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

Post Monsoon (December 2022 to February 2023)

Maharashtra Pollution Control Board

Kalptaru Point, Sion East, Mumbai – 400 022

Index

ABBREVIATIONS

CPCB	Central Pollution Control Board
MPCB	Maharashtra Pollution Control Board
CEPI	Comprehensive Environmental Pollution Index
EPA	Environmental Protection Act, 1986
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
CETP	Common Effluent Treatment Plant
VOCs	Volatile Organic Compounds
MIDC	Maharashtra Industrial Development Corporation
NWMP	National Water Quality Monitoring Program
NAAQS	National Ambient Air Quality Standard
ZLD	Zero Liquid Discharge
CPA	Critically Polluted Area
SPA	Severely Polluted Area

1. Executive Summary

The Dombivali CEPI area including 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 ground Water in consideration with the previous CEPI monitoring and covering the entire CEPI Impact Zone. The post monsoon monitoring was carried out during the period of December 2022 to February 2023 to verify the Ambient Air Quality, Surface water and Ground water.

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 exceeding the limit prescribed by NAAQS as the locations are located nearby road where the maximum vehicular movements are happening. The surface water of Dombivali is contaminated as domestic waste water drain is also connected with the surface water and hence the quality of surface water could not able to compare with IS10500:2012 drinking water standards. In ground water, the concentration of Total Kjeldahl Nitrogen is high in some of the water samples collected. Rainwater can wash nitrates in the fertilizer and the nitrates can seep into ground water.

Based on the study report conducted by CPCB during the period January 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 $PM_{2.5}$ are the main contribution in the increase in the score and this is mainly due to the AAQM stations fixed nearby the road side where the maximum vehicular movements are happening due to which PM_{10} and $PM_{2.5}$ concentrations are more apart from the industrial emission sources. Also, health data collection also affects the score of Dombivali CEPI region

Maharashtra Pollution Control Board has taken various initiatives in reducing the CPCB CEPI Score of 69.67 of 2018 to 64.05 of 2023. Based on the study as per the revised CEPI 2016, the CEPI index of Post-Monsoon - Ambient Air is 34.25, Surface Water is 57.50, and Ground Water is 45.00. The overall CEPI score for Dombivali area for the Post-monsoon 2023 is 64.05.

2. Introduction

Over the past few decades, environmental deterioration has become a "common concern" for humanity. The distinctive nature of the current environmental issues is that human activity contributes to them more than natural events. Economic expansion and mindless consumption are beginning to have negative impacts on mother nature. It's been studied and reported that the majority of industries (77% approximately) contribute to water pollution, 15% to air pollution, and the remaining 8% to both air and water pollution. Additionally, the most polluting businesses are those that depend on natural resources and are expanding quickly.

These human activities have an adverse effect on the environment by polluting the water we drink, the air we breathe, and the soil in which plants grow. Untreated wastewater from industries has affected the potability and hygiene of drinking water due to the presence of hazardous impurities in it, causing detrimental health effects to human, animal and aquatic life. Exposure to air pollutants is closely related to Pulmonary Diseases, wheezing, asthma, respiratory disease, cardiovascular diseases etc. Moreover, air pollution seems to have various malign health effects in early human life, such as respiratory, cardiovascular, mental, and perinatal disorders, leading to infant mortality or chronic disease in adult age. Therefore, it is crucial to identify and investigate the major sources of pollution to implement mitigation strategies for substantial environmental and health co-benefits. Even though health is a major concern, industrial growth is a necessity for a developing economy. Research into the development of such systems that can cut down on the usage of freshwater by industrial sectors as well as the development of efficient and effective water treatment methods is encouraged for overall socioeconomic progress and wellbeing. To mitigate any hazardous impacts, new advancements and ongoing monitoring of the execution methods of various programmes and interventions related to industrial wastewater treatment are critically important.

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. 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 & Ground Water 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 Ground Water 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

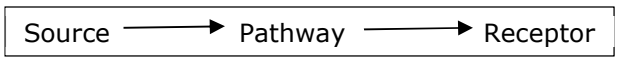
Sampling Criteria	Number of sites	Total Sites	Monitoring Parameters
			methane, Toluene, O-Xylene, Bromoform, 1,1,2,2-Tetrachloroethane, 4-Chlorotoluene, 1,1-Dichloroethylene, Trans-1,2-Dichloroethylene, 1,1-Dichloroethane, CIS-1,2-Dichloroethylene, Bromochloromethane, 1,1,1-Trichloroethane
Water Quality 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	**Ground Water**		
	As mentioned in Table 3.1	03	01 sample at each round
D	**Surface Water**		
	As mentioned in Table 3.1	03	01 sample at each round

4. Methodology

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



Ambient air stations, Surface water locations and Ground water 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 10th, 12th and 14th Jan, 2023. All twelve parameters are observed well within the limits (except Sulphur dioxide and PM_{10}) 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	10.01.2023	12.01.2023	14.01.2023
2.	Near main gate DEBESA CETP	19°13'0.45"N	73°6'18.07"E	10.01.2023	12.01.2023	14.01.2023
3.	Near main gate Balkrishna Industries Ltd.	19°12'36.40"N	73°6'41.92"E	10.01.2023	12.01.2023	14.01.2023
4.	Near main gate Sagar Ice & Cold Storage Pvt. Ltd.	19°12'55.54"N	73°6'26.29"E	10.01.2023	12.01.2023	14.01.2023

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	10.01.2023	12.01.2023	14.01.2023
2.	Near main gate DEBESA CETP	19°13'0.45"N	73°6'18.07"E	10.01.2023	12.01.2023	14.01.2023

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	40.43	37.34	97.15	128.00
Nitrogen Dioxide (NO_2)	µg/m³	27.87	26.10	25.53	32.25
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	89	102	79	80
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	27	26	23	21
Ozone (O_3)	µg/m³	20.50	77.05	42.40	34.00
Lead (Pb)	µg/m³	0.07	0.04	0.06	0.06
Carbon Monoxide (CO) (1 h)	mg/m³	1.44	1.37	1.35	1.31
Carbon Monoxide (CO) (8 h)	mg/m³	1.82	2.00	2.07	1.83
Ammonia (NH_3)	µg/m³	29.50	32.70	32.20	32.70
Benzene (C_6H_6)	µg/m³	2.80	2.03	2.50	3.04
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	1.93	0.47	0.82	0.53
Nickel (Ni)	ng/m³	BLQ	3.78	5.06	4.11

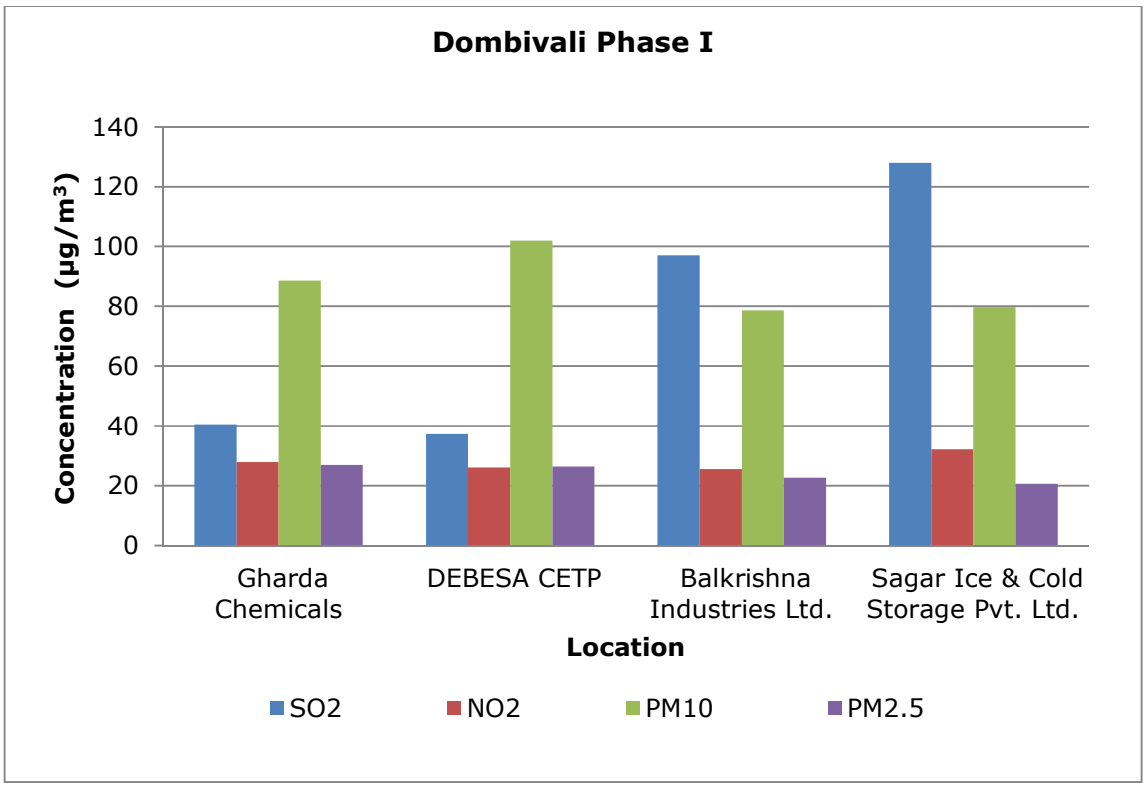
Table 5.4 Phase I - Volatile Organic Compounds (VOCs) in Ambient Air Results

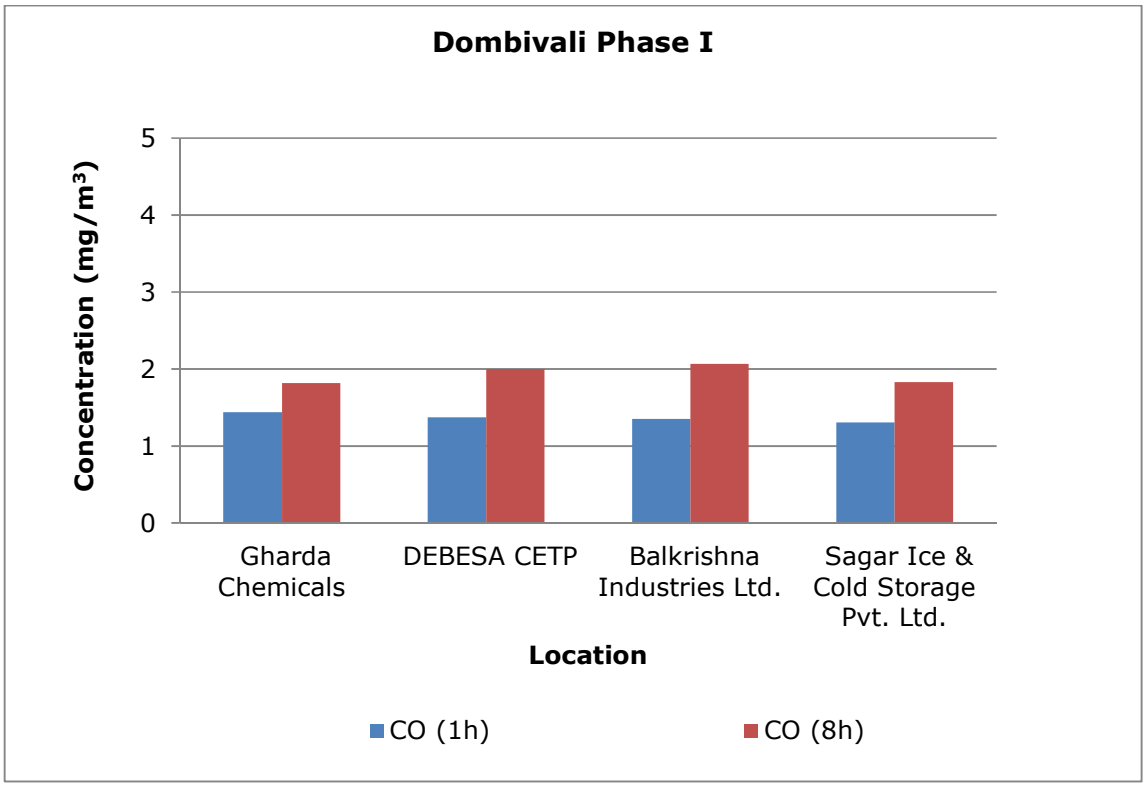
Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
Dichloromethane	µg/m³	BLQ	BLQ
Chloroform	µg/m³	BLQ	BLQ
Carbon Tetrachloride	µg/m³	0.63	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	3.82	1.39
1,3-Dichlorobenzene	µg/m³	3.91	2.46
1,2-Dichlorobenzene	µg/m³	2.42	1.05
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Napthalene	µg/m³	7.72	6.38
Bromobenzene	µg/m³	BLQ	BLQ

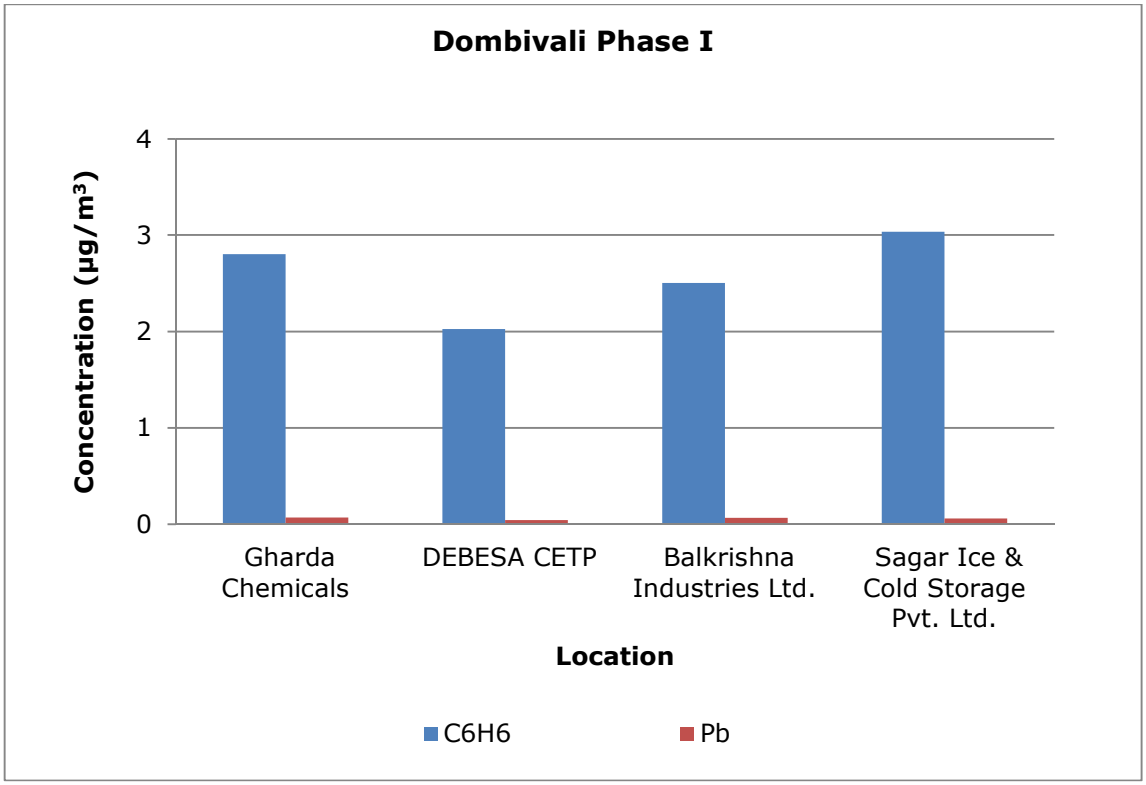
Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	1.11	0.89
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	0.94	BLQ
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	30.70	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	0.64	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	0.98	BLQ
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	30.70	12.12
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	16.10	6.75
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	1.21	0.68
O-Xylene	µg/m³	BLQ	BLQ

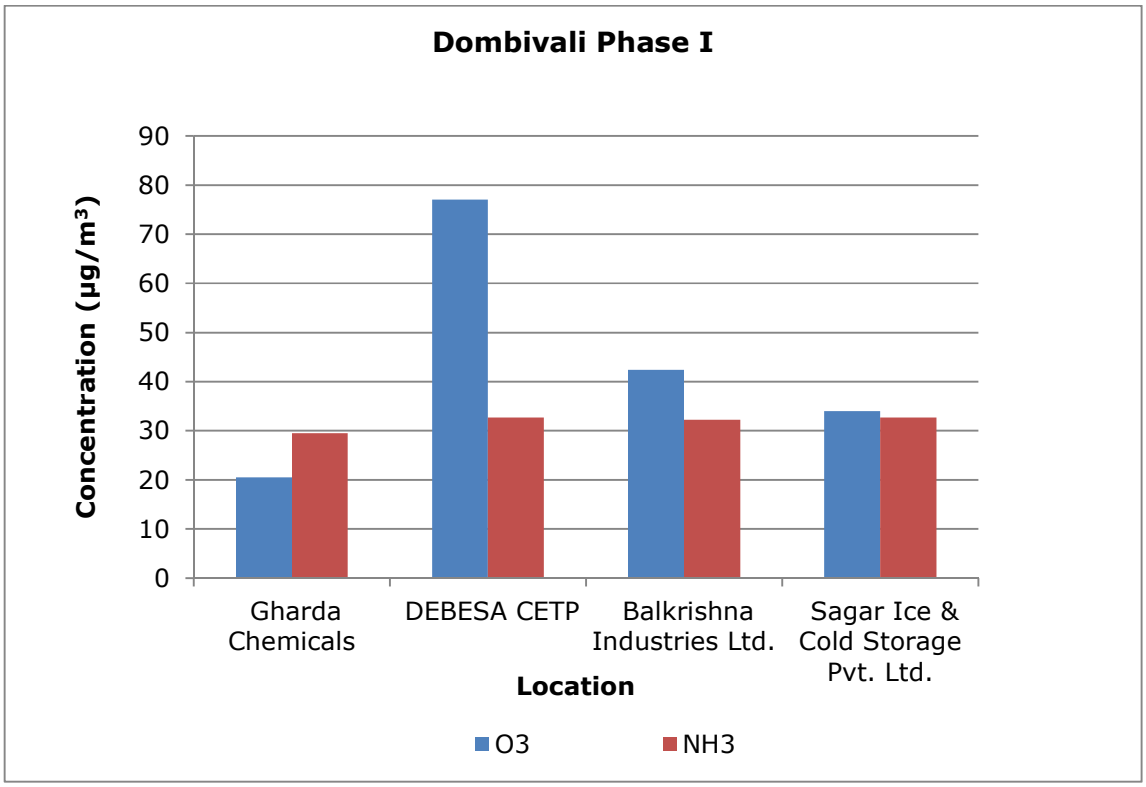
Parameters	Unit	Results	
		Gharda Chemicals	DEBESA CETP
Bromoform	µg/m³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m³	0.93	BLQ
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

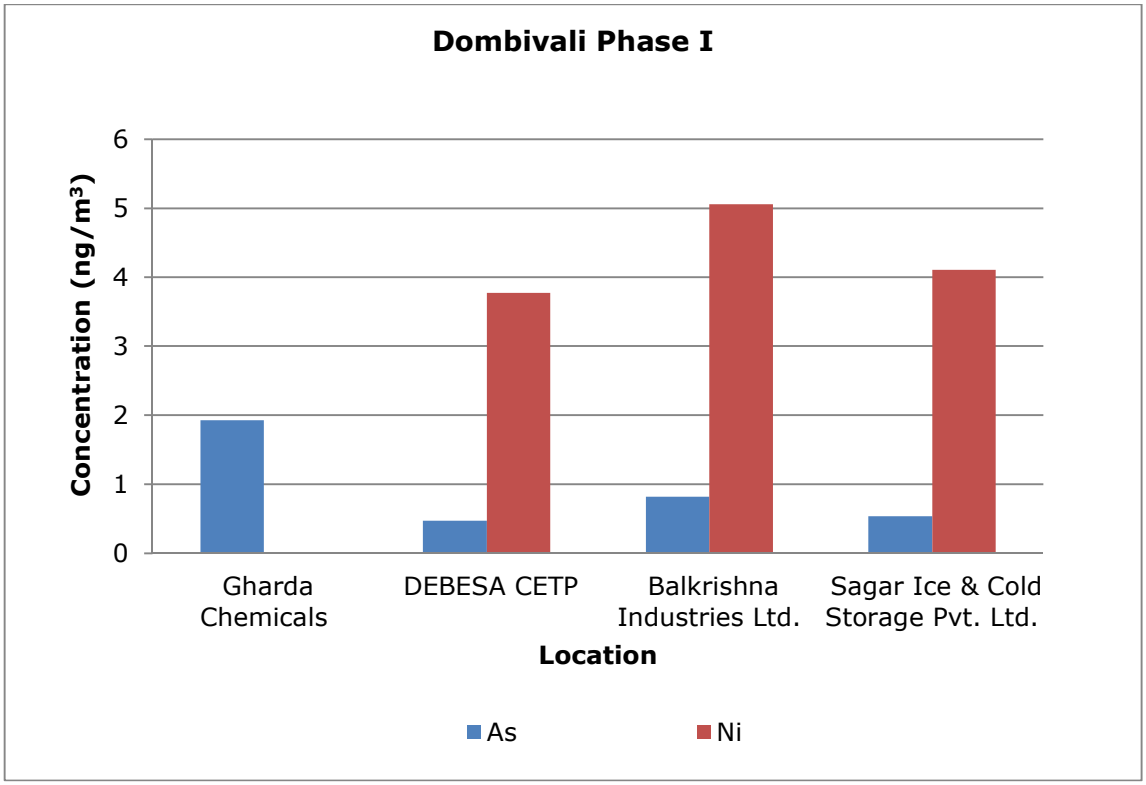
Graphs - Ambient Air Quality of MIDC Dombivali Phase I






Dombivali Phase I
Concentration (µg/m³)
4
3
2
1
0
Gharda Chemicals
DEBESA CETP
Balkrishna Industries Ltd.
Sagar Ice & Cold Storage Pvt. Ltd.
Location
C6H6
Pb


Dombivali Phase I
Concentration (µg/m³)
90
80
70
60
50
40
30
20
10
0
Gharda Chemicals
DEBESA CETP
Balkrishna Industries Ltd.
Sagar Ice & Cold Storage Pvt. Ltd.
Location
O3
NH3


Dombivali Phase I
Concentration (ng/m³)
6
5
4
3
2
1
0
Gharda Chemicals
DEBESA CETP
Balkrishna Industries Ltd.
Sagar Ice & Cold Storage Pvt. Ltd.
Location
As
Ni

2. **MIDC Phase II:** In MIDC Phase II of Dombivali also all 4 locations monitored were well within the limits (except Sulphur dioxide at Apartim Equipments) for all 12 NAAQS parameters.

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	10.01.2023	12.01.2023	14.01.2023
2.	Behind Connectwell Industries Pvt. Ltd.	19°11'37.12"N	73° 5'39.80"E	10.01.2023	12.01.2023	14.01.2023
3.	Near main gate Metropolitan Eximchem Ltd.	19°12'7.89"N	73° 5'56.18"E	10.01.2023	12.01.2023	14.01.2023
4.	Near main gate Apartim Equipment	19°12'22.33"N	73° 6'1.31"E	10.01.2023	12.01.2023	14.01.2023

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	10.01.2023	12.01.2023	14.01.2023
2.	Behind Connectwell Industries Pvt. Ltd.	19°11'37.12"N	73° 5'39.80"E	10.01.2023	12.01.2023	14.01.2023

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

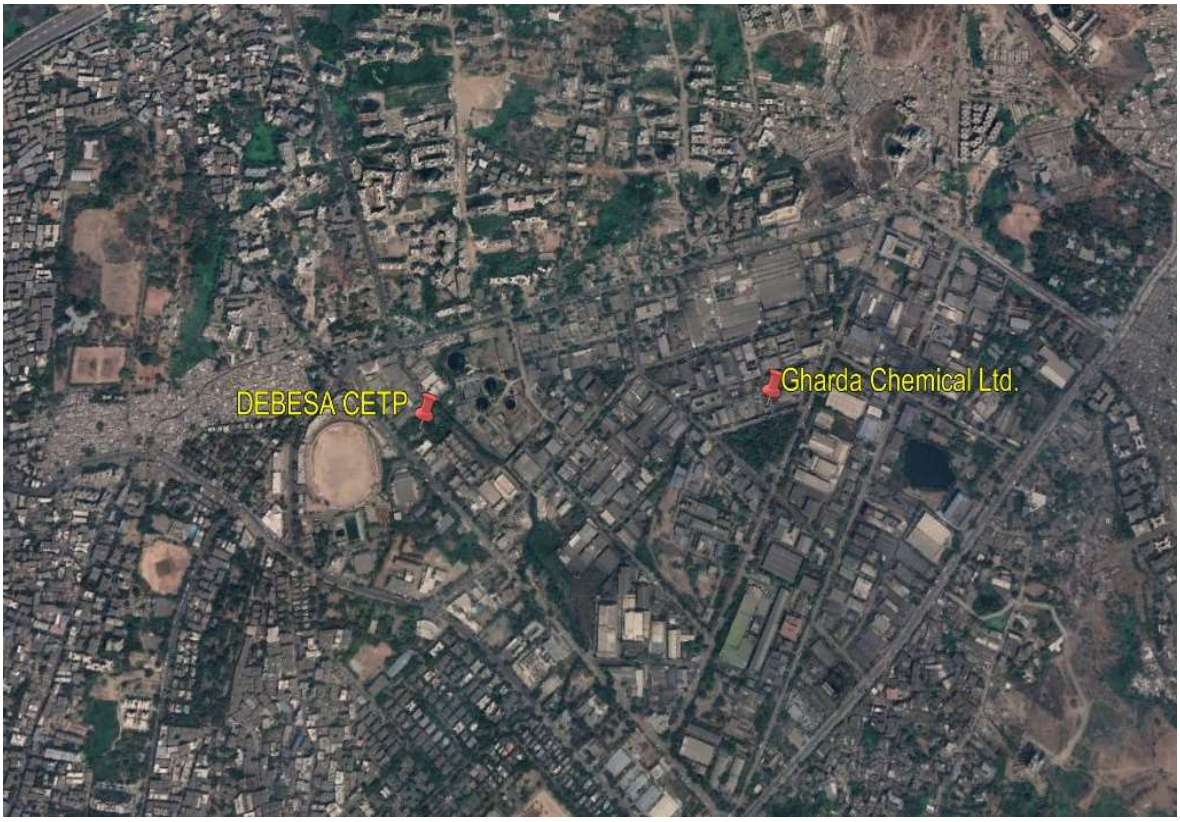


Fig. Geographical Locations of VOCs Monitoring MIDC Dombivali Phase II

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	72.00	70.70	63.70	195.00
Nitrogen Dioxide (NO_2)	µg/m³	34.00	23.95	24.70	32.10
Particulate Matter (size less than 10 µm) or PM_{10}	µg/m³	93	67	93	65
Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$	µg/m³	27	19	23	18
Ozone (O_3)	µg/m³	36.55	26.30	92.35	61.15
Lead (Pb)	µg/m³	0.03	0.10	0.04	0.06
Carbon Monoxide (CO) (1 h)	mg/m³	1.24	1.63	1.42	1.47
Carbon Monoxide (CO) (8 h)	mg/m³	1.72	2.24	1.96	1.88
Ammonia (NH_3)	µg/m³	32.70	30.90	29.70	27.43
Benzene (C_6H_6)	µg/m³	2.73	2.07	2.65	2.17
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m³	0.52	0.65	2.91	1.10
Nickel (Ni)	ng/m³	4.52	5.39	BLQ	BLQ

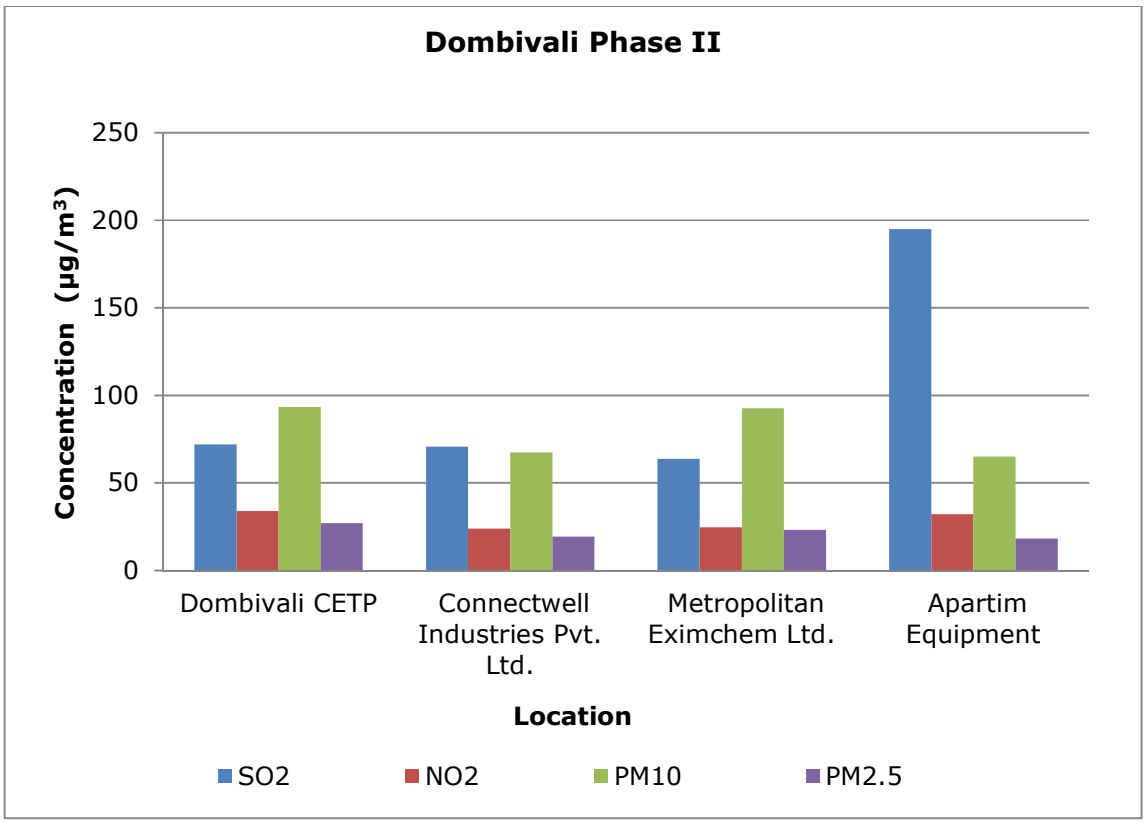
Table 5.8 Phase I - Volatile Organic Compounds (VOCs) in Ambient Air Results

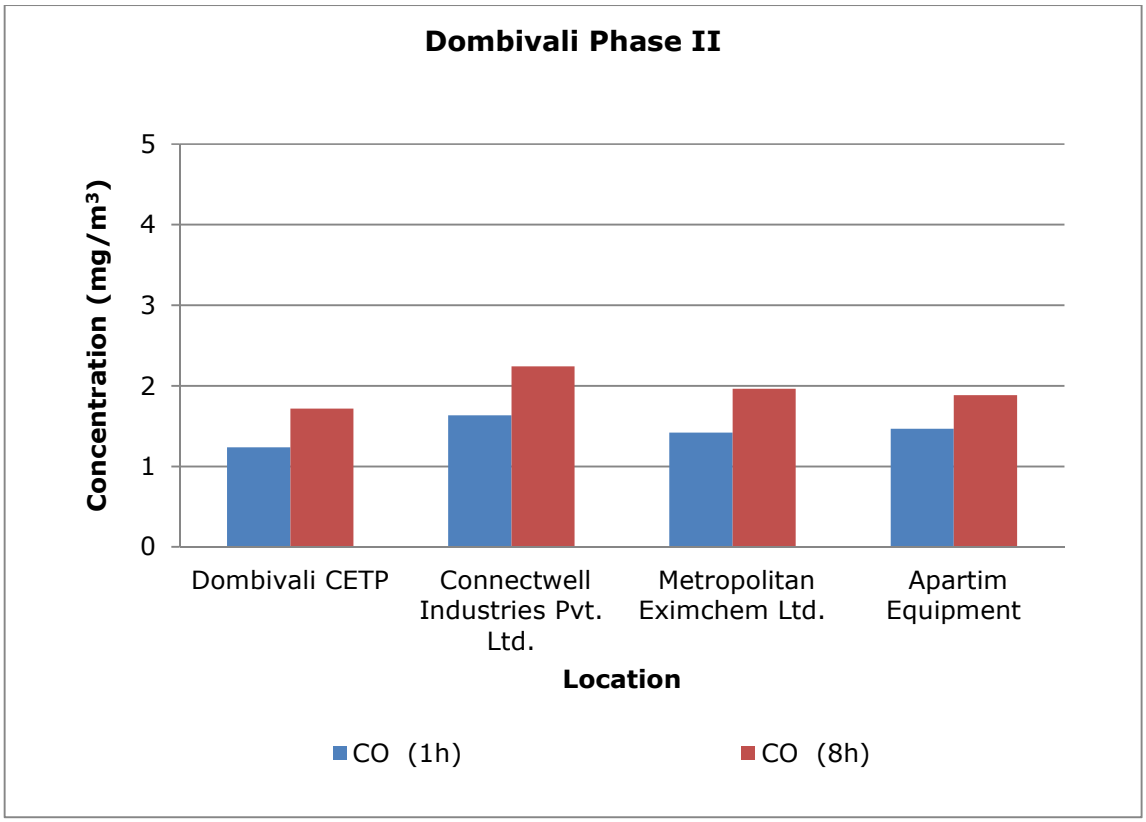
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
Dichloromethane	µg/m³	BLQ	BLQ
Chloroform	µg/m³	BLQ	BLQ
Carbon Tetrachloride	µg/m³	BLQ	BLQ
Trichloroethylene	µg/m³	BLQ	BLQ
Bromodichloromethane	µg/m³	BLQ	BLQ
1,3-Dichloropropane	µg/m³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m³	2.39	0.71
1,3-Dichlorobenzene	µg/m³	1.78	1.24
1,2-Dichlorobenzene	µg/m³	1.56	0.75
1,2-Dibromo-3-Chloropropane	µg/m³	BLQ	BLQ
Naphthalene	µg/m³	3.85	3.89
Bromobenzene	µg/m³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m³	BLQ	BLQ

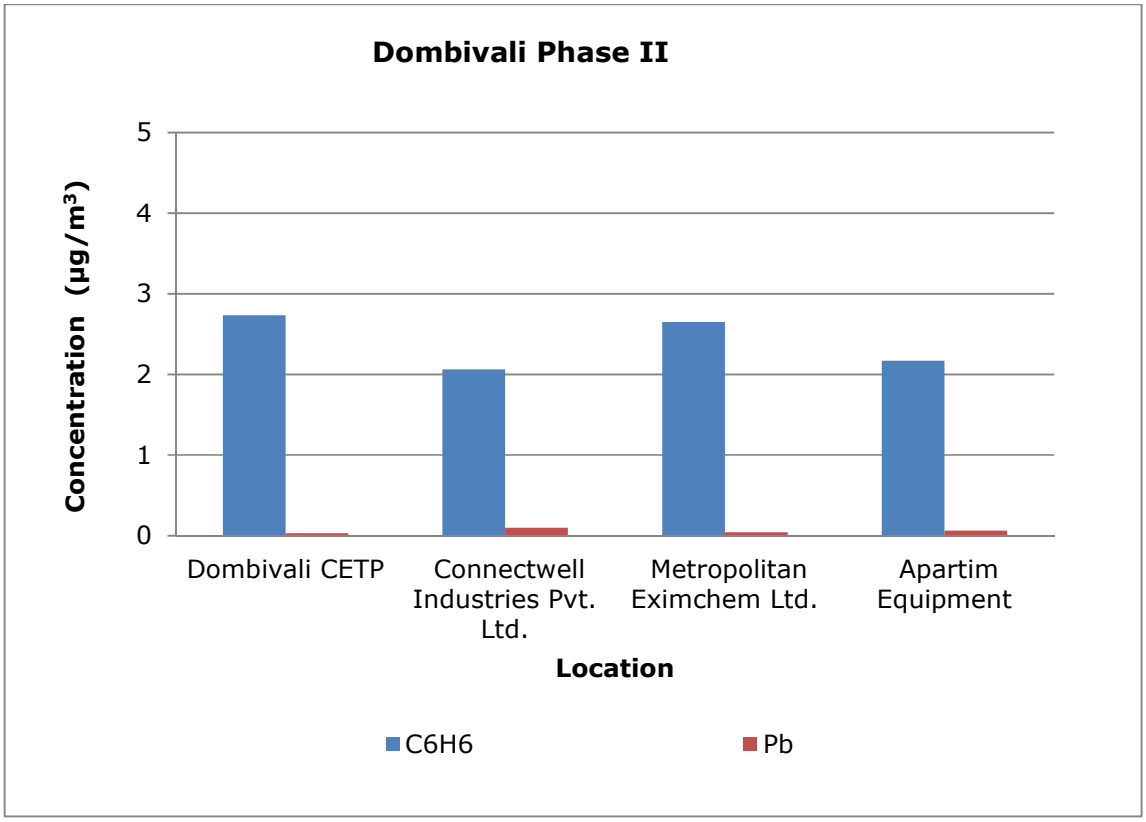
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
2-Chlorotoluene	µg/m³	BLQ	BLQ
Tert-Butylbenzene	µg/m³	BLQ	BLQ
SEC-Butylbenzene	µg/m³	BLQ	BLQ
P-Isopropyltoluene	µg/m³	1.13	1.28
M-Xylene	µg/m³	BLQ	BLQ
P-Xylene	µg/m³	BLQ	BLQ
Styrene	µg/m³	1.05	1.31
Cumene	µg/m³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m³	30.70	BLQ
N-Propylbenzene	µg/m³	0.64	BLQ
Dibromochloromethane	µg/m³	BLQ	BLQ
1,2-Dibromoethane	µg/m³	BLQ	BLQ
Chlorobenzene	µg/m³	0.66	0.64
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	0.81	0.78
1,3,5-Trimethylbenzene	µg/m³	BLQ	BLQ
N-Butylbenzene	µg/m³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m³	17.00	8.08
Hexachlorobutadiene	µg/m³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m³	4.86	5.08
2,2-Dichloropropane	µg/m³	BLQ	BLQ
Dibromomethane	µg/m³	BLQ	BLQ
Toluene	µg/m³	0.75	1.37
O-Xylene	µg/m³	BLQ	BLQ
Bromoform	µg/m³	BLQ	BLQ

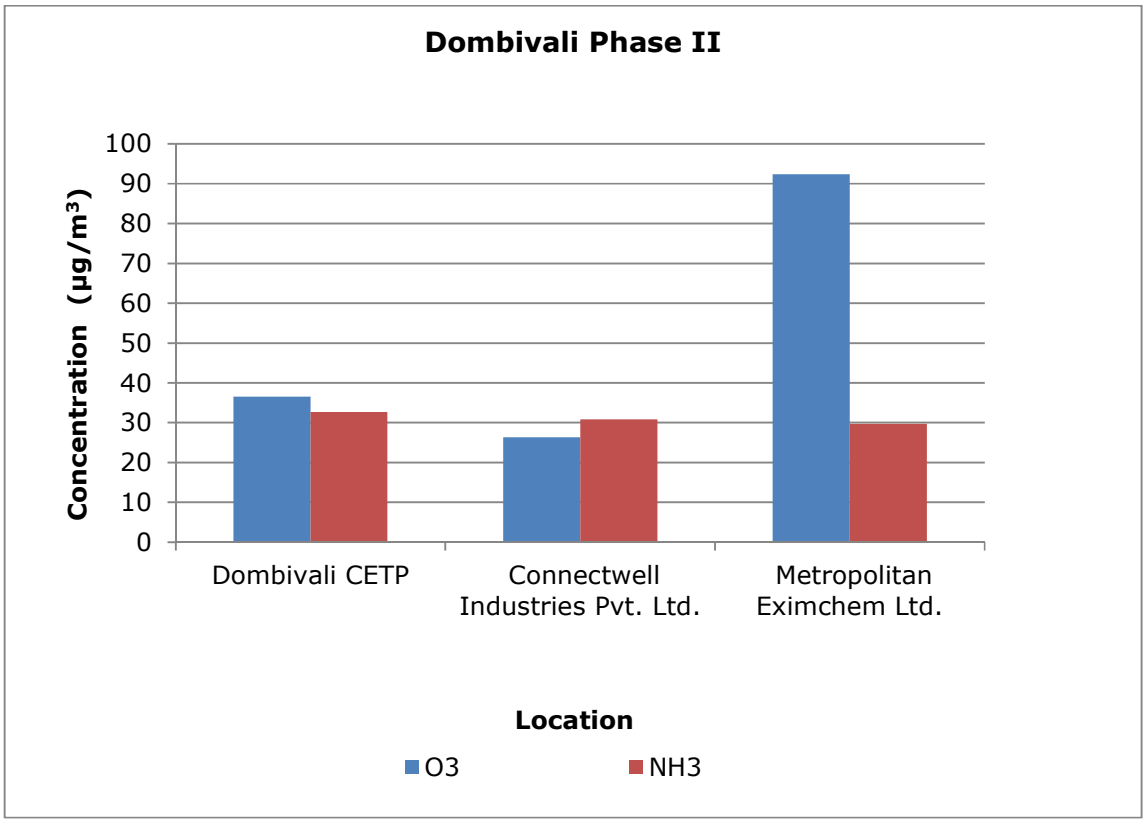
Parameters	Unit	Results	
		Dombivali CETP	Connectwell Industries Pvt. Ltd.
1,1,2,2-Tetrachloroethane	µg/m³	0.93	0.74
4-Chlorotoluene	µg/m³	BLQ	BLQ
1,1-Dichloroethylene	µg/m³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
1,1-Dichloroethane	µg/m³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m³	BLQ	BLQ
Bromochloromethane	µg/m³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m³	BLQ	BLQ

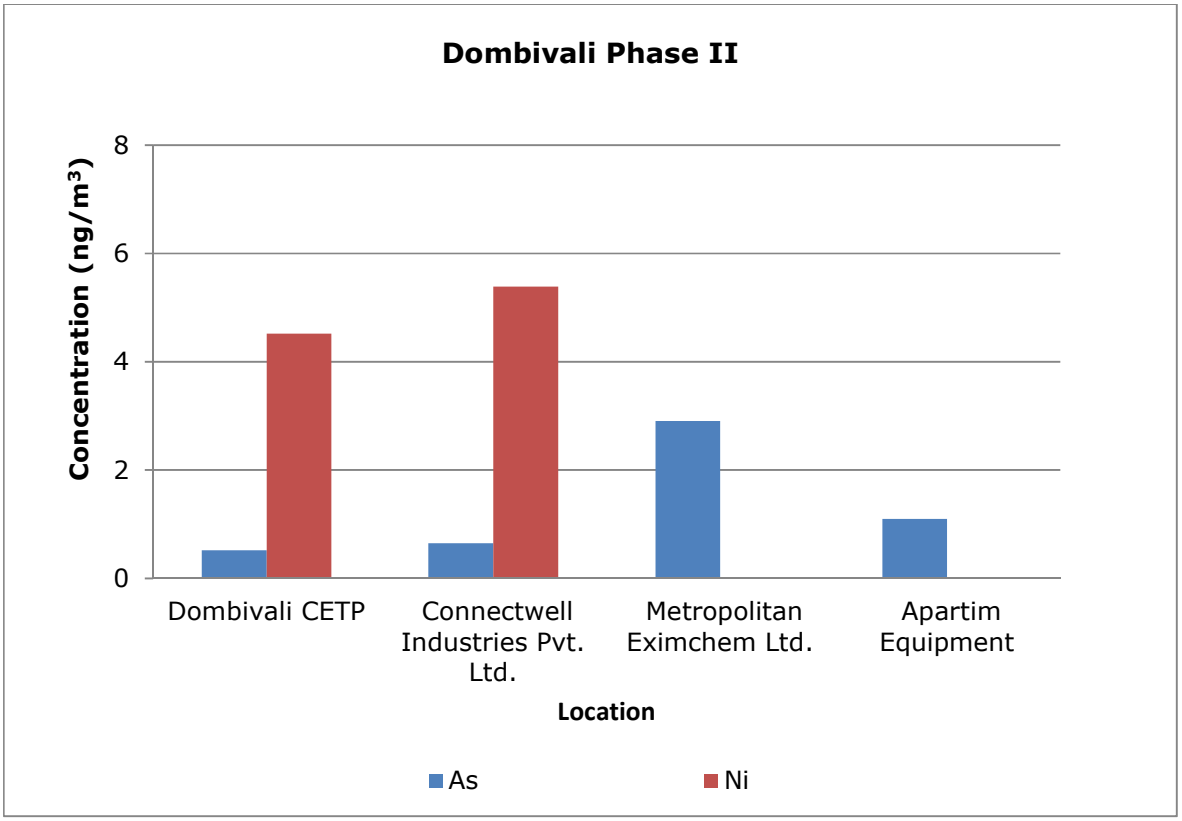
Graphs - Ambient Air Quality of MIDC Dombivali Phase II






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


Dombivali Phase II
Concentration (µg/m³)
100
90
80
70
60
50
40
30
20
10
0
Dombivali CETP
Connectwell Industries Pvt. Ltd.
Metropolitan Eximchem Ltd.
Location
O3
NH3


Dombivali Phase II
Concentration (ng/m³)
8
6
4
2
0
Dombivali CETP
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 water sample.
- pH and suspended solids are well within the limits of all the collected samples.
- BOD exceeded in all the collected samples except stormwater of DEBESA CETP.
- 100% survival was achieved in Fish Bioassay in the water sample collected from Khambal pada and stormwater of DEBESA CETP.
- The value of Iron exceeded in five out of six samples. 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, Fluoride, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- Total Kjeldahl Nitrogen exceeded in all the samples collected from MIDC Phase I.
- 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	11.01.2023	13.01.2023	15.01.2023
2.	Near Khambal Pada	19°13'49.19"N	73°6'19.11"E	11.01.2023	13.01.2023	15.01.2023
3.	Thakurli Talav	19°13'19.42"N	73°5'57.92"E	11.01.2023	13.01.2023	15.01.2023

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
4.	Storm Water DEBESA CETP Nallah	19°12'58.47"N	73°6'56.60"E	11.01.2023	13.01.2023	15.01.2023
5.	Gharda Chemical Ltd.	19°13'2.87"N	73°6'44.41"E	11.01.2023	13.01.2023	15.01.2023
6.	Krishna Alkali Pvt. Ltd.	19°13'1.18"N	73°6'38.89"E	11.01.2023	13.01.2023	15.01.2023

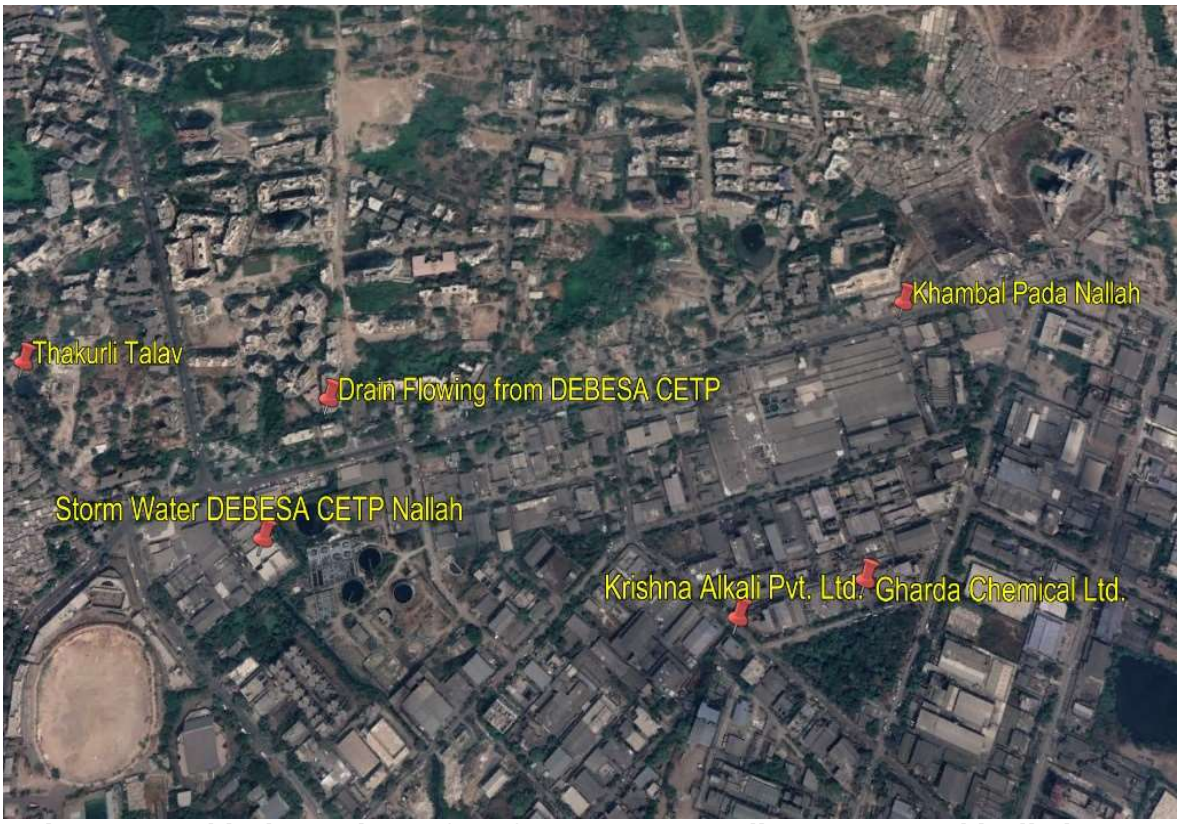


Fig. Geographical Locations of Surface Water Sampling MIDC Dombivali Phase I

Table 6.2 Phase I – Results of Surface Water

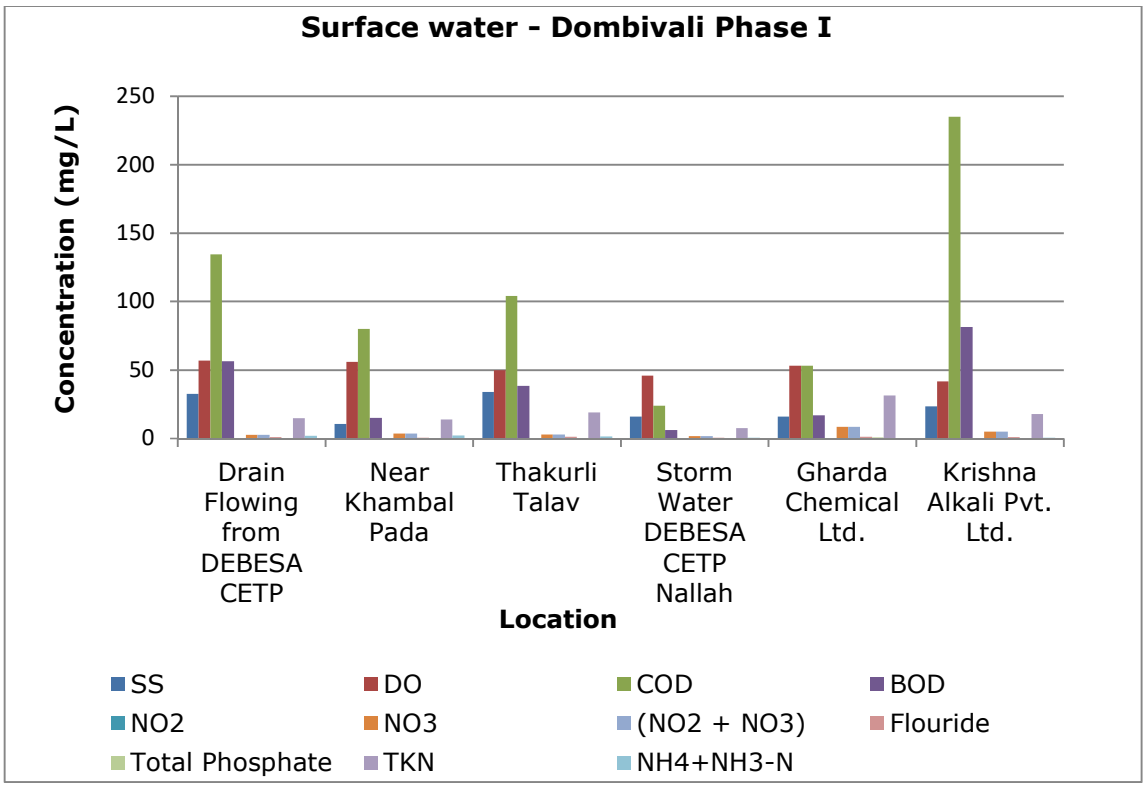
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Sanitary Survey		Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood
General Appearance		No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter

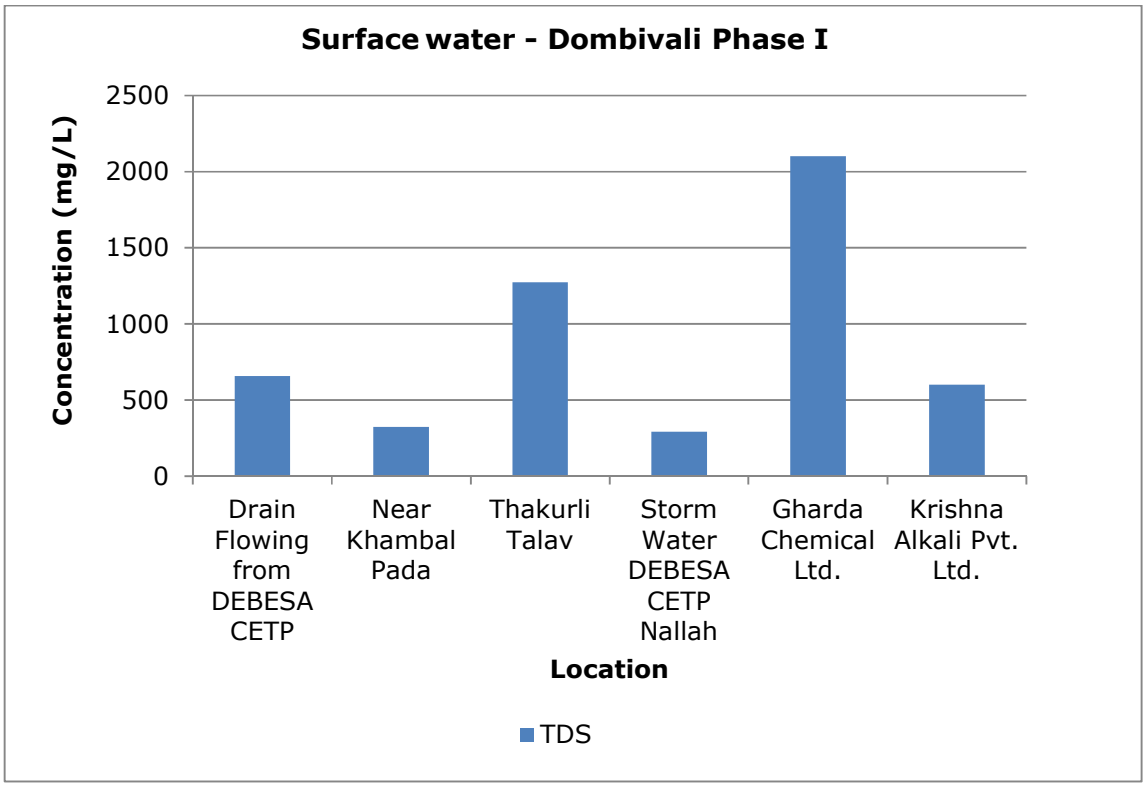
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Transparency	m	0.53	0.57	0.47	0.50	0.57	0.53
Temperature	°C	28	28	29	28	28	28
Colour	Hazen	2	2	4	1	2	2
Smell	-	Agreeable	Agreeable	Not Agreeable	Agreeable	Agreeable	Agreeable
pH	-	7.67	6.87	7.94	7.35	7.90	7.51
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	33	11	34	16	16	23
Total Dissolved Solids	mg/L	658	325	1273	293	2103	601
Dissolved Oxygen (% Saturation)	%	57.00	56.00	50.00	46.00	53.33	41.67
Chemical Oxygen Demand	mg/L	135	80	104	24	53	235
Biochemical Oxygen Demand (3 days,27°C)	mg/L	56	15	38	6	17	81
Electrical Conductivity (at 25 °C)	µmho/cm	1173	578	2269	521	3753	1070
Nitrite Nitrogen (as NO_2)	mg/L	0.02	0.07	BLQ	0.08	0.03	0.03
Nitrate Nitrogen (as NO_3)	mg/L	2.66	3.54	3.04	1.61	8.40	4.99
(NO_2 + NO_3)-Nitrogen	mg/L	2.67	3.58	3.04	1.67	8.41	5.02
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.10	0.12	0.06	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.07	0.47	1.30	0.53	1.27	1.03
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.16	BLQ	0.28	BLQ	0.57	BLQ

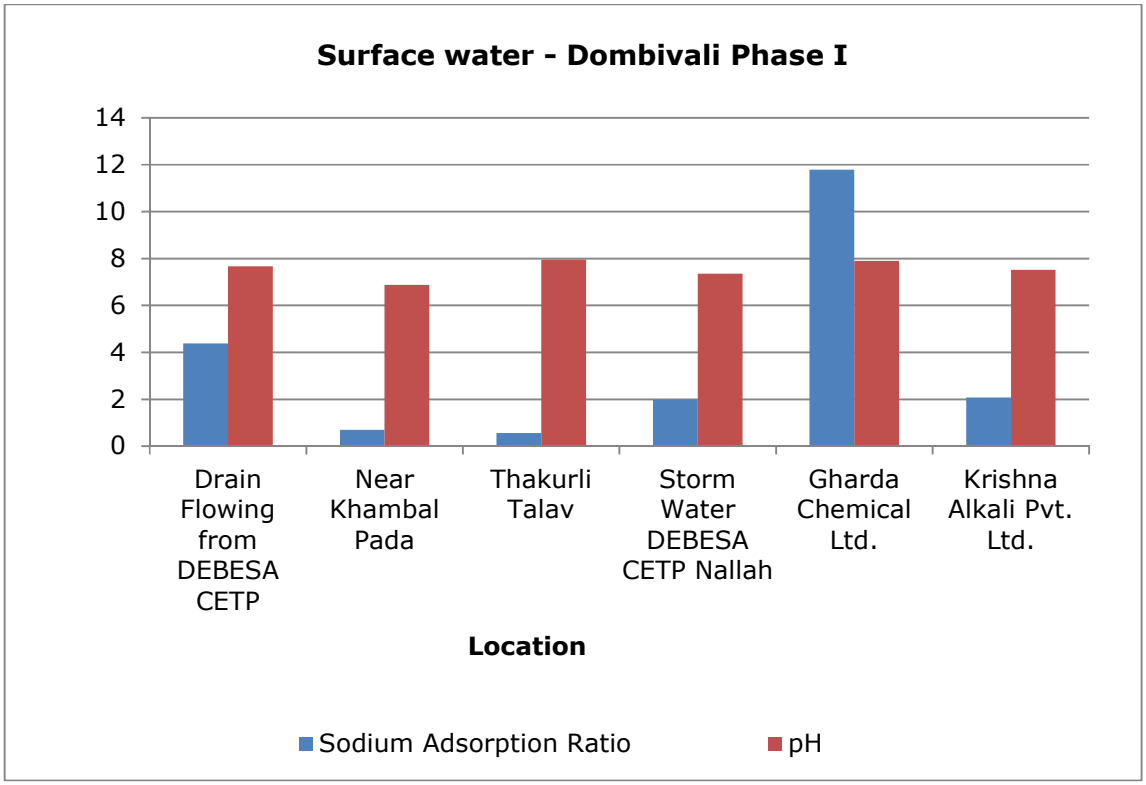
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Sodium Adsorption Ratio	-	4.37	0.70	0.56	1.97	11.78	2.07
Total Coliforms	MPN Index/ 100 ml	653	192	370	180	151	370
Faecal Coliforms	MPN Index/ 100 ml	160	127	317	66	135	189
Total Phosphate (as P)	mg/L	0.29	BLQ	0.38	BLQ	0.83	0.20
Total Kjeldahl Nitrogen (as N)	mg/L	14.84	13.86	19.04	7.61	31.50	17.83
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	1.86	2.39	1.49	0.55	0.34	0.61
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	0.11	BLQ	0.10	BLQ	BLQ
Nickel (as Ni)	mg/L	0.01	BLQ	0.01	0.01	BLQ	0.02
Copper (as Cu)	mg/L	0.02	BLQ	BLQ	0.05	BLQ	BLQ
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Arsenic (as As)	mg/L	0.01	BLQ	0.01	BLQ	0.01	BLQ

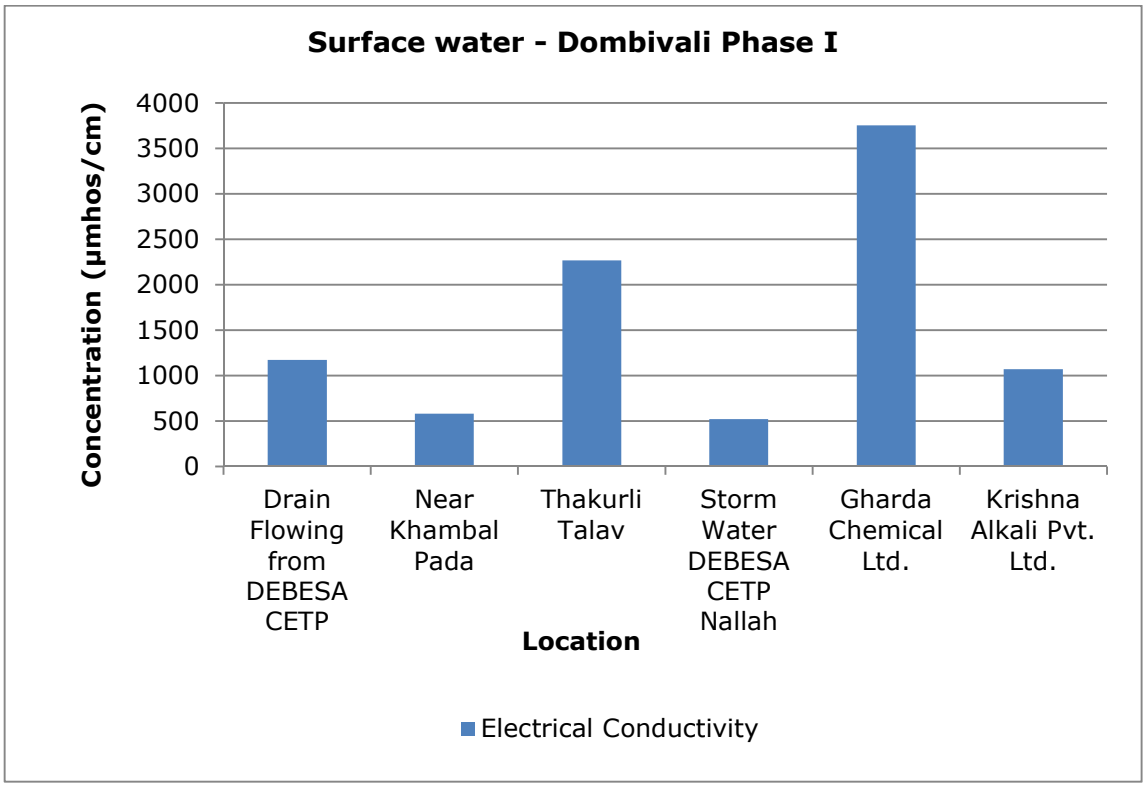
Parameters	Unit	Results					
		Drain Flowing from DEBESA CETP	Near Khambal Pada	Thakurli Talav	Storm Water DEBESA CETP Nallah	Gharda Chemical Ltd.	Krishna Alkali Pvt. Ltd.
Lead (as Pb)	mg/L	BLQ	BLQ	BLQ	0.01	BLQ	0.04
Cadmium (as Cd)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Mercury (as Hg)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Manganese (as Mn)	mg/L	0.53	0.22	0.36	0.33	0.02	0.29
Iron (as Fe)	mg/L	0.37	0.65	0.19	0.37	0.33	1.09
Vanadium (as V)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Selenium (as Se)	mg/L	0.01	0.02	0.02	0.01	0.01	0.02
Boron (as B)	mg/L	0.11	2.54	0.14	BLQ	0.10	17.10
Total Nitrogen	mg/L	17.50	17.45	22.09	9.27	39.87	22.84
Bioassay Test on fish	% survival	93	100	90	100	93	97

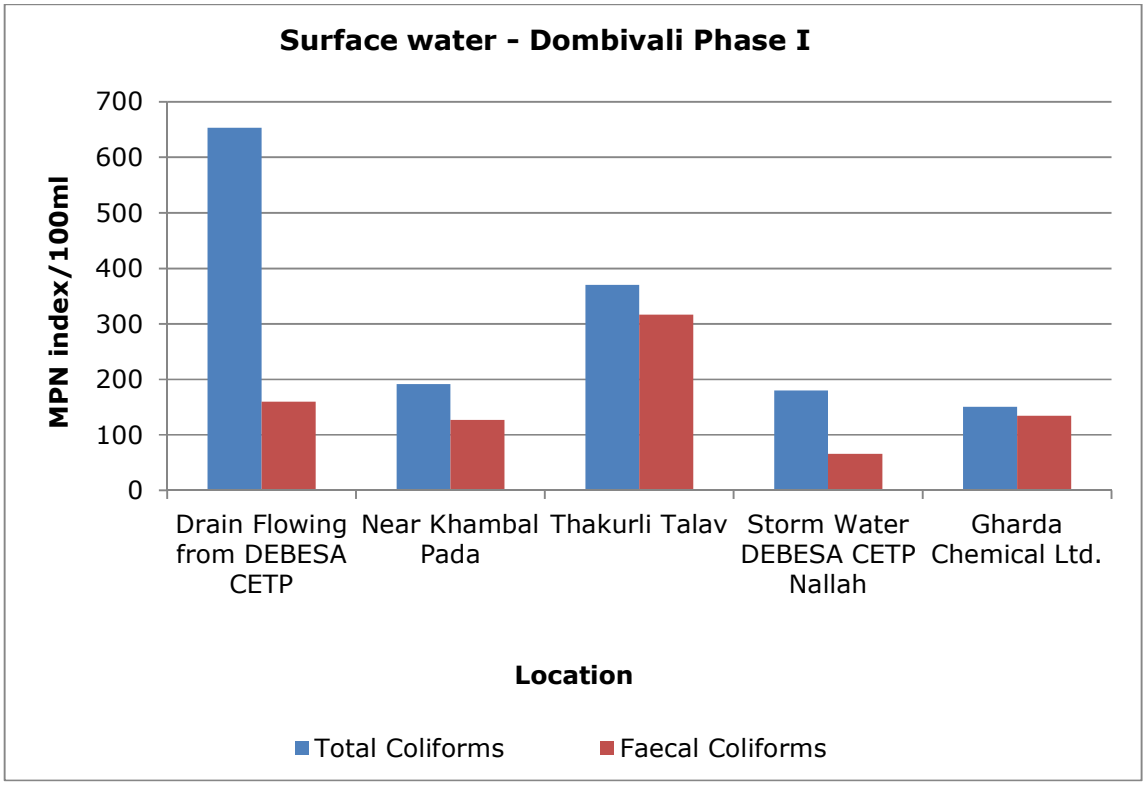
Graphs - Surface Water Quality of MIDC Dombivali Phase I

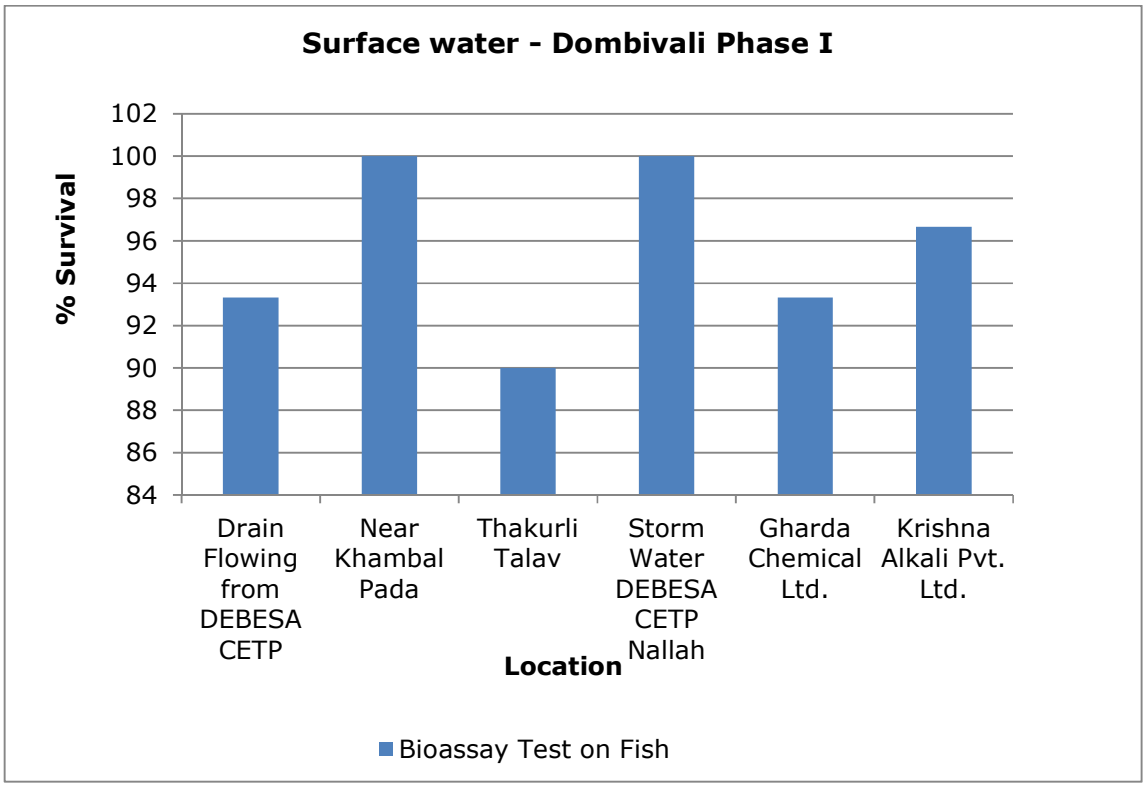





Surface water - Dombivali Phase I
14
12
10
8
6
4
2
0
Drain Flowing from DEBESA CETP
Near Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical Ltd.
Krishna Alkali Pvt. Ltd.
Location
Sodium Adsorption Ratio
pH


Surface water - Dombivali Phase I
Concentration (µmhos/cm)
4000
3500
3000
2500
2000
1500
1000
500
0
Drain Flowing from DEBESA CETP
Near Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical Ltd.
Krishna Alkali Pvt. Ltd.
Location
Electrical Conductivity


Surface water - Dombivali Phase I
MPN index/100ml
700
600
500
400
300
200
100
0
Drain Flowing from DEBESA CETP
Near Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical Ltd.
Location
Total Coliforms
Faecal Coliforms


Surface water - Dombivali Phase I
% Survival
102
100
98
96
94
92
90
88
86
84
Drain Flowing from DEBESA CETP
Near Khambal Pada
Thakurli Talav
Storm Water DEBESA CETP Nallah
Gharda Chemical Ltd.
Krishna Alkali Pvt. Ltd.
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. The smell was agreeable in all 3 samples out of six samples collected.
- pH and suspended solids of all six samples collected are observed less than the permissible limit.
- Electrical conductivity in Nallah nearby Metropolitan Exichem Ltd.is high with 11203.3 µmhos/cm.
- BOD exceeded in five samples collected, except in the water sample of Tempo Naka.
- 100% survival was achieved in 2 out of six samples collected for 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, Fluoride, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- Concentration of Total Kjeldahl Nitrogen (TKN) also exceeded the permissible limit and was found highest in CETP Outlet i.e. 15.41 mg/L.
- 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	11.01.2023	13.01.2023	15.01.2023
2.	Nallah nearby Metropolitan Exichem Ltd.	19°12'1.77"N	73°5'52.83"E	11.01.2023	13.01.2023	15.01.2023
3.	Nallah after DCETP	19°12'14.67"N	73°5'49.60"E	11.01.2023	13.01.2023	15.01.2023
4.	Nallah near Ramchandra Nagar	19°12'16.38"N	73°5'24.75"E	11.01.2023	13.01.2023	15.01.2023
5.	CETP Outlet	19°12'15.32"N	73°5'52.87"E	11.01.2023	13.01.2023	15.01.2023

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
6.	Tempo Naka Nallah	19°11'50.39"N	73°5'53.34"E	11.01.2023	13.01.2023	15.01.2023

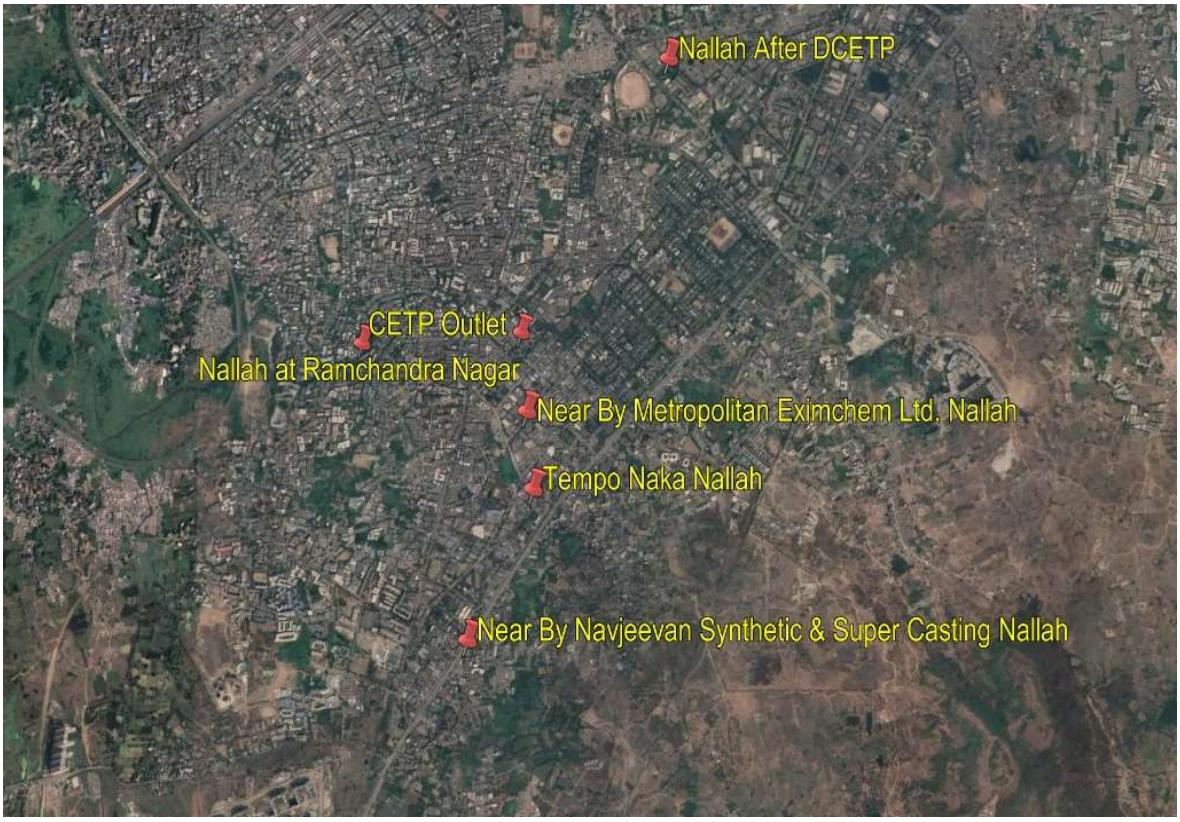


Fig. Geographical Locations of Surface Water Sampling MIDC Dombivali Phase II

Table 6.4 Phase II – Results of Surface Water

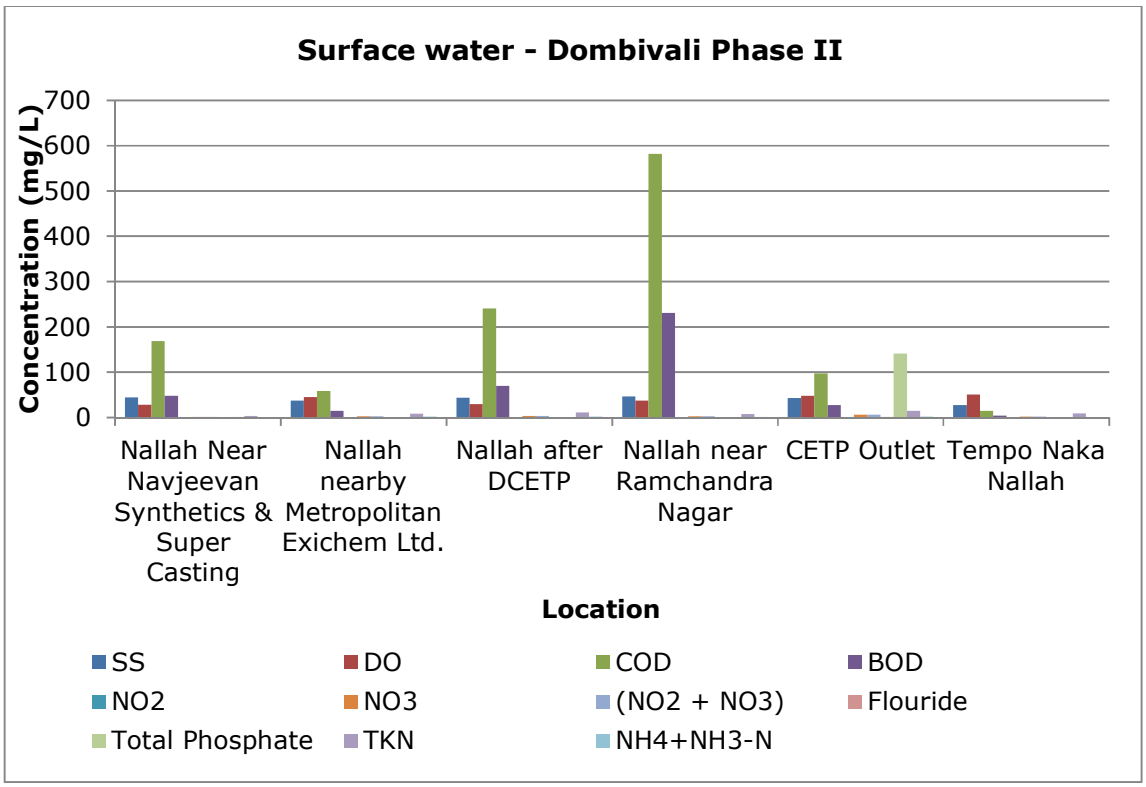
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	**Metropolitan Eximchem Ltd. Nallah**	**Nallah after DCETP**	**Ram chandra Nagar**	**CETP Outlet**	**Tempo Naka**
Sanitary Survey	-	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood
General Appearance	-	No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter	No Floating Matter
Transparency	m	0.60	0.60	0.53	0.47	0.57	0.57
Temperature	°C	29	29	29	29	29	28
Colour	Hazen	5	2	3	4	2	4
Smell	-	Not Agreeable	Agreeable	Not Agreeable	Agreeable	Not Agreeable	Agreeable
pH	-	5.84	7.41	7.85	7.54	7.65	6.19
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	44	38	44	47	43	28

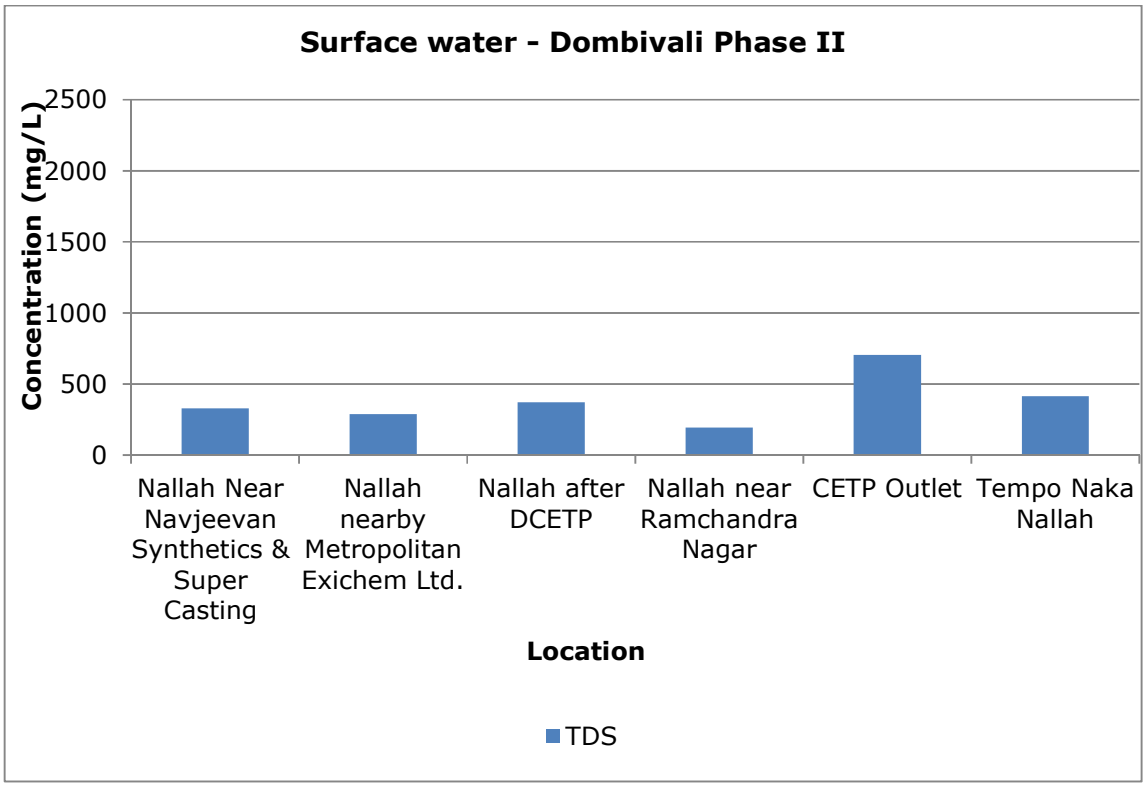
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Total Dissolved Solids	mg/L	328	289	373	193	706	415
Dissolved Oxygen (% Saturation)	%	28.33	45.33	29.67	38.00	48.00	50.67
Chemical Oxygen Demand	mg/L	169	58	241	582	98	15
Biochemical Oxygen Demand (3 days,27°C)	mg/L	48	15	69	231	28	4
Electrical Conductivity (at 25 °C)	µmho/cm	584	514	662	341	1260	713
Nitrite Nitrogen (as NO_2)	mg/L	0.17	0.04	0.07	0.03	0.36	0.03
Nitrate Nitrogen (as NO_3)	mg/L	1.35	2.71	3.03	2.35	6.50	1.84
(NO_2 + NO_3)-Nitrogen	mg/L	1.44	2.73	3.06	2.38	6.83	1.85
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	0.73	0.57	0.70	0.53	1.03	0.70
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.39	BLQ	0.53	BLQ	1.21	0.19
Sodium Adsorption Ratio	-	0.72	1.92	1.63	1.06	3.89	2.96
Total Coliforms	MPN Index/ 100 ml	957	350	1140	443	130	285
Faecal Coliforms	MPN Index/ 100 ml	608	220	622	178	154	250
Total Phosphate (as P)	mg/L	0.87	0.21	0.67	0.11	141.06	0.30

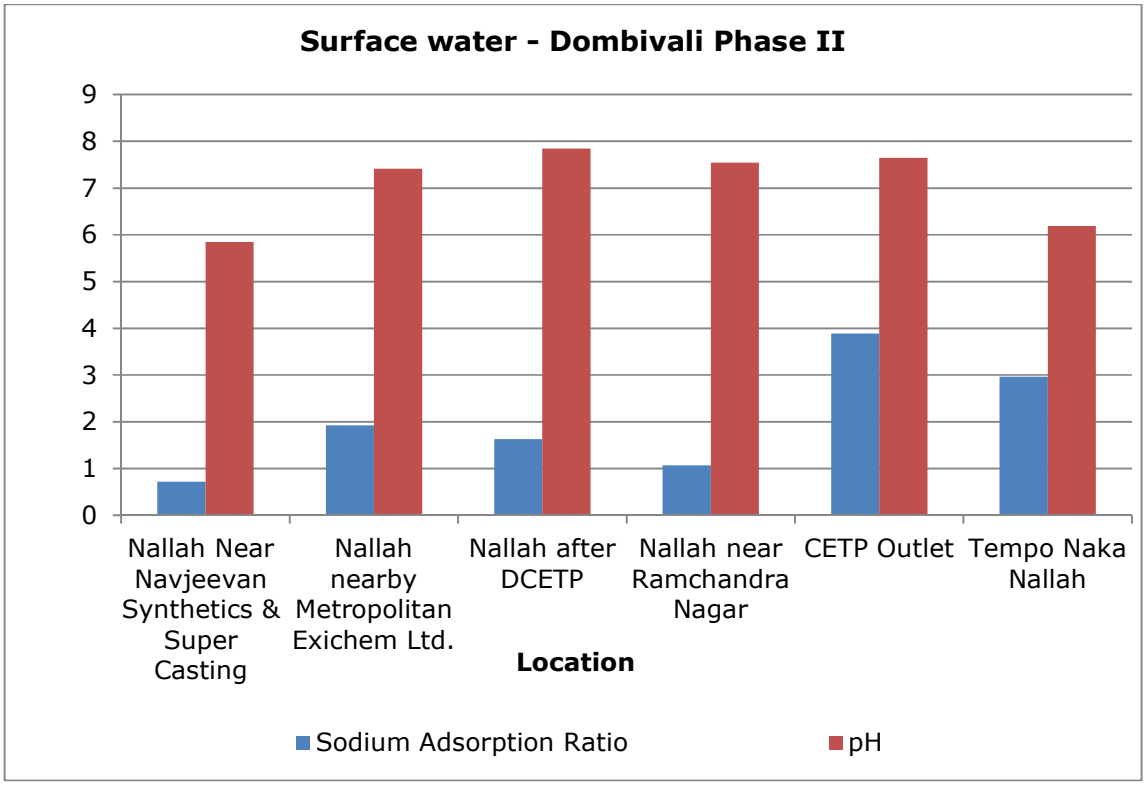
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Total Kjeldahl Nitrogen (as N)	mg/L	3.55	8.80	11.01	8.01	15.41	9.14
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.49	1.55	1.59	1.50	1.84	0.50
Phenols (as 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	0.09	BLQ	0.05	0.47	0.16	0.09
Nickel (as Ni)	mg/L	0.03	0.07	0.02	0.08	0.03	0.45
Copper (as Cu)	mg/L	0.09	BLQ	BLQ	0.09	BLQ	0.05
Hexavalent Chromium (as Cr^{6+})	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.06	BLQ	BLQ	0.05	BLQ	0.07
Total Arsenic (as As)	mg/L	BLQ	0.09	BLQ	BLQ	0.01	BLQ
Lead (as Pb)	mg/L	0.02	BLQ	0.01	0.13	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	0.22	0.76	0.32	0.20	0.25	0.20
Iron (as Fe)	mg/L	9.15	0.75	0.85	0.41	0.25	0.60
Vanadium (as V)	mg/L	0.02	0.03	BLQ	0.05	0.02	BLQ

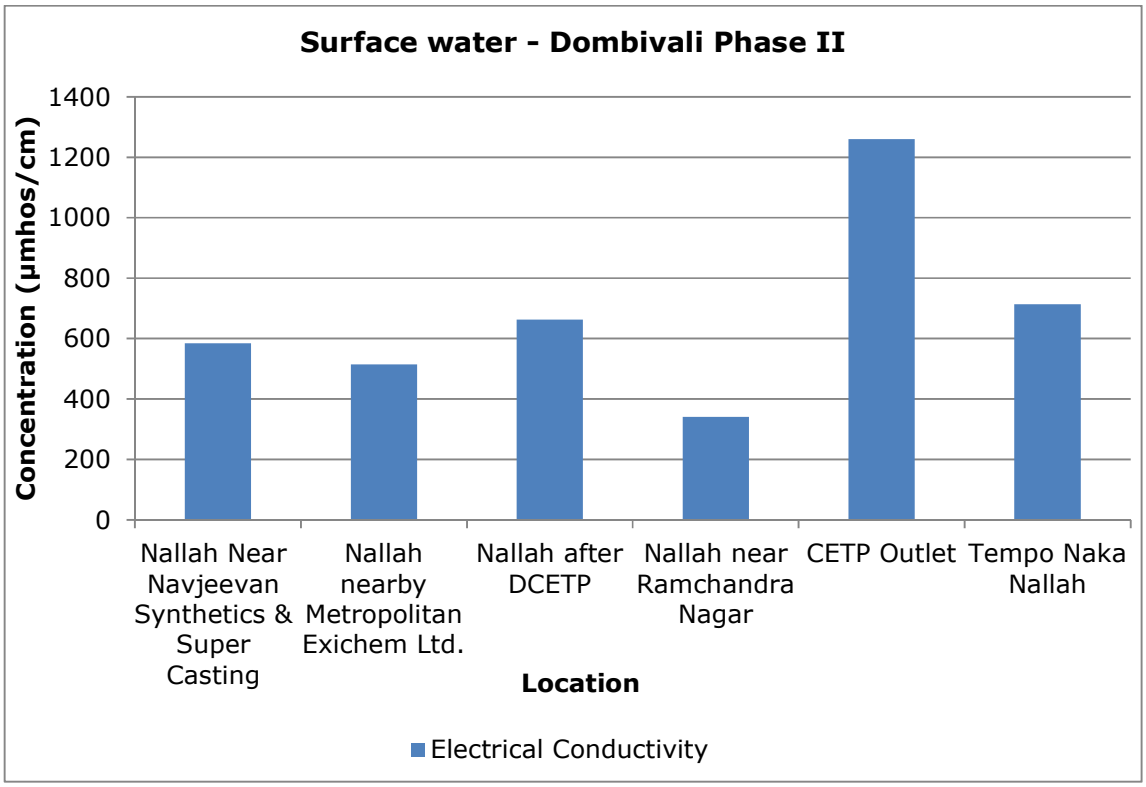
Parameters	Unit	Results					
		Navjeevan Synthetics Pvt Ltd	Metropolitan Eximchem Ltd. Nallah	Nallah after DCETP	Ram chandra Nagar	CETP Outlet	Tempo Naka
Selenium (as Se)	mg/L	0.01	0.01	0.01	0.01	0.01	0.02
Boron (as B)	mg/L	BLQ	0.18	BLQ	BLQ	0.16	BLQ
Total Nitrogen	mg/L	4.83	10.86	14.07	9.90	22.27	11.00
Bioassay Test on fish	% survival	80	100	70	87	83	100

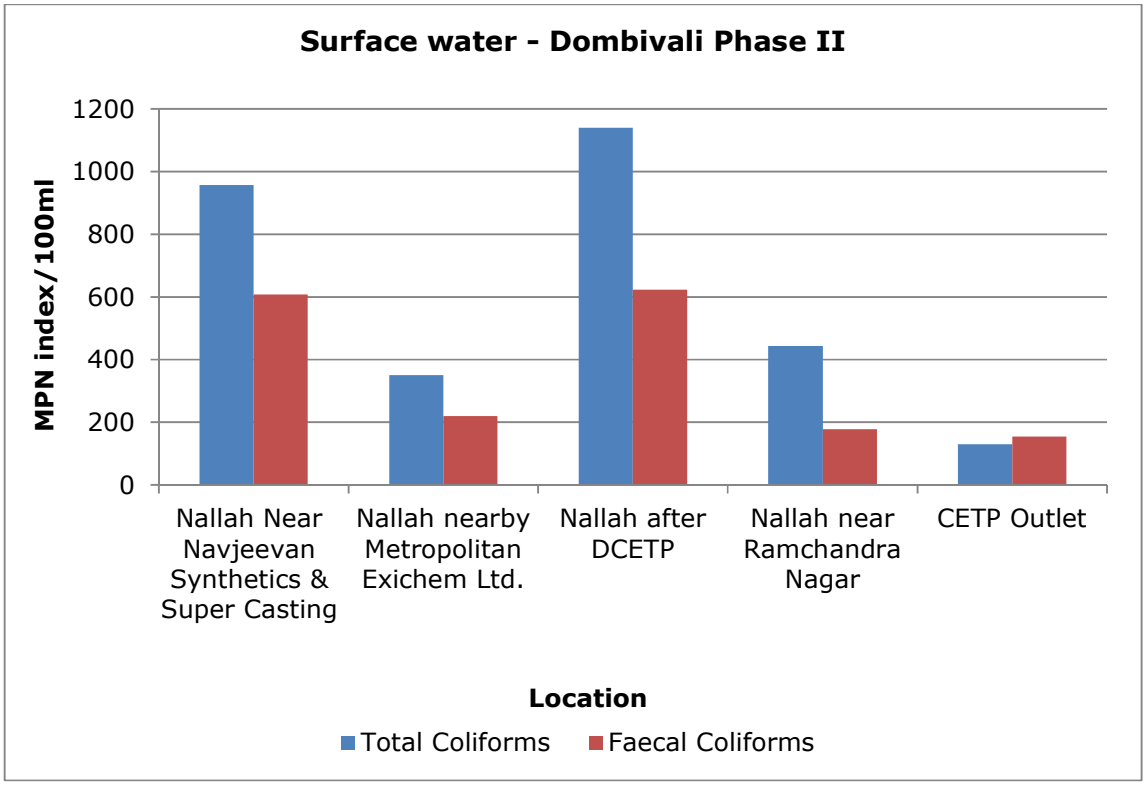
Graphs - Surface Water Quality of MIDC Dombivali Phase II

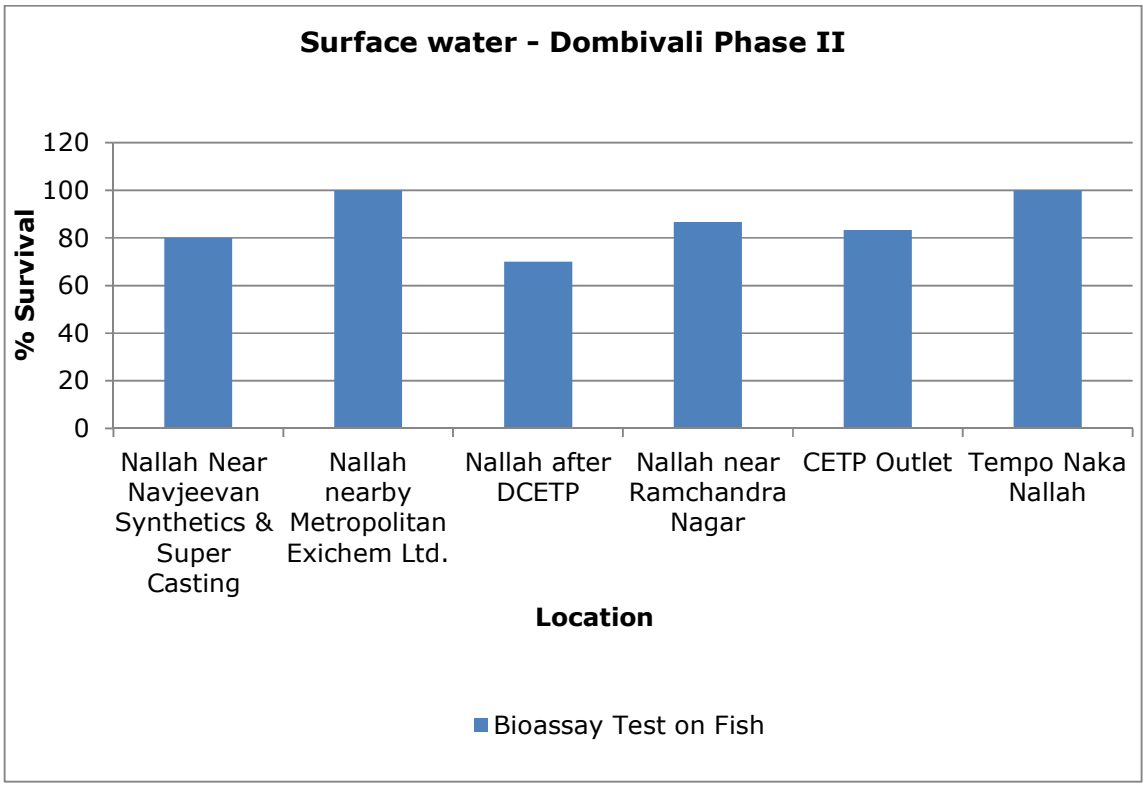





Surface water - Dombivali Phase II
9
8
7
6
5
4
3
2
1
0
Nallah Near Navjeevan Synthetics & Super Casting
Nallah nearby Metropolitan Exichem Ltd.
Nallah after DCETP
Nallah near Ramchandra Nagar
CETP Outlet
Tempo Naka Nallah
Location
Sodium Adsorption Ratio
pH


Surface water - Dombivali Phase II
Concentration (µmhos/cm)
1400
1200
1000
800
600
400
200
0
Nallah Near Navjeevan Synthetics & Super Casting
Nallah nearby Metropolitan Exichem Ltd.
Nallah after DCETP
Nallah near Ramchandra Nagar
CETP Outlet
Tempo Naka Nallah
Location
Electrical Conductivity


Surface water - Dombivali Phase II
MPN index/100ml
1200
1000
800
600
400
200
0
Nallah Near Navjeevan Synthetics & Super Casting
Nallah nearby Metropolitan Exichem Ltd.
Nallah after DCETP
Nallah near Ramchandra Nagar
CETP Outlet
Location
Total Coliforms
Faecal Coliforms


Surface water - Dombivali Phase II
% Survival
120
100
80
60
40
20
0
Nallah Near Navjeevan Synthetics & Super Casting
Nallah nearby Metropolitan Exichem Ltd.
Nallah after DCETP
Nallah near Ramchandra Nagar
CETP Outlet
Tempo Naka Nallah
Location
Bioassay Test on Fish

LAND ENVIRONMENT

7. Land Environment

For studying the land Environment of Dombivali area, ground water 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.
   - BOD of two water samples are found to exceed the permissible limit.
   - 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.
   - Parameters like Total Residual Chlorine, Cyanide, Fluoride, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
   - Total Phosphate exceeded in the sample collected from Bore well opposite Kama Office.
   - 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 Ground Water

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	11.01.2023	13.01.2023	15.01.2023
2.	Bore well Near Mamata Hospital	19°12'27.36"N	73°6'15.12"E	11.01.2023	13.01.2023	15.01.2023
3.	Bore well at Horizon hall	19°11'30.01"N	73°5'31.82"E	11.01.2023	13.01.2023	15.01.2023

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

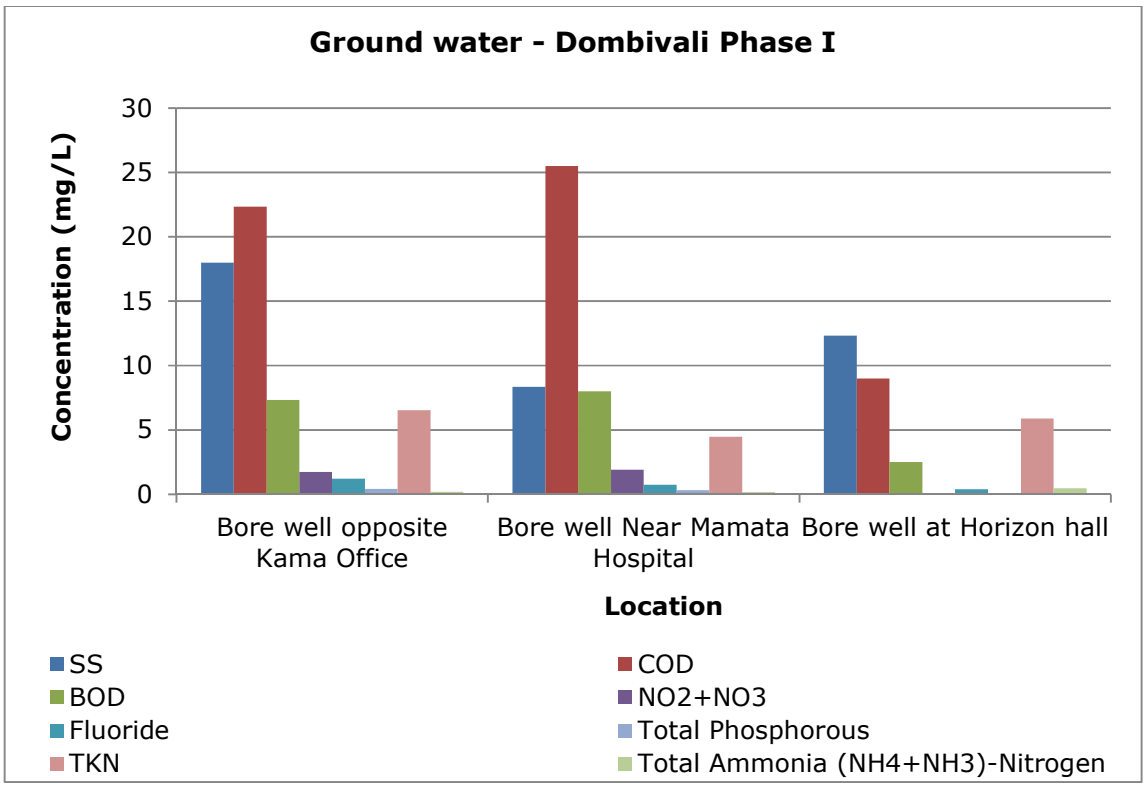
Table 7.2 Phase I – Results of Ground Water

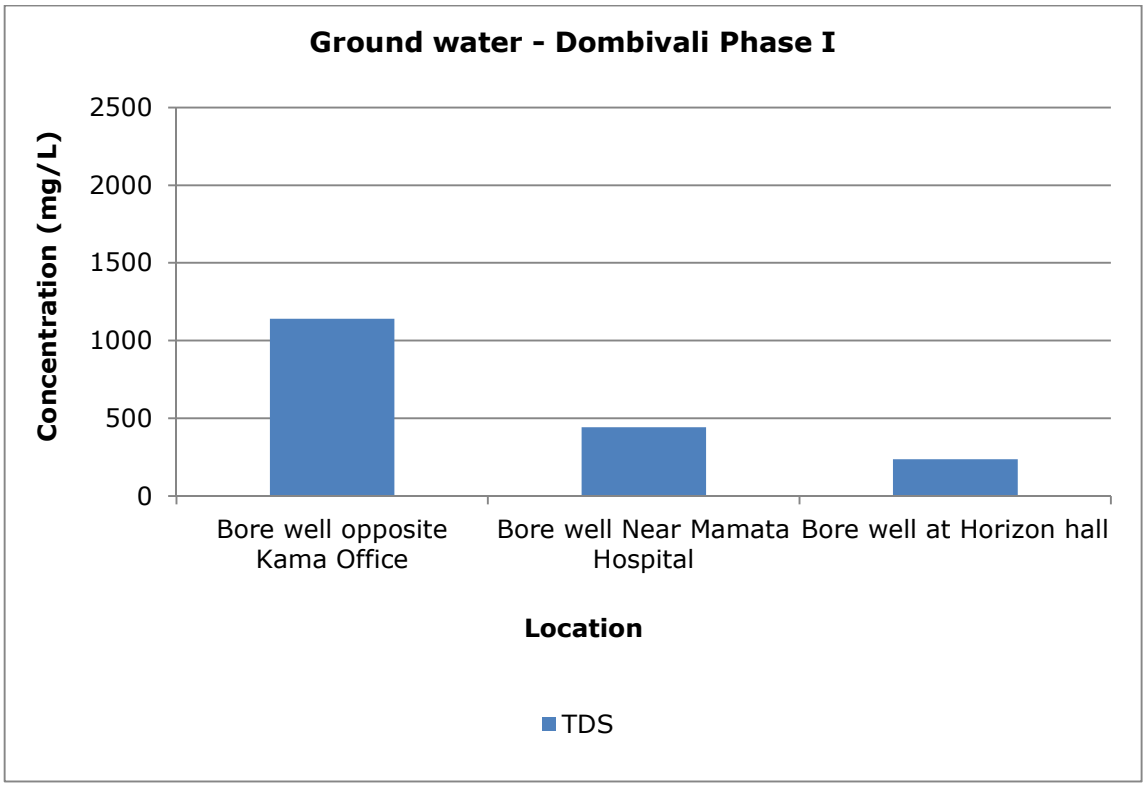
Parameters	Unit	Results		
		Bore well opposite Kama Office	Bore well Near Mamata Hospital	Bore well at Horizon hall
Sanitary Survey	-	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood
General Appearance	-	No Floating Matter	No Floating Matter	No Floating Matter
Transparency	m	Not Applicable	Not Applicable	Not Applicable
Temperature	°C	29	29	27
Colour	Hazen	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.92	8.25	7.82
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Suspended Solids	mg/L	18	8	12
Total Dissolved Solids	mg/L	1141	441	235
Chemical Oxygen Demand	mg/L	22	26	9
Biochemical Oxygen Demand (3 days,27°C)	mg/L	7	8	3
Electrical Conductivity (at 25 °C)	µmho/cm	2035	786	419
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	BLQ	BLQ

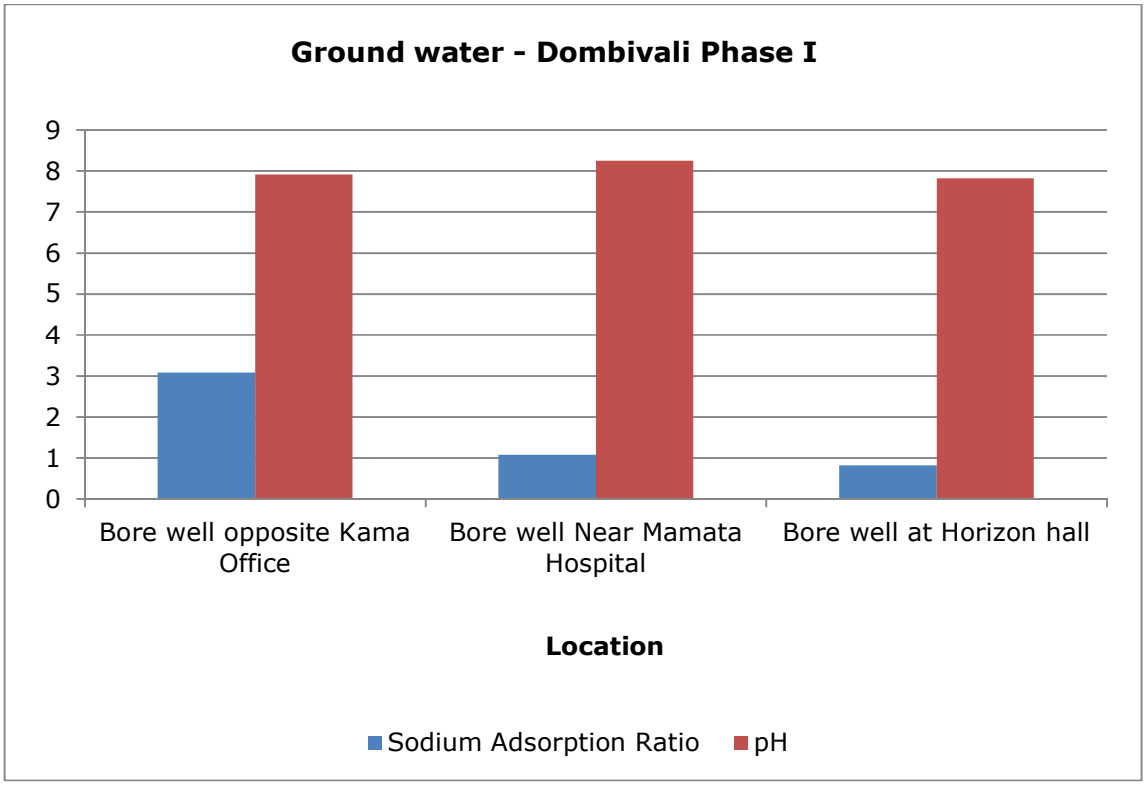
Parameters	Unit	Results		
		Bore well opposite Kama Office	Bore well Near Mamata Hospital	Bore well at Horizon hall
Nitrate Nitrogen (as NO_3)	mg/L	1.71	1.91	BLQ
(NO_2 + NO_3)-Nitrogen	mg/L	1.71	1.91	BLQ
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	1.20	0.73	0.38
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.11	0.16	BLQ
Sodium Adsorption Ratio	-	3.08	1.08	0.82
Total Coliforms	MPN Index/ 100 ml	297	122	8
Faecal Coliforms	MPN Index/ 100 ml	103	117	5
Total Phosphate (as P)	mg/L	0.41	0.31	BLQ
Total Kjeldahl Nitrogen (as N)	mg/L	6.53	4.47	5.88
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.19	0.15	0.46
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	0.15	BLQ	BLQ
Nickel (as Ni)	mg/L	0.02	0.01	BLQ
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	BLQ	BLQ
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	0.35	1.46	0.04
Iron (as Fe)	mg/L	0.45	0.17	0.14
Vanadium (as V)	mg/L	0.02	BLQ	0.04

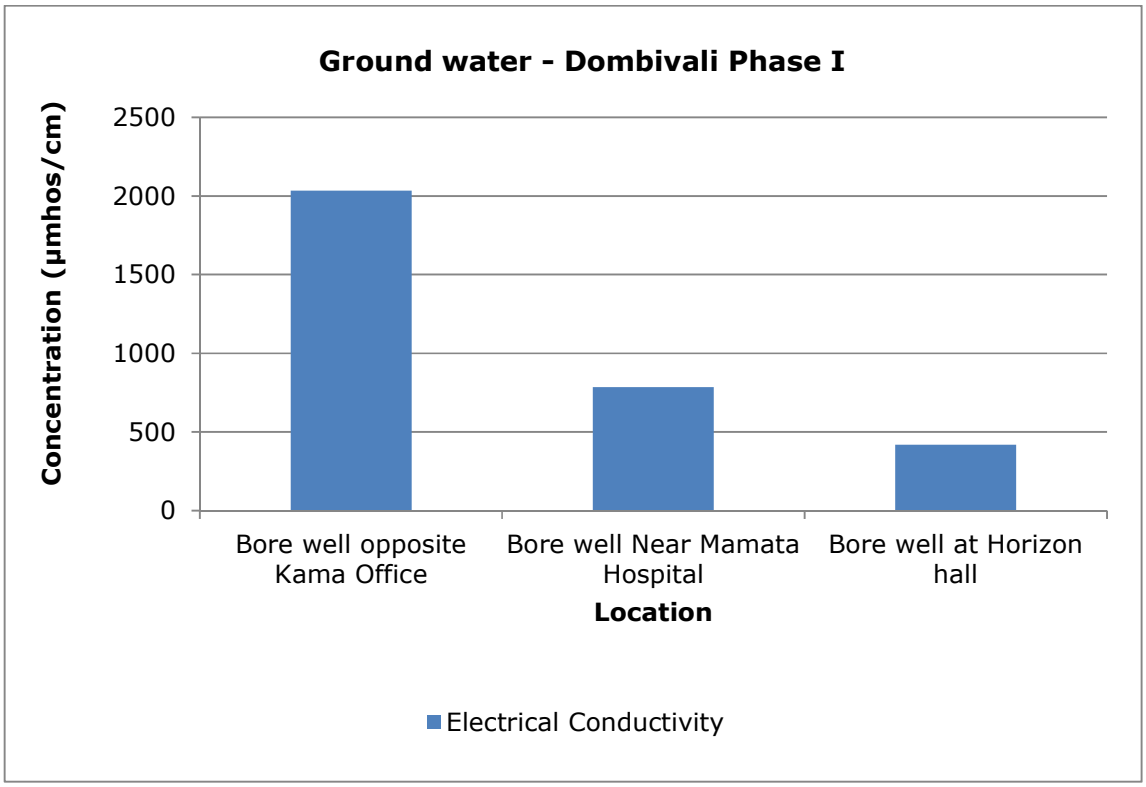
Parameters	Unit	Results		
		Bore well opposite Kama Office	Bore well Near Mamata Hospital	Bore well at Horizon hall
Selenium (as Se)	mg/L	0.02	0.01	0.01
Total Nitrogen	mg/L	5.92	5.83	6.64
Boron (as B)	mg/L	0.25	BLQ	BLQ
Bioassay Test on fish	% survival	100	100	100

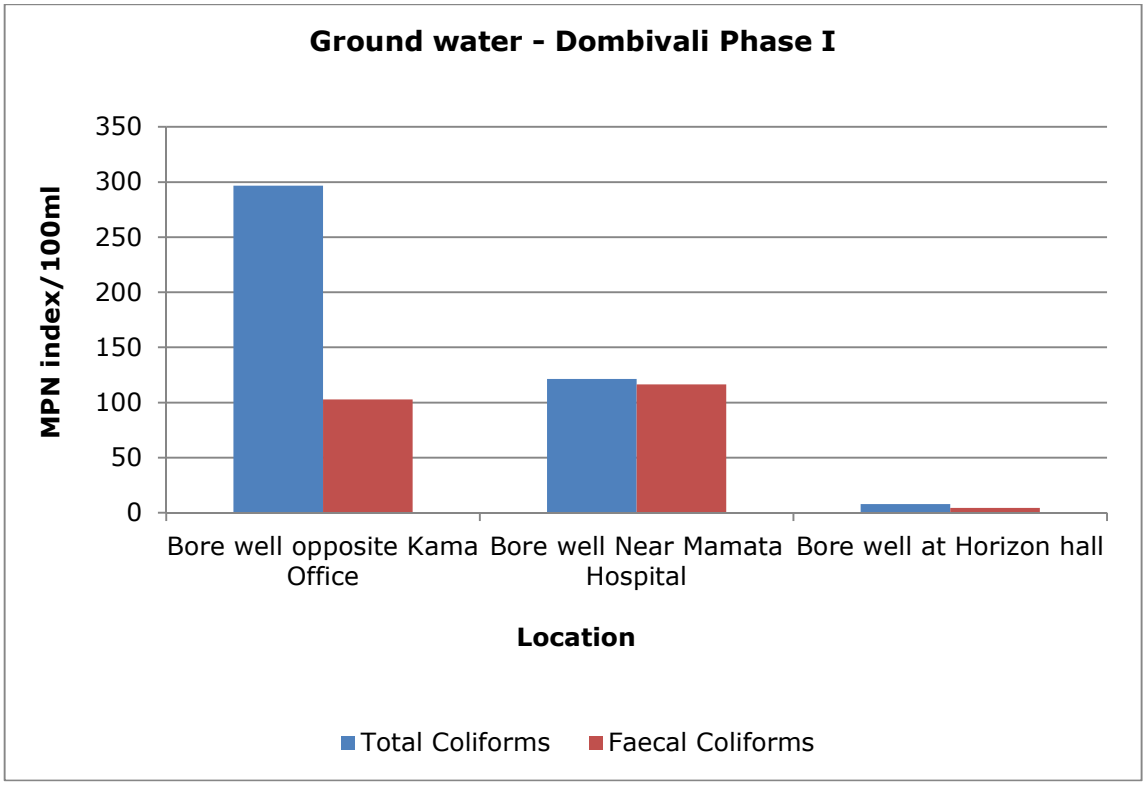
Graphs - Ground water Quality of MIDC Dombivali Phase I

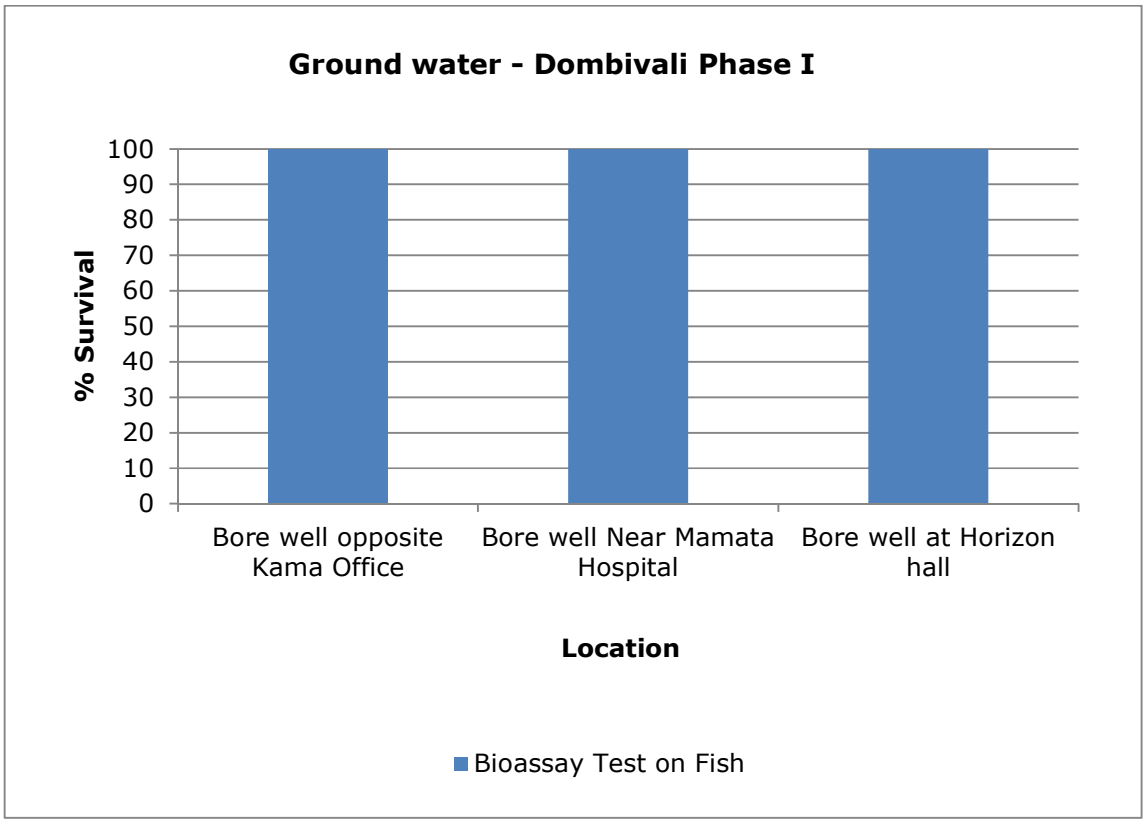





Ground water - Dombivali Phase I
9
8
7
6
5
4
3
2
1
0
Bore well opposite Kama Office
Bore well Near Mamata Hospital
Bore well at Horizon hall
Location
Sodium Adsorption Ratio
pH


Ground water - Dombivali Phase I
Concentration (µmhos/cm)
2500
2000
1500
1000
500
0
Bore well opposite Kama Office
Bore well Near Mamata Hospital
Bore well at Horizon hall
Location
Electrical Conductivity


Ground water - Dombivali Phase I
MPN index/100ml
350
300
250
200
150
100
50
0
Bore well opposite Kama Office
Bore well Near Mamata Hospital
Bore well at Horizon hall
Location
Total Coliforms
Faecal Coliforms


Ground water - Dombivali Phase I
% Survival
100
90
80
70
60
50
40
30
20
10
0
Bore well opposite Kama Office
Bore well Near Mamata Hospital
Bore well at Horizon hall
Location
Bioassay Test on Fish

2. **MIDC Phase II:** From MIDC Phase II, three ground water 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 with 2433µmhos/cm.
- 100% survival was achieved in Fish Bioassay of Bore well water sample of Lodha Vihar.
- All metals like Arsenic, Nickel, Copper, Iron, Hexavalent Chromium (Cr6+) etc. are observed either below the limit of quantification or below their standard limits.
- Parameters like Total Residual Chlorine, Cyanide, Fluoride, Sulphide, Dissolved Phosphate, Total Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also meet the criteria as prescribed by CPCB.
- The concentration of Total Kjeldahl Nitrogen (TKN) exceeded the permissible limit in all the ground water 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 was found below the detectable limit in both samples collected.

Table 7.3 Phase I – Details of Sampling Location of Ground Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Bore well water Pimpleshwar Mahadev Temple	19°11'37.88"N	73° 5'41.06"E	11.01.2023	13.01.2023	15.01.2023
2.	Bore well Hardikar Hospital	19°12'21.16"N	73° 5'28.58"E	11.01.2023	13.01.2023	15.01.2023
3.	Borewell at Lodha Vihar	19°11'27.55"N	73° 5'15.26"E	11.01.2023	13.01.2023	15.01.2023

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

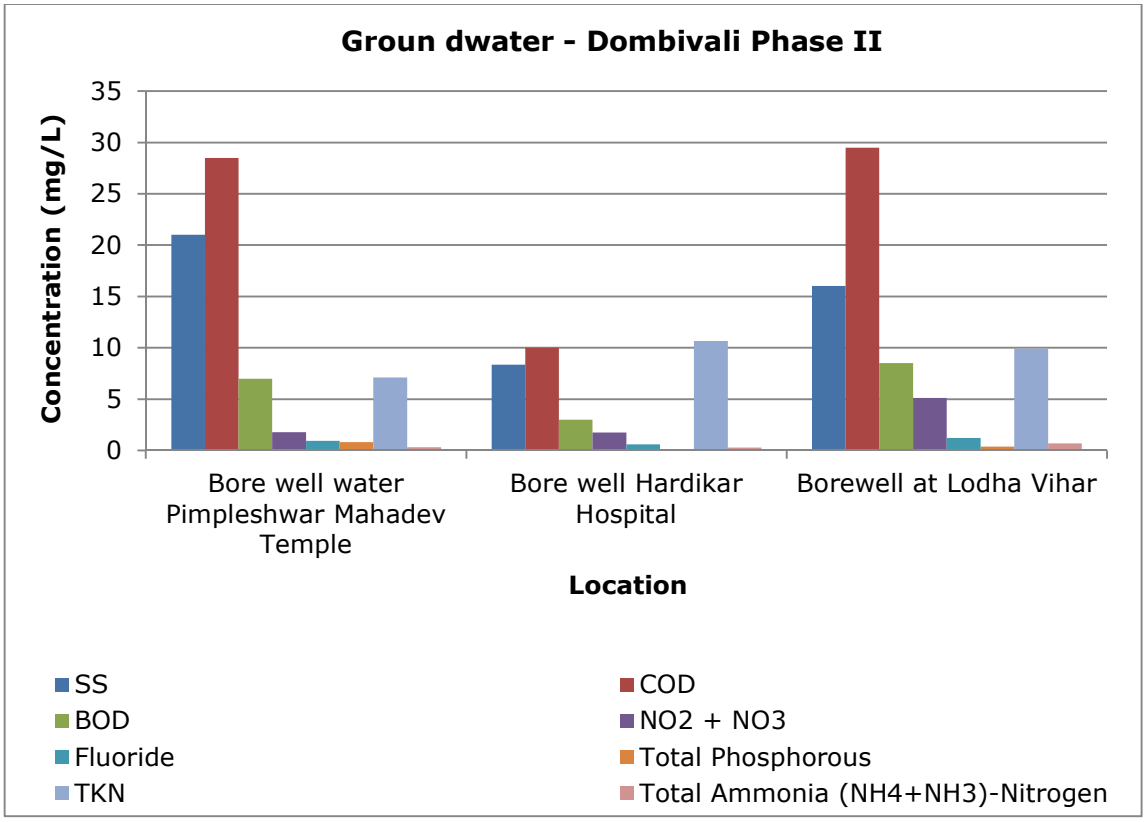
Table 7.4 Phase II – Results of Ground Water

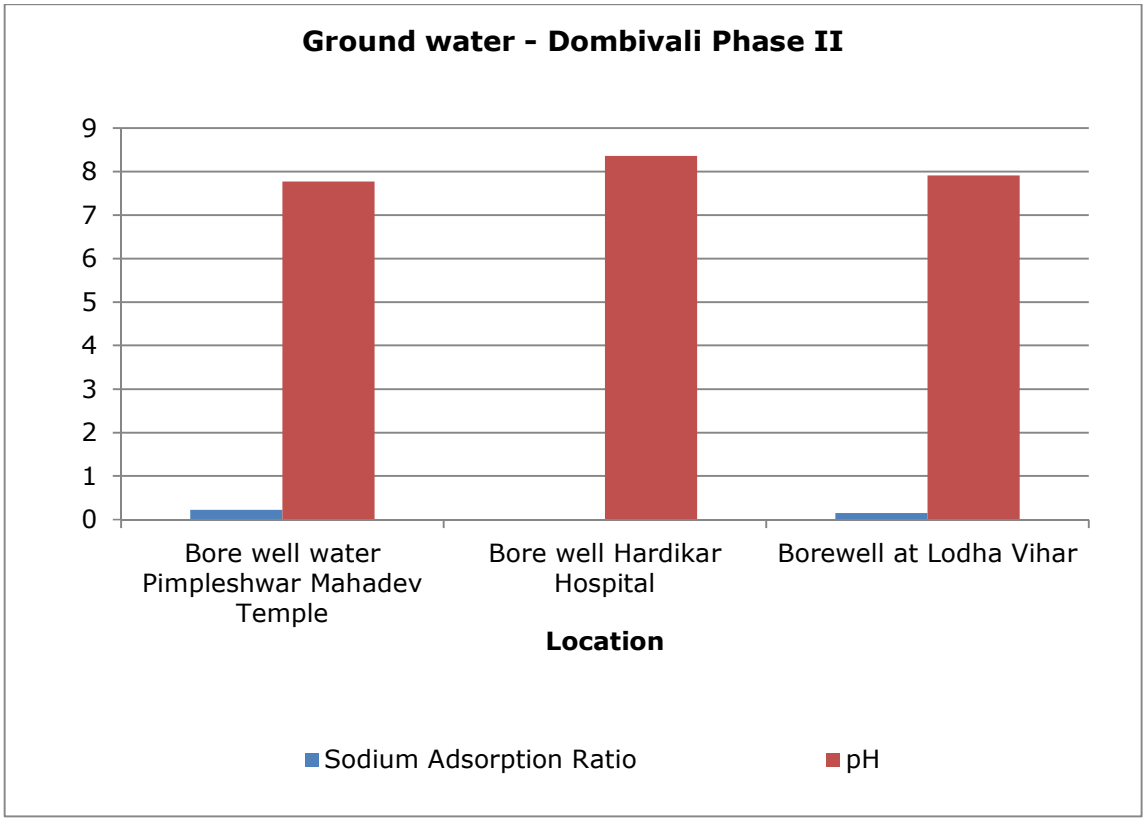
Parameters	Unit	Results		
		Pimpleshwar Mahadev Temple	Hardikar Hospital	Lodha Vihar
Sanitary Survey	-	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood
General Appearance	-	No Floating Matter	No Floating Matter	No Floating Matter
Transparency	m	Not Applicable	Not Applicable	Not Applicable
Temperature	°C	29	29	29
Colour	Hazen	1	1	1
Smell	-	Agreeable	Agreeable	Agreeable
pH	-	7.77	8.36	7.91
Oil & Grease	mg/L	BLQ	BLQ	BLQ
Suspended Solids	mg/L	21	8	16
Total Dissolved Solids	mg/L	604	342	1364
Chemical Oxygen Demand	mg/L	29	10	30
Biochemical Oxygen Demand (3 days, 27°C)	mg/L	7	3	9
Electrical Conductivity (at 25 °C)	µmho/cm	1078	610	2433
Nitrite Nitrogen (as NO_2)	mg/L	BLQ	BLQ	BLQ

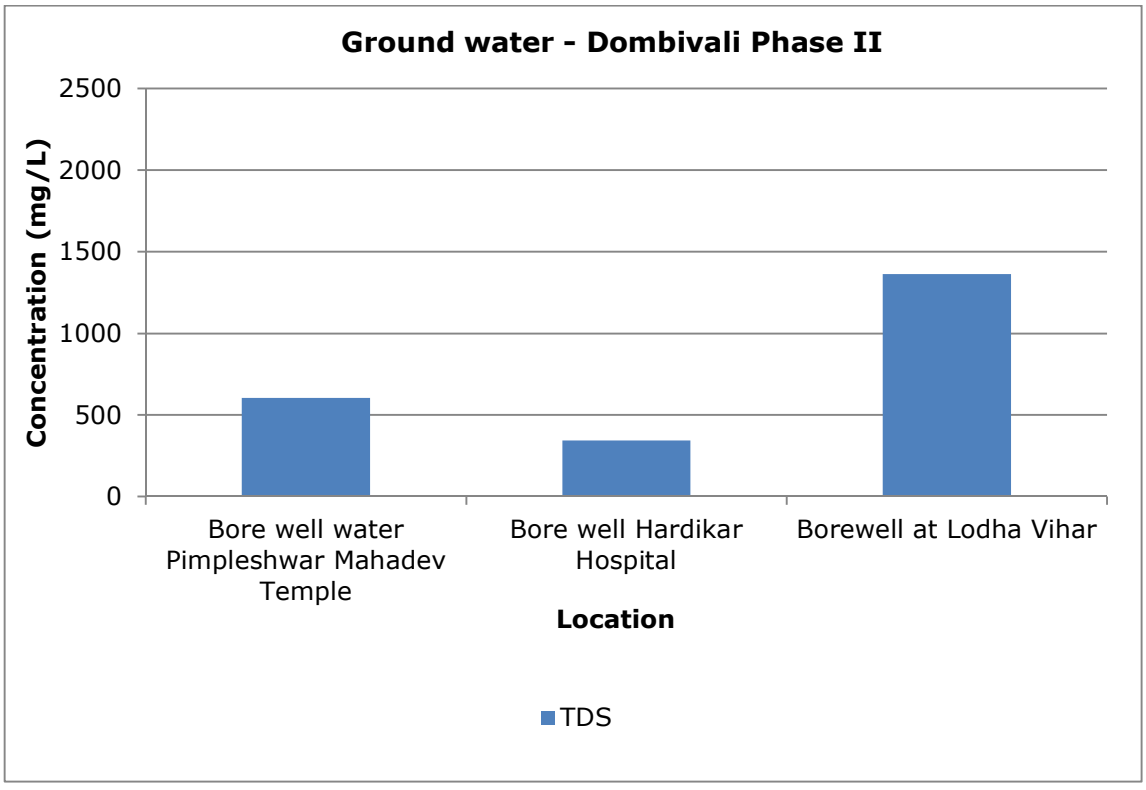
Parameters	Unit	Results		
		Pimpleshwar Mahadev Temple	Hardikar Hospital	Lodha Vihar
Nitrate Nitrogen (as NO_3)	mg/L	1.76	1.75	5.12
(NO_2 + NO_3)-Nitrogen	mg/L	1.76	1.75	5.12
Free Ammonia (as NH_3-N)	mg/L	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.93	0.60	1.20
Sulphide (as H_2S)	mg/L	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.23	BLQ	0.16
Sodium Adsorption Ratio	-	1.37	1.29	1.83
Total Coliforms	MPN Index/ 100 ml	283	814	64
Faecal Coliforms	MPN Index/ 100 ml	193	124	22
Total Phosphate (as P)	mg/L	0.80	BLQ	0.38
Total Kjeldahl Nitrogen (as N)	mg/L	7.11	10.65	9.92
Total Ammonia (NH_4+NH_3)-Nitrogen	mg/L	0.29	0.26	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	BLQ
Nickel (as Ni)	mg/L	0.02	0.01	BLQ
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	BLQ	BLQ
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	1.93	BLQ	BLQ
Iron (as Fe)	mg/L	0.39	0.11	0.09

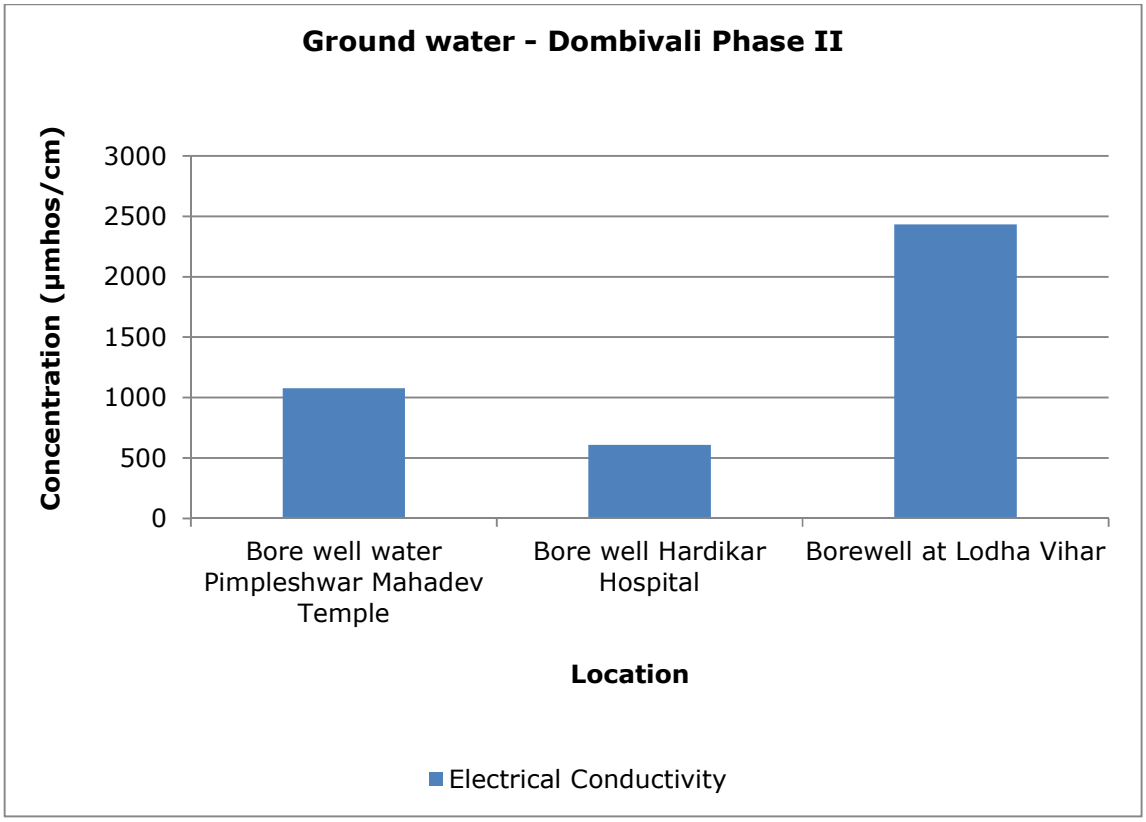
Parameters	Unit	Results		
		Pimpleshwar Mahadev Temple	Hardikar Hospital	Lodha Vihar
Vanadium (as V)	mg/L	BLQ	0.04	BLQ
Selenium (as Se)	mg/L	0.01	0.01	0.02
Total Nitrogen	mg/L	8.87	12.35	15.07
Boron (as B)	mg/L	BLQ	BLQ	BLQ
Bioassay Test on fish	% survival	93	97	100

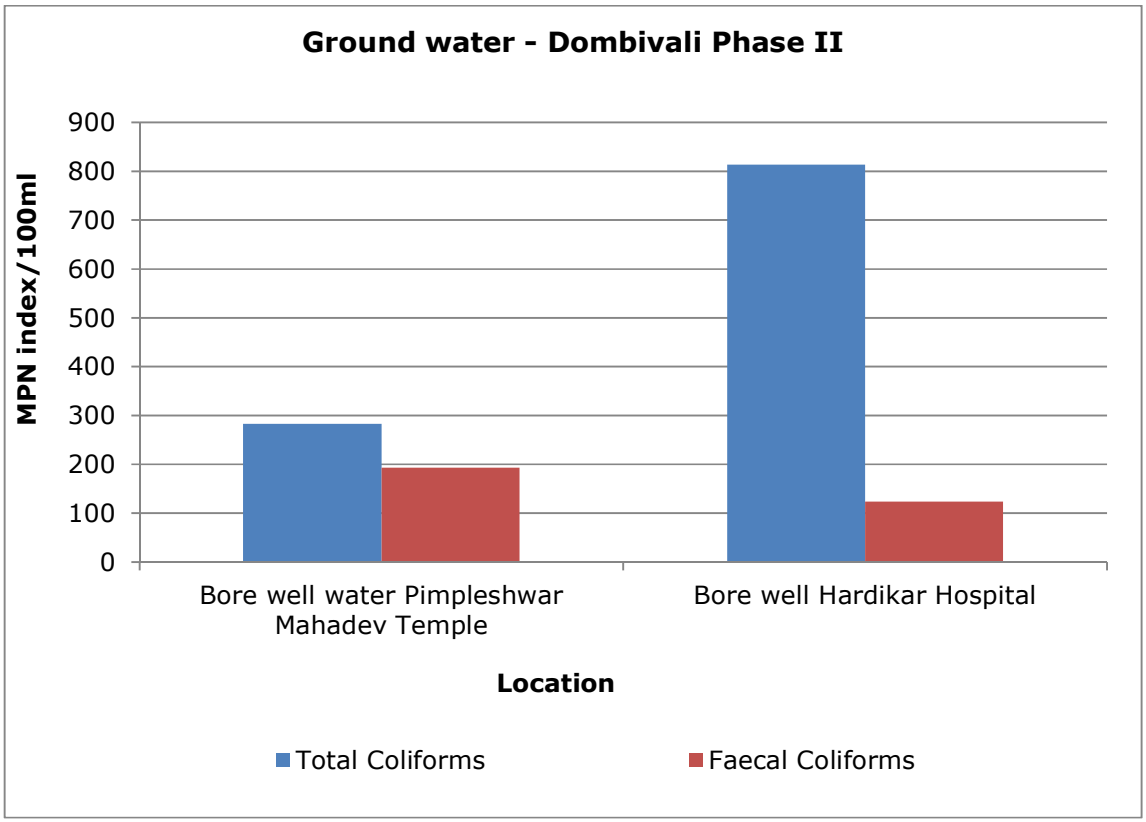
Graphs - Ground water Quality of MIDC Dombivali Phase II

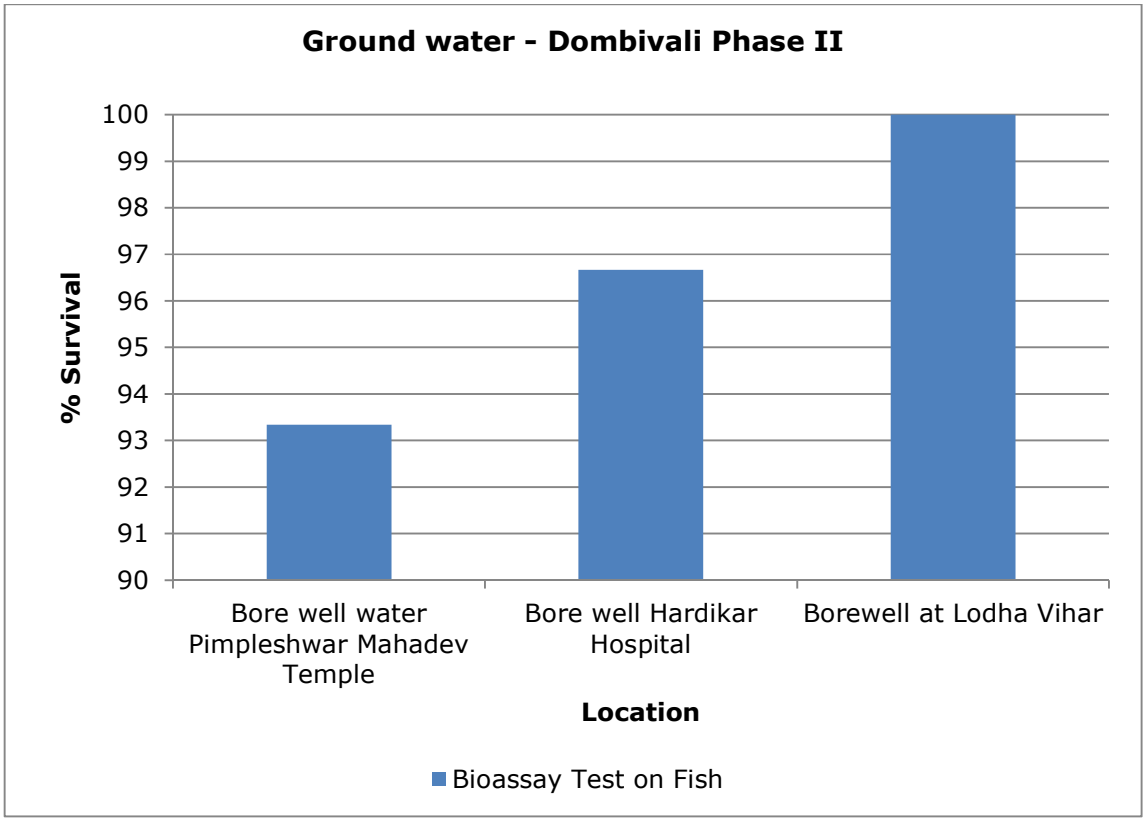



Ground water - Dombivali Phase II
9
8
7
6
5
4
3
2
1
0
Bore well water Pimpleshwar Mahadev Temple
Bore well Hardikar Hospital
Borewell at Lodha Vihar
Location
Sodium Adsorption Ratio
pH


Ground water - Dombivali Phase II
Concentration (mg/L)
2500
2000
1500
1000
500
0
Bore well water Pimpleshwar Mahadev Temple
Bore well Hardikar Hospital
Borewell at Lodha Vihar
Location
TDS


Ground water - Dombivali Phase II
Concentration (µmhos/cm)
3000
2500
2000
1500
1000
500
0
Bore well water Pimpleshwar Mahadev Temple
Bore well Hardikar Hospital
Borewell at Lodha Vihar
Location
Electrical Conductivity


Ground water - Dombivali Phase II
MPN index/100ml
900
800
700
600
500
400
300
200
100
0
Bore well water Pimpleshwar Mahadev Temple
Bore well Hardikar Hospital
Location
Total Coliforms
Faecal Coliforms


Ground water - Dombivali Phase II
100
99
98
97
96
95
94
93
92
91
90
% Survival
Bore well water Pimpleshwar Mahadev Temple
Bore well Hardikar Hospital
Borewell at Lodha Vihar
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/ ground water Environment, cases related to Gastroenteritis, Diarrhoea, renal (kidney) malfunction, cancer etc are to be considered.
- For the above evaluation, the previous 5 years records of 3-5 major hospitals of the area shall be considered.

Annexure – I Health Related Data enclosed.

9. CEPI Score

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

Table 8.1 CEPI score of the Post monsoon season 2023 is given below

	A1	A2	A	B	C	D	CEPI
Air Index	2	4	8	21.25	0	5	**34.25**
Water Index	1.75	4	7	45.5	0	5	**57.50**
Land Index	1.5	4	6	34	0	5	**45.00**
						Aggregated CEPI	**64.05**

Among all Environment Pollution Indices (EPI), Water Environment Pollution Index is the highest with a score of 57.50. 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 March 2023	34.25	57.50	45.00	**64.05**
CEPI score June 2021	21	56	45	**60.2**
CEPI Score March 2021	21	59.8	48	**63.9**
CEPI score March 2020	57.3	49	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 64.05. The present study is the compilation of post-monsoon season, which also affects the score value. This time CEPI is observed lower than the CPCB CEPI score March 2018 which was 69.67.

CEPI Score Calculation:

Dombivali

Ambient Air Analysis Report

Pollutant	**Group**	**A1**	**A2**	**A (A1 X A2)**
SO_2	A	1	Large	
PM_{10}	B	0.5		
CO	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)**	
SO_2	88.04	80	1.10	3	8	0.41	M	14.25
PM_{10}	83.42	100	0.83	1	8	0.10	M	3.25
CO	1.94	2	0.97	2	8	0.24	M	3.75
B score = (B1+B2+B3)							**B**	**21.25**

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

Air CEPI Score	**(A+B+C+D)**	**34.25**

Water Quality Analysis Report

Pollutant	**Group**	**A1**	**A2**	**A (A1 X A2)**
TKN	A	1	Large	
TN	B	0.5		
BOD	A	0.25		
		1.75	**4**	**7**

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	13.83	3	4.61	12	12	4.61	C	30
TN	16.83	15	1.12	6	12	0.56	H	5.5
BOD	50.76	8	6.35	10	12	5.29	C	10
B score = (B1+B2+B3)							**B**	**45.5**

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

Water CEPI Score	**(A+B+C+D)**	**57.50**

Ground Water Quality Analysis Report

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

Pollutant	**Avg (1)**	**Std (2)**	**EF (3) [(3)=(1)/(2)]**	**No. of samples Exceeding (4)**	**Total no. of samples (5)**	**SNLF Value (6) [(6)=(4)/(5)x(3)]**	**SNLF score (B)**	
TKN	7.43	1	7.43	6	6	7.43	C	30
TDS	687.89	2000	0.34	0	6	0.00	L	0
Fe	0.23	0.3	0.77	2	6	0.26	M	4
B score = (B1+B2+B3)							**B**	**34**

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

Land CEPI Score	**(A+B+C+D)**	**45.00**

Water CEPI Score (im) **57.50**

Land CEPI score (i2) **45.00**

Air CEPI Score (i3) **34.25**

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 **64.05**

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 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.

Ground Water Quality

- Ground water samples were collected from different Bore well in the region.
- Higher concentration of TKN was observed in the ground water 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 post monsoon season is 64.05.
- In comparison with the CEPI Score of March 2021, the Land index is observed similar, however an increase is observed in the Air and the water 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 post monsoon season, which results in dilution of environmental samples resulting in lower pollution load, hence also affects the total score.
- In conclusion, a decrease in CEPI score is observed from 69.67 of the CPCB score of March 2018 to 64.05 in 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**

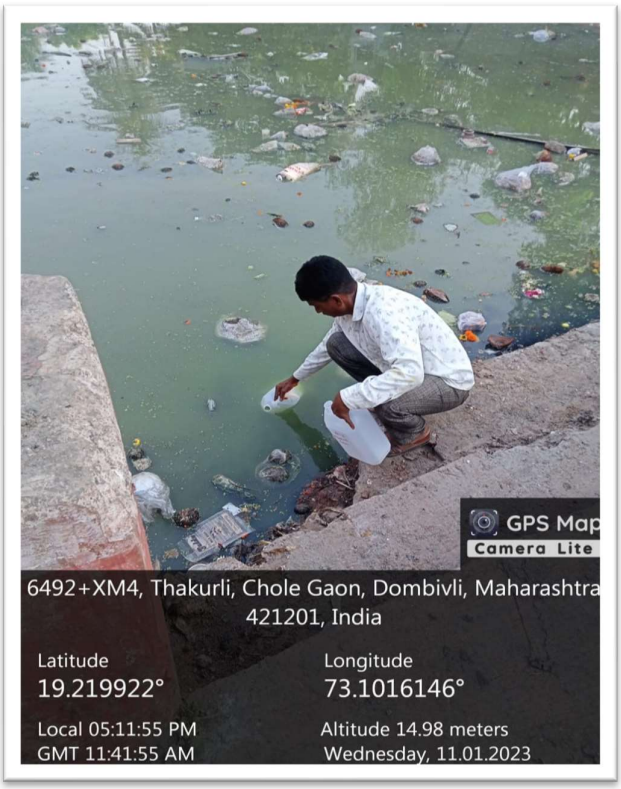
12. Photographs

Dombivali Phase – I - Ambient Air Sampling at Gharda Chemicals

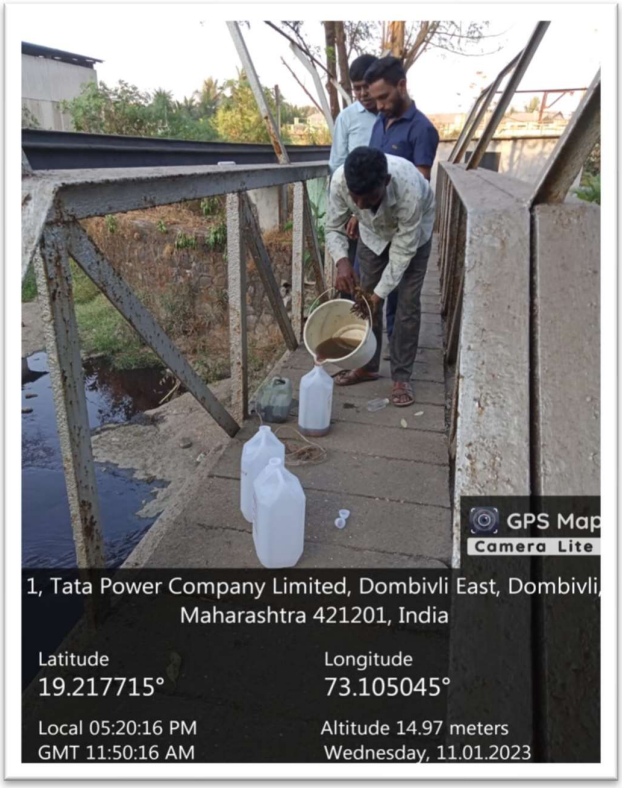
Dombivali Phase – I- Ambient Air Sampling at DEBESA CETP

Dombivali Phase – I - Ambient Air Sampling at BKT

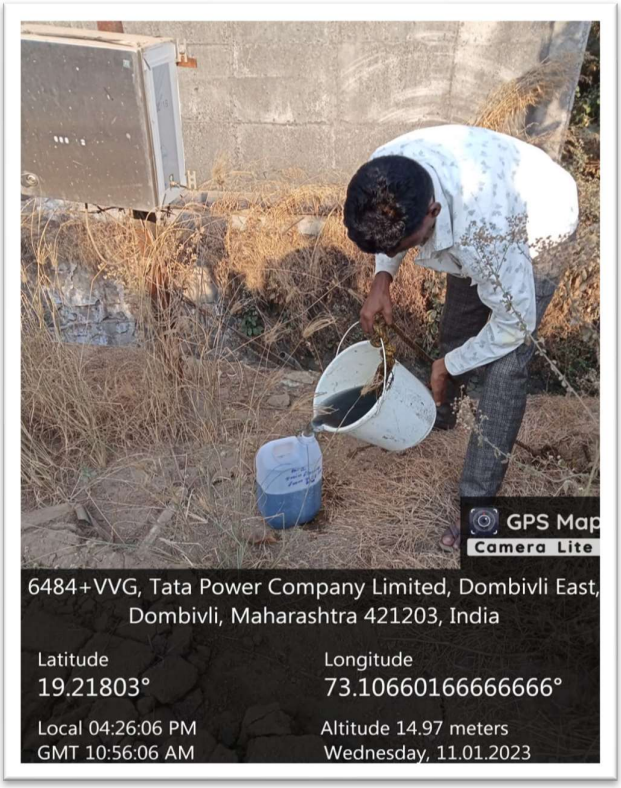
Dombivali Phase – II- Ambient Air Sampling at Metropolitan Eximchem



Dombivali Phase – I- Surface water sampling at Thakurli Talav



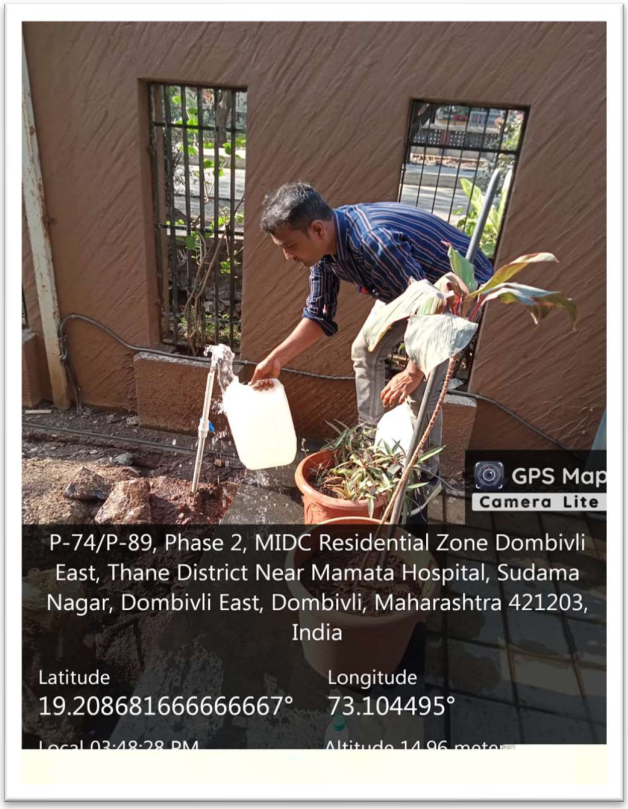
Dombivali Phase – I- Surface water sampling of storm water DEBESA



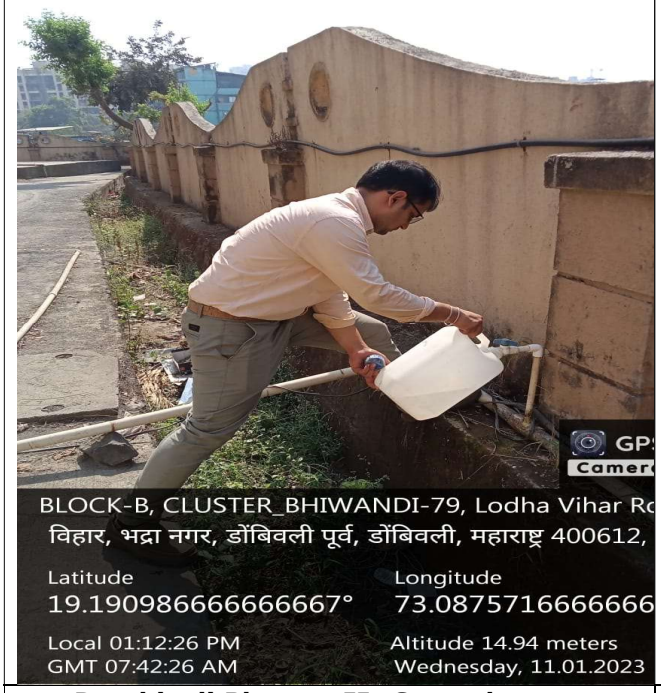
Dombivali Phase – I- Surface water Sampling from a drain near DEBESA

Dombivali Phase – II- Surface water Sampling from a nallah after DCETP

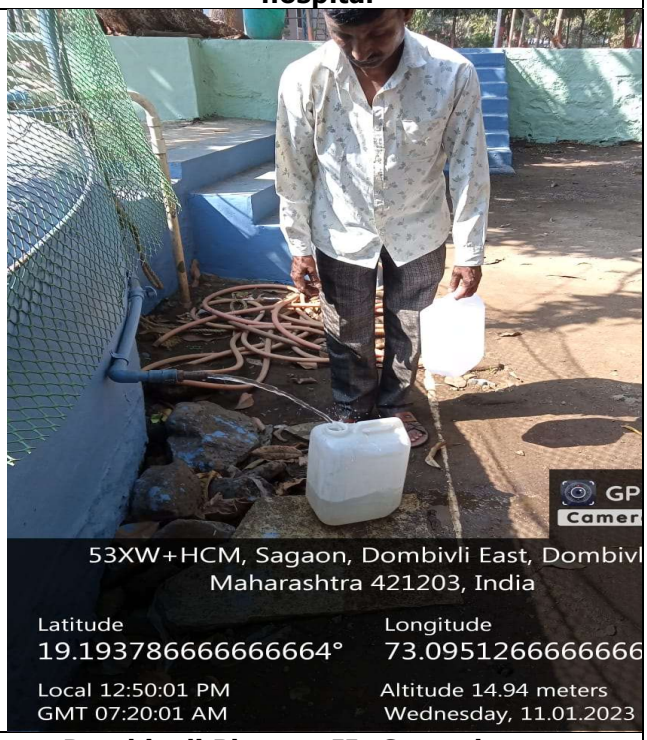
Dombivali Phase – I- Ground water Sampling at borewell water opposite KAMA office



Dombivali Phase – I- Ground water Sampling at borewell water near Mamta hospital



Dombivali Phase – II- Ground water Sampling at Lodha Vihar



Dombivali Phase – II- Ground water Sampling at Pimpleshwar temple

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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