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

DOMBIVALI

Pre-Monsoon (April 2023 to June 2023)

MAHARASHTRA

LiFE Lifestyle for Environment

Maharashtra Pollution Control Board

Kalptaru Point, Sion East, Mumbai – 400 022

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 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. The concentration of PM_{10} and $PM_{2.5}$ are found within the limit prescribed by NAAQS, 2009. The concentration of surface water parameters of few locations is observed higher than its acceptable limit as domestic waste water drain is also connected with the surface water. In Groundwater, the concentration of Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) is found higher in one water sample of Dombivali Phase II.

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.

Maharashtra Pollution Control Board has taken various initiatives in reducing the CPCB CEPI Score of 69.67 in 2018 to 58.6 in June 2023. This shows a decrease by almost 19% 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 28.3, Surface Water is 54.8, and Groundwater is 30.0. The overall CEPI score for Dombivali area for the Pre-monsoon 2023 is 58.6.

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 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 based on the revised CEPI version 2016. The results of the application of the Comprehensive Environmental Pollution Index (CEPI) to select 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 the 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.

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

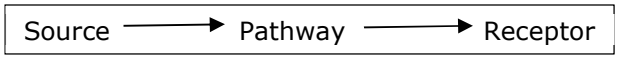
Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
Water Quality Monitoring	**Surface water** • Phase I-06 • Phase I-06	**12**	**(i) Simple Parameters** Sanitary Survey, General Appearance, Colour, Smell, Transparency and Ecological **(ii) Regular Monitoring Parameters** pH, O & G, Suspended 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 29th May and 2nd June 2023. 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	29.05.2023	31.05.2023	02.06.2023
2.	Near main gate DEBESA CETP	19°13'0.45"N	73°6'18.07"E	29.05.2023	31.05.2023	02.06.2023
3.	Near main gate Balkrishna Industries Ltd.	19°12'36.40"N	73°6'41.92"E	29.05.2023	31.05.2023	02.06.2023
4.	Near main gate Sagar Ice & Cold Storage Pvt. Ltd.	19°12'55.54"N	73°6'26.29"E	29.05.2023	31.05.2023	02.06.2023

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	29.05.2023	31.05.2023	02.06.2023
2.	Near main gate DEBESA CETP	19°13'0.45"N	73°6'18.07"E	29.05.2023	31.05.2023	02.06.2023

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	9.39	6.90	41.51	8.22
Nitrogen Dioxide (NO_2)	µg/m³	22.20	25.80	20.27	23.57
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	59	63	57	62
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	15	18	16	17
Ozone (O_3)	µg/m³	109	32	BLQ	69
Lead (Pb)	µg/m³	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1 h)	mg/m³	1.40	1.25	1.42	1.53
Carbon Monoxide (CO) (8 h)	mg/m³	1.67	1.67	1.70	2.10
Ammonia (NH_3)	µg/m³	87.77	105	168	125.37
Benzene (C_6H_6)	µg/m³	3.54	2.95	2.46	2.65
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	BLQ	BLQ	0.40	0.43
Nickel (Ni)	ng/m³	4.14	BLQ	BLQ	BLQ

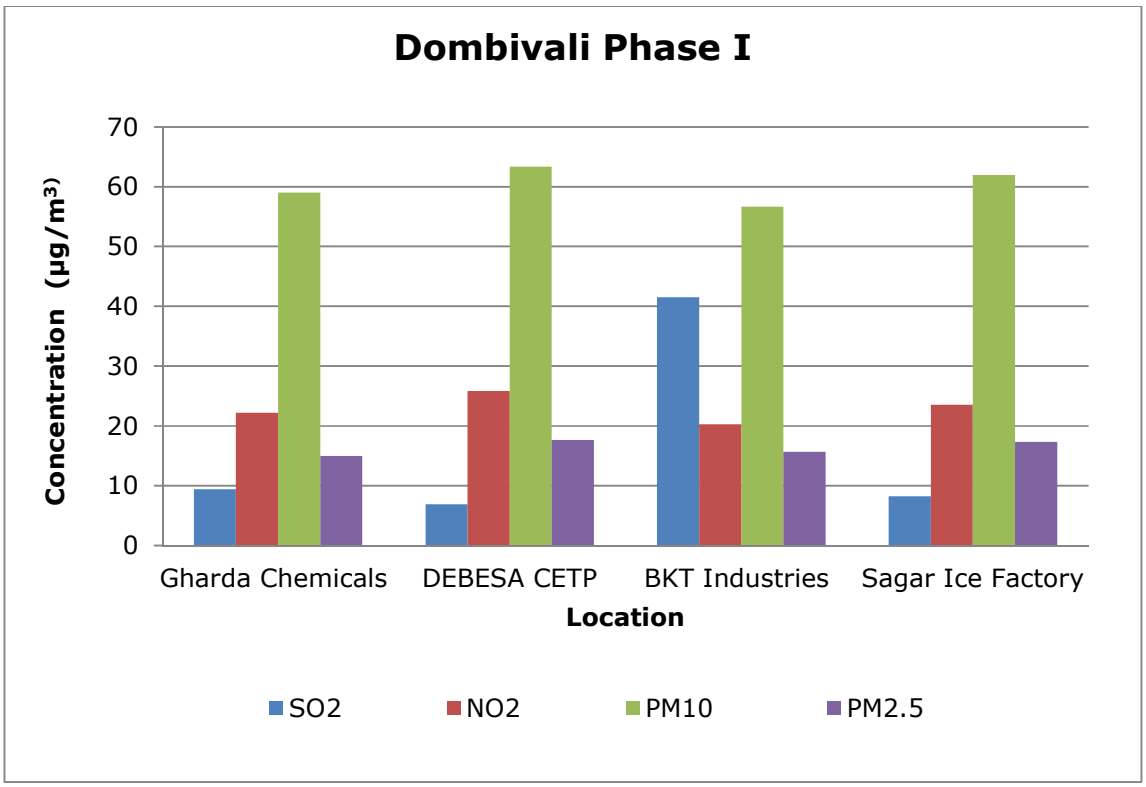
Table 5.4 Phase I - Volatile Organic Compounds (VOCs) in Ambient Air Results

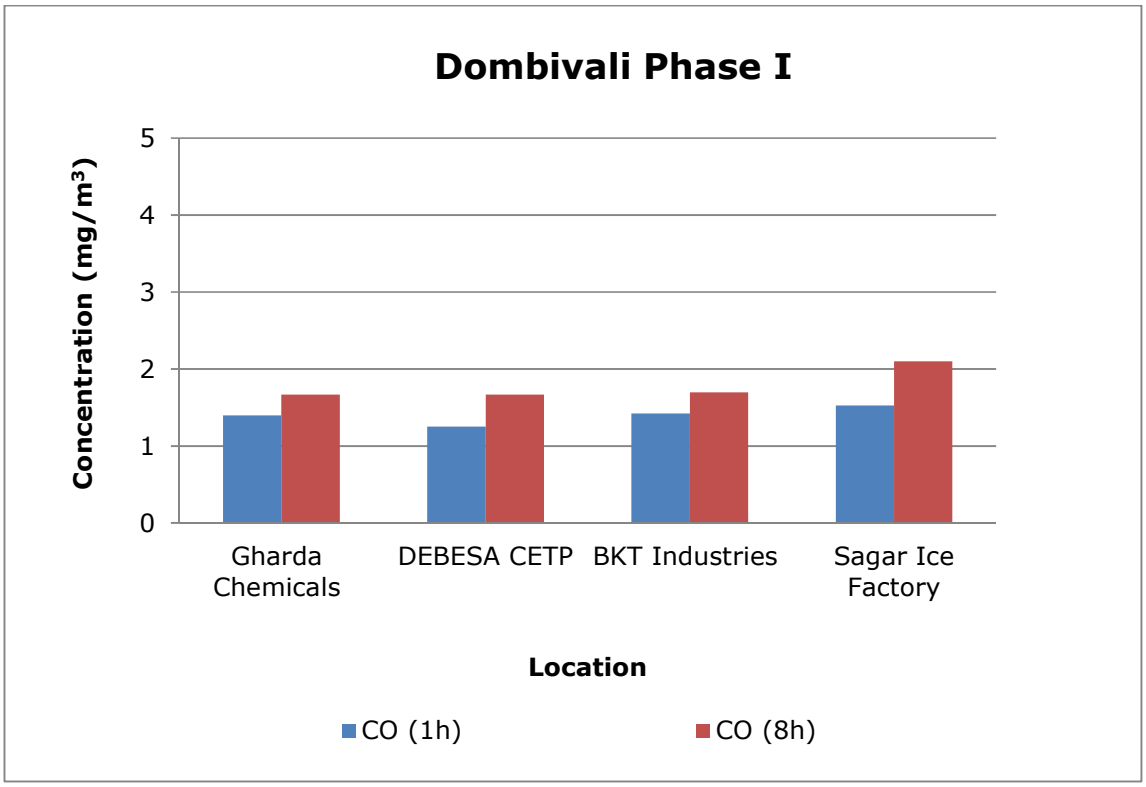
Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
Dichloromethane	µg/m³	1.29	1.34
Chloroform	µg/m³	1.22	0.61
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	0.81	0.56
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	9.51	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

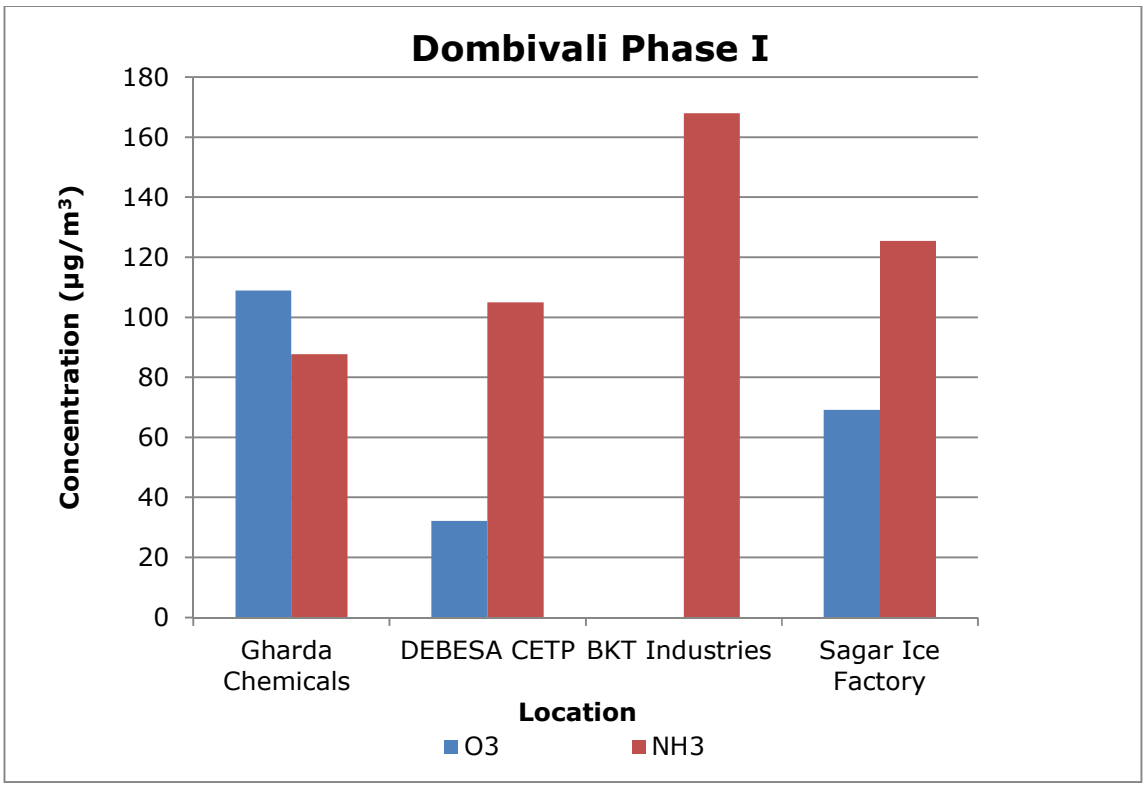
Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
1,2,4-Trimethylbenzene	µg/m³	BLQ	0.85
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	3.00	BLQ
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	2.41	2.22
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	6.86	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	0.70	2.58
1,1-Dichloropropylene	µg/m³	BLQ	BLQ
1,2-Dichloroethane	µg/m³	5.08	4.26
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	1.50	1.95
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	BLQ	BLQ
O-Xylene	µg/m³	BLQ	BLQ

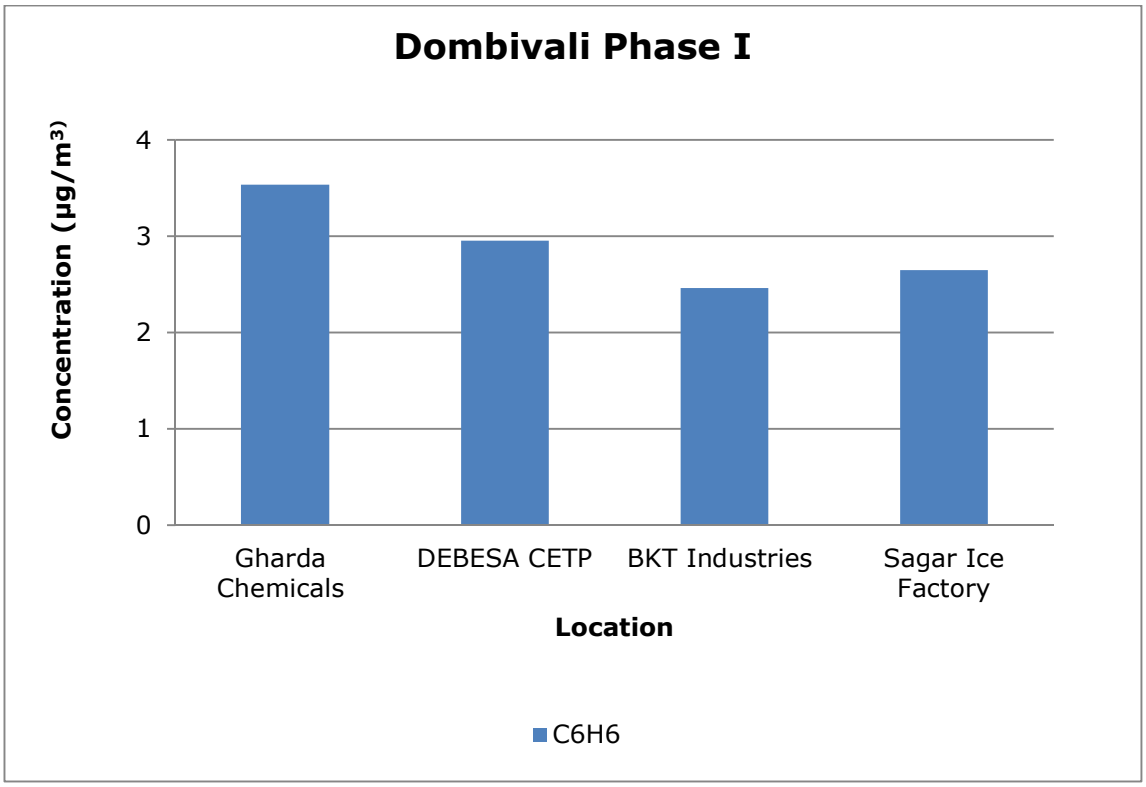
Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane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

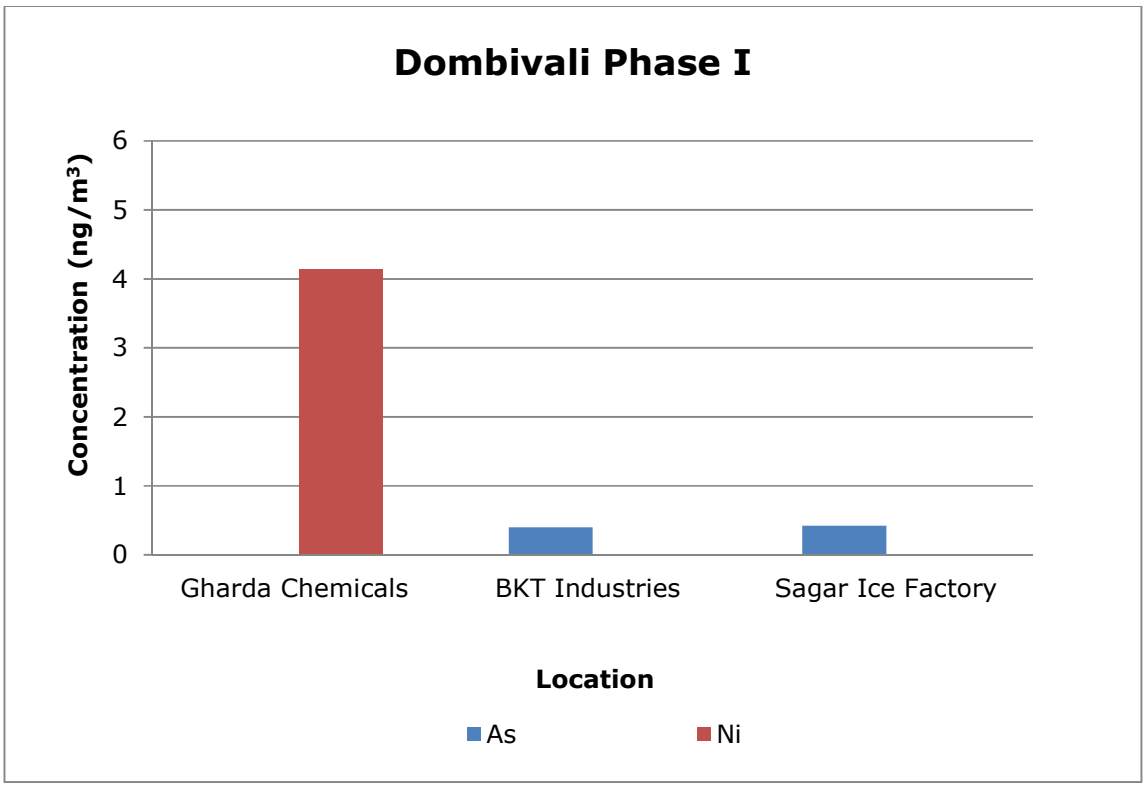
Graphs - Ambient Air Quality of MIDC Dombivali Phase I






Dombivali Phase I
Concentration (µg/m³)
180
160
140
120
100
80
60
40
20
0
Gharda Chemicals
DEBESA CETP
BKT Industries
Sagar Ice Factory
Location
O3
NH3


Dombivali Phase I
Concentration (µg/m³)
4
3
2
1
0
Gharda Chemicals
DEBESA CETP
BKT Industries
Sagar Ice Factory
Location
C6H6


Dombivali Phase I
Concentration (ng/m³)
6
5
4
3
2
1
0
Gharda Chemicals
BKT Industries
Sagar Ice Factory
Location
As
Ni

2. **MIDC Phase II:** In MIDC Phase II of Dombivali also all 4 locations monitored were well within the limits for all 12 parameters 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	05.06.2023	07.06.2023	09.06.2023
2.	Behind Connectwell Industries Pvt. Ltd.	19°11'37.12"N	73° 5'39.80"E	05.06.2023	07.06.2023	09.06.2023
3.	Near main gate Metropolitan Eximchem Ltd.	19°12'7.89"N	73° 5'56.18"E	05.06.2023	07.06.2023	09.06.2023
4.	Near main gate Apartim Equipment	19°12'22.33"N	73° 6'1.31"E	05.06.2023	07.06.2023	09.06.2023

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	05.06.2023	07.06.2023	09.06.2023
2.	Behind Connectwell Industries Pvt. Ltd.	19°11'37.12"N	73° 5'39.80"E	05.06.2023	07.06.2023	09.06.2023

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

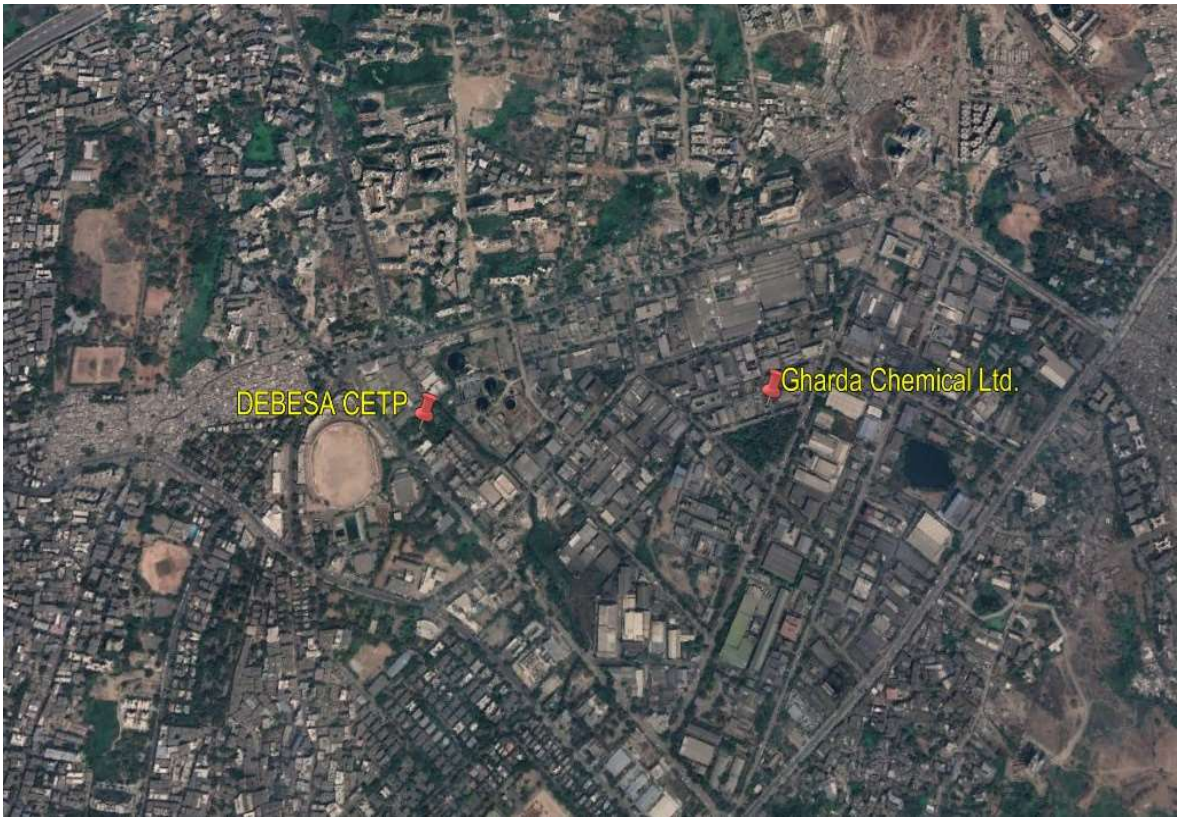


Fig. Geographical Locations of VOCs Monitoring MIDC Dombivali Phase II

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	43.93	7.55	7.58	10.05
Nitrogen Dioxide (NO_2)	µg/m³	15.60	15.63	16.10	13.37
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	58	62	67	61
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	14	16	18	17
Ozone (O_3)	µg/m³	145.00	22.10	BLQ	BLQ
Lead (Pb)	µg/m³	0.02	0.03	BLQ	0.06
Carbon Monoxide (CO) (1 h)	mg/m³	1.54	1.31	1.48	1.29
Carbon Monoxide (CO) (8 h)	mg/m³	1.95	1.72	2.09	1.61
Ammonia (NH_3)	µg/m³	112.60	126.00	116.77	57.70
Benzene (C_6H_6)	µg/m³	2.90	2.95	2.88	3.44
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	BLQ	BLQ	BLQ	BLQ
Nickel (Ni)	ng/m³	3.56	BLQ	BLQ	8.91

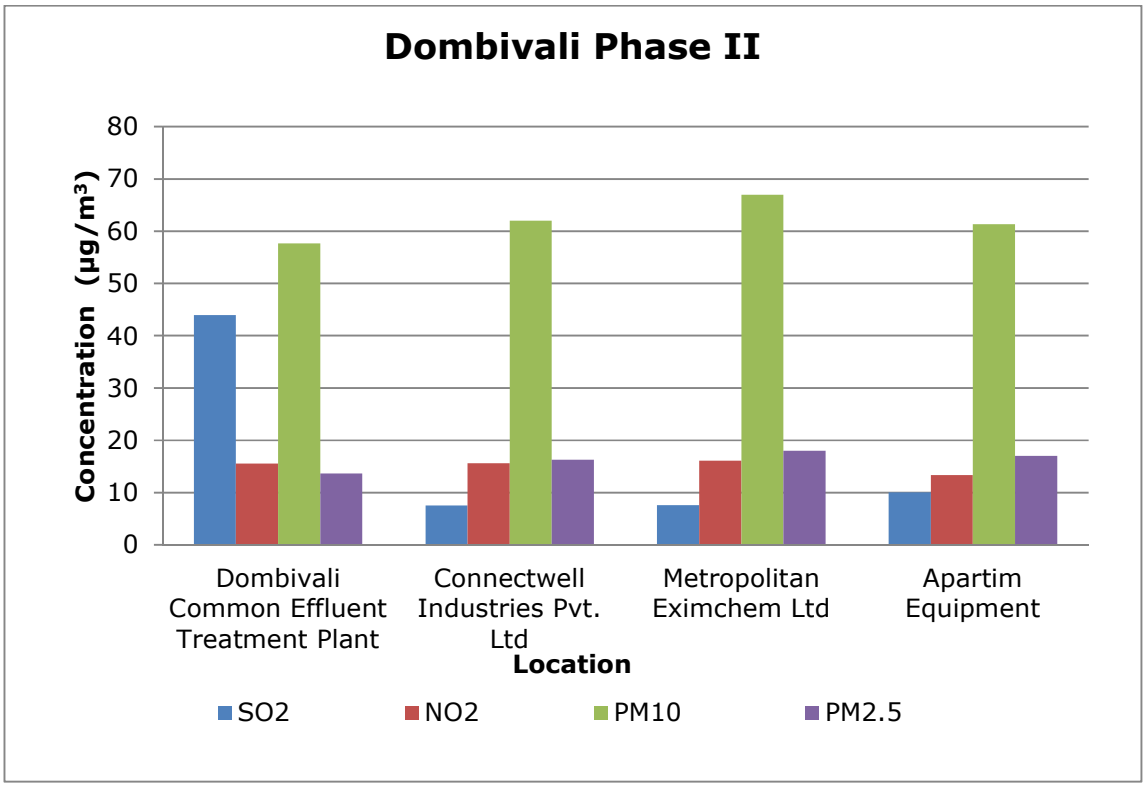
Table 5.8 Phase I - Volatile Organic Compounds (VOCs) in Ambient Air Results

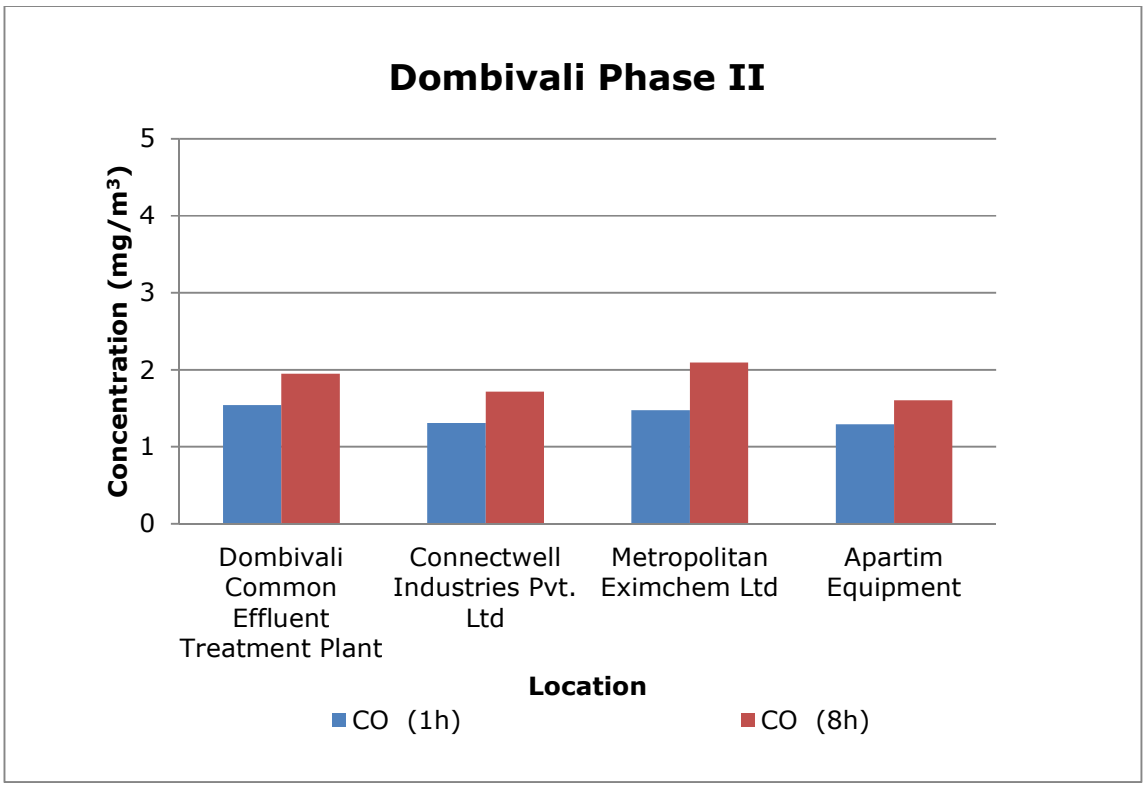
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
Dichloromethane	µg/m³	0.98	2.34
Chloroform	µg/m³	1.32	1.47
Carbon Tetrachloride	µg/m³	4.94	3.87
Trichloroethylene	µg/m³	0.77	1.26
Bromodichloromethane	µg/m³	BLQ	1.39
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	BLQ	BLQ
1,3-Dichlorobenzene	µg/m³	4.91	6.36
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	1.03	4.30

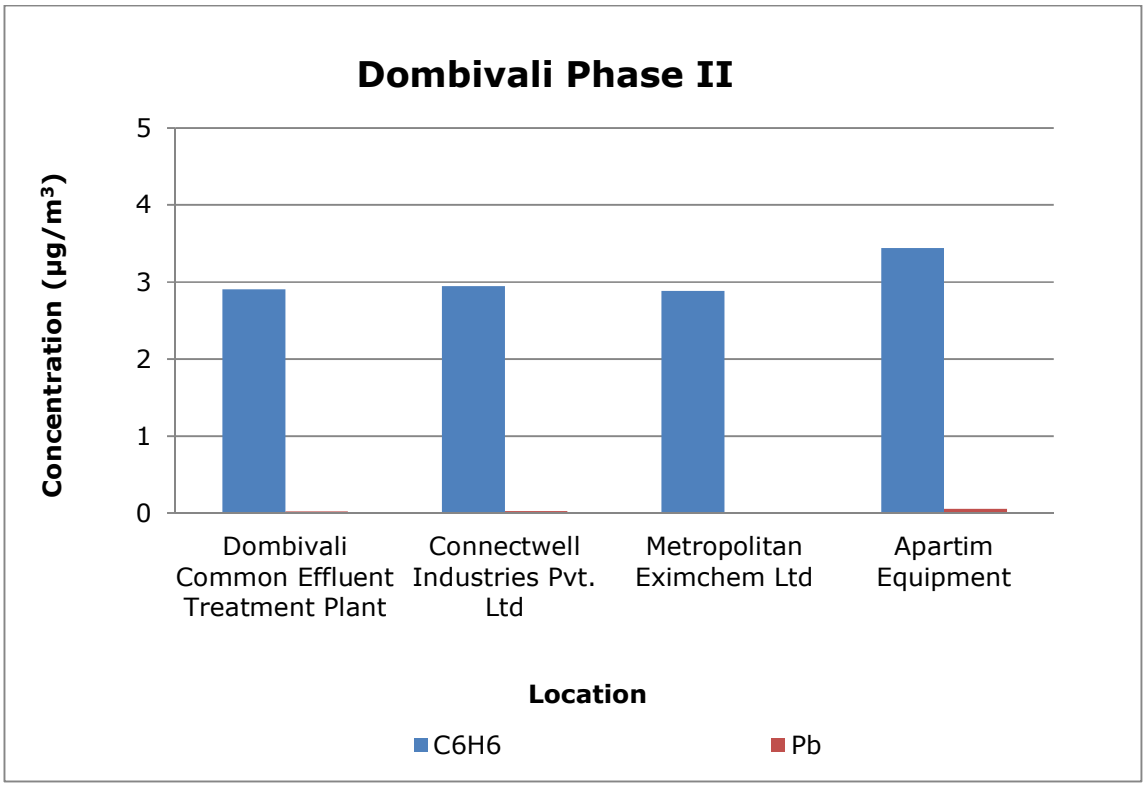
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	5.27	6.96
M-Xylene	µg/m³	BLQ	4.63
P-Xylene	µg/m³	3.35	2.26
Styrene	µg/m³	BLQ	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	BLQ	BLQ
N-Propylbenzene	µg/m³	BLQ	7.53
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m³	BLQ	BLQ
Ethylbenzene	µg/m³	0.89	1.44
1,1-Dichloropropylene	µg/m³	5.12	3.90
1,2-Dichloroethane	µg/m³	2.76	4.42
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	2.23	1.44
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	0.51	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.53	0.51
O-Xylene	µg/m³	BLQ	0.62
Bromoform	µg/m³	BLQ	BLQ

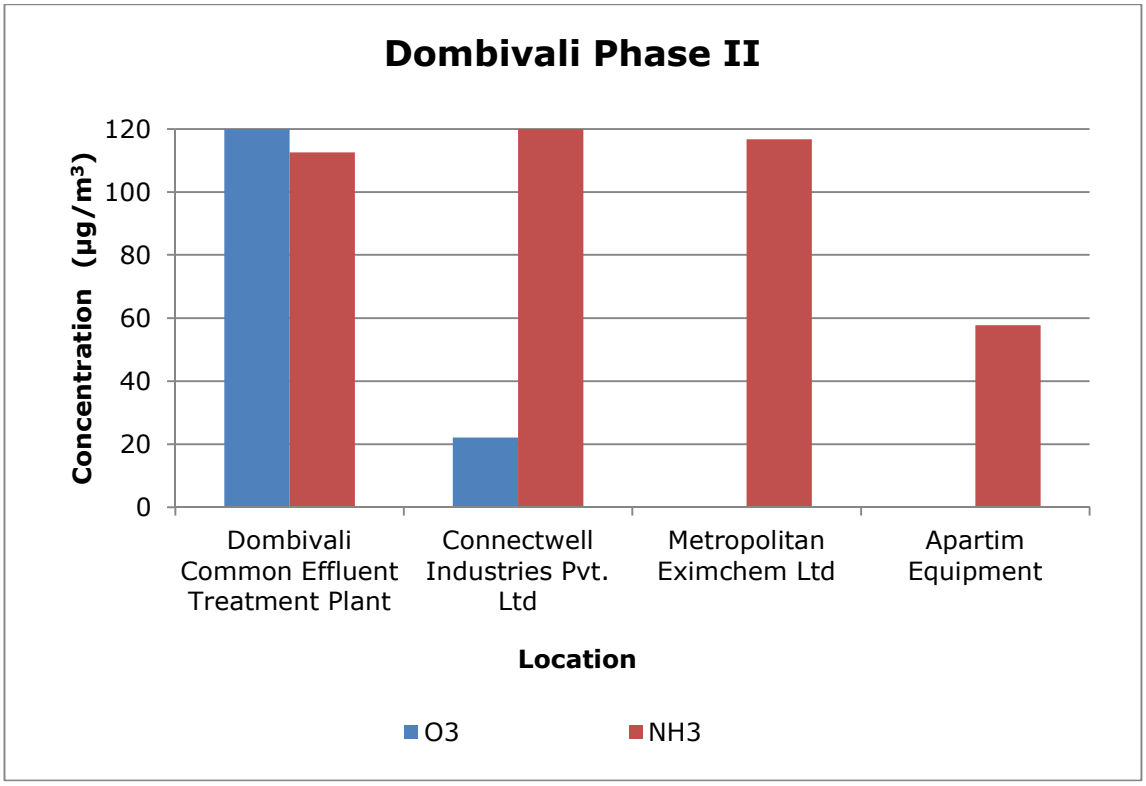
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
1,1,2,2-Tetrachloroethane	µg/m³	BLQ	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane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

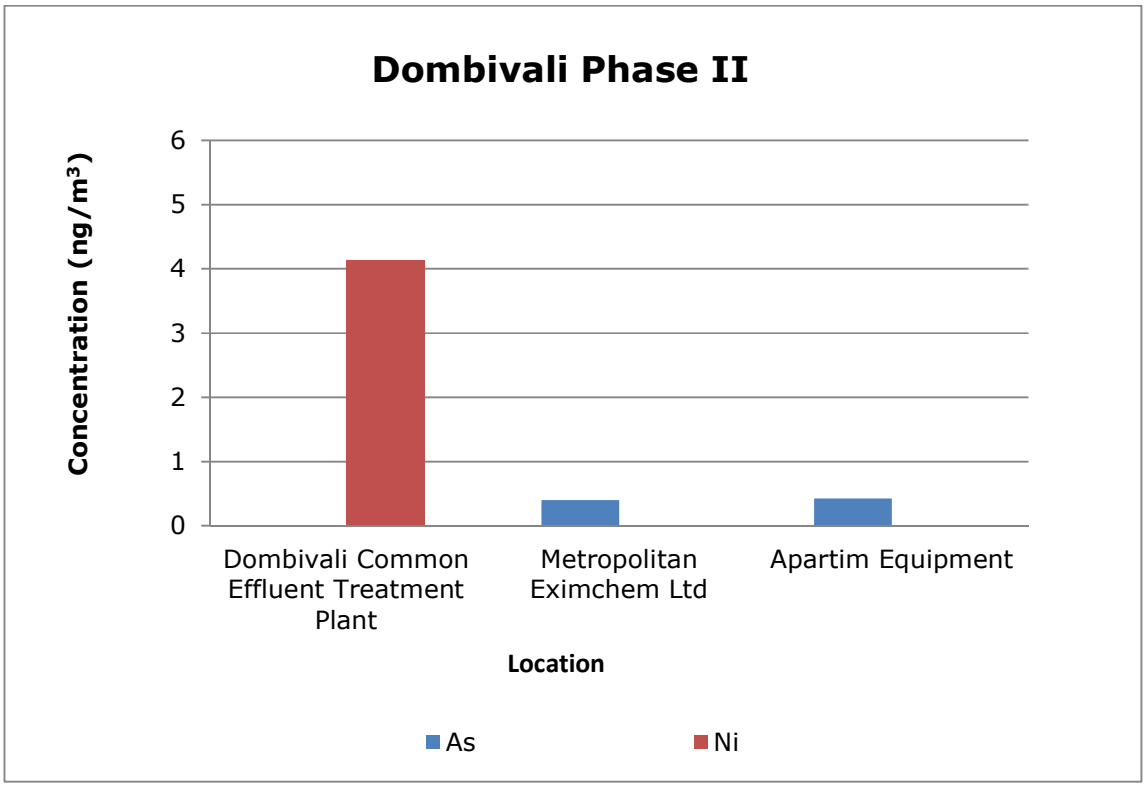
Graphs - Ambient Air Quality of MIDC Dombivali Phase II




Dombivali Phase II
Concentration (mg/m³)
5
4
3
2
1
0
Dombivali Common Effluent Treatment Plant
Connectwell Industries Pvt. Ltd
Metropolitan Eximchem Ltd
Apartim Equipment
Location
CO (1h)
CO (8h)


Dombivali Phase II
Concentration (µg/m³)
5
4
3
2
1
0
Dombivali Common Effluent Treatment Plant
Connectwell Industries Pvt. Ltd
Metropolitan Eximchem Ltd
Apartim Equipment
Location
C6H6
Pb


Dombivali Phase II
Concentration (µg/m³)
120
100
80
60
40
20
0
Dombivali Common Effluent Treatment Plant
Connectwell Industries Pvt. Ltd
Metropolitan Eximchem Ltd
Apartim Equipment
Location
O3
NH3


Dombivali Phase II
Concentration (ng/m³)
6
5
4
3
2
1
0
Dombivali Common Effluent Treatment Plant
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 all the collected samples.
- 100% survival was achieved in Fish Bioassay in the water sample collected from Gharda chemicals.
- 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	30.05.2023	01.06.2023	03.06.2023
2.	Near Khambal Pada	19°13'49.19"N	73°6'19.11"E	30.05.2023	01.06.2023	03.06.2023
3.	Thakurli Talav	19°13'19.42"N	73°5'57.92"E	30.05.2023	01.06.2023	03.06.2023
4.	Storm Water DEBESA CETP Nallah	19°12'58.47"N	73°6'56.60"E	30.05.2023	01.06.2023	03.06.2023

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
5.	Nallah nearby Gharda Chemical Ltd.	19°13'2.87"N	73°6'44.41"E	30.05.2023	01.06.2023	03.06.2023
6.	Nallah nearby Krishna Alkali Pvt. Ltd.	19°13'1.18"N	73°6'38.89"E	30.05.2023	01.06.2023	03.06.2023

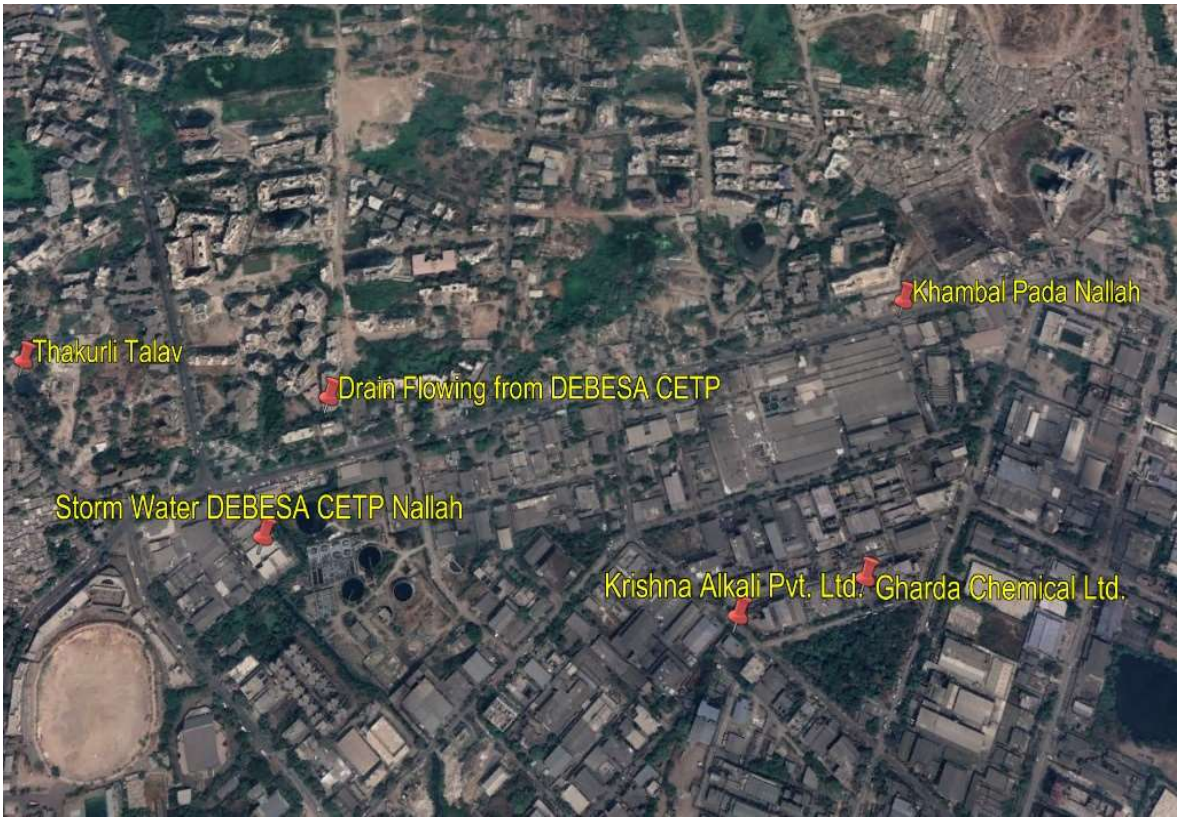


Fig. Geographical Locations of Surface Water Sampling MIDC Dombivali Phase I

Table 6.2 Phase I – Results of Surface Water

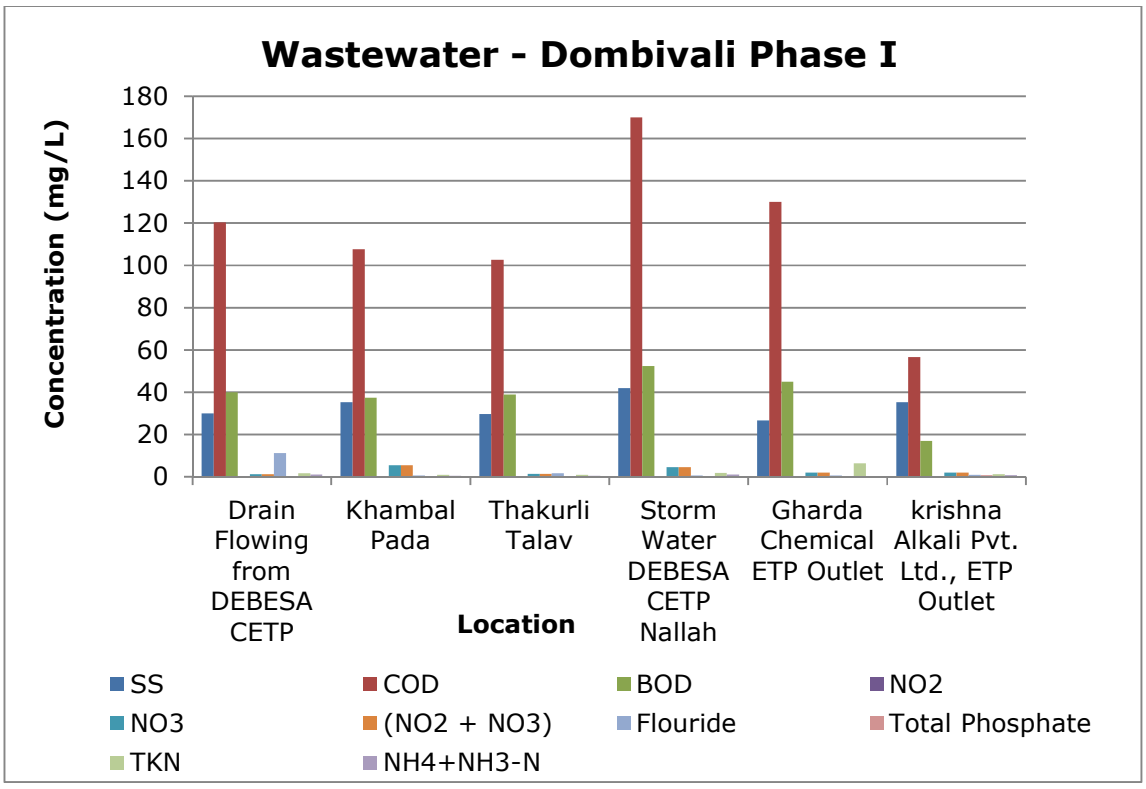
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Sanitary Survey	-	Very clean neighbourhood and catchment	Very clean neighbourhood and catchment	Reasonably clean neighbourhood	Very clean neighbourhood and catchment	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	0.20	0.23	0.30	0.13	0.13	0.20

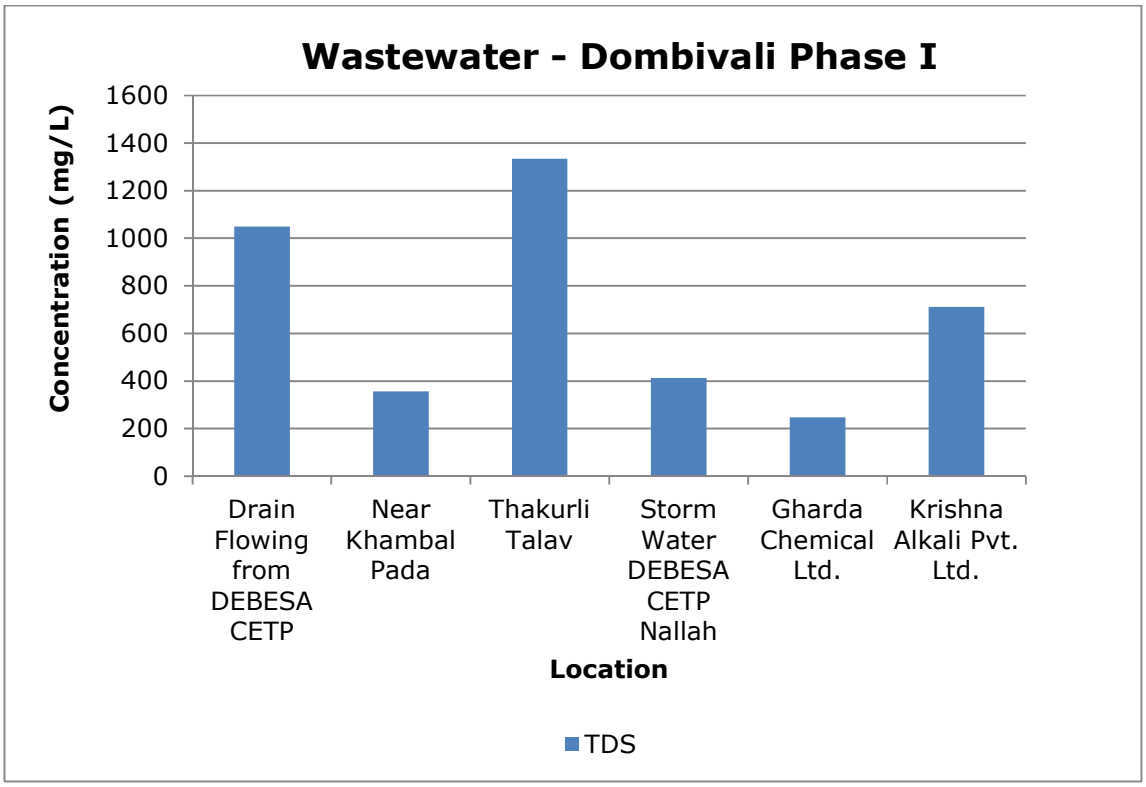
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Temperature	°C	32	32	32	130	32	32
Colour	Hazen	2	3	2	2	1	2
Smell	-	Agreeable	Agreeable	Not Agreeable	Not Agreeable	Agreeable	Agreeable
pH	-	6.90	6.73	6.90	6.62	6.60	6.87
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	30	35	30	42	27	35
Total Dissolved Solids	mg/L	1049	356	1334	413	247	712
Dissolved Oxygen (% Saturation)	%	51.00	59.00	42.67	42.67	49.33	53.33
Chemical Oxygen Demand	mg/L	120	108	103	170	130	57
Biochemical Oxygen Demand (3 days,27°C)	mg/L	40	37	39	52	45	17
Electrical Conductivity (at 25 °C)	µmho/ cm	1872	634	2381	736	442	1270
Nitrite Nitrogen (as NO_2)	mg/L	0.60	BLQ	BLQ	BLQ	BLQ	BLQ
Nitrate Nitrogen (as NO_3)	mg/L	1.31	5.54	1.48	4.54	2.00	2.00
(NO_2 + NO_3)-Nitrogen	mg/L	1.31	5.54	1.48	4.54	2.00	2.00
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	11.20	0.63	1.67	0.67	0.63	0.97
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.13	0.30	0.22	0.32	0.26	0.74

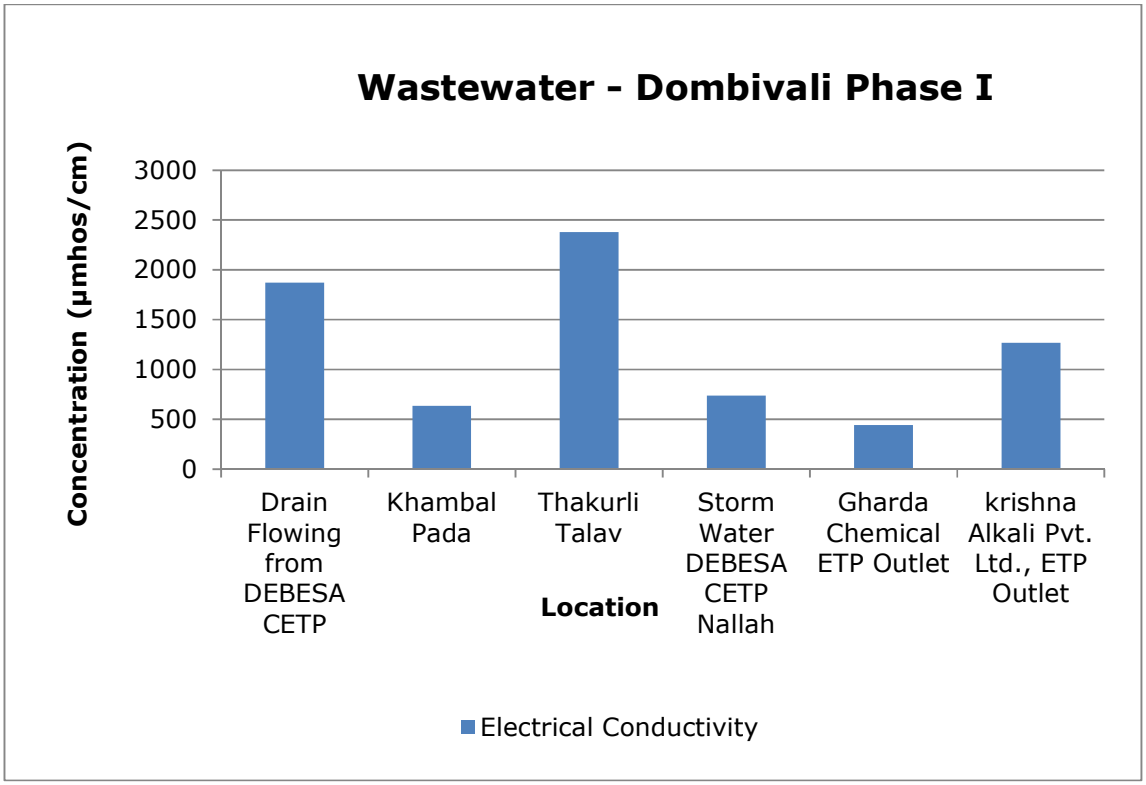
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Sodium Adsorption Ratio	-	3.23	1.39	3.10	1.75	1.23	2.40
Total Coliforms	MPN Index/ 100 ml	1373	1373	1373	1600	1600	920
Faecal Coliforms	MPN Index/ 100 ml	1373	957	1247	830	1183	920
Total Phosphate (as P)	mg/L	0.19	0.38	0.29	0.39	0.34	0.83
Total Kjeldahl Nitrogen (as N)	mg/L	1.68	0.93	0.93	1.87	6.34	1.31
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	1.16	0.51	0.49	1.17	0.40	0.80
Total Nitrogen	mg/L	3.04	4.82	2.42	5.14	7.41	2.28
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	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.08	0.10	0.10	0.08	0.09
Nickel (as Ni)	mg/L	0.05	0.02	BLQ	0.01	0.02	0.01
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	0.02
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.07	0.05	0.04	0.04	BLQ	BLQ

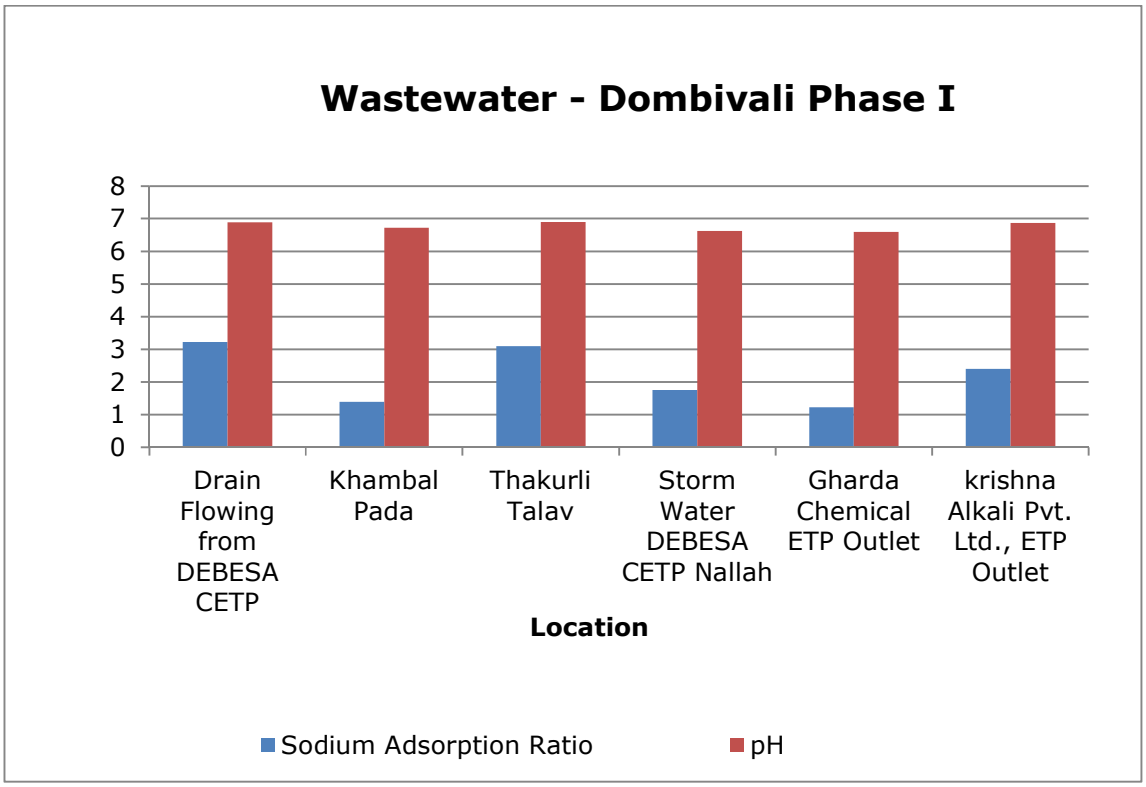
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Total Arsenic (as As)	mg/L	0.01	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.16	0.08	0.06	0.15	0.07	0.15
Iron (as Fe)	mg/L	0.26	0.52	0.37	0.29	0.36	0.25
Vanadium (as V)	mg/L	0.01	0.02	0.02	0.02	BLQ	BLQ
Selenium (as Se)	mg/L	0.01	BLQ	0.01	0.01	0.01	0.01
Boron (as B)	mg/L	BLQ	BLQ	0.29	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	93.33	96.67	86.67	96.67	100.00	60.00

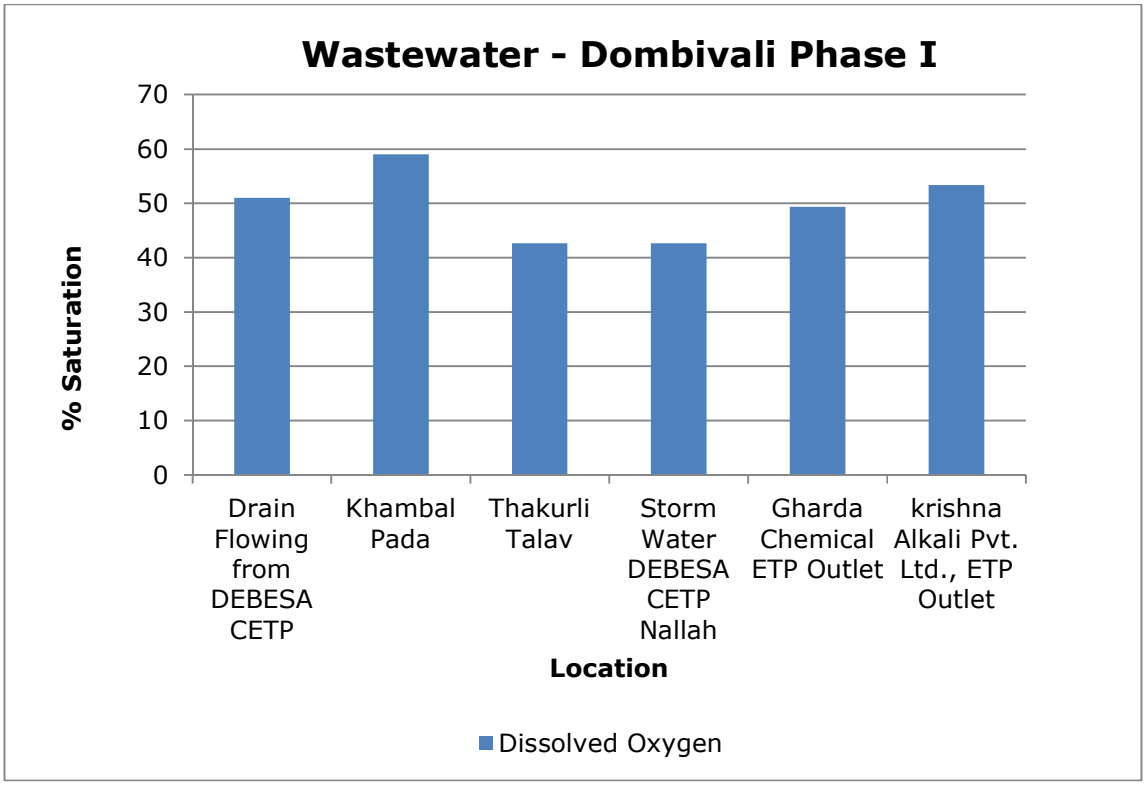
Graphs - Surface Water Quality of MIDC Dombivali Phase I

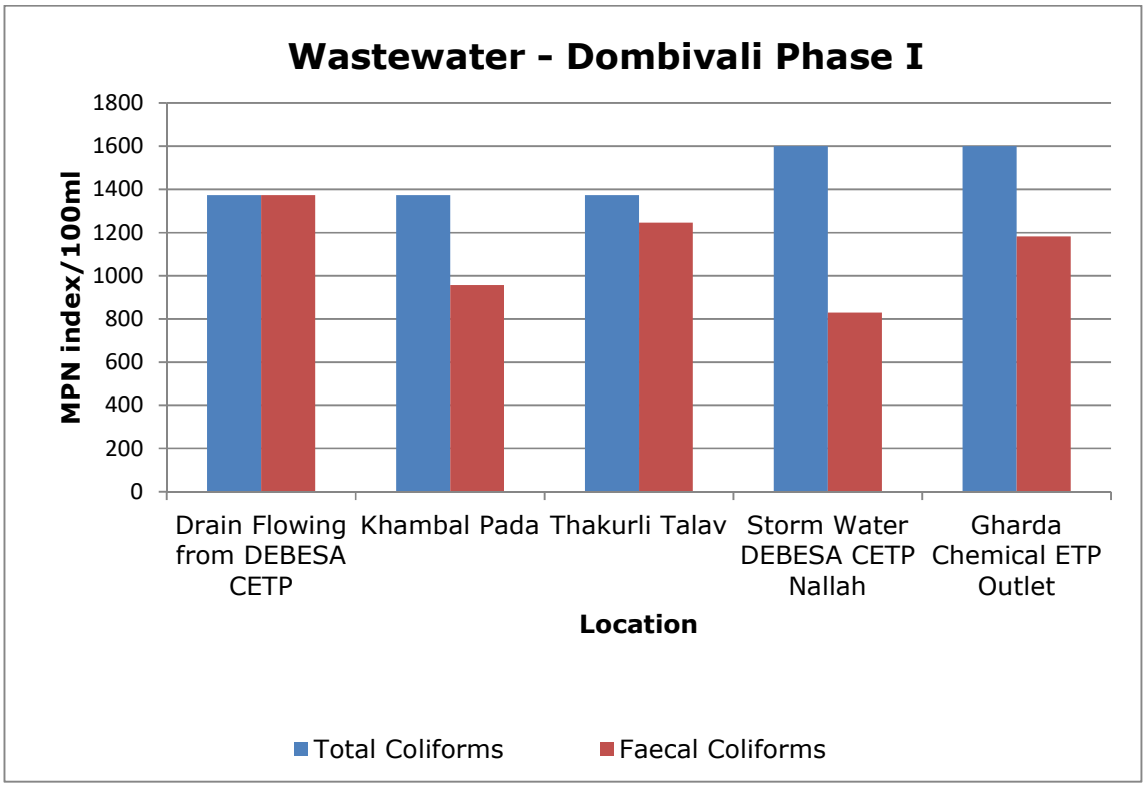


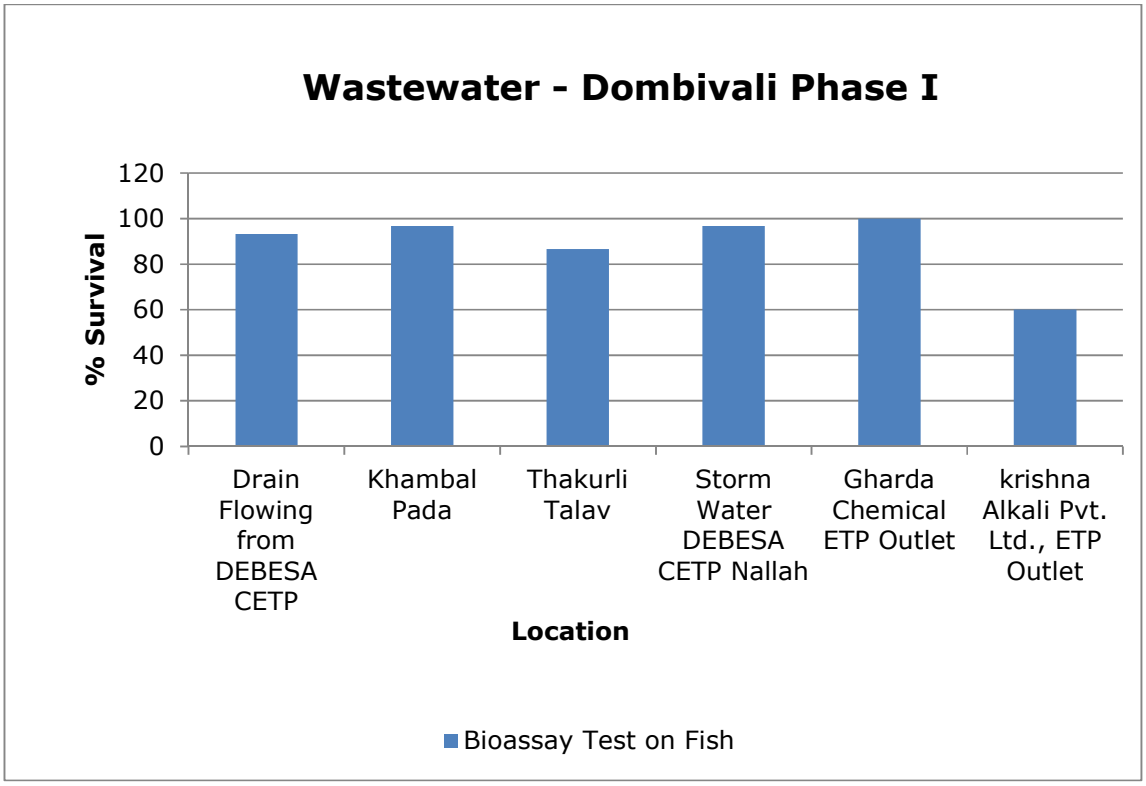



Wastewater - Dombivali Phase I
Concentration (µmhos/cm)
3000
2500
2000
1500
1000
500
0
Drain Flowing from DEBESA CETP
Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical ETP Outlet
krishna Alkali Pvt. Ltd., ETP Outlet
Location
Electrical Conductivity


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 ETP Outlet
krishna Alkali Pvt. Ltd., ETP Outlet
Location
Sodium Adsorption Ratio
pH


Wastewater - Dombivali Phase I
70
60
50
40
30
20
10
0
% Saturation
Drain Flowing from DEBESA CETP
Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical ETP Outlet
krishna Alkali Pvt. Ltd., ETP Outlet
Location
Dissolved Oxygen


Wastewater - Dombivali Phase I
1800
1600
1400
1200
1000
800
600
400
200
0
MPN index/100ml
Drain Flowing from DEBESA CETP
Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical ETP Outlet
Location
Total Coliforms
Faecal Coliforms


Wastewater - Dombivali Phase I
120
100
80
60
40
20
0
% Survival
Drain Flowing from DEBESA CETP
Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical ETP Outlet
krishna Alkali Pvt. Ltd., ETP 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 2883 µmhos/cm.
- Concentration of BOD and COD exceeded the acceptable limit in all six samples collected.
- 100% fish survival was achieved in only one water sample i.e. Tempo Naka during Fish Bioassay.
- 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.
- 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	06.06.2023	08.06.2023	10.06.2023
2.	Nallah nearby Metropolitan Exichem Ltd.	19°12'1.77"N	73°5'52.83"E	06.06.2023	08.06.2023	10.06.2023
3.	Nallah after DCETP	19°12'14.67"N	73°5'49.60"E	06.06.2023	08.06.2023	10.06.2023
4.	Nallah near Ramchandra Nagar	19°12'16.38"N	73°5'24.75"E	06.06.2023	08.06.2023	10.06.2023
5.	CETP Outlet	19°12'15.32"N	73°5'52.87"E	06.06.2023	08.06.2023	10.06.2023
6.	Tempo Naka Nallah	19°11'50.39"N	73°5'53.34"E	06.06.2023	08.06.2023	10.06.2023

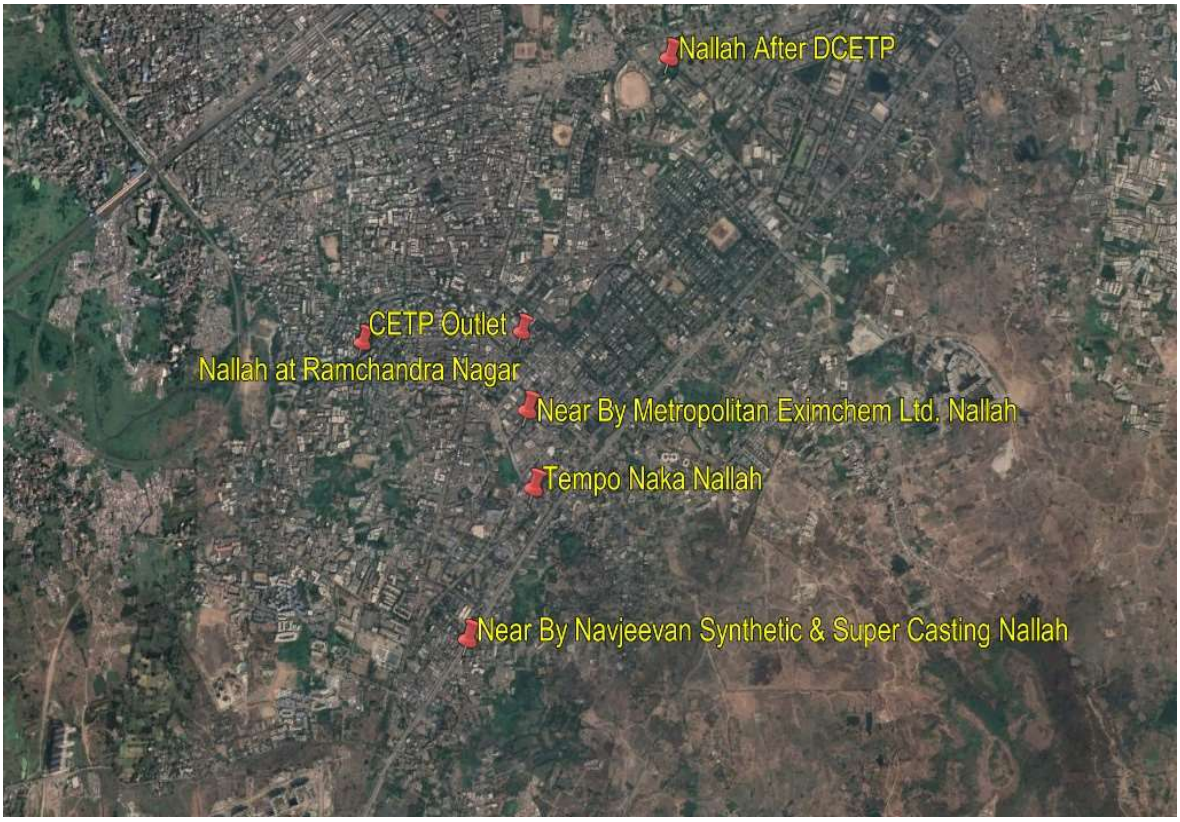


Fig. Geographical Locations of Surface Water Sampling MIDC Dombivali Phase II

Table 6.4 Phase II – Results of Surface Water

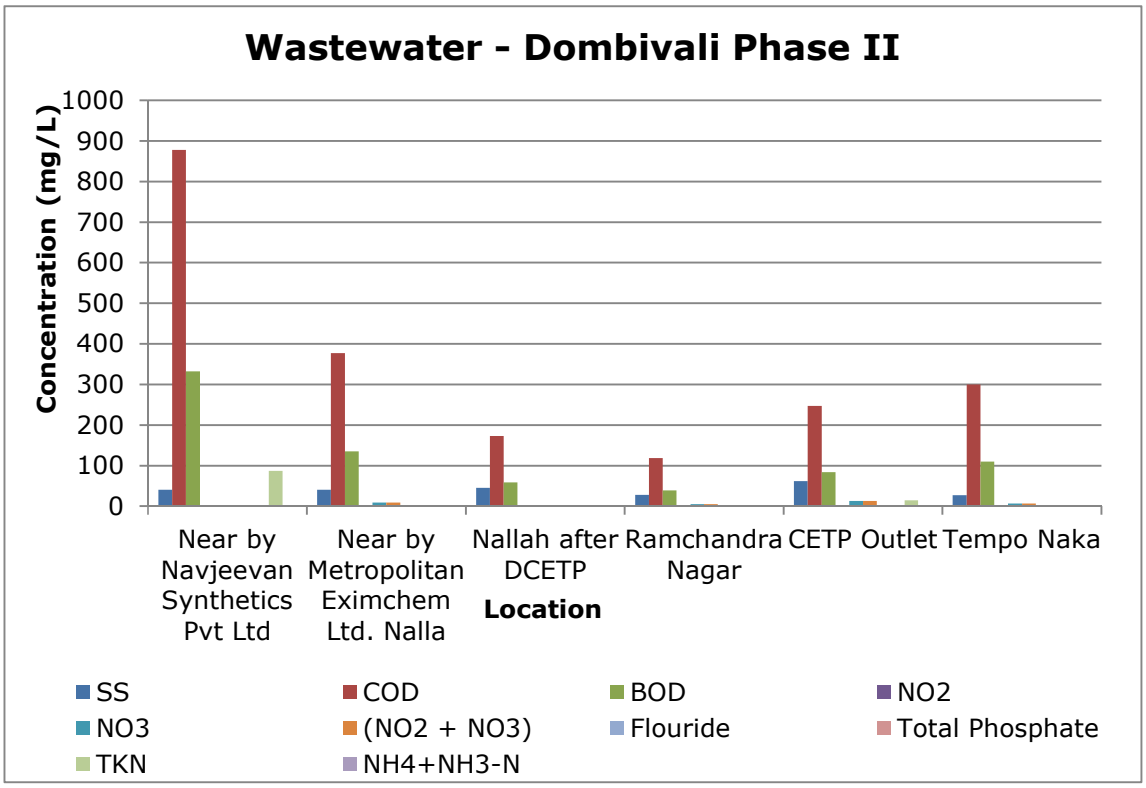
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Sanitary Survey	-	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably 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	0.10	0.17	0.13	0.20	0.20	0.23
Temperature	°C	31	32	32	32	32	32
Colour	Hazen	3	3	3	3	6	2
Smell	-	Not Agreeable	Agreeable	Not Agreeable	Not Agreeable	Not Agreeable	Not Agreeable
pH	-	6.90	6.65	6.68	6.68	6.73	6.57
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ

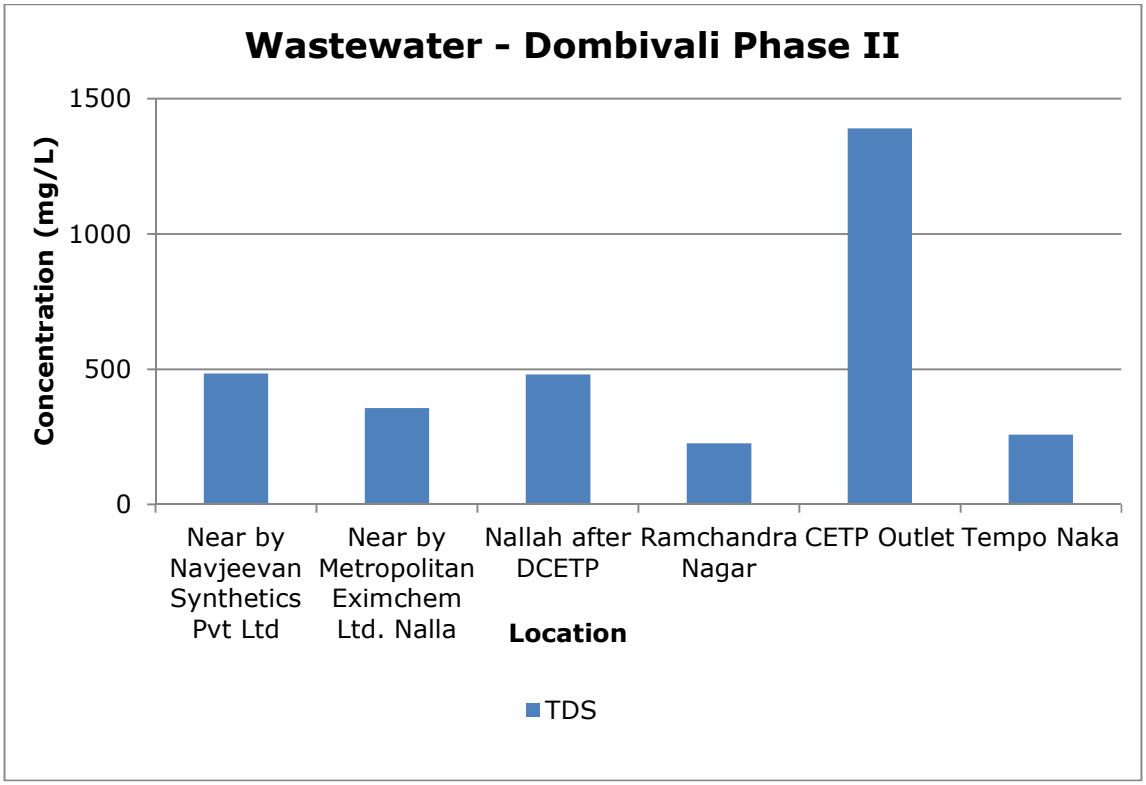
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Suspended Solids	mg/L	41	41	45	28	62	27
Total Dissolved Solids	mg/L	484	356	481	226	1391	258
Dissolved Oxygen (% Saturation)	%	40.67	46.00	43.00	50.67	36.00	48.00
Chemical Oxygen Demand	mg/L	878	377	173	118	247	300
Biochemical Oxygen Demand (3 days,27°C)	mg/L	332	135	59	39	84	109
Electrical Conductivity (at 25 °C)	µmho/cm	862	634	859	401	2483	457
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	0.04	BLQ	0.04	0.27	0.14
Nitrate Nitrogen (as NO_3)	mg/L	1.65	8.73	2.41	5.15	12.27	6.69
(NO_2 + NO_3)-Nitrogen	mg/L	1.65	8.73	2.41	5.15	12.43	6.79
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	0.48	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.63	0.57	0.80	0.37	2.47	0.40
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	1.32	1.27	0.51	0.47	0.16	0.20
Sodium Adsorption Ratio	-	1.74	1.62	2.26	1.19	5.88	1.33
Total Coliforms	MPN Index/ 100 ml	1600	1140	1600	1600	1020	1600
Faecal Coliforms	MPN Index/ 100 ml	1083	877	1160	957	614	933

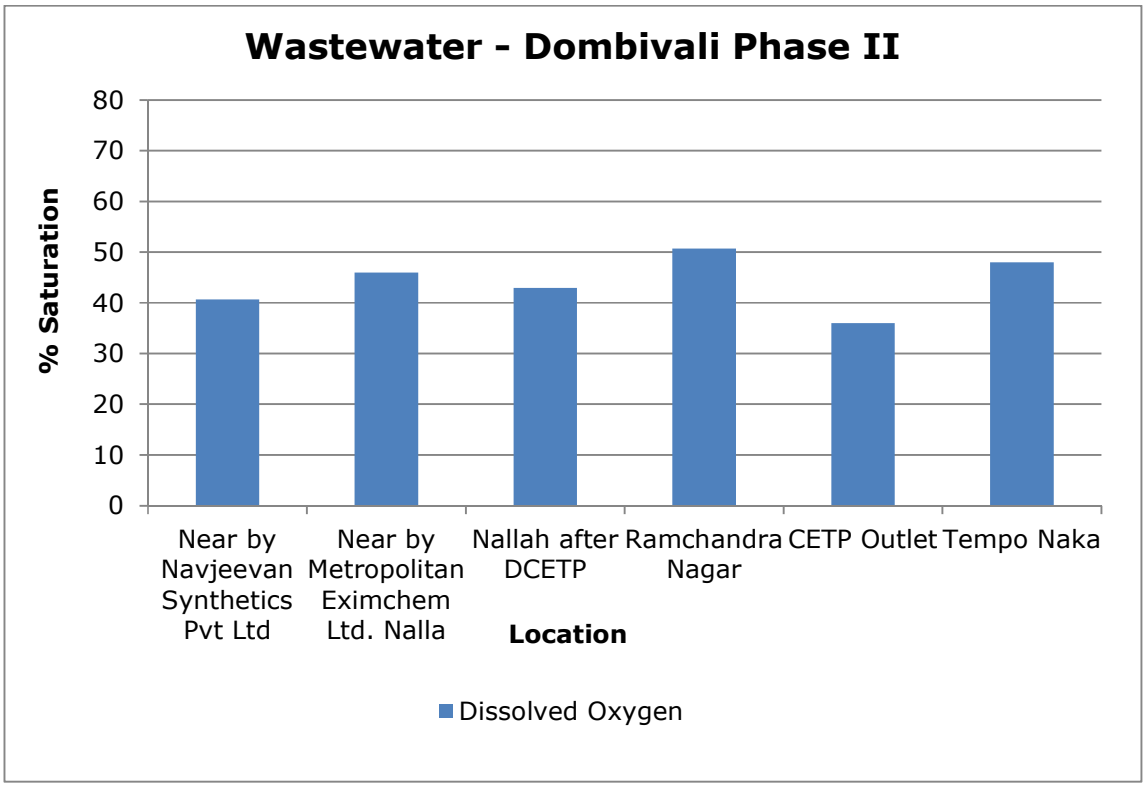
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Total Phosphate (as P)	mg/L	1.78	1.23	0.56	0.56	0.18	1.87
Total Kjeldahl Nitrogen (as N)	mg/L	86.89	1.31	2.24	1.68	14.43	1.12
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	1.01	0.65	1.39	0.94	2.40	0.28
Total Nitrogen	mg/L	88.14	7.32	4.07	6.27	26.87	7.89
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	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	0.10	BLQ	BLQ	0.09	0.14
Nickel (as Ni)	mg/L	0.01	BLQ	0.07	BLQ	0.10	0.01
Copper (as Cu)	mg/L	0.02	BLQ	BLQ	BLQ	0.01	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.03	0.05	BLQ	BLQ	0.05	0.04
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ	BLQ	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	0.14	0.09	0.19	0.07	0.11	0.15

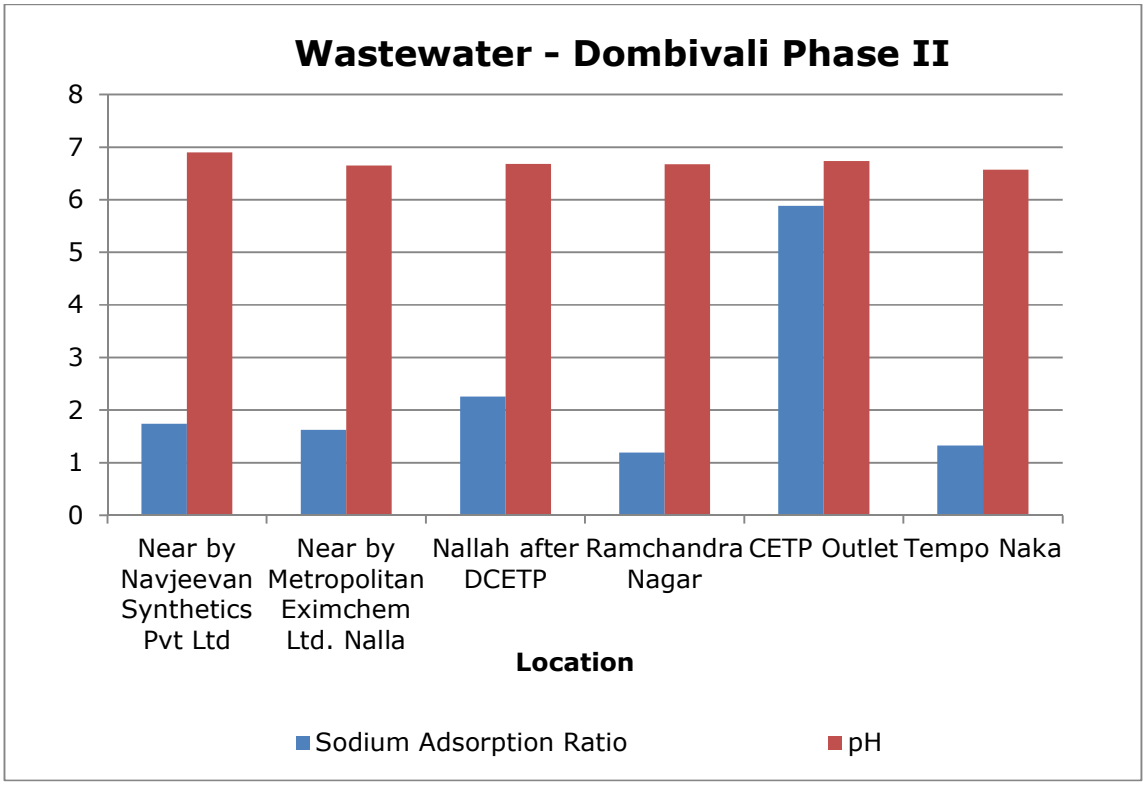
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Iron (as Fe)	mg/L	1.81	0.47	0.49	0.36	0.44	0.36
Vanadium (as V)	mg/L	0.02	0.03	0.02	0.03	0.02	0.03
Selenium (as Se)	mg/L	0.01	0.01	0.01	BLQ	0.01	0.01
Boron (as B)	mg/L	0.21	BLQ	BLQ	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	90	60	97	90	60	100

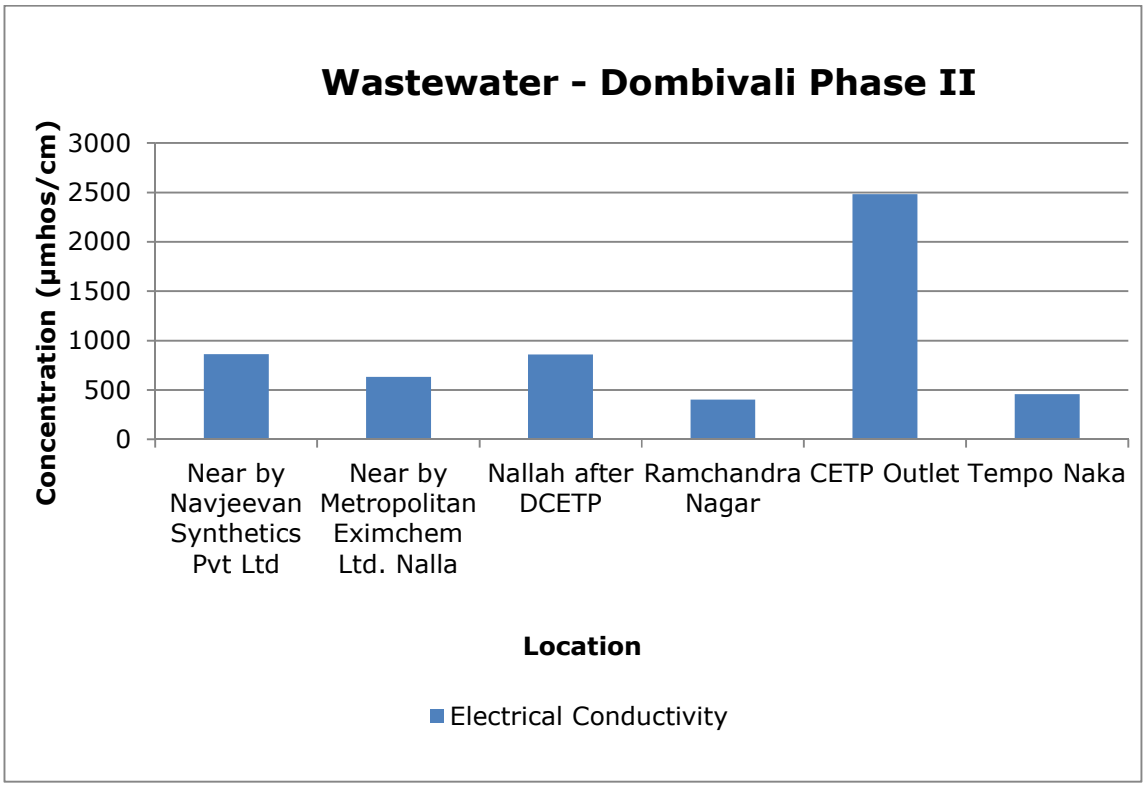
Graphs - Surface Water Quality of MIDC Dombivali Phase II

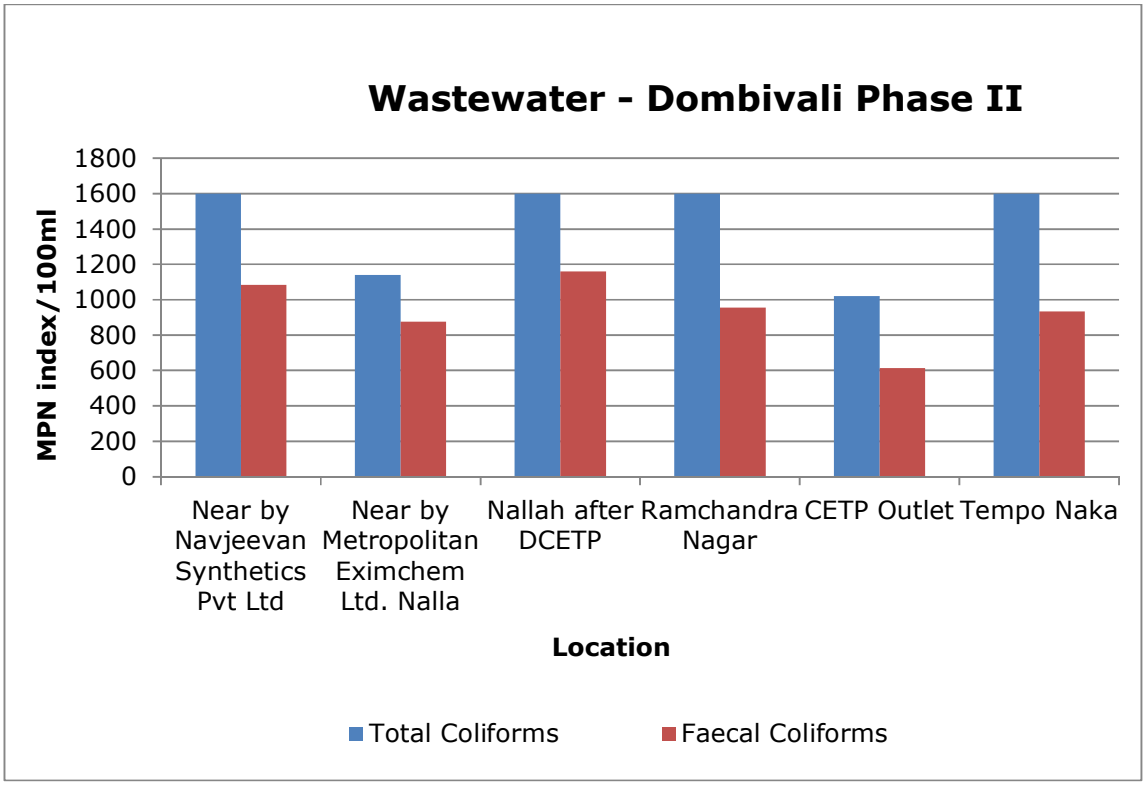


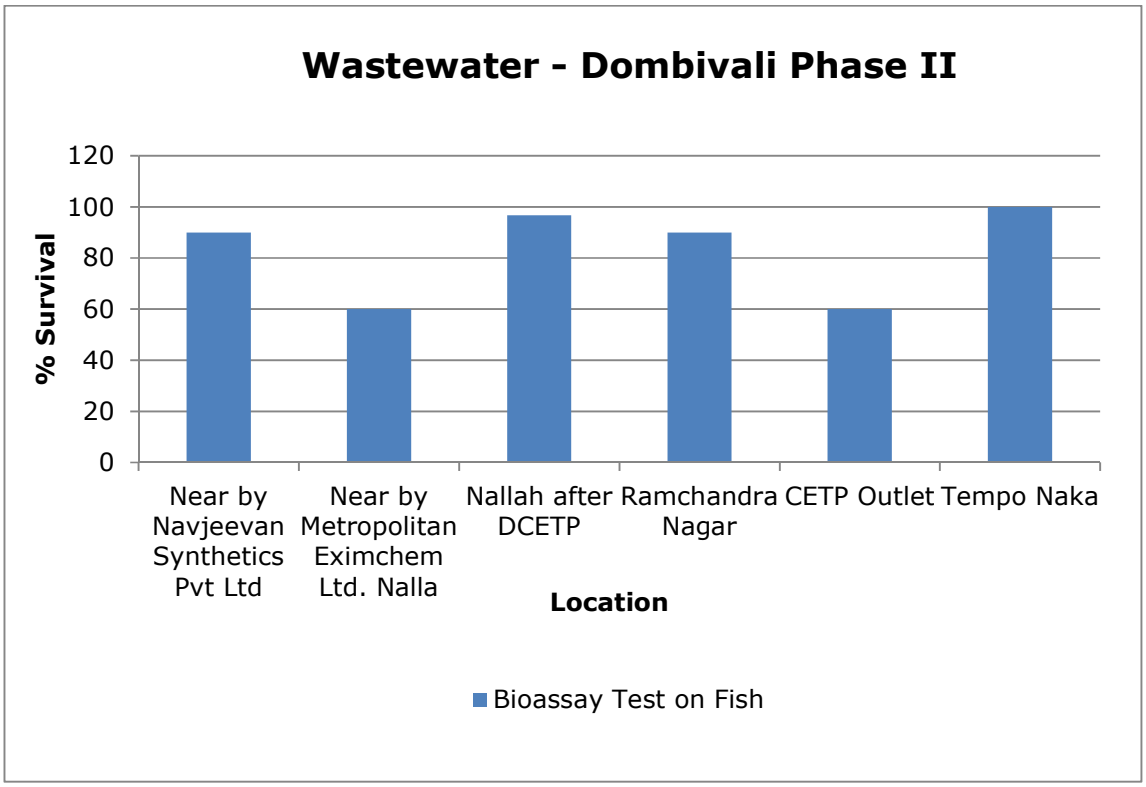

Wastewater - Dombivali Phase II
1500
1000
500
0
Concentration (mg/L)
Near by Navjeevan Synthetics Pvt Ltd
Near by Metropolitan Eximchem Ltd. Nalla
Nallah after DCETP
Ramchandra Nagar
CETP Outlet
Tempo Naka
Location
TDS


Wastewater - Dombivali Phase II
80
70
60
50
40
30
20
10
0
% Saturation
Near by Navjeevan Synthetics Pvt Ltd
Near by Metropolitan Eximchem Ltd. Nalla
Nallah after DCETP
Ramchandra Nagar
CETP Outlet
Tempo Naka
Location
Dissolved Oxygen


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


Wastewater - Dombivali Phase II
Concentration (µmhos/cm)
3000
2500
2000
1500
1000
500
0
Near by Navjeevan Synthetics Pvt Ltd
Near by Metropolitan Eximchem Ltd. Nalla
Nallah after DCETP
Ramchandra Nagar
CETP Outlet
Tempo Naka
Location
Electrical Conductivity


Wastewater - Dombivali Phase II
MPN index/100ml
1800
1600
1400
1200
1000
800
600
400
200
0
Near by Navjeevan Synthetics Pvt Ltd
Near by Metropolitan Eximchem Ltd. Nalla
Nallah after DCETP
Ramchandra Nagar
CETP Outlet
Tempo Naka
Location
Total Coliforms
Faecal Coliforms


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

LAND ENVIRONMENT

7. Land Environment

For studying the land Environment of Dombivali area, Groundwater was collected from Bore well. 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 two 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	30.05.2023	01.06.2023	03.06.2023
2.	Bore well Near Mamata Hospital	19°12'27.36"N	73°6'15.12"E	30.05.2023	01.06.2023	03.06.2023
3.	Bore well at Horizon hall	19°11'30.01"N	73°5'31.82"E	30.05.2023	01.06.2023	03.06.2023

Fig. Geographical Locations of Groundwater Sampling MIDC Dombivali Phase I

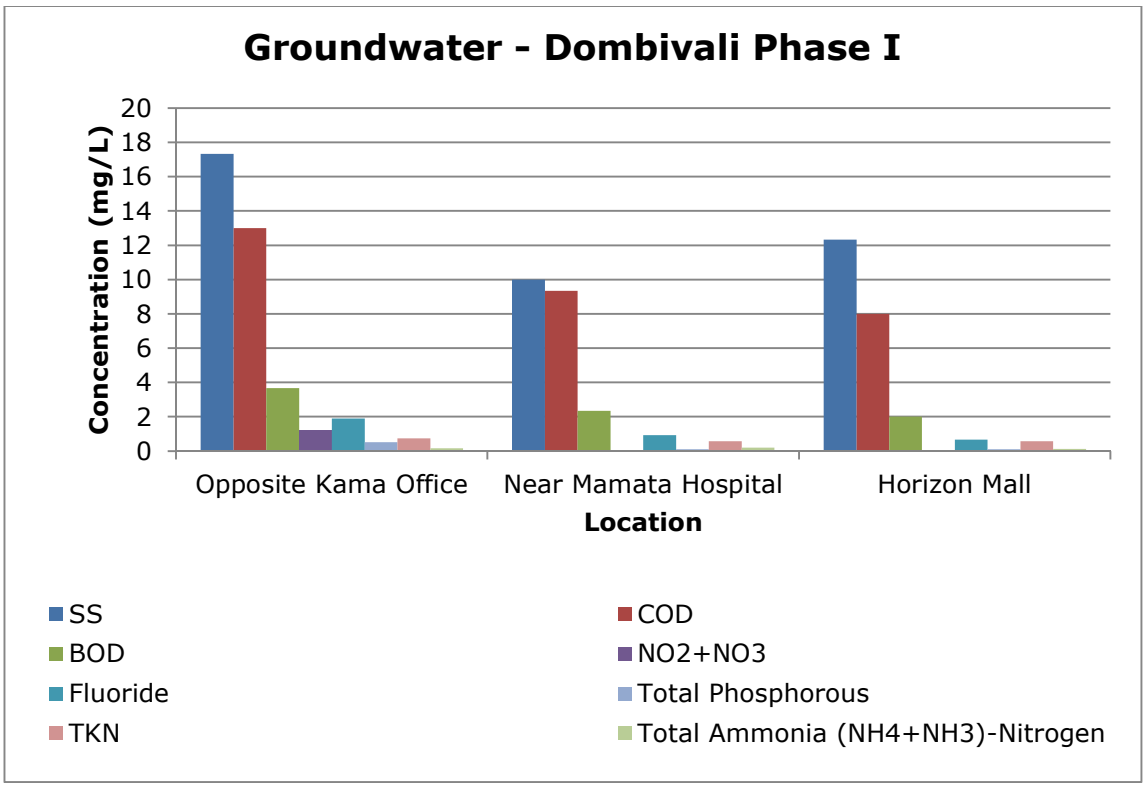
Table 7.2 Phase I – Results of Groundwater

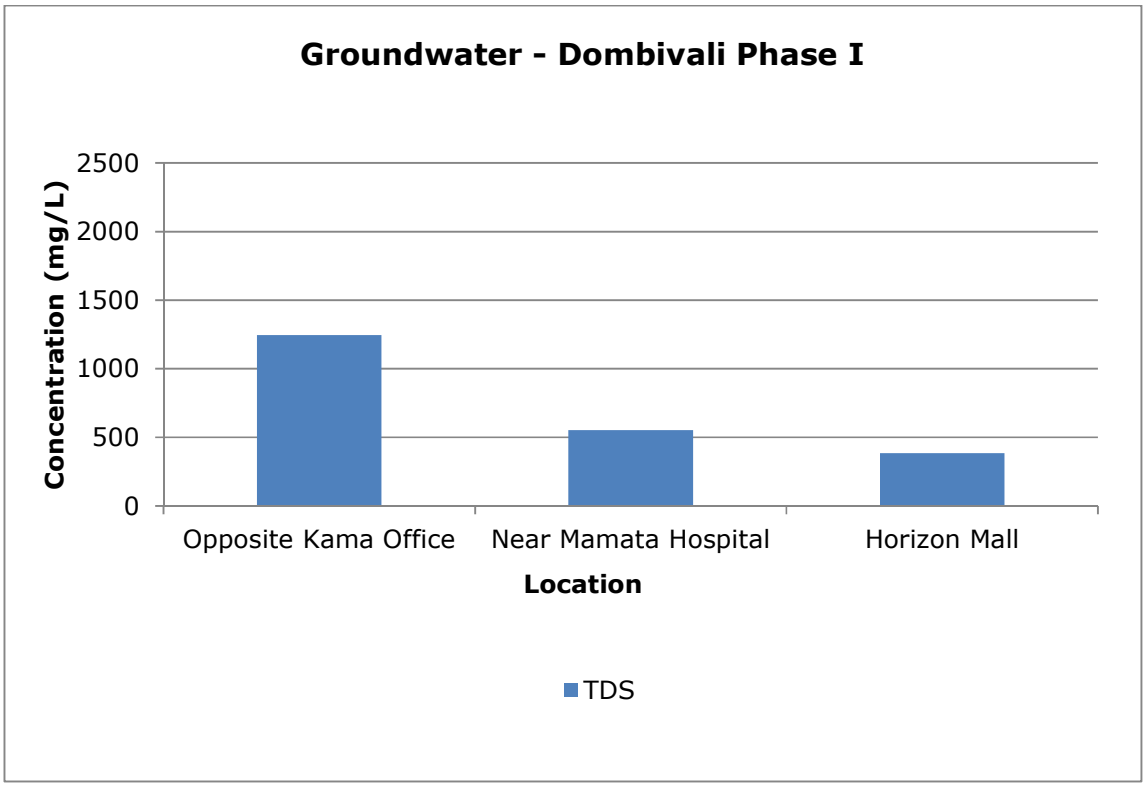
Parameters	Unit	Results		
		Bore well opposite Kama Office	Bore well Near Mamata Hospital	Bore well at Horizon Hall
Sanitary Survey	-	Very clean neighbourhood and catchment	Very clean neighbourhood and catchment	Very clean neighbourhood and catchment
General Appearance	-	No Floating Matter	No Floating Matter	No Floating Matter
Transparency	m	N.A.	N.A.	N.A.
Temperature	^{o}C	32	32	32
Colour	Hazen	2	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	6.77	6.95	6.88
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Suspended Solids	mg/L	17	10	12
Total Dissolved Solids	mg/L	1246	552	383
Chemical Oxygen Demand	mg/L	13	9	8
Biochemical Oxygen Demand (3 days,27^{o}C)	mg/L	4	2	2
Electrical Conductivity (at 25 ^{o}C)	µmho/cm	2224	983	682
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	0.10	BLQ

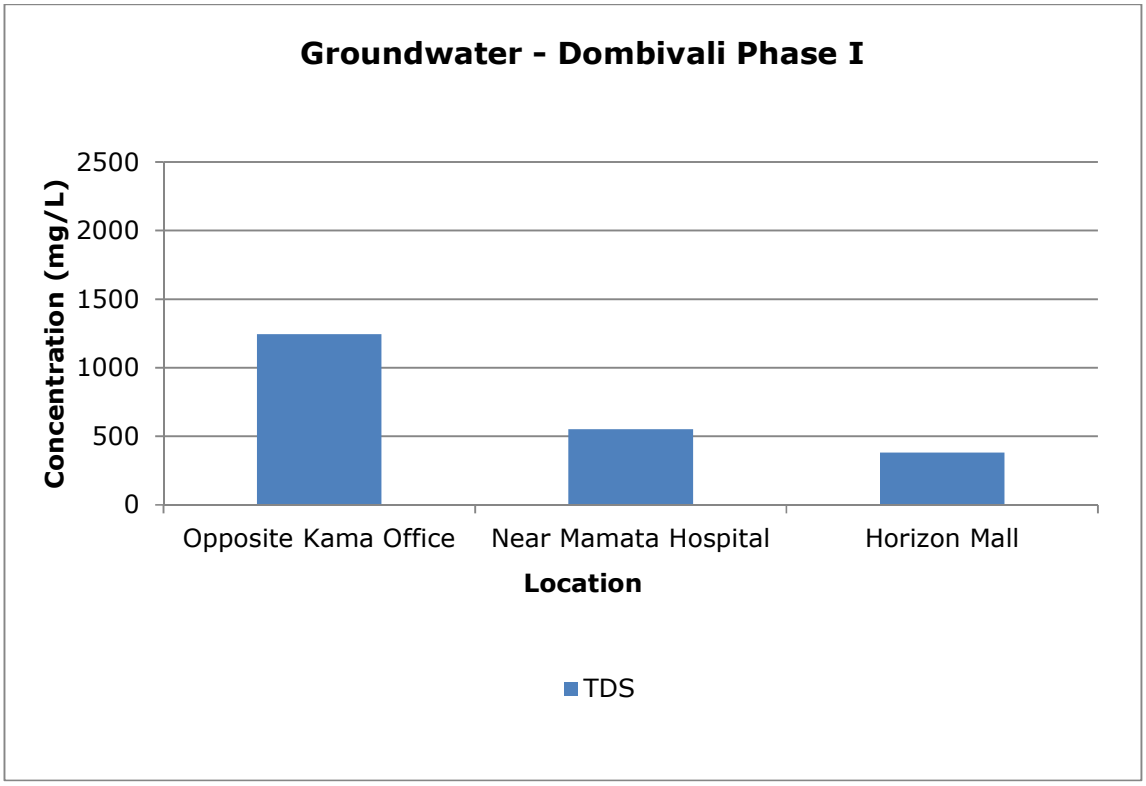
Parameters	Unit	Results		
		Bore well opposite Kama Office	Bore well Near Mamata Hospital	Bore well at Horizon Hall
Nitrate Nitrogen (as NO_3)	mg/L	1.20	BLQ	BLQ
(NO_2 + NO_3)-Nitrogen	mg/L	1.20	BLQ	BLQ
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.33	0.27	0.34
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.90	0.93	0.67
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.45	BLQ	BLQ
Sodium Adsorption Ratio	-	3.04	2.12	1.98
Total Coliforms	MPN Index/ 100 ml	485	1123	549
Faecal Coliforms	MPN Index/ 100 ml	477	443	89
Total Phosphate (as P)	mg/L	0.52	0.11	0.12
Total Kjeldahl Nitrogen (as N)	mg/L	0.75	0.56	0.56
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.16	0.20	0.13
Total Nitrogen	mg/L	1.58	0.69	0.96
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	0.10	BLQ
Nickel (as Ni)	mg/L	0.02	0.01	0.01
Copper (as Cu)	mg/L	BLQ	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	0.05	0.03
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.06	0.06	0.12
Iron (as Fe)	mg/L	0.30	0.45	0.38

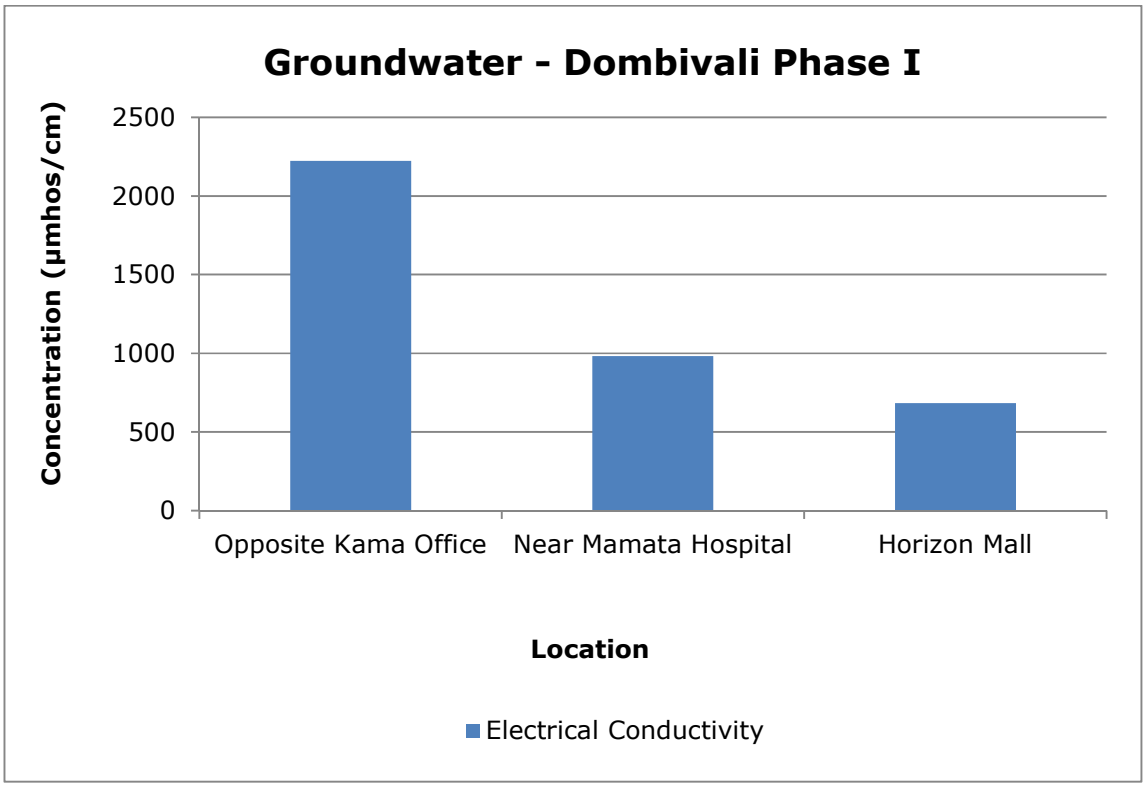
Parameters	Unit	Results		
		Bore well opposite Kama Office	Bore well Near Mamata Hospital	Bore well at Horizon Hall
Vanadium (as V)	mg/L	0.02	0.02	0.01
Selenium (as Se)	mg/L	0.01	0.01	0.01
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	100	93	100

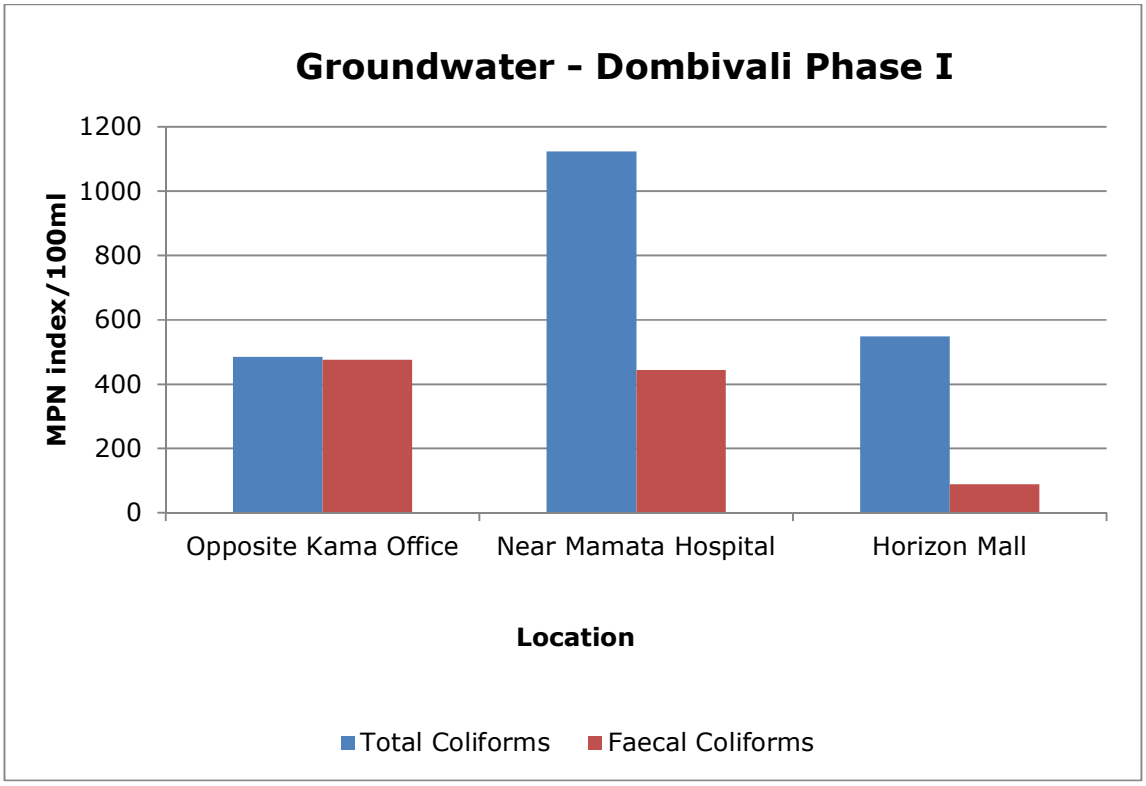
Graphs - Groundwater Quality of MIDC Dombivali Phase I

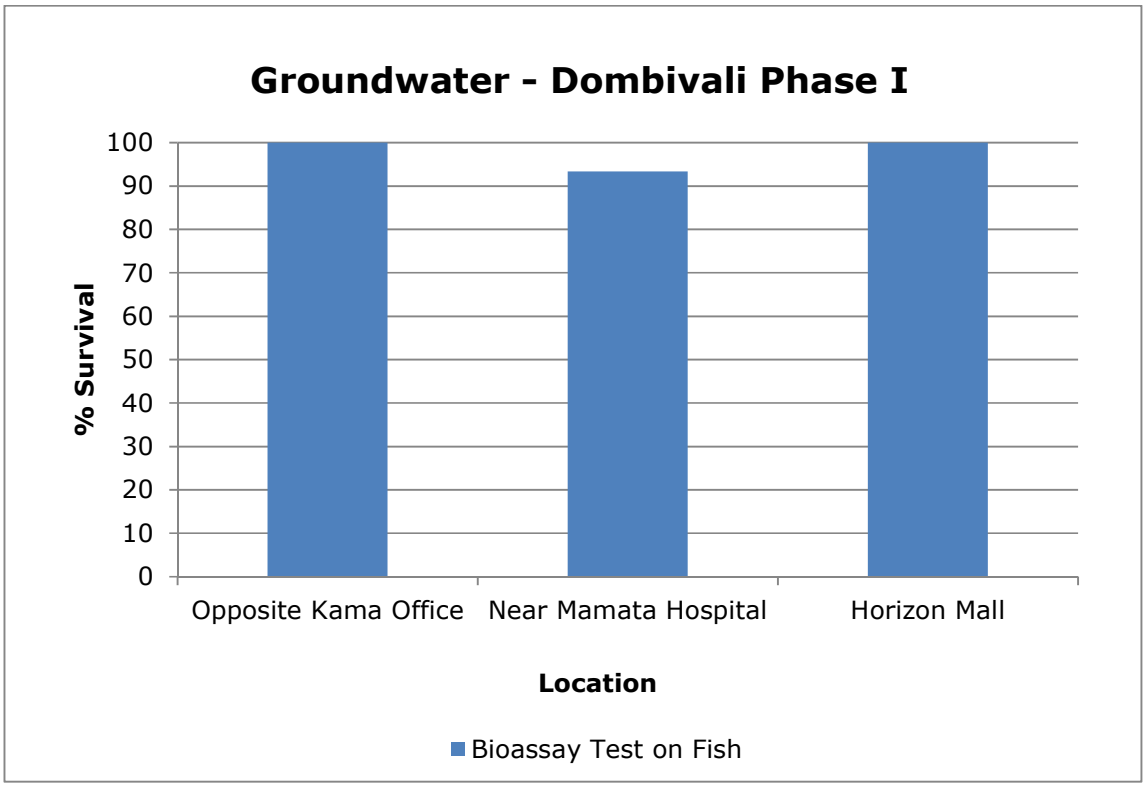





Groundwater - Dombivali Phase I
Concentration (mg/L)
2500
2000
1500
1000
500
0
Opposite Kama Office
Near Mamata Hospital
Horizon Mall
Location
TDS


Groundwater - Dombivali Phase I
Concentration (µmhos/cm)
2500
2000
1500
1000
500
0
Opposite Kama Office
Near Mamata Hospital
Horizon Mall
Location
Electrical Conductivity


Groundwater - Dombivali Phase I
MPN index/100ml
1200
1000
800
600
400
200
0
Opposite Kama Office
Near Mamata Hospital
Horizon Mall
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	06.06.2023	08.06.2023	10.06.2023
2.	Bore well Hardikar Hospital	19°12'21.16"N	73° 5'28.58"E	06.06.2023	08.06.2023	10.06.2023
3.	Borewell at Lodha Vihar	19°11'27.55"N	73° 5'15.26"E	06.06.2023	08.06.2023	10.06.2023

Fig. Geographical Locations of Groundwater Sampling MIDC Dombivali Phase II

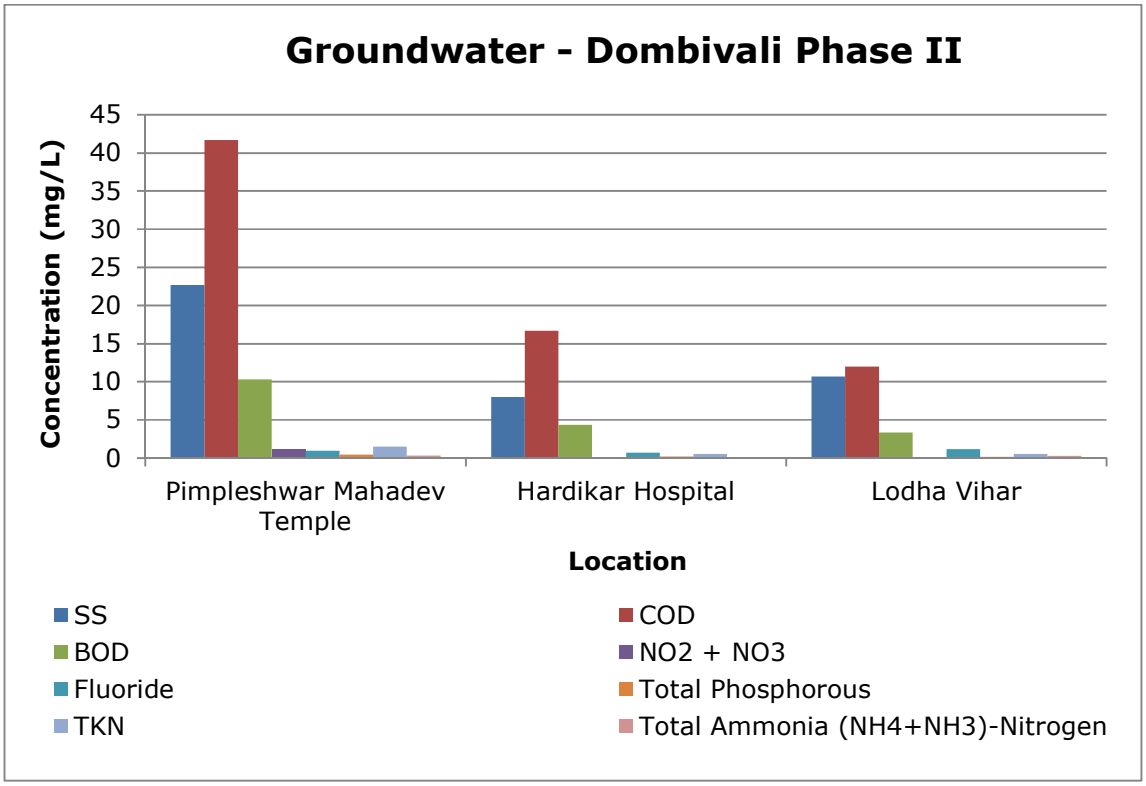
Table 7.4 Phase II – Results of Groundwater

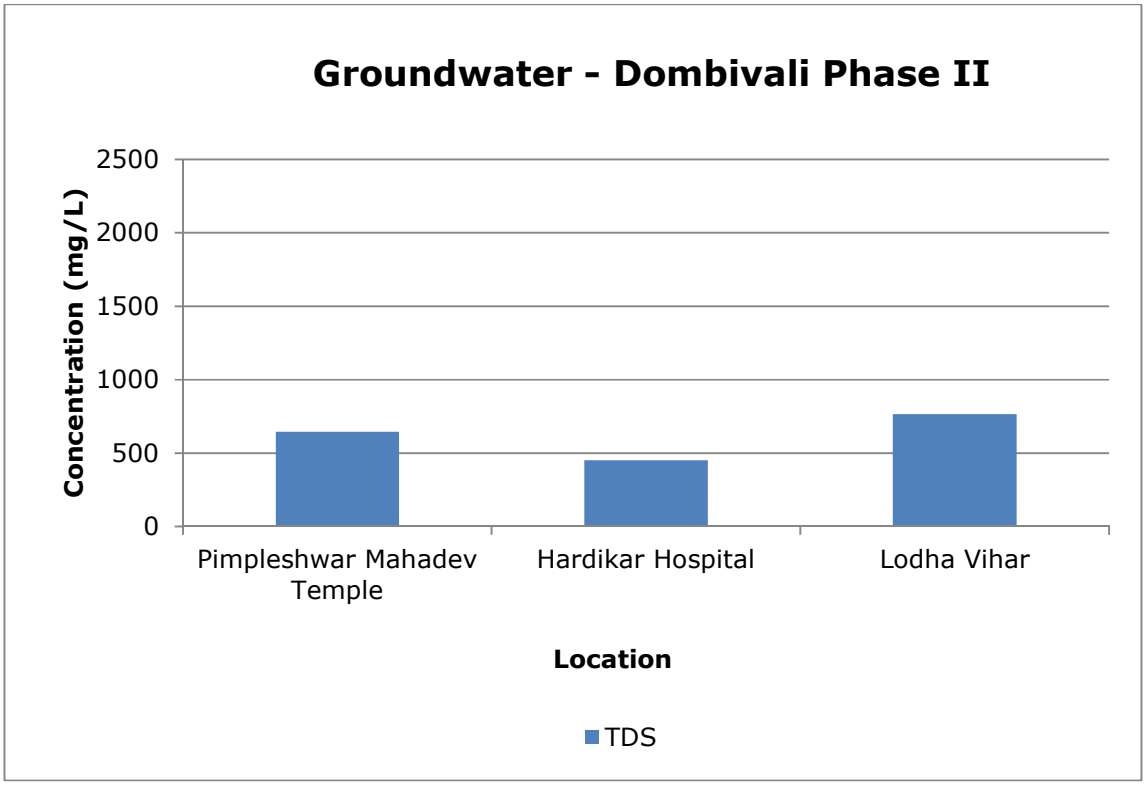
Parameters	Unit	Results		
		Pimpleshwar Mahadev Temple	Hardikar Hospital	Lodha Vihar
Sanitary Survey	-	Very clean neighbourhood and catchment	Very clean neighbourhood and catchment	Very clean neighbourhood and catchment
General Appearance	-	No Floating Matter	No Floating Matter	No Floating Matter
Transparency	m	N.A.	N.A.	N.A.
Temperature	°C	32	32	32
Colour	Hazen	2	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	6.74	7.08	6.94
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Suspended Solids	mg/L	23	8	11
Total Dissolved Solids	mg/L	645	451	767
Chemical Oxygen Demand	mg/L	42	17	12
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	10	4	3
Electrical Conductivity (at 25 °C)	µmho/cm	1148	803	1367

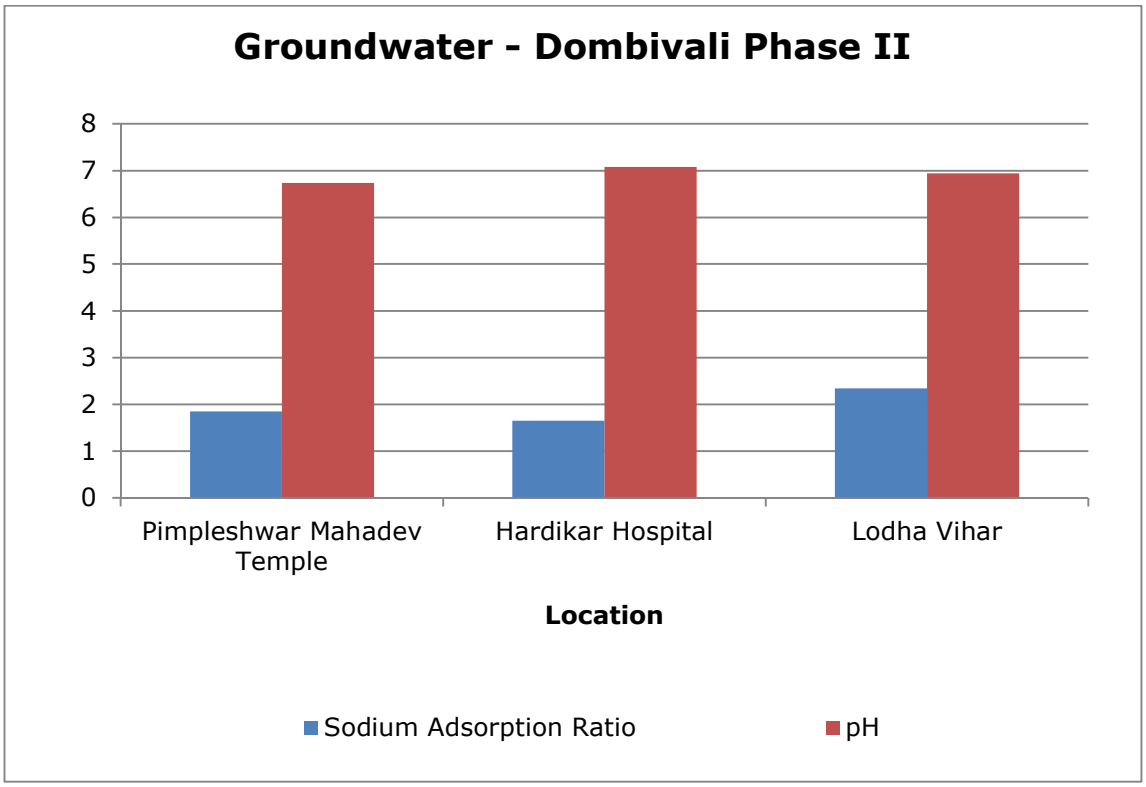
Parameters	Unit	Results		
		Pimpleshwar Mahadev Temple	Hardikar Hospital	Lodha Vihar
Nitrite Nitrogen (as NO_2)	mg/L	0.05	BLQ	0.03
Nitrate Nitrogen (as NO_3)	mg/L	1.05	BLQ	BLQ
(NO_2 + NO_3)-Nitrogen	mg/L	1.05	BLQ	BLQ
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.30	0.27	0.27
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.93	0.70	1.17
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.42	0.15	0.11
Sodium Adsorption Ratio	-	1.85	1.65	2.34
Total Coliforms	MPN Index/ 100 ml	1600	1600	840
Faecal Coliforms	MPN Index/ 100 ml	1020	1260	48
Total Phosphate (as P)	mg/L	0.48	0.19	0.14
Total Kjeldahl Nitrogen (as N)	mg/L	1.49	0.56	0.56
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.31	BLQ	0.27
Total Nitrogen	mg/L	2.16	0.49	0.67
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	BLQ	0.06
Nickel (as Ni)	mg/L	0.01	0.02	0.01
Copper (as Cu)	mg/L	BLQ	BLQ	0.05
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	0.03	0.03
Total Arsenic (as As)	mg/L	BLQ	BLQ	BLQ
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ

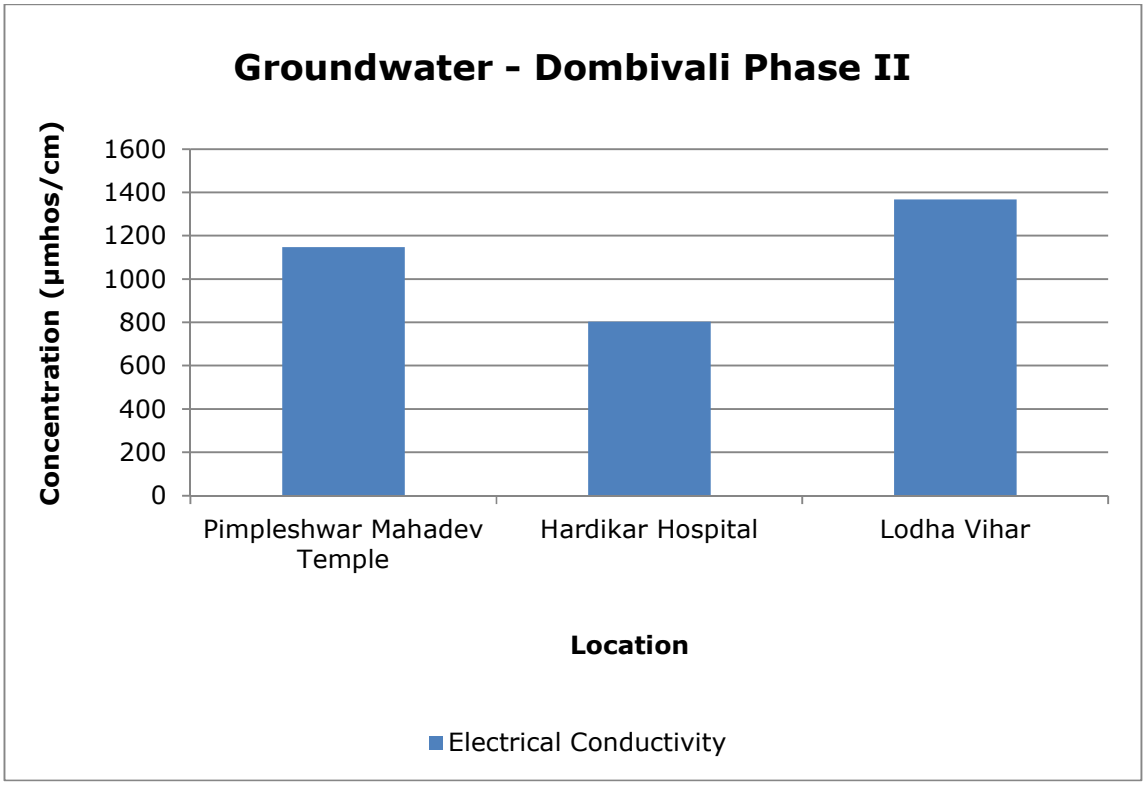
Parameters	Unit	Results		
		Pimpleshwar Mahadev Temple	Hardikar Hospital	Lodha Vihar
Manganese (as Mn)	mg/L	0.04	0.07	0.08
Iron (as Fe)	mg/L	0.24	0.24	0.33
Vanadium (as V)	mg/L	0.04	0.06	0.03
Selenium (as Se)	mg/L	0.01	BLQ	0.01
Boron (as B)	mg/L	50.08	0.15	BLQ
Bioassay Test on fish	% survival	33	97	90

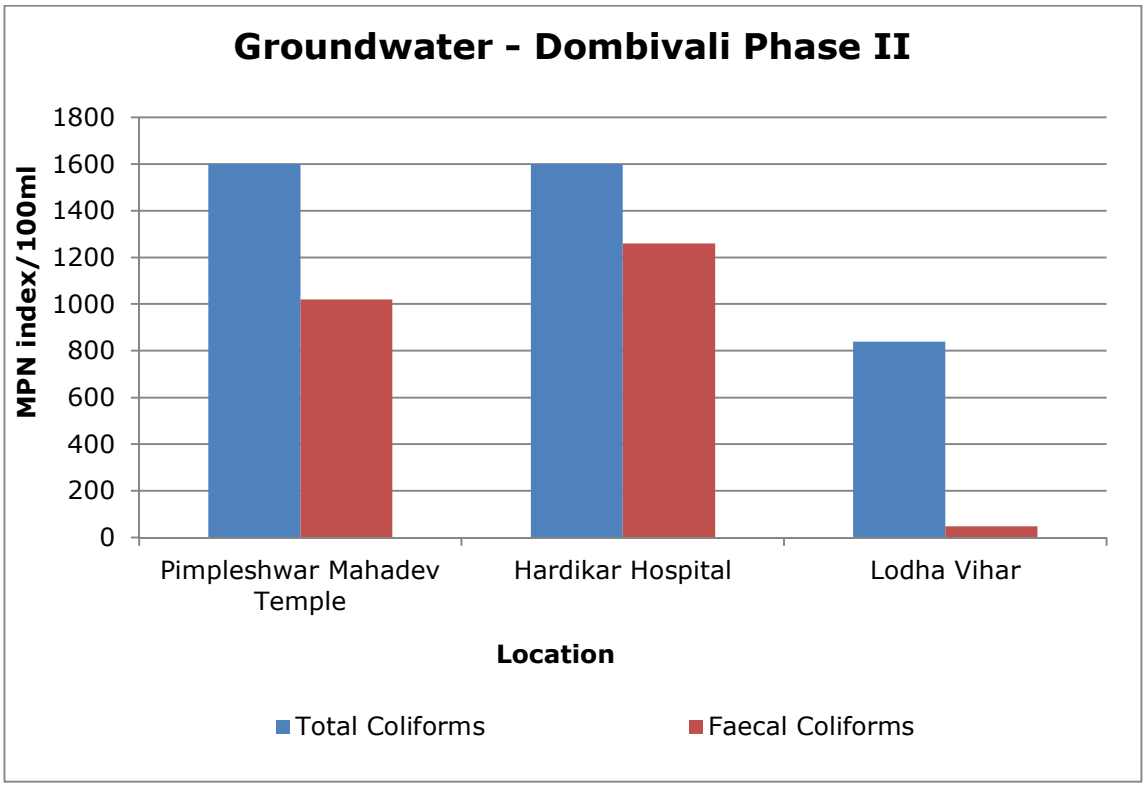
Graphs - Groundwater Quality of MIDC Dombivali Phase II

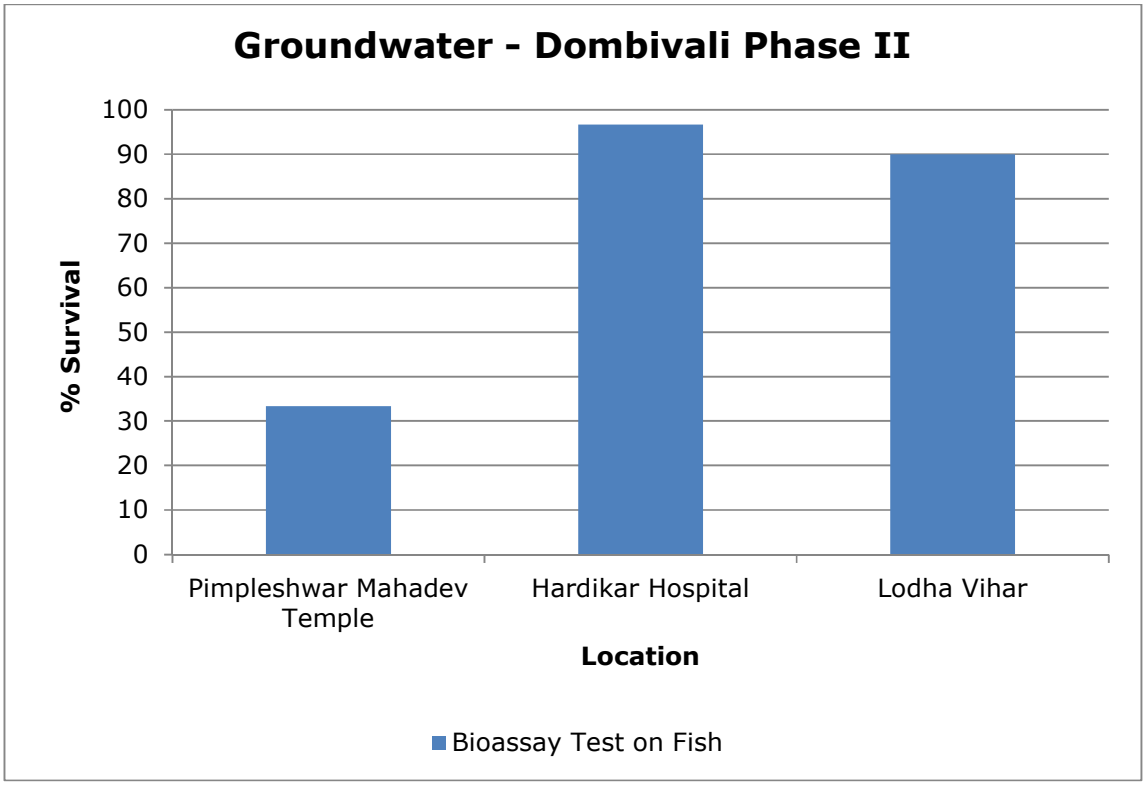



Groundwater - Dombivali Phase II
Concentration (mg/L)
2500
2000
1500
1000
500
0
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
TDS


Groundwater - Dombivali Phase II
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)
1600
1400
1200
1000
800
600
400
200
0
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
Electrical Conductivity


Groundwater - Dombivali Phase II
MPN index/100ml
1800
1600
1400
1200
1000
800
600
400
200
0
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
Total Coliforms
Faecal Coliforms


Groundwater - Dombivali Phase II
100
90
80
70
60
50
40
30
20
10
0
% Survival
Pimpleshwar Mahadev Temple
Hardikar Hospital
Lodha Vihar
Location
Bioassay Test on Fish

8. Health Related Data

C: Receptor

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

- % increase is evaluated based on the total no. of cases recorded during two consecutive years.
- For Air Environment, total no. of cases related to Asthma, Bronchitis, Cancer, Acute respiratory infections etc. are to be considered.
- For surface water/ 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 2023 is given below

	A1	A2	A	B	C	D	CEPI
Air Index	3	4	12	11.25	0	5	**28.3**
Water Index	2.5	4	10	39.75	0	5	**54.8**
Land Index	1.5	4	6	19	0	5	**30.0**
						Aggregated CEPI	**58.6**

Among all Environment Pollution Indices (EPI), Water Environment Pollution Index is the highest with a score of 54.8. The reason for the higher Water EPI is the exceedance of Total Kjeldahl Nitrogen and BOD in all the surface water samples. The increase in BOD may be due to microbial activity in surface water. Total Kjeldahl Nitrogen (TKN) is the sum of organic nitrogen, ammonia, and ammonium in a water body. High TKN concentration is the indicator of sewage and manure discharges in the water body.

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI Score June 2023	28.3	54.8	30.0	**58.6**
CEPI Score March 2023	34.25	57.5	45.0	**64.05**
CEPI Score June 2021	21.0	56.0	45.0	**60.2**
CEPI Score March 2021	21.0	59.8	48.0	**63.9**
CEPI score March 2020	57.3	49.0	29.3	**63.4**
CEPI Score June 2019	44.1	38.5	42.3	**53.20**
CEPI score March 2019	45.9	41.55	40.9	**55.09**
CEPI score June 2018	46.31	40.6	46.2	**46.2**

CEPI score March 2018	54.88	48.63	46.04	**64.98**
CPCB CEPI score March 2018	62	63.5	27.25	**69.67**

The result shows that CEPI score of the Dombivali region is 58.6. This time CEPI is observed lower than the CPCB CEPI score March 2018 which was 69.67.

CEPI Score Calculation:

Ambient Air Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
CO	B	2	Large	
PM_{10}	B	0.5		
$PM_{2.5}$	B	0.5		
		3	**4**	**12**

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	1.81	2	0.91	2	8	0.23	M	11.25
PM_{10}	61.13	100	0.61	0	8	0.00	L	0
$PM_{2.5}$	16.33	60	0.27	0	8	0.00	L	0
B score = (B1+B2+B3)							**B**	**11.25**

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

Air CEPI	**(A+B+C+D)**	**28.3**

Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
BOD	B	2	Large	
TKN	A	0.25		
(NH_4+NH_3)-N	A	0.25		
		2.5	**4**	**10**

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF Value (6) [(6)=(4)/(5)x(3)]	SNLF score (B)	
BOD	82.36	8	10.30	12	12	10.30	C	30
TKN	10.06	3	3.35	3	12	0.84	H	3
(NH_4+NH_3)-N	0.99	1.5	0.66	1	12	0.06	M	6.75

B score = (B1+B2+B3)	**B**	**39.75**

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

Water CEPI	**(A+B+C+D)**	**54.8**

Groundwater Quality Analysis Report

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

Pollutant	Avg (1)	Std (2)	EF (3) [(3)=(1)/(2)]	No. of samples Exceeding (4)	Total no. of samples (5)	SNLF Value (6) [(6)=(4)/(5)x(3)]	SNLF score (B)	
Fe	0.32	0.3	1.07	3	6	0.53	H	15.75
TDS	673.78	2000	0.34	0	6	0.00	L	0
F	1.05	1.5	0.70	1	6	0.12	M	3.25
B score = (B1+B2+B3)							**B**	**19**

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

Land CEPI	**(A+B+C+D)**	**30.0**

Water CEPI Score (im)	**54.8**
Land CEPI score (i2)	**30.0**
Air CEPI Score (i3)	**28.3**
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	**58.6**

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 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.
- Higher concentration of TKN was observed in the groundwater samples collected.
- 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 58.6.
- In comparison with the CEPI Score of June 2021, Land and water indices get decreased, however, an increase is observed in the Air Index 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. 16% in CEPI score is observed from 69.67 of the CPCB score of March 2018 to 58.6 in June 2023.

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 till December 2023, so as to cater 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 National Water Quality Monitoring Programme (NWMP) are established.
- Steps are taken for industrial area/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 to use PNG as fuel to boiler.

  3 Concreted road with tree plantation along the road is going on
- Tree plantation in last one year (2021-2022): 6000 nos.
- Other initiatives taken to control and reduce pollution in air, surface water and groundwater in last one year (2021-2022):

  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) MPC Board is continuously in touch with industry to use 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 also been carried out to check the status during night period.

  d) Industries located in MIDC area are discharging partially treated effluent to CETP through underground pipeline. No direct discharged of effluent to the nallah by the industries. MPCB and MIDC combine visited area to see the leakages or overflow of chambers and if found it get repaired immediately to avoid effluent discharged to nearby nallah.

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

12. Photographs

Dombivali Phase – I - Ambient Air Sampling at Gharda Chemicals

Dombivali Phase – I- Ambient Air Sampling at DEBESA CETP

Dombivali Phase – II - Ambient Air Sampling at CETP Dombivali

Dombivali Phase – II- Ambient Air Sampling at Metropolitan Eximchem

Dombivali Phase – I- Surface water sampling at Kambal Pada Nallah

Dombivali Phase – I- Surface water sampling of storm water DEBESA

Dombivali Phase – I- Surface water Sampling from Tempo Naka Nallah

Dombivali Phase – II- Surface water Sampling from CETP Dombivali

Dombivali Phase – I- Groundwater Sampling at Mamta Hospital

Dombivali Phase – I- Groundwater Sampling at opposite Kama Office

Dombivali Phase – II- Groundwater Sampling at Hardikar Hospital

Dombivali Phase – II- Groundwater Sampling at Pimpleshwar temple

शास्त्रीनगर सामान्य रुग्णा...
जावक क्र. 1471
दिनांक 22/11/23

HEALTH STATISTICS

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

Name of the Polluted Industrial Area (PIA)	DOMBIVALI
Name of the major health center/ organization	KDMC HOSPITAL
Name and designation of the Contact person	
Address	

S No.	Diseases	No. of Patients Reported	
		2022 (Jan-Dec)	2021 (Jan-Dec)
AIRBORNE DISEASES			
1.	Asthma	148	39
2.	Acute Respiratory Infection	161	281
3.	Bronchitis	08	103
4.	Cancer	Nil	Nil
WATERBORNE DISEASES			
1.	Gastroenteritis	79	54
2.	Diarrhea	116	87
3.	Renal diseases	02	Nil
4.	Cancer	01	Nil

Date: 20/1/2023

Signature

Chief Medical Officer
Shastrinagar Hospital, Dombivli (W)
Kalyan Dombivali Municipal Corporation

HEALTH STATISTICS

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

Name of the Polluted Industrial Area (PIA)	DOMBIVALI
Name of the major health center/ organization	SRV MAMATA HOSPITALS,
Name and designation of the Contact person	Dr Apeksha Kanchan, MS.
Address	P-43, Phase II, Next to ICICI Bank, MIDC Dombivali

S No.	Diseases	No. of Patients Reported	
		2022 (Jan-Dec)	2021 (Jan-Dec)
AIRBORNE DISEASES			
1.	Asthma	75	86
2.	Acute Respiratory Infection	132	198
3.	Bronchitis	104	152
4.	Cancer	110	86
WATERBORNE DISEASES			
1.	Gastroenteritis	93	84
2.	Diarrhea	112	107
3.	Renal diseases	738 (Including Dialysis	978 (Including Dialysis).
4.	Cancer	110	86

Date: 24/1/23.

Signature

SRV MAMATA HOSPITAL