

# **ACTION PLAN FOR INDUSTRIAL CLUSTER : NAVI MUMBAI**



**November-2010**

**Maharashtra Pollution Control Board**

**Kalpataru Point 2<sup>nd</sup>, 3<sup>rd</sup>, & 4<sup>th</sup> floor,  
Opposite Cine Planet Cinema,  
Near Sion Circle, Sion (E)  
Mumbai – 400 022.**

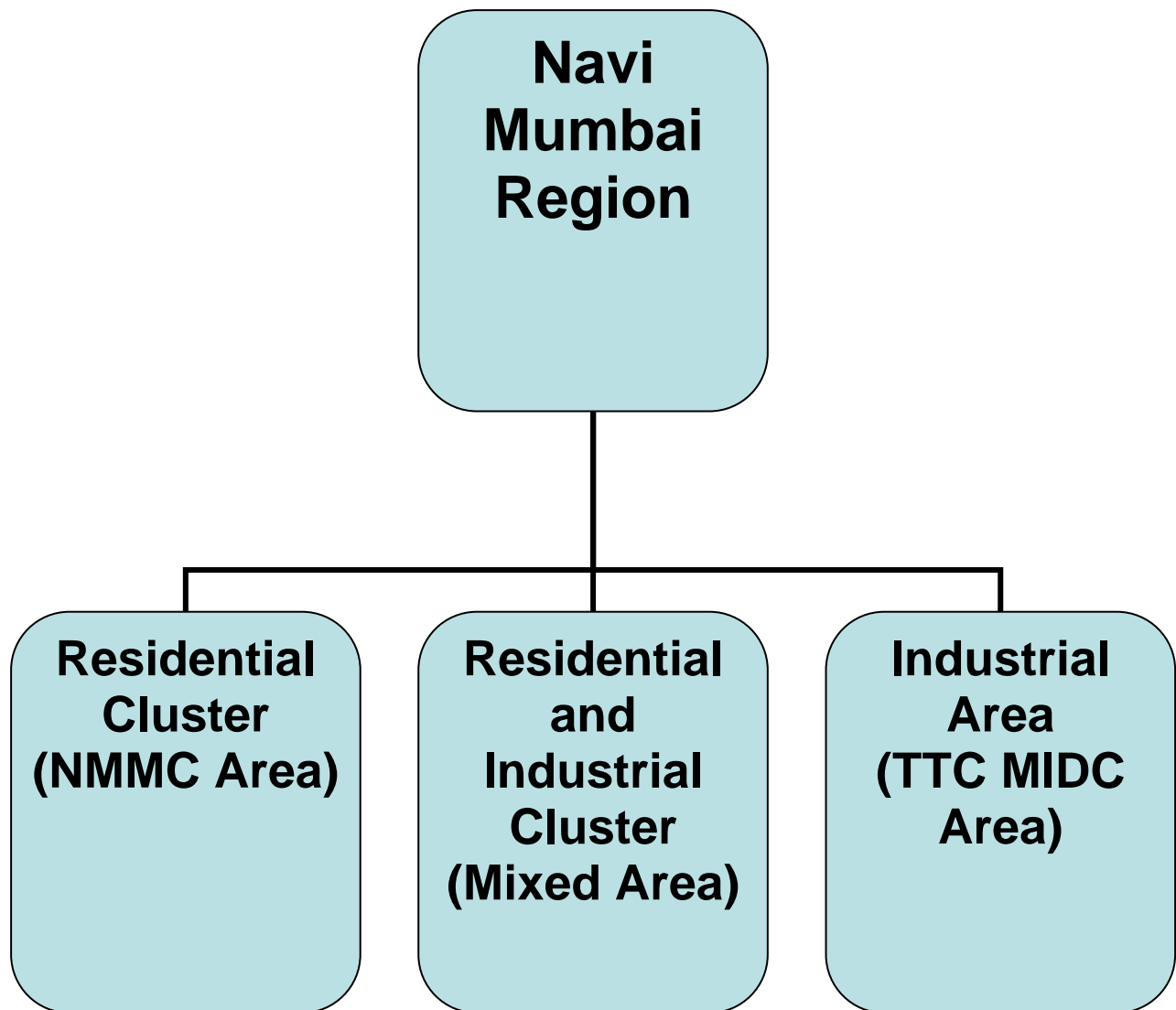
**Website: [www.mpcb.gov.in](http://www.mpcb.gov.in)**

**Regional Office – Navi Mumbai**  
**Action Plan**

**November-2010**

- **For Water Environment**
- **For Air Environment**
- **For Land Environment**

## Core Sector of Navi Mumbai Region



## **1.INTRODUCTION**

### **1..1 Area detail :**

Maharashtra Industrial Development Corporation established an industrial estate at Thane Belapur Road, Navi Mumbai in 1963 which is oftenly known as TTC MIDC Estate. The Estate is located along Thane Belapur Road towards Northern side of road and total area of the industrial estate is 27 sq.kms.

There are about 2200 industrial units of various category engaged in the manufacture of chemicals, dyes, dye-intermediates, Bulk drugs, pharmaceuticals, Textile auxiliaries, Pesticides, Petrochemicals, Textile processors, Engineering units etc. Some of them are generating trade effluent and total effluent quantity from all these unit is 26 MLD. All the major & medium industries have provided full-fledged effluent treatment plant and the small industries have provided primary effluent treatment plants (ETP). The treated effluent of the industries is discharged into Common Effluent Treatment Plant (CETP) for further treatment and disposal. The effluent is further treated in CETP and then discharged into TTC creek through closed pipeline at the point recommended by National Institute of Oceanography (NIO).

All the air polluting industries have provided emission control systems such as Scrubbers, Wet scrubbers, Dust collectors and stacks of sufficient height. Some industries generate hazardous waste from their process and effluent treatment plant. The Hazardous waste is sent to CHWTSDF.

There are two major common infrastructures in TTC MIDC area. One is Common Effluent Treatment Plant (CETP). Capacity of the CETP is 27 MLD and based on extended aerations activated sludge process technology. The treated effluent from the industries is collected through closed pipeline. The CETP comprises of collection / equalization / neutralization sump, Clariflocculator, Aeration tank, clarifier, sludge drying beds & decanter etc.

Another infrastructure is Common Hazardous Waste Treatment Storage and Disposal Facility (CHWTSDF) provided by TTC Waste Management Association. The Hazardous Waste from the Navi Mumbai area is discharged at the facility by either direct landfill (DFL) or landfill after treatment (LAT) as required. The incineratable waste is sent to another CHWTSDF at Talaja, provided by M/s. Mumbai Waste Management Ltd. MIDC Talaja, Dist. Raigad.

There is a Township newly established by CIDCO on the either side of Thane Belapur Road which is known as Navi Mumbai and is governed by Navi Mumbai Municipal Corporation (NMMC). Population of the Town is above a million. Requirement of water for the Township is 317 MLD which is fulfilled by Morbe, Barvi and Hetwane dam, and generation of sewages is 245 MLD. The NMMC have provided 7 Sewage Treatment Plants (STP) at various places. Three of them are fully equipped and working satisfactorily. Another three are being upgraded and time schedule for up-gradation is June, 2011. The seventh STP is to be scrapped and the sewage is to be connected to the nearby STP as feasible. The work is under investigation. At present, it is operating.

About 550 MT/D of Municipal solid waste is generated in Navi Mumbai for which NMMC has developed landfill site at Turbhe. The site is already in operation where MSW is disposed off scientifically. NMMC has proposed to install Waste to Compost and RDF (Refuse Derived Fuel) project. Work is in progress and the project will be commissioned by October 2010. There are leachates from the MSW dumping cells for which leachate treatment plant is being installed. The plant is under construction and will be commissioned by February 2011. At present, leachates are transported to Vashi STP through tanker for treatment and disposal.

Besides the industries, there are other sources which are major contributors for pollution, especially air pollution. Navi Mumbai is a developing town and so many construction activities are going on. There is lot of emissions by transport and handling of cement and other construction material. There is another organization i.e. Agro Produces Marketing Committee (APMC) where there is huge transaction of agro products. There is lot of emissions due to transport, loading, unloading and handling of agro produces. These activities contribute air pollution.

Another major source for air pollution is the transport. Navi Mumbai is the major pass-way for Mumbai and Thane and lacs of vehicles pass to and fro. The auto exhaust as well as dust emissions from these vehicles contribute lot of air pollution. There are also other source of stationery emissions such as Rail/Bus transport, Market places etc. The sources other than the industries contribute more.

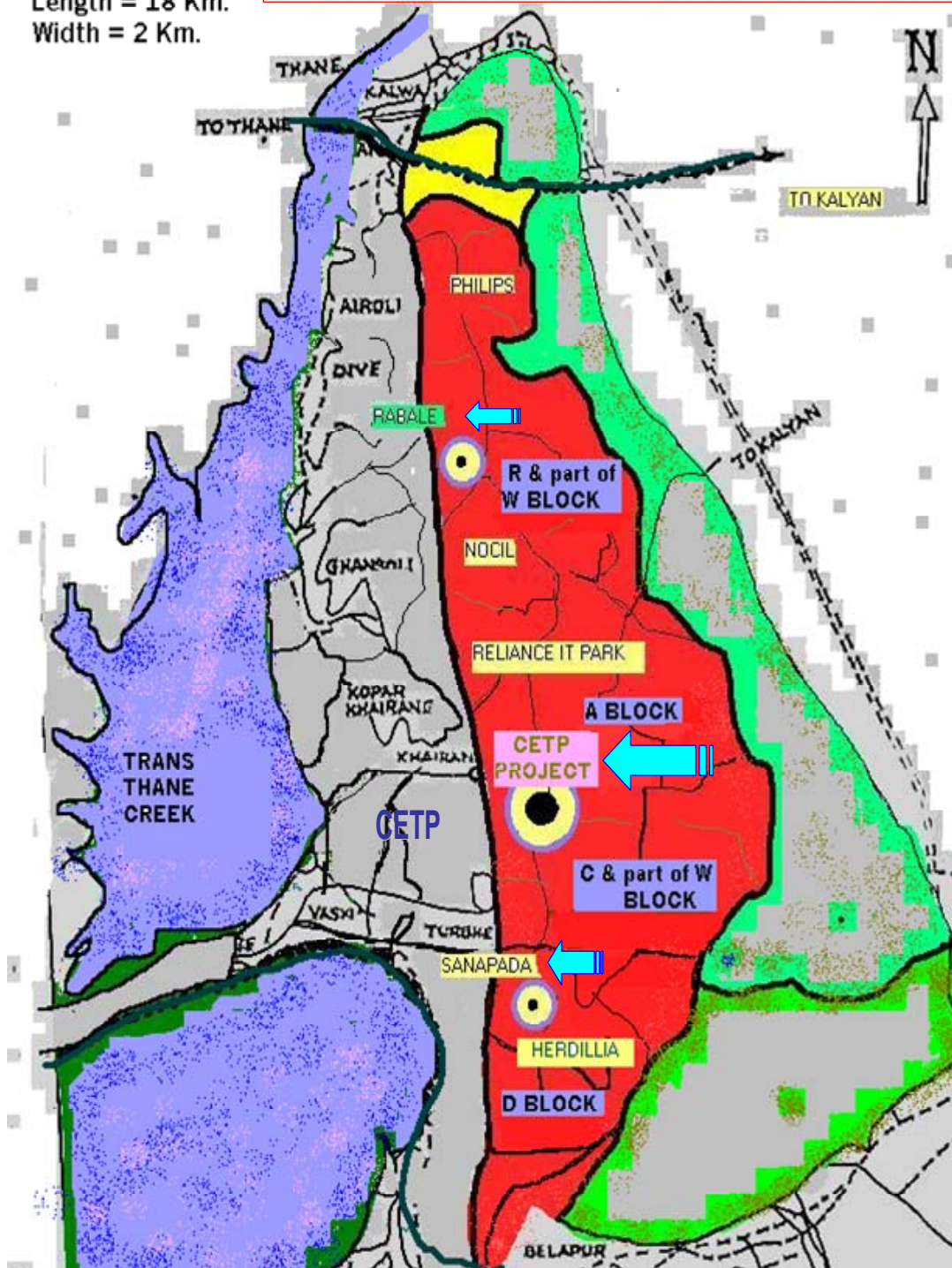
## **1.2. Location :**

<b>Name of the Industrial cluster</b>	TTC MIDC area, Thane Belapur Road, Navi Mumbai.
<b>Area</b>	Approx. 27 Sq.km.
<b>Surroundings</b>	East : Parsik Hill range. West : Thane Municipal Area North: Parsik Hill South : Thane Belapur Road , and Navi Mumbai Township.

**Digitized Map :**

TTC INDL. AREA  
Length = 18 Km.  
Width = 2 Km.

**TTC INDUSTRIAL AREA AND CETP LOCATION**



#### 1.4. CEPI Score of Navi Mumbai for (Air, Water, Land and Total) :

CPCB has published a report on Comprehensive Environmental Assessment of Industrial Cluster in December 2009. In respect of industrial estates in the Maharashtra Chandrapur, Dombivali, Aurangabad, Navi Mumbai & Tarapur have been designated as critical /severe from environmental pollution angle. The CPCB report diverted out attention towards environmental quality and it felt to be improved further.

CEPI SCORE														
Sr. No.	PARTICULAR	POLLUTANTS			PATHWAYS				RECEPTOR				AHRE	CEPI SCORE
		A1	A2	A = (A1 x A2)	B1	B2	B3	B = (B1+B2+B3)	C1	C2	C3	C = (C1 x C2) + C3	D	
1	AIR	6.0	5.0	30.0	6.0	0.0	0.0	6.0	3.0	5.0	0.0	15.0	10.0	61.0
2	WATER	3.0	5.0	15.0	8.0	3.0	3.0	14.0	5.0	3.0	5.0	20.0	10.0	59.0
3	LAND/SOIL	3.0	5.0	15.0	6.0	1.5	3.0	10.5	5.0	3.0	5.0	20.0	10.0	55.5

#### 1.5. Information of the cluster and its impact zone:

The population pressure on the city is ever growing. As per the 2001 census, the Population of the residential area around the industrial area of Navi Mumbai is about 7.5 lacs numbers and as per growth rate considered as 10% per annum, the present population is about 12.5 lacs.

Navi Mumbai enjoys a tropical climate with mean annual temperature of 23.3<sup>0</sup> C (min) to 34.9<sup>0</sup> C (max). The hottest and driest part of the year is April-May, when temperature rises to 39<sup>0</sup> C. The humidity is usually in the range of 58 to 84% and sea breeze in the evening hours is a blessing to combat the high temperature and humidity during summer months. The average southwest monsoon rainfall is in the range of 1850mm to 2000mm.

The Residential area is adjacent to the cluster of TTC industrial area. The following information /data are available from the source of Navi Mumbai Municipal Corporation.

1.	Population	Above 10 Lakhs
2.	Hospitals	Approx. 178 (Bedded)
3.	Education Institute	Approx. 200
4.	Courts	One

### **1.6. Eco-geological features Impact Zone :**

#### **1.6.1 The Major Water Bodies (River, Lakes, ponds, etc.):**

There are 7 small village lakes exists in the vicinity of Navi Mumbai cluster. Following is the list of those lakes;

- i) Rabale lake.
- ii) Digha lake.
- iii) Lake Near Bachat Bhavan.
- iv) Lake Near Karave Village.
- v) Lake Near Dharave Village.
- vi) Chincholi lake, Juinagar.
- vii) Lake Near Turbhe Village.

**1.6.2.** No Ecological parks, Sanctuaries, flora and fauna or any eco sensitive zones within radius of 2 Km of the cluster.

**1.6.3.** No Buildings or Monuments of Historical / archaeological / religious importance within radius of 2 Km of the cluster.



## 1.7. Industry classification :

The TTC-MIDC is one of the biggest industrial zones in India. This industrial cluster consists of mainly Chemical, Textile, Bulk-drug manufacturing Units and also has IT Parks.

<b>Sr.No.</b>	<b>Type of Industries</b>	<b>No. of Industries</b>
1.7.1.	Highly Polluted Industries (Under CREP -17 categories).	<b>23</b>
1.7.2.	Red Category Industries (54 categories)	<b>548</b>
1.7.3.	Orange and Green Category Industries	<b>1478</b>
1.7.4.	Grossly Polluted Industries	<b>Nil</b>

## 2. WATER ENVIRONMENT

**2.1.1** The MIDC has made its own arrangements for supplying water to the industries.

There is no direct or indirect discharge of effluent in the water bodies. However, MPCB monitors four Nallas passing through the industrial cluster.

**2.1.2.** Present levels of pollutants in water bodies/effluent receiving drains/ground water (routine parameters, special parameters and water toxics relevant to the area in three categories – known carcinogens, probable carcinogens and other toxics)

There are four Nallas viz. Juinagar Nalla, Alok Nalla, Nocil Nalla and Airoli Nalla, and the creek water monitoring points at Airoli Bridge and Vashi Bridge.

**Results of Water Quality in Nallas Monitored by MPCB:**

<b>Sr.No.</b>	<b>Location</b>	<b>pH</b>	<b>SS</b>	<b>BOD</b>	<b>COD</b>
1.	Airoli Nalla	7.1	47	7.1	386
2.	Nocil Nalla	7.1	47	7.1	348
3.	Alok Nalla	7.0	64	7.0	156
4.	Nalla Near Juinagar Station	7.1	62	7.1	116

## Water Quality Monitored at : **Vashi Creek at Airoli Bridge**

Name of the program	: NWMP	Type of Sample	: Surface
Class	: N/A	Frequency	: Monthly (Trend)
Regional Office	: Navi Mumbai	Regional Lab	: ---

Months	Parameters																	
	pH			Dissolved Oxygen (mg/l)			B.O.D. (mg/l)			C.O.D. (mg/l)			Nitrate (mg/l)			Fecal Coliform (MPN/100 ml)		
YEAR : 2009																		
January	7.2			3.6			8.0			N/A			1.4			80.0		
February	7.1			3.8			7.0			N/A			1.9			350.0		
March	7.6			4.5			8			N/A			2.05			250		
April	7.7			3.8			16			152			2.65			250		
May	7.3			3.8			18.0			N/A			2.4			130.0		
June	7.9			5.0			11			N/A			2.19			170		
July	8.3			4.0			12.0			N/A			1.26			110.0		
August	7.9			5.5			7.0			N/A			1.27			170.0		
September	7.7			5.7			8.0			N/A			3.2			170.0		
October	7.4			5.6			12.0			N/A			2.1			250.0		
November	7.3			5.2			12.0			N/A			2.33			140.0		
December	7.9			4.1			6.0			N/A			1.43			130.0		
=====																		
TOTAL	MIN MAX AVG			MIN MAX AVG			MIN MAX AVG			MIN MAX AVG			MIN MAX AVG			MIN MAX AVG		
	7.1	8.3	7.61	3.6	5.7	4.55	6.0	18.0	10.42	152	152	12.67	1.26	3.2	2.02	80.0	350.0	183.33

## Water Quality Monitored at : **Vashi Creek at Vashi Bridge**

Name of the program	: NWMP	Type of Sample	: Surface
Class	: N/A	Frequency	: Monthly (Trend)
Regional Office	: Navi Mumbai	Regional Lab	: ---

Months	Parameters																	
	pH			Dissolved Oxygen (mg/l)			B.O.D. (mg/l)			C.O.D. (mg/l)			Nitrate (mg/l)			Fecal Coliform (MPN/100 ml)		
YEAR : 2009																		
January	7.7			4.6			8.0			N/A			1.8			80.0		
February	7.4			4.9			7.0			N/A			2.1			900.0		
March	7.4			5			6			N/A			1.9			250		
April	7.7			3.9			18.0			224.0			1.82			900.0		
May	7.9			3.9			16.0			N/A			1.79			80.0		
June	7.9			5.0			9			N/A			2.0			130		
July	7.5			4.0			12.0			N/A			1.69			225.0		
August	7.8			5.8			6.0			N/A			1.5			130.0		
September	7.0			4.5			8.0			N/A			1.33			550.0		
October	7.5			5.4			10.0			N/A			1.4			80.0		
November	7.1			5.1			14.0			N/A			3.74			170.0		
December	7.5			3.7			16.0			N/A			2.01			350.0		
=====																		
TOTAL	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG
	7.0	7.9	7.53	3.7	5.8	4.65	6	18.0	10.83	224.0	224.0	18.67	1.33	3.74	1.92	80.0	900.0	320.42

**AVERAGE ANALYSIS REPORT OF STPs**

Sr. No.	Name of STPs	pH	BOD	COD	Turbidity	Detergent	S.S.	R-Chlorine	Remarks
1	STP- Sector 12, CBD-Belapur, Navi Mumbai.	6.9	120	236	21	3.2	75	NIL	STP up-gradation is under progress. Work to be completed by June-2011.
2	STP- Sector 2, Nerul, Navi Mumbai.	7	117	223	5.6	2.6	82	NIL	To be stopped and sewage to be connected to Nerul sector-50 STP or Sanpada STP.
3	STP- Sector 50, Nerul, Navi Mumbai.	7.1	6	26	0.8	0.8	13.5	NIL	Achieving standards.
4	STP- Sector 20, Sanpada, Navi Mumbai.	7.7	139	390	20.3	1.2	204.5	NIL	STP up-gradation is under progress. Work to be completed by June-2011.
5	STP- Sector 18, Vashi, Navi Mumbai.	7.7	9.2	58	1.2	0.1	15.5	NIL	Achieving standards.
6	STP- Airoli Navi Mumbai.	7.9	13.5	53	--	--	20	NIL	Achieving standards.
7	STP – Koparkhairane, Navi Mumbai.	6.9	24	72	--	--	43	NIL	STP up-gradation is under progress. Work to be completed by June-2011.

### 2.1.3. Predominant sources contributing to various pollutants:

There are 571 Industries which are generating trade effluent and have provided ETPs for treating the same and the treated effluent is sent to CETP for further treatment and disposal. Following is the list of 31 Major Polluting Industry whose pollution load in Kg/day is displayed below:

<b>Pollution Load of Major Polluting Industry</b>					
<b>Sr.No.</b>	<b>Name of Industry</b>	<b>Type &amp; Category</b>	<b>Water Pollution Load in Kg/Day</b>		
			<b>BOD</b>	<b>COD</b>	<b>SS</b>
1	M/s.Alok Industries Ltd.	Red/LSI	21.00	61.69	33.46
2	M/s.Cray Valley Resins India Ltd.	Red/LSI	0.24	1.56	0.27
3	M/s.BASF	Red/LSI	7.29	34.19	9.66
4	M/s.Rallies	Red/LSI	3.58	19.52	5.00
5	M/s.Savita Oil	Red/LSI	0.16	1.23	0.63
6	M/s.RPG Life Sciences	Red/LSI	17.29	30.00	4.67
7	M/s.Zydus	Red/LSI	3.80	14.74	7.66
8	M/s.Lubrizol	Red/LSI	6.77	28.65	15.52
9	M/s.Sandoz Ltd.	Red/LSI	11.00	48.90	13.15
10	M/s.NOCIL LTD.	Red/LSI	51.70	224.40	78.65
11	M/s.SI GROUP	Red/LSI	26.38	152.47	70.79
12	M/s.PFIZER LTD	Red/LSI	2.15	10.32	8.77
13	M/s.HINDUSTAN PLATINUM	Red/LSI	3.98	17.82	2.96
14	M/s.ELDER PHARMA	Red/LSI	1.13	3.89	0.87
15	M/s.AMINES & PLASTICIZERS	Red/MSI	1.16	5.60	1.81
16	M/s.ASIAN PAINTS	Red/LSI	0.48	2.56	1.44
17	M/s.SUDITI TEXTILE	Red/LSI	16.34	41.75	17.38
18	M/s.DARSHAN HOIESARY	Red/MSI	1.64	7.36	6.56
19	M/s.AKASAKA ELECTRONICS	Red/LSI	0.69	5.49	3.72
20	M/s.MAZADA COLOURS LTD.	Red/MSI	11.88	123.39	33.34
21	M/s.EXPANDED POLYMER	Red/MSI	0.19	1.07	0.32
22	M/s.SHIVSHANKAR TEXTILES	Red/SSI	48.00	158.08	17.92
23	M/s.Glenmark Pharmaceutical Ltd.	Org/LSI	0.03	0.08	0.04
24	M/s.Cabot (I) Ltd.	Red/LSI	0.50	2.48	1.12
25	M/s.CRODA Chemicals	Red/LSI	1.32	3.50	1.55
26	M/s.Unique Chemicals	Red/MSI	4.50	15.94	1.47
27	M/s.Henkel Chemicals Pvt.Ltd.	Red/MSI	0.33	1.34	0.62
28	M/s.Maharashtra Polybutene	Red/LSI	0.57	2.85	1.29
29	M/s.Sandoz Ltd.	Org/LSI	2.83	9.56	3.42
30	M/s.Akash Fabric	Red/SSI	7.17	177.60	9.72
31	M/s.Sovotex	Red/SSI	18.38	58.75	10.85

## **2.2 Sources of Water Pollution:**

**2.2.1. Industrial effluent :** Out of 571 effluent generating industries, major units are textile, chemical and bulk drugs, pharmaceuticals, dyes, pesticides, etc. The partly treated effluent of the SSI units and fully treated Effluent of MSI/ LSI units is carried through MIDC pipe line to CETP, along with the domestic effluent (sewage) of some Industries and some of the residential areas which are in the MIDC zone.

### **2.2.2. Domestic Effluent (Sewage):**

The total domestic effluent generated from the residential area of Navi Mumbai Municipal Corporation is about 245 MLD. The NMMC have provided seven Sewage Treatment Plants (STP) at various places. Three of them are fully equipped and working satisfactorily. Another three are being upgraded and time schedule for up-gradation is June, 2011. The seventh STP is to be scrapped and the sewage is to be connected to the nearby STP as feasible. The work is under investigation. At present, it is operating.

### **2.2.3. Others :**

The Navi Mumbai city is spread at the bottom of the hill. Total area is urbanized and there is no agriculture land and so no agriculture runoff.

The population of Navi Mumbai is above 10 lacs and about 550 T/D of MSW is generated. NMMC has developed MSW dumping site at Turbhe and the site in operation since 2005. Area of site is 65 Acre which may be sufficient for next 50 years. At present secured landfill is going on and quantity of MSW accumulated at site is about 12 lacs Tonnes. There are three cells, out of which two cells are already completed and third cell is in operation. The completed cells are covered with soil. NMMC has proposed to install Waste to Compost and RDF (Refuse Derived Fuel) projects. Work is in progress and the project will be commissioned by October 2010. There are leachates from the MSW dumping yard for which leachate treatment plant is being installed. The plant is under construction

and will be commissioned by February 2011 At present, leachates are transported to Vashi STP through tanker for treatment and disposal. NMMC has been awarded with 'Vasundara Award 2010' for their appreciable work towards Environmental points.

There is no illegal dumping site in the jurisdiction.

#### **2.2.4. Impact on surrounding area( outside the CEPI area) on the water course/ drainage system of the area under consideration:**

Most of the area of TTC MIDC is covered with MIDC drainage system which carries effluent of the industries to CETP for further treatment and disposal. Little part of TTC MIDC Area particularly at Digha, Airoli, and part of Mahape is not connected with the MIDC drainage system due to topography. The major units are using their treated effluent for gardening in non-monsoon season and discharging treated effluent to CETP by tankers in monsoon and quantity of effluent is about 40 m<sup>3</sup>/day. Small units are discharging their treated effluent into the nearby nalla and hence colored water is seen in the nallas sometime. All the units are member of CETP. Necessary follow up will be taken with MIDC for providing drainage system for the uncovered area.

#### **2.3. Details of Water Polluting Industries in the area/cluster.**

Category- wise list of industries are shown as below.

Type	Large	Medium	Small	Total
Red	44	27	500	571
Orange	18	16	329	363
Green	05	07	1103	1115
Total	67	50	1932	2049

#### **2.4. Effluent Disposal Methods :**

Treated effluent from all the industries is received at CETP through conduit pipe line. This effluent is further treated at CETP. As per the guidelines of NIO, treated effluent is discharged into TTC Creek through closed pipeline. For this purpose MIDC has provided close pipe line upto disposal point. Total length of pipe line is 7.1 km with diameter of 900 mm. About 4 km part of the pipe is on land, another portion of 2 km is tidal zone and remaining 1.1 km is in the submerge zone. Effluent is discharged through gravity and quantity of effluent is 26 MLD.

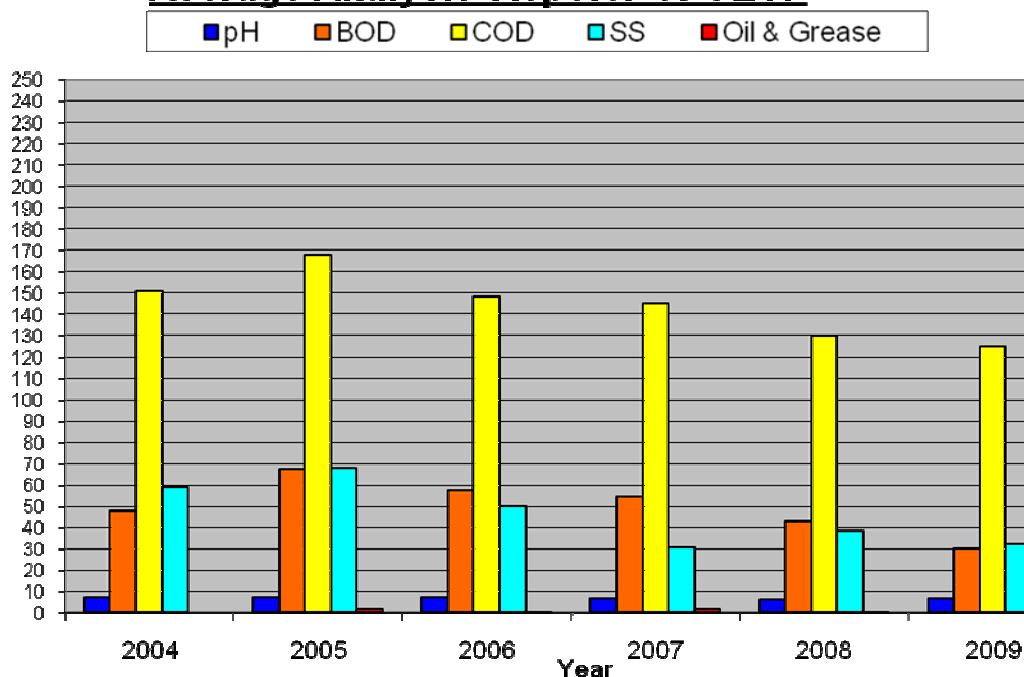


## 2.5 Quantification of wastewater pollution load and relative contribution by different sources viz. industrial /domestic:

Total industrial effluent is collected at CETP for further treatment and disposal and the treated effluent of CETP is discharged into TTC creek. The quality of the effluent as well as the quantification of waste pollution load is given below:

<b>AVERAGE ANALYSIS REPORT OF TREATED EFFLUENT OF CETP</b>					
<b>Parameters</b>	<b>pH</b>	<b>BOD</b>	<b>COD</b>	<b>SS</b>	<b>O &amp; G.</b>
<b>Standards</b>	<b>5.5 to 9.0</b>	<b>Less than 100 mg/l</b>	<b>Less than 250 mg/l</b>	<b>Less than 100 mg/l</b>	<b>Less than 10 mg/l</b>
<b>2004</b>	7	48	151	58	0
<b>2005</b>	7	67	167	67	2
<b>2006</b>	7	57	148	50	0.5
<b>2007</b>	6.5	54	144	30	1.5
<b>2008</b>	6.5	43	130	38	0.5
<b>2009</b>	6.5	30	30	32	1
<b>Pollution Load in Kg./day</b>	-	<b>1296</b>	<b>3337</b>	<b>1192</b>	<b>24</b>

### Average Analysis Reports of CETP



## 2.6 Action plan for compliance and control of pollution:

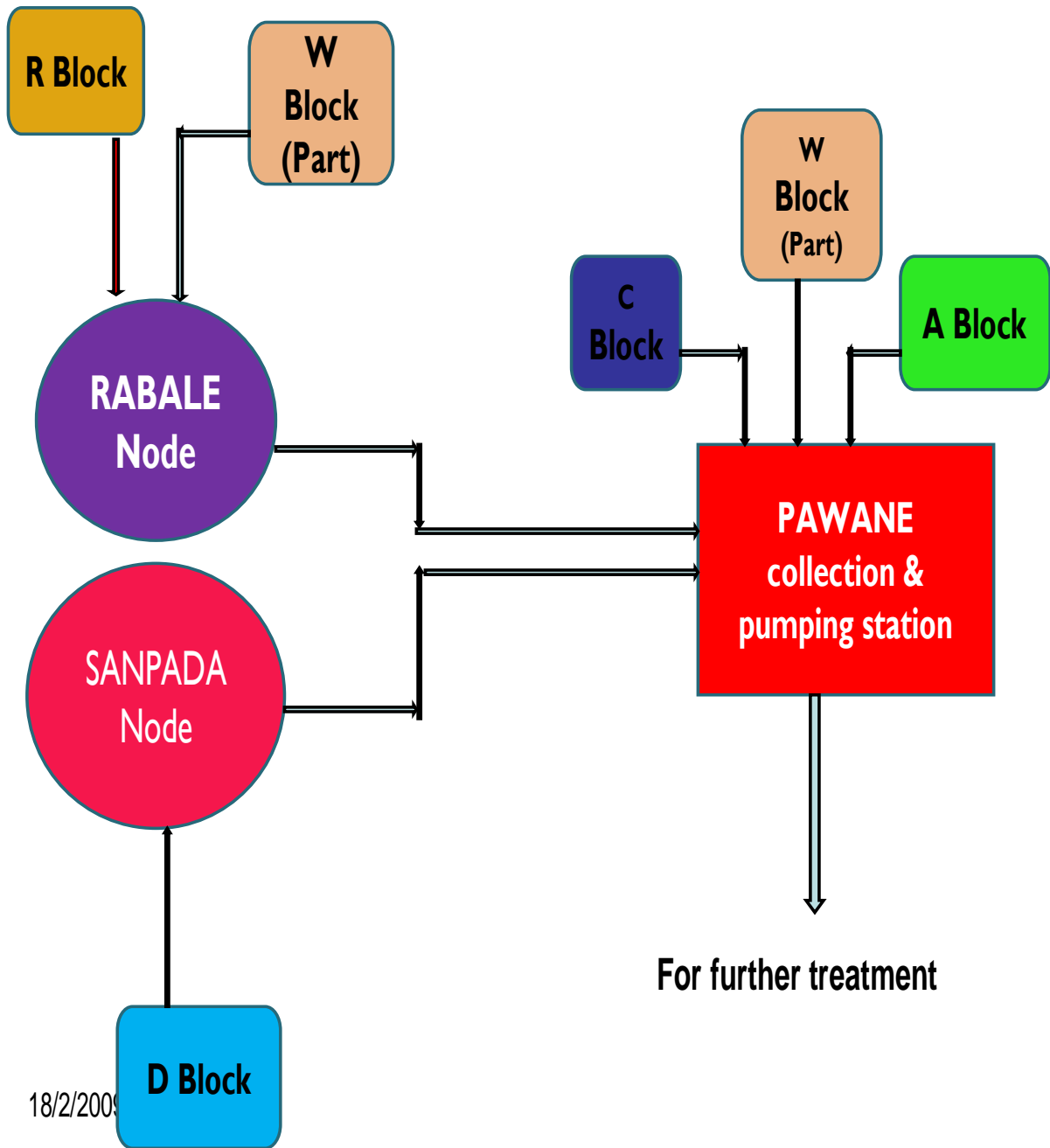
### 2.6.1 Details of existing infrastructural facilities of CETP:

Intensive efforts were made by Thane Belapur Industrial Association (TBIA) to set up a CETP in MIDC, TTC industrial area. The plant of 12 MLD capacity (Phase-I) is in successful operation since 1997. In order to tackle extra load generated by the industries in TTC industrial area, an additional common effluent treatment plant of 15 MLD capacity (Phase-II) was envisaged and is commissioned in 2006. CETP scheme was implemented mainly to tackle the problem of liquid effluent generated especially from small scale industrial units (SSI) who are having techno-economic constraints. The facility was also made available to all medium and large scale industrial units with the aim to strengthen the financial feasibility, to get advantage of mixing of treated effluents and utilize the common single disposal system.

### TECHNOLOGY – PROCESS DETAILS :

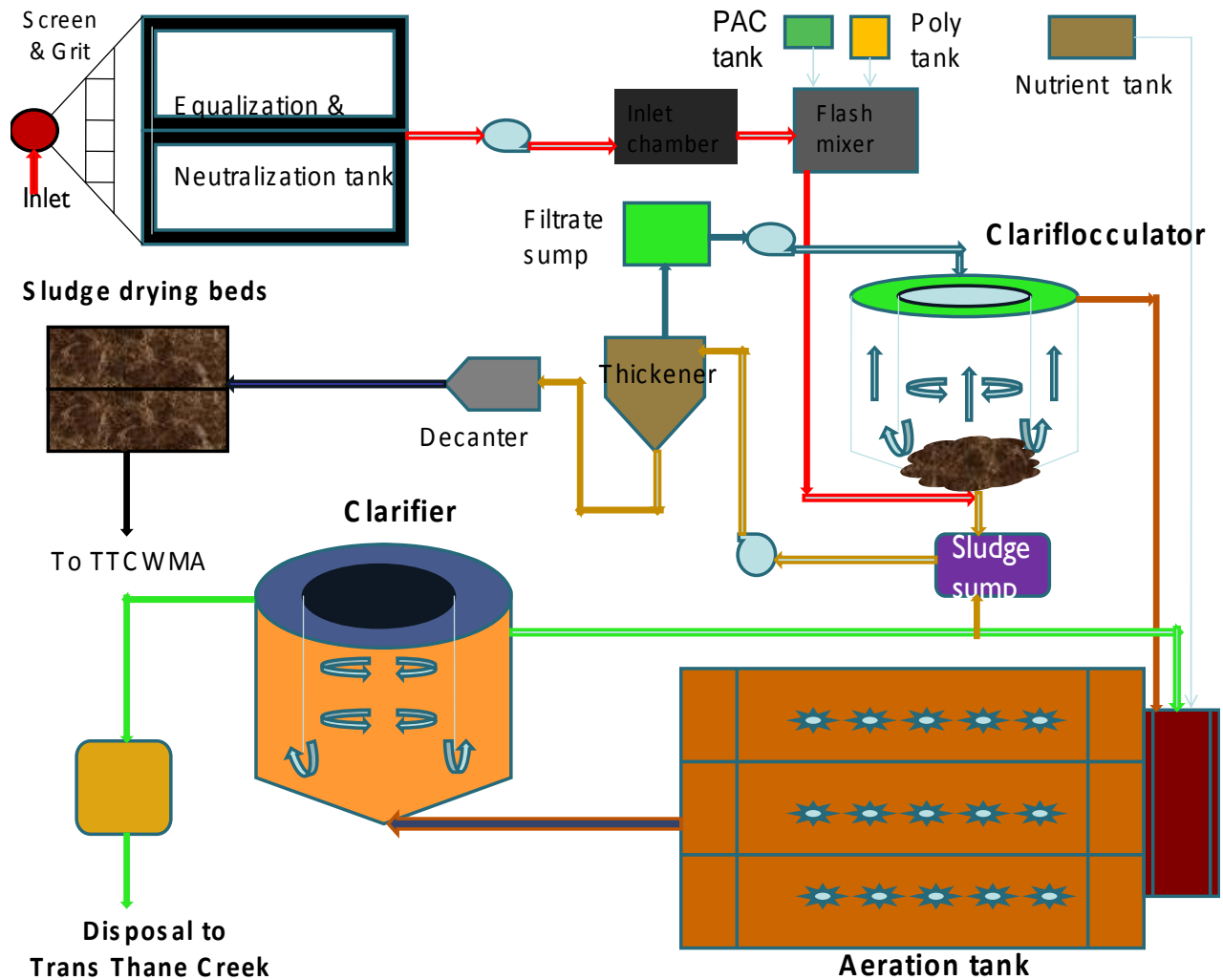
<b>TOTAL CAPACITY : 27 MLD ( 12MLD + 15 MLD )</b>		
<b>CAPACITY</b>	<b>12 MLD</b>	<b>15 MLD</b>
<b>PROJECT START-UP</b>	<b>1994</b>	<b>2002</b>
<b>PROJECT COMMISSIONED</b>	<b>MARCH – 1997</b>	<b>MARCH – 2006</b>
<b>PROJECT COST</b>	<b>4.0 Crs.</b>	<b>8.5 Crs.</b>

# Effluent Transfer Network System



### I) Treatment Scheme of CETP:

CETP comprises of various units of treatment scheme such as Equalization tank, Inlet chamber, Flash Mixer, Clariflocculator, Aeration tank, Clarifier, Sludge sump, Thickener, Filtrate sump, sludge drying beds, Centrifuge Decanter, having total treatment capacity of 27 MLD.



**II) STPs – Domestic Effluent (Sewage):-** The total domestic effluent generated from the **residential** area of Navi Mumbai Municipal Corporation is about **245 MLD**. NMMC has provided 7 STP's at various places for treatment of domestic effluent.

<b>Information</b>	<b>Status</b>	<b>Remarks</b>
Population of the city	above 10.0 lacs.	-
Water consumption	317 MLD	-
Qty of waste water generation	245 MLD	.
Collection	Sewage is collected through under ground sewerage system.	
Treatment	7 STPs are provided at various locations i.e. Vashi, Airoli, Sanpada, Nerul Sec-50, Nerul Sec-2, CBD-Belapur and Koparkhairane.	4 STPs having SBR Method & performance is satisfactory. Up-gradation of 3 STPs is in progress.
Disposal	Thane Creek.	-

## Detailed information about STPs in Navi Mumbai

Sr. No.	Location	Capacity MLD	Type of Effluent.	Performance
1.	STP sector-50, Nerul, Navi Mumbai	100	Domestic Effluent	C-Tech SBR in (Aerated Lagoons) operation.
2.	STP sector-18 Vashi, Navi Mumbai	100	Domestic Effluent	C-Tech SBR in (Aerated Lagoons) operation.
3.	STP sector-18 Airoli, Navi Mumbai	80	Domestic Effluent	C-Tech SBR in (Aerated Lagoons) operation.
4.	STP sector-12, CBD Belapur, Navi Mumbai	21	Domestic Effluent	Being upgraded to C-Tech SBR Technology. Time schedule fixed up to June-2011
5.	STP sector-20 Sanpada, Navi Mumbai	37.50	Domestic Effluent	Being upgraded to C-Tech SBR Technology. Time schedule fixed up to June-2011
6.	STP sector-14 Koparkhairane, Navi Mumbai	87.50	Domestic Effluent	Being upgraded to C-Tech SBR Technology. Time schedule fixed up to June-2011
7.	STP sector-2, Nerul, Navi Mumbai	17	Domestic Effluent	In operation at present. NMMC decided to stop the STP and sewage to be connected to either STP Sanpada or STP sector-50 Nerul. Project under investigation.

C-Tech is a cyclic activation sludge treatment process. It provides highest treatment efficiency possible in a single treatment. This method is operated in a batch reactor mode. This eliminates all the inefficiencies of continuous process.

The complete biological operation is divided into three cycles. A basic cycle comprises of

1. Filling- The raw waste water is filled in the C-Tech basin up to operating level. Aeration is done at a time for a pre-determined time to aerate the effluent along the bio-mass
2. Aeration- after the Aeration cycle, Bio-mass settles under perfect settling conditions.
3. Settling & Decanting- Once settled the supernatant is removed from the top using decanting. Solids are wasted from tank during decanting phase.

## **Photographs of STP's :**





### **Photographs of existing STP's**







**Photographs of existing STP's**



## 2.6.2 Pollution control measure installed by industries:

All major polluting industries (571 industries) having their own Primary or full fledged ETP in their premises for treatment of effluent generated during activities. And then effluent is sent to CETP for further treatment and disposal in the Creek.

## 2.6.3. Technological Intervention:

### 2.6.3.1. Inventorization of prominent industries with technological gaps.

On the basis of assessment studies inventory of the major industries in order to assess further improvements.

### 2.6.3.2 Identification of low cost and advanced cleaner technology for pollution control:

Following industries have adopted Cleaner technology for minimization of waste and other major units are being proposed to adopt Cleaner technology.

Sr. No.	Name & Address of Factory	Particular project/treatment plant of Air/Water/clean Technology	Results after Cleaner technology
1	M/s. BASF India Ltd. Plot No. 12, TTC Industrial Area, MIDC Turbhe, Navi Mumbai.	Fuel switch over from Furnace oil to bio-briquette.	2300 T/Annum CO2 emission reduced. 235.77 KL furnace oil saved. SO2 Emission reduced 20kg/day. Planned to run Briquettes fired boiler for 90% of duration.
		Replacement of the use of methyl bromide (ODS) with a greener chemical Di-methyl Sulfide.	Bromine gas emissions reduced.
2	M/s. Pfizer Ltd, TTC Industrial Area, MIDC Turbhe, Navi Mumbai.	Fuel switch over from furnace oil to Briquettes for 12 TPH Boiler	Reduce So2 emission & recovered extra heat from exhaust gas by introducing economizer. Obtained carbon credit of 12200 MT.

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3	<b>M/s. NOCIL Ltd, Plot No. C-37, TTC Industrial Area, MIDC Pawne, Navi Mumbai.</b>	The source effluent stream from the Accelerator plant is segregated and treated to recover the intermediate product. The product is then recycled back in to the process	Beside recovery of valuable product, there is COD reduction of the source stream by 50%.
		In the Antioxidant process, the acid catalyst being used was getting lost through the aqueous stream. By carrying out process modifications and incorporating necessary changes in the equipments	The catalyst is now extracted and recycled back into the process.
		Distillation residue from the Accelerator Plant is disposed off through Incineration at site. An additional stripping unit was installed to recover the intermediate by-product (Which was earlier part of the residue) and same is recycled back into the process.	Besides the recovery of valuable by-product, it has resulted in reduction of solid waste by approx. 50 MT/Annum.
4	<b>M/s. Cabot India Ltd., Plot No. 3, TTC, MIDC, Ghansoli, Navi Mumbai</b>	Utilization of heat content of tail gas for captive power generation (4 MW)	Previously tail gas (mixture of co-40-45% & other gases O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> etc) was flared. Tail gas temp. is approximately 220 <sup>o</sup> C. Now by investing approx. 40 to 50 Crores 4 MW captive power plant installed & commissioned.
5	<b>M/s. Coromandel Fertilizers Ltd. Plot -22/1, TTC, Mahape, P.O Navi Mumbai</b>	Solvent Replacement. (Replacement of CCT by Toulene)	Previously CTC (Carbon tetra Cholide) Solvent was used which is Ozone depleting substance. CTC solvent requirement was approx. 450Kg per ton of endosulphan. Phase wise CTC was replaced with new solvent toluene. At present use of toluene is 100kg per ton of endousulphan.

**Proposed Cleaner technology for pollution control:**

<b>Industries being Proposed to Upgrade/Improve existing Pollution Control System.</b>			
<b>Sr. No.</b>	<b>Name of Industry</b>	<b>Effluent quantity</b>	<b>Upgradation/Improvements proposed.</b>
1	M/s.NOCIL LTD. Plot No.C-37, TTC-MIDC, Pawane, Navi Mumbai.	2200	To reduce the effluent load at least by 300 m3 by recycle, reuse, gardening, etc.
2	M/s.Zydus Altana Health Care Pvt.Ltd. Plot No.C-4, TTC-MIDC, Pawane, Navi Mumbai.	200	To reduce the effluent load at least by 20 m3 by recycle, reuse, gardening, etc.. To improve emission Control System by increasing efficiency of scrubber.
3	M/s.RPG Life Sciences Ltd. Plot No.C-25 & 25A, TTC-MIDC, Pawane, Navi Mumbai.	120	To reduce the effluent load at least by 15 m3 by recycle, reuse, gardening, etc. To use NaOH to reduce quantity of ETP sludge & to provide tertiary treatment. To improve emission Control System by increasing efficiency of scrubber.
4	M/s.SI GROUP Plot No.D-1/2, TTC-MIDC, Turbhe, Navi Mumbai.	1021	To reduce the effluent load at least by 110 m3 by recycle, reuse, gardening, etc. To provide tertiary treatment & to reduce Hazardous quantity by adopting cleaner technology.
5	M/s.MAZADA COLOURS LTD. Plot No. D-51, TTC-MIDC, Turbhe, Navi Mumbai.	958	To reduce the effluent load at least by 100 m3 by recycle, reuse, gardening, etc. To provide tertiary treatment & to reduce Hazardous quantity by adopting cleaner technology.
6	M/s.AMINES & PLASTICIZERS Plot No.D-21/21A, TTC-MIDC, Turbhe, Navi Mumbai.	80	To reduce the effluent load at least by 10 m3 by recycle, reuse, gardening, etc. To reduce quantity of HW quantity by adopting cleaner technology.
7	M/s.Rallies India Ltd. (Agro Chemical Div.) Plot No.C-15 &16, TTC-MIDC, Pawane, Navi Mumbai.	140	To reduce the effluent load at least by 15 m3 by recycle, reuse, gardening, etc. To increase the capacity of scrubber to reduce smell.
8	M/s.SHIVSHANKAR TEXTILES Plot No.C-482, TTC-MIDC, Pawane, Navi Mumbai.	320	To reduce the effluent load at least by 35 m3 by recycle, reuse, gardening, etc. To use Eco-friendly fuel and to increase efficiency of wet scrubber.
9	M/s.HINDUSTAN PLATINUM LTD. Plot No.C-154, TTC-MIDC, Pawane, Navi Mumbai.	125	To reduce the effluent load at least by 15 m3 by recycle, reuse, gardening, etc. To increase capacity of clarifier for better sedimentation.
10	M/s.Lubrizol (I) Ltd. Plot No.9/3, TTC-MIDC, Turbhe, Navi Mumbai.	635	To reduce the effluent load at least by 65 m3 by recycle, reuse, gardening, etc. To replace lime by NaOH for neutralization in order to reduce quantity of ETP sludge.
11	M/s.Cray Valley Resins India Ltd. Plot No.D-43/1, TTC-MIDC, Shiravane, Navi Mumbai.	8	To reduce the effluent load at least by 1 m3 by recycle, reuse, gardening, etc.
12	M/s.AKASAKA ELECTRONICS LIMITED. Plot No.C-107, TTC-MIDC, Pawane, Navi Mumbai.	42	To upgrade existing ETP and to use NaOH in order to reduce quantity of ETP sludge. To reduce the effluent load at least by 5 m3 by recycle, reuse, gardening, etc.
13	M/s.ELDER PHARMACEUTICALS LTD. Plot No. D-220, TTC-MIDC, Shiravane, Navi Mumbai.	30	To use NaOH instead of lime in order to reduce quantity of ETP sludge. To reduce the effluent load at least by 5 m3 by recycle, reuse, gardening, etc.

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14	M/s.EXPANDED POLYMER Plot No.C-45/3, TTC-MIDC, Pawane, Navi Mumbai.	20	To replace old tertiary units by new units of higher capacity. To reduce the effluent load at least by 3 m3 by recycle, reuse, gardening, etc.
15	M/s.SUDITI Industries Ltd. Plot No.253/254, TTC-MIDC, Pawane, Navi Mumbai.	250	To increase capacity settling tank & use eco-friendly fuel. To reduce the effluent load at least by 30 m3 by recycle, reuse, gardening, etc.
16	M/s.PFIZER LTD. Plot No.16, TTC-MIDC, Turbhe, Navi Mumbai.	430	To reduce the effluent load at least by 45 m3 by recycle, reuse, gardening, etc.
17	M/s.Alok Industries Ltd. Plot No.C-16/2, TTC-MIDC, Pawane, Navi Mumbai.	1305	To upgrade ETP and to increase capacity of wet scrubber. To use eco-friendly fuel. To reduce the effluent load at least by 130 m3 by recycle, reuse, gardening, etc.
18	M/s.DARSHAN HOSIERY INDUSTRIES LTD. Plot No.A-745, TTC-MIDC, Mahape, Navi Mumbai.	240	To increase capacity of wet scrubber. To reduce the effluent load at least by 25 m3 by recycle, reuse, gardening, etc.
19	M/s.Sandoz Pvt.Ltd. Plot No.D-31/32, TTC-MIDC, Turbhe, Navi Mumbai.	430	To reduce the effluent load at least by 45 m3 by recycle, reuse, gardening, etc.
20	M/s.Savita Oil Technologies Ltd. Plot No.C-17/17A, TTC-MIDC, Pawane, Navi Mumbai.	25	To increase capacity of Oil trap & to reduce Hazardous waste quantity by adopting cleaner technology. To reduce the effluent load at least by 3 m3 by recycle, reuse, gardening, etc.
21	Hemmo Pharma Plot No.C-43, TTC-MIDC, Pawane, Navi Mumbai	50	To reduce the effluent load at least by 5 m3 by recycle, reuse, gardening, etc.
22	M/s.BASF India Ltd. Plot No.12, TTC-MIDC, Turbhe, Navi Mumbai.	444	To use NaOH instead of lime in order to reduce quantity of ETP sludge. To reduce the effluent load at least by 45 m3 by recycle, reuse, gardening, etc.
23	M/s.Glenmark Pharmaceutical Ltd. Plot No.A-607, TTC-MIDC, Mahape, Navi Mumbai.	7	To provide tertiary treatment units. To reduce the effluent load at least by 0.5 m3 by recycle, reuse, gardening, etc.
24	M/s.Maharashtra Polybutene Plot No.R-802, TTC-MIDC, Mahape, Navi Mumbai.	78	To reduce the effluent load at least by 10 m3 by recycle, reuse, gardening, etc.
25	Alfa Laval Plot No.R-674, MIDC, Rabale, Mahape, Navi Mumbai.	20	To provide tertiary treatment units. To reduce the effluent load at least by 2 m3 by recycle, reuse, gardening, etc.
26	M/s.Unique Chemicals Plot No.10, TTC-MIDC, Mahape, Navi Mumbai.	60	To increase stack height . To reduce the effluent load at least by 5 m3 by recycle, reuse, gardening, etc.
27	Hindustan Unilever Ltd. Plot No.7, MIDC, Airoli, Navi Mumbai	40	To reduce the effluent load at least by 5 m3 by recycle, reuse, gardening, etc.
28	CETP Plot No.P-60, TTC, Khairane, Navi Mumbai.	26 MLD	To provide PSF and ACF to undertake performance evaluation study and prepare improvement plan accordingly with time frame schedule for implementation.

**List of solvent Distillation Units proposed to adopt clean Technology  
in order to minimize liquid & solid waste**

Sr. No.	Name of Industries
1	M/s Wellchem Laboratories, Plot No. W-183 , TTC Indl Area, MIDC, Navi Mumbai
2	M/s Anuj Organics Ptd. Ltd Plot No. W-151, TTC Indl Area, MIDC, Navi Mumbai
3	M/s Sangdeep Acid Chem Pvt Plot No. C-126, Pawane, TTC Indl Area, MIDC, Navi Mumbai
4	M/s Mehk Chemicals Pvt. Ltd. Plot No.W-6,Pawane, TTC Indl Area,MIDC, Navi Mumbai
5	M/s Darshan Chemicals Plot No. A-39, TTC Indl Area, MIDC, Navi Mumbai
6	M/s Sujata Chemicals Plot No. A-146/3, Pawane, TTC Indl Area, MIDC, Navi Mumbai
7	M/s Suvarna Specility Chemical Plot No. W-465, TTC Indl Area, MIDC, Navi Mumbai
8	M/s Betachem Industries Plot No. W-177, TTC Indl. Area, MIDC, Navi Mumbai
9	M/s Desmo Exports Ltd. Plot No. C-108, Pawane, TTC Indl Area, MIDC, Navi Mumbai
10	M/s Rajput Organics Pvt, Ltd. Plot No.D-206, TTC Indl. Area, MIDC, Navi Mumbai
11	M/s Darshi Organics Plot No. C-430, TTC Indl. Area, MIDC, Navi Mumbai
12	M/s Reshma Organic Chemicals Plot No. D-61, TTC Indl. Area, MIDC, Navi Mumbai
13	M/s Padma Plastic Plot No. C-166/2, TTC Indl. Area, MIDC, Navi Mumbai
14	M/s Pratap Organics Plot No. C-481/5, TTC Indl. Area , MIDC, Navi Mumbai
15	M/s Dhirajlal & Co. Plot No. C-481/1, TTC Indl. Area, MIDC, Navi Mumbai
16	M/s Kaushalya Chemicals Plot No. D-29/3, TTC Indl. Area , MIDC, Navi Mumbai
17	M/s Ester & Solvents Plot No. W-180, TTC Indl. Area, MIDC, Navi Mumbai
18	M/s Swastik Chemicals Plot No. W-155, TTC Indl. Area, MIDC, Navi Mumbai
19	M/s Subel Alloys Co.(I) Ltd., TTC Indl. Area, Navi Mumbai
20	M/s Romal Holding P. Ltd. Plot No. W-292, MIDC, Rabale, Navi Mumbai
21	M/s Amrutyog Chemicals Plot No. W-297, MIDC, Rabale, Navi Mumbai
22	M/s Sumitra Chemicals Plot No. W-278, MIDC, Rabale, Navi Mumba
23	M/s Pharmaceuticals Plot No. R-69, MIDC, Navi Mumabai
24	M/s Oriental Metal Fabrication Plot No. R-382, MIDC, Navi Mumbai

**Note :** All the solvent distillation units are being proposed to enhance scrubber efficiency Above 85%

## **2.6.4 Infrastructure Renewal:**

**2.6.4.1 Details of existing infrastructural facilities:** There are following infrastructure existing in Navi Mumbai:

1. **CETP at Khairane.**- Thane Belapur Industrial Association (TBIA) set up a CETP in MIDC, TTC industrial area. The plant of 12 MLD capacity (Phase-I) is in successful operation since 1997. In order to tackle extra load generated by the industries in TTC industrial area, an additional CETP of 15 MLD capacity (Phase-II) was envisaged and is commissioned in 2006. CETP scheme was implemented mainly to tackle the problem of liquid effluent generated especially from small scale industrial units (SSI) who are having techno-economic constraints. The facility was also made available to all medium and large scale industrial units with the aim to strengthen the financial feasibility, to get advantage of mixing of treated effluents and utilize the common single disposal system.

2. **CHWTSDF at TTCWMA, Mahape-** In the year 2004 second hazardous waste management facility or collection, Transport, Storage, Treatment and Disposal of composite hazardous waste was set up in Maharashtra at TTC industrial area. This facility was established by TTCWMA.

There are 1340 members of TTCWMA. Approximately 53000 MT of hazardous waste material have been secured landfill method at this site till date. The capacity of this secured landfill site is 170,000 tonnes. New cellof capacity of 1,00,000 tonnes is proposed in future. This TSDF site is located in TTC industrial area hence it is very convenient for transportation and disposal of hazardous waste from TTC industrial area.

3. **Sewage Treatment Plants:** There is a Township newly established by CIDCO on the either side of Thane Belapur Road which is known as Navi Mumbai and is governed by Navi Mumbai Municipal corporation (NMMC). Population of the Town is above a million and generation of sewages is 245 MLD. The NMMC have provided 7 Sewage Treatment Plants (STP) at various places. Three of them are fully equipped and working satisfactorily. Another three are being upgraded and time schedule for up-gradation is June, 2011. The seventh STP is to be scrapped and the sewage is to be connected to the nearby STP as feasible. The work is under investigation. At present, it is operating. Details of the STP are already given above.

**4. MSW Scientific landfill Site at Turbhe.:** About 550 MT/D of Municipal solid waste is generated in Navi Mumbai for which NMMC has developed landfill site at Turbhe. The site is already in operation since 2005 where MSW is disposed off scientifically. NMMC has proposed to install Waste to Compost and RDF (Refuse Derived Fuel) project. Work is in progress and the project will be commissioned by October 2010. There are leachates from the MSW dumping cells for which leachate treatment plant is being installed. The plant is under construction and will be commissioned by February 2011. At present, leachates are transported to Vashi STP through tanker for treatment and disposal.

#### **2.6.4.2 Need of up gradation of existing facilities:**

- 1. Up-gradation in STP:** There are 7 STPs at various places in Navi Mumbai provided by NMMC. Three STPs are fully equipped another three are being upgraded. The implementation work is expected by June-2011. The seventh STP which is at Sector- 21, Nerul is to be demolished and the sewage is to be connected to the either STP Sanpada or STP, Sector-50, Nerul. The project is under investigation.
- 2. Placement of pipeline for non covered area –** Most of the area of TTC MIDC is covered with MIDC drainage system which carries effluent of the industries to CETP for further treatment and disposal. Little part of TTC MIDC Area particularly at Digha, Airoli, and part of Mahape is not connected with the MIDC drainage system due to topography. Necessary follow up will be taken with MIDC for providing drainage system for the uncovered area.
- 3. Replacement of underground damaged pipelines in industrial area-** MIDC has provided under ground pipe line to carry treated industrial effluent from the industry to CETP. However, at some places the pipe line got corrosion which may results in leakages in future. Hence it is necessary to replace the corroded parts.

#### **2.6.4.3. De-silting of water tanks, drains, rivulets, etc.**

Most of the TTC area has good network of underground effluent carrying pipe lines/chambers laid by MIDC and are connected to industries. The de-silting of water tanks, drains, rivulets, etc. is carried out on regularly.



**2.6.4.4. Construction of lined drains/connections.**

MIDC has provided underground drainage system for carrying effluent to CETP. Around 90% area has been covered by lined drains; remaining area is required to be covered. MIDC has proposal to provide the pipe line accordingly.

**2.6.4.5 Treatment and management of contaminated surface water bodies:**

Treatment and managements of contaminated surface water bodies is Not Applicable.

**2.6.4.6** Rejuvenation/ Management Plan for important eco-geological features is Not Applicable.

**2.6.4.7** Carrying of effluent from industrial units located in non industrial locations to CETP facilities by lined drains/pipeline only and prevention of their disposal into city sewerage/surface drains.

No any effluent is carried from industrial units located in non-industrial locations to CETP.

**2.6.4.8. Installation of Gen. sets at CETP.**

CETP has already Installed 2 Nos. of Generators having capacity of 900 KVA each with acoustic enclosure.

## 2.6.5. Managerial and Financial aspects:

**2.6.5.1. Cost and time estimates:** Regarding the improvement of drainage system, the expenditures to be bared by MIDC. M. P. C. B. will be coordinate with MIDC and will take review of the implementation.

### ACTION PLAN FOR WATER ENVIRONMENT :

Sr. No.	Action Points	Agency	Estimated Cost
1	Performance evaluation of water pollution control measures in the 571 industrial units with respect to efficiency, operation, maintenance and implementation of maintenance/operation charter along with up gradation of Water pollution control equipments	Industries	Online pH Meter, flow meter, U-tube Discharge, Total Amount for all industries having Industrial Effluent < 25CMD is about = 2.5 Crore
2	Performance evaluation of CETP	CETP	8 – 9 Lac
3	Taking possession of drainage pipeline carrying effluent to CETP.	CETP & MIDC	--
4	Providing advance waste water treatment systems.	CETP	Up gradation work = 2.0 Crore
5	Laying of new effluent carrying pipe line at uncovered area.	MIDC	1. Length of pipeline = 7.0 Km 2. Estimated Cost = 6.0 Cr. 3. Time Schedule = August 2011
6	Replacement of the damaged pipeline.	MIDC	1. A-Block (14 Km) = 13.0 Cr. 2. R-Block (18 Km) = 16.0 Cr.
7	Use treated sewage for gardening and industrial purpose.	NMMC	NMMC has already provided 7 STPs at various locations.
7A	To provide proper sewerage system for slum pockets & connect the sewage to STPs	NMMC	NMMC is being proposed accordingly. 15.0 Cr.
8	Lifting of effluent passed into nalla due to any accident or leakage or chamber overflow into CETP by providing bund on nalla near CETP or other remedy .	MIDC/ CETP	50.0 Lac Period – June 2011.

**2.6.5.2 Identified Private/ Public sector potential investors and their contribution/obligation – Not Applicable**

**2.6.5.3. Govt. budgetary support requirement :**

CETP has already obtained Subsidy for Existing plant during the construction.

**2.6.5.4. Hierarchical and structured managerial system for efficient implementation :**

CETP (Thane Belapur) Association, is a registered organization under section 25 of Companies act 1956 and is managed by well qualified & experienced Board of Directors.

**2.6.6. Self monitoring system in industries ( ETPs etc) :**

- (i) CETP has self-monitoring & well equipped laboratory for analysis of effluent.
- (ii) Some Large and Medium industries are also having in-house laboratory for carrying out the analysis of effluent and some are conducting through outsourcing.

**2.6.7. Data linkages to SPCB/CPCB (of monitoring devices)**

Proposal is being prepared in centralize manner by MPCB.

**Comprehensive Environmental Pollution Index for Water Environment (CEPI):**

	A1	A2	A	B1	B2	B3	B	C1	C2	C3	C	D
As per CPCB report	3.0	5.0	15.0	8.0	3.0	3.0	14.0	5.0	3.0	5.0	20	10.0
As per MPCB report	2.0	5.0	10	2.0	0.0	0.0	2.0	5.0	3.0	5.0	20.0	5.0

B2 = No evidence of adverse impact on People,(As per the report of Medical officer, Navi Mumbai Municipal Corporation)  
 B3 = No reliable evidence is available about impact on Eco-geological Features.

**As per CPCB report = 59.0**

**As per MPCB report = 37.0**

### 3. AIR ENVIRONMENT

**3.1. Present status of Air Environment supported with minimum one year analytical data.**

#### 3.1.1. Critical locations of air quality monitoring

There are three AAQM locations covered under NAMP at Nerul, Mahape and Rabale. These stations being monitored since 2006. Navi Mumbai Municipal Corporation has set up two CAAQM stations at Vashi and Airoli. These stations are in operation for the last three years. The results are as below;

**3.1.2. Present level of pollutants in air (routine parameters, special parameters and air toxics relevant to the area in three categories – known carcinogens, probable carcinogens and other toxics) – To be identified soon.**

### AMBIENT AIR QUALITY RESULTS

(2009)

Standards	SO <sub>2</sub> in ug/m <sup>3</sup> 80 ug/m <sup>3</sup>			Nox in ug/m <sup>3</sup> 80 ug/m <sup>3</sup>			RSPM in ug/m <sup>3</sup> 100 ug/m <sup>3</sup>		
	Min	Max	Avg.	Min	Max	Avg.	Min	Max	Avg.
<b>Nerul</b>	8.11	27.56	17.30	20.17	68.70	39.56	45.00	171.35	90.85
<b>Mahape</b>	8.10	35.10	18.75	23.93	62.80	41.70	49.15	219.60	112.00
<b>Rabale</b>	10.45	26.85	14.80	20.00	52.10	33.22	36.96	198.70	88.13
<b>Vashi</b>	13.00	70.00	28.62	21.00	115.00	70.38	37.00	175.00	105.30
<b>Airoli</b>	5.00	158.0	25.18	7.00	249.0	91.17	12.00	396.0	134.78

### **3.1.3. Predominant sources contributing to various pollutants.**

Following sources are identified which contributes to various pollutants

- (i) Industries – Flue gas, TPM, SPM, SO<sub>2</sub>, Nox, Cl<sub>2</sub>, NH<sub>3</sub>, Acid Mist, VOC etc.
- (ii) Vehicles – SPM, SO<sub>2</sub>, RSPM, Nox, Dust particles.
- (iii) Construction activities – Dust particles,
- (iv) Quarries and Stone Crushers – Dust particles.
- (v) Public places – Dust particles.
- (vi) Unauthorized burning of domestic and other waste in residential areas

### **3.2. Sources of Air Pollution viz industrial, domestic (Coal and Biomass burning), natural and Transport & Heavy Earth Movers :**

1. Industry – Fuel burning, Process Emissions, fugitive emission.
2. Domestic – Coal and biomass burning.
3. Transport – Fuel combustion,
4. Heavy Earth Movers – Fugitive emissions.
5. There are around 16 industries using coal as fuel and the total quantity of coal consumed by these industries is around 300 Ton/day.

### **3.3. Air polluting industries in the area/cluster.**

- There are 581 Air Polluting industries in area/cluster. These are of different types and pollutants are differing. Major pollutants are TPM/SPM, SO<sub>2</sub>, Nox, NH<sub>3</sub>, Cl<sub>2</sub>, and VOC from pesticide and bulk drug units.
- 

### **3.4. Impact of activities of near by area on the CEPI area.**

Besides the industries in TTC MIDC area falling sources are also responsible for impact on air quality in Navi Mumbai area. These are as follows;

1. Quarries and Stone Crushers nearby TTC industrial cluster.
2. Huge transport of Vehicles throughout MIDC and Navi Mumbai residential area.
3. Construction activities in huge quantum.

4. Stationery pollution from public places.
5. Fuel burning in domestic area, especially hotels/houses/bakeries.
6. Unauthorized burning of waste in residential area.

### **3.5. Quantification of the air pollution load and relative contribution by different sources.**

There are multiple source of pollution i.e. industries, Vehicles, Construction activities, hotels, bakeries, Unauthorized burning of waste in residential area, etc. Data will be prepared by conducting survey.

### **3.6. Action Plan for compliance and control of pollution.**

#### **3.6.1. Existing infrastructure facilities.**

There are three AAQM locations covered under NAMP at Nerul, Mahape and Rabale. These stations being monitored since 2006. Navi Mumbai Municipal Corporation has set up two CAAQM stations at Vashi and Airoli. These stations are in operation for the last three years.

#### **3.6.2. Pollution control measures installed by the individual source of pollution.**

There are various types of industries and hence type of pollutants differ. All the Air polluting industries have provided emission control systems as required i.e. Dust collectors, Scrubbers, and Stack of sufficient height. All the bulk drug and pesticides manufacturing units are being proposed to improve efficiency of their VOC scrubbers. The chemical and dyes units are to be improved their scrubbers and dust collectors. Some units are having coal fired boilers. These units are being proposed to improve efficiency of the wet scrubber and to stick for eco-friendly fuel in future when Mahanagar gas pipeline supply will be commenced. There are about 100 stone crushing units along the northern side of MIDC area. Most of them have provided sprinkler system for dust suppression however, improvements are required. All these units will be proposed to install efficient emission control system.

#### **3.6.3. Technological Intervention.**

##### **3.6.3.1. Inventorisation of prominent industries with technological gaps.**

On the basis of assessment studies inventory of the major industries in order to assess further improvements will be prepared.

##### **3.6.3.2 Identification of low cost and advanced cleaner technology for air pollution control.**

Five major industries have already adopted Cleaner technology. Remaining major units are being proposed to adopt cleaner technology.

### 3.6.3.3. Introduction and switch over to cleaner fuel:

M/s. Mahanagar Gas Ltd. Is laying down gas pipe line which is to be commissioned in next year. All the industries will be proposed to use natural gas soon after commissioning of Gas supply.

### 3.6.4. Need of infrastructure Renovation.

There are three AAQM locations covered under NAMP at Nerul, Mahape and Rabale. These stations being monitored since 2006. Navi Mumbai Municipal Corporation has set up two CAAQM stations at Vashi and Airoli. These stations are in operation for the last three years. All these stations are maintained and functioning properly.

#### 3.6.4.1. Development of roads.

Navi Mumbai is interconnected by Asphalt /Cement roads however; internal roads in MIDC area require improvement. NMMC will be proposed to undertake repairing work of the roads.

### 3.6.5. Impact of CEPI Score after installation/commissioning of full-fledged air pollution control system.

#### Comprehensive Environmental Pollution Index for Air Environment

	A1	A2	A	B1	B2	B3	B	C1	C2	C3	C	D
As per CPCB report	6.0	5.0	30.0	6.0	0.0	0.0	6.0	3.0	5.0	0.0	15.0	10.0
As per MPCB report	4.0	5.0	20	3.0	0.0	0.0	3.0	3.0	2.0	0.0	6.0	10.0

B2 = No evidence of adverse impact on People,(As per the report of Medical officer, Navi Mumbai Municipal Corporation)

B3 = No reliable evidence is available about impact on Eco-geological Features.

As per CPCB report = 61.0

As per MPCB report = 39.0

### 3.6.6. Managerial and Financial aspects –

#### 3.6.6.1. Cost and Time estimates:

### **ACTION PLAN FOR AIR ENVIRONMENT :**

Sr. No	Action Points	Agency	Estimated Cost
1	Performance evaluation of Air pollution control measures in the 571 industrial units with respect to efficiency, operation, maintenance and implementation of maintenance/operation charter along with up-gradation of Air pollution control equipments	Individual Industries	Online Display for : SO <sub>2</sub> , SPM, Nox = 5.0 Cr. (Total Amount for all Large and medium scale industries.)
2	Inventorizing of Hazardous Air Pollutant emitting units And Installation of Leak Detection and Repair (LDAR) in case of pesticide and bulk drug manufacturing units and	MPCB/ Individual industry	(LDAR =10.0 Lacs ) 15 Bulk drug and pesticide industries Total cost:- 1.5 Crores
3	Introduction of Cleaner fuel like CNG/LPG	Mahanagar Gas Ltd. & TBIA	12.0 Cr. (Gas stations & pipeline)
4	Installation of CAAQM Stations with digital display on screen.	TBIA	60.0 Lacs
5	Setup of new AAQM station	TBIA MPCB	40.0 Lacs Equipment & operation for one year
6	On Display of AAQM data	TBIA	5.0 Lacs
7	Development of Green belt & garden	MIDC/ TBIA	1.0 Crore
8	Repairing of internal roads & proper maintenance of the same.	NMMC	1. Length of roads = 95 Km. 2. Cost = 55 Cr. (Work under progress)



**3.6.6.2. Identified Private / Public sector potential investors & their contribution / Obligation.**

Not Relevant.

**3.6.6.3. Government Budgetary support requirement.**

Not Relevant.

**3.6.6.4. Hierarchical and structured managerial system for efficient implementation.**

Industries and other organization are responsible to implement improvement plans related to them. The cost for the improvement will be bared by the industries. The MPCB will co-ordinate and will take review of the implementation of the above proposal.

**3.6.7. Self monitoring systems in industries (Stacks, APCDs)**

Some Large and Medium industries are monitoring air emissions regularly through outsourcing.

**3.6.8. Data linkage to SPCB/CPCB (of monitoring devices)**

Proposal is being prepared in centralize manner by MPCB.

## 4. LAND ENVIRONMENT (Soil and Ground Water)

### 4.1. Soil Contamination.

Navi Mumbai is totally urbanized area and there is no agricultural land .No any crop is cultivated in this region. In Navi Mumbai total population is covered with tap water supply. Ground water is not used for drinking purpose. For ground water monitoring, Bore well water at TTCWMA is being monitored. One well is identified nearby MSW site, monitoring will be started soon.

#### 4.1.1. Present status of land environment supported with minimum one year analytical data.

Monitoring of Bore well water in the premises of CHWTSDf is carried out regularly and results are given below;

##### A] Bore well of TTCWMA. – CHWTSDf Analysis Report.

Sr.No.	Parameter	Result
1	pH	8.20
2.	BOD	6.17
3.	COD	40.67
4.	S.S	20.67
5.	Oil & Grease	BDL

#### 4.1.2. Critical locations for land / soil pollution assessment and ground water monitoring .

There are two locations which may be considered as critical locations. i.e. MSW site at Turbhe and CHWTSDf at Mahape. The bore well water at Mahape is being monitored regularly. Another ground water source is to be identified nearby MSW site.

#### 4.1.3. Present levels of pollutants in land / soil and ground water (routine parameters, special parameters and air toxics relevant to the area in three categories – known carcinogens, probable carcinogens and other toxics).

Bore well water at CHWTSDf premises is being monitored regularly. From the results it seems that ground water in the above vicinity is not deteriorated.

#### 4.1.4. Predominant sources contributing or posing danger of pollution of land and ground water such as hazardous / toxic wastes or chemicals dumps / storage etc.

Not identified.

#### **4.1.5. Sources of Soil Contamination.**

Most of the area of TTC MIDC is covered with MIDC drainage system which carries effluent of the industries to CETP for further treatment and disposal. Little part of TTC MIDC Area particularly at Digha, Airoli, and part of Mahape is not connected with the MIDC drainage system due to topography. The major units are using their treated effluent for gardening in non-monsoon season and discharging treated effluent to CETP by tankers in monsoon and quantity of effluent is about 40 m<sup>3</sup>/day. Small units are discharging their treated effluent into the nearby nalla and hence colored water is seen in the nallas sometime. All the units are member of CETP. Necessary follow up will be taken with MIDC for providing drainage system for the uncovered area.

#### **4.1.6. Types of existing pollution.**

No relevant.

#### **4.1.7. Remedies for abatement, treatment and restoration of normal soil quality.**

Total Navi Mumbai area including MIDC estate is fully urbanized. There no land for cultivation of crops and hence, there no contamination of soil.

#### **4.2. Ground water contamination.**

##### **4.2.1. Present status / quality of ground water.**

Results of Bore well water at TTCWMA – CHWTSDF are given above, and it states that ground water is not contaminated.

##### **4.2.2. Source Identification (Existing sources of Ground water Pollution)**

Not relevant.

##### **4.2.3. Ground water quality monitoring program.**

Bore well water at TTCWMA – CHWTSDF is monitored regularly and another source nearby MSW site is being identified and will be monitored regularly.

#### 4.2.4. Action Plan for control of pollution including cost / time aspects.

#### **ACTION PLAN FOR LAND ENVIRONMENT :**

<b>Sr. No</b>	<b>Action Points</b>	<b>Agency</b>	<b>Estimated Cost</b>
1	Scientific Disposal of municipal solid waste.	NMMC	NMMC has already developed disposal facility which is already in operation. They had appointed M/s NEERI to study problems and to suggest proper measures. Accordingly NEERI has suggested certain measures. Implantation work is going on.
2	Scientific disposal of Hazardous Waste.	TTC-WMA	CHWT SDF has already being provided at TTC, MIDC Area & the facility is in operation.
3.	Scientific disposal of Bio-medical Waste.	Health Care units/MWML	M/s. Mumbai Waste Management Ltd.(MWML) has developed disposal facility for BMW at MIDC, Taloja, Dist.Raigad. All the BMW in Navi Mumbai is collected and disposed scientifically by MWML.

#### 4.2.5. Treatment and management of contaminated ground water bodies, etc.

Not relevant.

#### 4.2.6. Impact on CEPI score after abatement of pollution.

#### Comprehensive Environmental Pollution Index for Land Environment:

	A1	A2	A	B1	B2	B3	B	C1	C2	C3	C	D
As per CPCB report	3.0	5.0	15.0	6.0	1.5	3.0	10.5	5.0	3.0	5.0	20.0	10.0
As per MPCB report	3.0	5.0	15.0	3.0	00	0.0	3.0	5.0	1.5	5.0	12.5	5.0

B2 = No evidence of adverse impact on People,(As per the report of Medical officer, Navi Mumbai Municipal Corporation)

B3 = No reliable evidence is available about impact on Eco-geological Features.

As per CPCB report = 55.5

As per MPCB report = 35.5

#### 4.3. Solid waste Generation and management.

##### 4.3.1. Waste Classification and Quantification

4.3.1.1. Hazardous Waste - 17665 T/M (2009)

4.3.1.2. Bio-medical waste - Approx.250 T/Year.

4.3.1.3. Electronic waste - Data Not available.

4.3.1.4. Municipal solid waste – 550 T/day.

4.3.1.5. Plastic waste - Data not available.

##### 4.3.1.6. Quantification of wastes and relative contribution from different sources.

There are multiple source of waste i.e. Industrial process waste, ETP Sludge, MSW, waste from commercial sectors and service industries. Data will be prepared by conducting survey.

##### 4.3.2. Identification of waste minimization and waste exchange option.

Data not available.

#### **4.3.3. Reduction / Reuse / Recovery / Recycle option in co-processing waste.**

NMMC has developed MSW disposal site. The wet garbage is to be converted into compost and refuse derived fuel. The project is under construction and will be commissioned by October 2010. There are two cells which are completed and capped with soil, NMMC has decided to recover methane gas by suction method. The project is under consideration.

#### **4.3.4. Infrastructure facilities.**

##### **4.3.4.1. Existing TSDF / Incineration facilities including capacities.**

##### **1. TTC Waste Management Association:**

In the year 2004 second hazardous waste management facility or collection, Transport, Storage, Treatment and Disposal of composite hazardous waste was set up in Maharashtra at TTC industrial area. This facility was established by TTCWMA.

The policy of TTCWMA is to maintain highest standards of quality of disposal methods by confirming to environmentally friendly, safe, economic methods. There are 1340 members of TTCWMA. Approximately 53000 MT of hazardous waste material has been disposed by secured landfill method at this site .The capacity of this secured landfill site is 1,70,000 . New cell of capacity of 1,00,000 MT is proposed in future. This TSDF site is located in TTC industrial area hence it is very convenient for transportation and disposal of hazardous waste from TTC industrial area.

The authority of TTCWMA has provided all technical vigilance system to protect the environment.

**2. MSW Scientific landfill Site at Turbhe :** About 550 MT/D of Municipal solid waste is generated in Navi Mumbai for which NMMC has developed landfill site at Turbhe. The site is already in operation since 2005 where MSW is disposed off scientifically. NMMC has proposed to install Waste to Compost and RDF (Refuse Derived Fuel) project. Work is in progress and the project will be commissioned by October 2010. There are leachates from the MSW dumping cells for which leachate treatment plant is being installed. The plant is under construction and will be commissioned by February 2011. At present, leachates are transported to Vashi STP through tanker for treatment and disposal.

**NAVI MUMBAI NMMC SOLID WASTE MANAGEMENT SITE - TURBHE**



**CONFERENCE ROOM**



**MSW DUMPING SITE**



**MSW LEACHATE COLLECTION TANK**





## CHWTSDF SITE - MAHAPE



### 4.3.4.2. Present status / Performance and need of up-gradation of existing facilities including enhancement of capacities.

CHWTSDF is developed fully and no up-gradation is not required at present. MSW site is also fully developed and further work of improvement is going on. Work of waste to compost and RDF project is going under progress.

### 4.3.4.3. Treatment and management of contaminated waste disposal sites.

Hazardous waste from Navi Mumbai area is disposed at CHWTSDF Mahape. The site is fully developed scientifically. No any other site is identified where hazardous waste is disposed unauthorized.

MSW site at turbhe is also developed scientifically where MSW from Navi Mumbai is disposed off in scientific manner.

#### **4.3.4.4. Impact on CEPI score after proper management of solid waste.**

After implementation the CEPI score will be reduced by 20. Details are shown in para 4.2.6.

### **5. PPP Model**

#### **5.1. Identification of project proposals (for both the options i.e. technology interventions and infrastructure renewal) for implementation under the PPP Mode under the Action Plan.**

NMMC is being proposed to developed technology for achievement of sewage quality in order to use the treated sewage for industrial use, construction activities, etc. Also at present, they have option to utilize the treated sewage for gardening. Considering the huge area of gardens, NMMC can use most of the treated sewage for gardening. The NMMC as well as CETP authorities will be followed for similar line of action.

#### **5.2. Identification of Stakeholders/Agencies to be involved and to evolve financial and managerial mechanism for implementation of PPP projects.**

The responsible stakeholders i.e. CETP, Navi Mumbai will implement the above project. These projects would give them commercial benefits and hence they should manage financial aspects for implementation of projects.

### **6. Other infrastructural Renewal measure:**

**6.1. Green Belts -** NMMC , Industries, MIDC as well as local NGOs are planting trees every monsoon. One NGO i.e. Green hope organization has planted about two lacs of trees at various places in Navi Mumbai and they have planned to plant about 10 lacs trees in future in Navi Mumbai.

#### **6.2. Development of Industrial Estate(s) .**

Not proposed

#### **6.3. Development / shifting of industries located in the non – industrial areas to the existing / new industrial estates.**

Not proposed.

## 7. Specific Scheme:

- |   |              |
|---|--------------|
| 7.1. GIS-GPS system for pollution sources monitoring.           | Not relevant |
| 7.2. Hydro-geological fracturing for water bodies rejuvenation. | Not relevant |
| 7.3. In-situ remediation of sewage.                             | Not relevant |
| 7.4. Utilization of MSW inert by gas based brick kilns.         | Not relevant |
| 7.5. Co-processing of wastes in cement industries.              | Not relevant |

## 8. Public awareness and training programmes.

- To Organize Drawing competition in School & Colleges for making clean environment.
- Distribution of hand bills of safety measures to be adopted during accident.
- Posters and Banners displaying environmental awareness.
- To arrange Road Shows at public places.
- Arranging Lectures, Speech, Demonstration of the activities through School, Colleges, etc.

## 9. Overall Impact of installation/commissioning of pollution control equipments/measures on the CEPI Score.

Parameter	CEPI Score As per CPCB	CEPI Score As per MPCB
Water	59	37.0
Air	61	39.0
Land	55.5	35.55

**Total aggregate score as per CPCB - 73.77**

**Total aggregate score as per MPCB - 47.01**

## **10. Assessment of Techno-economical feasibility of pollution control equipment / measure on the CEPI score.**

The entire effluent from TTC MIDC is received at CETP for further treatment and disposal. The treated effluent is discharged into TTC creek through closed pipeline. CETP is working satisfactory and achieving standards. NMMC has provided seven STPs at various places which are also working satisfactorily. The TTCWMA has provided CHWTSDF at Mahape where hazardous waste is disposed in scientific manner. NMMC has also developed MSW site at Turbhe where MSW is disposed in scientific manner. At present all above infrastructure is working satisfactory. Some major industries, about 20 Nos. which were major contributors in all type of pollution (Water, Air, HW) are closed permanently. Therefore, there is remarkable decline in pollution load. All the major units have provided full-fledged Emission control systems, Effluent Treatment plants, and disposing of hazardous waste to CHWTSDF.

1. Considering the performance of the ETPs in industries as well as CETP and STPs the CEPI score given to Water CEPI i.e. A1, B1 and D (AHRE) would have been quite less.
2. Considering the performance of the CHWTSDF the CEPI score given to Land CEPI i.e. A1, B1 and D (AHRE) would have been quite less.
3. Considering the performance of the Emission control system of the industries, as well as closure of major 20 industries, and major contribution of other sources of air pollution the CEPI score given to Air CEPI i.e. A1, B1 and D (AHRE) would have been quite less.

Besides the above it is also to mention that there are no considerable eco-geological features in Navi Mumbai area as well as there is no evidence of impact on people, the score given to B2 and B3 for Water, Air and Land CEPI would have been quite less.

## **11. Efforts shall be made to encourage use of Bio-compost and Bio-Fertilizer alongwith the chemical fertilizer in the state to minimize the unutilized chemical fertilizer run-off into the natural water resources from agriculture fields (through Govt. policy)**

This point will be covered in public awareness program.

## 12. Summary of proposed action points:

### 12.1. Short Term Action Point (upto 1 year, including continuous Activities)

Sr. No.	Action Points (including source & mitigation measures)	Responsible Stake Holders	Time limit	Cost	Remarks
1.	Uncovered area will be connected to CETP	MIDC CETP MPCB	Dec-2011	13 Cr.	Some part of TTC Industrial area is not connected to MIDC drainage system due to topography. That area is required to be connected.
2.	Performance Evaluation of CETP	CETP MPCB	March-2011	9 Lac	In order to improve CETP treated water further and to make feasible for recycle. CETP authorities are being proposed to improve the system
3.	Performance Evaluation of ETPs	Industries	March-2011	Expenses to be bear by individual industries	All the major industries are being proposed to improve their treatment system in order to reduce pollutant load at lease by 10%
4.	Performance Evaluation of ECS.	Industries	March-2011	----	All the major industries are being proposed to improve their ECS in order to reduce pollutant load at lease by 10%
5.	Repairs of Internal Roads in MIDC area.	NMMC	June-2011	55 Cr.	There are internal roads of 95 km in MIDC area, most of the roads required improvement in order to limit dust emissions by vehicle transport .
6.	Taking possession of drainage pipeline carrying effluent to CETP.	CETP MIDC MPCB as Nodal Agency	March-2011	-----	Treated effluents of the MIDC area is collected at CETP through MIDC drainage system. Part of system is under possession of MIDC and part under possession of CETP : considering the quick response by CETP official in case of accidental breakages.

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7.	Replacement of damaged pipeline	MIDC MPCB as Nodal Agency	Dec-2011	29 Cr.	Some part of effluent carrying pipeline is corroded which may create problem of leakages in future. MIDC has decided to replace damaged pipeline.
8.	Online display of AAQM data.	TBIA MPCB as Nodal Agency	Dec-2011	5 Lac	AAQM is carried out at three locations; however there is no online display of air quality at present. TBIA is being proposed to provide the same.
9.	Inventorizing of Hazardous Air Pollutant emitting units and installation of leak detection and repair (LDAR) in case of pesticide and bulk drug manufacturing units.	MPCB/Individual industry	June-2011	1.5 Cr.	Inventory of the hazardous air pollutant emitting industries will be prepared by conducting survey. Some units are engaged in mfg. of pesticides and bulk drugs. These units will be proposed to install leak detection system.
10.	Monitoring of the Industries for compliance of CEPI norms	MPCB/Individual industry	June-2011	-	Point wise review will be taken every 3 months i.e. by Dec-2010, March-2011, June-2011, Sept-2011 and final report will be submitted by Dec-2011.
11.	Recovery of Solvent by solvent using units.	Industries	June-2011	5 Cr.	Bulk Drugs units are using solvents in their process and generate waste solvents as by-product. At present they are vending waste solvents to another party. However, they will be instructed to install their own facility for recovery of the solvents.
12.	Health Impact Assessment Study.	DISH District Health Officer MPCB	June-2011	--	DISH, District Health Officer are being requested to give information about health in the industrial area.

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13.	Monitoring of ground water at MSW/TSDF site.	MPCB	March-2011	--	Monitoring at CHWTSDF site is already going on. NMMC will be asked to provide piezometer holes accordingly and monitoring will started by March-2011.
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**12.2. Long Term Action Points (more than 1 year)**

Sr. No.	Action Points (including source & mitigation measures)	Responsible Stake Holders	Time limit	Cost	Remarks
1.	Improvements in CETP.	CETP	Dec-2011	2 Cr.	CETP is adequate. However, they have decided to adopt latest Environment friendly advanced technology including pre-tertiary treatment facilities in order to improve quality of effluent furthermore and to explore possibilities for reuse of the treated effluent.
2.	Up-gradation of individual ETPs	Industries	Dec-2011	Expenses has to be bared by individual industries. Approx. 10 Cr.	Major polluting industries.
3.	Change in fuel	Industries	Dec-2011	12 Cr. (Gas station & pipelines	At present most of the industries are using fuels like FO, Coal, etc, which create huge emission. The Mahanagar gas co. is laying down gas pipeline in TTC Area which is likely to be commissioned in the next year. All the industries will be proposed to use natural gas after completion of the pipeline work.

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4.	Improvement in ECS	Industries	Dec-2011	Expenses has to be bared by individual industries	All the air polluting industries are being proposed to improve their ECS by increasing efficiency of their scrubbers and changing to eco-friendly fuels
5.	Installation of VOC analyzer	Industries	June-2011	Expenses has to be bared by individual industries	All the pesticides and bulk mfg. units are being proposed to install VOC analyzer including alarm system
6.	To provide proper sewerage system for slum pockets & connect the sewage to STPs and use of treated sewage for gardening and industrial purpose.	NMMC	Dec-2011	15 Cr.	Navi Mumbai has provided 7 STPs at various places where sewage from the township is treated. However, the slum pockets are covered where municipal drainage system. NMMC is being proposed to cover the slum pockets under municipal drainage system.
7.	Installation of CAAQM Stations with digital display on screen.	TBIA	Dec-2011	60 Lac	----
8.	Set up of New AAQM Station	TBIA and MPCB	Dec-2011	40 Lac	At present there are three AAQM Stations established by MPCB and two CAAQM Stations by NMMC. One more AAQM Station is being proposed by MPCB at Turbhe
9.	Development of green belt & garden.	MIDC/TBIA	Dec-2011	1 Cr.	It is continuous process. TBIA have already planted more than 1.5 million trees since 1986 in MIDC and as well as outside area within the Municipal limit. Also NMMC, MIDC, Industries as well as NGOs are taking lead for plantation and green belt development.



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10.	Scientific Disposal of MSW.	NMMC	Dec-2011	NMMC has to bear the expenses	Certain improvements at MSW disposal site i.e. installation of leachate treatment plant, waste to compost and RDF projects etc.
11.	Minimization of waste by the industries	Industries	Dec-2011	Individual Industries	Some industries have adopted cleaner technology. Other major units are being proposed to minimize waste i.e. textile industries are being proposed to use eco-friendly chemicals so as to reduce process waste. Coal using industries are being proposed to use eco-friendly fuels. Overall the major industries are being proposed to reduce their waste atleast by 10%.
12.	Vehicle pollution and traffic management plan	NMMC RTO MIDC MPCB	Dec-2011	--	NMMC and MIDC have been directed to provide good roads in the area. Most of the public transport vehicles, taxis, Auto Rickshaw running on natural gas. RTO will be informed for synchronizing traffic line strategy for phase out old vehicles.
13.	Reuse of Treated Sewage.	NMMC MPCB	Dec-2011	--	NMMC has 7 STPs for treatment of sewage from residential areas. About 15 MLD out of 40 MLD treated Sewage of Vashi STP is used by CIDCO for gardening and construction purpose.
14.	Awareness program	MPCB TBIA	Dec-2011	15 Lac	Awareness program will be conducted at various schools, colleges, public places, etc. through road shows, posters, banners, hand bills and various programs etc.