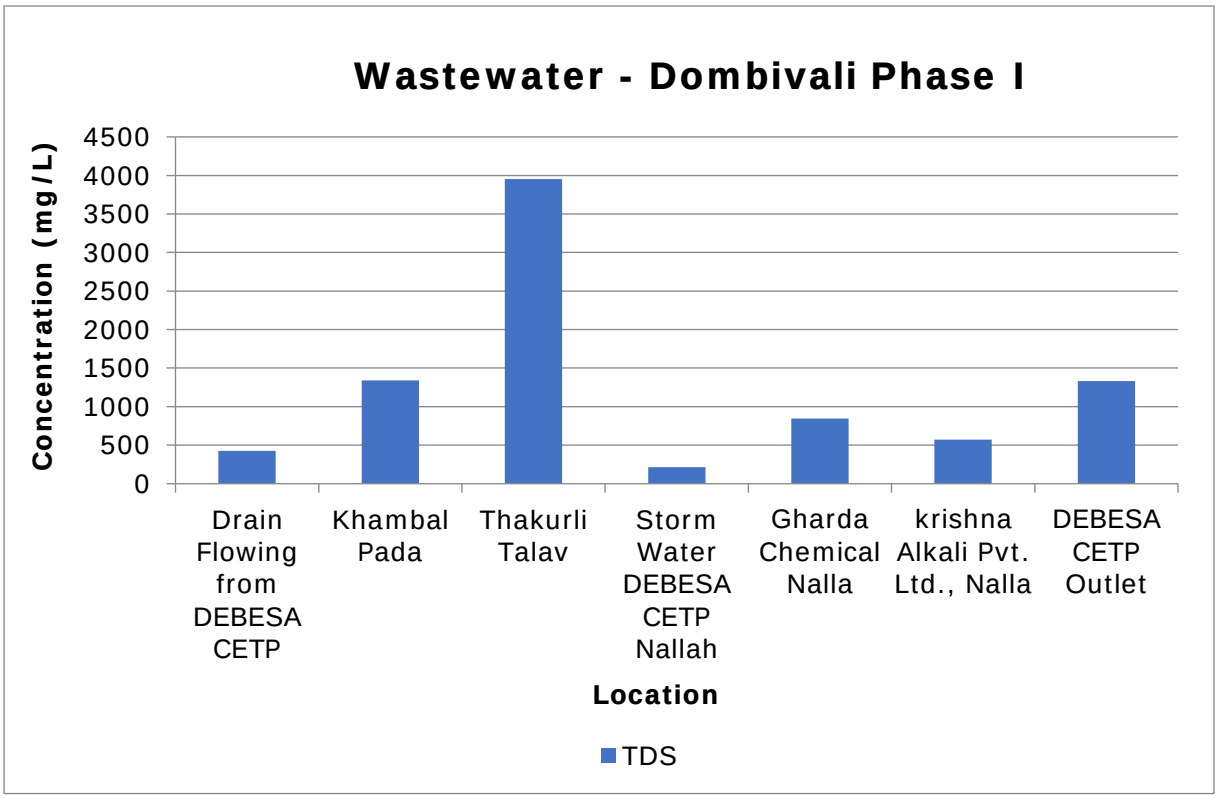
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	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	0.40	0.50	0.50	0.4	0.5	0.4
Temperature	°C	29	29	29	30	29	30
Colour	Hazen	1	2	1	1	2	2
Smell	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
pH	-	7.37	7.32	7.49	7.08	5.60	7.14
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ

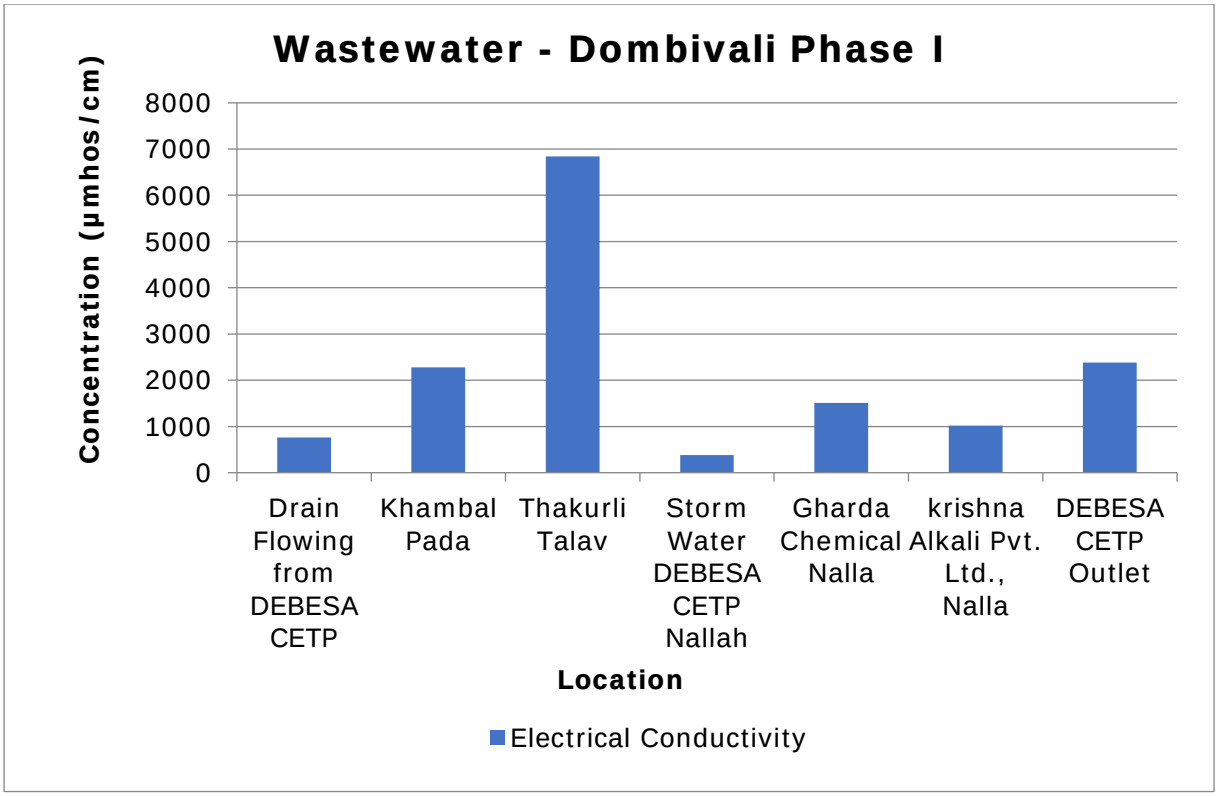
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Suspended Solids	mg/L	9.33	20.00	9.33	7.67	38.67	16.67
Total Dissolved Solids	mg/L	428	1339	3954	215	844	570
Dissolved Oxygen (% Saturation)	%	71.67	71.67	80.00	75.67	67.00	72.33
Chemical Oxygen Demand	mg/L	11	87	12	12	79	25
Biochemical Oxygen Demand (3 days,27°C)	mg/L	3	30	3	4	26	7
Electrical Conductivity (at 25 °C)	µmho/ cm	764	2277	6842	384	1508	1017
Nitrite Nitrogen (as NO_2)	mg/L	0.10	0.06	0.60	0.09	0.21	0.73
Nitrate Nitrogen (as NO_3)	mg/L	2.07	4.19	1.55	1.32	2.01	4.33
(NO_2 + NO_3)-Nitrogen	mg/L	2.17	4.21	1.75	1.38	2.15	4.82
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.70	1.53	1.97	0.37	1.47	1.00
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.16	0.20	0.39	0.50	1.10	0.20
Sodium Adsorption Ratio	-	1.73	1.34	1.35	1.30	1.47	2.47
Total Coliforms	MPN Index/ 100 ml	7	1073	573	1069	920	693
Faecal Coliforms	MPN Index/ 100 ml	3	33	67	1260	13	109
Total Phosphate (as P)	mg/L	0.20	0.40	0.60	2.60	2.27	0.16
Total Kjeldahl Nitrogen (as N)	mg/L	1.12	2.61	1.94	1.34	12.85	3.06

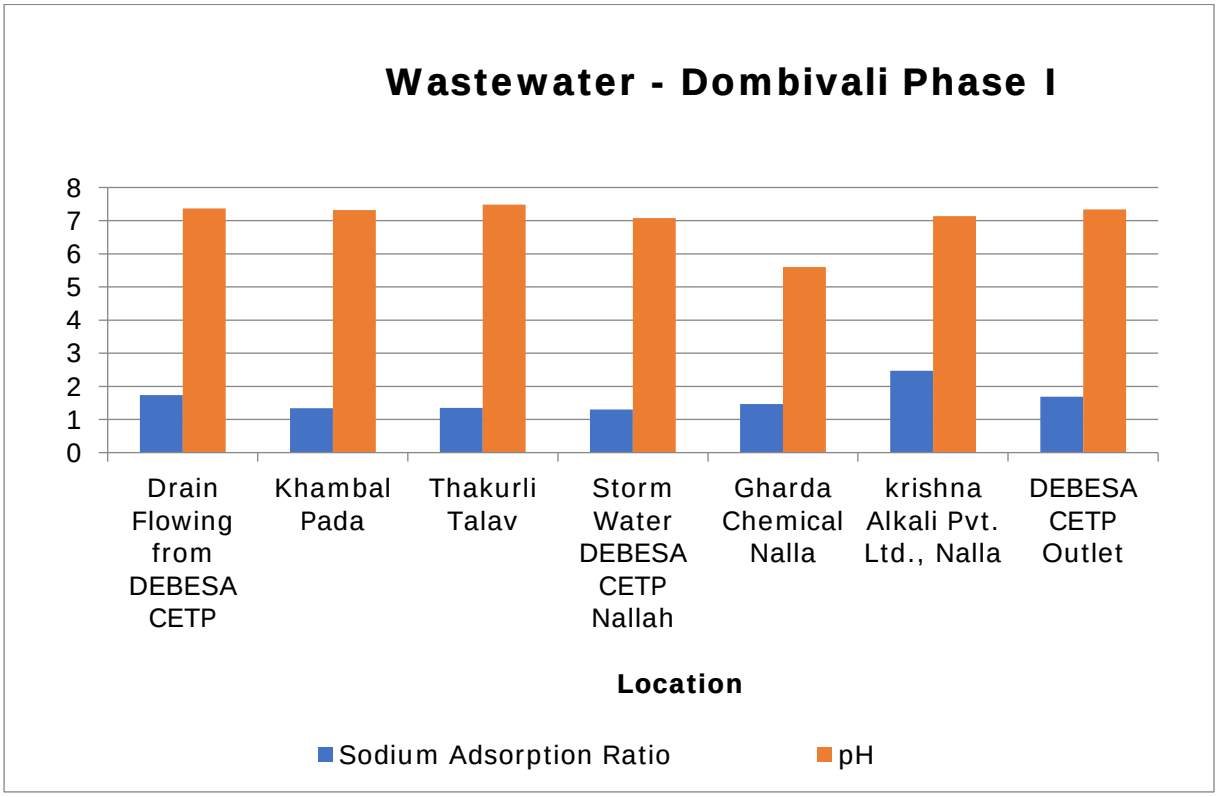
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.14	0.34	0.15	0.20	0.26	0.38
Total Nitrogen	mg/L	3.29	6.82	3.69	2.72	14.99	7.87
Phenols (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	0.00
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.13	0.09	0.07	0.06	0.30	BLQ
Nickel (as Ni)	mg/L	0.01	BLQ	BLQ	BLQ	0.05	0.04
Copper (as Cu)	mg/L	0.03	BLQ	BLQ	BLQ	6.43	0.05
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ	BLQ	0.02	BLQ
Total Arsenic (as As)	mg/L	0.02	BLQ	0.04	BLQ	0.01	BLQ
Lead (as Pb)	mg/L	0.01	BLQ	0.01	BLQ	0.02	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	0.01	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.34	0.12	0.11	0.10	0.38	0.13
Iron (as Fe)	mg/L	1.09	0.32	0.19	0.31	1.86	0.50
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ	BLQ	0.02	BLQ
Selenium (as Se)	mg/L	0.13	BLQ	0.02	BLQ	BLQ	0.01
Boron (as B)	mg/L	0.44	0.25	0.19	0.24	0.22	0.41
Bioassay Test on fish	% survival	100	80	93	100	35	80

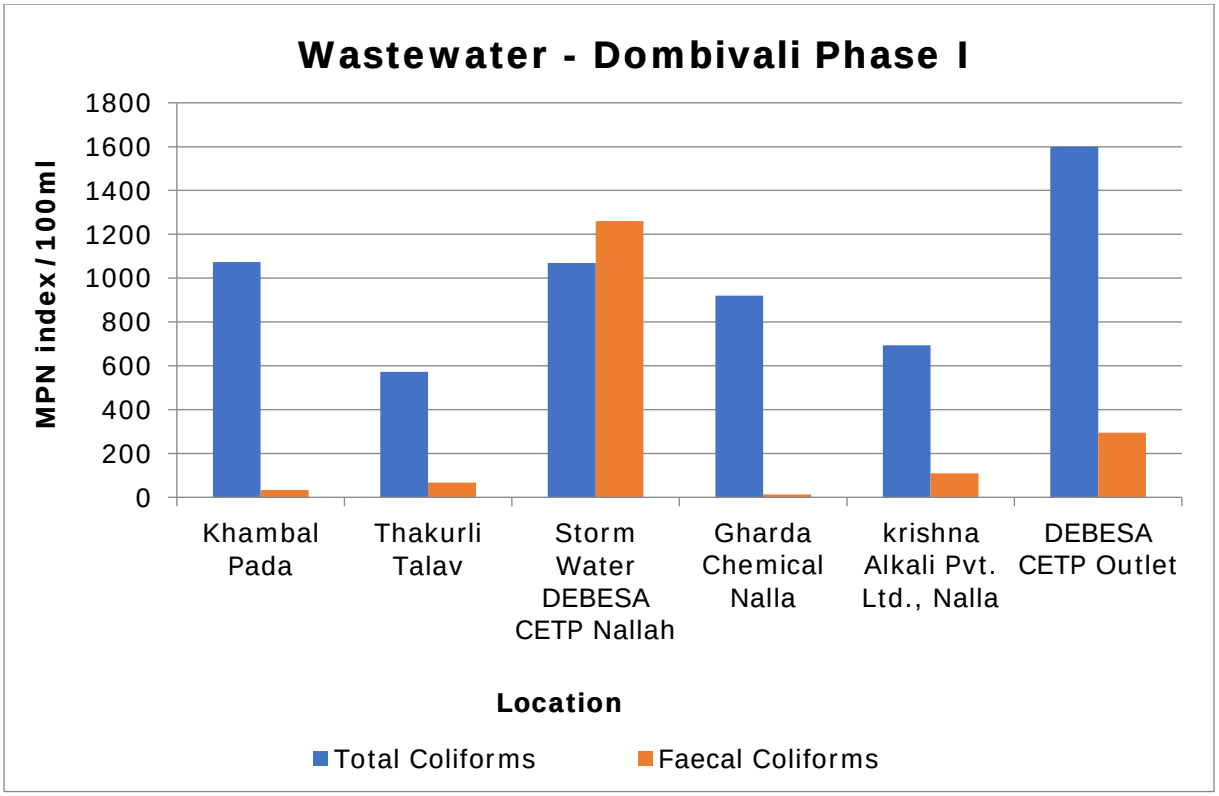
Graphs - Surface Water Quality of MIDC Dombivali Phase I

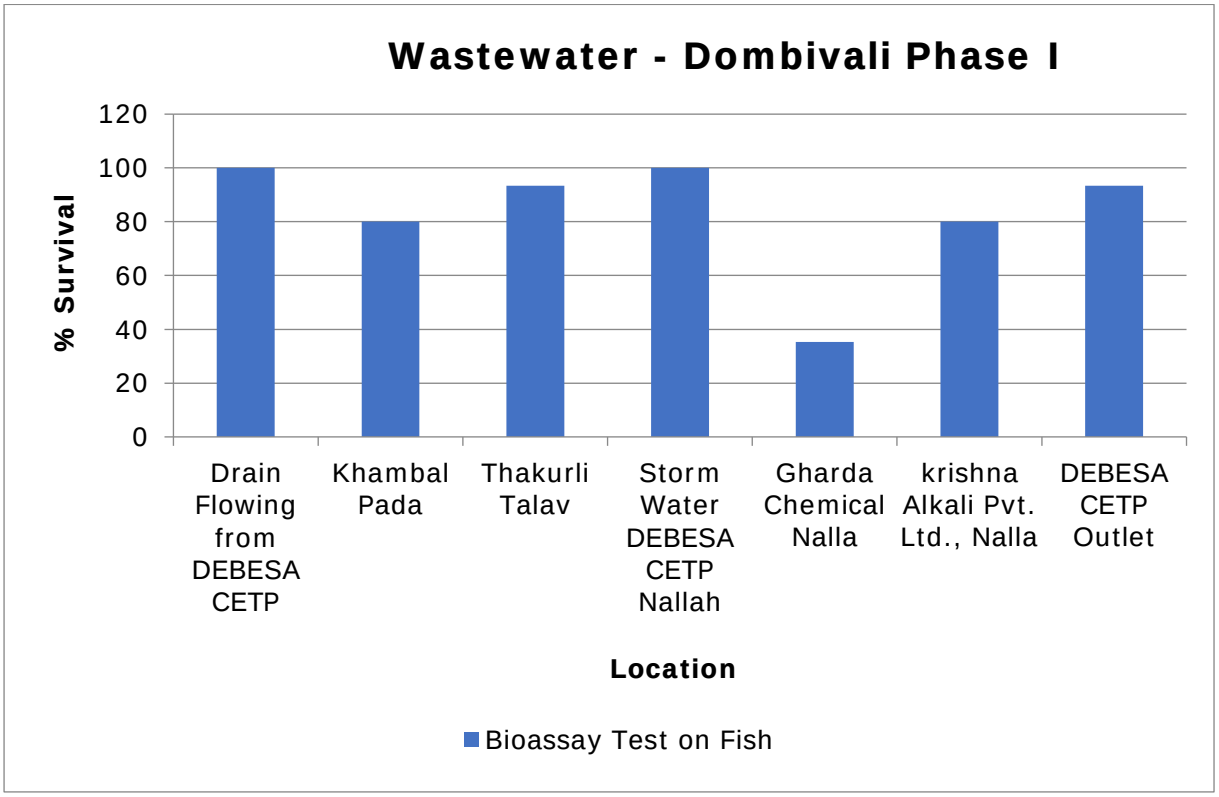





Wastewater - Dombivali Phase I
Concentration (µmhos/cm)
8000
7000
6000
5000
4000
3000
2000
1000
0
Drain Flowing from DEBESA CETP
Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical Nalla
krishna Alkali Pvt. Ltd., Nalla
DEBESA CETP Outlet
Location
Electrical Conductivity


Wastewater - Dombivali Phase I
8
7
6
5
4
3
2
1
0
Drain Flowing from DEBESA CETP
Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical Nalla
krishna Alkali Pvt. Ltd., Nalla
DEBESA CETP Outlet
Location
Sodium Adsorption Ratio
pH


Wastewater - Dombivali Phase I
MPN index/100ml
1800
1600
1400
1200
1000
800
600
400
200
0
Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical Nalla
krishna Alkali Pvt. Ltd., Nalla
DEBESA CETP Outlet
Location
Total Coliforms
Faecal Coliforms


Wastewater - Dombivali Phase I
% Survival
120
100
80
60
40
20
0
Drain Flowing from DEBESA CETP
Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical Nalla
krishna Alkali Pvt. Ltd., Nalla
DEBESA CETP Outlet
Location
Bioassay Test on Fish

2. **MIDC Phase II:** Six surface water samples are collected from Dombivali MIDC Phase II.

- No floating matter was observed in any of the six samples, but the odour of five samples is observed as non-agreeable.
- pH and suspended solids of all six samples collected are observed less than the permissible limit.
- Electrical conductivity in CETP water sample is observed highest with 2297µmhos/cm.
- Concentration of BOD and COD exceeded the acceptable limit in all six samples collected.
- Concentration of Iron is found to exceed the acceptable limit in all the samples.
- 100% fish survival was achieved in only one water sample i.e. Tempo Naka during Fish Bioassay.
- All metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr^{6+}) etc. are observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also met the criteria as prescribed by CPCB.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are also observed below the limit of quantification (BLQ) in all the water samples.
- Organo Chlorine Pesticides are also determined as below the limit of quantification (BLQ) in all 6 samples collected.

Table 6.3 Phase II – 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.	Nearby Navjeevan Synthetics & Super Casting Nallah	19°11'34.57"N	73°5'20.35"E	26.06.2024	28.06.2024	30.06.2024
2.	Nallah nearby Metropolitan Exichem Ltd.	19°12'1.77"N	73°5'52.83"E	26.06.2024	28.06.2024	30.06.2024
3.	Nallah after DCETP	19°12'14.67"N	73°5'49.60"E	26.06.2024	28.06.2024	30.06.2024
4.	Nallah near Ramchandra Nagar	19°12'16.38"N	73°5'24.75"E	26.06.2024	28.06.2024	30.06.2024
5.	CETP Outlet	19°12'15.32"N	73°5'52.87"E	26.06.2024	28.06.2024	30.06.2024
6.	Tempo Naka Nallah	19°11'50.39"N	73°5'53.34"E	26.06.2024	28.06.2024	30.06.2024

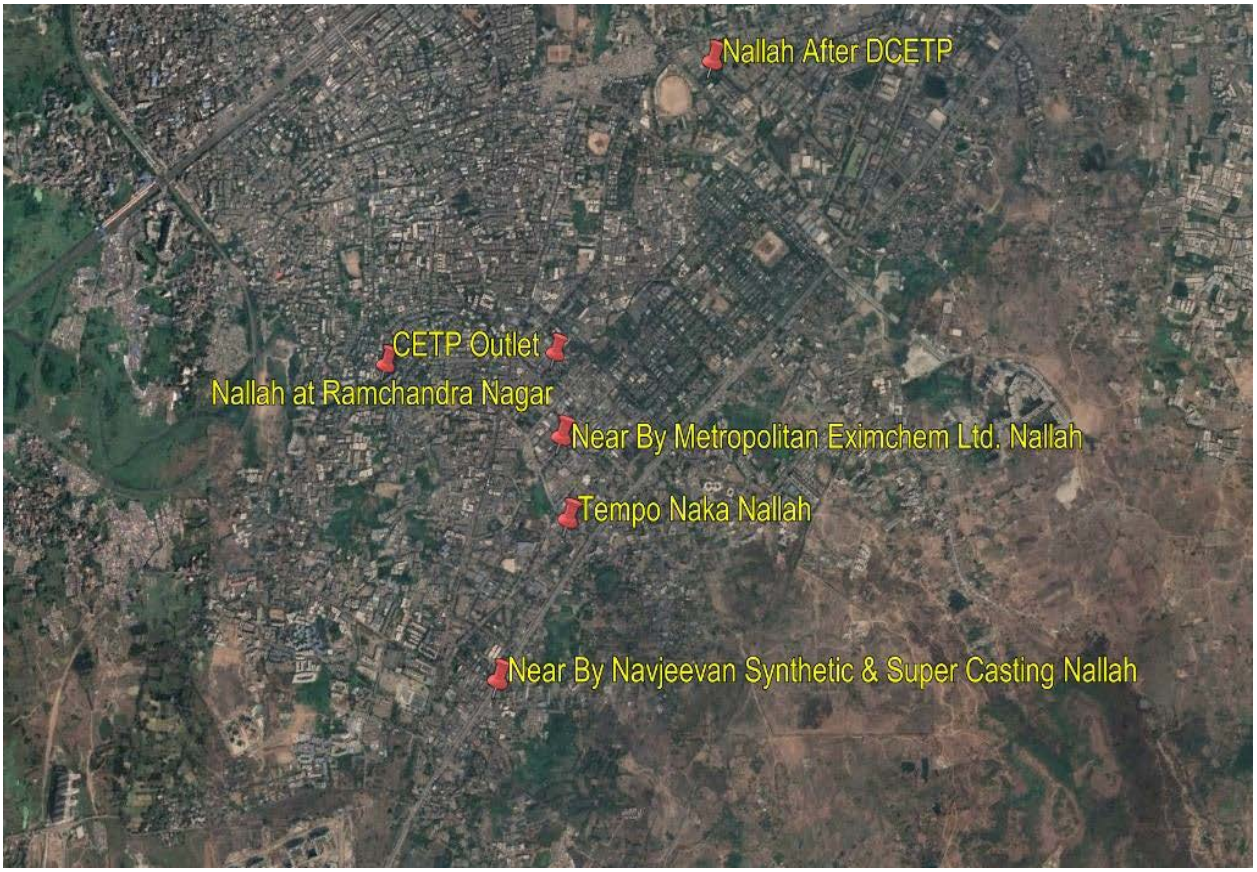


Fig. Geographical Locations of Surface Water Sampling MIDC Dombivali Phase II

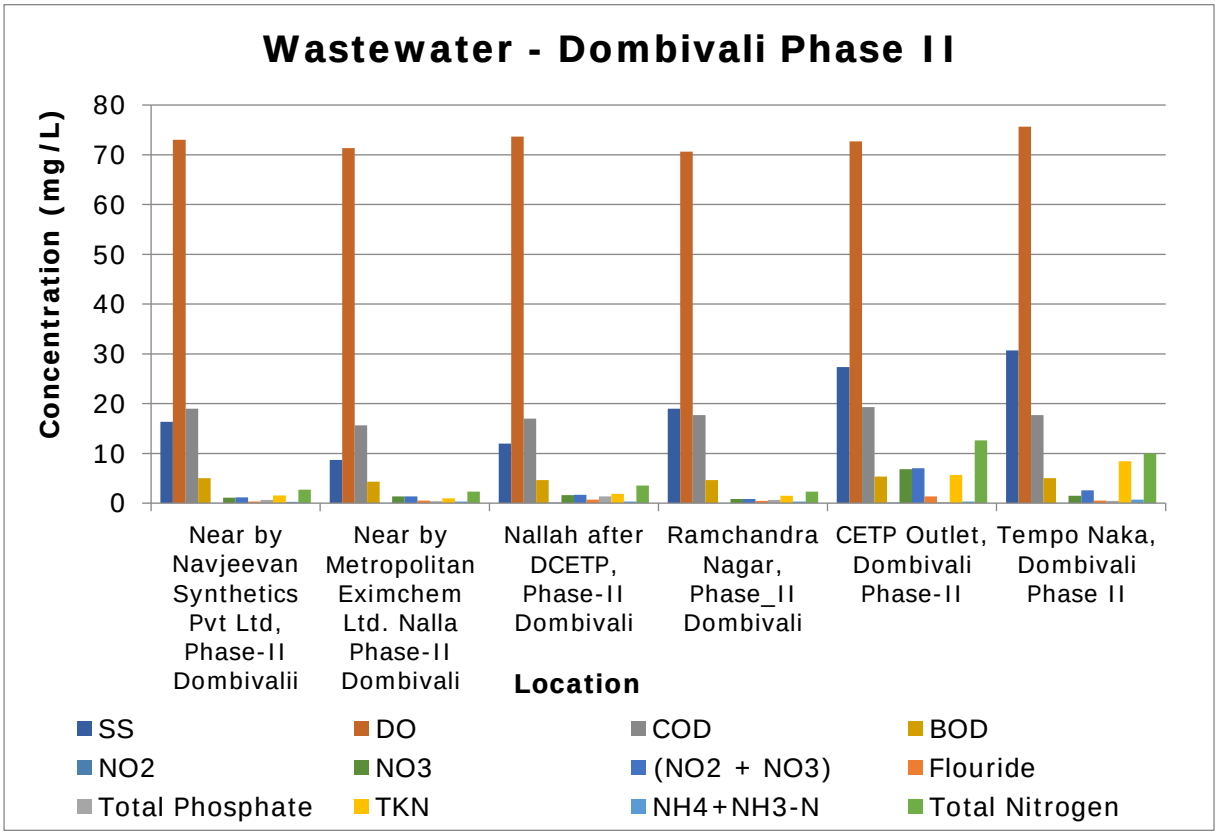
Table 6.4 Phase II – Results of Surface Water

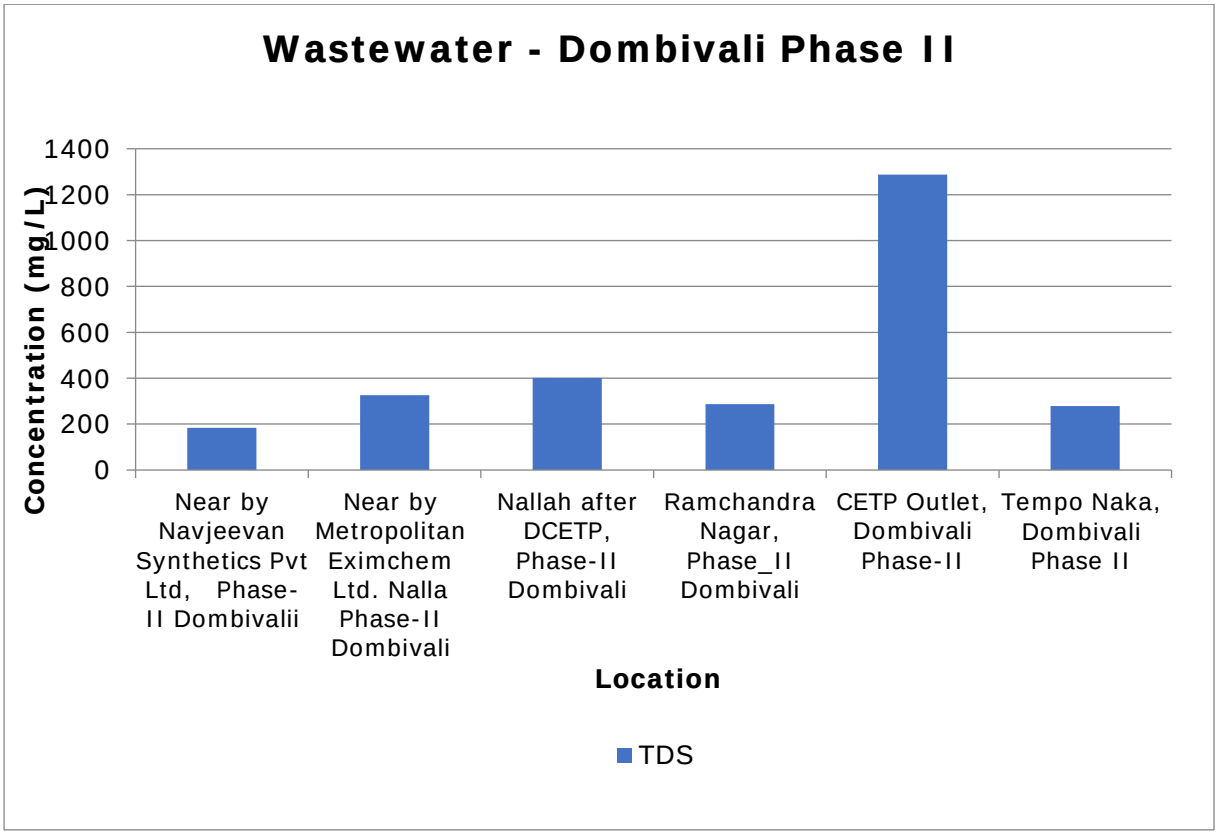
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Very clean neighbourhood and catchment
General Appearance	-	No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter
Transparency	m	0.50	0.4	0.50	0.4	0.5	0.4
Temperature	^{o}C	30	30	30	30	30	30
Colour	Hazen	2	1	1	1	25	6
Smell	-	Agreeable	Agreeable	Agreeable	Agreeable	Not Agreeable	Not Agreeable
pH	-	7.66	7.25	7.33	7.33	7.62	7.43
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	16.33	8.67	12.00	19.00	27.33	30.67

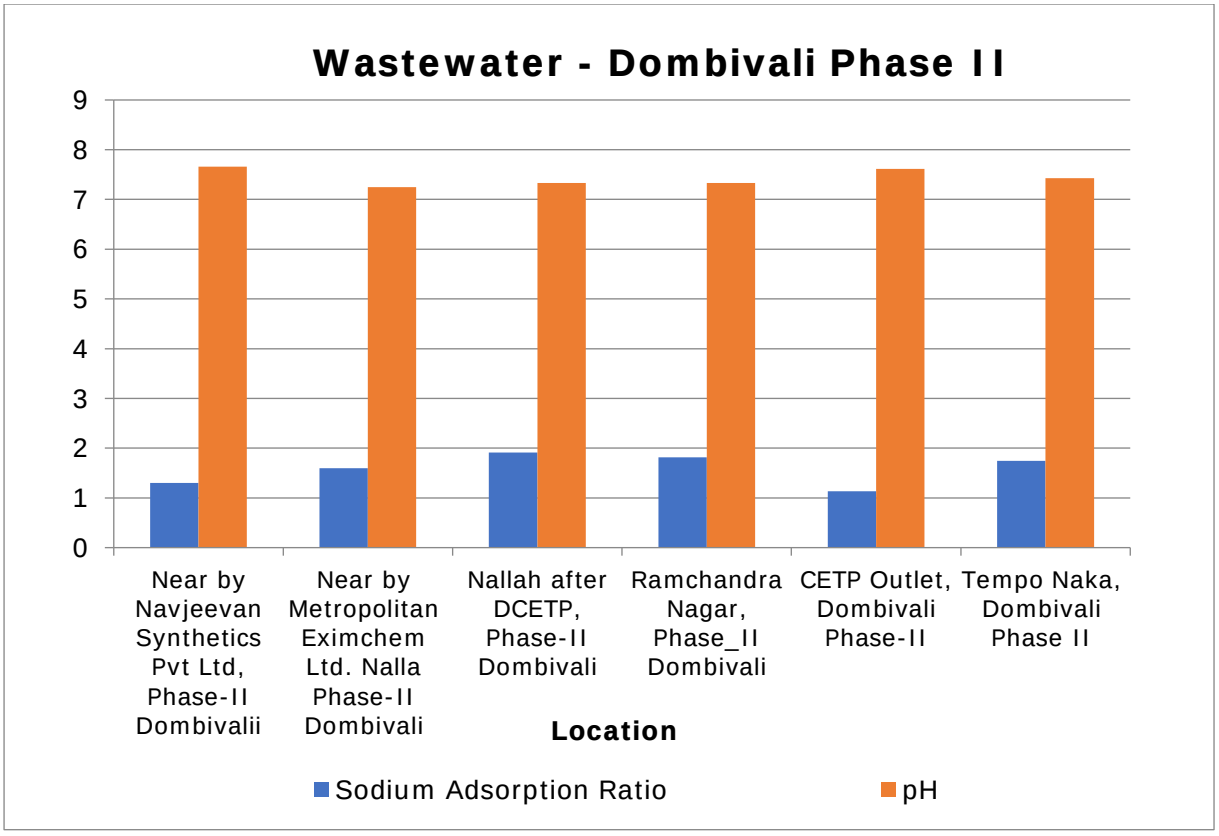
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Total Dissolved Solids	mg/L	184	327	402	287	1287	279
Dissolved Oxygen (% Saturation)	%	73.00	71.33	73.67	70.67	72.67	75.67
Chemical Oxygen Demand	mg/L	19	16	17	18	19	18
Biochemical Oxygen Demand (3 days,27°C)	mg/L	5	4	5	5	5	5
Electrical Conductivity (at 25 °C)	µmho/cm	328	582	718	513	2297	499
Nitrite Nitrogen (as NO_2)	mg/L	0.03	0.05	0.12	0.04	0.12	0.07
Nitrate Nitrogen (as NO_3)	mg/L	1.13	1.33	1.62	0.84	6.83	1.51
(NO_2 + NO_3)-Nitrogen	mg/L	1.14	1.36	1.66	0.87	7.02	2.56
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.30	0.53	0.70	0.47	1.37	0.50
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.40	0.24	0.81	0.40	0.24	0.19
Sodium Adsorption Ratio	-	1.30	1.60	1.91	1.81	1.13	1.75
Total Coliforms	MPN Index/100 ml	152	1113	830	1160	1373	1373
Faecal Coliforms	MPN Index/100 ml	87	85	204	197	1067	1090
Total Phosphate (as P)	mg/L	0.64	0.39	1.33	0.65	0.17	0.44
Total Kjeldahl Nitrogen (as N)	mg/L	1.57	0.97	1.87	1.46	5.68	8.45

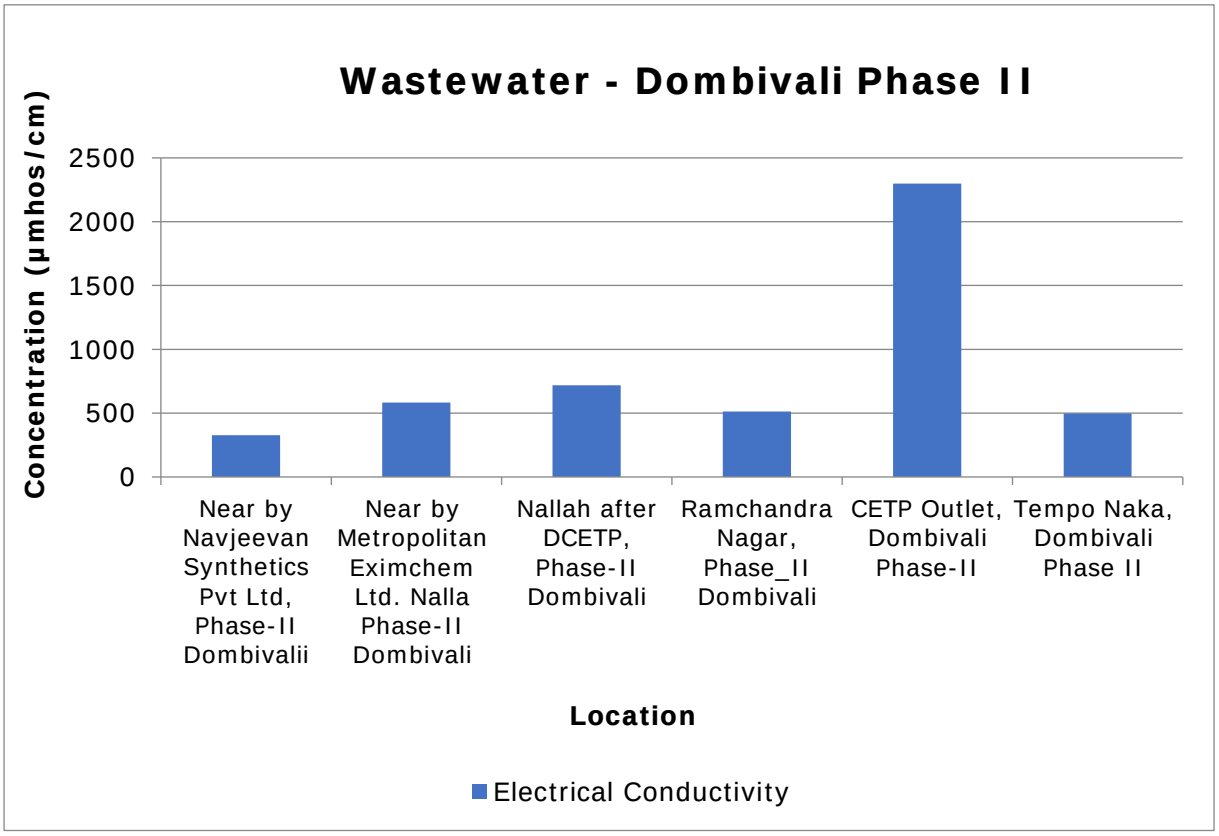
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.24	0.31	0.29	0.34	0.33	0.73
Total Nitrogen	mg/L	2.70	2.33	3.52	2.32	12.60	10.00
Phenols (as C_6H_5OH)	mg/L	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	0.00	BLQ	0.00	0.00	0.00
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.06	BLQ	0.53	0.25	0.11
Nickel (as Ni)	mg/L	0.01	0.01	0.04	0.03	0.07	0.02
Copper (as Cu)	mg/L	0.03	BLQ	0.03	0.02	0.03	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	0.05	0.02	0.02	BLQ
Total Arsenic (as As)	mg/L	BLQ	0.01	BLQ	BLQ	BLQ	0.01
Lead (as Pb)	mg/L	0.01	0.02	BLQ	0.03	0.01	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	0.29	0.19	0.30	0.06	0.10	0.16
Iron (as Fe)	mg/L	1.29	0.83	0.32	0.55	0.81	0.60
Vanadium (as V)	mg/L	0.03	BLQ	0.01	BLQ	0.03	BLQ
Selenium (as Se)	mg/L	BLQ	0.01	BLQ	BLQ	BLQ	BLQ
Boron (as B)	mg/L	0.26	0.21	0.37	0.13	1.23	0.17
Bioassay Test on fish	% survival	93	100	100	53	67	67

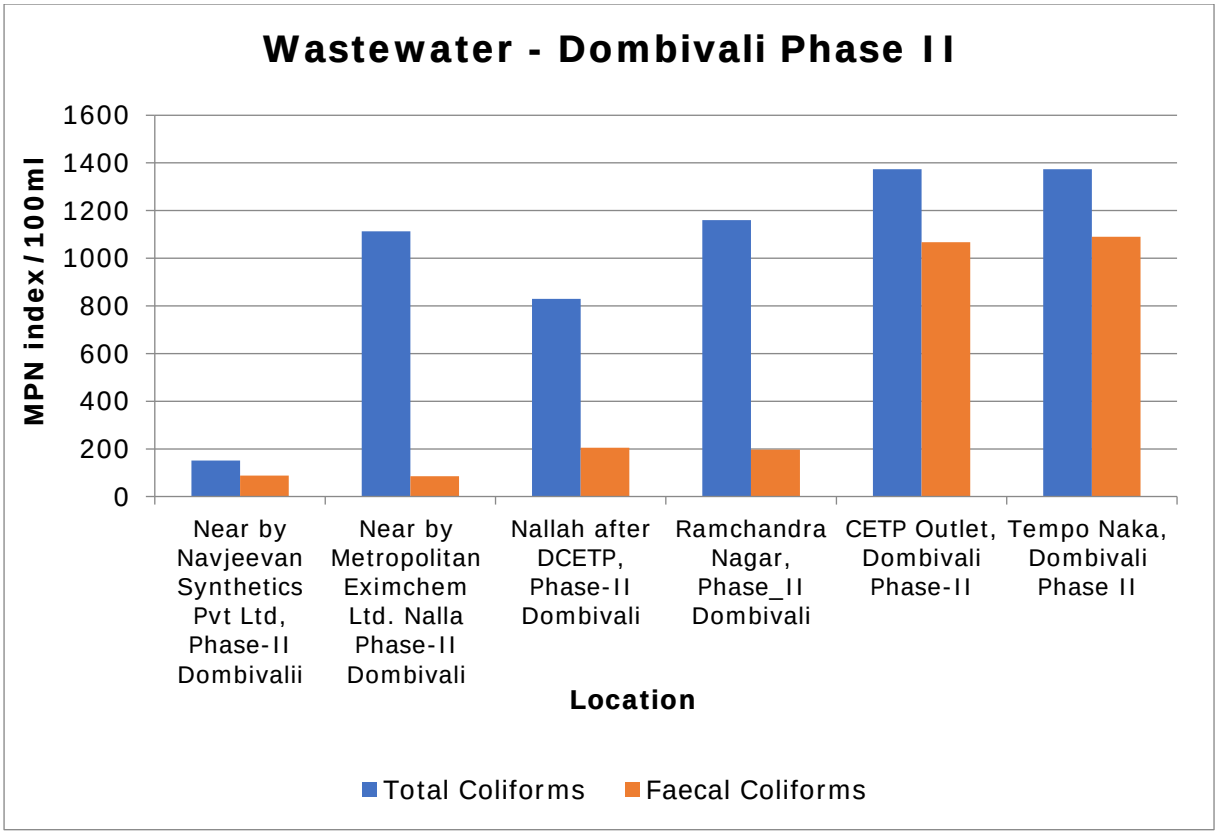
Graphs - Surface Water Quality of MIDC Dombivali Phase II

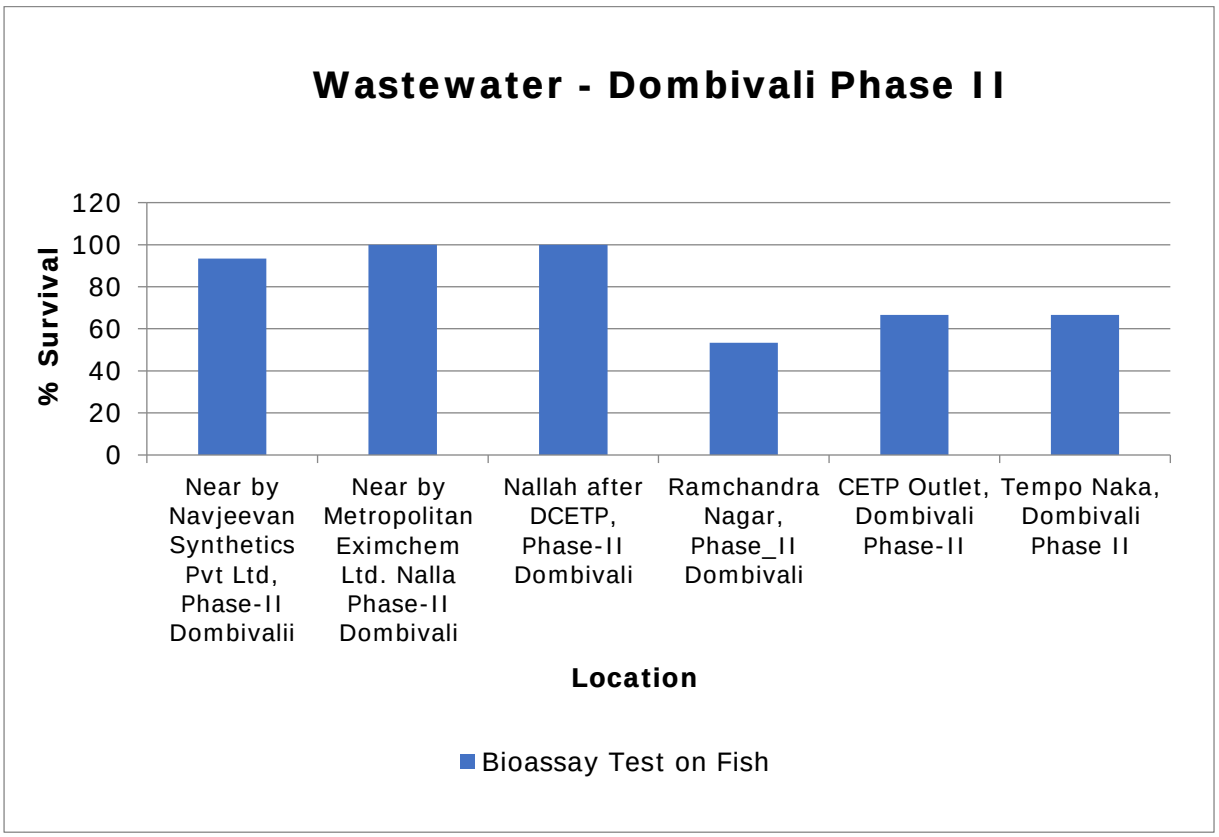





Wastewater - Dombivali Phase II
9
8
7
6
5
4
3
2
1
0
Near by Navjeevan Synthetics Pvt Ltd, Phase-II Dombivalii
Near by Metropolitan Eximchem Ltd. Nalla Phase-II Dombivali
Nallah after DCETP, Phase-II Dombivali
Ramchandra Nagar, Phase_II Dombivali
CETP Outlet, Dombivali Phase-II
Tempo Naka, Dombivali Phase II
Location
Sodium Adsorption Ratio
pH


Wastewater - Dombivali Phase II
Concentration (µmhos/cm)
2500
2000
1500
1000
500
0
Near by Navjeevan Synthetics Pvt Ltd, Phase-II Dombivalii
Near by Metropolitan Eximchem Ltd. Nalla Phase-II Dombivali
Nallah after DCETP, Phase-II Dombivali
Ramchandra Nagar, Phase_II Dombivali
CETP Outlet, Dombivali Phase-II
Tempo Naka, Dombivali Phase II
Location
Electrical Conductivity


Wastewater - Dombivali Phase II
MPN index/100ml
1600
1400
1200
1000
800
600
400
200
0
Near by Navjeevan Synthetics Pvt Ltd, Phase-II Dombivalii
Near by Metropolitan Eximchem Ltd. Nalla Phase-II Dombivali
Nallah after DCETP, Phase-II Dombivali
Ramchandra Nagar, Phase_II Dombivali
CETP Outlet, Dombivali Phase-II
Tempo Naka, Dombivali Phase II
Location
Total Coliforms
Faecal Coliforms


Wastewater - Dombivali Phase II
% Survival
120
100
80
60
40
20
0
Near by Navjeevan Synthetics Pvt Ltd, Phase-II Dombivalii
Near by Metropolitan Eximchem Ltd. Nalla Phase-II Dombivali
Nallah after DCETP, Phase-II Dombivali
Ramchandra Nagar, Phase_II Dombivali
CETP Outlet, Dombivali Phase-II
Tempo Naka, Dombivali Phase II
Location
Bioassay Test on Fish

LAND ENVIRONMENT

7. Land Environment

For studying the land Environment of Dombivali area, Groundwater was collected from Borewell in triplicates from 26th June to 30th June 2024. A total of 6 samples were collected from MIDC Phase I and MIDC Phase II of Dombivali region.

1. **MIDC Phase I:** Three groundwater samples were collected from MIDC Phase I of the Dombivali region.

   - All three water samples collected are acceptable in general appearance, colour, smell and transparency.
   - pH and suspended solids are observed well within the limits at all three samples collected.
   - Parameters like Total Residual Chlorine, Cyanide, Fluoride, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
   - 100% survival was achieved in Fish Bioassay of all three water samples.
   - All metals like Arsenic, Nickel, Copper, Iron, Hexavalent Chromium (Cr^{6+}) etc. are observed either below limit of quantification or below their standard limits.
   - Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were found below the limit of quantification in all 3 samples collected.
   - Organo Chlorine Pesticides were also observed below the limit of quantification in all 3 samples collected.

Table 7.1 Phase I – Details of Sampling Location of Groundwater

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Bore well opposite Kama Office	19°12'49.14"N	73°6'27.99"E	26.06.2024	28.06.2024	30.06.2024
2.	Bore well Near Mamata Hospital	19°12'27.36"N	73°6'15.12"E	26.06.2024	28.06.2024	30.06.2024
3.	Bore well at Horizon hall	19°11'30.01"N	73°5'31.82"E	26.06.2024	28.06.2024	30.06.2024

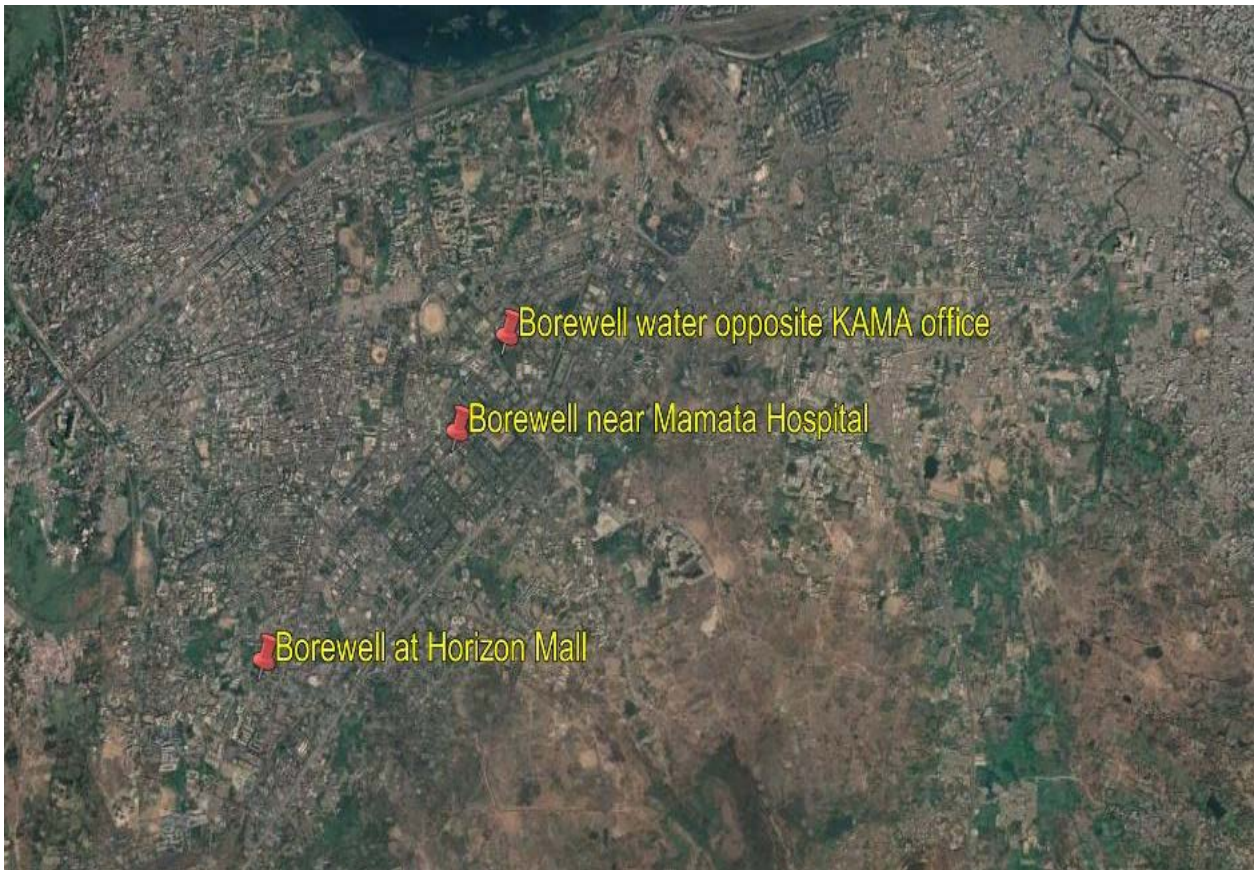


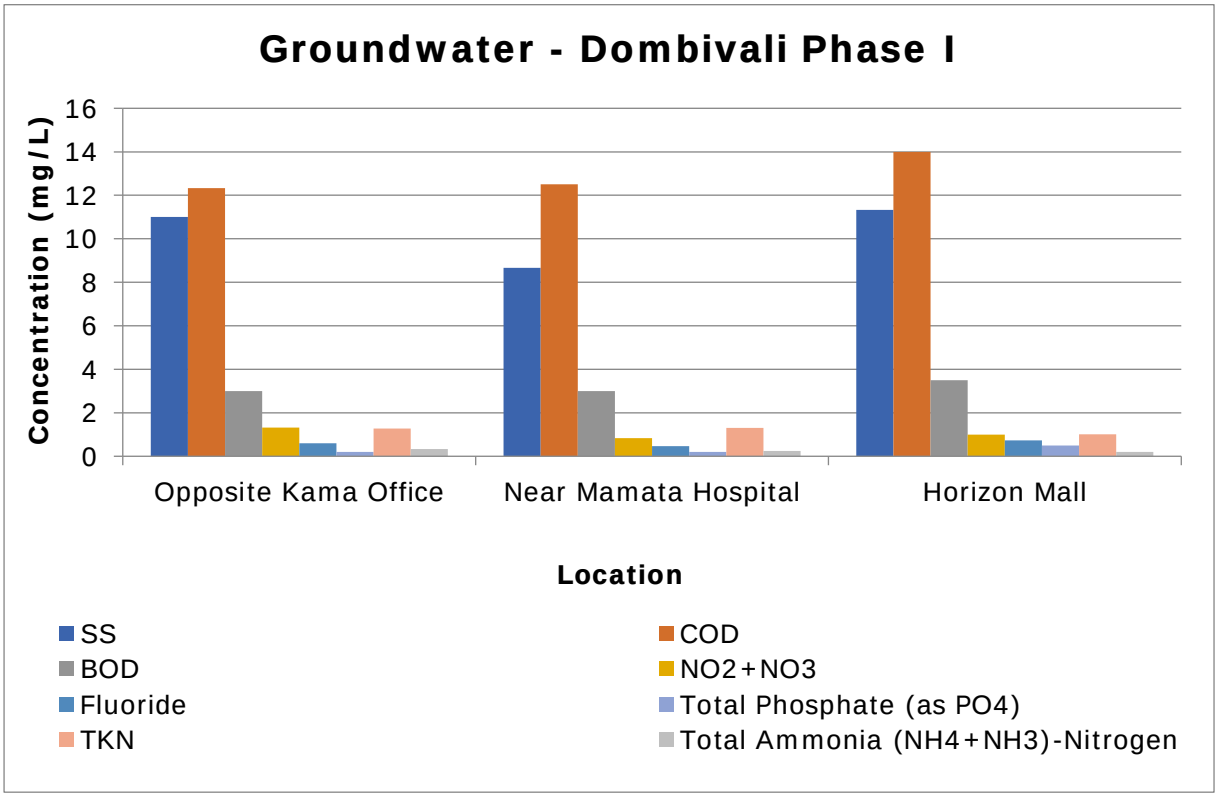
Fig. Geographical Locations of Groundwater Sampling MIDC Dombivali Phase I

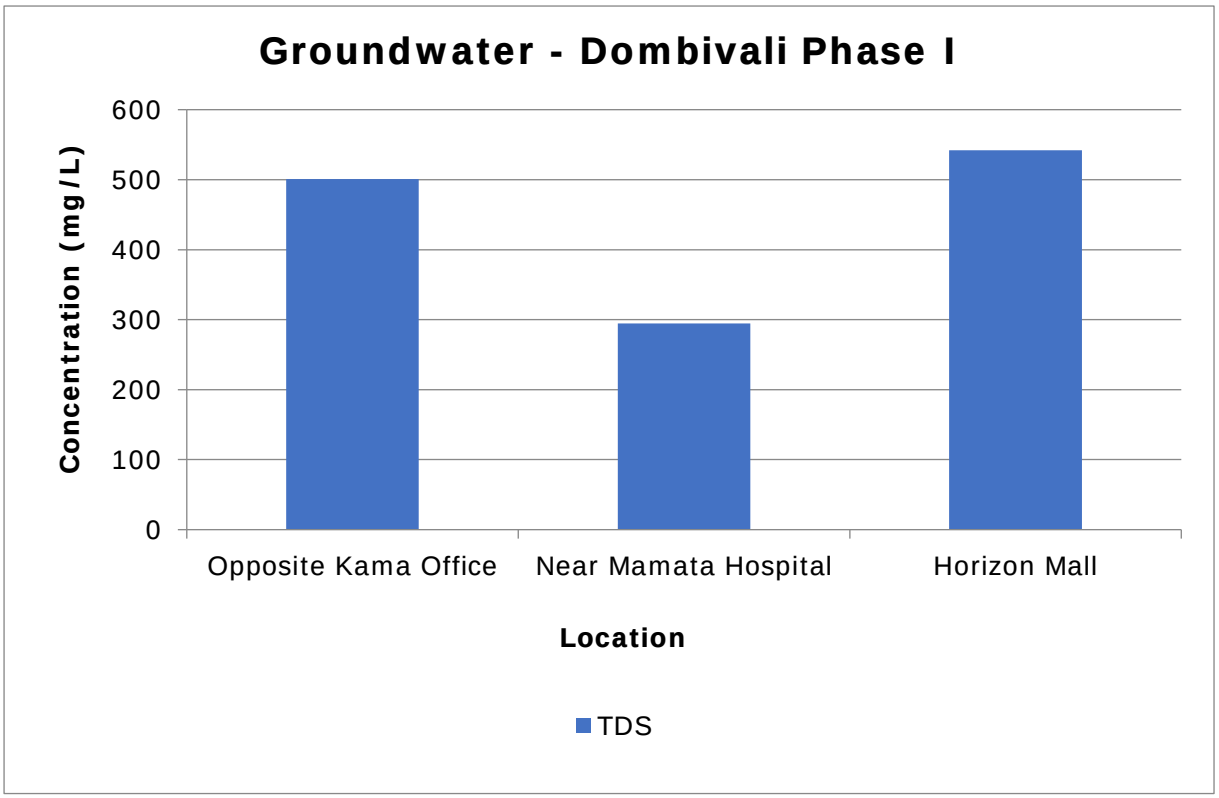
Table 7.2 Phase I – Results of Groundwater

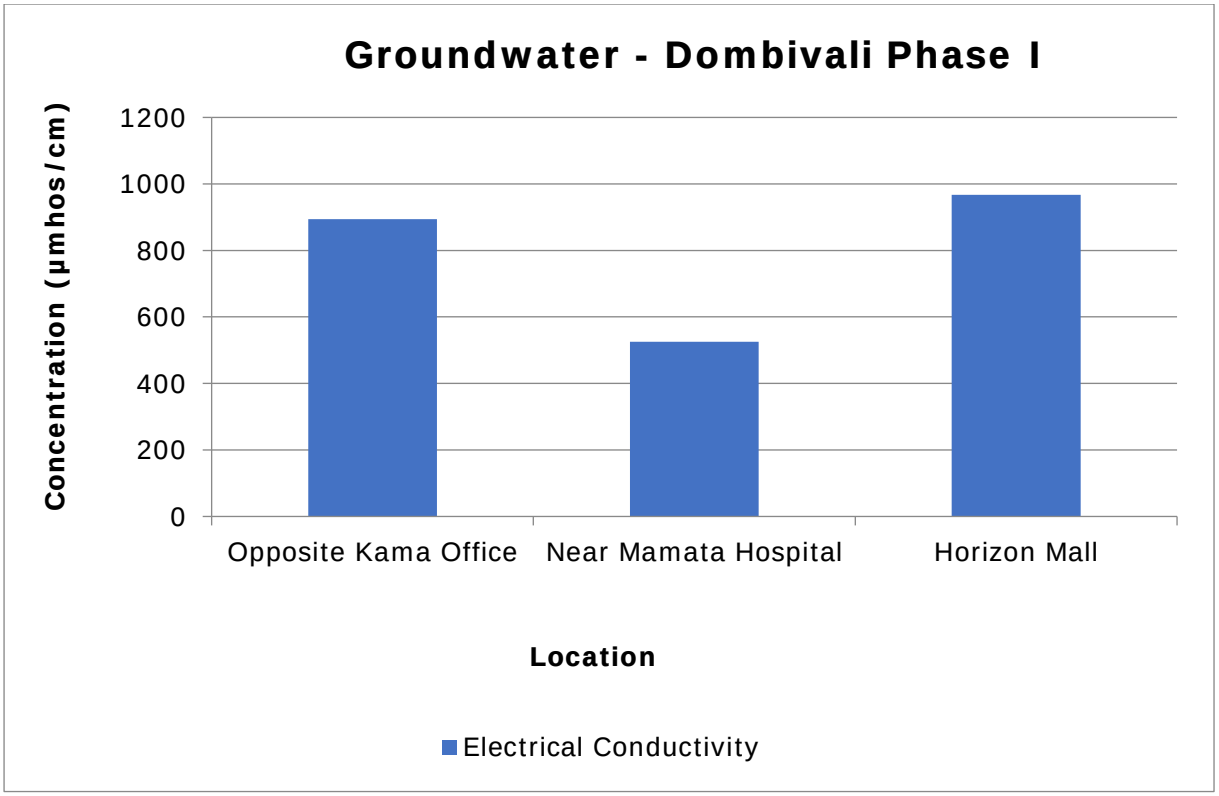
Parameters	Unit	Results		
		Bore well opposite Kama Office	Bore well Near Mamata Hospital	Bore well at Horizon Hall
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	No Floating Matter	No Floating Matter	No Floating Matter
Transparency	m	NA	NA	NA
Temperature	^oC	29	29	29
Colour	Hazen	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.71	7.62	7.60
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Suspended Solids	mg/L	11.00	8.67	11.33
Total Dissolved Solids	mg/L	501	295	542
Chemical Oxygen Demand	mg/L	NA	NA	NA
Biochemical Oxygen Demand (3 days,27^oC)	mg/L	12	13	14
Electrical Conductivity (at 25 ^oC)	µmho/cm	3	3	4
Nitrite Nitrogen (as NO_2)	mg/L	894	525	968
Nitrate Nitrogen (as NO_3)	mg/L	BLQ	0.06	0.05
(NO_2 + NO_3)-Nitrogen	mg/L	1.31	0.81	0.98

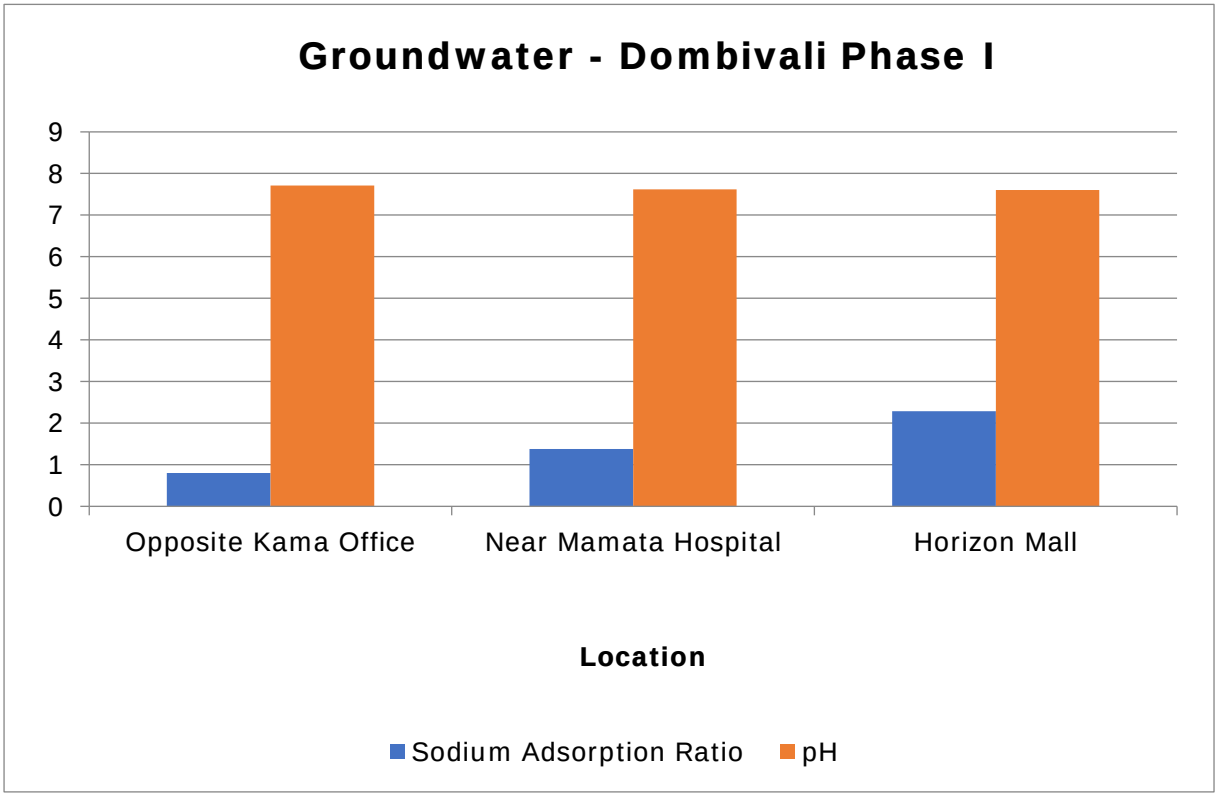
Parameters	Unit	Results		
		Bore well opposite Kama Office	Bore well Near Mamata Hospital	Bore well at Horizon Hall
Free Ammonia (as NH_3-N)	mg/L	1.31	0.83	0.99
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	BLQ	BLQ	BLQ
Sulphide (as H_2S)	mg/L	0.60	0.47	0.73
Dissolved Phosphate (as P)	mg/L	BLQ	BLQ	BLQ
Sodium Adsorption Ratio	-	BLQ	BLQ	0.18
Total Coliforms	MPN Index/ 100 ml	0.80	1.38	2.29
Faecal Coliforms	MPN Index/ 100 ml	574	78	<1.8
Total Phosphate (as P)	mg/L	469	14	<1.8
Total Kjeldahl Nitrogen (as N)	mg/L	0.20	0.20	0.50
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	1.27	1.31	1.01
Total Nitrogen	mg/L	0.34	0.24	0.21
Phenols (as C_6H_5OH)	mg/L	2.58	2.13	2.00
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	0.18	1.04	0.07
Copper (as Cu)	mg/L	0.01	BLQ	0.01
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	0.03	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	0.01	BLQ	BLQ
Lead (as Pb)	mg/L	0.01	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.10	0.07	0.04
Iron (as Fe)	mg/L	0.95	0.70	0.69
Vanadium (as V)	mg/L	BLQ	BLQ	0.03
Selenium (as Se)	mg/L	0.02	BLQ	0.01
Boron (as B)	mg/L	0.24	0.75	0.38
Bioassay Test on fish	% survival	100	100	100

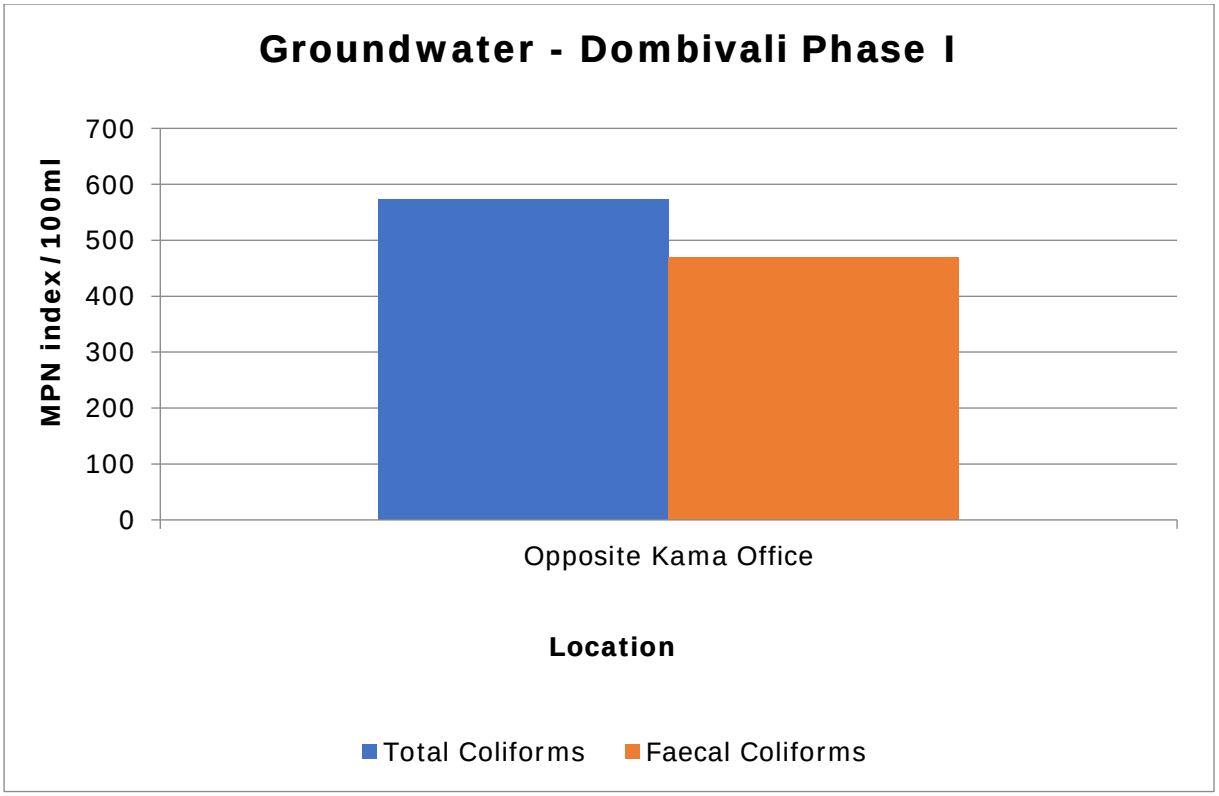
Graphs - Groundwater Quality of MIDC Dombivali Phase I

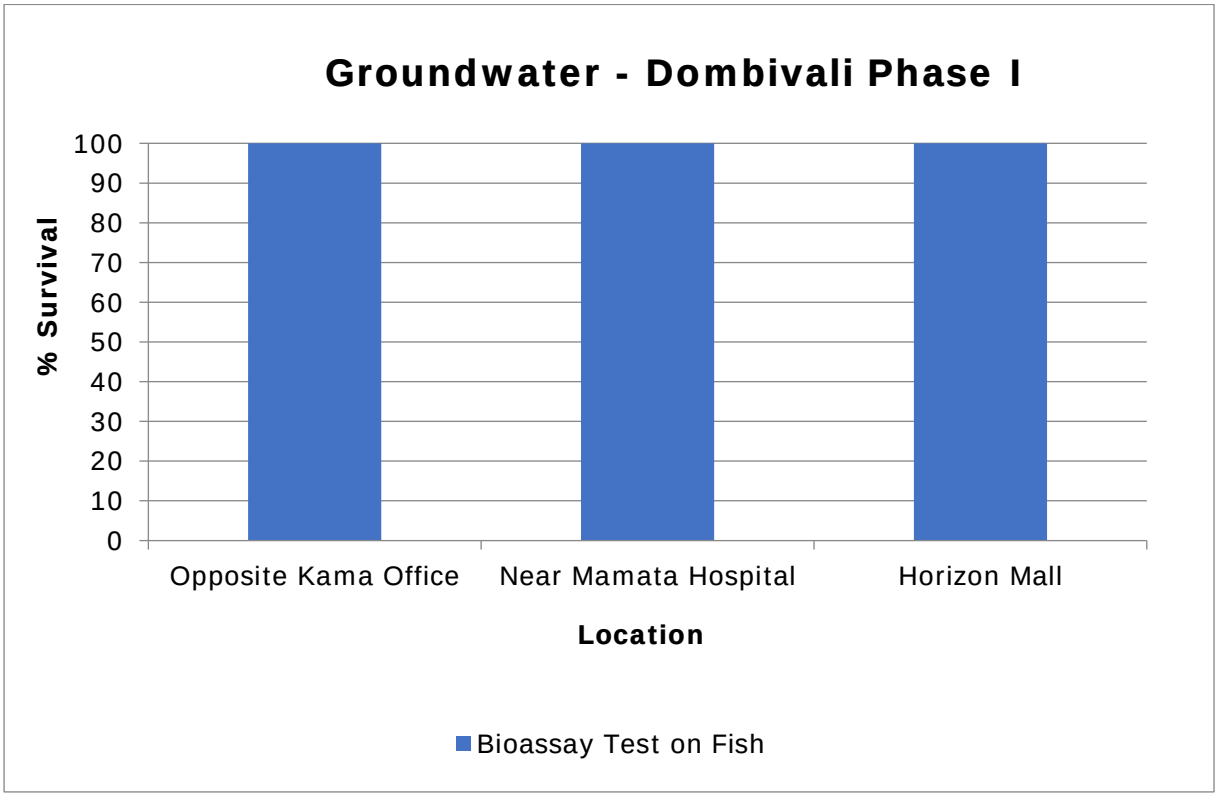





Groundwater - Dombivali Phase I
Concentration (µmhos/cm)
1200
1000
800
600
400
200
0
Opposite Kama Office
Near Mamata Hospital
Horizon Mall
Location
Electrical Conductivity


Groundwater - Dombivali Phase I
9
8
7
6
5
4
3
2
1
0
Opposite Kama Office
Near Mamata Hospital
Horizon Mall
Location
Sodium Adsorption Ratio
pH


Groundwater - Dombivali Phase I
MPN index/100ml
700
600
500
400
300
200
100
0
Opposite Kama Office
Location
Total Coliforms
Faecal Coliforms


Groundwater - Dombivali Phase I
% Survival
100
90
80
70
60
50
40
30
20
10
0
Opposite Kama Office
Near Mamata Hospital
Horizon Mall
Location
Bioassay Test on Fish

2. **MIDC Phase II:** From MIDC Phase II, three groundwater samples are collected.

- All three water samples collected were found acceptable in general appearance, colour, smell and transparency.
- pH and suspended solids were observed within the limits at both the samples collected.
- Electrical conductivity of Bore well Lodha Vihar was high at 2433µmhos/cm.
- Parameters like Total Residual Chlorine, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also met the criteria as prescribed by CPCB.
- All metals like Arsenic, Nickel, Copper, Iron, Hexavalent Chromium (Cr^{6+}) etc. are observed either below the limit of quantification or below their standard limits.
- The concentration of Total Kjeldahl Nitrogen (TKN) exceeded the permissible limit in all the Groundwater samples collected from MIDC Phase II.
- Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) were also observed below the limit of quantification in all 3 samples collected.
- Organo Chlorine Pesticides were found below the detectable limit in both samples collected.

Table 7.3 Phase II – Details of Sampling Location of Groundwater

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Bore well water Pimpleshwar Mahadev Temple	19°11'37.88"N	73° 5'41.06"E	26.06.2024	28.06.2024	30.06.2024
2.	Bore well Hardikar Hospital	19°12'21.16"N	73° 5'28.58"E	26.06.2024	28.06.2024	30.06.2024
3.	Borewell at Lodha Vihar	19°11'27.55"N	73° 5'15.26"E	26.06.2024	28.06.2024	30.06.2024

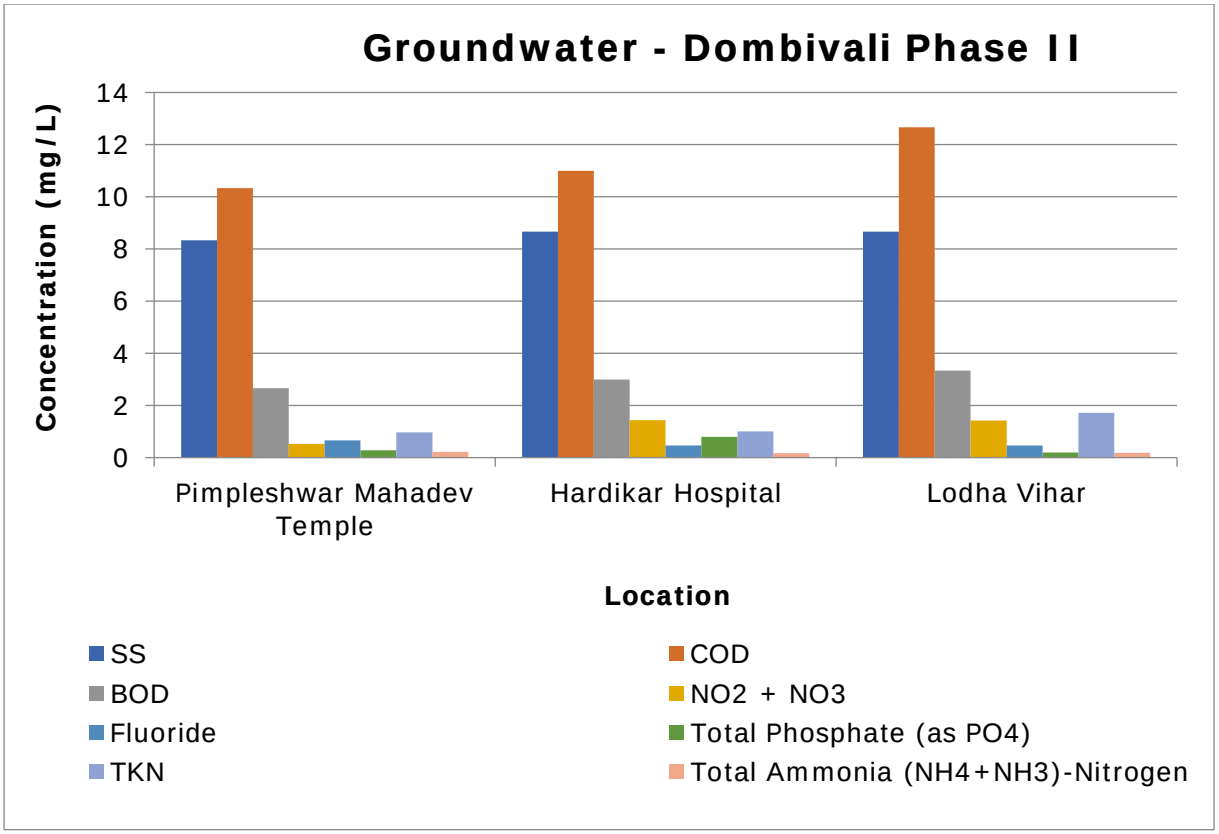
Fig. Geographical Locations of Groundwater Sampling MIDC Dombivali Phase II

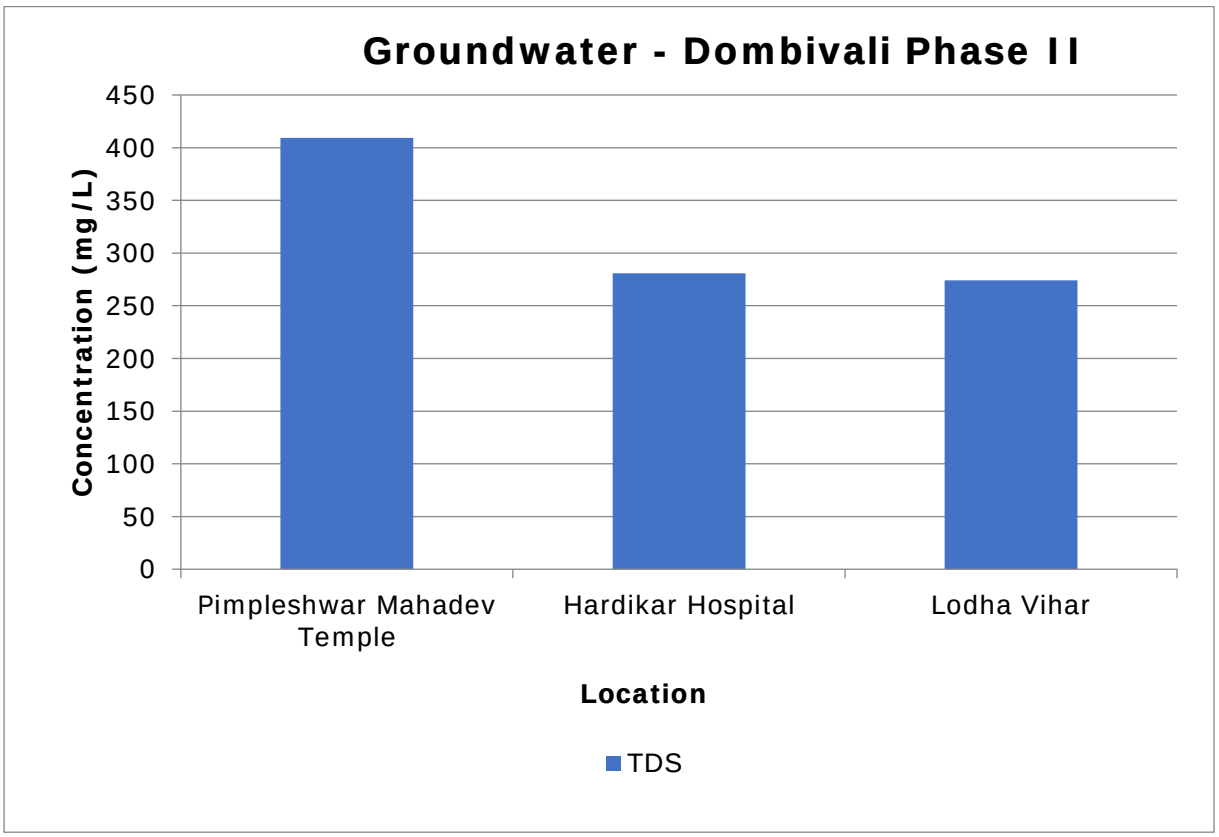
Table 7.4 Phase II – Results of Groundwater

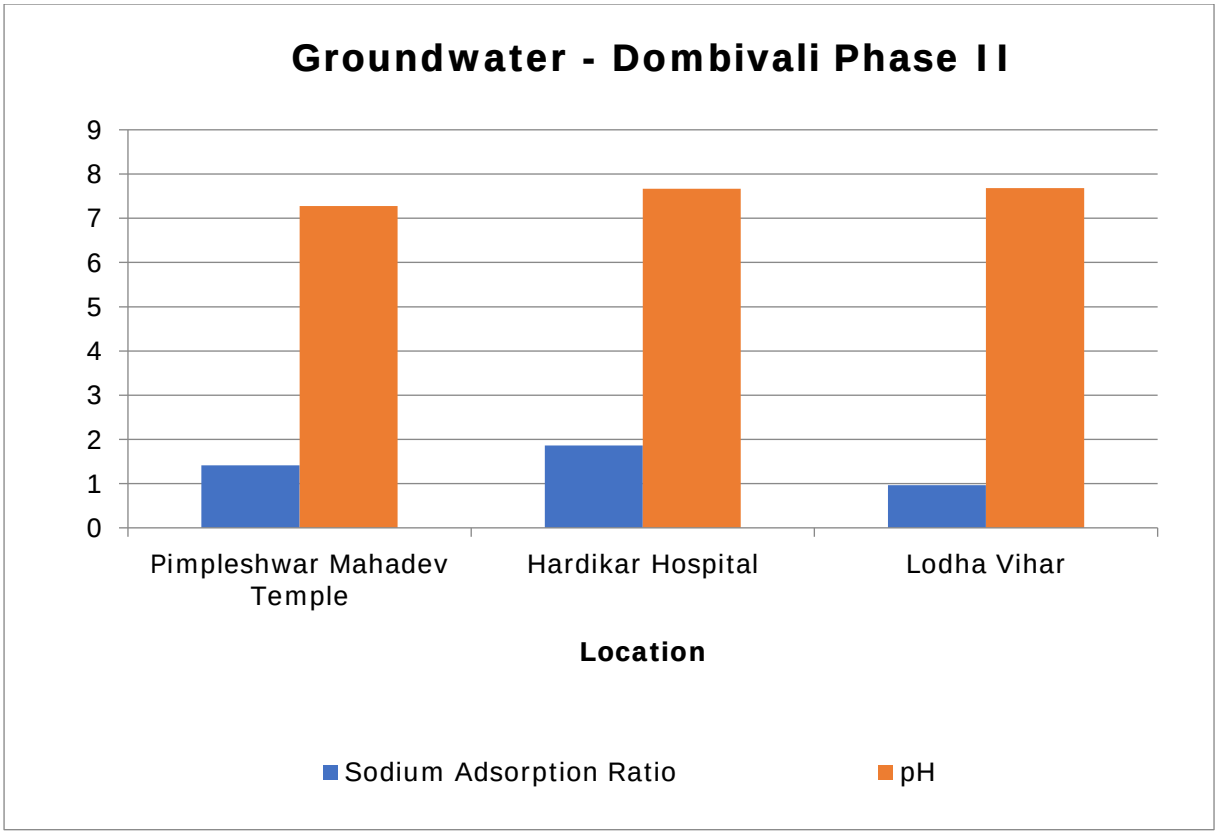
Parameters	Unit	Results		
		Pimpleshwar Mahadev Temple	Hardikar Hospital	Lodha Vihar
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	No Floating Matter	No Floating Matter	No Floating Matter
Transparency	m	NA	NA	NA
Temperature	^{o}C	30	29	29
Colour	Hazen	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.27	7.67	7.68
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Suspended Solids	mg/L	8.33	8.67	8.67
Total Dissolved Solids	mg/L	409	281	274
Chemical Oxygen Demand	mg/L	NA	NA	NA
Biochemical Oxygen Demand (3 days, 27^{o}C)	mg/L	10	11	13
Electrical Conductivity (at 25 ^{o}C)	µmho/cm	3	3	3
Nitrite Nitrogen (as NO_2)	mg/L	0.03	0.05	0.21
Nitrate Nitrogen (as NO_3)	mg/L	0.52	1.41	1.28
(NO_2 + NO_3)-Nitrogen	mg/L	0.53	1.44	1.42

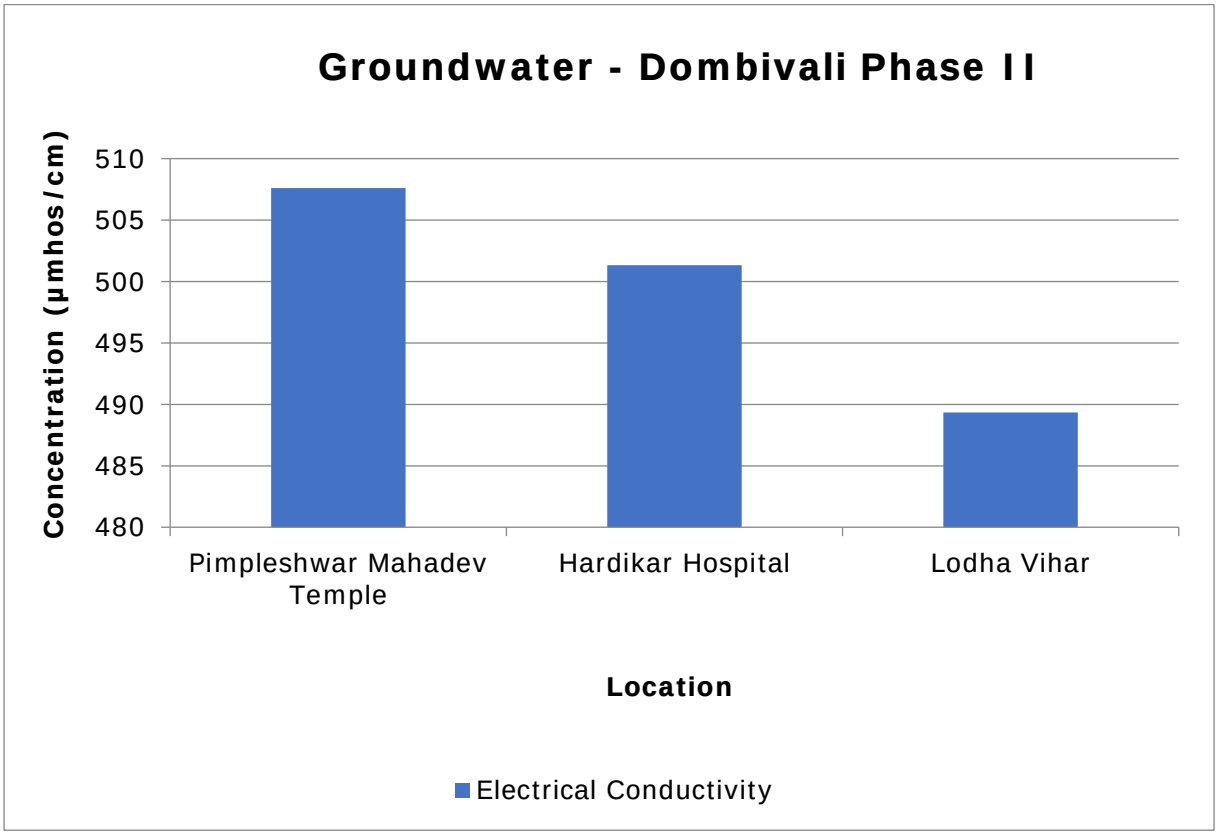
Parameters	Unit	Results		
		Pimpleshwar Mahadev Temple	Hardikar Hospital	Lodha Vihar
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.67	0.47	0.47
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.12	BLQ	0.20
Sodium Adsorption Ratio	-	1.41	1.86	0.96
Total Coliforms	MPN Index/ 100 ml	193	52	84
Faecal Coliforms	MPN Index/ 100 ml	12	19	14
Total Phosphate (as P)	mg/L	0.28	0.80	0.20
Total Kjeldahl Nitrogen (as N)	mg/L	0.97	1.01	1.72
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.23	0.17	0.19
Total Nitrogen	mg/L	1.50	2.44	3.14
Phenols (as C_6H_5OH)	mg/L	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.69	1.11
Nickel (as Ni)	mg/L	0.07	0.02	BLQ
Copper (as Cu)	mg/L	0.03	0.03	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.05	BLQ	BLQ
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	0.04	0.03
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.35	0.78	BLQ
Iron (as Fe)	mg/L	0.17	0.42	0.57
Vanadium (as V)	mg/L	0.01	BLQ	BLQ
Selenium (as Se)	mg/L	BLQ	BLQ	BLQ
Boron (as B)	mg/L	1.07	0.12	0.14
Bioassay Test on fish	% survival	100	100	100

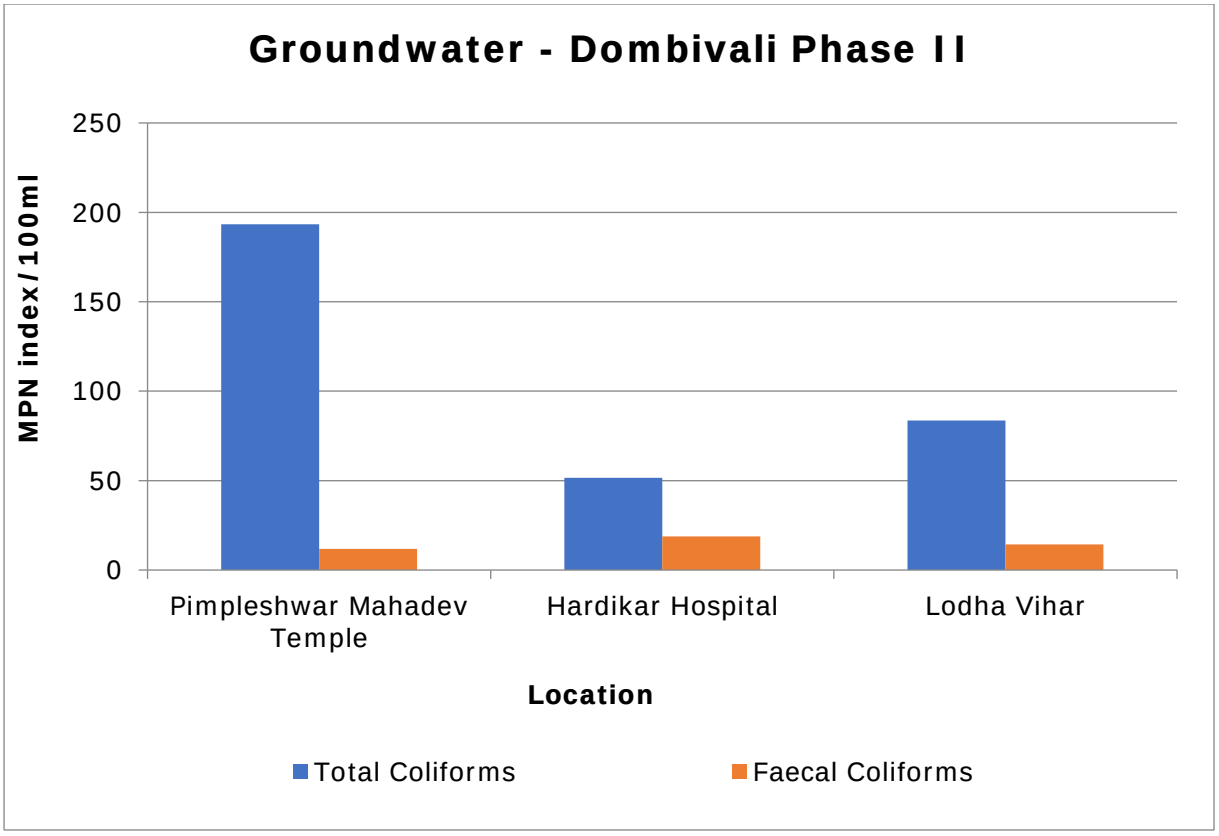
Graphs - Groundwater Quality of MIDC Dombivali Phase II

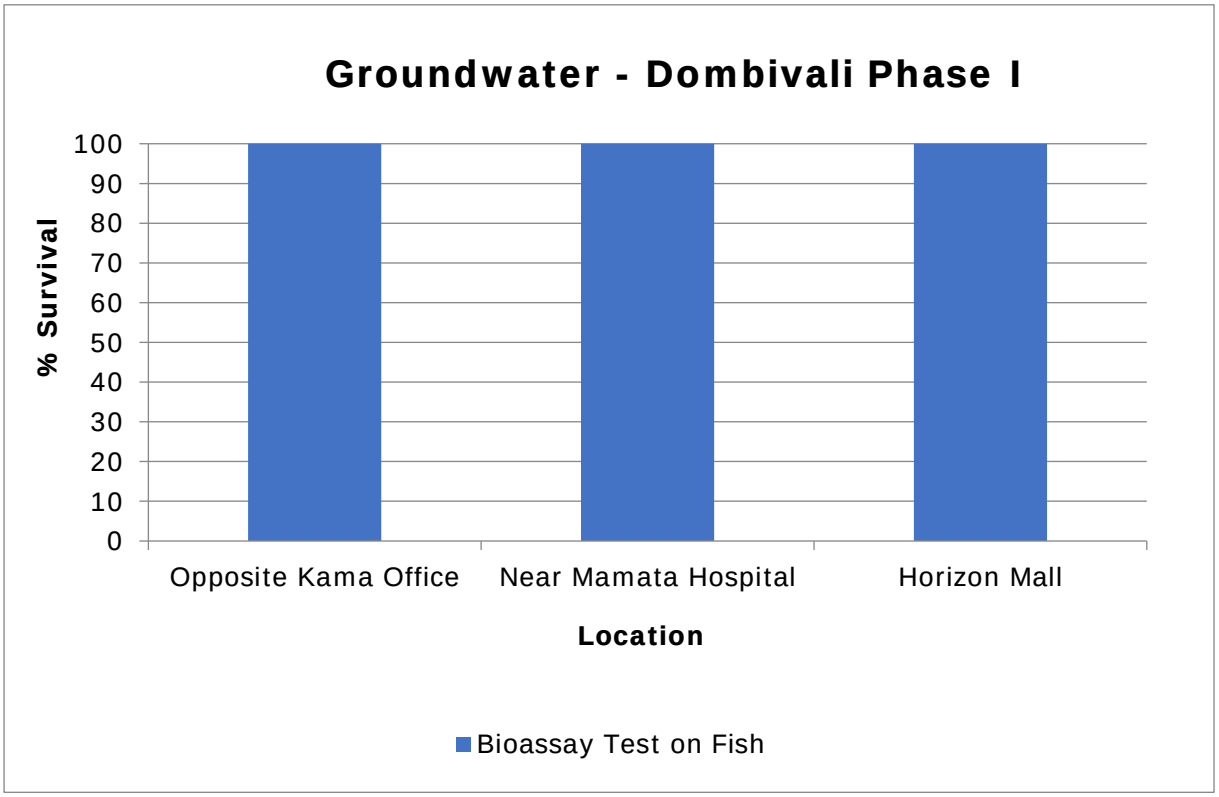

Groundwater - Dombivali Phase II
Concentration (mg/L)
14
12
10
8
6
4
2
0
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
SS
COD
BOD
NO2 + NO3
Fluoride
Total Phosphate (as PO4)
TKN
Total Ammonia (NH4+NH3)-Nitrogen


Groundwater - Dombivali Phase II
Concentration (mg/L)
450
400
350
300
250
200
150
100
50
0
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
TDS


Groundwater - Dombivali Phase II
9
8
7
6
5
4
3
2
1
0
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
Sodium Adsorption Ratio
pH


Groundwater - Dombivali Phase II
Concentration (µmhos/cm)
510
505
500
495
490
485
480
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
Electrical Conductivity


Groundwater - Dombivali Phase II
MPN index/100ml
250
200
150
100
50
0
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
Total Coliforms
Faecal Coliforms


Groundwater - Dombivali Phase I
% Survival
100
90
80
70
60
50
40
30
20
10
0
Opposite Kama Office
Near Mamata Hospital
Horizon Mall
Location
Bioassay Test on Fish

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/ Groundwater 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 Groundwater in & around the industrial cluster and health related statistics.

Table 8.1 CEPI score of the Pre-monsoon season 2024 is given below

	A1	A2	A	B	C	D	CEPI
Air Index	3.5	4	14	0	10	5	**29.0**
Water Index	2	4	8	23.5	10	5	46.5
Land Index	1.5	4	6	30	10	5	51.0
						Aggregated CEPI	**57.6**

Among all Environment Pollution Indices (EPI), Land Environment Pollution Index is the highest with a score of 51.0. The reason for the higher Land EPI is the exceedance of Iron concentration in all the water samples.

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI score June 2024	29.00	46.50	51.00	**57.60**
CEPI score March 2024	38.50	40.30	32.50	**47.80**
CEPI score June 2023	28.30	54.80	30.00	**58.60**
CEPI Score March 2023	34.30	57.50	45.00	**64.10**
CEPI score June 2021	21.00	56.00	45.00	**60.20**
CEPI Score March 2021	21.00	59.80	48.00	**63.90**
CEPI score March 2020	57.30	49.00	29.30	**63.40**
CEPI score June 2019	44.10	38.50	42.30	**53.20**
CEPI score March 2019	45.90	41.55	40.90	**55.09**
CEPI score June 2018	46.31	40.60	46.20	**46.20**

	Air Index	Water Index	Land Index	CEPI
CEPI score March 2018	54.88	48.63	46.04	**64.98**
CPCB CEPI score March 2018	62.00	63.50	27.25	**69.67**

The result shows that CEPI score of the Dombivali region is 57.6. This time CEPI is observed lower than the CPCB CEPI score March 2018 which was 69.67.

CEPI Score Calculation:

Dombivali, Maharashtra - CEPI - JUNE 2024

Ambient Air Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
CO	B	2	Large	
Benzene	C	1		
PM_{10}	B	0.5		
		3.5	**4**	**14**

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)	
CO	1.39	2	0.70	0	8	0.00	L	0
Benzene	2.08	5	0.42	0	8	0.00	L	0
PM_{10}	64.92	100	0.65	0	8	0.00	L	0
B score = (B1+B2+B3)							**B**	**0**

C	**10**	**>10 %**
D	**5**	**A-IA-A**

Air CEPI	(A+B+C+D)	29.0

Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
TKN	A	1	Large	
Se	B	0.5		

BOD	B	0.5		
		2	**4**	**8**

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)	
TKN	3.70	3	1.23	4	13	0.38	M	13.5
Se	0.04	0.01	4.00	2	13	0.62	H	6
BOD	8.96	8	1.12	3	13	0.26	M	4
B score = (B1+B2+B3)							**B**	**23.5**

C	**10**	**>10 %**
D	**5**	**A-IA-A**

Water CEPI	**(A+B+C+D)**	**46.5**

Ground Water Quality Analysis Report

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

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF Value (6) [(6)=(4)/(5)x(3)]	SNLF score (B)	
Fe	0.58	0.3	1.93	6	6	1.93	C	30
F	0.57	1.5	0.38	0	6	0.00	L	0
TDS	383.67	2000	0.19	0	6	0.00	L	0
B score = (B1+B2+B3)							**B**	**30**

C	**10**	**>10 %**
D	**5**	**A-IA-A**

Land CEPI	**(A+B+C+D)**	**51.0**

Land CEPI Score (im) **51.0**

Water CEPI score (i2) **46.5**

Air CEPI Score (i3)	**29.0**
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	**57.6**

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.
- In the CEPI score calculated for Air Environment by CPCB in March 2018, PM_{10} and $PM_{2.5}$ have exceeded which may also be due to the vehicular emissions.

Surface Water Quality

- Higher concentration of BOD and Total Kjeldahl Nitrogen (TKN) was observed in the 3-4 surface water samples collected which may be due to an increase in microbial activity, leaking septic systems or discharges from sewage treatment plants.
- All the industries in the Dombivali region are either reusing the treated trade effluent as sewage in their process or gardening or are disposed into Sea.
- In the CEPI score calculated for Water Environment by CPCB in March 2018, the concentration of BOD and total ammoniacal nitrogen exceeded at all samples collected.

Groundwater Quality

- Groundwater samples were collected from different Bore well in the region.
- In the present study, concentration of Iron is found to exceed in all the water samples.
- In the CEPI score calculated for Land Environment by CPCB in March 2018, BOD and Total Ammonia Nitrogen have exceeded in all the samples collected.
- Identification of contamination of Groundwater is difficult as there are many sources.

CEPI Score

- The CEPI Score pre-monsoon season is 57.6.
- In comparison with the CEPI Score of June 2023, water indices decreased substantially, however little increase is observed in the Air as well as land Indices this year.
- Collective efforts of MPCB, administration and environmental organizations have resulted in improved and safer groundwater. This shows a decline in pollution levels in Dombivali.
- The present study is the compilation of pre-monsoon season, which results in dilution of environmental samples resulting in lower pollution load, hence also affecting the total score.
- In conclusion, a decrease of approx. 17% in CEPI score is observed from 69.67 of the CPCB score
- of March 2018 to 57.6 in June 2024.

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

- Drive against open burning of bio-mass, crop residue, garbage, leaves, etc.
- **Organic Waste Compost machines**: Residential complexes or Commercial complexes more than 20,000 sqm BUA has installed organic waste compost machines individually.
- **Waste collection and segregation centres**: KDMC has provided waste collection segregation centres at various places and also segregation is carried out at MSW processing sites.
- **Construction of Common Effluent Treatment plant (CETP)**: Two CETPs are in operation. 1. CETP having capacity 16 MLD for textile effluent 2, CETP having capacity 1.5 MLD for chemical effluent.
- **Installation of CEMS installed for Air and Water in Large and Medium scale RED category industries**: Online monitoring system with SCADA and NRV system provided by the industries.
- Arrangement of scientific collection and treatment of sewage generated: KDMC has provided 9 STPs, out of which 6 STPs are in operation. Rest will be brought into operation, so as to cater the entire 216 MLD domestic effluent.
- Installation of CAAQMS station: Two stations
- Number of CAAQMS proposed for future: Two stations are installed one is at Pimpleshwar Temple, MIDC Dombivali, Phase-II and second at 'B' Ward KDMC, Kalyan (W).
- Two Monitoring stations under the National Water Quality Monitoring Programme (NWMP) are established.
- Steps are taken for industrial areas/other units to recycle 100% treated effluent to achieve zero liquid discharge (ZLD)- Forty units have achieved Zero Liquid Discharge.
- Steps taken to reduce dust emission:-

  1. Board has changed the norms of TPM from 150 mg/Nm^3 to 50 mg/Nm^3 in consent.

  2. Board is promoting the use of PNG as fuel to the boiler.

  3 Concreted road with tree plantation along the road is going on
- Tree plantation: 6000 nos.
- Other initiatives taken to control and reduce pollution in air, surface water and groundwater:

  a) To know the status of air quality in Kalyan Dombivali area MPC Board has installed two CAAQM stations and two AAQM stations. Out of which two are installed in MIDC area and other two are installed other than MIDC area.

  b) The MPC Board is continuously in touch with industry to use the proper quantity of fuel to the boiler to avoid the overload and thereby emission. As well as ensure that air pollution control system provided by industry are continuously operation are not

  c) Night monitoring was also carried out to check the status during the night period.

  d) Industries located in the MIDC area are discharging partially treated effluent to CETP through underground pipelines. No direct discharge of effluent to the nallah by the industries.

- Introduction of Deep Clean Drive Campaign, wherein Daily Targeted Roads are Washed & Cleaned using Non-Potable Water.

- In F.Y 2023-24, from Last Winter i.e., Start of Nov 2023 to till date, approx. 1,04,493.938 Kms. of road length is washed with the help of more than 5000 Tankers.
- For Suppression of road dust Sprinkling Machines & Misting Machines are deployed.
- Under Deep Clean Drive Campaign, more than 2250 MT of garbage & more than 875 MT of odd trash/abandoned materials were removed.
- Deployment of 114 E-buses, 67 old diesel buses [more than 10 years] are phased out from fleet & monthly average 35,500 litres of diesel is saved resulting in reduced carbon emissions.

Deployment of E-buses, and charging stations

PNG Crematorium

C&D Plant – 300 TPD

Stationary Water Cannons

Ambient Air Quality Monitoring (AAQM) Van

Continuous Ambient Air Quality Monitoring Station (CAAQMS)

12. Photographs

Dombivali Phase – I - Ambient Air Sampling Near main gate Balkrishna Industries Ltd.

Dombivali Phase – I- Ambient Air SamplingSagar Ice & Cold Storage Pvt. Ltd.

Dombivali Phase – II - Ambient Air Sampling Near main gate DEBSA CETP.

Dombivali Phase – II - Ambient Air Sampling Near main gate Apartim Equipment.

	
Dombivali Phase – I- Surface water sampling at Khambal Pada	**Dombivali Phase – I- Surface water sampling of Gharda Chemical Ltd.**
	
Dombivali Phase – I- Surface water Sampling from a Thakurli Talav	**Dombivali Phase – II- Tempo Naka Nallah**

	
Dombivali Phase – I- Ground water Sampling at opposite Kama Office	**Dombivali Phase – I- Ground water Sampling at Horizon hall**
	
Dombivali Phase – II- Ground water Sampling at Pimpleshwar Mahadev Temple	**Dombivali Phase – II- Ground water Sampling at Lodha Vihar**

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Pre-monsoon Season (April-2023-June2023) Study by Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	DOMBIVALI
Name of the major health center/ organization	Hambarde Hospital
Name and designation of the Contact person	Mr. Rajiv K. Hambarde
Address	Dombivli (east)

S No.	Diseases	No. of Patients Reported	
		Year 2022-2023	Year 2023-2024
AIRBORNE DISEASES			
1.	Asthma	22	18
2.	Acute Respiratory Infection	4	5
3.	Bronchitis	4	4
4.	Cancer	6	4
WATERBORNE DISEASES			
1.	Gastroenteritis	23	25
2.	Diarrhea	23	26
3.	Renal diseases	17	10
4.	Cancer	6	4

Date: 01/08/2023

Signature

Dr. Rajiv K. Hambarde (M.S.)
Reg. No. [illegible]
Consulting General & Laparoscopic Surgeon
HAMBARDE HOSPITAL
Reg. No. KMC / MD / [illegible]
Tal Pingle Chowk, Opp. Sarvesh Hall, Dombivli (E) - 421201

Name of the Polluted Industrial Area	DOMBIVALI
Name of the major health center/ organization	Minicipal Hospital
Name and designation of the contact person	Chief Medical Officer
Address	Kopar Rd Dombivali (west)

S-No.	Diseases	No- of patients Reported	
		Year 2022/2023	Year 2023/2024
AIRBORNE DISEASES			
1	Asthma	11	153
2	Acute Respiratory Infection	-	-
3	Bronchitis	-	-
4	Cancer	-	-
WATERBORNE DISEASES			
1	Gastroenteritis	33	67
2	Diarrhea	85	154
3	Renal diseases	-	-
4	Cancer	-	-

डॉ. सुहासिनी बडेकर
प्र. मुख्य वैद्यकीय अधिकारी,
शास्त्रीनगर सामान्य रुग्णालय,डोंबिवली विभाग
कल्याण डोंबिवली महानगरपालिका

HEALTH STATISTICS

Required for Comprehensive Environmental Pollution Index (CEPI) Pre-monsoon Season (April-2023-June2023) Study by Maharashtra Pollution Control Board (MPCB), MAHARASHTRA

Name of the Polluted Industrial Area (PIA)	DOMBIVALI
Name of the major health center/ organization	Mamta Hospital
Name and designation of the Contact person	DR. APEKSHA · KANCHAN
Address	P-43, PHASE 2, NEXT TO ICICI BANK, MIDC, DOMBIVILI-EAST THANE - 421 203.

S No.	Diseases	No. of Patients Reported	
		Year 2022-2023	Year 2023-2024
AIRBORNE DISEASES			
1.	Asthma	48	47
2.	Acute Respiratory Infection	189	185
3.	Bronchitis	140	139
4.	Cancer	—	—
WATERBORNE DISEASES			
1.	Gastroenteritis	114	119
2.	Diarrhea	78	80
3.	Renal diseases	—	—
4.	Cancer	—	—

Date: 23/7/2024

Signature