

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

TARAPUR

Pre-Monsoon (April 2023 to June 2023)



LiFE
Lifestyle for Environment

Maharashtra Pollution Control Board

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ABBREVIATIONS

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

1. Executive Summary

Tarapur was monitored for Ambient Air Quality, Ground and Surface Water quality. Based on the data collected by monitoring, a Comprehensive Environmental Pollution Index (CEPI) Score [as per latest directions 120 of Letter No. B-29012/ESS (CPA)/2015-16 dated 26th April 2016 of Central Pollution Control Board (CPCB)] was calculated. Maharashtra Pollution Control Board (MPCB) has carried out monitoring at CPCB location with the additional locations of sampling for ambient air, surface and ground water 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 assess the ambient air quality, surface water quality and ground water quality.

The Ambient Air Quality stations were identified considering the upwind and cross wind direction in the CEPI impact area. Ambient Air Quality was monitored at eight locations. The concentration of all the ambient air parameters was found well within the limits prescribed by NAAQS. Six locations each for surface water and groundwater were monitored for the study. Concentration values of Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Dissolved Solids (TDS) and Total Kjeldahl Nitrogen (TKN) were found above the standard limits in the surface water monitoring. Land index is represented by groundwater in the CEPI. Ground water parameters were observed within the permissible limits when compared with IS 10500:2012 drinking water standards.

Based on the study conducted by CPCB during the period of March 2018, the CEPI score of Tarapur region as per the revised guidelines of CEPI (2016) was 93.69 (Air Index-72, Water Index-89 and Land Index-59.25). However, in the present study, the aggregated CEPI score of the Tarapur region of the pre-monsoon season (June, 2023) was calculated as 62.3. Based on the study, the present CEPI score is calculated on the basis of the sub-index of Air-24.0, Water Index-56.5, and Land Index-56.0). The CEPI score is the combination of A, B, C, and D factors. Here, the C factor represents the health data and the D factor represents the initiatives taken by the regional office of MPCB in the past few years to mitigate pollution. The regional office of MPCB has taken various initiatives like the installation of CAAQMS, CETPs, online VOC analysers etc. in the past few years to control and mitigate air and water pollutants. This has contributed to factor D, hence reducing the CEPI score of the region over the years.

The analysis of the aggregated CEPI score shows that the pollution in the Tarapur industrial cluster has decreased from a critical level of pollution to a severe one. During the pre-monsoon season study, a decline in CEPI score of about 33.5% was seen, going from 93.69 in 2018 to 62.3 in June 2023.

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 perceptible 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 Tarapur region, which is an industrial town located some 45 km north of Virar, on the Western Railway line of Mumbai Suburban Division (Mumbai Suburban Railway). The important river flowing through the region are Surya. This river is important drinking water resources of the region. Unlike other industrial estates, this industrial estate has a pleasant look due to the roads crossing at right angles and lots of small gardens adjacent to the boundary

walls of the industrial units. Tarapur accounts for about 23 highly polluting 17 category industries and 59 red category industries, 53 orange category industries and 66 green category industries of various category engaged in the manufacturing of chemicals, dyes, dye-intermediates, Bulk drugs, pharmaceuticals, Textile auxiliaries, Pesticides, Petrochemicals, Iron and steel, Textile processors, Engineering units etc. Besides the industries, there are other sources which are major contributors of pollution like emissions by transport and construction activities etc.

The present report is also based on the revised CEPI version 2016. The results of the application of the Comprehensive Environmental Pollution Index (CEPI) to selected industrial clusters or areas are presented in this report. The main objective of the study is to identify polluted industrial clusters or areas in order to take concerted action and to centrally monitor them at the national level to improve the current status of their environmental components such as air and water quality data, ecological damage, and visual environmental conditions. The index captures the various dimensions of 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. Tarapur 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 Tarapur, 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 Tarapur

Sampling Criteria	Total Sites	Monitoring Parameters
Ambient Air Quality	08	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , NH ₃ , O ₃ , C ₆ H ₆ , CO, BAP, Pb, Ni, As
Volatile Organic Compounds (VOCs)	02	Dichloromethane, Chloroform, Carbon Tetrachloride, Trichloroethylene, Bromodichloromethane, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,3-Dichlorobenzene, 1,2-Dichlorobenzene, 1,2-Dibromo-3-Chloropropane, Naphthalene, Bromobenzene, 1,2,4-Trimethylbenzene, 2-Chlorotoluene, Tert-Butylbenzene, SEC-Butylbenzene, P-Isopropyl toluene, M-Xylene, P-Xylene, Styrene, Cumene 1,2,3-Trichloropropane, N-Propyl benzene, Dibromochloromethane, 1,2-Dibromoethane, Chlorobenzene, 1,1,1,2-Tetrachloroethane, Ethylbenzene, 1,1-Dichloropropylene, 1,2-Dichloroethane, 1,2-Dichloropropane, Trans-1,3-Dichloropropene, CIS 1,3-Dichloropropene, 1,1,2-Trichloroethane, Tetrachloroethylene, 1,3,5-Trimethylbenzene, N-Butylbenzene, 1,2,3-Trichlorobenzene, Hexachlorobutadiene, 1,2,4-Trichlorobenzene, 2,2-

Sampling Criteria	Total Sites	Monitoring Parameters
		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
Water Quality Monitoring	Surface water - 06	<p>(i) Simple Parameters Sanitary Survey, General Appearance, Colour, Smell, Transparency and Ecological</p> <p>(ii) Regular Monitoring Parameters pH, O & G, Suspended Solids, DO, COD, BOD, TDS, Electrical Conductivity, Total Dissolved Solids, Nitrite-Nitrogen, Nitrate-Nitrogen, (NO₂+NO₃) total nitrogen, Free Ammonia, Total Residual Chlorine, Cyanide, Fluoride, Chloride, Sulphate, Sulphides, Total Hardness, Dissolved Phosphates, SAR, Total Coliforms, Faecal Coliform</p> <p>(iii) Special Parameters Total Phosphorous, TKN, Total Ammonia (NH₄+NH₃)-Nitrogen, Phenols, Surface Active Agents, Anionic detergents, Organo-Chlorine Pesticides, PAH, PCB and PCT, Zinc, Nickel, Copper, Hexa-valent Chromium, Chromium (Total), Arsenic (Total), Lead, Cadmium, Mercury, Manganese, Iron, Vanadium, Selenium, Boron</p> <p>(iv) Bio-assay (zebra Fish) Test – For specified samples only.</p>
	Ground water - 06	

Table 3.2 Frequency of Sampling

	Parameter	Round of Sampling	Frequency in Each Round
A	Ambient Air Quality Monitoring		
1.	Particulate Matter (size less than 10 µm) or PM ₁₀	03	3 Shifts of 8 hrs each
2.	Particulate Matter (size less than 2.5 µm) or PM _{2.5}	03	1 Shift of 24 hrs
3.	Sulphur Dioxide (SO ₂)	03	6 Shifts of 4 hrs each

	Parameter	Round of Sampling	Frequency in Each Round
4.	Nitrogen Dioxide (NO ₂)	03	6 Shifts of 4 hrs each
5.	Ammonia (NH ₃)	03	6 Shifts of 4 hrs each
6.	Ozone (O ₃)	03	24 Shifts of 1 hr each
7.	Benzene (C ₆ H ₆)	03	1 Shifts of 24 hrs
8.	Carbon Monoxide (CO)	03	24 Shifts of 1 hr each
9.	Benzo (a) Pyrene (BaP) – particulate phase only	03	3 Shifts of 8 hrs each
10.	Lead (Pb)	03	3 Shifts of 8 hrs each
11.	Arsenic (As)	03	3 Shifts of 8 hrs each
12.	Nickel (Ni)	03	3 Shifts of 8 hrs each
B	Volatile Organic Compounds (VOCs)		
	As mentioned in Table 3.1	03	3 Shifts of 24 hrs each
C	Ground Water		
	As mentioned in Table 3.1	03	01 sample at each round
D	Surface Water		
	As mentioned in Table 3.1	03	01 sample at each round

4. Methodology

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



Ambient air stations, Surface water locations and 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 potentially polluted areas so as to arrive at the CEPI. This will further help the authorities to monitor the areas in order to improve the current status of their environmental components such as air and water quality data, ecological damage and visual environmental conditions.

AIR ENVIRONMENT

5. Air Environment

For studying the Air Environment of the Tarapur 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 carried out.

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

In Tarapur eight locations have been monitored of checking the Ambient Air Quality (AAQ) in triplicate from 2nd June 2023 to 6th June 2023. The concentration of all the parameters at all the studied locations is observed well within the limits. Volatile Organic Compounds (VOCs) were monitored at 2 locations namely Kokuyo Camlin Ltd. and Lupin Ltd.

Table 5.1 Details of Sampling Location of Ambient Air Quality Monitoring

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Kokuyo Camlin Ltd.	19.798036°N	72.737654°E	02.06.2023	04.06.2023	06.06.2023
2.	D Docor Export Pvt. Ltd.	19.789417°N	72.752577°E	02.06.2023	04.06.2023	06.06.2023
3.	Sumitomo Chemical India Pvt. Ltd.	19.790828°N	72.718491°E	02.06.2023	04.06.2023	06.06.2023
4.	MPCB SRO Office	19.8098767°N	72.7435753°E	02.06.2023	04.06.2023	06.06.2023
5.	Loba Chemical Pvt Ltd	19.809545°N	72.734732°E	02.06.2023	04.06.2023	06.06.2023
6.	Unitec Fibres Pvt Ltd	19.804582°N	72.729414°E	02.06.2023	04.06.2023	06.06.2023
7.	Lupin Ltd	19.79615°N	72.720105°E	02.06.2023	04.06.2023	06.06.2023
8.	MPIL Steel Structure Ltd	19.797829°N	72.746503°E	02.06.2023	04.06.2023	06.06.2023

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

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Kokuyo Camlin Ltd.	19.798036°N	72.737654°E	02.06.2023	04.06.2023	06.06.2023
2.	Lupin Ltd	19.79615°N	72.720105°E	02.06.2023	04.06.2023	06.06.2023



Fig: Geographical Locations of Ambient Air Quality Sampling



Fig: Geographical Locations of VOCs Monitoring

Table 5.3 Ambient Air Quality Monitoring Results

Parameters	Unit	Results			
		Kokuyo Camlin Ltd.	D Docor Export Pvt. Ltd.	Sumitomo Chemical India Pvt. Ltd	MPCB SRO Office
Sulphur Dioxide (SO ₂)	µg/m ³	16.35	11.85	7.49	6.96
Nitrogen Dioxide (NO ₂)	µg/m ³	13.75	13.06	13.66	14.34
Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	53	59	66	67
Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	14	15	18	17
Ozone (O ₃)	µg/m ³	BLQ	BLQ	BLQ	26.50
Lead (Pb)	µg/m ³	BLQ	BLQ	BLQ	BLQ
Carbon Monoxide (CO) (1h)	mg/m ³	1.19	1.54	1.62	1.53
Carbon Monoxide (CO) (8 h)	mg/m ³	1.46	1.90	1.92	1.98
Ammonia (NH ₃)	µg/m ³	46.60	201.00	198.00	132.90
Benzene (C ₆ H ₆)	µg/m ³	1.88	1.98	1.92	2.14

Parameters	Unit	Results			
		Kokuyo Camlin Ltd.	D Docor Export Pvt. Ltd.	Sumitomo Chemical India Pvt. Ltd	MPCB SRO Office
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m ³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m ³	0.70	BLQ	BLQ	BLQ
Nickel (Ni)	ng/m ³	BLQ	13.80	8.21	5.79

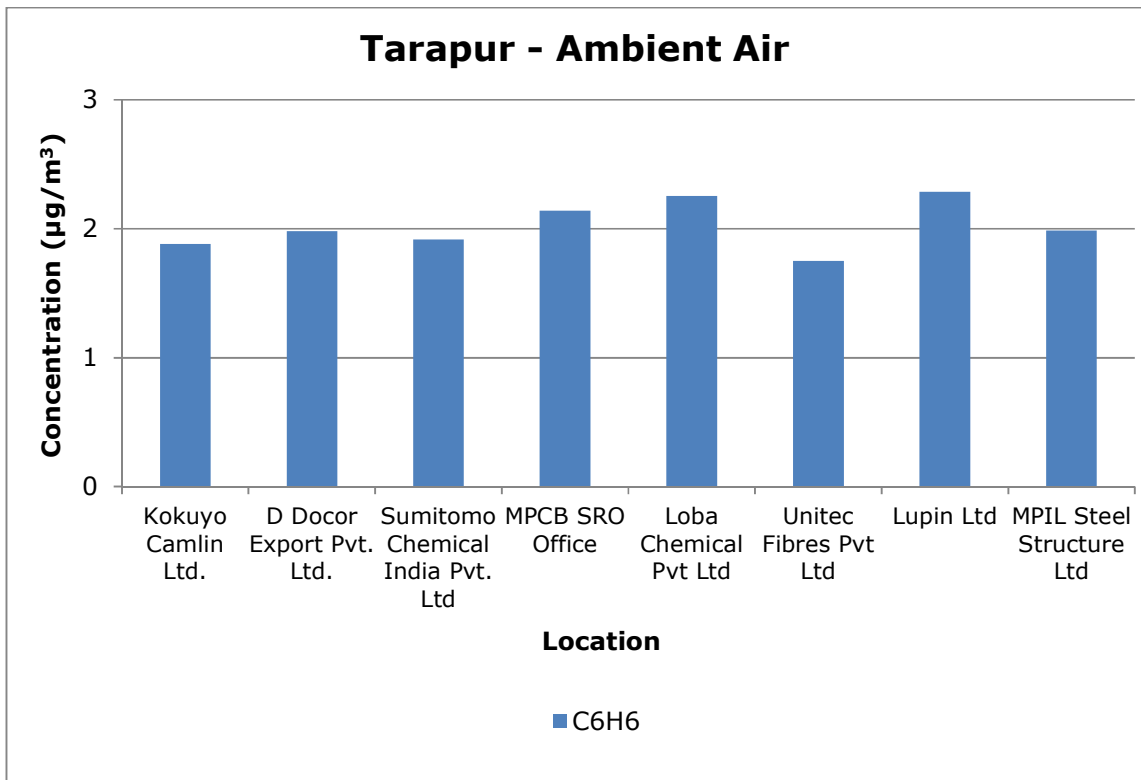
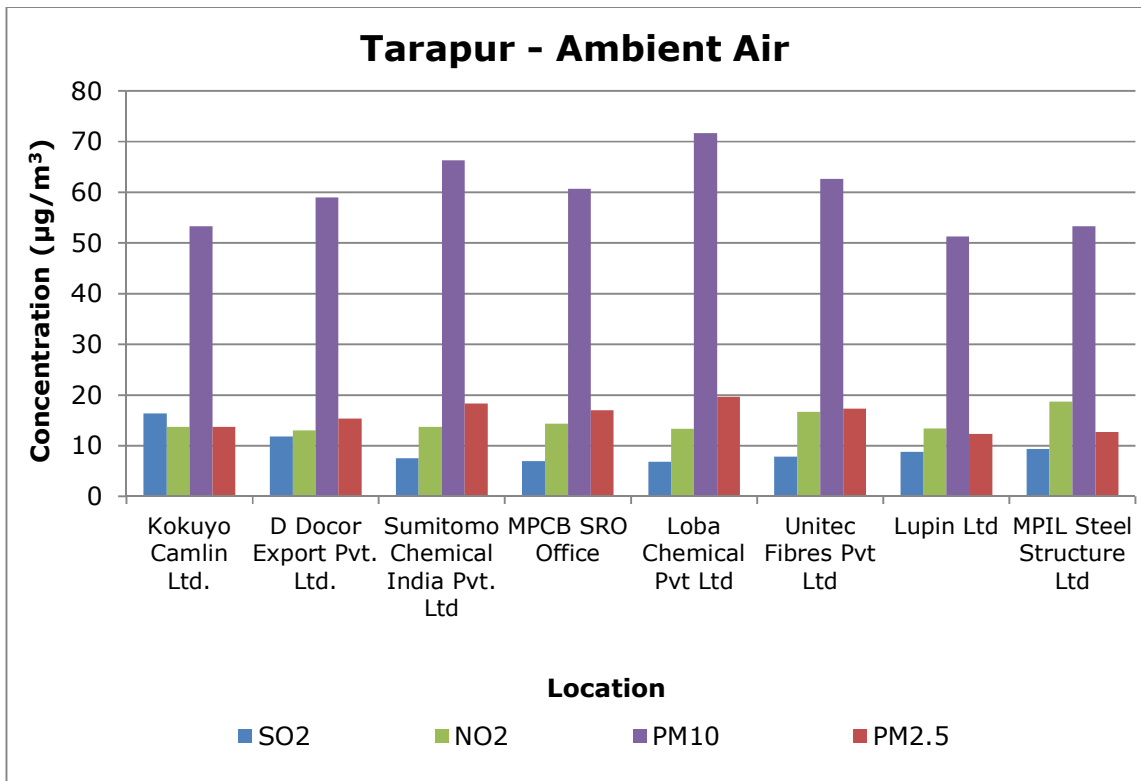
Parameters	Unit	Results			
		Loba Chemical Pvt Ltd.	Unitec Fibres Pvt Ltd.	Lupin Ltd.	MPIL Steel Structure Ltd.
Sulphur Dioxide (SO ₂)	µg/m ³	6.83	7.89	8.77	9.33
Nitrogen Dioxide (NO ₂)	µg/m ³	13.33	16.70	13.40	18.73
Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	77	623	51	53
Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	20	17	12	13
Ozone (O ₃)	µg/m ³	BLQ	BLQ	BLQ	75.00
Lead (Pb)	µg/m ³	BLQ	0.02	BLQ	BLQ
Carbon Monoxide (CO) (1h)	mg/m ³	1.35	1.15	1.17	1.64
Carbon Monoxide (CO) (8 h)	mg/m ³	1.72	1.77	1.93	1.96
Ammonia (NH ₃)	µg/m ³	51.20	85.67	43.30	133.35
Benzene (C ₆ H ₆)	µg/m ³	2.25	1.75	2.29	1.99
Benzo (a) Pyrene (BaP) – particulate phase only	ng/m ³	BLQ	BLQ	BLQ	BLQ
Arsenic (As)	ng/m ³	0.40	0.39	BLQ	BLQ
Nickel (Ni)	ng/m ³	BLQ	BLQ	7.20	BLQ

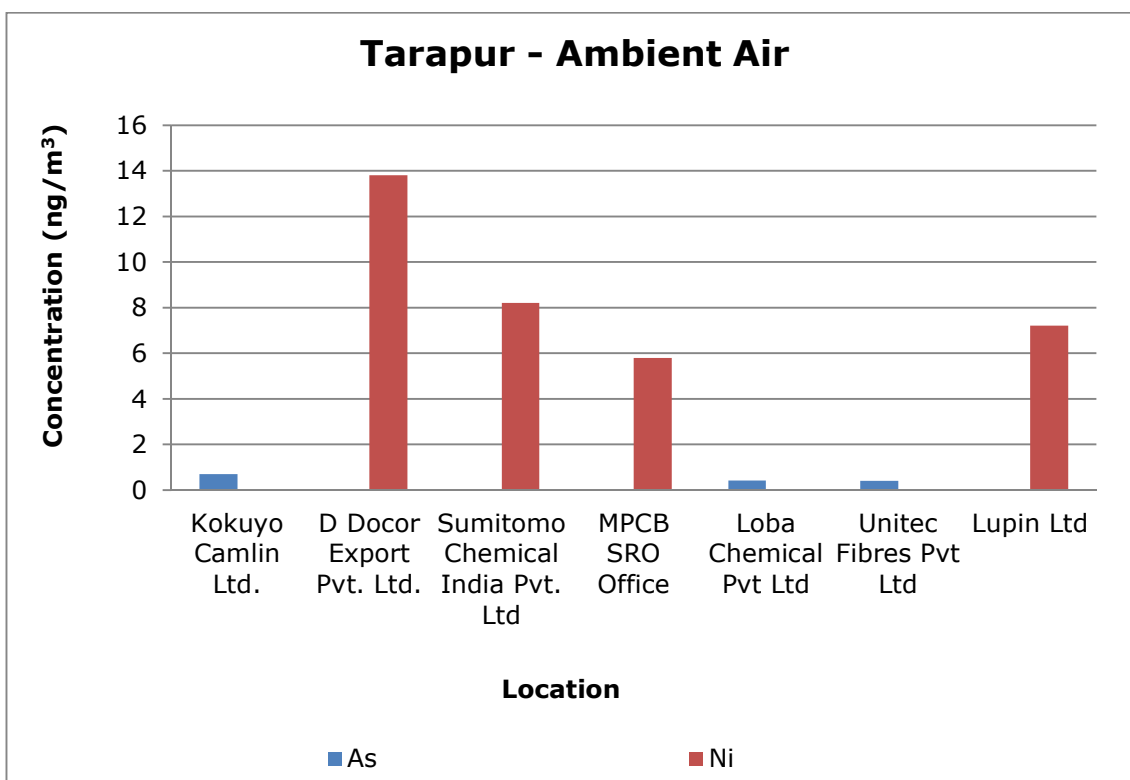
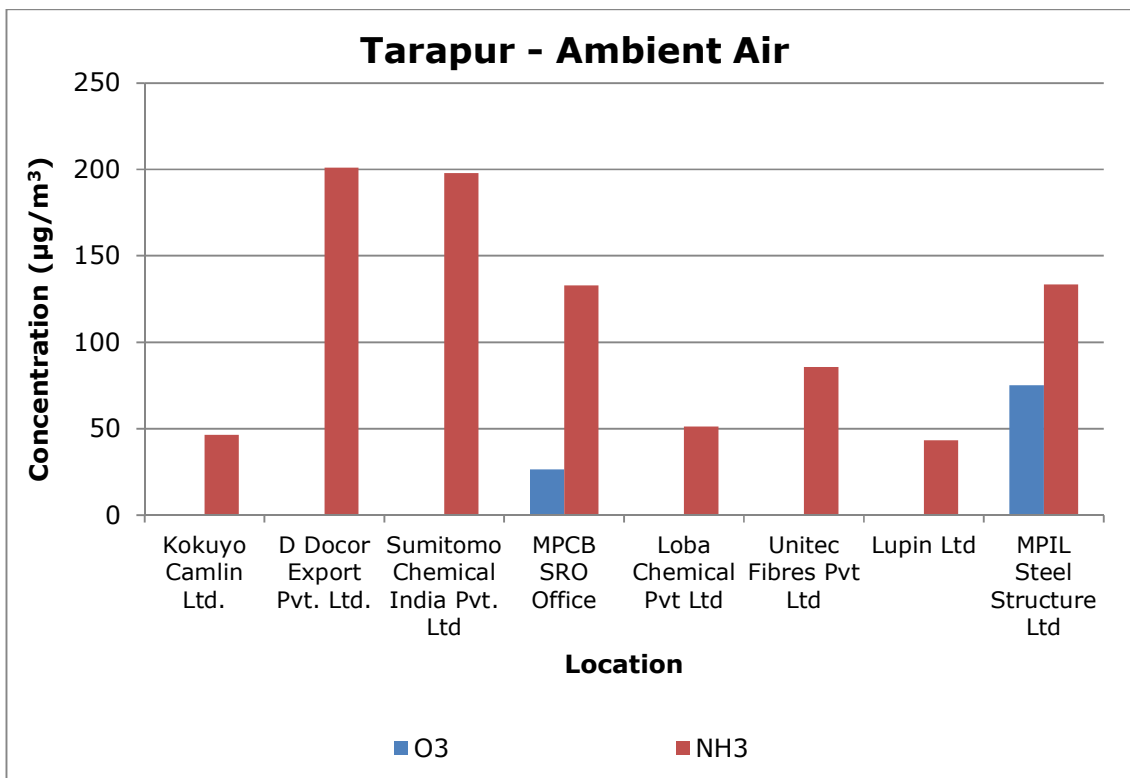
Table 5.4 Volatile Organic Compounds (VOCs) in Ambient Air Results

Parameters	Unit	Results	
		Kokuyo Camlin Ltd.	Lupin Ltd.
Dichloromethane	µg/m ³	3.04	0.95
Chloroform	µg/m ³	2.57	1.44
Carbon Tetrachloride	µg/m ³	0.69	0.51
Trichloroethylene	µg/m ³	BLQ	BLQ
Bromodichloromethane	µg/m ³	0.83	BLQ
1,3-Dichloropropane	µg/m ³	BLQ	BLQ
1,4-Dichlorobenzene	µg/m ³	6.19	BLQ
1,3-Dichlorobenzene	µg/m ³	9.76	BLQ
1,2-Dichlorobenzene	µg/m ³	BLQ	BLQ
1,2-Dibromo-3-Chloropropane	µg/m ³	BLQ	BLQ
Naphthalene	µg/m ³	BLQ	BLQ
Bromobenzene	µg/m ³	BLQ	BLQ
1,2,4-Trimethylbenzene	µg/m ³	3.56	BLQ
2-Chlorotoluene	µg/m ³	BLQ	BLQ
Tert-Butylbenzene	µg/m ³	BLQ	BLQ
SEC-Butylbenzene	µg/m ³	BLQ	BLQ
P-Isopropyl toluene	µg/m ³	BLQ	BLQ
M-Xylene	µg/m ³	BLQ	BLQ
P-Xylene	µg/m ³	0.98	2.21
Styrene	µg/m ³	BLQ	BLQ
Cumene	µg/m ³	BLQ	BLQ
1,2,3-Trichloropropane	µg/m ³	BLQ	BLQ
N-Propyl benzene	µg/m ³	BLQ	1.53
Dibromochloromethane	µg/m ³	BLQ	BLQ
1,2-Dibromoethane	µg/m ³	BLQ	BLQ
Chlorobenzene	µg/m ³	BLQ	BLQ
1,1,1,2-Tetrachloroethane	µg/m ³	BLQ	BLQ
Ethylbenzene	µg/m ³	0.71	BLQ
1,1-Dichloropropylene	µg/m ³	0.64	BLQ
1,2-Dichloroethane	µg/m ³	6.84	2.75
1,2-Dichloropropane	µg/m ³	BLQ	BLQ

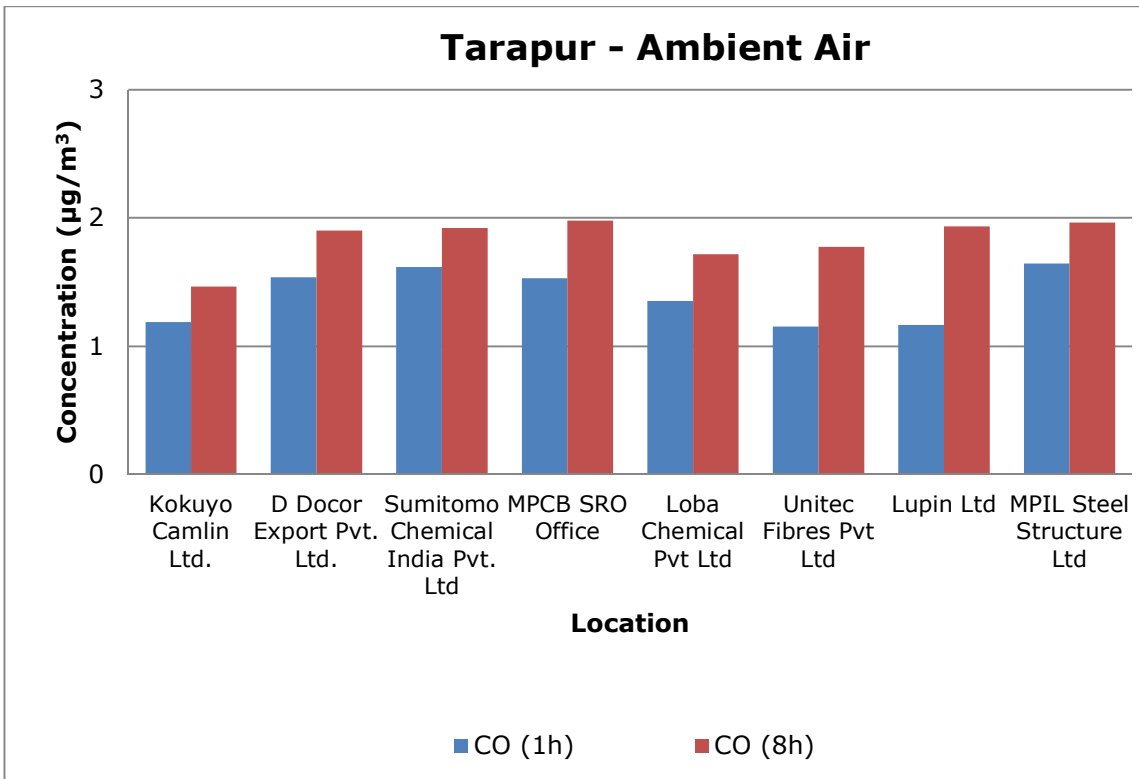
Parameters	Unit	Results	
		Kokuyo Camlin Ltd.	Lupin Ltd.
Trans-1,3-Dichloropropene	µg/m ³	BLQ	BLQ
CIS 1,3-Dichloropropene	µg/m ³	BLQ	BLQ
1,1,2-Trichloroethane	µg/m ³	BLQ	BLQ
Tetrachloroethylene	µg/m ³	BLQ	BLQ
1,3,5-Trimethylbenzene	µg/m ³	BLQ	BLQ
N-Butylbenzene	µg/m ³	BLQ	BLQ
1,2,3-Trichlorobenzene	µg/m ³	BLQ	BLQ
Hexachlorobutadiene	µg/m ³	BLQ	BLQ
1,2,4-Trichlorobenzene	µg/m ³	BLQ	BLQ
2,2-Dichloropropane	µg/m ³	BLQ	BLQ
Dibromomethane	µg/m ³	BLQ	BLQ
Toluene	µg/m ³	0.68	0.86
O-Xylene	µg/m ³	0.74	BLQ
Bromoform	µg/m ³	BLQ	BLQ
1,1,2,2-Tetrachloroethane	µg/m ³	BLQ	BLQ
4-Chlorotoluene	µg/m ³	BLQ	BLQ
1,1-Dichloroethylene	µg/m ³	BLQ	BLQ
Trans-1,2-Dichloroethylene	µg/m ³	BLQ	BLQ
1,1-Dichloroethane	µg/m ³	BLQ	BLQ
CIS-1,2-Dichloroethylene	µg/m ³	BLQ	BLQ
Bromochloromethane	µg/m ³	BLQ	BLQ
1,1,1-Trichloroethane	µg/m ³	BLQ	BLQ

Graphs Ambient Air Quality Monitoring of Tarapur





Tarapur - Ambient Air



6. Water Environment

For studying the water environment of Tarapur area, surface water was collected from Nallah, Lake and River. To understand the quality of treated effluent, samples were collected from six locations.

- All six water samples collected were found acceptable in general appearance, colour, smell and transparency.
- General parameters like pH, electrical conductivity and suspended solids are also observed well within the limits in all the samples.
- Concentration of Biological Oxygen Demand (BOD), and Total Kjeldahl Nitrogen (TKN) is found to exceed the acceptable limits at four of the studied locations.
- In fish bioassay, 83-97% survival of fishes was achieved.
- Metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr⁶⁺) etc. were also observed either below the limit of quantification.
- Parameters like Total Residual Chlorine, Nitrogen, Cyanide, Sulphide, Dissolved Phosphate, Total Ammonical Nitrogen and Phenolic compounds, also met the criteria as prescribed by CPCB.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are also observed below the limit of quantification (BLQ) in all the studied samples.

Table 6.1 Details of Sampling Location of Surface Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	BPT Navapur out Fall	19.790747°N	72.743416°E	03.06.2023	05.06.2023	07.06.2023
2.	Over Flow of Sump No-1	19.785157°N	72.738008°E	03.06.2023	05.06.2023	07.06.2023
3.	Nallah Near sump 2 Tarapur CETP	19.805635°N	72.724122°E	03.06.2023	05.06.2023	07.06.2023
4.	Open Drain Near Sump 3 Node	19.782267°N	72.721677°E	03.06.2023	05.06.2023	07.06.2023
5.	Nallah to Dandi	19.79258°N	72.690175°E	03.06.2023	05.06.2023	07.06.2023
6.	Nallah Carrying Domestic Sewage at Saravali	19.770204°N	72.751514°E	03.06.2023	05.06.2023	07.06.2023



Fig: Geographical Locations of Surface Water Sampling

Table 6.2 Results of Surface Water

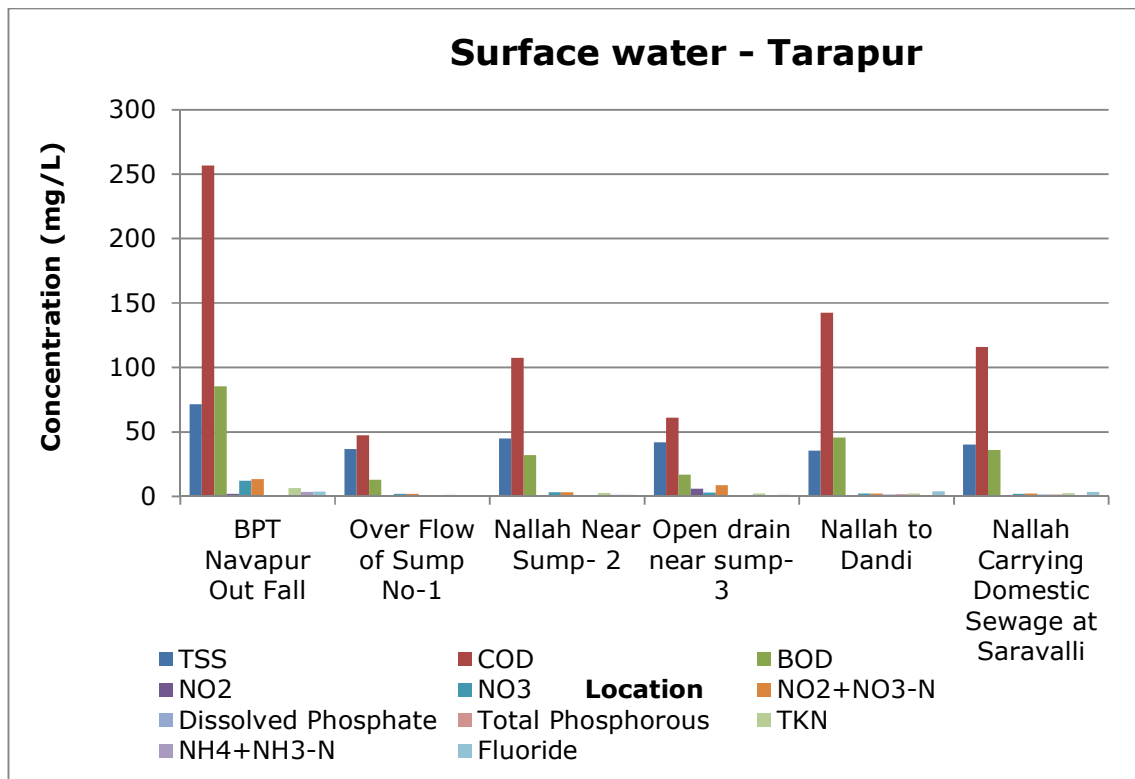
Parameters	Unit	Results					
		BPT Navapur Out Fall	Over Flow of Sump No-1	Nallah Near Sump- 2	Open drain near sump- 3	Nallah to Dandi	Nalla Carrying Domestic Sewage at Saravalli
Sanitary Survey	-	Generally clean neighbourhood	Generally clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood	Reasonably clean neighbourhood
General Appearance	-	No floating matter	No floating matter	No floating matter	No floating matter	No floating matter	No floating matter
Transparency	M	0.33	0.50	0.50	0.60	0.50	0.30
Temperature	°C	27	27	28	27	27	28
Colour	Hazen	4	1	3	2	1	1.67
Smell	-	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
pH	-	7.07	7.49	7.10	7.90	6.81	7.00
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	71	37	45	42	35	40

Parameters	Unit	Results					
		BPT Navapur Out Fall	Over Flow of Sump No-1	Nallah Near Sump- 2	Open drain near sump- 3	Nallah to Dandi	Nalla Carrying Domestic Sewage at Saravalli
Total Dissolved Solids	mg/L	3865	232	861	959	21983	16350
Dissolved Oxygen (% Saturation)	%	29.67	50.67	40.00	48.33	38.67	41.33
Chemical Oxygen Demand	mg/L	257	47	107	61	142	116
Biochemical Oxygen Demand (3 days,27°C)	mg/L	85	13	32	17	46	36
Electrical Conductivity (at 25 °C)	µmho/cm	6900	413	1537	1711	37967	28233
Nitrite Nitrogen (as NO ₂)	mg/L	1.83	0.07	0.07	5.67	0.05	0.18
Nitrate Nitrogen (as NO ₃)	mg/L	12.04	1.76	3.09	3.02	2.06	1.74
(NO ₂ + NO ₃)-Nitrogen	mg/L	13.25	1.84	3.14	8.54	2.09	1.93
Free Ammonia (as NH ₃ -N)	mg/L	BLQ	BLQ	1.40	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.45	BLQ	0.32	0.23	0.31	0.32
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	3.60	0.37	1.13	1.17	4.00	3.40
Sulphide (as H ₂ S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.75	0.30	0.24	0.27	1.25	1.31
Sodium Adsorption Ratio	-	11	1	2	3	20	23
Total Coliforms	MPN Index/100 ml	1247	386	1183	707	623	497
Faecal Coliforms	MPN Index/100 ml	108	150	913	168	366	253

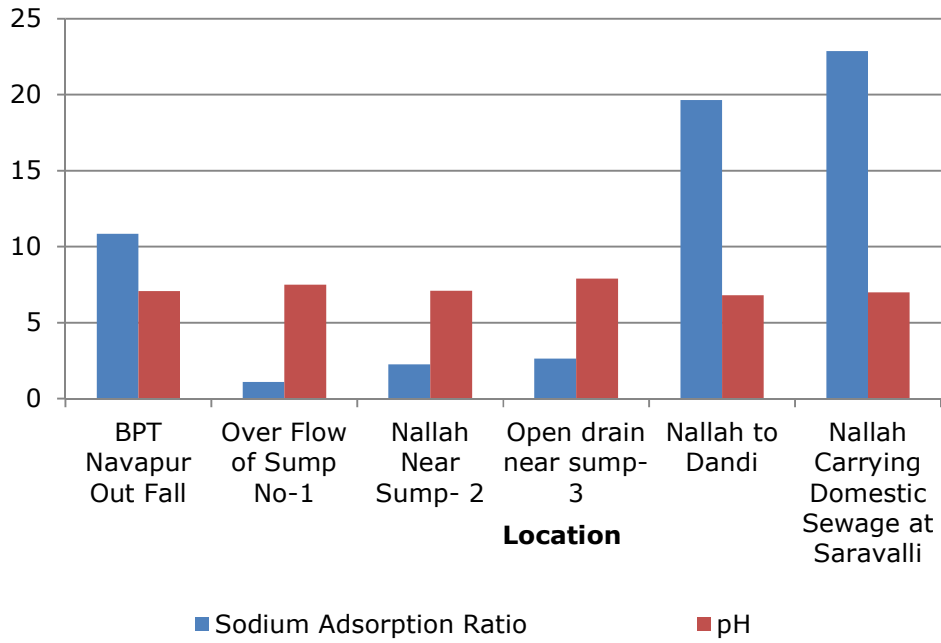
Parameters	Unit	Results					
		BPT Navapur Out Fall	Over Flow of Sump No-1	Nallah Near Sump- 2	Open drain near sump- 3	Nallah to Dandi	Nalla Carrying Domestic Sewage at Saravalli
Total Phosphate (as P)	mg/L	0.95	0.21	0.32	0.36	1.47	1.43
Total Kjeldahl Nitrogen (as N)	mg/L	6.16	1.12	2.80	2.05	2.05	2.24
Total Ammonia (NH ₄ +NH ₃)-Nitrogen	mg/L	3.48	0.57	1.13	0.84	0.80	0.82
Total Nitrogen	mg/L	19.41	2.19	5.93	10.75	4.14	4.16
Phenols (as C ₆ H ₅ OH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	0.32	BLQ	0.07	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	0.11	BLQ	0.03	0.03	BLQ	0.02
Copper (as Cu)	mg/L	0.48	BLQ	BLQ	0.04	BLQ	0.04
Hexavalent Chromium (as Cr ⁶⁺)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.12	BLQ	0.04	0.07	BLQ	0.04
Total Arsenic (as As)	mg/L	0.02	BLQ	BLQ	BLQ	0.01	0.01
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	0.27	0.10	0.25	0.34	0.04	0.14

Parameters	Unit	Results					
		BPT Navapur Out Fall	Over Flow of Sump No-1	Nallah Near Sump- 2	Open drain near sump- 3	Nallah to Dandi	Nalla Carrying Domestic Sewage at Saravalli
Iron (as Fe)	mg/L	2.83	0.35	0.42	2.47	0.50	0.80
Vanadium (as V)	mg/L	0.02	BLQ	BLQ	0.03	0.01	0.02
Selenium (as Se)	mg/L	0.02	0.01	0.01	0.02	0.01	0.02
Boron (as B)	mg/L	0.89	BLQ	0.17	0.28	2.61	2.50
Bioassay Test on fish	% survival	93	97	83	97	90	93

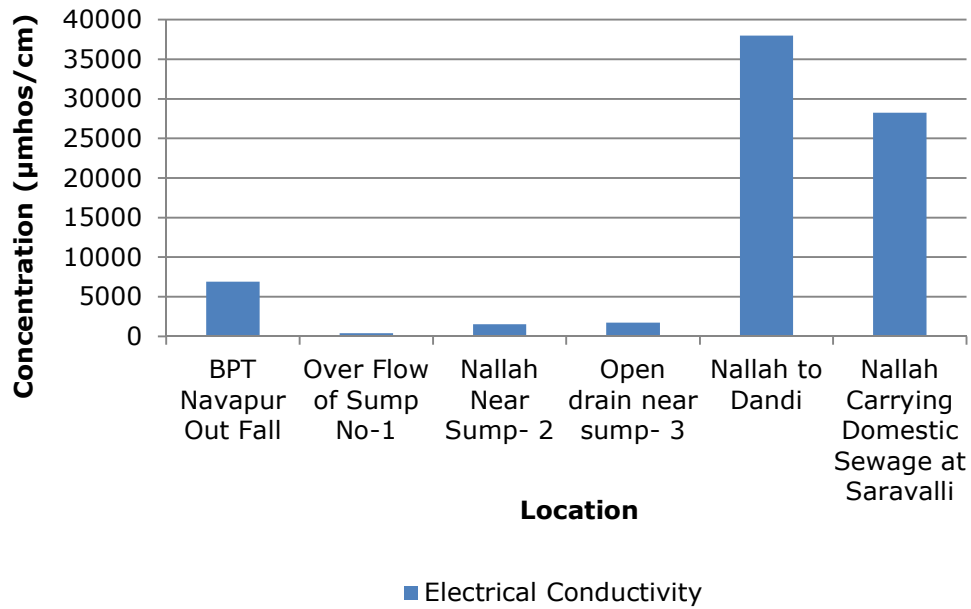
Graphs - Surface Water Quality of Tarapur



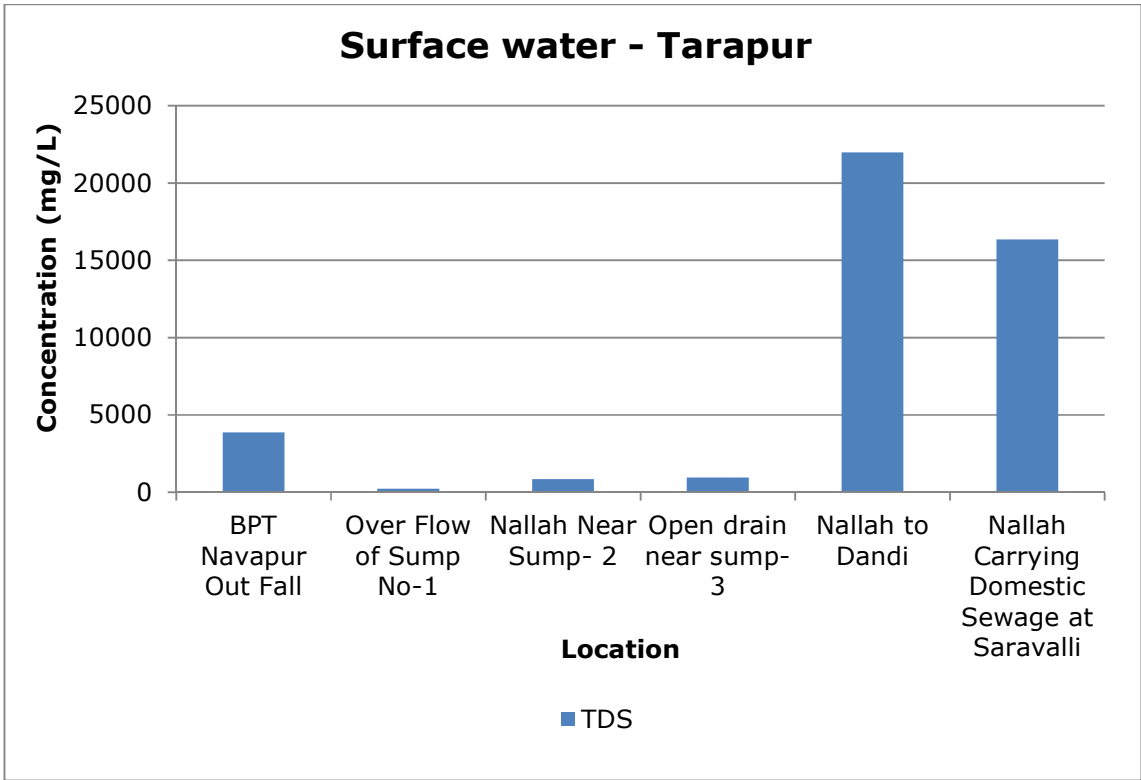
Surface water - Tarapur



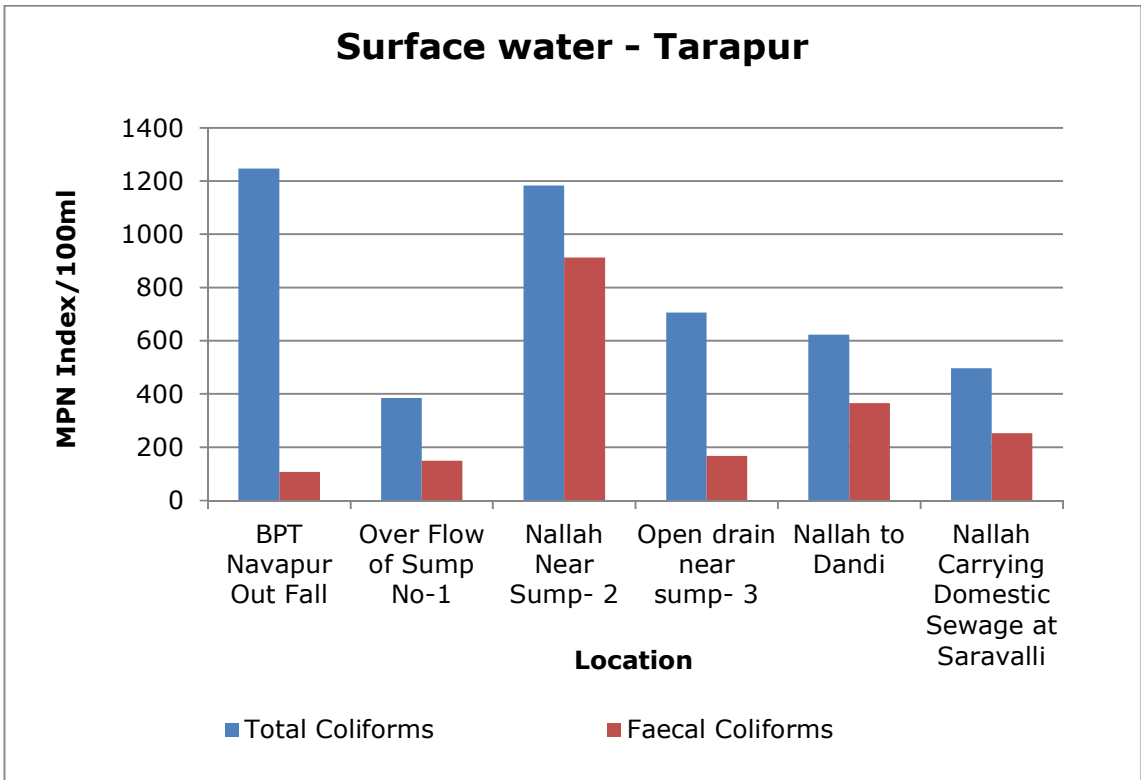
Surface water - Tarapur

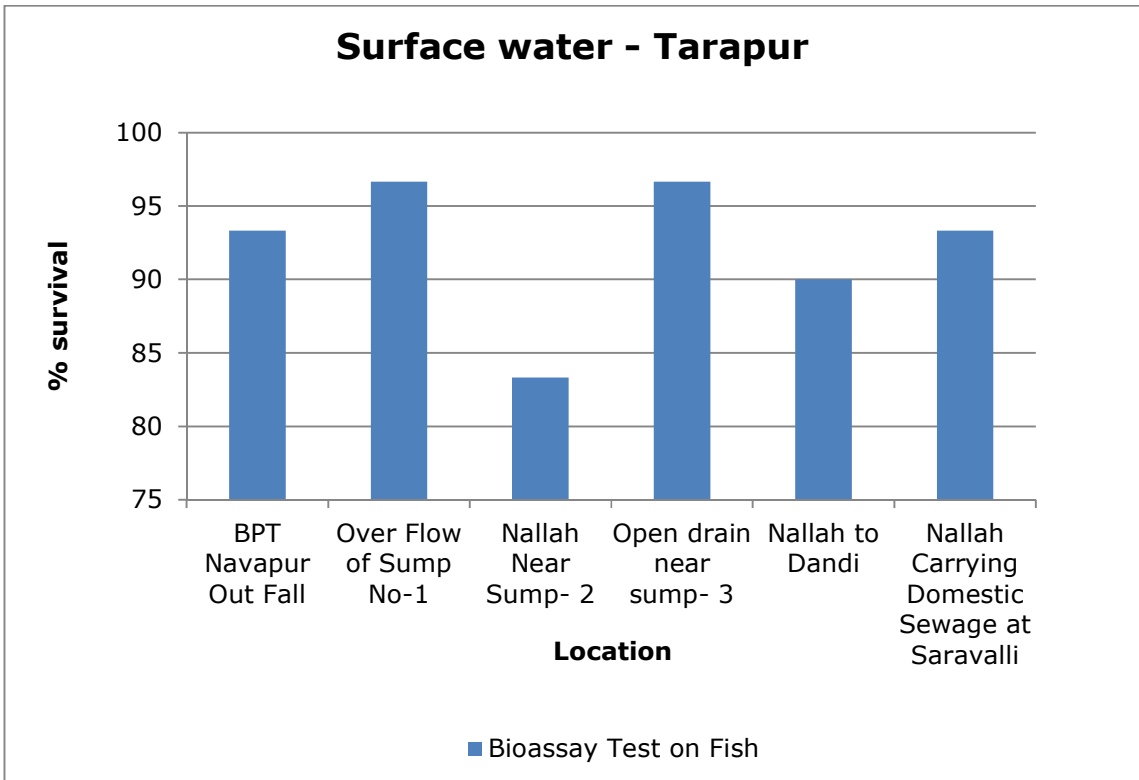
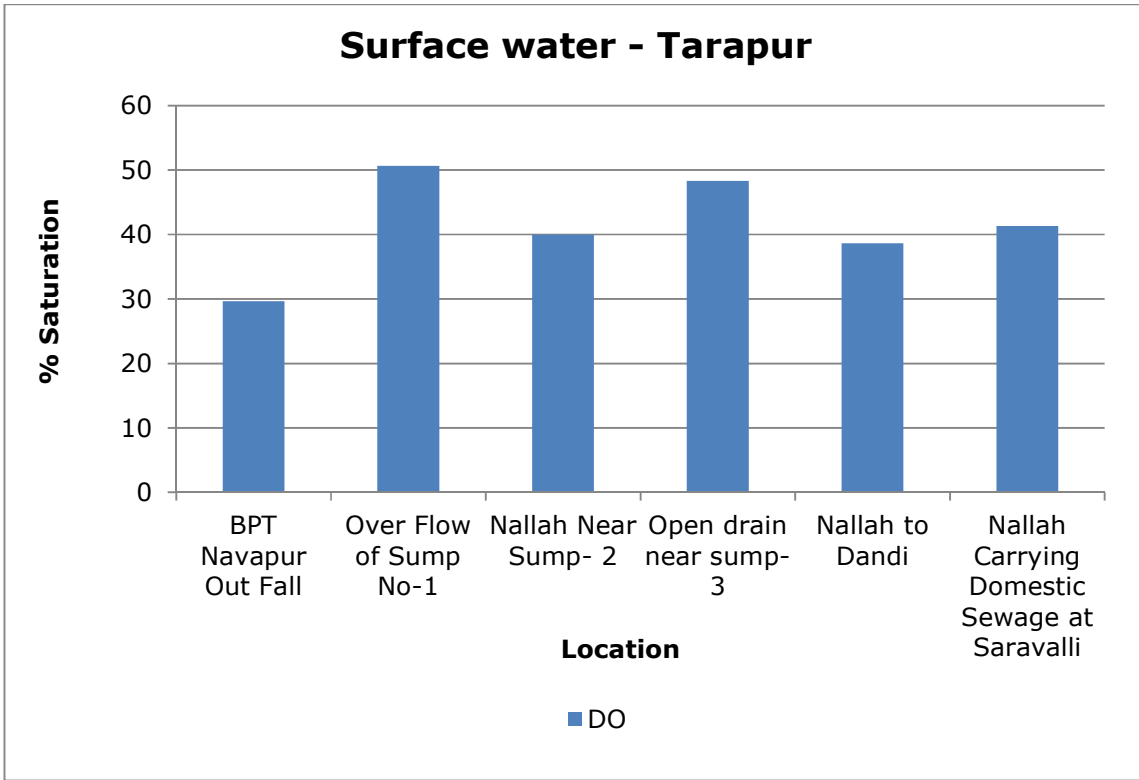


Surface water - Tarapur



Surface water - Tarapur





7. Land Environment

For studying the land Environment of Tarapur area, ground water was collected from Bore well, Dug well, and Hand Pump. A total of 6 samples were collected and analysed to check the concentration of different parameters.

Six groundwater samples were collected from Tarapur region.

- All the water samples collected were acceptable in general appearance, colour, smell and transparency.
- General parameters like pH, suspended solids, BOD, and COD were also well within the limits in all six samples collected.
- Total dissolved solids are found to exceed the acceptable limit of 2000mg/l in the water samples of sai complex, Gharat and Ramji Nagar.
- Three water samples out of six showed achieved 100% survival in Fish Bioassay.
- Concentration of Iron (Fe) is observed to exceed the permissible limit in five of the water samples out of six. All other metals like Arsenic, Nickel, Copper, Hexavalent Chromium (Cr⁶⁺) etc. are also 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.
- Organo Chlorine Pesticides, Polynuclear aromatic hydrocarbons (PAH) and Polychlorinated Biphenyls (PCB) are below the limit of quantification in all studied samples.

Table 7.1 Details of Sampling Location of Ground Water

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
1.	Handpump water, besides sai complex	19.80961°N	72.74466°E	03.06.2023	05.06.2023	07.06.2023
2.	Dhodi Pooja Borewell Water	19.79777°N	72.752702°E	03.06.2023	05.06.2023	07.06.2023
3.	Open well, near nalla Sump 1	19.785158°N	72.738027°E	03.06.2023	05.06.2023	07.06.2023
4.	Borewell at Shivaji Nagar, Boisar Tarapur	19.804566°N	72.753556°E	03.06.2023	05.06.2023	07.06.2023
5.	Borewell at Gharat Wadi	19.811848°N	72.740713°E	03.06.2023	05.06.2023	07.06.2023

Sr. No.	Name of Monitoring Location	Latitude	Longitude	Date of Sampling		
				Round-1	Round-2	Round-3
6.	Ramji Nagar, Tarapur	19.782236°N	72.723859°E	03.06.2023	05.06.2023	07.06.2023

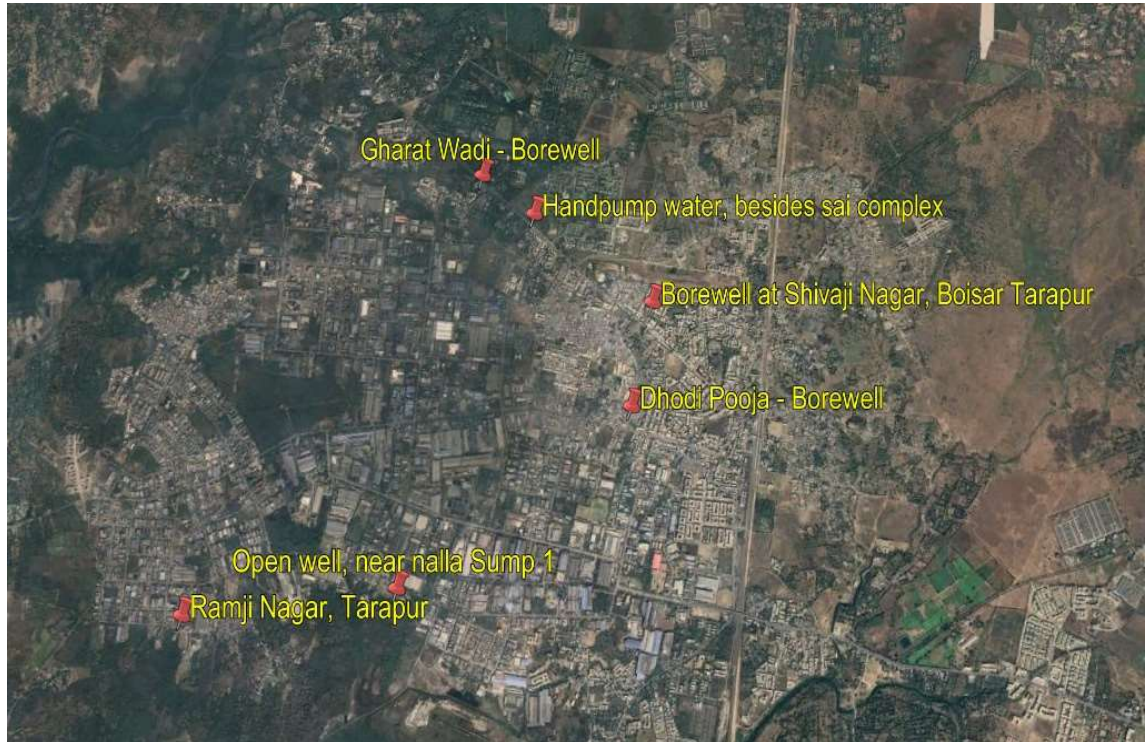


Fig: Geographical Locations of Ground Water Sampling

Table 7.2 Results of Groundwater

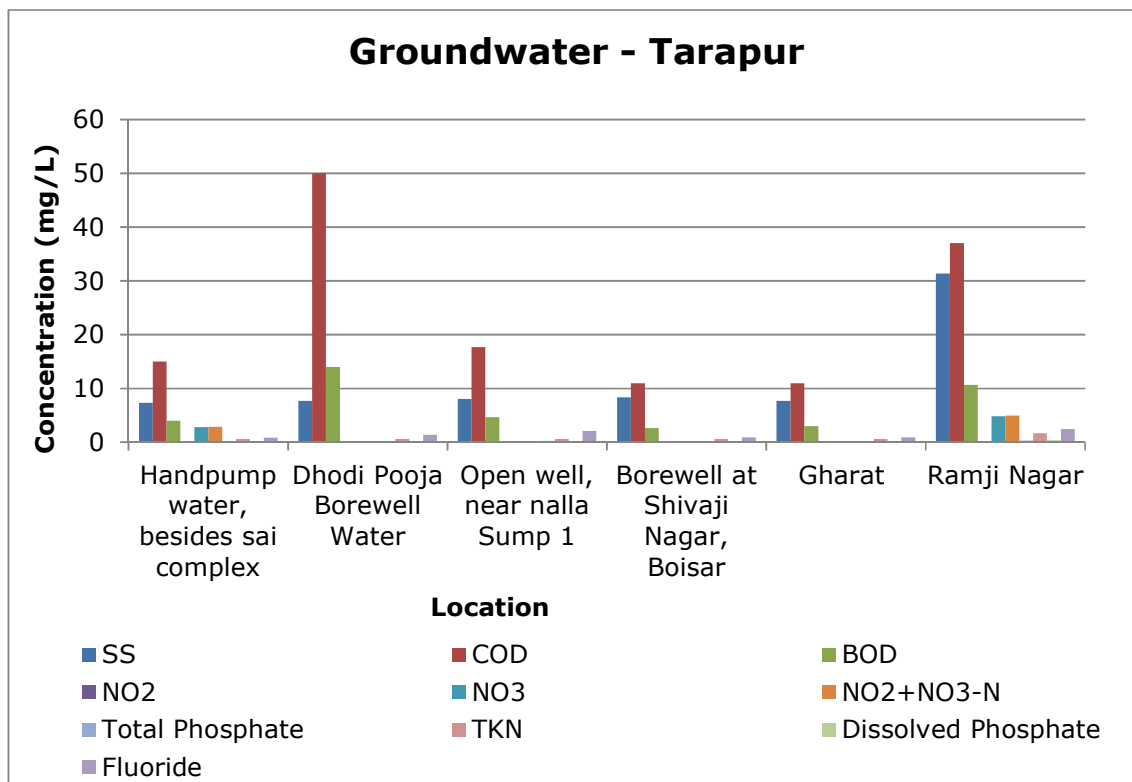
Parameters	Unit	Results					
		Handpump water, besides sai complex	Dhodi Pooja Borewell Water	Open well, near nallah Sump 1	Borewell at Shivaji Nagar, Boisar	Gharat	Ramji Nagar
Sanitary Survey	-	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean neighbourhood	Generally clean 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	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Temperature	°C	27	27	27	28	110	27
Colour	Hazen	1	1	1	1	1	1

Parameters	Unit	Results					
		Handpump water, besides sai complex	Dhodi Pooja Borewell Water	Open well, near nallah Sump 1	Borewell at Shivaji Nagar, Boisar	Gharat	Ramji Nagar
Smell	-	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
pH	-	7.82	7.83	8.10	7.61	7.63	7.01
Oil & Grease	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Suspended Solids	mg/L	7	8	8	8	8	31
Total Dissolved Solids	mg/L	510	928	1252	560	553	1951
Chemical Oxygen Demand	mg/L	15	50	18	11	11	37
Biochemical Oxygen Demand (3 days,27°C)	mg/L	4	14	5	3	3	11
Electrical Conductivity (at 25 °C)	µmho/cm	909	1656	2235	998	987	3481
Nitrite Nitrogen (as NO ₂)	mg/L	0.07	0.12	0.06	0.05	0.04	0.09
Nitrate Nitrogen (as NO ₃)	mg/L	2.80	BLQ	BLQ	BLQ	BLQ	4.84
(NO ₂ + NO ₃)-Nitrogen	mg/L	2.84	BLQ	BLQ	BLQ	BLQ	4.93
Free Ammonia (as NH ₃ -N)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Residual Chlorine	mg/L	0.23	BLQ	BLQ	BLQ	BLQ	BLQ
Cyanide (as CN)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Fluoride (as F)	mg/L	0.87	1.37	2.07	0.93	0.93	2.43
Sulphide (as H ₂ S)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Dissolved Phosphate (as P)	mg/L	0.10	0.14	0.17	0.10	0.10	0.34
Sodium Adsorption Ratio	-	1.51	2.96	3.26	1.75	1.61	3.11
Total Coliforms	MPN Index/100 ml	240	340	65	377	197	606
Faecal Coliforms	MPN Index/100 ml	133	240	45	139	58	340
Total Phosphate (as P)	mg/L	0.14	0.18	0.24	0.17	0.16	0.31

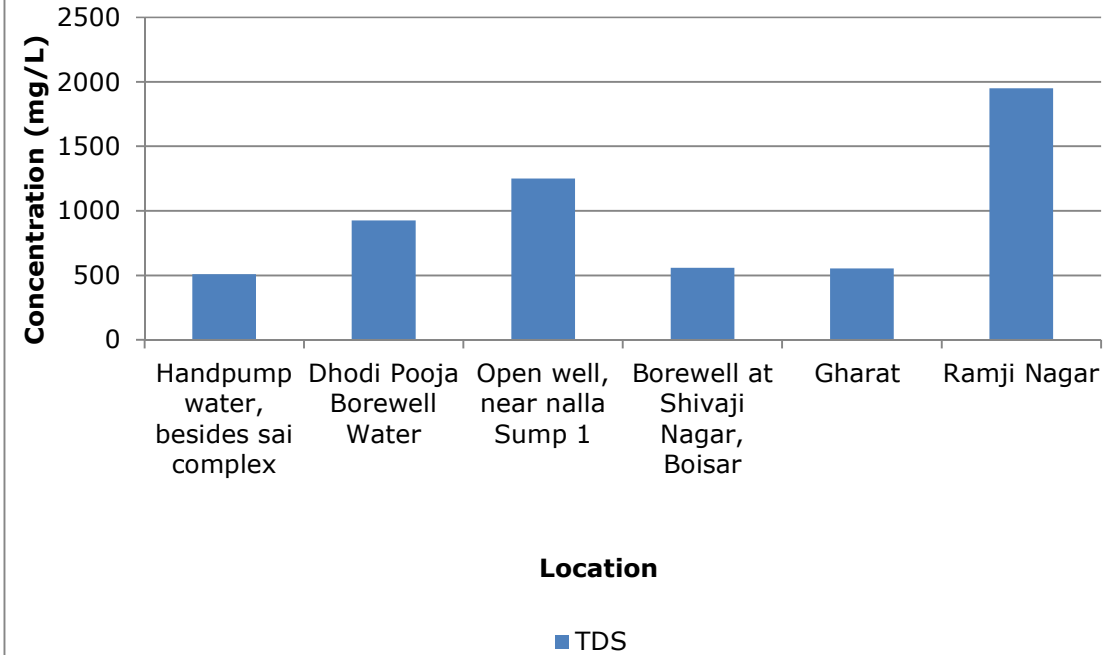
Parameters	Unit	Results					
		Handpump water, besides sai complex	Dhodi Pooja Borewell Water	Open well, near nallah Sump 1	Borewell at Shivaji Nagar, Boisar	Gharat	Ramji Nagar
Total Kjeldahl Nitrogen (as N)	mg/L	0.56	0.56	0.56	0.56	0.56	1.68
Total Ammonia (NH ₄ +NH ₃)-Nitrogen	mg/L	BLQ	BLQ	BLQ	BLQ	0.31	1.03
Total Nitrogen	mg/L	3.02	0.85	1.13	0.77	0.86	6.62
Phenols (as C ₆ H ₅ OH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Anionic Detergents (as MBAS Calculated as LAS, mol.wt.288.38)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Organo Chlorine Pesticides	µg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polynuclear aromatic hydrocarbons (as PAH)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Polychlorinated Biphenyls (PCB)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Zinc (as Zn)	mg/L	BLQ	BLQ	0.08	BLQ	BLQ	BLQ
Nickel (as Ni)	mg/L	0.01	0.01	0.02	0.01	0.01	0.01
Copper (as Cu)	mg/L	0.04	BLQ	0.11	BLQ	BLQ	0.04
Hexavalent Chromium (as Cr ⁶⁺)	mg/L	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Total Chromium (as Cr)	mg/L	0.04	BLQ	BLQ	BLQ	BLQ	0.03
Total Arsenic (as As)	mg/L	BLQ	BLQ	0.01	0.01	0.01	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	0.22	0.03	0.06	0.12	0.05	0.15
Iron (as Fe)	mg/L	0.41	0.16	0.49	2.36	0.46	0.63
Vanadium (as V)	mg/L	0.02	0.03	BLQ	0.05	0.02	0.02
Selenium (as Se)	mg/L	0.01	0.02	0.01	0.01	0.01	0.02

Parameters	Unit	Results					
		Handpump water, besides sai complex	Dhodi Pooja Borewell Water	Open well, near nallah Sump 1	Borewell at Shivaji Nagar, Boisar	Gharat	Ramji Nagar
Boron (as B)	mg/L	0.15	BLQ	BLQ	BLQ	0.11	BLQ
Bioassay Test on fish	% survival	100	93	100	93	100	93

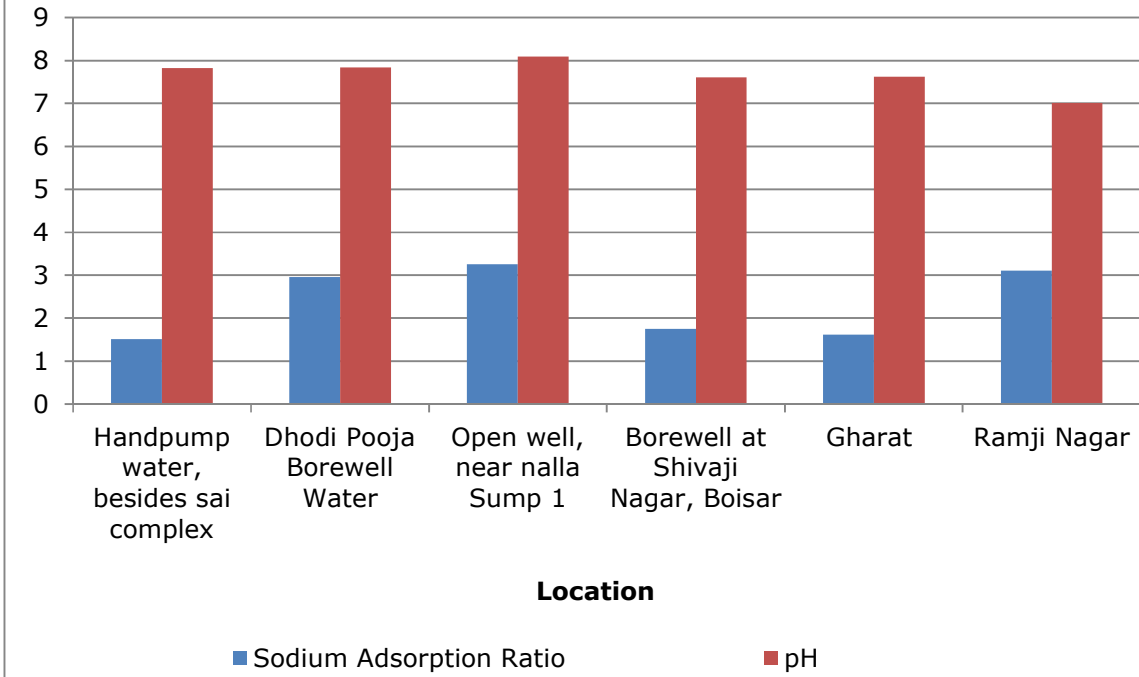
Graphs - Ground Water Quality of Tarapur



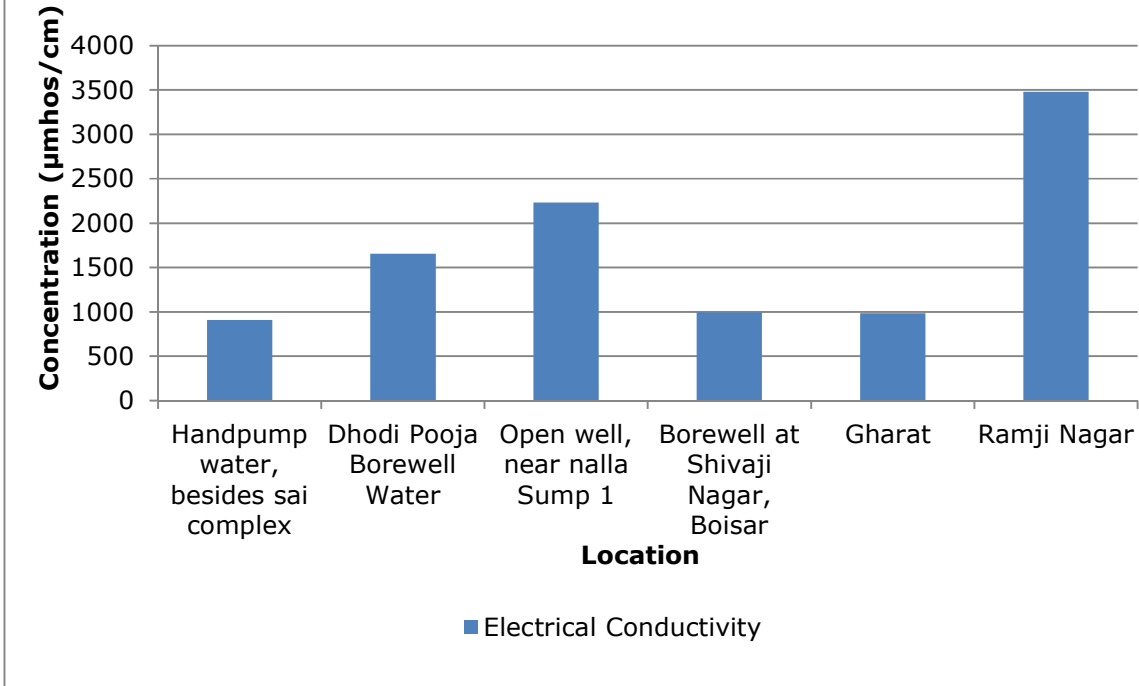
Groundwater - Tarapur



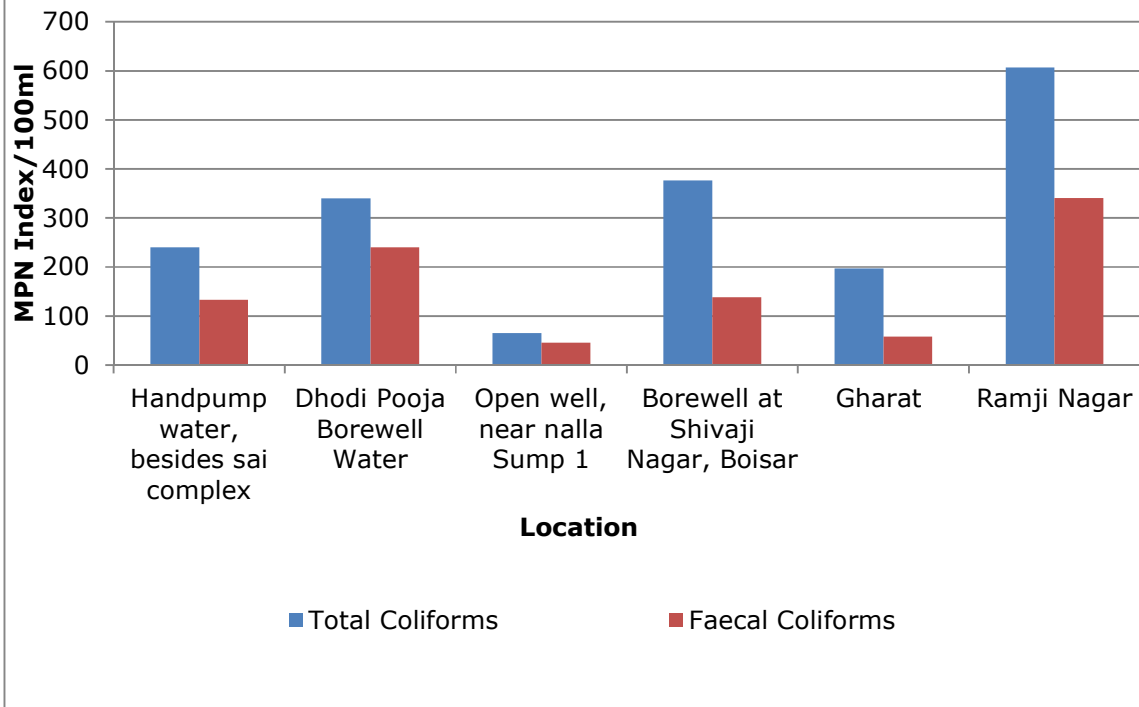
Groundwater - Tarapur



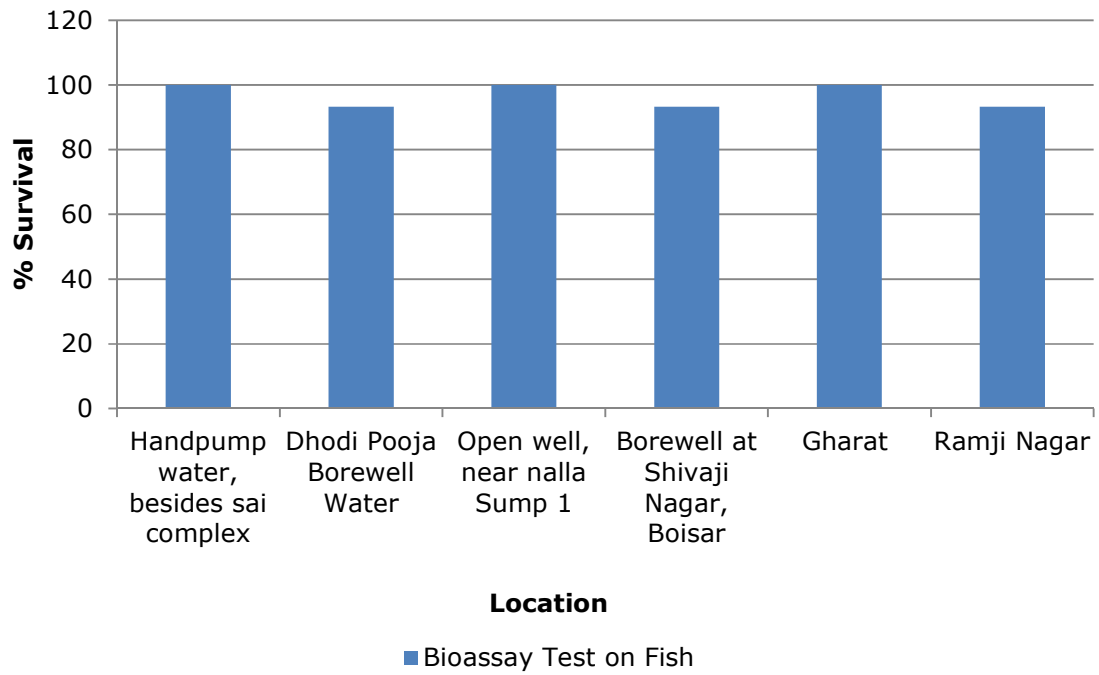
Groundwater - Tarapur



Groundwater - Tarapur



Groundwater - Tarapur



8. Health Related Data

C: Receptor

Component C	
(Impact on Human Health)	
10	
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 an early warning tool which helps in the categorization of industrial clusters/ areas in terms of priority of needing attention. The CEPI score have been calculated based on CPCB Letter No. B-29012/ESS (CPA)/2015-16 dated 26th April 2016. The scoring system involves an algorithm that considers the basic selection criteria. It is proposed to develop the CEPI based on sources of pollution, real time observed values of the pollutants in the ambient air, surface water and ground water in & around the industrial cluster and health related statistics.

Table 8.1 CEPI score of the Pre-monsoon season 2023

	A1	A2	A	B	C	D	CEPI
Air Index	3	4	12	2	0	10	24.0
Water Index	2.5	4	10	36.5	0	10	56.5
Land Index	1.5	4	6	40	0	10	56.0
Aggregated CEPI							62.3

Table 8.2 Comparison of CEPI Scores

	Air Index	Water Index	Land Index	CEPI
CEPI Score June 2023	24.00	56.50	56.00	62.30
CEPI Score March 2023	21.00	63.00	50.75	66.94
CEPI score June 2021	31.00	61.50	60.00	68.66
CEPI Score March 2021	31.00	65.00	30.75	68.34
CEPI score March 2020	47.00	65.30	36.50	71.30
CEPI score June 2019	37.07	51.10	54.40	54.56
CEPI score March 2019	34.75	45.00	45.00	53.60
CEPI score June 2018	26.00	39.25	45.00	50.61
CEPI score March 2018	32.50	38.50	45.00	51.88

	Air Index	Water Index	Land Index	CEPI
CPCB CEPI score March 2018	72.00	89.00	59.25	93.69

CEPI Score Calculation:

Pollutant	Group	A1	A2	A (A1 X A2)
PM ₁₀	B	2	Large	
PM _{2.5}	B	0.5		
CO	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)	
PM ₁₀	59.79	100	0.60	0	8	0.00	L	0
PM _{2.5}	15.79	60	0.26	0	8	0.00	L	0
CO	1.83	2	0.92	0	8	0.00	L	2
B score = (B1+B2+B3)							B	2

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

Air CEPI	(A+B+C+D)	24.0
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Water Quality Analysis Report

Pollutant	Group	A1	A2	A (A1 X A2)
BOD	B	2	Large	
Zn	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)]
BOD	38.06	8	4.76	6	6	4.76
Zn	0.19	0.3	0.63	1	6	0.11
TN	1.27	1.5	0.85	1	6	0.14

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

Water CEPI	(A+B+C+D)	56.5
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Pollutant	Group	A1	A2	A (A1 X A2)
Fe	A	1	Large	
TDS	A	0.25		
Zn	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)]
Fe	0.75	0.3	2.50	5	6	2.08
TDS	7375.22	2000	3.69	3	6	1.84
Zn	0.08	15	0.01	0	6	0.00

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

Land CEPI	(A+B+C+D)	56.0
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Water CEPI Score (im) 56.5

Land CEPI Score (i2) 56.0

Air CEPI Score (i3) 24.0

Aggregated CEPI Score = $im + \{(100-im)*i2/100\}*i3/100\}$

where, im = maximum sub index; and i2 and i3 are sub indices for other media

CEPI Score 62.3

10. Conclusion

Ambient Air Quality

- In the present study, 08 AAQ stations were identified in the CEPI impact area to cover both upwind and cross wind directions and AAQ survey was conducted.
- All air quality parameters were observed well within the limits as per NAAQS.
- Concentration of PM₁₀ was observed in the range of 51.33µg/m³ to 71.67µg/m³ and PM_{2.5} in the range of 12.33 to 19.67µg/m³ at the studied locations.
- In the CEPI score calculated for Air Environment by CPCB in March 2018, the concentration of PM₁₀ has exceeded at all the studied locations and PM_{2.5} has exceeded at 10 locations out of 12, which contributed to higher air index (72.00). However, in the present report, concentration of both PM₁₀ and PM_{2.5} are found below permissible levels resulted in less exceedance factor, hence lower air index (21.00).

Surface Water Quality

- To understand the quality of treated effluent, samples were collected from six industries
- Higher concentration of BOD, COD and Total Kjeldahl Nitrogen (TKN) was observed in the four surface water samples collected which may be due to domestic wastewater, sewage, other localized activities.
- All the industries in the Tarapur region are either reusing the treated trade effluent as sewage in their process or gardening.
- In the CEPI score calculated for Water Environment by CPCB in March 2018, concentration values of TKN were higher and exceeded at all the studied locations as observed in the present study also.

Ground Water Quality

- Six ground water samples were collected from different Dug well, well and Bore well in the region.
- All the parameters of ground water analysis were found within the permissible limits.
- In the CEPI score calculated for Land Environment by CPCB in March 2018, concentration of TKN and Total hardness was found to exceed in most of the water sample.

CEPI Score

- The CEPI Score pre-monsoon season is 62.30.
- During calculation of CEPI score, Water Index is calculated highest with a score of 56.5, followed by the Land index as 56.0 and the Air Index 24.0. The parameters of air and groundwater in

Tarapur region are observed well within the limits. Hence, aggregated CEPI score is calculated as 62.30, which is lower than the CPCB CEPI score March 2018 which was 93.69.

- In CEPI score of CPCB 2018, all the indices i.e. Air index, water index and land index were higher as compared to the present (June, 2023) indices.
- In comparison with the CEPI Score of June 2021, a decrease in all the three indices is observed.
- As per the CPCB CEPI calculation revised in 2016, Health statistics represented by Receptor C in CEPI Calculation, also play an important role.
- For analysing the health data collected from hospitals, 38% decrease in water borne disease cases is observed in the year 2022 as compared to the year 2021. Hence score for receptor C is considered as 0 for water & land Environment. However, in the CEPI score calculated by CPCB (2018), the receptor C (the health data) score was 10 for water and land environment.
- Collective efforts of the regional office of MPCB, NMMC, administration and environmental organizations are resulting in a significant reduction in pollution levels.
- Efforts taken to reduce the pollution level is represents factor D in CEPI Calculation, which also affects the overall CEPI score.
- The present study is the compilation of pre-monsoon season, which results in the dilution of environmental samples resulting in lower pollution load, hence also affecting the total score.
- In conclusion, an approximately a 33.5% decrease in CEPI score is observed from 93.69 (critically polluted) in 2018 to 62.3 in June 2023.

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

Efforts Taken to Control Water Pollution

- Issued closure direction to Old 25 MLD CETP towards continuous non-performance.
- Commissioned New CETP Diversion of the entire effluent of old CETP to new CETP of 50 MLD (25 MLD partly in operation).
- Improved CETP Inlet Standards which resulted in improved outlet standards
- As per MPC Board directives positive discharge system, 2-way SCADA, NRV & Autosampler installed by CETP members.
- Chamber numbering helps to identify defaulter areas and industries.
- Industry-wise Segregation of high COD/TDS effluent stream.
- Persuasion towards commissioning of common High COD Treatment Facility. 1st on-site common HCOD/TDS reduction Facility in Maharashtra (300 CMD) established in MIDC Tarapur & in operation.
- Establishment of eight monitoring stations under the National Water Quality Monitoring Program (NWMP).
- Steps are taken for industrial area/other units to recycle 100% treated effluent to achieve zero liquid discharge (ZLD) -120
- Installation of CEMS installed for Air and Water in Large and Medium scale RED category industries: Two-way SCADA installed by industries

Efforts Taken to Control Air Pollution

- Introduction of Cleaner fuel PNG instead of Coal. 130 industries switched fuel from Coal to PNG. The use of clean fuel (PNG) will reduce dust emissions by industries.
- Which improves air quality in the vicinity.
- Increase Air monitoring vigilance to verify the Air pollution Control system.
- Establishment of three Continuous Ambient Air Quality Monitoring (CAAQM) with meteorological data in the Tarapur industrial area is also proposed by the regional office.
- M/s JSW Steel Ltd has installed a CAAQM station with an AQI display to be aware of Air Quality
- Established 3 manual Air monitoring stations

Efforts Taken to Control Land Pollution

- Persuasion with CHWTSDF to increase the frequency of collecting HW and its transportation.
- Removed and disposed of Sludge lying in Sump No.2 during the COVID period.
- Repeated directives to CETP for Sludge removal and disposal at CHWTSDF which resulted in CETP having disposed of more than 25000 MT of Sludge from 2019 to till date.
- Increase HW disposal quantum

Other Efforts taken to Control Pollution:

- Total 978 trees are planted in last one year (2021-2022).
- Action taken against non-complied industries as mentioned in the below table:

YEAR	2019	2020	2021	2022
SCN	169	70	328	230
PD	22	36	6	3
CD	30	78	280	16
Total	221	184	614	249



Continuous Ambient Air Quality Monitoring Station (CAAQMS)



Ambient Air Quality Monitoring (AAQM) Van

12. Photographs



Ambient Air Sampling at D Décor Export Pvt Ltd.



Ambient Air Sampling at Lupin Ltd.



Ambient Air Quality Monitoring at Kokuyo Camlin



Ambient Air Quality Monitoring at Loba Chemicals



Surface water sampling at Khairpada Nallah



Surface water sampling at Nallah near sump 2



Groundwater sampling at Gharat wadi



Groundwater sampling at Ramji nagar

Annexure – I Health Related Data

HEALTH STATISTICS

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


Name of the Polluted Industrial Area (PIA)	TARAPUR
Name of the major health center/ organization	GOVERNMENT HOSPITAL
Name and designation of the Contact person	Mrs. Savita S. Bagul
Address	R. H. Boisar.

S No.	Diseases	No. of Patients Reported	
		2022 (Jan-Dec)	2021 (Jan-Dec)
AIRBORNE DISEASES			
1.	Asthma	12	19
2.	Acute Respiratory Infection	107	253
3.	Bronchitis	0	0
4.	Cancer	0	02
WATERBORNE DISEASES			
1.	Gastroenteritis	28	05
2.	Diarrhea	67	128
3.	Renal diseases	0	0
4.	Cancer	0	02

Date: 21/1/2023

Signature

S. Bagul
R. H. Boisar.


Medical Superintendent
Class-I
RURAL HOSPITAL BOISAR
Class-I
Medical Superintendent

HEALTH STATISTICS

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

Name of the Polluted Industrial Area (PIA)	TARAPUR
Name of the major health center/ organization	THUNGA HOSPITAL
Name and designation of the Contact person	SANTOSHIA SHETTY (ADMIN OFFICER) 8380005944
Address	AM-32, Tarapur M.I.D.C., Boisar, Maharashtra 401506

S No.	Diseases	No. of Patients Reported	
		2022 (Jan-Dec)	2021 (Jan-Dec)
AIRBORNE DISEASES			
1.	Asthma	328	454
2.	Acute Respiratory Infection	2	22
3.	Bronchitis	17	6
4.	Cancer	2	3
WATERBORNE DISEASES			
1.	Gastroenteritis	142	108
2.	Diarrhea	10	12
3.	Renal diseases	45	41
4.	Cancer	-	-

Date: 20/01/2023

Signature

