BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

SOUTHERN BENCH, CHENNAI

ORIGINAL APPLICATION NO. 256 OF 2020

IN THE MATTER OF:

Tribunal on its own motion-SUO MOTU based on The News item in News Desk Magazine Dated 11.11.2020, Air Pollution and Industries, "These Six Industries in North Chennai are polluting the air for more than half the year."

...Applicant

Versus

Union of India and Others …Respondents

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Place: Chennai
Date : 28.07.2021

DEPONENT

H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
(MoEF & CC, Govt. of India)
Regional Directorate (Chennai)
2nd Floor, 77-A, South Avenue Road,
Ambattur Industrial Estate, Chennai - 600 058

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI

ORIGINAL APPLICATION NO. 256 OF 2020

IN THE MATTER OF:

Tribunal on its own motion-SUO MOTU
based on The News item in News Desk
Magazine Dated 11.11.2020, Air Pollution and
Industries, "These Six Industries in North Chennai
are polluting the air for more than half the year." ...Applicant

Versus

Union of India and Others …Respondents

REPLY AFFIDAVIT ON BEHALF OF RESPONDENT NO. 7, CENTRAL POLLUTION CONTROL BOARD (CPCB)

I, H.D. Varalaxmi, D/o Shri H.S. Devaiah, aged about 51 years and having office at the Regional Directorate – Chennai, Central Pollution Control Board, 2nd Floor, 77-A, Ambattur Industrial Estate, Chennai – 600058, do hereby solemnly affirm and sincerely state as follows: -

1. That I am presently working as Scientist 'E' & holding charge of Regional Director (Chennai), Central Pollution Control Board (hereinafter referred to as CPCB) and have been authorized to file the counter affidavit on behalf of 7th respondent. I am fully conversant with the facts of the case and hence, competent and authorized to depose and swear the present as under:

H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
(MoEF & CC, Govt. of India)
Regional Directorate (Chennai)
2nd Floor, 77-A, South Avenue Road,
Ambattur Industrial Estate, Chennai - 600 058

2. Hon'ble NGT (SZ) has Suo-Moto registered the case on the basis of the News item in News Desk Magazine, dated 11.11.2020, Air Pollution and Industries, "These Six Industries in North Chennai are polluting the air for more than half the year," It is reported in the newspaper that air quality in Ennore - Manali region has been seriously affected on account of the emission made by some of the industries namely, Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO's), North Chennai Thermal Power Station (NCTPS) Stage 1, NTECL Vallur Power Plant, Chennai Petroleum Corporation Limited (CPCL), Tamil Nadu Petro Products Limited (TPL), Manali Petrochemicals Limited (MPL), and Madras Fertilizers Limited (MFL) and these industries are constantly violating the conditions /consent/ permissions granted.

3. It is submitted that the State Pollution Control Boards (hereinafter referred to as SPCBs)/Pollution Control Committees (hereinafter referred to as PCCs) are empowered to grant Consent to Establish (hereinafter referred to as CTE) and Consent to Operate (hereinafter referred to as CTO) under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981, to the industries. SPCBs/PCCs also monitor the compliance of industrial emissions/effluent discharges and ensure compliance of conditions as prescribed in the CTE & CTO to prevent air and water pollution. In case of non-compliances, actions against industries are taken under the provisions of laws.

4. It is further submitted that, during 2018, CPCB conducted environmental quality monitoring in 100 industrial clusters/areas (including Manali, Tamil Nadu), located in 21 states across the country for Comprehensive Environmental Pollution Index (hereinafter referred to as CEPI) evaluation. The CEPI score of Manali industrial area, was assessed as 84.15, and therefore identified as Critically Polluted Area (CPA).

5. Meanwhile, the Hon'ble NGT (PB) issued directions vide order dated 13/12/2018, in the matter of O.A. No. 1038/2018, in view of the news item titled 'CPCB to rank industrial units on pollution levels' published in 'The Asian Age' dated 6/12//2018. As per the order, SPCBs/PCCs were directed to finalize time bound action plans.

H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
(MoEF & CC, Govt. of India)
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The Hon'ble NGT in the next hearing on 10/7/2019, issued directions as follow:

i. *'…CPCB in coordination with all State PCBs/PCCs to take steps in exercise of statutory powers to prohibit operation of polluting activities in the CPAs and SPAs within three months and furnish compliance report to the Tribunal.*

ii. *CPCB in coordination with the State PCBs may make assessment of compensation to be recovered from the polluting units for the period of last five years, taking into account the cost of restoration and cost of damage to public health and environment and the deterrence element.*

Interim Environmental Compensation be recovered at the scale adopted by the Tribunal in case of Vapi industrial area

a. *Large Scale Industries– Rs. One Crore each*
b. *Medium Scale Industries- Rs. Fifty Lakhs each*
c. *Small Scale Industries- Rs. Twenty-Five Lakhs each*

iii. *No further industrial activities or expansion be allowed with regard to red and orange category units till the said PIAs are brought within the prescribed parameters or till carrying capacity of area is assessed and new units or expansion is found viable having regard to the carrying capacity of the area and environmental norms…'.*

Thereafter, based on appeals of MoEF&CC and CPCB, Hon'ble NGT vide Order dated 23/8/2019 directed as follow:

'*…There is no absolute bar for such units being set up if they are found to be viable. The MoEF&CC can forthwith devise an appropriate mechanism to ensure that new legitimate activity or expansion can take place after due precautions are taken in the areas in question by Red and Orange category of units…'*

H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
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Again, as per the order dated 14.11.2019 of Hon'ble NGT, one of the directions is as follow:

> *'...The Tribunal has thus no option except to reiterate that meaningful action has to be taken by the State PCBs/PCCs as already directed and action taken report furnished showing the number of identified polluters in polluted industrial areas mentioned above, the extent of closure of polluting activities, the extent of environmental compensation recovered, the cost of restoration of damage for the environment of the said areas, otherwise there will be no meaningful environmental governance.*
>
> *Such action taken reports strictly in terms of law and order of this Tribunal referred to above may be furnished by the State PCBs/PCCs on or before 31.01. 2020…'*

6. The Hon'ble NGT Orders dated 10.07.2019 and 14.11.2019 in OA No. 1038/2018 were challenged by the Chamber of Small Industry Associations before the Hon'ble Supreme Court of India by Civil Appeal Diary No(s). 8478/2020. The copy of the Order dated 18.03.2020 passed by Hon'ble Supreme Court of India is annexed herewith and marked as **Annexure R7-1,** the operative part of Order is as follows:

> *'In the meantime, there shall be stay of operation of the impugned orders dated 10.07.2019 and 14.11.2019 passed by National Green Tribunal Principle Bench, New Delhi'*

In another Civil Appeal (Diary No. 19271/2020) filed by "M/s Gujarat Chambers of Commerce and Industry" against CPCB & another, the Hon'ble Supreme Court of India vide its Order dated 22.09.2020, the copy of the Order is annexed herewith and marked as **Annexure R7-2,** directed as follows:

H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
(MoEF & CC Govt. of India)
Regional Directorate (Chennai)
2nd Floor, 77-A, South Avenue Road,
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'In the meantime, there shall be stay of operation of the impugned orders dated 10.07.2019, 23.08.2019 and 14.11.2019 passed by National Green Tribunal Principle Bench, New Delhi'

7. The Tamil Nadu Pollution Control Board (TNPCB) submitted the action plan for Manali Industrial Area in January' 2020, a copy of which is annexed herewith and marked as **Annexure R7-3**. CPCB further reviewed the action plan and provided the recommendations to 'TNPCB vide letter dated 15/5/2020 for consideration and incorporation in action plan, the copy of the same is annexed herewith and marked as **Annexure R7-4**.

8. It is submitted that Hon'ble NGT (SZ), Chennai vide order dated 15.12.2020 constituted a Joint Committee comprising of MoEF&CC (nodal agency), CPCB, TNPCB and Anna university, to inspect the area in question and submit a factual as well as action taken report, if there is any violation found and to carry out ambient air quality monitoring of individual industries and to ascertain the environment carrying capacity of the area. The Committee was directed to submit the report on/before 15.02.2021. As the monitoring could not be completed due to lockdown in State of Tamil Nadu, the Committee through MoEF&CC requested for additional time. Accordingly, Hon'ble Tribunal directed the Committee to submit the report on/before 26.08.2021.

PRAYER

In view of above, it is respectfully prayed that this answering Respondent No. 7, the Central Pollution Control Board (CPCB) may be deleted/dispensed from the array of Respondents. However, this Respondent shall abide by any order / direction passed by this Hon'ble Bench.

Deponent

H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
(MoEF & CC Govt of India)
Regional Directorate (Chennai)
2nd Floor, 77-A, South Avenue Road,
Ambattur Industrial Estate, Chennai - 600 098

VERIFICATION

I, Smt. H. D. Varalaxmi, D/o Shri H.S. Devaiah, working as Scientist 'E' and posted as Regional Director (Chennai), Central Pollution Control Board, 7th Respondent herein do hereby state that what is stated in paragraph 1 to 8 above are true to the best of my knowledge, belief and information.

Verified at Chennai on this 28th day of July, 2021.

Deponent

H.D. VARALAXMI, M.Tech
Regional Director
CENTRAL POLLUTION CONTROL BOARD
(MoEF & CC Govt of India)
Regional Directorate (Chennai)
2nd Floor, 77-A, South Avenue Road,
Ambattur Industrial Estate, Chennai - 600 098

Counsel for CPCB-Respondent no. 7

ITEM NO.8 COURT NO.3 SECTION XVII

S U P R E M E C O U R T O F I N D I A
RECORD OF PROCEEDINGS

CIVIL APPEAL Diary No(s). 8478/2020

(Arising out of impugned final judgment and order dated 10-07-2019 in OA No. 1038/2018 14-11-2019 in OA No. 1038/2018 passed by the National Green Tribunal)

CHAMBER OF SMALL INDUSTRY ASSOCIATIONS Appellant(s)

VERSUS

CENTRAL POLLUTION CONTROL BOARD Respondent(s)

(IA No.42410/2020-EXEMPTION FROM FILING C/C OF THE IMPUGNED JUDGMENT and IA No.42407/2020-EX-PARTE STAY and IA No.42415/2020-INTERVENTION/IMPLEADMENT and IA No.42402/2020-PERMISSION TO FILE APPEAL and IA No.42405/2020-CONDONATION OF DELAY IN FILING APPEAL and IA No.42413/2020-PERMISSION TO FILE ADDITIONAL DOCUMENTS/FACTS/ANNEXURES)

WITH
Diary No(s). 8479/2020 (XVII)
(IA No.42282/2020-CONDONATION OF DELAY IN FILING and IA No.42279/2020-EXEMPTION FROM FILING C/C OF THE IMPUGNED JUDGMENT and IA No.42277/2020-STAY APPLICATION and IA No.42489/2020-INTERVENTION/IMPLEADMENT and IA No.42276/2020-PERMISSION TO FILE APPEAL and IA No.42284/2020-PERMISSION TO FILE ADDITIONAL DOCUMENTS/FACTS/ANNEXURES)

Date : 18-03-2020 These appeals were called on for hearing today.

CORAM :
HON'BLE MR. JUSTICE ROHINTON FALI NARIMAN
HON'BLE MR. JUSTICE S. RAVINDRA BHAT

For Appellant(s) Mr. Dhruv Mehta, Sr. Adv.
Mr. Ninad Laud, Adv.
Mr. Ivo D'Costa, Adv.
Mr. Saurabh Kulkarni, Adv.
Ms. Anshula Vijay Kumar Grover, AOR
For Respondent(s)

UPON hearing the counsel the Court made the following
O R D E R

Permission to file appeals is granted.

Delay condoned.

Applications for impleadment are allowed.

Applications seeking exemption from filing certified copy of the impugned order(s) are allowed.

Issue notice.

In the meantime, there shall be stay of operation of the impugned orders dated 10.07.2019 and 14.11.2019 passed by the National Green Tribunal, Principal Bench, New Delhi.

(R. NATARAJAN)
AR-cum-PS

(PARVEEN KUMARI PASRICHA)
BRANCH OFFICER

ITEM NO.12 Court 3 (Video Conferencing) SECTION XVII

S U P R E M E C O U R T O F I N D I A
RECORD OF PROCEEDINGS

CIVIL APPEAL Diary No. 19271/2020
(Arising out of impugned final judgment and order dated 10-07-2019 in OA No. 1038/2018 and 23-08-2019 in OA No. 1038/2018 and 14-11-2019 in OA No. 1038/2018 passed by the National Green Tribunal)

GUJARAT CHAMBERS OF COMMERCE AND INDUSTRY Petitioner(s)
VERSUS
CENTRAL POLLUTION CONTROL BOARD & ANR. Respondent(s)
(FOR ADMISSION and I.R. and IA No.90231/2020-CONDONATION OF DELAY IN FILING and IA No.90230/2020-EXEMPTION FROM FILING C/C OF THE IMPUGNED JUDGMENT and IA No.90228/2020-EX-PARTE STAY and IA No.90233/2020-INTERVENTION/IMPLEADMENT and IA No.90225/2020-PERMISSION TO FILE APPEAL)

Date : 22-09-2020 This matter was called on for hearing today.

CORAM : HON'BLE MR. JUSTICE ROHINTON FALI NARIMAN
HON'BLE MR. JUSTICE NAVIN SINHA
HON'BLE MS. JUSTICE INDIRA BANERJEE

For Petitioner(s) Mr. Dhruv Mehta, Sr. Adv.,
Mr. Mahesh Agarwal, Adv.
Mr. M. S. Ananth, Adv.
Mr. Mitul Shelat, Adv.
Mr. Saurabh Kulkarni, Adv.
Mr. Anirudh Bhatia, Adv.
Mr. E. C. Agrawala, AOR
For Respondent(s)

UPON hearing the counsel the Court made the following
O R D E R

Permission to file appeal granted.

Application for impleadment stands allowed.

Delay condoned.

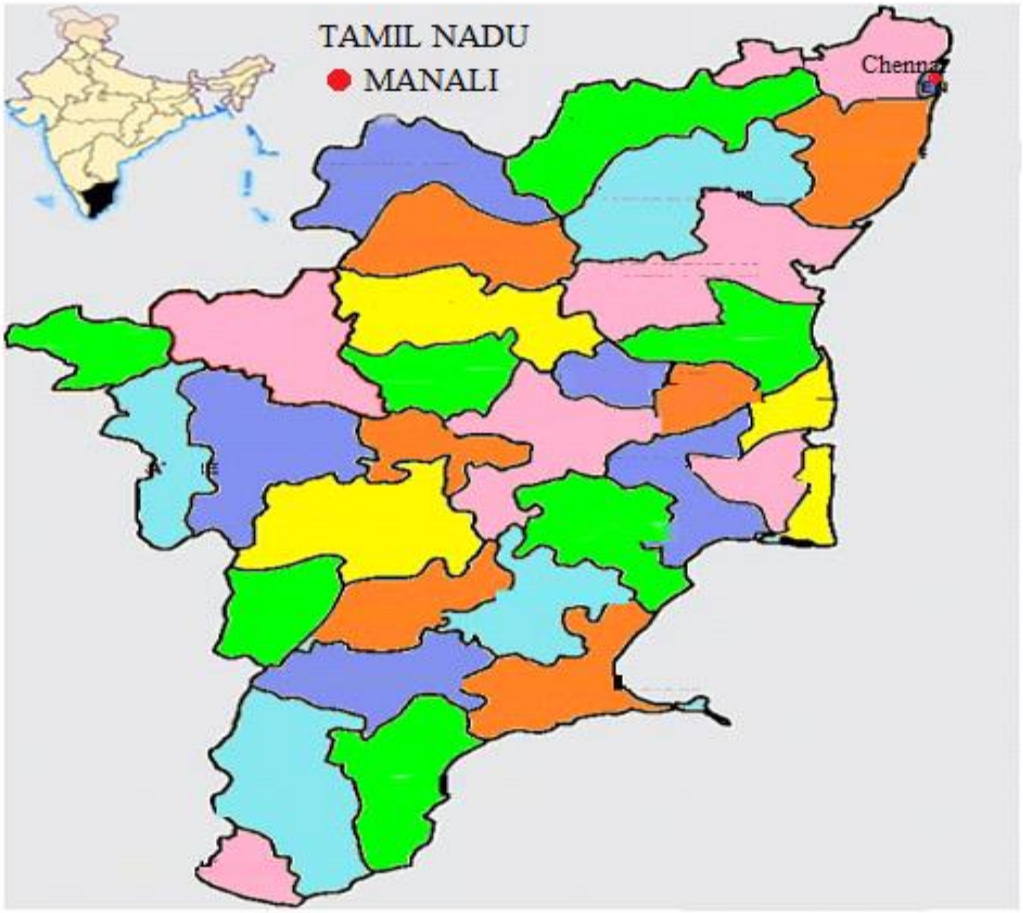
Issue notice.

In the meantime, there shall be a stay of the operation of the impugned orders dated 10.07.2019, 23.08.2019 and 14.11.2019 passed by the National Green Tribunal, Principal Bench, New Delhi.

Tag the matter along with Civil Appeal Nos. 2218-2219/2020.

(NIDHI AHUJA) (NISHA TRIPATHI)
AR-cum-PS BRANCH OFFICER

EVALUATION OF CEPI SCORE & ACTION PLAN FOR CEPI AREA OF MANALI, TAMILNADU



SUBMITTED

JANUARY 2020

Tamil Nadu Pollution Control Board

INDEX

EXECUTIVE SUMMARY

The Manali CEPI area (Manali Industrial Area) was monitored for Ambient Air Quality, Ground and Surface Waters quality and Revised CEPI Score was calculated. TNPCB finalized the location of samplings for both AAQM and Water in consideration with the previous CEPI monitoring. The existing sampling locations with respect to air monitoring, groundwater sampling and surface water sampling where monitoring was undertaken during 2009, 2011, 2013, 2017 and 2018 were sampled. In addition to the existing four sampling stations located in the core area, two more additional Ambient Air Quality stations were identified to cover the upwind and cross wind direction in the CEPI impact area, since the previous AAQM stations are fixed within 10 to 20m from 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.

Ambient Air Quality survey was conducted during December 2019 in all six locations and found the average PM_{10} and $PM_{2.5}$ concentrations are well below within NAAQM standards. Further, in addition to the existing four surface water sampling stations located in the core zone, three more additional surface water sampling stations were identified in the CEPI Core / Impact Zone. Buckingham canal is identified as one of the CEPI surface water body but which is the back water as well as the North Chennai city domestic waste water drain also with which could not able to compare the quality of surface water with IS10500:2012 drinking water standards.

As per the CPCB CEPI 2018 sampling and analysis it was found that PAH and Phenol is exceedances in the Buckingham canal may be this due to domestic wastewater / sewage or other localized sources and which will not be because of industrial contribution since no industries are discharging their effluent or sewage into the inland surface water bodies. The sampling and analysis were carried out as per the CPCB/EPA/ APHA / IS / ASTM standard methods for the samples collected on December 2019.

After the sampling and analysis of both AAQM & Water, the results were used for calculating the CEPI score as per the CPCB revised guidelines of 2016.The salient features of CEPI concepts and the evaluation methodology as per revised CEPI guidelines are enumerated.

Based on the study report conducted during the period January 2018, the CEPI score as per the revised guidelines is 84.15 (Ambient Air – 59.75, Water- 72.25, Land - 71.75, An_Wc_Ln).

The regional office of Tamilnadu Pollution Control Board has taken various initiatives in reducing the CEPI Score of 76.32 of 2009 to 26.261 of 2019 post monsoon. All the 17 category units and Red Large units have installed Zero Liquid Discharge System to achieve Zero Discharge Liquid adequate Air Pollution Control measures.

Based on the study results of December 2019 the CEPI score as per the revised CEPI, 2016, the CEPI index of Post-Monsoon - Ambient Air is 14, Surface Water is 24, and Ground Water is 21.25 respectively. The overall CEPI score for Manali Industrial area **for the Post-monsoon 2019 is 26.261**.

1.0 INTRODUCTION

General Introduction about CEPI

Industrial pollution is the contamination of the environment by businesses, particularly plants and factories that dump waste products into the air and water. Industrial waste is one of the largest contributors to the global pollution problem endangering people and the environment. The Central Pollution Control Board (CPCB) has developed a Comprehensive Environmental Pollution Index (CEPI). 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 concept of Comprehensive Environmental Pollution Index (CEPI) was evolved by Central Pollution Control Board (CPCB) 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 is a rational number between 0 and 100, assigned to a given location to characterize the environmental quality following the algorithm of source, pathway and receptor. Out of identified 88 prominent industrial clusters, 43 industrial clusters in 16 States having CEPI score of 70 and above are identified as Critically Polluted Industrial Clusters. Further, 32 industrial clusters with CEPI scores between 60 & 70 are categorized as severely polluted areas. Thereafter, Ministry of Environment & Forests (Govt. of India) had imposed temporary moratorium vide O. M. 13.01.2010 on consideration of developmental projects in critically polluted industrial cluster/areas including the projects in the pipeline for Environmental Clearance.

Later on, proposals were received from the SPCBs, State Governments, and Industrial Associations and concerned Stakeholders for revisiting the criteria of assessment under CEPI concept. After careful examination and consideration of the suggestions of concerned stakeholders, it was decided to prepare the revised concept of CEPI by eliminating the subjective factors but retaining the factors which can be measured precisely.

The present CEPI study includes, Manali industrial area which is located about 20 km north of Chennai, Tamilnadu and spreads over an area of 2000 hectares covering the revenue village of Manali, Chinnasekadu, Vaikadu Sadayankuppam & Amulavoyal Village of Ambattur Taluk at Tiruvallur District. The focal point of this cluster is the Manali refinery, run by M/s. Chennai Petroleum Corporation Limited (CPCL). The main products of the company are LPG, Motor Spirit, Superior Kerosene, Aviation Turbine Fuel, High Speed Diesel, Naphtha, Bitumen, Lube Base Stocks, Paraffin Wax, Fuel Oil, Hexane and Petrochemical feed stocks. Thus many of the units located in the industrial complex are Petro Chemical-based units, using refinery's product as feedstock and producing a range of products, from fertilizers to polyolefins.

Manali Industrial Complex is bounded by Buckingham canal & Tiruvottiyur on the east side and, south by Chennai city, north by Kossathaliyar River and Ponneri Taluk and west by villages of Manjambakkam, Mathur and Madhavaram of Tiruvallur District. Further this industrial complex is connected by east with Ennore High Road, and west by Chennai Kolkata NH-5A, north by Ponneri - Manali high road, and south by Madhavaram – Manali road. The Ennore port is situated at a distance of 15km from this industrial Complex and the nearest railway station is Tiruvottiyur at 3km.

This industrial area lies on the thermal equator and is also on the coast, which prevents extreme variation in seasonal temperature. The weather is hot and humid for most of the year. This area gets most of its seasonal rainfall from the north–east monsoon winds, from mid–October to mid–December. Cyclones in the Bay of Bengal sometimes hit coast. The highest annual rainfall recorded is 257 cm (101 in) in 2005. Average rainfall is around 100-120 cm. The mean maximum temperature during summer is 45°C and the mean minimum temperature during winter is 20°C. The relative humidity is around 70 – 80%.

1.1 CEPI AREA BOUNDARY DETAILS

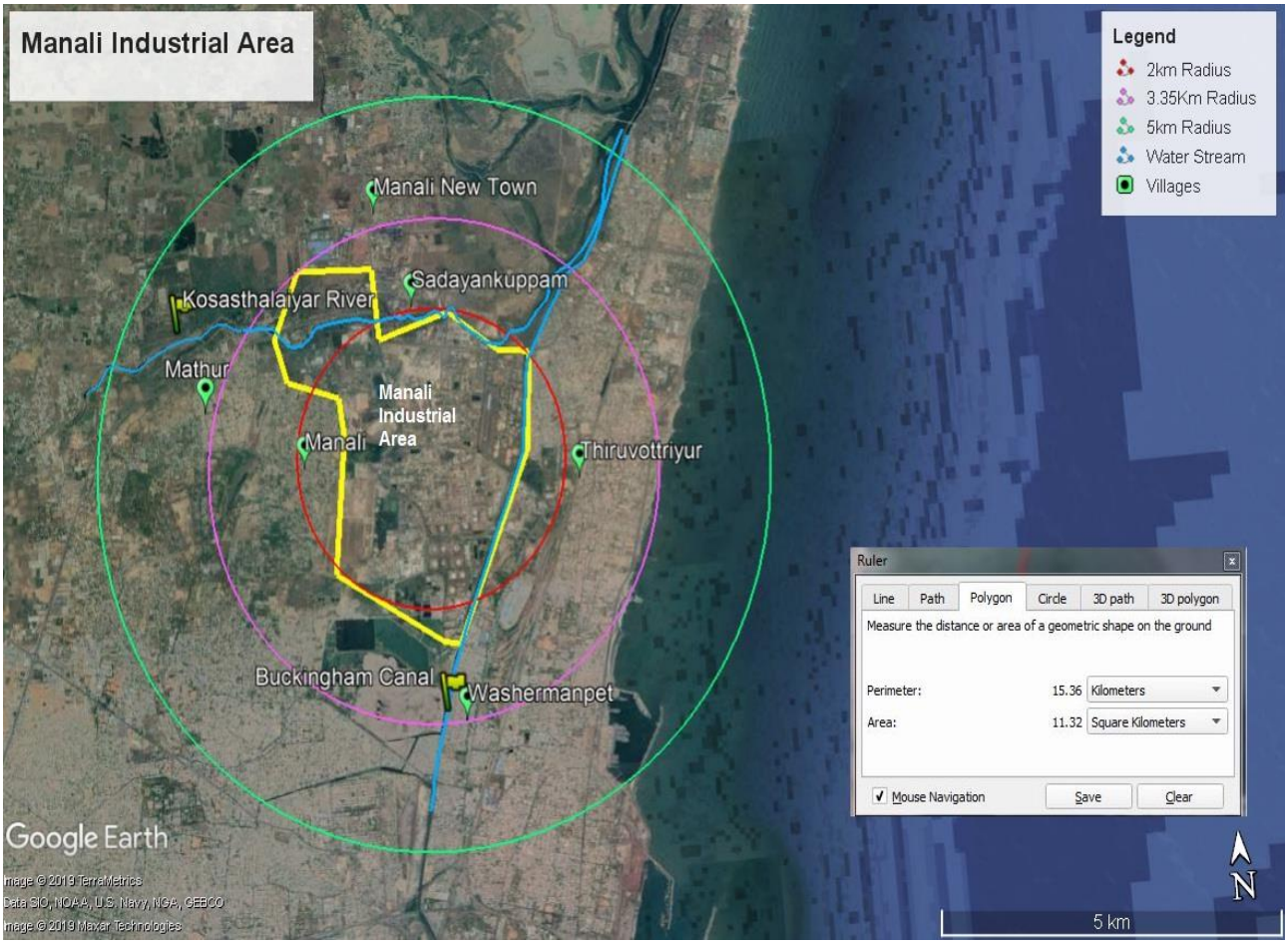
Total critically polluted area:

S.No	Critically Polluted Area	Area in Square kilometer
1	**Manali Industrial area**	**11.32**

Boundaries of Manali Industrial critically polluted area (core zone) are marked as

S.No.	Reference Point	Coordinates	
		Latitude	Longitude
1	East(Bank of Buckingham Canal, Near MPL Plant-II)	13.163290	80.289342
2	South East(Bank of Buckingham Canal, Near CPCL)	13.141108	80.278290
3	South (Near CPCL towards Kodungaiyur Dump Yard)	13.141592	80.276066
4	South West(Backside of CETEX Petrochemicals)	13.150705	80.262005
5	West(Near Madras Fertilizers Limited)	13.166963	80.264355
6	North West(Near Natco Pharma)	13.187401	80.259418
7	North(Near Burma Nagar, Manali New Town)	13.186358	80.290606
8	North East(Bank of Buckingham Canal, near CMDA Iron& Steel Wholesale Warehouse)	13.174857	80.290606

MAP SHOWING LATITUDE AND LONGITUDE, TOTAL AREA IN SQ. KM OF CEPI AREA



1.2 HABITATION DETAILS IN CEPI AREA

The Manali town is the nearest residential and commercial area located at the western side of this industrial complex, and Tiruvottiyur town is at the eastern side having residential colonies. The details of the towns, villages, which are located around 2.0Km from the Industrial Complex is stated as follows.

S.No.	Village Name	Location		Direction	Distance km	Population
		Latitude	Longitude			
1.	Manali	13°10’15”	80°15’ 47”	West &North	0.0	36,588
2.	Tiruvottiyur	13°10’29”	80°18’29”	Northeast & East	0.20	2,11,436
3.	Madhavaram	13° 9’ 19”	80°14’ 28”	West	1.8	76,793
4.	Chinnasekkadu	13° 9’ 36”	80°15’ 30”	South West	1.0	9,744

1.3 ECO GEOLOGICALFEATURES IN AND AROUND CEPI AREA

Major Water Bodies:

Buckingham Canal

The Buckingham Canal is a fresh water navigation canal, running parallel to the Coromandel Coast of South India. It has a total length of 420km of which 163km is in TamilNadu and the remaining 257 km in Andhra Pradesh. The stretch in the Manali area connects most of the sea backwaters along the coast to the port of

Chennai (Madras). Araniar River, Korataliyur River, Otteri Nullah, Cooum River, Adyar River and Palar River are connected with this canal. It was once used for carrying goods such as fire wood, salt and lime shell through country boats. It was constructed by the British Raj, and was an important waterway during the late nineteenth and the twentieth century. The canal is the eastern boundary of this Manali Industrial Complex.

Kasasthalaiyar River

Kosasthalaiyar River is 136-kilometre long and originates near Pallipattu in Thiruvallur district and drains into the Bay of Bengal. Its northern tributary Nagari river originates in Chitoor district of Andhra Pradesh and joins the main river in the backwaters of Poondi reservoir. Its catchment area is spread over Vellore, Chitoor, North Arcot, Thiruvallur and Chennai districts. It has a catchment area in North Arcot District where it branches near Kesavaram Anicut and this tributary flows to the Chennai city as Cooum River, while the main river flows to the Poondi reservoir. From Poondi reservoir, the river flows through Thiruvallur District, enters the Chennai metropolitan area, through north of Manali Industrial area and joins the sea at Ennore creek.

Other than this, two lakes which have water at all times are at Sadayankuppam and Manali Mathur.

Eco-geological features

The eco-geological features within 2Km radius from the Manali Industrial Complex, are studied, and no such important features were noticed generally. Noecological parks, sanctuaries, flora and fauna or any eco sensitive zones are present. No Buildings, Monuments of Historical/ archaeological /religious importance are present.

1.4 INDUSTRIES DETAILS IN CEPI AREA

There are 16 highly polluting 17 category industries and 16 red category industries and five orange category industries located in the industrial complex. There is no grossly polluting industries in the Manali CEPI Area.

Highly Polluting Industries (17categories)

Sl. No	Name of the Industry	Type	Category
1	Chennai Petroleum Corporation Limited (CPCL)-Refinery I, II & CPP	Petroleum Refinery	Red- Large
2	Chennai Petroleum Corporation Limited, (CPCL) Refinery III	Petroleum Refinery	Red- Large
3	Chennai Petroleum Corporation Limited (CPCL) - Propylene Butylene Lube Plant	Petroleum Refinery	Red- Large
4	Chennai Petroleum Corporation Limited (CPCL) - Resid Upgradation Plant	Petroleum Refinery	Red- Large
5	Chennai Petroleum Corporation Limited (CPCL) - DHDS Plant	Petroleum Refinery	Red- Large
6	Chennai Petroleum Corporation Limited (CPCL) Hexane Plant	Petroleum Refinery	Red- Medium
7	Madras Fertilizers Ltd (MFL)	Fertilizer	Red- Large
8	Tamilnadu Petro Products Ltd (TPL)-Linear Alkyl Benzene(LAB)	Petrochemical	Red- Large
9	Tamilnadu Petro Products Ltd (TPL)-ECH	Petrochemical	Red- Large
10	Tamilnadu Petro Products Ltd (TPL)-HCD	Caustic Soda	Red- Large
11	Manali Petro Chemical Ltd(MPL)-I	Petrochemical	Red- Large

12	Manali Petro Chemical Ltd (MPL)-II	Petrochemical	Red- Large
13	Kothari Petrochemicals Ltd.	Petrochemical	Red- Large
14	NATCO Pharma Ltd.	Bulk Drug	Red- Large
15	CETEX Petrochemicals Ltd	Petrochemical	Red- Large
16	Indian Additives Ltd.(IAL)	Additives	Red- Large

Red Category Industries

Sl. No	Name of the Industry	Type	Category
1	SRF Ltd., Technical Textile Business,	Manmade fiber	Red-Large
2	Balmer Lawrie & Co Ltd -Leather Chemical Dn,	Basic Chemical	Red- Large
3	Balmer Lawrie & Co Ltd -Grease division,	Lubricating oil	Red- Large
4	Balmer Lawrie & Co Ltd -Barrel Division,	Metal surface treatment	Red- Large
5	IOT Infrastructure & Energy Services Ltd (CPCL)	LPG Storage	Red- Large
6	Chennai Petroleum Corporation Limited (CPCL) - TWENTY MW GTG POWER PLANT	Power plant	Red- Large
7	Chennai Petroleum Corporation Limited (CPCL) - Tertiary Treatment Plant	Sewage Treatment Plant	Red- Large
8	Chennai Petroleum Corporation Limited - Crude oil Pipeline project.(CPCL)	Pipeline project	Red- Large
9	M/s Madras Fluorine Products Ltd.,(MFPL)	Chemical	Red –Small
10	INOX Air Products Ltd	Industrial Gas	Red- Large

11	Manali Petro Chemical Ltd-II (MPL) (Captive Power Plant) Biomass	Captive Power Plant	Red- Large
12	Indian Oil Corporation Limited, Chennai-Bangalore Pipeline Project,	Pipeline Project	Red- Large
13	Indian Oil Corporation Limited, Chennai -Airport ATF Pipeline Project,	Pipeline Project	Red- Large
14	Indian Oil Corporation Limited, Chennai - Madurai Pipeline Project	Pipeline Project	Red- Large
15	Cetex PetroChemicals Ltd- Fine Chem- Unit-1,	Petrochemical	Red-Medium
16	Madras Fertilizers Ltd (MFL) -TTP	Sewage Treatment Plant	Red-Medium

Orange Category Industries

Sl. No	Name of the Industry	Type	Category
1	SRF Ltd (EPB Plant)	Manmade fiber	Orange
2	Supreme Petrochemicals Ltd	synthetic resin	Orange.
3	Pure Industrial Gases Pvt. Ltd	Industrial Gas	Orange.
4	SICGIL India Ltd	Industrial Gas	Orange
5	Popular Carbonic Pvt. Ltd.	Industrial Gas	Orange

1.5 GREEN BELT DEVELOPMENT DETAILS IN CEPI AREA

S.No	Name of the Industry	No. of green belt developed, total area
1.	Madras Fertilizers Limited	Increasing Green Belt area of 1 acre per Annum. The green belt development is being continued periodically.

S.No	Name of the Industry	No. of green belt developed, total area
2.	Chennai Petroleum Corporation Limited	Development of Green Belt – 40 Acres in Amullavoyal Land of CPCL (10000 Trees)
3.	Tamilnadu Petro Products LAB	Green belt will be developed in addition to the existing area. 1) Within the premises for about1 acre by June 2020 2) Outside premises for about1.5 acre by Dec 2020 upon approval from Govt. agencies
4.	Tamilnadu Petro products HCB	Green belt will be developed in addition to the existing area. 1) Within the premises for about 1acre by June 2020 2) Outside premises for about 1.5acre by Dec 2020 upon approval from Govt. agencies
5.	Tamilnadu Petro Products ECH	Green belt will be developed in addition to the existing area. 1) Within the premises for about0.5acre by June 2020. 2) Outside premises for about 0.5acre by Dec 2020 upon approval from Govt. agencies
6.	Manali Petro Chemicals - I	It is planned to develop green belt on either side, central meridian of the Ennore-Express Highway existing in Manali complex by NHAI and Manali Industries Association is also supporting this programme.

S.No	Name of the Industry	No. of green belt developed, total area
7.	Manali Petro Chemicals - II	More than 650 trees planted based on growth rate of trees remaining part will be planted. Green layer development planned in between trees.
8.	Balmer & Lawrie Co Ltd.,	To Continue to develop Green Belt area within the premises
9.	SRF Limited - TTBM	SRF Manali Complex has a green belt over 34 acres and more than 4000 trees in its premises. In the financial year 2019-20, five hundred trees are been planned to plant at the complex. As on September 2019, 135 trees are planted in the premises.
10.	Indian Additives Ltd.,	The Green belt development is being continued.
11.	Cetex Petrochemicals Limited	Currently 6.7 acres of green belt has been developed with species like Neem, Pongam, Indian Badam etc; It is planned to increase this number gradually inside the plant. It is also planned to have more green belt outside the plant premises along with other industries.
12.	Kothari Petrochemicals Ltd.,	The total greenbelt area developed of about 5.5 acres inside the factory premises, and there is proposal to develop 0.5 acres of greenbelt area in front of the factory premises outside the compound wall.

S.No	Name of the Industry	No. of green belt developed, total area
13.	NATCO Pharma Ltd.,	We are maintaining 37% of greenbelt in the premises from our total land area.
14.	Supreme Petrochemicals Ltd.,	Increasing green belt in and around the plant complex from 1000 nos to 1300 nos.

1.6 CEPI SCORE DECLARED BY CPCB

Previous year CEPI score for Manali area is as follows:

S.No.	Period	CEPI Score
1.	2009	76.32
2.	2011	88.88
3.	2013	77.26
4.	2018	84.15

Worksheet of Manali, TamilNadu –CEPI 2018

Air Quality Analysis Report

Pollutant	Group	A1	A2	A
PM10	B	0.5	Large	A1*A2
PM2.5	B	0.5		
C6H6	C	3		
		4	4	16

Pollutants	Avg(1)	Std(2)	EF{(3)=1/2)}	No of Samples Exceeding (4)	Total No of Samples(5)	SNLF Value {(6)=4/5x3}	SNLF Score	
PM10	132.83	100	1.33	12	12	1.33	C	30
PM2.5	55.58	60	0.93	6	12	0.46	M	5
C6H6	4.51	5	0.90	3	12	0.23	M	3.75
B = B1+B2+B3								38.75

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

AIR EPI	**(A+B+C+D)**	**59.75**

Water Quality Analysis Report

Pollutant	Group	A1	A2	A
BOD	B	0.5	Large	A1*A2
Phenols	C	3		
PAH	B	0.5		
		4	4	16

Pollutants	Avg(1)	STD(2)	EF{(3)=1/2)}	No of Samples Exceeding (4)	Total No of Samples(5)	SNLF Value {(6)=4/5x3}	SNLF Score	
BOD	11.83	8	1.48	6	12	0.74	H	6.25
Phenols	0.19	0.01	18.76	9	12	14.07	C	10
PAH	26.55	0.2	132.75	12	12	132.75	C	30
B = B1+B2+B3								**46.25**

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

WATER EPI	**(A+B+C+D)**	**72.25**

Ground Water Quality Analysis Report

Pollutant	Group	A1	A2	A
TP	B	0.5	Large	A1*A2
Phenols	C	3		
PAH	B	0.5		
		4	4	16

Pollutants	Avg(1)	STD(2)	EF{(3)=1/2)}	No of Samples Exceeding (4)	Total No of Samples(5)	SNLF Value {(6)=4/5x3}	SNLF Score	
TP	0.77	0.3	2.56	3	12	0.64	H	5.75
Phenols	0.05	0.001	53.54	7	12	31.23	C	10
PAH	21.12	0.2	105.6	12	12	105.59	C	30
B = B1+B2+B3								**45.75**

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

GROUND WATER EPI	(A+B+C+D)	71.75

Air - 59.75; Water – 72.25; Land – 71.75

CEPI Score = i_{max} + {(100-i_{max})*(i_2/100)*(i_3/100)}

= 72.25 + {(100-72.25)*(59.75/100)*(71.75/100)}

CEPI Score = 84.15

2. AIR ENVIRONMENT

2.1 PRIMARY AND SECONDARY POLLUTANTS CONSIDERED FOR AEPI

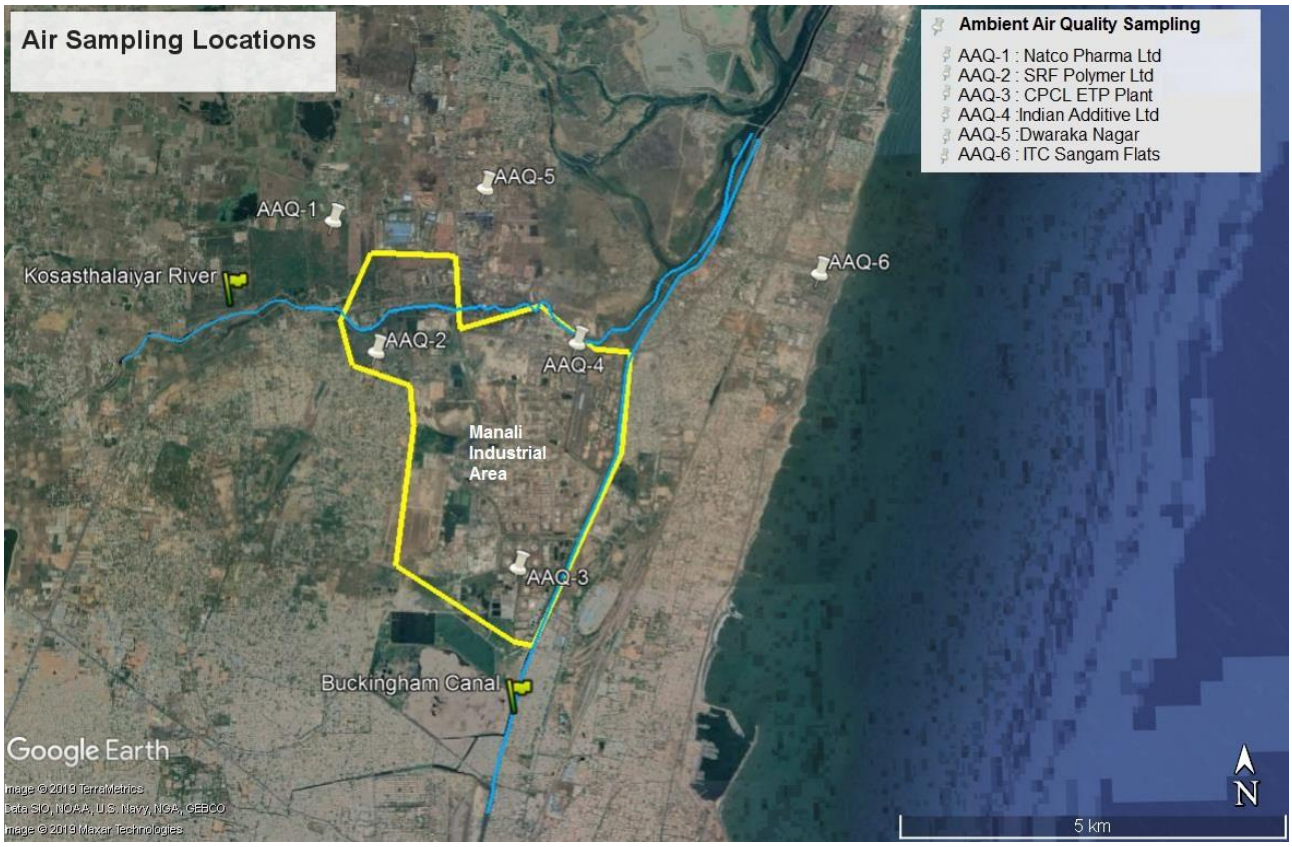
The primary and secondary pollutant considered for Air Environmental Pollution Index declared by CPCB as on 2018 for Manali Industrial Area is

S.No.	Pollutant	Parameter
1.	Primary	PM_{10}
2.	Secondary	$PM_{2.5}$ and C_6H_6

2.2 AIR QUALITY SAMPLING LOCATIONS

S.No.	Name of Location	Latitude	Longitude
AAQ-1	Natco Pharma Ltd.,	13°11'22.3"N	080°15'96.3"E
AAQ-2	SRF Polymer Ltd.,	13°10'44.4"N	080°15'57.6"E
AAQ-3	Chennai Petroleum Corporation Ltd., ETP plant	13°08'54.7"N	080°16'34.0"E
AAQ-4	Indian Additives Ltd.,	13°10'47.8"N	080°17'00.1"E
AAQ-5	Dwaraka Nagar, Manali New Town **(Additional Point)**	13°11'35.0"N	080°16'22.0"E
AAQ-6	ITC Quarters, Ramakrishna Nagar **(Additional Point)**	13°10'56.0"N	080°18'47.0"E

MAP SHOWING EXISTING AND NEWLY IDENDIFIED SAMPLING LOCATIONS



2.3 AMBIENT AIR QUALIT IN 2018 IN MANALI CEPI AREA

AMBIENT AIR QUALITY MONITORING RESULTS

S.No	Pollutant	Unit	Mean Concentration	CPCB NAAQ Standards
1.	PM_{10}	$\mu g/m^3$	132.83	100 (24 hours)
2.	$PM_{2.5}$	$\mu g/m^3$	55.58	60 (24 hours)
3.	Benzene	$\mu g/m^3$	4.51	05 (annual)

2.4 INDUSTRIES STACK EMISSION DETAILS

The Tamilnadu Pollution Control Board is monitoring the level of pollutants let out through the process stack provided by the industry periodically. Critical locations and their stack monitoring values are as follows.

S.No	Company name & Critical locations	Stack Attached	Height, m	Stack survey 2017-2018,mg/m^3			Stack survey 2018-2019,mg/m^3		
				PM	SO_2	NO_2	PM	SO_2	NO_2
1	**Madras Fertilizers Limited** Stack attached to theBoiler. To monitor NH3 at the prilltower Ammonia vent stack and urea ventstack	Boiler 1&2	70	54	418	151	52	437	43
		Boiler 3&4	117	51	298	221	48	---	49
		Prill tower	72	5	---	---	9	---	---
2	**Chennai Petroleum Corporation Limited** Stack attached to theBoilers. To monitor the level of PM, SO2, NOx, in the stack attached to the captive power plant.	Boiler 1	100	57	412	247	52	364	207
		Boiler 2	100	48	457	110	48	457	110
		Boiler 3	100	62	565	231	45	743	302
		Boiler 4	100	51	508	234	53	1234	425
		Boiler 5	100	44	322	136	44	322	136
		GT-1	100	7	11	77	7	11	77
		GT-2	100	10	13	59	10	13	59
		GT-3	100	42	40	101	42	40	101
		GT-4	100	40	60	81	40	60	81
3.	**Tamilnadu Petro Products - LAB** To monitor the level of PM, CO, SO2, NOx stack attached to the oil heater, captive powerplantsof3.2MW,6.6MWand6.8 MW.,	Hot Oil heater	76	52	1580	280	41	1550	255
		PACOl heater	56	36	860	269	35	840	270
		Hydrobon heater	30	62	478	231	50	450	195
		Boiler	30	41	595	210	48	605	200
4	**Tamilnadu Petro Products - HCD**		33	6	150	272	8	155	280

S.No	Company name & Critical locations	Stack Attached	Height, m	Stack survey 2017-2018,mg/m^3			Stack survey 2018-2019,mg/m^3		
				PM	SO_2	NO_2	PM	SO_2	NO_2
		Boiler							
5	**Tamilnadu Petro Products - ECH** Tomonitor the level of PM, SO2, NOx, in the stack attached to the propylene furnace, 8 T/hr capacity boiler, captive power plant.	Boiler	47.4	70	128	103	70	128	103
6	**Manali PetroChemical Ltd., Plant I** To monitor the stack attached to the Boiler.	Boiler 18T/h-2nos	32	58	481	60	42	225	35
7	**Manali PetroChemical Ltd., Plant II** To monitor the stack attached to the Boiler.	Boiler 10T -2nos &Boiler 21T	30	48	311	33	35	307	33
8	**Cetex Petrochemicals Limited** To monitor the level of SPM in the stack attached Bio mass Boiler 8T/hr.	Biomass Boiler22T	35	43	BDL	34	38	BDL	28
		Biomass Boiler8T	30	31	BDL	24	42	BDL	36
9	**Indian Additives Ltd.,** To monitor the level of SPM in the stack attached to the pibsareactor.	Boiler (5TPH)-1no.& Boiler (10TPH)-2no.	47	47	128	197	38	1481	209
		Thermic Fluid Heater -2MKCal/h-2nos	30	12	53	84	19	1263	70
		PIBSA reactor	22	9	BDL	<1.0	4	BDL	<1.0
10	**Kothari Petrochemicals Ltd.,** To monitor the stack attached to the Boiler.	Biomass Boiler & Thermopac	33	35	BDL	44	28	BDL	42
11	**Balmer & Lawrie Co Ltd.,**	Boiler 850kg/h)-	18	64	25	15	68	22	17

S.No	Company name & Critical locations	Stack Attached	Height, m	Stack survey 2017-2018,mg/m^3			Stack survey 2018-2019,mg/m^3		
				PM	SO_2	NO_2	PM	SO_2	NO_2
	Chlorine and SO2 emissions in the process stack.	2nos & 600kg/h-1no							
12	**SRF Limited – TTBM** To monitor the level of SPM, NOX, and SO2 for the stack attached to the Bio mass boiler of 12 T/hr capacity.	Biomass Boiler 12T	30	36	BDL	53	42	BDL	45
		Biomass Boiler 2T	30	26	BDL	42	38	BDL	51
13	**Supreme Petrochemicals Ltd.,** To monitor the stack attached to the Boiler.	Boiler 5T	30.5	48	117	98	54	42	52

2.5 & 2.6 QUANTIFICATION OF STACK EMISSION LOAD

2.5.1 Pollution load from the industry's stack emission is calculated as follows:

S.No	Company name	Stack Attached	Height, m	Flow m3/h	Pollution Load, kg/day 2017-2018			Pollution Load, kg/day 2018-2019		
					PM	SO_2	NO_2	PM	SO_2	NO_2
1	**Madras Fertilizers Limited**	Boiler 1&2	70	355398	8.53	3757	366.8	444	3727	367
		Boiler 3&4	117	245180	688	300	1754	282	---	288
		Prill tower	72	1200000	144	---	---	259	---	---
2	**Chennai Petroleum Corporation Limited**.	Boiler 1	100	105247	144	1041	624	131	920	523
		Boiler 2	100	102684	118	1126	271.1	120	1126	271
		Boiler 3	100	100922	150	1369	560	110	1800	731.5
		Boiler 4	100	97900	120	1194	550	124	2900	999
		Boiler 5	100	86511	91.4	669	282	91.4	669	282

S.No	Company name	Stack Attached	Height, m	Flow m3/h	Pollution Load, kg/day 2017-2018			Pollution Load, kg/day 2018-2019		
					PM	SO_2	NO_2	PM	SO_2	NO_2
		GT-1	100	32231	5.41	8.51	59.6	5.41	8.51	59.6
		GT-2	100	32518	7.8	10.2	46	7.8	10.15	46
		GT-3	100	32521	32.8	31.2	78.83	32.8	31.2	78.83
		GT-4	100	33333	32	48	65	32	48	65
3.	**Tamilnadu Petro Products - LAB**	Hot Oil heater	76	100000	125	3792	672	98.4	3720	612
		PACOl heater	56	17100	15	353	110	14.4	345	111
		Hydrobon heater	30	5100	7.6	58.5	28.27	6.12	55.1	24
		Boiler	30	12400	12.2	177	62.5	14.3	180	59.52
4	**Tamilnadu Petro Products - HCD**	Boiler	33	10500	1.5	37.8	68.5	2	39	71
5	**Tamilnadu Petro Products - ECH**	Boiler	47.4	11450	19.2	35.2	28.3	19.2	35.17	28.3
6	**Manali PetroChemical Ltd., Plant I**	Boiler 18T/h-2nos	32	49673	50	268	41.7	69	573.4	71.6
7	**Manali PetroChemical Ltd., Plant II**	Boiler 10T - 2nos &Boiler 21T	30	51172	43	377	40.52	59	382	40.52
8	**Cetex Petrochemicals Limited**	Biomass Boiler22T	35	39235	40.5	BDL	32.01	35.78	BDL	26.36
		Biomass Boiler8T	30	28702	21.4	BDL	16.5	28.93	BDL	24.8
9	**Indian Additives Ltd.,**	Boiler (5TPH)-1no.& Boiler (10TPH)-2no.	47	14698	16.6	45.2	69.5	13.4	522	10.23

S.No	Company name	Stack Attached	Height, m	Flow m3/h	Pollution Load, kg/day 2017-2018			Pollution Load, kg/day 2018-2019		
					PM	SO_2	NO_2	PM	SO_2	NO_2
		Thermic Fluid Heater - 2MKCal/h-2nos	30	15454	7.04	468	26	4.5	19.7	31.2
		PIBSA reactor	22	615	0.14	BDL	0	0.06	BDL	0
10	**Kothari Petrochemicals Ltd.,**	Biomass Boiler & Thermopa	33	45210	30.4	BDL	45.6	26.1	BDL	48
11	**Balmer & Lawrie Co Ltd.,**	Boiler 850kg/h)-2nos & 600kg/h-1no	18	931	1.43	0.56	0.34	1.52	0.5	0.41
12	**SRF Limited – TTBM**	Biomass Boiler 12T	30	244487	211	BDL	311	246	BDL	264
		Biomass Boiler 2T	30	235679	147	BDL	238	215	BDL	288
13	**Supreme Petrochemicals Ltd.,**	Boiler 5T	30.5	125908	145	353.5	296	163	127	157
Total Pollution load in kg/day			**1799** **Avg.ht. 60**		**2436**	**15520**	**5827**	**1705**	**17881**	**4791**

Therefore the ground level emission concentration prevails at a distance of 60 x10 = 600m from the centre of core zone.

2.5.2 Ambient Air quality data at Manali CEPI area

Some of the industrial units in the Manali Industrial Complex have also installed Continuous Ambient Air Quality Monitoring Station (CAAQMS) in their premises so as to measure the level of pollutants in the ambient air. The industry located in upwind direction and down wind direction has been chosen and average of online ambient air quality parameters of January 2018 are as follows.

Location	TNPCB CAC-Online Ambient Air Monitoring data in µg/m^3			
	PM_{10}	$PM_{2.5}$	SO_2	NO_2
CPCL	---	36.21	16.36	12.07
Indian Additives Limited	33.30	---	4.491	4.59

2.5.3 CAAQMS stations in and around Manali CEPI area:

Further the level of pollutant in ambient air around the Manali Industrial area is being monitored by the Continuous Ambient Air Quality monitoring station situated at Manali, Kattivakkam, and Tiruvottiyur by the Tamilnadu Pollution Control Board under the National Ambient Air Quality Monitoring Project (NAMP) by Tamilnadu Pollution Control Board. The readings taken during January 2018 are as follows:

S. No.	Sampling location	24hours	Parameters (µg/m^3)			
			RSPM	SO_2	NO_2	NH_3
		Standard	100	80	80	400
1.	Kathiwakkam Industrial Near UPHC	Min	30	11.2	13.2	20.9
		Max	51	15.3	17.6	29.8
		Avg	44	13.5	13.2	26.7

2.	Manali Industrial, Padasalai street Govt.Hr.Sec School	Min	66	11.7	13.8	26.0
		Max	91	15.6	18.6	34.9
		Avg	82	13.7	15.5	28.3
3.	Thiruvottiyur Industrial Municipality Building	Min	58	11.0	13.0	20.7
		Max	82	14.6	17.4	27.8
		Avg	71	12.6	14.4	25.0

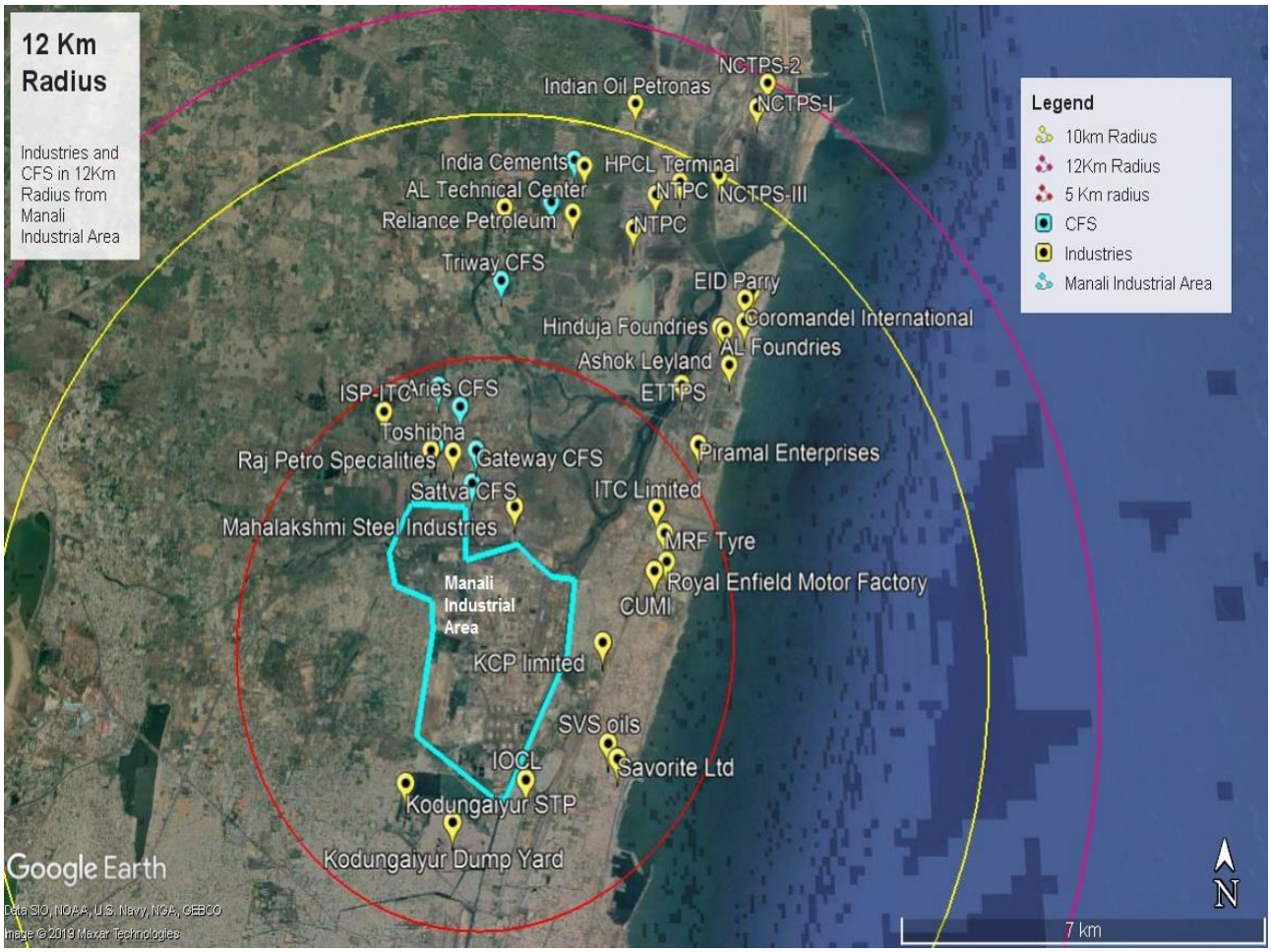
The Central Pollution Control Board has also installed one Continuous Ambient Air Quality Monitoring Station at Manali. This monitoring station gives the real time ambient air quality data. All the readings are well within the standards prescribed by the Board.

2.5.4 Impact of the activities of nearby area on the Manali CEPI area.

The east and northern sides of the CEPI area is covered by Tiruvottiyur Municipality which spread over an extent of 21.42 Sqkms. The unit of M/s Ennore Thermal Power Plant (which is not under operation now), M/s Ashok Leyland, M/s. Hinduja Foundary, M/s Royal Enfield, and M/s, MRF Limited are located within 5km radius of CEPI Area.

Further the M/s. NTPC Tamilnadu Energy Company Limited, Vallur Thermal Power project, Ponneri Taluk is having stack height of 275m is located in northern direction within 10km direction. Similarly M/s. North Chennai Thermal Power Station- Stage I & Stage II , Athipattu Village, Ponneri Taluk each having stack height of 275m are located in northern direction within the 12km radius, which may be the one of sources of particulate matter pollution on the Manali industrial area. However it is depend on metrological pattern.

MAP SHOWING INDUSTRIES LOCATED IN UPSTREAM OF CEPI AREA



Effect of emission from Stack located nearby area to CEPI Manali Area:

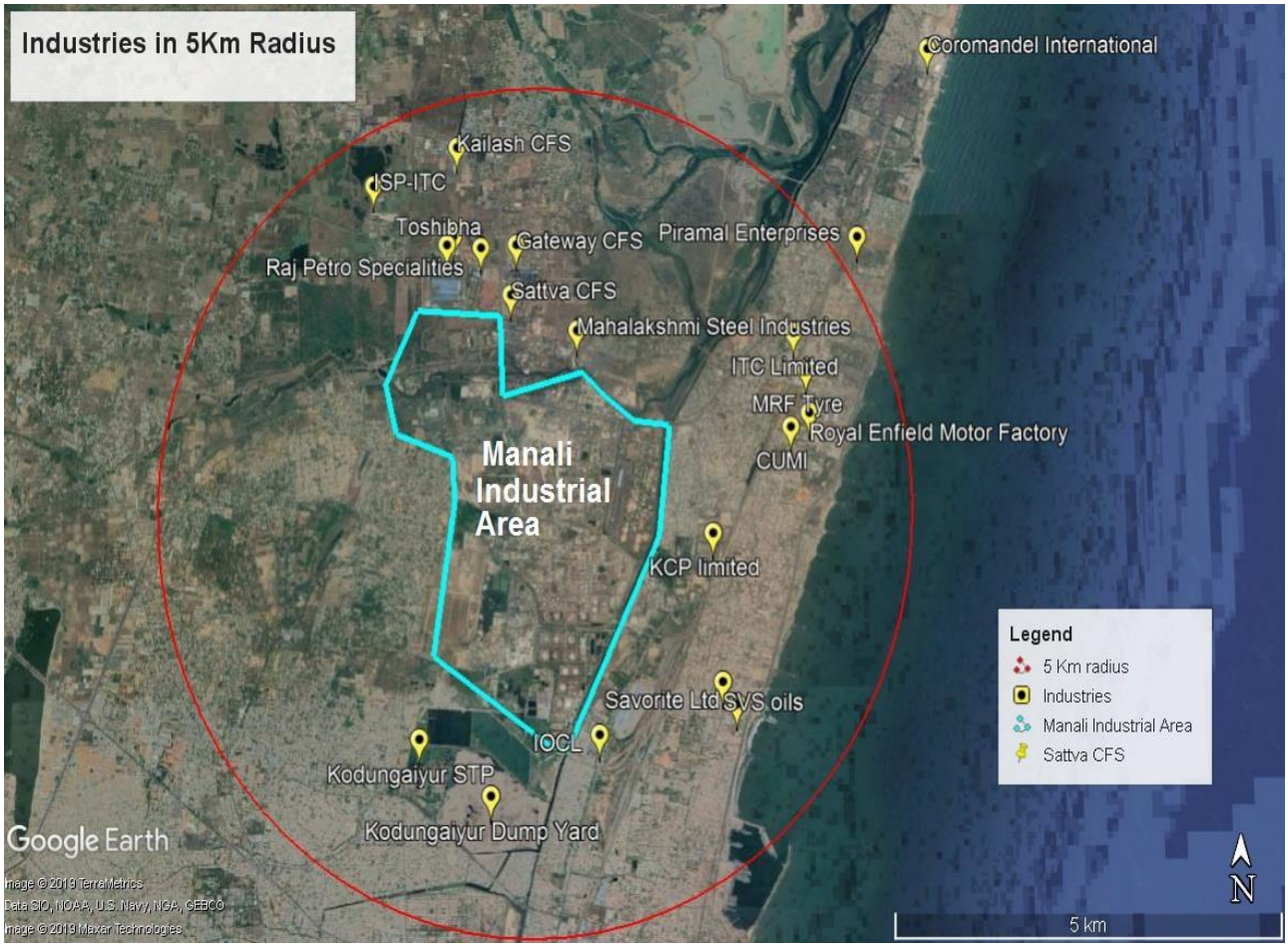
Industry Name	Stack attached to	Stack height in m	Discharge rate m^3/day	Particulate Matter	
				Emission in mg/m^3	Pollution Load in kg/day
NTPC Tamilnadu Energy Company Ltd.,	Unit-I	275	1155006347	60	69300
	Unit-II		1272707450	54	68726.2
	Unit-III		130897351	65	8508.3
North Chennai Thermal Power Station Stage	Unit-I	275	32299913	42	1356.6
	Unit-II		32163623	59	1897.65
	Unit-III		33193202	49	1626.5
TOTAL		275			151415.25

2.5.5 Vehicular emission

One of the important sources of fugitive emission is vehicular movement in the Manali area which should be addressed to reduce the CEPI score regarding air.

In and around Manali there are Tiruvottiyur Town, many residential colonies, industries, Ennore port and more than 5 container Freight stations (CFS). Raw material, product and any other transport are through this core industrial area via Manali express highways. Approximate truck & lorry movement in the Manali area for industry alone is approximately 1069 number as follows:

MAP SHOWING CONTAINER FRIEGHT STATIONS LOCATED IN CEPI AREA



S.No.	Name of the Industry	No. of vehicles per day
1.	CPCL	580
2.	Cetex Petrochemical	40
3.	Indian Additives Limited	50
4.	Kothari Petro Chemical	45
5.	Madras Fertilizer Limited	25
6.	Manali Petrochemical Limited I &II	44
7.	Natco Pharma Limited	05
8.	SRF Limited	40
9.	Supreme petrochem Limited	20
10.	Toshiba power systems	10
11.	Raj Petro	50
12.	Tamilnadu Petroproducts Ltd.,	120
13.	Balmer & Lawrie Co Ltd.,	40
Total		**1069**
Average no.of vehicles commuted every day by container fright stations		1000

It was collected from the toll of Manali, that the number of vehicle passing through tollgate of Manali is 20000 per day. In which 2000 to 3000 are light vehicle and 16000 to 17000 vehicles are heavy vehicles.

2.7 AMBIENT AIR QUALITY MONITORING RESULTS IN 2019 IN MANALI CEPI AREA

S.No.	Pollutant	Unit	SAMPLING LOCATIONS AND RESULTS SURVEY ON 18.11.2019 – 19.11.2019						Mean Concentration	CPCB NAAQ Standards
			Natco pharma Ltd., Manali	SRF Polymer Ltd, Manali	Chennai Petroleum Corporation Ltd, Manali	Indian Additives Ltd, Manali	Dwaraka Nagar, Manali New Town	ITC quarters ,sangam flats		
1.	PM_{10}	$\mu g/m^3$	102	105.14	113	85.7	56	59	86.80	100 (24 hours)
2.	$PM_{2.5}$	$\mu g/m^3$	34.42	23.33	25.37	32.12	12.53	18.96	24.45	60 (24 hours)
3.	Benzene	$\mu g/m^3$	3.9	4.2	5.5	3.8	2.8	3.2	3.9	05 (Annual)

2.8 CONCLUSION

The more exceedances of PM_{10} and $PM_{2.5}$ in most of the ambient air monitoring locations during CPCB CEPI 2018 monitoring is majorly due to vehicular emission since the sampling locations are 10 to 20m from the roadside where higher traffic movements in these locations. Due to which two additional AAQ stations were identified in the CEPI impact area to cover both upwind and cross wind directions and AAQ survey was conducted.

Particulate Matter (PM_{10}):

Out of 6 samples 3 samples exceeds the standard limit of 100 µg/m^3 and the values varies between 56 µg/m^3 and 113 µg/m^3 since those locations are nearby road side whereas in new locations which are 500m away from the road side, the values on new locations varied between 56 to 59 µg/m^3 which clearly indicates the major contribution of PM_{10} and $PM_{2.5}$ is from the vehicular emissions. For $PM_{2.5}$ all the results are observed lower than the standard limit of 60 µg/m^3. The value varies between 12.53 µg/m^3 and 18.96 µg/m^3.

It seems that during 2018 study all the sampling locations have been fixed within 20m from the main road whereas the sampling has to be fixed between 100 and 500m from the main Road to avoid the vehicular emission sources. Because of which only the PM_{10} exceeded in all the locations taken during February 2018. The Manali Express Highway is in the middle of Manali industrial area i.e., core area, vehicular movements influence the PM_{10} value. There are around 20000 heavy vehicles commuting through Manali area per day and this is the route for all the vehicles moving to the port also. The source emission of particulate load for Manali industries is 2436kg/day and the average stack height is 60m which by the dispersion of PM to the ambient based on the mixing depth, exit velocity, wind speed and wind direction is very low.

3.0 WATER ENVIRONMENT

3.1 PRIMARY AND SECONDARY POLLUTANTS CONSIDERED FOR SWEPI

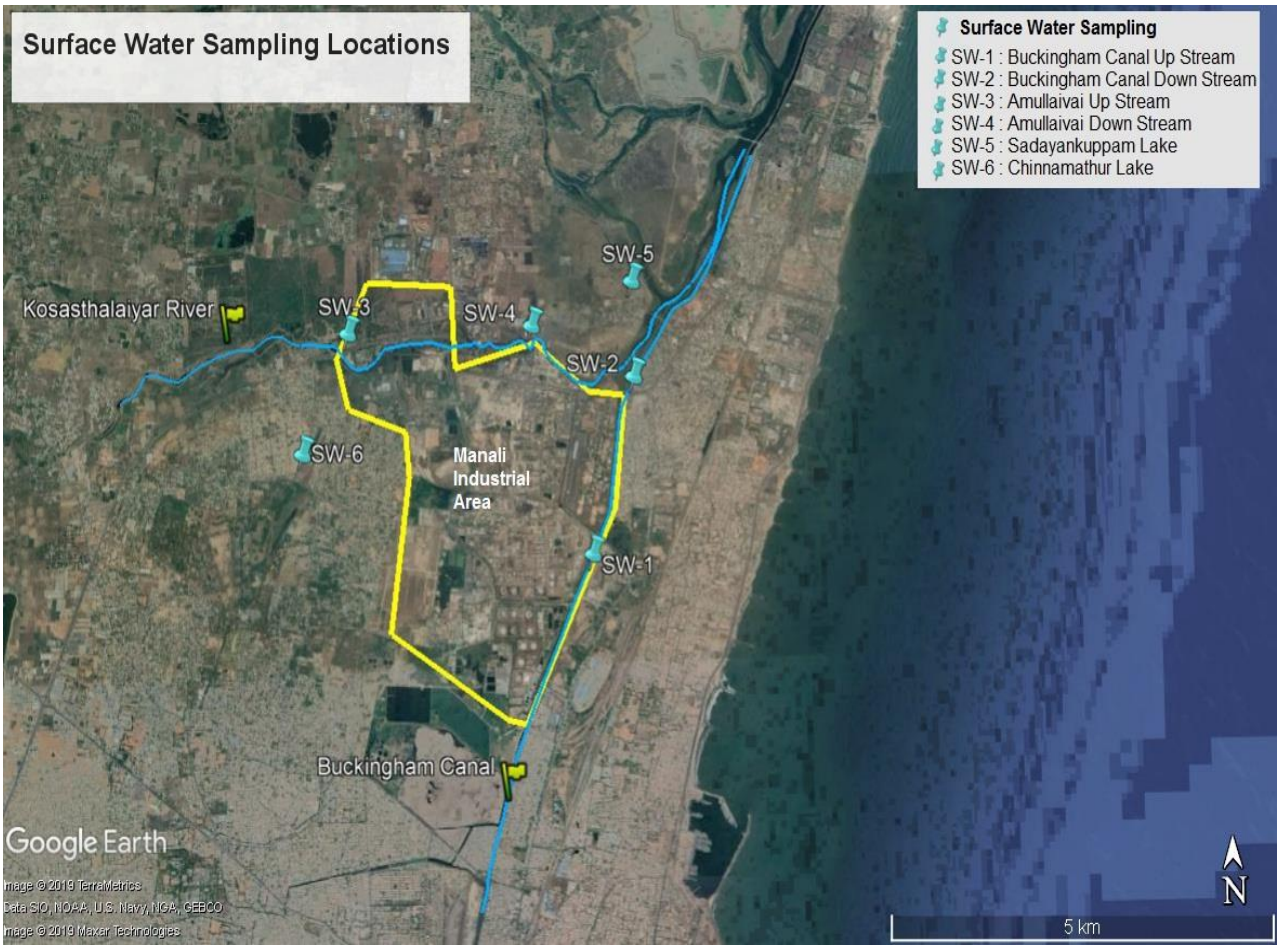
The primary and secondary pollutant considered for Surface water Environmental Pollution Index declared by CPCB as on 2018 for Manali Industrial Area is

S.No.	Pollutant	Parameter
1.	Primary	PAH
2.	Secondary	Phenol and BOD

3.2 SURFACE WATER QUALITY SAMPLING LOCATIONS

S.No.	Name of Location	Latitude	Longitude
SW-1	Buckingham canal Upstream(Bridge near CMDA Iron & Steel ware house)	13°09'24.6"N	080°17'09.5"E
SW -2	Buckingham canal downstream (CPCL Back side & near Tiruvottiyur STP)	13°10'31.0"N	080°17'40.7"E
SW -3	Amullavai canal up stream (opposite to M/s. SRF)	13°10'86.2"N	080°15'23.2"E
SW -4	Amullavai canal downstream(Bridge at Manali Junction)	13°10'57.6"N	080°16'43.8"E
SW -5	Sadayankuppam Lake, Edayanchavadi (**Additional Point**)	13°11'7"N	080°17'28"E
SW -6	Chinnamathur Lake (**Additional Point**)	13°10'4"N	080°15'3"E
SW-7	Behind CPCL adjacent to Buckingham canal (after crossing the road) (**Additional Point**)	13°10'31.0"N	080°17'40.7"E

MAP SHOWING SURFACE WATER SAMPLING LOCATIONS IN CEPI AREA



3.3 DETAILS OF EFFLUENT GENERATION FROM MAJOR INDUSTRIES LOCATED IN CEPI AREA

There are 19 waste water generating industries located in the Manali Industrial Complex. All the industries generating industrial effluent have provided ETPs. Most of the industries have provided Sewage Treatment Plants for treatment of domestic wastewater. The treated effluent is ZLD/reused in the process/ used for gardening / sending to other industries for processing. Consent to operate has been considered only to the industries providing adequate treatment systems. New units are allowed here and it is incumbent upon them to strictly adhere to the air, water and soil pollution norms that have been laid down, right from inception. The generation of sewage and trade effluent from operating industries located in the Manali Industrial Complex is summarized as follows.

S.No	Name of the Industry	Source	Year 2017-2018	
			Trade Effluent KLD	Sewage KLD
1	Chennai Petroleum Corporation Ltd.	Boiler Blow down, Cooling Tower blowdown, RO Plant reject, floor washings and surface runoff.	32330	1275
2	Madras Fertilizers Ltd	Boiler Blow down, Cooling Tower blowdown, Regeneration from the Water Treatment Plant & Plant washings	8400	480
3	Tamilnadu Petro Products Ltd (LAB)	Process, Boiler Blow down, Cooling Tower blow down, Water Treatment Plant Regeneration water and Plant washings.	1164	60

S.No	Name of the Industry	Source	Year 2017-2018	
			Trade Effluent KLD	Sewage KLD
4	Tamilnadu Petro Products Ltd-ECH	Process, Boiler Blow down, Cooling Tower blow down, Water Treatment Plant Regeneration water and Plant washings.	1805	10
5	Tamilnadu Petro Products Ltd-HCD	Process, Boiler Blow down, Cooling Tower blow down, Water Treatment Plant Regeneration water and Plant washings.	310	100
6	Manali Petro Chemical Ltd-I	Industrial process and cooling.	2399	15
7	Manali Petro Chemical Ltd-II	Industrial process and cooling	2559	15
8	Balmer & Lawrie Co. Ltd (Leather Chemical Division)	Process, Boiler Blow down, Cooling Tower blow down, Water Treatment Plant Regeneration water and Plant washings	33	12
9	Balmer & Lawrie & Co. Ltd (Barrel Division)			
10	Kothari Petrochemicals Ltd.	Cooling Tower blowdown Boiler blow down	230	30

S.No	Name of the Industry	Source	Year 2017-2018	
			Trade Effluent KLD	Sewage KLD
11	Kothari Petrochemicals Ltd (Cogen Plant)	Processeffluents		
12	SRF Ltd (TTBM)	Boiler Blow down, Cooling Tower blowdown, Water Treatment Plant Regenerationwater & Plant washings	427	137
13	SRF Ltd (EPB Plant)			
14	Indian Additives Ltd	1.Effluent from process plants - 2.Cooling tower blow down 3.Boiler blow down	219	45
15	Natco Pharma Ltd.	Process, Boiler Blow down, Cooling Tower blow down.	37	20
16	CETEX Petrochemicals Ltd	Boiler Blow down, Cooling Tower blow down, Water Treatment Plant Regeneration water, and Plantwashings	70	20
17	INOX Air Products Ltd	From the process.	0.03	1.37
18	Madras Flourine Products Limited	Process vessel washing	2	2
19	Supreme Petrochem Ltd (Orange category)	Process	257	5
		Total	**50242.03 (50.24MLD)**	**2227.37 (2.22MLD)**

The maximum quantity of total trade effluent generation and Sewage generation from the Manali Industries is 50.24MLD & 2.22MLD respectively.

Generally the industries located in Manali Area are deprived of Water source. They are obtaining water from other sources such as Chennai Metro Water Supply and Sewerage Board (CMWSSB), Desalination plant, sewage water, water through private lorries etc. They do not have sufficient water for their process and hence all the industries are used their treated effluent maximum extent possible.

The wastewater generated from the industries located in Manali Industrial Area is being treated in the effluent treatment plant provided by individual industries. Treated effluent (sewage/ trade effluent) should satisfy the standards prescribed by the Board. After met the standards, the treated effluent is being disposed by the individual industries as follows.

S. No	Name of the Industry	Effluent	Effluent Quantity, KLD	Disposed Quantity, KLD				
			Consented Quantity	Reused in their process	Given to other industries for their process	Bay of Bengal	Gardening	Solar Evaporation pan
1	**Chennai Petroleum Corporation Ltd.**	Trade	32330	28130	3120	---	1080	---
		Sewage	1275	1275	---	---	---	---
2	**Madras Fertilizers Ltd**	Trade	8400	7400	1000	---	---	---
		Sewage	480	480	---	---	---	---
3	**Tamilndu Petro Products Ltd (LAB)**	Trade	1164	---	---	1164	---	---
		Sewage	60	60	---	---	---	---
4	**Tamilnadu Petro Products Ltd- ECH**	Trade	1805	---	---	1805	---	---
		Sewage	10	10	---	---	---	---
5	**Tamilnadu Petro Products Ltd- HCD**	Trade	310	---	---	310	---	---
		Sewage	100	100	---	---	---	---
6	**Manali Petro**	Trade	2399	---	---	2414	---	---

S. No	Name of the Industry	Effluent	Effluent Quantity, KLD	Disposed Quantity, KLD				
			Consented Quantity	Reused in their process	Given to other industries for their process	Bay of Bengal	Gardening	Solar Evaporation pan
	Chemical Ltd-I	Sewage	15	---	---	---	---	---
7	**Manali Petro Chemical Ltd-II**	Trade	2559	---	---	2574	---	---
		Sewage	15	---	---	---	---	---
8	**Balmer & Lawrie Co. Ltd.,(Leather Chemical)**	Trade	33	33	---	---	---	---
9	**Balmer & Lawrie Co. Ltd.,(Barrel Divison)**	Sewage	12	---	---	---	12	---
10	**Kothari Petrochemical Ltd**	Trade	230	170	---	60	---	---
11	**Kothari Petrochemical Ltd.(Cogen Plant)**	Sewage	30	---	---	---	30	---
12	**SRF Ltd.,(TTBM)**	Trade	427	427	---	---	---	---
13	**SRF LTd., (EPB Plant)**	Sewage	137	---	---	---	137	---
14	**Indian Additives Ltd**	Trade	219	200	---	---	19	---
		Sewage	45	---	---	---	45	---
15	**Natco Pharma Ltd**	Trade	37	37	---	---	---	---
		Sewage	20	20	---	---	---	---
16	**CETEX Petrochemical Ltd**	Trade	70	68	---	---	---	2
		Sewage	20	---	---	---	20	---
17	**INOX Air Products Ltd**	Trade	0.03	---	---	---	---	0.03
		Sewage	1.37	---	---	---	1.37	---
18	**Madras Flourine Products Limited**	Trade	2	---	---	---		2
		Sewage	2	---	---	---	2	---

S. No	Name of the Industry	Effluent	Effluent Quantity, KLD	Disposed Quantity, KLD				
			Consented Quantity	Reused in their process	Given to other industries for their process	Bay of Bengal	Gardening	Solar Evaporation pan
19	**Supreme Petrochemical Ltd(Orange Category)**	Trade	257	250	---	---	---	7
		Sewage	5	---	---	---	5	---
Total		**Effluent**	**52469.4**	**38660**	**4120**	**8327**	**1351.37**	**11.03**
		In MLD	**52.471**	**38.66**	**4.12**	**8.33**	**1.35**	**0.011**

The various mode of disposal of treated trade effluent with quantity are furnished below**.**

S.No.	Method of disposal	Quantity in MLD
Treated Effluent		
1	Treated effluent reused by the industries for their process	38.66
2	Utilization of treated effluent by the other industry	4.12
3	Treated effluent discharged into sea (TPL,MPL & Kothari)	8.33
4	Treated effluent utilized for gardening by the industries	1.35
5	Effluent disposed through solar pond	0.011
	Total	52.471

From the above, it is clear that major quantum of treated water is being reused by the industries for their process and also utilized by other industries since there is water source demand within the industries and hence most of the treated water has been reused by industries themselves. Treated effluent of around 8.33 MLD is being

discharged into sea after confirming the marine disposal standard prescribed by the Board since there is no technique to reduce the TDS level of the treated effluent.

3.4 DOMESTIC WASTEWATER GENERATION AND DISPOSAL IN CEPI AREA:

The domestic waste water from the residential colonies and commercial areas of the nearby local bodies, such as Manali Municipality, Chinna sekadu are discharged in the Buckingham canal without any treatment as there is no underground sewerage system. The quantity of generation of sewage from the local bodies is as follows:

S.No.	Name of the local body	Sewage generation (approximately)
1.	Manali Municipality	5.1 MLD
2.	Chinnamathur Municipality	1.5 MLD
3.	Chinnasekkadu Town Panchayat	1.2 MLD
	Total	7.8 MLD

Total generation of sewage in Manali is 7.8MLD. There is no treatment system for the above sewage generated.

3.5 Industrial and Domestic Waste water impact on surface water bodies

All the industries in Manali CEPI area either reusing the treated trade effluent /sewage in their process/gardening or disposed into Sea. There is no disposal of treated trade effluent /sewage into Buckingham canal. But the Buckingham canal is contaminated with domestic sewage and other activities such as road side heavy vehicle/light vehicle washing, illegal municipal solid waste leachates. Further the only

sources of PAH is combustion as well as by used/waste oil. As per the material balance of effluent/domestic waste water of industries which clearly indicates that there is no discharge of effluent/domestic waste water into surface water.

Further Buckingham canal is the manmade fresh water navigation canal and flows from Tamilnadu to Andra Pradesh with total length of 420km. Out of which 163km is in TamilNadu and throughout the stretches various discharges is being carried out and also the water carryover the sullages all the way and hence the pollution load in Buckingham canal cannot be taken as exclusive contribution of Manali area and it cannot be taken as surface water source as it is salt water channel passing through Manali.

Further, residential areas/ villages along the periphery of the industrial area and Corporation area also contribute substantially to the pollution load.

3.6 COMMON TREATMENT FACILITIES DETAILS:

There is no Common Treatment facility in the area of the Manali Industrial Complex.

3.7 STATUS OF SURFACE WATER QUALITY IN 2018 IN CEPI AREA

SURFACE WATER QUALITY RESULTS

S.No.	Pollutant	Unit	Mean Concentration	CPCB MINARS/17/2001-2002 Standard
1.	PAH	µg/L	26.55	0.2
2.	Phenol	mg/L	0.19	0.01
3.	BOD	mg/L	11.83	8

3.8 STATUS OF SURFACE WATER QUALITY DURING NOVEMBER/DECEMBER 2019 IN MANALI CEPI AREA

S.No.	Pollutant	Unit	SAMPLING LOCATIONS AND RESULTS							Mean Concentration	CPCB MINARS/ 17/2001-2002 Standard
			BUCKINGHAM CANAL UPSTREAM, Manali 01.11.2019	BUCKINGHAM CANAL DOWN STREAM, Manali 01.11.2019	AMULAVAI CANAL UPSTREAM Manali 01.11.2019	AMULAVAYAL CANAL DOWN STREAM, Manali 01.11.2019	SADAYANKUPPAM LAKE EDAYANCHAVADI,MANALI 04.12.2019	CHINNAMATHUR LAKE MANALI 04.12.2019	SURFACEWATERBEHINDCPCL ADJUST TO BUCKINGHAM CANAL, 01.11.2019		
1.	PAH	µg/L	BLQ 0.00005	BLQ 0.00005	BLQ 0.00005	BLQ 0.00005	BLQ 0.00005	BLQ 0.00005	BLQ 0.00005	0.00005	0.2
2.	Phenol	mg/L	1.4	0.005	0.18	BDL 0.001	BDL 0.001	BDL 0.001	0.17	0.265	0.01
3.	BOD	mg/L	15	7	4	6	5	4	10	7.29	8

BDL – Below Detection Limit, BLQ- Below Limit of Quantification

3.9 CONCLUSION

In the surface water, the concentration of PAH, Phenol and BOD present more than the limit value during CPCB CEPI 2018 samples, which may be due to domestic wastewater, sewerage, other localized activities across the canal, since the canal is the stretch of 163 kms in which the Manali area crossing will be only 1000m and along the bank of canal, the industries are provided with ZLD system so that, there is no effluent discharge into this stream. In addition to the existing four sampling stations located in the core zone, three additional surface water sampling stations were identified in the CEPI Impact Zone and analysed. The analysis results of November 2019 are summarized as follows:

1. **PAH:**

   All the results for PAHare observed lower than the standard limit of 0.2 mg/L·The values are below detectable level.

2. **Phenol:**

   Out of 7 samples 3 samples exceeds the standard limit of 0.01mg/L·The values vary between 0.001mg/L and 1.4mg/L.

3. **Biochemical Oxygen Demand:**

   All the values are observed below the standard limit of 8 mg/L except in one location. The value varies between 4 mg/L and 15 mg/L.

All the industries in Manali CEPI area are either reusing the treated trade effluent /sewage in their process/gardening or disposed into Sea. There is no disposal of treated trade effluent /sewage into Buckingham canal. But the Buckingham canal is contaminated with domestic sewage and other activities such as road side heavy vehicle/light vehicle washing, illegal municipal solid waste leachates. Further the only sources of PAH is combustion as well as by used/waste oil. As per the material balance of effluent/domestic waste water of industries which clearly indicates that there is no discharge of effluent/domestic waste water into surface water.

Further Buckingham canal is the manmade navigation canal and flows from Tamilnadu to Andra Pradesh with total length of 420km. Out of which 163km is in

TamilNadu and throughout the stretches various discharges is being carried out and also the water carryover the sullages all the way and hence the Buckingham canal cannot be taken as exclusive contribution of Manali area and it cannot be taken as surface water source as it is salt water channel passing through Manali.

4.0 LAND ENVIRONMENT

4.1 PRIMARY AND SECONDARY POLLUTANTS CONSIDERED FOR GWEPI

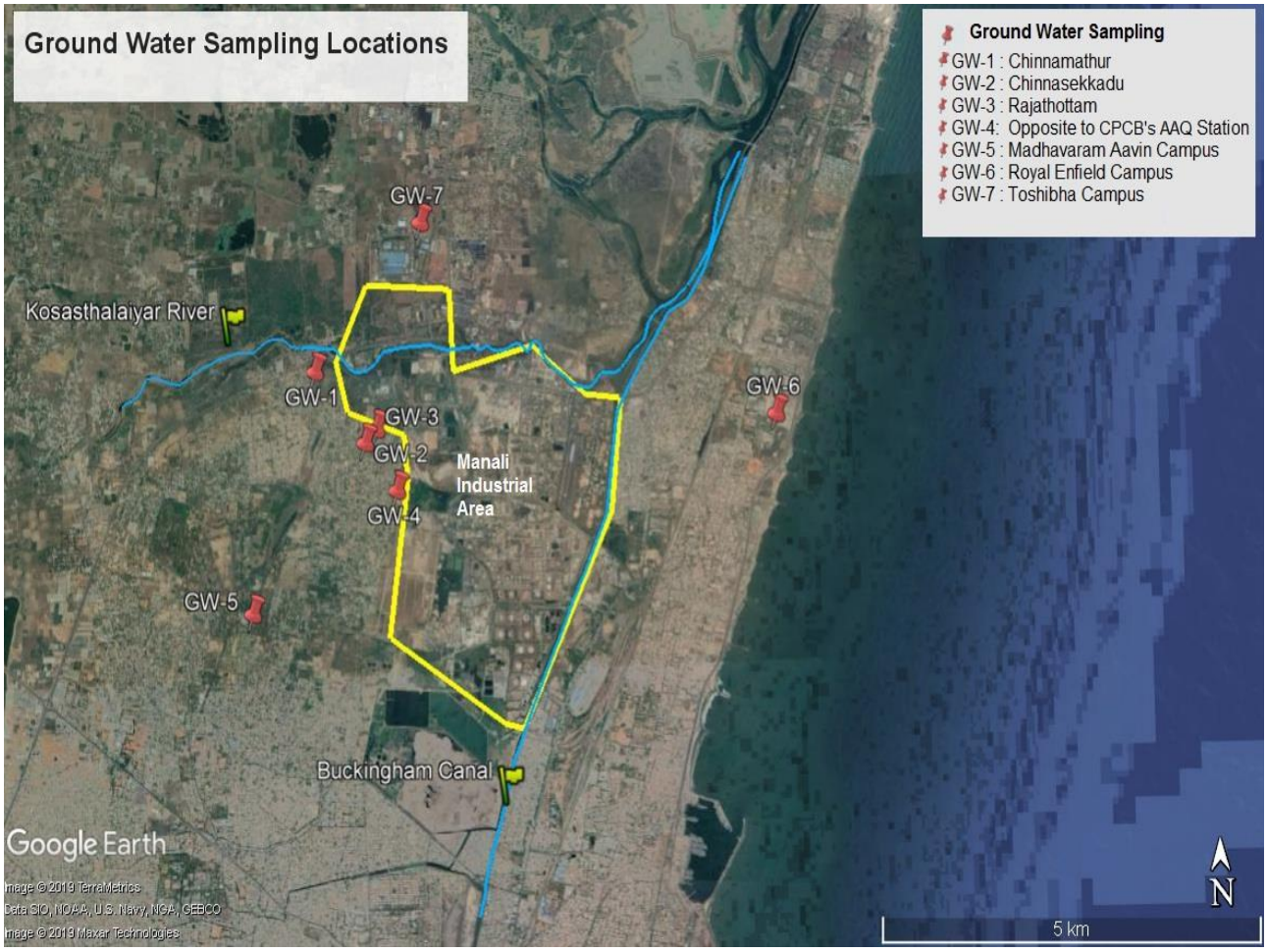
The primary and secondary pollutant considered for Ground water Environmental Pollution Index declared by CPCB as on 2018 for Manali Industrial Area is

S.No.	Pollutant	Parameter
1.	Primary	PAH
2.	Secondary	Phenol and Total Phosphorous

4.2 Ground water Quality Sampling Locations

S.No.	Name of Location	Latitude	Longitude
GW-1	ChinnaMathur - 3/46, MGR Salai,(house of Vijaya)	13°10'36"N	080°15'9"E
GW -2	Chinnasekkadu – 6, Vimalapuram, First street.	13°10'9"N	080°15'31"E
GW -3	Rajathottam – 1/77, Bharathiyar salai	13°10'14"N	080°15'36"E
GW -4	Manali Town – No.1, Thiruvengadam Street(House opposite to CPCB's AAQ station)	13°9'51"N	080°15'45"E
GW -5	Aavin campus, Madhavaram Milk Colony, madavaram (**Additional Point**)	13°9'06"N	080°14'41"E
GW -6	Royal Enfield Company, Tiruvottiyur (**Additional Point**)	13°10'17"N	080°18'33"E
GW -7	Toshiba Power System , manali New Town (**Additional Point**)	13°11'31.6"N	080°15'56.2"E

MAP SHOWING GROUND WATER SAMPLING LOCATIONS IN CEPI AREA



4.3 STATUS OF GROUND WATER QUALITY IN 2018 IN CEPI AREA

GROUND WATER QUALITY RESULTS

S.No	Pollutant	Unit	Mean Concentration	CPCB MINARS/17/2001-2002 Standard
1.	PAH	µg/L	21.12	0.2
2.	Phenol	mg/L	0.05	0.01
3.	Total Phosphorous	mg/L	0.77	0.3

BDL – Below Detection Limit, BLQ- Below Limit of Quantification

4.4 STATUS OF GROUND WATER QUALITY DURING NOVEMBER/DECEMBER 2019 IN MANALI CEPI AREA

S.No.	Pollutant	Unit	SAMPLING LOCATIONS AND RESULTS Sample taken on 15.11.2019							Mean Concentration	CPCB MINARS/ 17/2001-2002 Standard
			MGR SALAI, CHINNAMATHUR Manali	CHINNA SEKDU, VIMALAPURAM FIRST STREET, Manali	Rajathottam – 1/77, Bharathiyar salai Manali	Manali Town – no.1, Thiruvengadam StreetManali	Aavin campus, Madhavaram Milk Colony	Royal Enfield Company, Tiruvottiyur	Toshiba Power System , manali New Town		
1.	PAH	µg/L	BLQ 0.05	BLQ 0.05	BLQ 0.05	BLQ 0.05	BLQ 0.05	BLQ 0.05	BLQ 0.05	0.05	0.2
2.	Phenol	mg/L	BDL 0.001	BDL 0.001	BDL 0.001	BDL 0.001	BDL 0.001	BDL 0.001	BDL 0.001	0.001	0.01
3.	Total Phosphorous	mg/L	BDL 0.05	1.60	1.93	BDL 0.05	BDL 0.05	0.84	0.08	0.65	0.3

BDL – Below Detection Limit, BLQ- Below Limit of Quantification

4.5 MANAGEMENT OF HAZARDOUS WASTE IN CEPI AREA

All the industries in Manali industrial area are obtained hazardous waste Authorization under Hazardous waste Management Rules. The unit have provided separate closed shed with impervious platform to store the Hazardous waste. The details of hazardous waste generation by the industries in Manali industrial Area is as follows:

S. No.	Industry Name	Waste Category	Authorized quantity	Disposal Method			Disposed quantity
				Recyclable (Authorised recycler)	Incinerable/ Coprocessing/ Fuel (captive)	Landfillable	
1.	Chennai Petroleum Corporation Ltd.,	Oil Sludge	12000				Water & Oil recycled back in the process
		Spent Catalyst	315	124.8 (Generated)			124.8
		Spent ion exchange resin/ Carbon	5		5		---
		Empty barrels	1600nos.	1600nos.			1600nos.
2.	Madras Fertilizers Ltd.,	Waste Oil	1.8	1.8 (no generation)			
		Used oil	40.14	40.14			25(reused in plant)
		Spent catalyst	100.4	100.4 (no generation)			
		Empty barrels	99nos	600nos			Nil
3.	Tamilnadu Petro Products Ltd.(LAB)	Used oil	10	9.07			
		ETP Sludge	5			5 TSDF, GMD	
		Oil sludge	10		8.42 TSDF,GMD		8.42
		Spent catalyst	20				9.925 Sent to UK for recovery of precious metal
		Slop oil	1100		1100 (Captive use)		
		Oil soaked cotton wastes	2		2 (TSDF,GMD		3.35

S. No.	Industry Name	Waste Category	Authorized quantity	Disposal Method			Disposed quantity
				Recyclable (Authorised recycler)	Incinerable/ Coprocessing/ Fuel (captive)	Landfillable	
					)		
		CaF_2 sludge Fluorine compound	43			43 (TSDF,GMD)	
4	Tamilnadu Petro Products Ltd.(ECH)	Waste oil	140		140 (Captive use)		
		Used oil	2.0	2.0			
		ETP sludge	300			300 (TSDF,GMD)	
5	Tamilnadu Petro Products Ltd.(HCD)	Waste oil	300		300 (captive use)		
		Used oil	30	30			
		ETP Sludge	1			1 (TSDF,GMD)	
		Oil Soaked cotton waste	1		1 (TSDF, GMD)		2
6	Manali Petro Chemical Ltd I	Used Oil	2	2			2.1
7	Manali Petro Chmeical Ltd II	Used oil	4	4			1.47
8	Balmer & Lawrie Co Ltd.,	Oil Soaked cotton waste	2.5		2.5 (TSDF, GMD)		0.88
		Spent solvent	0.6		0.6 (TSDF, GMD)		0.0735
		Waste/Residue of Paint sludge	10.08		10.08 (TSDF, GMD)		9.96
9	Supreme Petrochemicals Ltd.,	Used oil	3.0	3.0			0.440
		ETP Sludge	12.25			12.25 (TSDF, GMD)	11.760
10	Kothari Petrochemicals Ltd.,	Used oil	3.5	3.5			
		ETP Sludge	0.5			0.5 (TSDF, GMD)	
11	SRF Ltd (TTBM)	Oil soaked cotton waste	1.7		1.7 (GEPIL)		

S. No.	Industry Name	Waste Category	Authorized quantity	Disposal Method			Disposed quantity
				Recyclable (Authorised recycler)	Incinerable/ Coprocessing/ Fuel (captive)	Landfillable	
		Empty barrels	552nos.	552nos.			
		VP Latex residue	0.710		0.710 (GEPIL)		
		Deploy Crackers	2.740		2.740 (GEPIL)		
12.	SRF Ltd,(EPB)	Used oil	12	12			
13.	Indian Additives Ltd.,	Waste oil	15		15 (TSDF, GMD)		10.40
		Used oil	150	150			43.85
		ETP Sludge	20			20 (TSDF, GMD)	18.40
		Distillation/Process residue	2300		2300 (GEPIL, TSDF)		810.52
		Spent solvent	1500	1500			148.58
		Spent ion exchange resin/carbon	2			2 (TSDF, GMD)	
		Empty barrels	80	80			35.02
14.	Natco Pharma Ltd	Waste oil	322.711		322.711 (TSDF, GMD)		
		Spent catalyst	0.003		0.003 (TSDF, GMD)		
		Distillation/Process residue	103.955		103.955 (TSDF, GMD)		
		Spent Solvent	8.64	8.64			7.195
		Spent ion Exchange resin/Carbon	1		1 (TSDF,GMD)		
		Off specification Product	0.054		0.054 (TSDF, GMD)		
		Date Expired products	0.054		0.054 (TSDF, GMD)		
15.	Cetex petro chemical Ltd	Waste oil	1.6	1.6			
		ETP Sludge	2			2 (TSDF, GMD)	
		Spent catalyst	1		1 (TSDF, GMD)		
16.	Madras	SEP salt	40			40	

S. No.	Industry Name	Waste Category	Authorized quantity	Disposal Method			Disposed quantity
				Recyclable (Authorised recycler)	Incinerable/ Coprocessing/ Fuel (captive)	Landfillable	
	fluorine Products Ltd.,					(TSDF, GMD)	
				10128 T	4318.5 T	623.75 T	

In Manali CEPI area, 10128T of Recyclable waste, 4318.5T incinerable waste and 623.75 T landfillable waste are generated and wastes are disposed then and there by the industries as per Hazardous waste Management Rule 2016. Further all the industries are provided closed shed, concrete floor, bund wall, Trench for the storage of Hazardous waste as per the Hazardous waste Management Rules, 2016.

4.6 MANAGEMENT OF BIO-MEDICAL WASTE IN CEPI

The biomedical waste generated in the area is handed over to the Common biomedical waste treatment facility for final treatment and disposal.

4.7 MANAGEMENT OF MUNICIPAL SOLID WASTE IN CEPI AREA

There is no Municipal Solid waste disposal facility within the Manali area. Manali Corporation Zone II have the waste segregation with composting facility and non biodegradable waste are incinerated through incinerator in Chinna Mathur area.

4.8 DETAILS OF CETP

There is no CETP in the Manali CEPI area.

4.9 CONCLUSION

In the Ground water, it is observed high concentration of Phenol, PAH and Total phosphorous in all four locations of CPCB CEPI Manali 2018 samples. There were no sources of PAH and Phenol contamination to the ground water. In addition to the existing four sampling stations located in the core zone, three additional ground water sampling stations were identified in the CEPI Impact Zone and analysed the results are as follows:

1. **PAH:**

   All the results for PAHare observed lower than the standard limit of 0.2mg/L·The values are below limit of quantification.

2. **Phenol:**

   All the results for phenols are observed lower than the standard limit of 0.01mg/L·The values are below detection limit.

3. **Total Phosphorous:**

   Out of 7 samples 3 samples exceeds the standard limit of 0.3mg/L·The values vary between 0.05mg/Land1.93mg/L.

Which clearly indicates no ground water contamination of PAH, Phenol and Phosphorous based on the samples collected during November 2019.

5.0 HEALTH STATISTICS

5.1 HOSPITAL DETAILS IN AND AROUND CEPI AREA

S.No.	Name of the Hospital
1.	Manali UPHC, Manali -Zone II, Greater Chenani Corporation, Manali, Chennai-68
2.	Manali New Town UPHA, Greater Chennai Corporaption, Manali.
3.	SSS Hospital, 924, T.H.Road, Thiruvottiyur, Chenani-19
4.	Aakash Hospital 393/1, T.H.Road, Thiruvottiyur, Chennai-19
5.	Govt. Hospital, Thiruvottiyur, Chennai-19

5.2 HEALTH DATA OF FIVE YEARS

S.NO.	Disease	No. of patients reported for the year				
		2017-2018	2016-2017	Disease	2017-2018	2016-2017
Disease	Air Borne			Water Borne		
1. Government Hospital, Thiruvottiyur						
1.	Asthma	1008	1010	Gastroenteritis	2100	2000
2.	Acute Respiratory infection	21000	21010	Diarrhea	2400	2400
3.	Bronchitis	780	750	Renal Disease	6	5
4.	Cancer	10	8	Cancer	-	-
2. Aakash Hospital						
5.	Asthma	27	34	Gastroenteritis	199	202
6.	Acute Respiratory infection	95	89	Diarrhea	-	
7.	Bronchitis	33	51	Renal Disease	89	198
8.	Cancer	65	53	Cancer	-	
	Total	**23018**	**23005**	**Total**	**4794**	**4705**
	Percentage	**0.057%**		**Percentage**	**1.89%**	

5.3 ANALYSIS OF DATA & CONCLUSION

From analyzing the health data collected from 2 hospitals, it is observed that there is decreasing trend of less than five percent in air and water borne disease cases considered in the consecutive years of 2016-17 & 2017-18. Hence score for receptor C is considered as zero for Air, Water & Land Environment.

6. ACTION TAKEN BY THE INDUSTRIES FOR POLLUTION CONTROL

1. CHENNAI PETROLEUM CORPORATION LIMITED

2018-19 & 2019-2020

- Parameters of all the 45 stacks attached to Process heaters, Boilers & Gas Turbines were connected to both TNPCB & CPCB.
- Treated Effluent parameters of ETPs viz pH, TSS, BOD & COD were connected to both TNPCB & CPCB
- ETP-2 revamp was completed by installing new Tilted Plate Interceptor (TPI), Dissolved Air Floatation (DAF) unit etc.
- ETPs open surge pond were converted in to closed to tank to prevent VOC emission control
- In-Situ Chemical sludge treatment was commenced to reduce open storage as well as to reduce VOC emission
- VOC adsorption system commissioned in ETPs
- Provision of Doom Roof for Naptha Tanks with N2 blanketing
- Commissioning of revamped Diesel Hydro Desulphurisation (DHDS) unit to supply 100% BS - IV quality Diesel at an estimated cost of Rs 367 Crores on 28th Feb, 2018.
- Installation and successful commissioning of SRU of 2 X 100 TPD capacity with Tail Gas Treating Unit to maximize the Sulphur Recovery.
- 500 saplings planted in CPCL during World Environment Day.
- Substantial reduction in usage of plastics due to the continual efforts and creating awareness among our employees.
- Coke – dust suppression system Water spray system over coke yard area
- New state of the art ETP-IV with latest SBR technology and inbuilt UF / RO & DM plant was commissioned at a cost of Rs 220 Crore.
- Development of Green Belt – 40 Acres in Amullavoyal Land of CPCL (10000 Trees)
- Routing of Crude – I Hot well gases thro' Caustic scrubber

2. MADRAS FERTILIZERS LTD

2018-19 & 2019-2020

- Switched over to LNG from Furnace Oil for Boiler 3 & 4 (110 ATA & PC Boiler). The project was initiated in 2012 for 110 ATA and 2015 for PC Boiler and completed in April, 2019 so as to reduce CO_2, SO_2& NO_2 load.
- Switched over from Naphtha to LNG for process and reformer fuel in Ammonia Plant. Project was completed in August, 2019 so as to reduce energy consumption by 33%. & Reduction in CO_2, SO_x& NO_x load.
- Replacement of Ultra Filtration Skid@ Rs.70 Lakhs so as to improve the performance of the cooling water blow down recovery.

3. TAMILNADU PETRO PRODUCTS LIMITED(TPL) – LAB Plant

2018-19 & 2019-2020

- ETP – RO Plant was installed and commissioned on March 2019 to process the Treated effluent generated from LAB plant.
- RO Plant permeate is utilised in the Cooling Tower as makeup water and RO reject is utilised in the TPL – ECH – PO plant process. Entire effluent is utilised and no effluent is discharged.
- Utilisation of R – LNG in place of Furnace Oil in oil fired heater and boiler to reduce air pollution.R-LNG – skid was installed during March 2019.

4. TAMIL NADU PETRO PRODUCTS LIMITED(TPL) – HCD Plant

2018-19 & 2019-2020

- Installation of Chlorine Recuperator to recover the heat and reduce load on Boiler. Installed and commissioned in Oct 2018. Reduction in consumption of steam and Power.

5. MANALI PETROCHEMICALS LIMITED PLANT- I

2018-19 & 2019-2020

- ETP process up gradation done by installing new equipments.
- Mixed flow diffuser system installed in the Bio-Reactor A&B
- OHRAerators120numbers installed at Bio Reactor C,D,E,F
- New effluent cooling tower installed
- New Effluent holding/settling tank constructed
- New high capacity Air blowers (160KW each)three numbers installed for air supply to OHR aerators.
- Liquid oxygen storage tank installed for continuous pure oxygen supply to Bioreactor A&B thru mixed flow diffuser system.
- New secondary clarifier construct with wet well for MLSS recovery and recycle.
- New advanced Bio-culture treatment commissioned
- Plate and Frame press installed for BIO-Mass recovery from secondary clarifier.
- HACH make TOC analyser installed for online BOD, COD monitoring and connected to TNPCB-CAC
- New TSS, pH. Temp, Flow measurement instruments installed and connected to TNPCB–CAC
- New DO meter 4numbers installed at Bio Reactor A,B,C,D.
- ORP–Oxidation reduction potential meter installed at Bio Reactor-C.
- Mass culture tank erected and commissioned

6. MANALI PETROCHEMICALS LIMITED (MPL) PLANT- 2

2018-19 & 2019-2020

- ETP process up gradation done by installing new equipments.
- New Bio-Reactor 5000m3 capacity made ready
- Jet Aerators(70HP)five numbers installed at Bio Reactor
- New effluent cooling tower installed
- New Effluent holding/settling tank constructed
- New Air blowers five numbers (10 HP each) installed for air supply to Jet aerators
- Secondary clarifier constructed with wet well pump for MLSS recovery and recycle.
- Aeration tank three numbers constructed.
- Effluent holding /settling tank constructed
- New advanced Bio-culture treatment commissioned
- Plate and Frame press installed for BIO-Mass recovery from secondary clarifier.
- HACH make TOC analyser installed for online BOD, COD monitoring and connected to TNPCB-CAC
- New TSS, pH, Temp, Flow measurement instruments installed and connected to TNPCB–CAC.
- New DO meter- one number installed at Bio Reactor.
- ORP–Oxidation reduction potential meter installed at Bio Reactor.
- Mass culture tank erected and commissioned

7. BALMER LAWRIE & CO. LTD.

2018-19 & 2019-2020

- Reuse of STP outlet treated water for Gardening
- Construct ed and maintained Rain Water Harvesting Systems
- Improved Reaction Efficiency and Reduce the Effluent Generation

8. KOTHARI PETROCHEMICALS LTD

2018-19 & 2019-2020

- Online monitoring system has been installed and monitored continuously.
- The online effluent quality analyzer for the effluent parameters pH, TSS, COD and BOD is connected with TNPCB Water quality watch centre through online and the results are within the limits prescribed by the board.
- Ensured connectivity of online monitoring system for the emission parameters PM, CO, NOx, and SOx and data to care Air centre is being sent from the analyzers. The on line VOC monitor is connected to the CARE AIR and is operating continuously.
- The total greenbelt area developed of about 5.5 acres inside the factory premises.
- The one new rain water harvesting pond was constructed and another one pond was renovated.
- Air emission control system implemented such as Bag filter and ESP. Automatic Bag Filter (50bags) and 4 stage ESP has been installed in Common stack attached to Husk fire boiler, Thermo pac and Cogen power plant boiler for controlling the emission that removes particulates released from boiler out of the air.
- In our plant premises there are two rainwater collection ponds during the monsoon period which collects of about 4000 KL of water and it is used for various plant activities.
- Effluent treatment plant three stage RO plant Annual Maintenance was taken to ensure the treated effluent qualities.
- Green Belt developed around the ETP plant. Drip irrigation system for Gardening by using STP treated water to reduce the water consumption.
- Off gas recovery system was installed in the plant to recover the off gas from the process, and used as a fuel for hot standby boiler earlier it was fully vent out in the flaring system to control the emission this system is adapted.
- Installed Steam condensate recovery system to reuse the condensate water.

9. SRF LIMITED

2018-19 & 2019-2020

- Green belt increased by plantation of 205 tree saplings
- Energy savings by optimising air compressors leading to savings of 4,06,578 kWH per annum
- Installation of energy efficient motor in water pumps with annual savings of 147296 KwH
- Installation of LED lights resulting in annual savings of 22075 Kwh
- Installation of high efficient compressor to save 719400 kWH per annum
- 400 Tree saplings were planted inside the campus
- Utilisation of renewal energy 3,25,000 kWH consumed from wind energy
- Optimising the boiler operation to reduce husk consumption
- Re-modification of the lighting system to save about 69,897 kWH per annum
- Trail on motion sensor and automated lights in office cabins expected energy saving around 36354 Kwh/Annum
- Installation of 12 energy efficient motors have led to a saving of 250285 Kwh/Annum
- Replacement of inefficient lights HPSV 250 W with 60W LED Lamps energy saved 46800 Kwh/Annum
- 478 Trees planted.

10. NATCO PHARMA LIMITED

2018-19 & 2019-2020

- Reduction on fresh water consumption by 10% in annum& fresh water intake reduced by 10 to 15%.Nearly 10 KLD of water saving achieved byoptimizing Soft water regeneration and reusing of DM plant flushing water to cooling towers.
- Oil ring vacuum pump is replaced with dry vacuum pump to eliminate the usage of oil, 3Nos of dry Vacuum pumps are replaced in place of oil ring vacuum pump.
- Reduction on usage of Ozone depleting substances (ODS) & phasing out ODS usage from unit by replacing existing Air conditioner operated with R-22 Gas. R-22 Gas which has been used in AC & its consumption is reduced from 73 Kgs to 40 Kgs from the year 2018 to 2019.
- Energy Saving in plant area lighting facility – Lamp watts reduced from 0.4 Kw/bulb to 0.09kw/bulb without compromising the Illumination level. Total Power saving achieved is 41 MW/Year & its respective indirect reduction in CO2 emission 34 Tons/year.
- Natco has installed 1 X 2100 KW Wind Electric Generator in Tuticorin district and the same has commissioned on 31.03.2017 for captive use purpose to NatcoPharma Limited, Chemical Division Chennai. Nearly per annum 3600 Metric Tons of CO2 Emissions are avoided by this renewable energy sources. By average 4300 MW of power produced per annum.
- Nearly 1700 trees are planted with drip irrigation system by hiring an external service provider to improve the greenbelt area & plant survival rate. Nearly 300 Nos of conocarpas trees were planted in the company boundaries and additionally we have planted 150 Nos of trees in the private land in about 9190 Sq.Meter land which is adjacent to our entrance from the Minjur highway road.
- Laboratory Bench Fume hood exhaust were connected to dry scrubber with carbon filter to eliminate the discharge to the atmosphere.
- Stack analysis is being done in our factory on monthly basis by 3rd party NABL accredited Lab.

- Reduction on usage of Ozone depleting substances (ODS) & phasing out ODS usage from unit by replacing existing Air conditioner operated with R-22 Gas. R-22 Gas which has been used in AC, its consumption is reduced from 40 Kgs to 10 Kgs from the year 2018 to 2019.
- Usage of Plastic which is less than fifty microns in thickness are restricted
- Oil ring vacuum pump is replaced with dry vacuum pump to eliminate the usage of oil, 2Nos of dry Vacuum pumps are replaced in place of oil ring vacuum pump.

11. CETEX PETROCHEMICALS LIMITED

2018-19 & 2019-2020

- IN ETP UASBR modified with attached growth process for efficient anaerobic process.
- Feeding system in one of the thermic fluid heaters is automized to control the feed and emission.
- Spent acid recovery was started to reduce the specific consumption of 98% sulphuric acid. This also has reduced the vehicle movement.
- DM plant RO Reject reused by routing to process cooling towers.
- Own power generation increased to 800 KWH.
- Replacement of the existing process plant lighting system with LED was done (30%).
- A standby Gas fired thermic fluid heater was procured and trial taken with our own LPG.
- Remote calibration facility provided for the stacks connected with Air care centre having online connectivity of PM, SOX,NOX and CO
- Stripping system was automized in SBA distillation section to reduce flare load.
- Own power generation increased to 850KWH with same specific consumption.
- Replacement of the existing process plant lighting system with LED was done (50%)
- Feed stream recovery enhanced in the feed preparation units there by optimizing the specific Butene consumption.

12. SUPREME PETROCHEM LIMITED

2018-19 & 2019-2020

- Installation of lamella clarifier in the DU wash water system . This can lead to reduced fresh water consumption of 30 M3/ Day.
- Dose fuel additives to improve burner efficiency and ultimately reduce emissions
- Increasing green belt in and around the plant complex by planting additional 150 Nos trees.
- Secondary Containment provision created in all small chemicals storage area
- Cooling tower water blow Down to be brought down from 4 KLD to 1 KLD by using RO water as input water
- Increasing green belt in and around the plant complex by planting additional 150 Nos trees.
- Impervious floor and dyke strengthening done in RM storage area.

7.0 PROPOSED ACTION PLAN FOR FURTHER REDUCTION OF CEPI SCORE

7.1 PROPOSED SHORT TERM ACTION PLAN

1. CHENNAI PETROLEUM CORPORATION LIMITED

Sl. No.	Description	Action Plan	Target	Investment, ₹ in Cr
1	Air Environment	Implementation of Re Gassified Liquefied Natural Gas (RLNG) in Hydrogen Generation units, process heaters, Boilers & Gas Turbines	Sep 2020	421.0
2		Installation and commissioning of Automatic foam flooding system for Floating roof tanks (Rim seal system : Tank 624-MS, 625-Naptha & 821 - Slop)	June 2020	1.68
3		Use of RLNG instead of LPG in SRU (Plant 210)	April 2020	0.1
4		Implementation of Energy conservation schemes equivalent to the saving of fuel oil 29400 SRFT.	June 2020	34.85
5		Implementation of BS VI project for Diesel & Petrol for meeting sulphur specification of 10 ppm	April 2020	1858

2. MADRAS FERTILIZERS LTD

Sl. No	Action Plan	Present status of compliance	Time Limit	Cost, ₹ Crore
1	LNG as feed to Boilers I & II	The unit has adopted RLNG fuel in 110 ATA boiler. The unit has yet to change the fuel in utility boilers.	July 2020	10.0
2	Increasing Green Belt area	The green belt development is being continued.	Periodical	0.10 / year
3	Dedicated RO to treat Cooling Water Blowdown Plant Outlet	It is reported that proposed to install a dedicated RO stream exclusively for this purpose.	June 2020	5.0

3. TPL – LAB Plant

Sl.No	Description	Action Plan	Target date	Cost in Rs.
1	Air Environment	Regasified – Liquefied Natural Gas, (R-LNG) a clean fuel will be utilized in place of Furnace Oil in oil fired heaters and boiler to reduce Air Pollution.	June 2020	360 Lac
2	Water Environment	Tertiary Treated Reverse Osmosis (TTRO) water from Chennai Metro Water Supply and Sewerage Board, Kodungaiyur will be utilized instead of metro water. - Reduction of effluent generation - Conservation of natural resource.	June 2020	21 lac

4. TAMILNADU PETRO PRODUCTS – ECH - PO PLANT

S.No	Description	Action Plan	Target date	Cost in Rs.
1	Air Environment	Regasified – Liquefied Natural Gas, (R-LNG) a clean fuel will be utilised in place of Furnace Oil in Boiler to reduce Air Pollution.	April 2020	75 Lac
2	Water Environment	Tertiary Treated Reverse Osmosis (TTRO) water from Chennai Metro Water Supply and Sewerage Board, Kodungaiyur will be utilised instead of metro water. - Reduction of effluent generation - Conservation of natural resource.	April 2020	10 lac

5. TAMILNADU PETRO PRODUCTS – HCD PLANT

S.No	Description	Action Plan	Target date	Cost in Rs.
1	Air Environment	Regasified – Liquefied Natural Gas, (R-LNG) a clean fuel will be utilised in place of Furnace Oil in Boiler to reduce Air Pollution.	April 2020	35 Lac
2	Water Environment	Tertiary Treated Reverse Osmosis (TTRO) water from Chennai Metro Water Supply and Sewerage Board, Kodungaiyur will be utilised instead of metro water. - Reduction of effluent generation - Conservation of natural resource.	April 2020	25 lac

6. MANALI PETROCHEMICAL LIMITED (MPL) - PLANT- I

S.No	Description	Action Plan	Target date
1	AIR Environment	Boiler Fuel from Furnace oil to LNG. Necessary line, skid installed, commissioning activities is in progress	June 2020

7. SRF LIMITED

S.No	Description	Action Plan	Target Date	Cost in Rs.
1	Water Environment	To be water self-sufficient Industry by Rainwater Harvesting *Phase 2 : Rainwater Collection Pond*	December 2020	1 Cr
		Adoption of Catalytic Radicalization Technique to treat water in eco-friendly manner	May 2020 (Negotiation Under Progress)	1.1 Cr
2	Air Environment	To continuously operate with clean fuel (rice husk)	Continuous	---
		Replace existing fluorescent lamps with 3500 no's of LED lights	May 2020 (500 LED Lights Dispatched and 3000 LED Lights Dispatch under progress)	0.15 Cr

		To add 500 more trees to existing green belt	June 2020	0.02 Cr
3	Land Environment (Not Applicable)	To develop green belt	June 2020	0.01 Cr

8. INDIAN ADDITIVESLIMITED

S.No	Action Points (including source & mitigation measures)	Responsible Stake Holders	Time limit	Cost - Rs in Lakhs
1	Switching over to LNG fuel for boilers and thermic fluid heaters from fuel oil	Industry	**October 2020**	**100**

9. KOTHARI PETROCHEMICALS LTD

S. No	**Description**	**Action Plan (SPA/CPA)**	**Target Date**	**Cost Involved in Rs.**
1.	WATER ENVIRONMENT	Development of greenbelt in front of the factory premises outside the compound wall of about 0.5 acres.	April 2020	3,00,000
2.		Drip irrigation system for Gardening by using STP treated water to reduce the	April 2020	4,00,000

		water consumption.		
3.		Development of greenbelt inside the factory premises of about 300 Sq.meter	April 2020	4,00,000
4.		Two Piezo monitoring wells will be constructed.	December .2020	4,00,000
1	AIR ENVIRONMENT	Online Electronic LED display board installation	April 2020	2,50,000

10. NATCO PHARMA LIMITED

S.No.	Description	Action Plan	Target Date	Cost
1	Air Environment	33% of Greenbelt area will be provided & well maintained in the plant premises from the total land area and additional trees also will be planned in between the trees wherever possible.	June 2020	Recurring cost 1.5 Lacs /month
2	Water Environment	STP to be installed separately & Sewage collection in below ground soak tanks to be avoided	September 2020	Total Capital Cost: 36 Lacs

11. CETEX PETROCHEMICALS LIMITED

Sl. No	Description	Action Points	cost in lakhs	Target
1	Air Environment	Increased power intake from own generation (Power plant)	15	JUNE 2020
2	Water Environment	Reduction of effluent generation by 10%	15	JUNE 2020

12. SUPREME PETROCHEM LIMITED

Source	Description	Target Date	Cost
Water Environment	Bringing down high TDS effluent generation from 5 KLD to 2 KLD by using TTRO water for fresh water input	June 2020	50 lakhs
	Fine tuning ETP operations/treatment for bringing down fresh water/TTRO water consumption from 120 KLD to 70 KLD	June 2020	15 lakhs
	Proposed to construct one more piezo well for analyzing well water	June 2020	3 Lakhs
	Rain water harvesting system implemented in all newly constructed building	May 2010	5 Lakhs

Land	Look for opportunities for co processing of solid waste generated in cement/brick industries, instead of present practice of disposal at TSDF	May 2020	2 lakhs/ Annum
	Modernization of sludge separation system by installing new filter press. This is expected to reduce moisture content & lesser quantity solid waste	June 2020	35 lakhs

7.2 PROPOSED LONG TERM ACTION PLAN

1. BALMER & LAWRIE CO LTD.

Sl. No.	Description	Action Plan	Target	Investment, ₹ in Cr
1	To reuse STP treated water for Gardening	Facility Creation	June 2020	**0.15**
2	Rain Water Harvesting Systems	To construct and maintain Rain Water Harvesting Systems by adopting new Methods	June 2020	**0.05**
3	Green-Belt Area	To continue to develop Gardening and Green-Belt	June 2020	**0.14**
4	Improving plant condition	To elevate Plant, Roads and to construct Open drains	Dec 2020	**5.0**

Sl. No.	Description	Action Plan	Target	Investment, ₹ in Cr
		for storm water flow		
5	Up-Gradation of existing STP	To Enhance the capacity of existing STP from 15 KLD to 50 KLD	Dec 2020	**0.2**
i.	ii. Reduction of Effluent Load	Improving Reaction Efficiency and Reduce the Effluent Generation.	Dec 2020	**0.50**

2. SRF LIMITED

S.No	Description	Action Plan	Target Date	Cost in Rs.
1	Water Environment	To be water self-sufficient Industry by Rainwater Harvesting *Phase 1: Rainwater Collection Pond*	October 2021	1.5 Cr

3. MANALI PETROCHEMICAL LIMITED (MPL) -PLANT-II

S.No	Description	Action Plan	Target date
2	AIR Environment	Boiler Fuel from Furnace oil to LNG. Necessary action taken and agreement with IOCL for LNG supply. LNG Line to be installed by IOCL.	June 2021

4. KOTHARI PETRO CHEMICAL LTD

S. No	Description	Action Plan (SPA/CPA)	Target Date	Cost Involved in Rs.
1.	AIR ENVIRONMENT	Presently husk is used as the fuel for the boiler operation slowly we will change to LNG within five years of duration.	August 2025 (The project will be implemented based on the feasibility study)	The feasibility study of the project is under progress.
2.		Miyawaki Forest development around the factory East/West side compound wall (approx. 2100 Sq.meter)	April 2023	8,00,000

5. CETEX PETROCHEMICALS LIMITED

Sl. No	Description	Action Points	COST in lakhs	Target
1	Air Environment	Use of Hydrogen in the Thermic fluid heater	50	June 2021
2		Conversion of 8MT/Hr Biomass standby boiler into Gas fired boiler	100	June 2021
3	Water Environment	Maximization of reuse of Process effluent for caustic preparation	50	December 2021

6. SUPREME PETROCHEM LIMITED

Source	Description	Target Date	Cost
Water	In addition to the above rain water harvesting measures , proposed to go for an additional pond to hold 2000 m3 water harvested from rains	Apr-2021	40 Lakhs
Air	Looking at options for switching over to RLNG in place of FO as fuel to boiler	Jan-2020	50 lakhs
	Increasing green belt in and around the plant complex from 1000 nos to 1300 nos	Apr-2021	30 lakhs
Land	Indirect solar based water evaporator to be installed to avoid solar pan system	Apr-2021	40 Lakhs

8.0 CEPI SCORE FOR THE POST MONSOON 2019

Comprehensive Environmental Pollution Index (CEPI) Working Sheet as per revised Formula given by CPCB Vide Lr No. B-29012/ESS (CPA)/2015-16/ Dated 26.4.2016

Hazard = Pollutant Source, Pathway and Receptor

1. Air Environment:

A: Source:

Factor A1- Presence of Toxins:

1. *Criteria pollutants* : PM_{10}

Pollutant	Measured Mean Concentration	Score
Group-B–PM_{10}(Pollutant that are probable carcinogens)	86.8 µg/m^3	2
Score of Criteria Pollutant = Maximum Score of criteria pollutant (2)		**2**

2. *Secondary Pollutants: (*$PM_{2.5}$, Benzene)

Group-B–$PM_{2.5}$(Pollutant that are probable carcinogens)	24.450 µg/m^3	0.5
Group C- Benzene(Pollutant that are known carcinogens)	3.9 µg/m^3	1
Score of secondary pollutant = Sum of all sec. pollutant score		**1.5**
A1 = Criteria pollutant score + Secondary pollutant score =2+1.5		**3.5**

Factor A2- Scale of industrial activities:

Manali Industrial area : 16 Nos. of 17 Category Large size units & 16 Nos. of Red Large Category units& 5 Nos. of Orange Category units are located		
A2 (As per guideline) =		**4**
Score A = A1 x A2 =3.5x4		**14**

B: Pathway:

1. Primary Pollutants:

Level of Exposure is to be calculated using SNLF and the value given Table.

SNLF refers to Surrogate number.

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

Exceedance Factor = Observed mean concentration of pollutant/Standard

1.1 Primary Pollutant: **-**PM10

PM_{10} Observed Mean concentration (($\mu g/m^3$)	86.8	-
PM_{10} Standard ($\mu g/m^3$) Annual Average	100	-
PM_{10}: Exceedance Factor = (Observed concentration of pollutant/Standard)	0.868	-
No.of samples exceed the standard =	3	-
Total no. of samples =	6	-
SNLF (PM_{10}) = (No.of samples exceed / total No.of samples) X (Exceedance factor)	**0.434**	**-**
EF < 0.75, SNLF = 0. Hence the Level of exposure Category of PM_{10} Low, Value (From Table) = 0	**0**	
Contribution of Primary Pollutant = B1 = Maximum Score of criteria pollutant		**0**

2. Secondary Pollutants

2.1. Secondary Pollutant - $PM_{2.5}$

$PM_{2.5}$: Observed mean concentration (µg/m³) =	24.45	-
$PM_{2.5}$: Standard (µg/m³)=	60	-
$PM_{2.5}$: Exceedance Factor= Observed mean concentration of pollutant/Standard	0.408	-
$PM_{2.5}$: No.of samples exceed the standard =	0	-
Total no. of samples =	6	-
SNLF ($PM_{2.5}$) = (No.of samples exceed / total No.of samples) X (Exceedance factor)	**0**	-
EF < 0.75, SNLF = 0. Hence the Level of exposure Category of $PM_{2.5}$: Low, Value = 0	0	

2.2. Secondary Pollutant: Benzene

Benzene: Observed mean concentration (µg/m³) =	3.9	-
Benzene: Standard (µg/m³)=	5	-
Benzene: Exceedance Factor =	0.78	-
Total no. of samples =	6	-
Benzene: No.of samples exceed the standard =	1	-
SNLF (Benzene) = (No.of samples exceed / total No.of samples) X (Exceedance factor)	**0.13**	-
EF < 0.75, SNLF = 0. Hence the Level of exposure Category of Benzene: Low, Value =0	0	
Contribution of Secondary Pollutant Sum of the score of secondary pollutants = B2		**0**
B = B1 + B2 =		**0**

C: Receptor:

There is decreasing trend of less than five percent in air borne disease cases considered in the consecutive years of 2016-17 & 2017-18. Hence score for receptor C is considered as zero for Air Environment.	
For Manali Area, C value is taken as =0	**0**

D: Additional High Risk Element:

All industries in Manali area have adequately designed/operated and maintained pollution Control facilities	
Hence D (From CPCB Guidelines) =	**0**
Sub-Index Score (Air) = (A+B+C+D) =14+0+0+0	**14**

2. Water Environment:

Surface Water Source taken up for study:

A: Source:

Factor A1- Presence of Toxins:

1. *Criteria pollutants:* - (PAH)

Pollutant	Measured Mean Concentration	Score
Group B - PAH(Pollutant are probable carcinogens or systemic toxicity)	0.00005(BDL)	2
Score of Criteria Pollutant = Maximum Score of criteria pollutant (1)		**2**

2. *Secondary Pollutants:* - (BOD, Phenols)

Pollutant	Measured Mean Concentration	Score
Group-B - BOD (Pollutant not assessed as acute or systemic)	7.29	0.5
Group C -Phenols(Pollutant that are known carcinogens with organ system toxicity)	0.2511mg/l	1.0
Score of secondary pollutants = sum of score of sec. pollutants =0.5+1		**1.5**
A1 = Criteria pollutant score + Secondary pollutants score =2+1.5		**3.5**

Factor A2- Scale of industrial activities:

Manali Industrial area : 16 Nos. of 17 Category Large size units & 16 Nos. of Red Large Category units& 5 Nos. of Orange Category units are located		
A2 (As per guideline) =		**4**
Score A = A1 x A2 =3.5x4		**14**

B: Pathway

1. PrimaryPollutants:

1.1 Primary Pollutant: -PAH

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

Total PAH: Observed Mean Concentration(mg/L) =0.00005	BDL (0.00005 mg/l)	-
Total PAH: Standard :Class- B Desirable CPCB 2002,Water Quality Criteria & Goals- MINARS Series;MINARS/17/2001-2002)	<0.2mg/l	-
PAH: Exceedance Factor =	0.00025	-
PAH: Total no. of samples =	7	-
PAH: No.of samples exceed the standard =	0	-
SNLF (PAH**) = (No.of samples exceed / total No.of samples) X (Exceedance factor)=**	**0**	-
EF < 0.75, SNLF = 0. Hence the Level of exposure Category of PAH: Low, Value = 0		**0**
Contribution of Primary Pollutant = B1 = Maximum Score of criteria pollutant (0)		**0**

2. Secondary Pollutant:

2.1 Secondary Pollutant- Phenols

Phenols: Observed Mean Concentration (mg/L) =	0.2511	-
Phenols (mg/L) : Standard :Class- B Desirable CPCB 2002,Water Quality Criteria & Goals- MINARS Series;MINARS/17/2001-2002)	0.01	-
Phenols: Exceedance Factor =	25.11	-
Phenols: Total no. of samples =	7	-
Phenols: No.of samples exceed the standard =	3	-
SNLF (Phenols) = (No.of samples exceed / total No.of samples) X (Exceedance factor)=	**10.76**	-
EF 25.11, SNLF = 10.76, Value = 10		**10**

***2.2 Secondary Pollutant: -* BOD**

BOD: Observed mean concentration (mg/L) =	7.29	-
BOD (mg/L) : Standard :Class- B Desirable CPCB 2002,Water Quality Criteria & Goals- MINARS Series;MINARS/17/2001-2002)	8	-
BOD: Exceedance Factor	0.911	-
Total no. of samples =	7	-
BOD: No.of samples exceed the standard =	2	-
SNLF (BOD**) = (No.of samples exceed / total No.of samples) X (Exceedance factor)**	**0.26**	-
EF 0.911, SNLF = 0.26. The Level of exposure Category of BOD: Low, Value = 0		**0**
Score of Secondary pollutants = sum of score of secondary pollutants = B2		**10**
B = B1 + B2 =10+0		**10**

C: Receptor:

There is decreasing trend of less than five percent in water borne disease cases considered in the consecutive years of 2016-17 & 2017-18. Hence score for receptor C is considered as zero for Water & Land Environment.

For Manali Area, C value is taken as =0	**0**

D: Additional High Risk Element:

All industries in Manali area have adequately designed/operated and maintained pollution Control facilities

Hence D (From CPCB Guidelines) =0	**0**
Sub-Index Score (Water) = (A+B+C+D) =14+10+0+0	**24**

3. Land Environment:

Ground Water Quality is considered to represent Land Environment

A: Source:

Factor A1- Presence of Toxins:

1. *Criteria pollutants:* - (PAH)

Pollutant	Measured Mean Concentration	Score
Group B-PAH(Pollutant are probable carcinogens or systemic toxicity)	0.05mg/l	2
Score of Criteria Pollutant = Maximum Score of criteria pollutant (2)		**2**

2. *Secondary Pollutants:* - (Phenols, Total Phosphorous)

Pollutant	Measured Mean Concentration	Score
Group-C - Phenols(Pollutant that are probable carcinogens)	0.001	1
Group B – Total Phosphorous (Pollutant not assessed as acute or systemic)	0.66	0.5
Score of secondary pollutants = sum of score of sec. pollutants =1+0.5		**1.5**

Score A1 = (sum of score of Primary pollutant and secondary pollutants)=2+1.5=		**3.5**

Factor A2- Scale of industrial activities:

Manali Industrial area : 16 Nos. of 17 Category Large size units & 16 Nos. of Red Large Category units& 5 Nos. of Orange Category units are located		
A2 (As per guideline) =		**4**
Score A = A1 x A2 =		**14**

B: Pathway

1. PrimaryPollutants:

1.1 Primary Pollutant: -PAH

SNLF = (No. of samples exceed / total No. of samples) X (Exceedance factor)

PAH: Observed Mean Concentration=	0.05	-
PAH: Standard :	0.2	-
PAH: Exceedance Factor =	0.25	-
PAH: Total no. of samples =	7	-
PAH: No.of samples exceed the standard =	0	-
SNLF (PAH**) = (No.of samples exceed / total No.of samples) X (Exceedance factor)=**	**0**	-
EF 0.25, SNLF = 0 Hence the Level of exposure Category of PAH: Low, Value = 0		**0**
Max contribution of Primary Pollutant = B1		**0**

2. Secondary Pollutant:

2.1. Secondary Pollutant: -Phenols

Phenols: Observed Mean Concentration=	0.001	-
Phenols: Standard : Standard IS: 10500-1991 (mg/L) =	0.01	-
Phenols: Exceedance Factor =	0.1	-
Phenols: Total no. of samples =	7	-
Phenols: No.of samples exceed the standard =	0	-

SNLF (Phenols) = (No.of samples exceed / total No.of samples) X (Exceedance factor)=	**0**	-
SNLF =0. Hence the Level of exposure Category of Phenols: Low, Value =0		**0**

***2.2. Secondary Pollutant:* - Total Phosphorous**

Total Phosphorous Observed Mean Concentration(mg/L)=	0.66	-
Total Phosphorous: Standard IS: 10500-1991 (mg/L) =	0.3	-
Total Phosphorous: Exceedance Factor =	2.2	-
Total Phosphorous: Total no. of samples =	7	-
Total Phosphorous: No.of samples exceed the standard =	3	-
SNLF (Total Phosphorous**) = (No.of samples exceed / total No.of samples) X (Exceedance factor)= 0**	**0.943**	-
SNLF = 0.943 (EF = 2.2) Hence the Level of exposure Category of Total Phosphorous: High, Value = 7.25		**7.25**
Score of Secondary pollutants = sum of score of secondary pollutants = B2		**7.25**
B = B1 + B2 =0+7.25		**7.25**

C: Receptor:

There is decreasing trend of less than five percent in water borne disease cases considered in the consecutive years of 2016-17 & 2017-18. Hence score for receptor C is considered as zero for Water & Land Environment.	
For Manali Area, C value is taken as 0	**0**

D: Additional High Risk Element:

All large and medium industries have adequately designed/operated and maintained pollution control facilities	
Hence D (From CPCB Guidelines) =	**0**
Sub-Index Score (Water) = (A+B+C+D) =14+7.25+0+0	**21.25**

Sub index of

Air - 14

Water - 24

Land - 21.25

Aggregated CEPI Score:

CEPI = im + [(100-im) *(i2/100) *(i3/100)]

Where,

Im : maximum sub index; and i2 and i3 are sub-indexes for other media

CEPI score = 24+ [(100-24) * (14/100)*(21.25/100)] = 26.261

Hence im	=	24
CEPI	=	26.261
CEPI score of Manali Area	**=**	**26.261**

9.0 CONCLUSIONS

The CEPI area of Manali, Tamilnadu was monitored for Ambient Air Quality, Surface Water & Ground Water and samples analysed for their quality and calculated the Revised CEPI Score. The location of samplings for AAQM, surface water and Ground water is already fixed for CEPI monitoring by CPCB. Now in addition to the existing four sampling stations located in the core area, two additional Ambient Air Quality stations, three surface water and three ground water locations were identified in the CEPI impact area and samples were taken. The sampling and analysis were carried out as per the CPCB/EPA/ APHA / IS / ASTM standard methods.

Air Environment:

The more exceedances of PM_{10} and $PM_{2.5}$ in most of the ambient air monitoring locations during CPCB CEPI 2018 monitoring is majorly due to vehicular emission since the sampling locations are 10 to 20m from the roadside where higher traffic movements in these locations. Due to which two additional AAQ stations were identified in the CEPI impact area to cover both upwind and cross wind directions and AAQ survey was conducted.

Particulate Matter(PM10):

Out of 6 samples 3 samples exceeds the standard limit of 100 µg/m^3 and the values varies between 56 µg/m^3 and 113 µg/m^3 since those locations are nearby road side whereas in new locations which are 500m away from the road side, the values on new locations varied between 56 to 59 µg/m^3 which clearly indicates the major contribution of PM_{10} and $PM_{2.5}$ is from the vehicular emissions. For $PM_{2.5}$ all the results are observed lower than the standard limit of 60 µg/m^3. The value varies between 12.53 µg/m^3 and 18.96 µg/m^3.

It seems that during 2018 study all the sampling locations have been fixed within 20m from the main road whereas the sampling has to be fixed between 100 and 500m

from the main Road to avoid the vehicular emission sources. Because of which only the PM_{10} exceeded in all the locations taken during February 2018.

The Manali Express Highway is in the middle of Manali industrial area i.e., core area, vehicular movements influence the PM_{10} value. There are around 20000 heavy vehicles commuting through Manali area per day and this is the route for all the vehicles moving to the port also. The source emission of particulate load for Manali industries is 2436 kg/day and the average stack height is 60m which by the dispersion of PM to the ambient based on the mixing depth, exit velocity, wind speed and wind direction is very low.

Water Environment

In the surface water, the concentration of PAH, Phenol and BOD present more than the limit value during CPCB CEPI 2018 samples, which may be due to domestic wastewater, sewerage, other localized activities across the canal, since the canal is the stretch of 163 kms in which the Manali area crossing will be only 1000m and along the bank of canal, the industries are provided with ZLD system so that, there is no effluent discharge into this stream. In addition to the existing four sampling stations located in the core zone, three additional surface water sampling stations were identified in the CEPI Impact Zone and analysed. The analysis results of November 2019 are summarized as follows:

1. **PAH:**

   All the results for PAHare observed lower than the standard limit of 0.2 mg/L·The values are below detectable level.

2. **Phenol:**

   Out of 7 samples 3 samples exceeds the standard limit of 0.01mg/L·The values vary between 0.001mg/L and 1.4mg/L.

3. **Biochemical Oxygen Demand:**

   All the values are observed below the standard limit of 8 mg/L except in one location. The value varies between 4 mg/L and 15 mg/L.

All the industries in Manali CEPI area are either reusing the treated trade effluent /sewage in their process/gardening or disposed into Sea. There is no disposal of treated trade effluent /sewage into Buckingham canal. But the Buckingham canal is contaminated with domestic sewage and other activities such as road side heavy vehicle/light vehicle washing, illegal municipal solid waste leachates. Further the only sources of PAH is combustion as well as by used/waste oil. As per the material balance of effluent/domestic waste water of industries which clearly indicates that there is no discharge of effluent/domestic waste water into surface water.

Further Buckingham canal is the manmade navigation canal and flows from Tamilnadu to Andra Pradesh with total length of 420km. Out of which 163km is in TamilNadu and throughout the stretches various discharges is being carried out and also the water carryover the sullages all the way and hence the Buckingham canal cannot be taken as exclusive contribution of Manali area and it cannot be taken as surface water source as it is salt water channel passing through Manali.

Land Environment

In the Ground water, it is observed high concentration of Phenol, PAH and Total phosphorous in all four locations of CPCB CEPI Manali 2018 samples. There were no sources of PAH and Phenol contamination to the ground water. In addition to the existing four sampling stations located in the core zone, three additional ground water sampling stations were identified in the CEPI Impact Zone and analysed the results are as follows:

1. **PAH:**

   All the results for PAHare observed lower than the standard limit of 0.2mg/L·The values are below limit of quantification.

2. **Phenol:**

   All the results for phenols are observed lower than the standard limit of 0.01mg/L·The values are below detection limit.

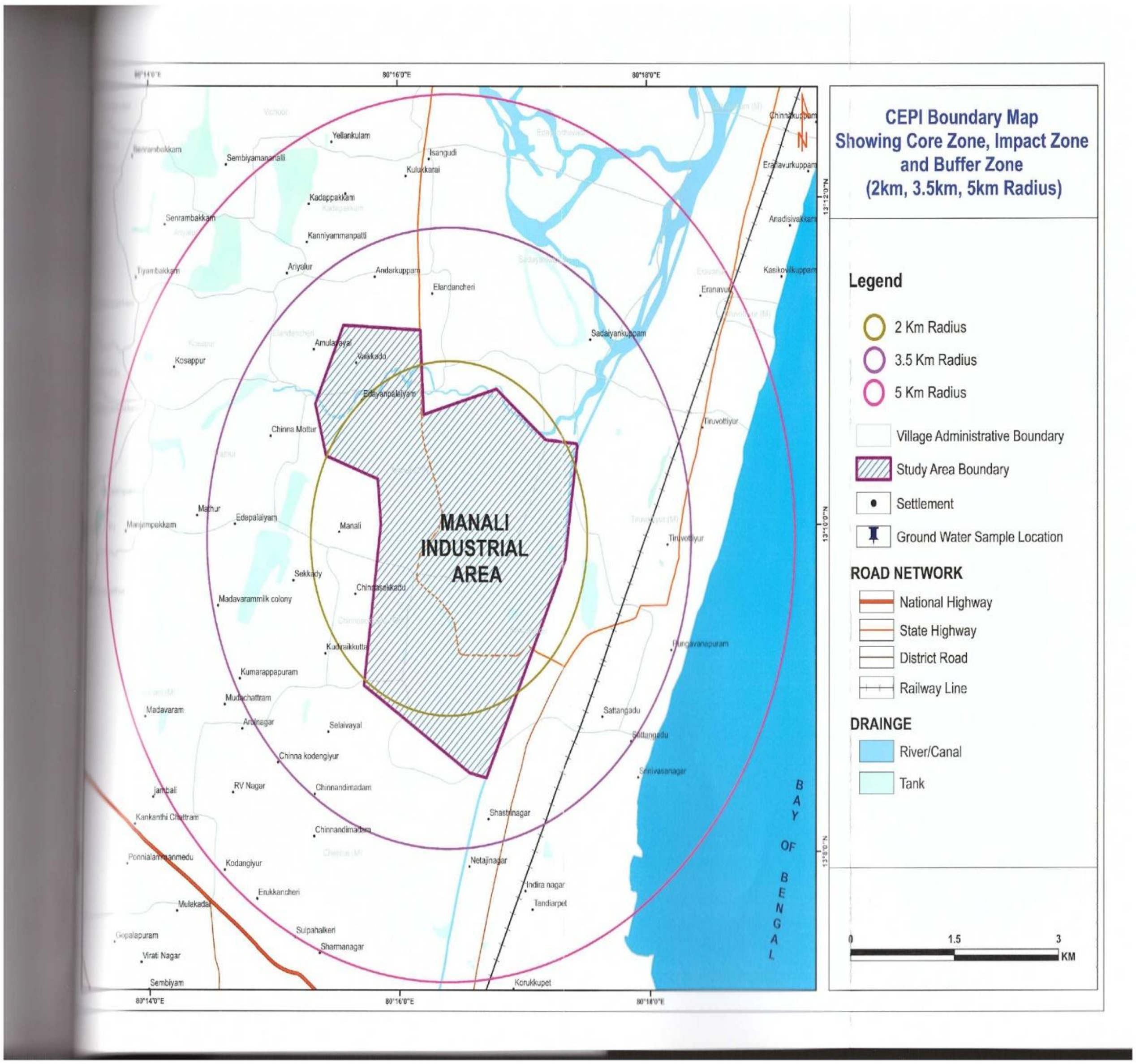
3. **Total Phosphorous:**

   Out of 7 samples 3 samples exceeds the standard limit of 0.3mg/L·The values vary between 0.05mg/Land1.93mg/L.

Which clearly indicates no ground water contamination of PAH, Phenol and Phosphorous based on the samples collected during November 2019.

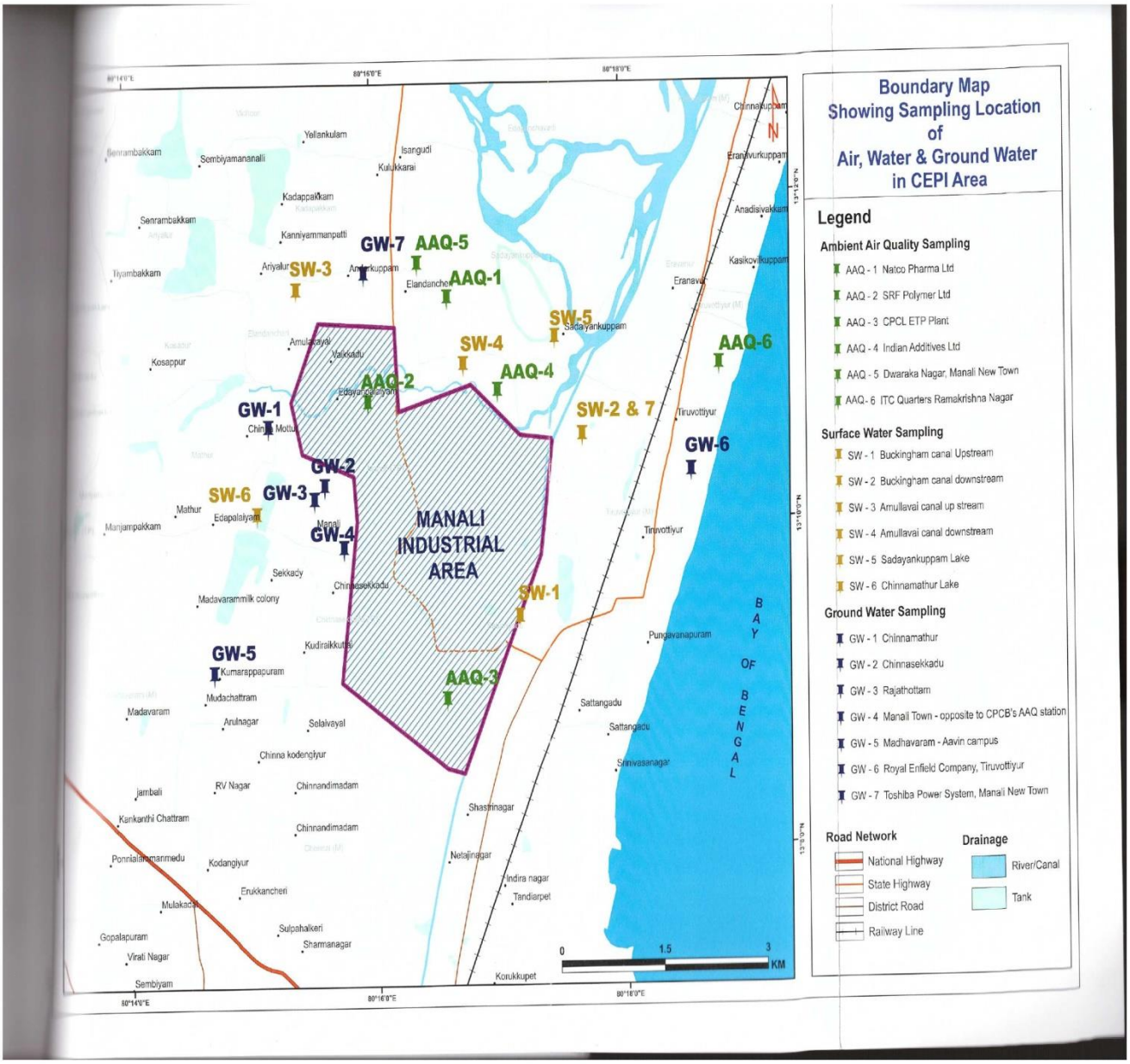
ANNEXURE – 1

CEPI BOUNDARY MAP SHOWING CORE ZONE, IMPACT ZONE AND BUFFER ZONE


CEPI Boundary Map
Showing Core Zone, Impact Zone
and Buffer Zone
(2km, 3.5km, 5km Radius)
Legend
2 Km Radius
3.5 Km Radius
5 Km Radius
Village Administrative Boundary
Study Area Boundary
Settlement
Ground Water Sample Location
ROAD NETWORK
National Highway
State Highway
District Road
Railway Line
DRAINGE
River/Canal
Tank
0
1.5
3
KM
N
MANALI
INDUSTRIAL
AREA
BAY
OF
BENGAL
80°16'0"E
80°18'0"E
80°14'0"E
Yellankulam
Sembiyamanamalli
Kadappakkam
Kanniyammanpatti
Ariyalur
Anderkuppam
Elandancheri
Sadaiyankuppam
Amulavoyal
Kosappur
Chinna Mottur
Mathur
Edapalaiyam
Manali
Sekkadu
Madavarammilk colony
Kumarappapuram
Madavaram
Selaivayal
Chinna kodengiyur
RV Nagar
Chinnandimadam
Kodangiyur
Erukkancheri
Sulpahalkeri
Sharmanagar
Virati Nagar
Sembiyam
Gopalapuram
Mulakadai
Ponniammanmedu
Kankanthi Chattram
Jambali
Tiruvottiyur
Saltangadu
Srinivasanagar
Shastrinagar
Netajinagar
Indira nagar
Tandiarpet
Korukkupet
Eranavur
Kasikovilkuppam
Anadisivakkam
Ernavurkuppam
Kuludkarai
Isangudi

ANNEXURE – 2

BOUNDARY MAP SHOWING SAMPLING LOCATION OF AIR, WATER & GROUND WATER IN CEPI AREA


Boundary Map
Showing Sampling Location
of
Air, Water & Ground Water
in CEPI Area
Legend
Ambient Air Quality Sampling
AAQ - 1 Natco Pharma Ltd
AAQ - 2 SRF Polymer Ltd
AAQ - 3 CPCL ETP Plant
AAQ - 4 Indian Additives Ltd
AAQ - 5 Dwaraka Nagar, Manali New Town
AAQ - 6 ITC Quarters Ramakrishna Nagar
Surface Water Sampling
SW - 1 Buckingham canal Upstream
SW - 2 Buckingham canal downstream
SW - 3 Amullavai canal up stream
SW - 4 Amullavai canal downstream
SW - 5 Sadayankuppam Lake
SW - 6 Chinnamathur Lake
Ground Water Sampling
GW - 1 Chinnamathur
GW - 2 Chinnasekkadu
GW - 3 Rajathottam
GW - 4 Manali Town - opposite to CPCB's AAQ station
GW - 5 Madhavaram - Aavin campus
GW - 6 Royal Enfield Company, Tiruvottiyur
GW - 7 Toshiba Power System, Manali New Town
Road Network
National Highway
State Highway
District Road
Railway Line
Drainage
River/Canal
Tank
MANALI INDUSTRIAL AREA
BAY OF BENGAL
GW-1
GW-2
GW-3
GW-4
GW-5
GW-6
GW-7
SW-1
SW-2 & 7
SW-3
SW-4
SW-5
SW-6
AAQ-1
AAQ-2
AAQ-3
AAQ-4
AAQ-5
AAQ-6
N
0
1.5
3
KM

ANNEXURE – 3

HEALTH DATA OBTAINED FROM HOSPITALS

Information on Health Statistics In Polluted Industrial Area

1. Name of the Polluted Industrial Area (PIA): Manali
2. Name of the Major Health Center/Organization: Govt. Hospital, Tiruvottiyur
3. Name and designation of the contact Person: –
4. Address: –

S.No		No. of Patients reported for the year				
	Air Borne Diseases	2017-2018	2016-2017	2015-2016	2014-2015	2013-2014
1	Asthma	1008	1010	980	1020	1002
2	Acute Respiratory Infection	11500	11010	20000	22500	21080
3	Bronchitis	720	700	745	730	710
4	Cancer	10	8	12	10	9
	Water Borne diseases					
5	Gastroenteritis	2100	2000	2080	2091	2210
6	Diarrhea	2400	2400	2410	2320	2540
7	Renal Diseases	6	5	7	6	6
8	Cancer					

5. Year of Establishment :

Signature of Hospital Head/Superintend

ASSISTANT SURGEON
GOVERNMENT HOSPITAL
THIRUVOTTIYUR
CHENNAI-600 019

Information on Health Statistics In Polluted Industrial Area

1. Name of the Polluted Industrial Area (PIA): Manali
2. Name of the Major Health Center/Organization: Aakash Hospital
3. Name and designation of the contact Person: Dr. A. Selvarajakumar
4. Address: as given below

		No. of Patients reported for the year				
S.No	Air Borne Diseases	2017-2018	2016-2017	2015-2016	2014-2015	2013-2014
1	Asthma	27	34	25	18	11
2	Acute Respiratory Infection	95	89	92	51	30
3	Bronchitis	33	51	45	38	21
4	Cancer	65	53	58	43	38
	Water Borne diseases					
5	Gastroenteritis	199	202	213	109	94
6	Diarrhea	–	–	–	–	–
7	Renal Diseases	89	98	84	71	68
8	Cancer					

5. Year of Establishment :

AAKASH HOSPITAL ... T.H. Road, Chennai-19

Signature of Hospital Head/Superintend

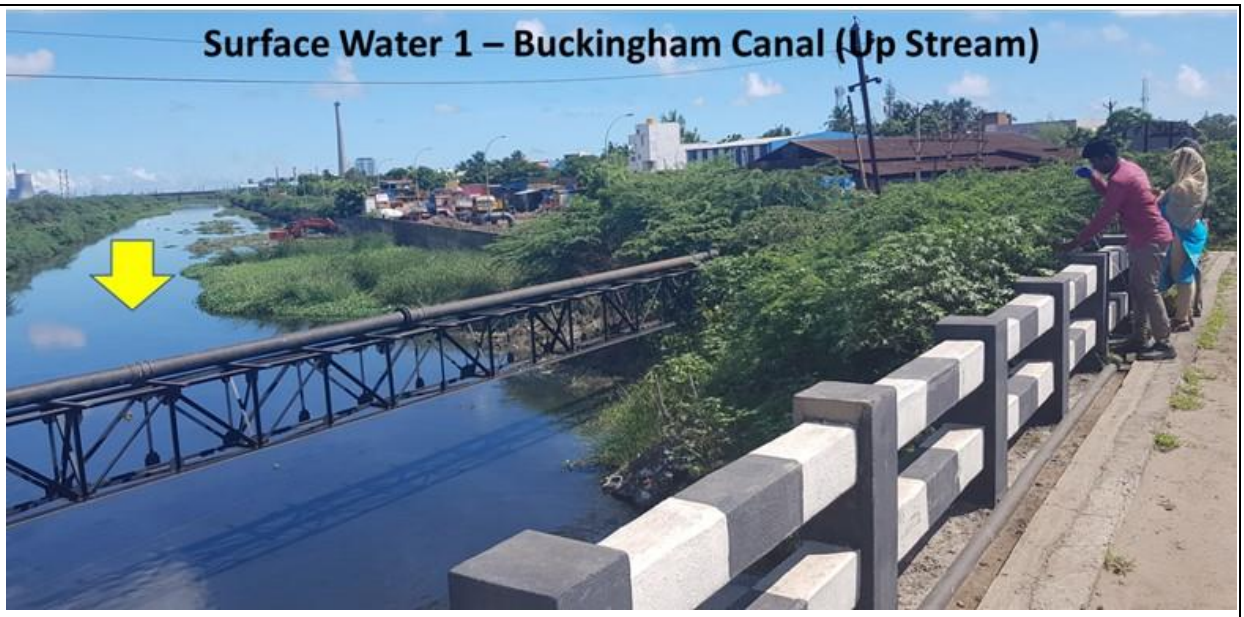
Dr. A. SELVARAJAKUMAR, M.S
AAKASH HOSPITAL
393/1, T.H. ROAD,
THIRUVOTTIYUR,
...600 019

ANNEXURE – 4

PHOTOS OF IMPROVEMENTS CARRIED OUT BY INDUSTRIES & OTHER INITIATIVE WORKS IN CEPI AREA

ANNEXURE – 5

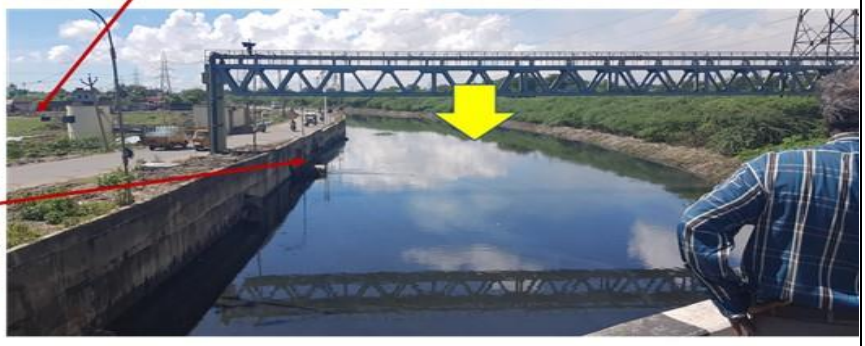
CEPI SURFACE WATER & AIR SAMPLING LOCATIONS



Surface Water 2 – Buckingham Canal (Down Stream)

Behind CPCL Refinery and Opposite to Dump yard

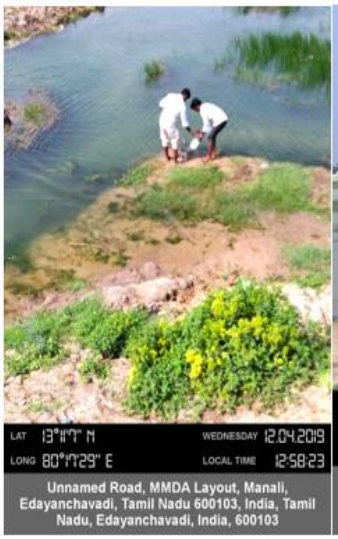
MSW Dumpsite and leachate from the dump which is parallel (5m) from Buckingham canal.



Sewage Intrusion into the Buckingham canal where samples collected

Surface Water 4 – Kosasthalayar (Up Stream)

Surface Water - Sadayankuppam lake

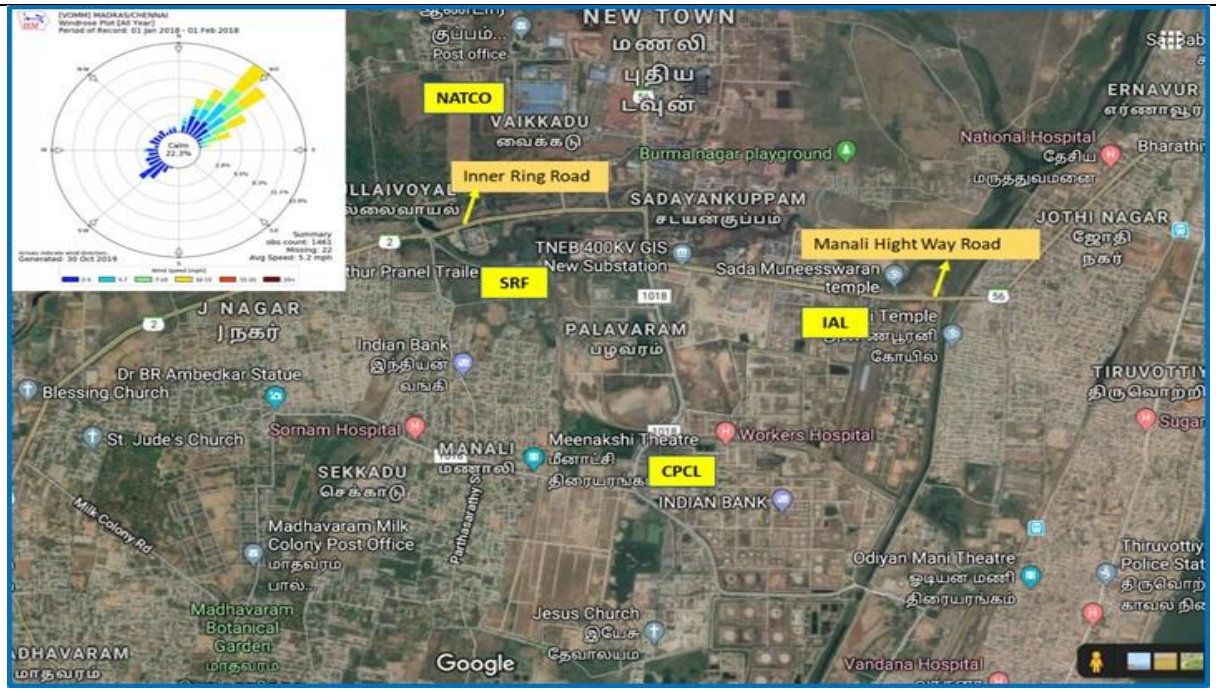


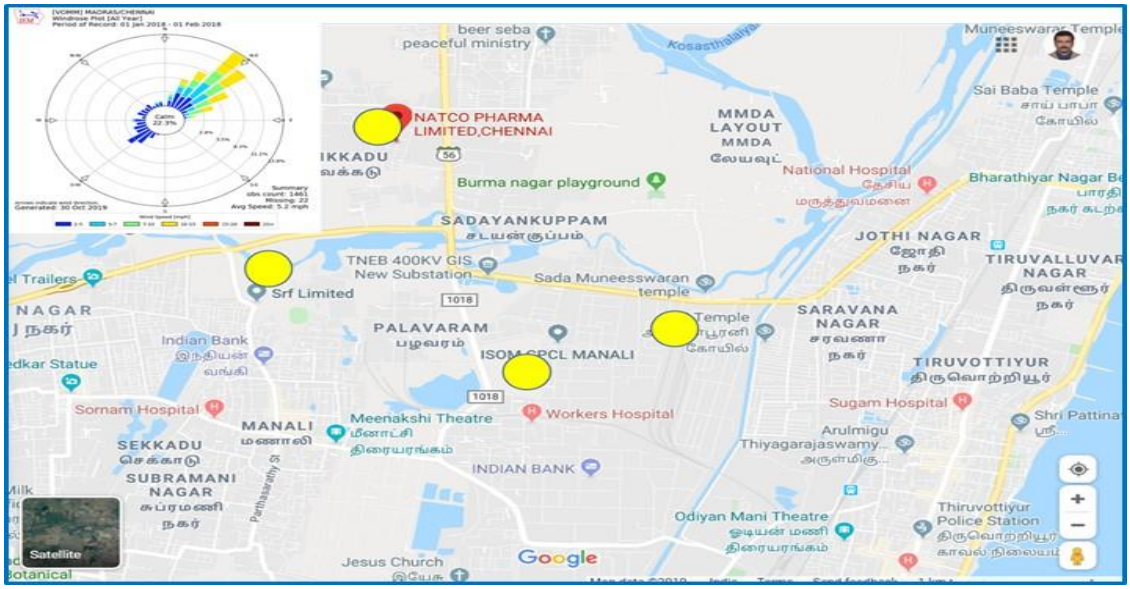
Surface Water - Chinnamathur Lake

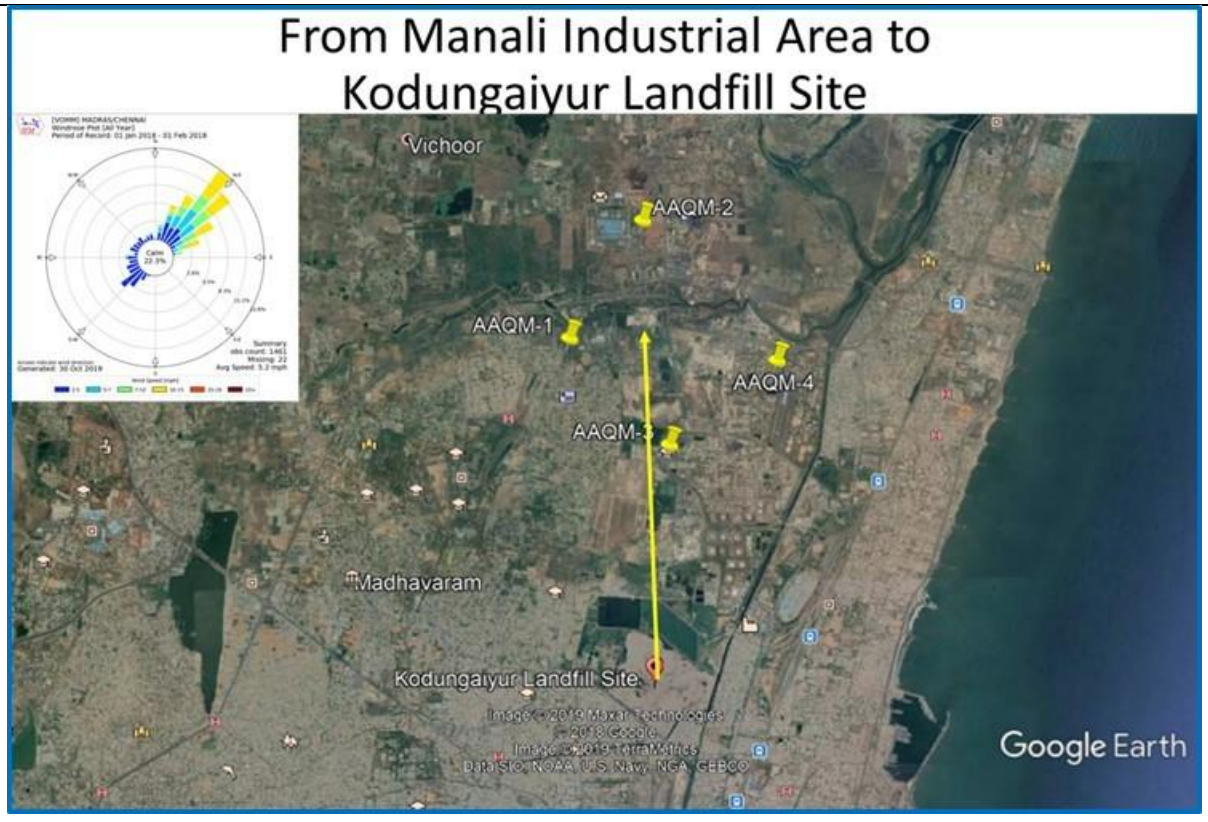
PHOTOGRAPHS OF GROUND WATER SAMPLING LOCATION, MANALI, TAMILNADU

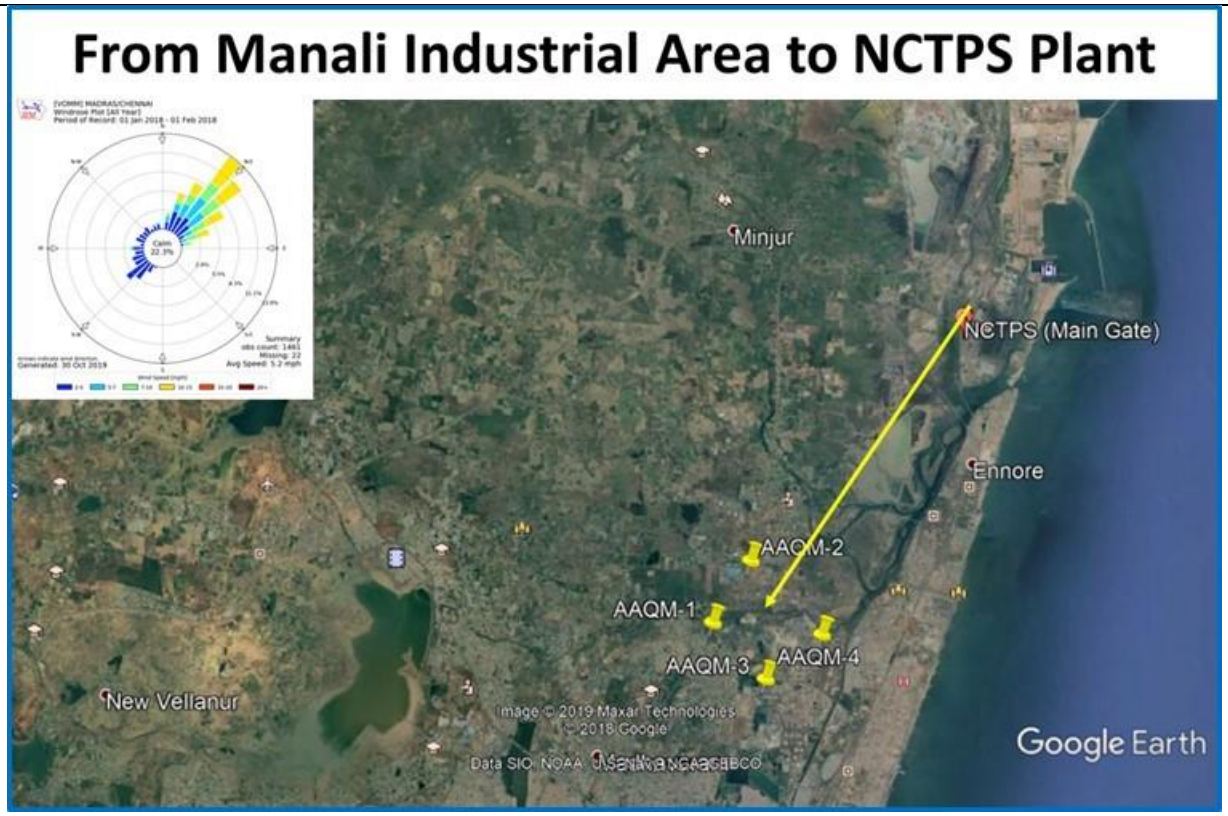
Air Sampling Locations:

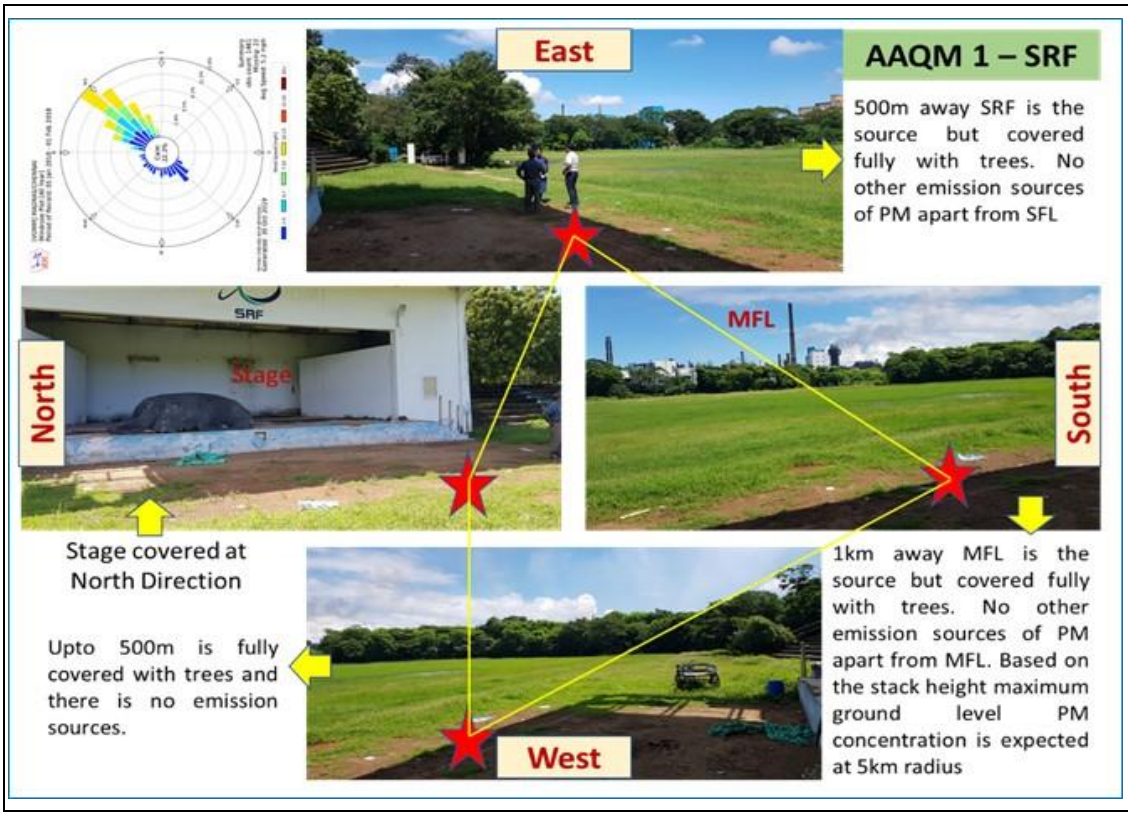
AAQM Locations in 2018 CEPI Monitoring:

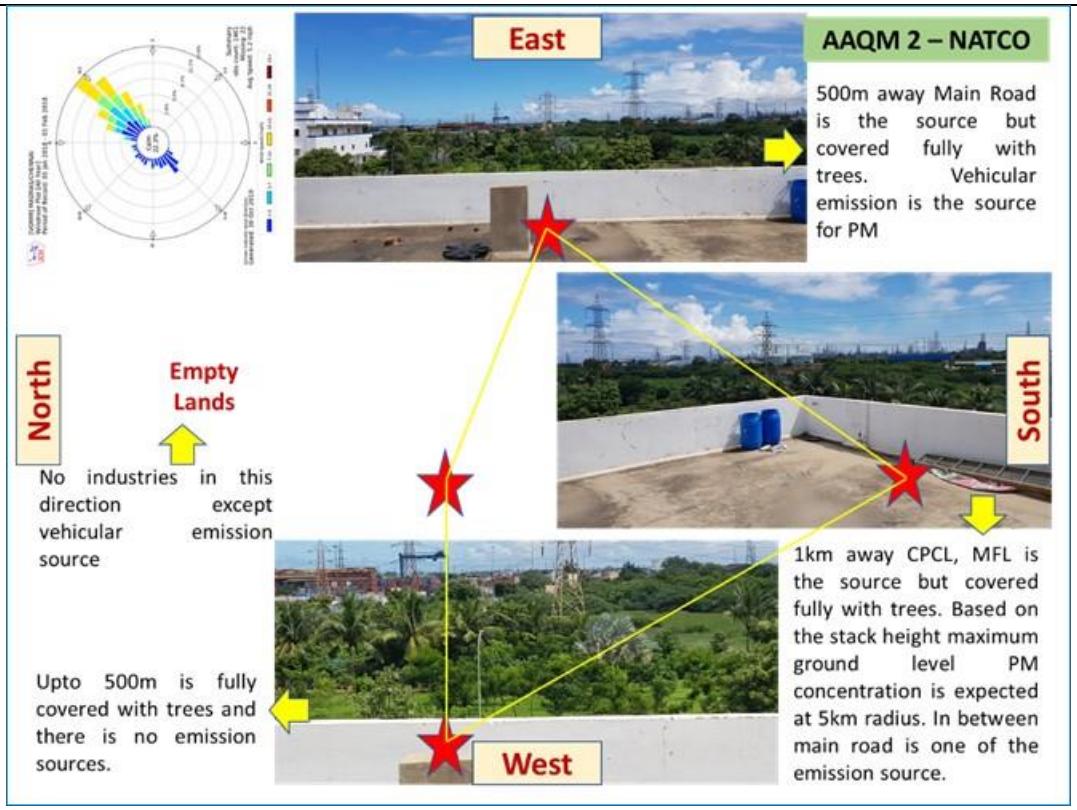


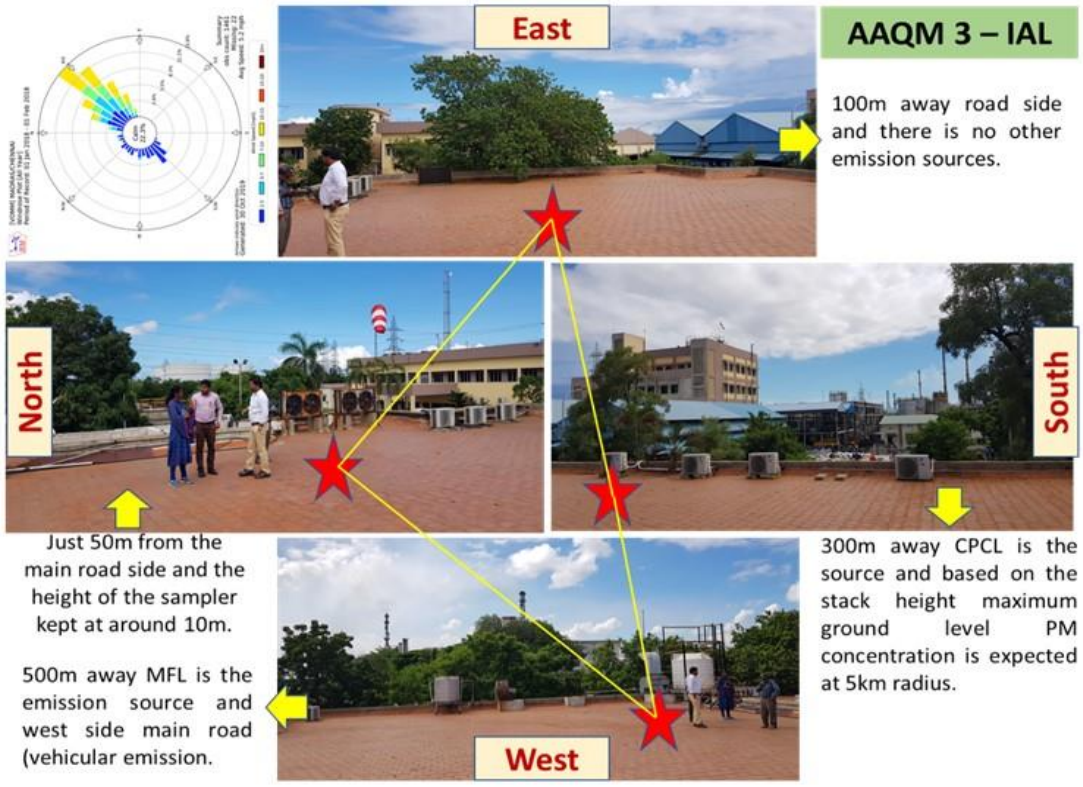

beer seba
peaceful ministry
NATCO PHARMA
LIMITED,CHENNAI
MMDA
LAYOUT
MMDA
Burma nagar playground
National Hospital
SADAYANKUPPAM
JOTHI NAGAR
TNEB 400KV GIS
New Substation
Srf Limited
Sada Muneeswaran
temple
TIRUVALLUVAR
NAGAR
SARAVANA
NAGAR
PALAVARAM
ISOM CPCL MANALI
TIRUVOTTIYUR
Indian Bank
Sornam Hospital
Meenakshi Theatre
Workers Hospital
Sugam Hospital
MANALI
SEKKADU
INDIAN BANK
SUBRAMANI
NAGAR
Odiyan Mani Theatre
Thiruvottiyur
Police Station
Jesus Church
Satellite
Google


From Manali Industrial Area to
Kodungaiyur Landfill Site
Vichoor
AAQM-2
AAQM-1
AAQM-4
AAQM-3
Madhavaram
Kodungaiyur Landfill Site
Google Earth


From Manali Industrial Area to NCTPS Plant
Minjur
NCTPS (Main Gate)
Ennore
AAQM-2
AAQM-1
AAQM-3
AAQM-4
New Vellanur
Image © 2019 Maxar Technologies
© 2018 Google
Google Earth


East
AAQM 1 – SRF
500m away SRF is the source but covered fully with trees. No other emission sources of PM apart from SFL
North
SRF
Stage
MFL
South
Stage covered at North Direction
Upto 500m is fully covered with trees and there is no emission sources.
1km away MFL is the source but covered fully with trees. No other emission sources of PM apart from MFL. Based on the stack height maximum ground level PM concentration is expected at 5km radius
West


East
AAQM 2 – NATCO
500m away Main Road is the source but covered fully with trees. Vehicular emission is the source for PM
North
Empty Lands
No industries in this direction except vehicular emission source
South
Upto 500m is fully covered with trees and there is no emission sources.
1km away CPCL, MFL is the source but covered fully with trees. Based on the stack height maximum ground level PM concentration is expected at 5km radius. In between main road is one of the emission source.
West


East
AAQM 3 – IAL
100m away road side and there is no other emission sources.
North
South
Just 50m from the main road side and the height of the sampler kept at around 10m.
500m away MFL is the emission source and west side main road (vehicular emission.
300m away CPCL is the source and based on the stack height maximum ground level PM concentration is expected at 5km radius.
West

001412

MINUTES OF THE COMMITTEE MEETING CONSTITUTED FOR CEPI ACTION PLAN OF MANALI LOCATED IN TAMILNADU HELD ON 09.01.2020 IN THE CHAMBER OF PRINCIPAL SECRETARY ENVIRONMENT & FORESTS DEPARTMENT, SECRETARIAT, CHENNAI.

Present:

1. Thiru. Shambhu Kallolikar I.A.S.,
   Principal Secretary to Government,
   Environment & Forests Department, Secretaraiat, Chennai.

2. Thiru. A.V.Venkatachalam, I.F.S,
   Chairman,
   Tamil Nadu Pollution Control Board, Chennai.

3. Dr. S.Selvan
   Chief Environmental Engineer,
   Tamil Nadu Pollution Control Board, Chennai

4. Dr.A.Viswanathan, JD (Acts)
   O/o the Directorate of Medical & Rural Health Services

5. Tmt.H.Prabhavathy, GM (PI) i/c
   Representative of State Industries Promotion Corporation of Tamilnadu (SIPCOT)

6. Thiru.A.Sohail Ahmed,
   Technical Expert (GP), O/o Chief Engineer, PWD, W.R.O.,
   State Ground & Surface Water Resources Data Centre,
   Taramani, Chennai – 600 113.

7. Other TNPCB Officials.

The Chief Environmental Engineer, Tamil Nadu Pollution Control Board welcomed the committee members and officials of TNPCB and briefed about the new CEPI methodology adopted by CPCB.

Dr.S.Suresh Kumar from G lens Innovations Labs Pvt Ltd on behalf of AC Tech, Chennai (hired as third party by TNPCB for analysis and assessment of CEPI – post monsoon 2019) detailed the the concept of CEPI and briefed about the individual CEPI scores of CPCB in 2018 in Tamilnadu

and the present post monsoon scores in 2019 with regard to Air, Water and Land Environment in the 8 industrial clusters of Vellore, Manali, Coimbatore, Erode, Mettur, Tuticorin, Tiruppur, and Cuddalore.

With regard to Manali CEPI area Dr.S.Suresh Kumar briefed the following

1. The CEPI scores for the last five periods are as follows

Period	CEPI Score
CEPI Score 2019	26.26
CEPI Score 2018	84.15
CEPI Score 2013	77.26
CEPI Score 2011	88.88
CPCB Report 2009	76.32

2. In the aggregated CEPI score of 2018, it has been reported that the Sub Index values for Air is 59.75, Water is 72.25 and Land is 71.75, thus the CEPI score was **84.15**, whereas in the present aggregated CEPI score during 2019 for the Sub Index values for Air is 14, Water is 24 and Land is 21.25, thus the CEPI score has reduced to **26.25**.
3. It has been distinguished for the high CEPI score in 2018 and for low CEPI score in 2019.

   The main reasons attributed for high CEPI score include,

   a. Presence of PM10 and PM2.5 exceeding in almost all locations due to vehicular emission.
   b. All sampling locations are just 20 to 30 M from Roadways.
   c. NCTPS is located 7km from the Manali industrial area and the stack height is 220m, likelihood of PM contribution in this CEPI area.
   d. Buckingham and Amullavoyal canals flowing close to Manali areas have been considered for surface water

quality. The crossing of Buckingham canal at Manali is only 1km, whereas its stretch is 163 kms. The entire stretch of Buckingham canal has intrusion of sewage, road side heavy vehicle/light vehicle washing, illegal municipal solid waste leachates in the upstream and downstream of Manali.

e. The industries Effluent generation is 52.47 MLD, in which all the effluents are reused or marine disposed. All major industries have provided ZLD systems.
f. BOD, Phenol, PAH exceeded in most of the samples and this may due to domestic sewage and other localized activities.
g. PAH is only from the combustion source, whereas in the ground water PAH got detected with high concentration.
h. The TDS and Total Hardness values are well below within the limits, which clearly indicates the ground water is not contaminated.

The main reasons for less CEPI score in 2019 include,

i. Additional AAQM locations identified to cover the entire core industrial area
ii. Presently, locations are relocated away from the vehicular sources
iii. All industries have provided proper APCD and the same is monitored through online monitoring system.
iv. For the entire trade effluent of 50.24 MLD generation, marine disposal and ZLD system have been provided and there is no discharge outside. For the sewage of 2.22 MLD generated from industries, it is treated and reused for green belt development. Thus there is no disposal of sewage outside.

v. Health data statistics shows that the No. of incidences is less than 5%, so the CEPI score on Health is 0.

4. To the queries raised by the Principal Secretary, it was clarified that the critical parameters and locations identified by CPCB during 2018 was also followed while sampling during 2019. Representative of Chief Engineer, PWD, W.R.O. wanted to know whether other parameters could be included for CEPI assessment, for which it was replied that the protocol followed by CPCB had to be adopted for harmonious CEPI calculation every year. To the representative of Director of Medical & Rural Health Services, it was clarified that as per the direction issued by CPCB on 26.04.2016, the air and water borne diseases to be considered in the health data are Asthma, Bronchitis, Cancer, Acute respiratory infections, Gastroenteritis, Diarrhea, renal (kidney) malfunction cancer etc
5. After detailed discussion the committee members decided to approve the CEPI action Plan prepared for Manali in Tamil Nadu and to submit to CPCB, New Delhi

With the above, the meeting came to an end.

S.No.	Members	Signature
1.	Thiru. Shambhu Kallolikar IAS., (Chairman of Committee) Principal Secretary to Government, Environment & Forests Department	
2.	Member Secretary, Tamilnadu Pollution Control Board, Chennai	Dr. S. Selvan CEE For Member Secretary.

3.	Director of Medical & Rural Health Services	Dr A. VISWANATHAN, MS JD (Acts)
4.	Representative of State Industries Promotion Corporation of Tamilnadu (SIPCOT)	H. Prabhavathy (H. PRABHAVATHY) G.M (PI) i/c, SIPCOT
5.	Chief Engineer, PWD, W.R.O., State Ground & Surface Water Resources Data Centre, Taramani, Chennai – 600 113	(A. SULTAN AHMED) Technical Expert (Geology) O/o the Chief Engineer, PWD & SWRDC, Chennai-600 113

Annexure R7 - 4

SPEED POST

CPCB/IPC-VII/CEPI/TN-Action Plan 68 **Dated: 15.05.2020**

To
The Member Secretary,
Tamil Nadu Pollution Control Board,
No. 76, Mount Salai, Guindy
Chennai-600 032

Sub: Hon'ble NGT orders in the matter of OA. No. 1038/2018 (CEPI matter)-Action Plans for the polluted industrial areas identified as CPAs/SPAs

Sir,

This has reference to Hon'ble NGT order, dated 13.12.2018, in the matter of O.A. No. 1038/2018, directing SPCBs/PCC to finalise time bound action plans with regard to the identified polluted industrial clusters. In this regard, Tamil Nadu PCB has submitted the action plans for Manali, Ranipet, Mettur and Tirupur industrial clusters (categorised as CPAs) and Coimbatore, Cuddalore, Erode, Thothukudi industrial areas (categorised as SPAs), vide letter No. TS4/TNPCB/F.2643/2020, dated 22.01.2020. The Central Board, after looking into the action plans, suggests the following views/recommendations for consideration and incorporation in the action plans:

- Action points for management of municipal solid wastes, vehicular pollution control, road dust emission etc.,
- Carrying out of CEPI monitoring as per the direction of CPCB dated 26.4.2016 for the parameters as per the protocol and locations already identified.
- Restoration of polluted water bodies/contaminated sites.
- Carrying out of source apportionment study for further planning of pollution control.

It is requested to modify the action plans accordingly, and upload the same at TNPCB's website. The progress of implementation of action plans should be reviewed quarterly by the concerned Committees constituted for this purpose and the status report should be uploaded at TNPCB's website.

It is further requested to provide a hard copy and also a soft copy of revised action plans to the Central Board.

Yours faithfully,

(P.K. Gupta)
AD & Div. Head, IPC-VII
(e-mail: ipc7.cpcb@gov.in)

O/C

18/05/20