

**MATERIAL FOR  
STUDY VISIT OF THE DEPARTMENT  
RELATED PARLIAMENTARY STANDING  
COMMITTEE ON SCIENCE AND  
TECHNOLOGY, ENVIRONMENT AND  
FORESTS TO CHENNAI  
ON JANUARY 07, 2014**



**MINISTRY OF ENVIRONMENT & FORESTS,  
GOVT. OF INDIA**

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STUDY VISIT OF THE DEPARTMENT RELATED  
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**1.0 Chennai**

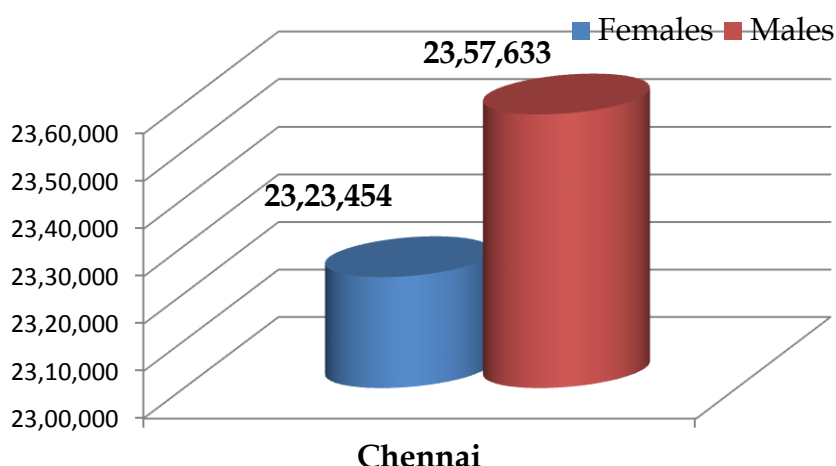
Chennai (formerly Madras ) is the capital city of the Indian state of Tamil Nadu. Chennai, sometimes referred to as the "Gateway to South India, is located on the south-eastern coast of India in the north-eastern part of Tamil Nadu on a flat coastal plain known as the Eastern Coastal Plains. Its average elevation is around 6.7 metres (22 ft), and its highest point is 60 m (200 ft). It is the biggest industrial, commercial center, and a major cultural, economic and educational center in South India.. It is located at 13° 04' N, 80° 17' E and covers an area of 181.1 km<sup>2</sup>. Chennai's economy has a broad industrial base in the automobile, computer, technology, hardware manufacturing and healthcare sectors. As of 2012, the city is India's second largest exporter of information technology (IT) and business process outsourcing (BPO) services. Chennai has a tropical wet and dry climate. the city lies on the thermal equator and is also on the coast, which prevents extreme variation in seasonal temperature with maximum temperatures around 35–40 °C (95–104 °F) and minimum temperatures around 15–22 °C (59–72 °F).



### 1.1. Population and Density

The population of the Tamilnadu State has increased 15.61% to reach 7.21 crore since 2001. The population of Tamil Nadu forms 5.96 percent of India in 2011. In 2001, the figure was 6.07 percent. Around 51.60 % of people's lives in rural area and 48.40% people's lives in Urban area. Sex Ratio in Tamil Nadu is 996 i.e. for each 1000 male.

According to the provisional population results of 2011, the Chennai city had a population of 4,681,087, with a density of 26,903 per km<sup>2</sup> and the urban agglomeration had a population of 8,696,010. The city registered a growth rate of 7.77% during the period 2001-2011. In 2001, the population density in the city was 24,682 per km<sup>2</sup> (63,926 per mi<sup>2</sup>), while the population density of the metropolitan area was 5,922 per km<sup>2</sup> (15,337 per mi<sup>2</sup>), making it one of the most densely populated cities in the world. The Chennai metropolitan area is the fourth most populated agglomeration in India and 31st largest urban area in the world The sex ratio is 951 females for every 1,000 males, slightly higher than the national average of 944



**Chennai Population as per population Census 2011**

Total literates in Chennai city are 3,850,472 of which 2,004,498 are males while 1,845,974 are females. Average literacy rate of Chennai city is 90.33 percent much higher than the national average of 79.5%. However, the city has the fourth highest population of slum dwellers among major cities in India, with about 820,000 people (18.6% of the city's population) living in slum conditions.<sup>1</sup>

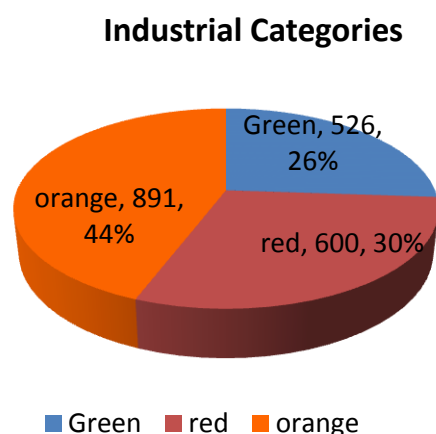
### 1.2 Industrial Areas

The Industrial Park Concept was originated from 'Industrial Estate Concept'. The Industrial Estates consist of ready built sheds which cater to the needs of small scale

industries. The sheds in the Industrial Estates were not suitable for medium scale industries and large scale industries. Further, the requirement of space is very large for the medium and large scale units which the industrial Estates could not provide. Therefore, there arose a need for industrial parks which allot developed plots in various sizes to small, medium and large scale industries. The Government of Tamil Nadu has set up 'Tamil Nadu Small Industries Development Corporation Ltd. (TANSIDCO) to set up Industrial Estates and State Industries Promotion Corporation of Tamil Nadu Ltd., (SIPCOT) to set up Industrial Parks in the state. Out of which 4 TANSIDCO namely Guindy, Arumbakkam, Villivakkam and Kodungaiyur are located in Chennai

### 2.0 Highly Polluting Industries

There are total 189 industries operating under the 17 category of highly polluting industries in the state of Tamilnadu. Out of 189 industries, 3 industries are located in Chennai which is of Pharmaceuticals and Tannery. The industrial activities are categorised as Red, Orange and Green based on the process involved and pollution load generated with respect to effluent, emission and hazardous wastes. These industries are required to comply with the provisions of the Water Act, the Air Act and the provisions of the Environmental (Protection) Act. Number of industries under Red, Orange and Green Category are given below:



Large			Medium			Small			Total
Red	Orange	Green	Red	Orange	Green	Red	Orange	Green	
127	87	12	37	38	23	436	766	491	2017

### 3.0 Common Effluent Treatment Plants

The concept of CETP was adopted as a way to achieve end-of-pipe treatment of combined wastewater at lower unit cost than could be achieved by individual industries, and to facilitate discharge, monitoring and enforcement by environmental regulatory agencies and the investment of substantial government

finances in the CETP scheme was justified on the basis of potential benefits in terms of pollution reduction and environmental improvements. In Tamil Nadu 40 CETPs are located in different industrial clusters, out of which 2 CETP's are located in Chennai following table shows the details of CETPs exist in the Chennai:

**Details Common Effluent Treatment Plants**

S. No.	Name of the CETP	Year of Commission	Capacity	Remarks
1.	Madhavaram Leather Manufacturers Facility Pvt Ltd., H 3, TALCO Industrial Estate, Madhavaram, Chennai- 60	Jan. 1997	0.4	Primary/Secondary treated effluent. Contemplating Dilution of its treated effluent with the domestic sewage of Chennai Corporation
2.	Pallavaram tanners Industrial Effluent Co. Ltd., 105, Anna Salai, Nagalkeni, Chromepet, Chennai-44	Fen. 1995	3.0	Achieved ZLD System

**Source:** TNPCB & CPCB

### General Status of CETP:

- Most of CETP's were found operating less than the designed capacity
- All CETP's are having Physico Chemical followed by biological Treatment System.
- Out of 13 CETPs for Tannery Sector, 11 CETPs have achieved ZLD and 2 CETPs have contemplated Dilution with domestic sewage.
- Out of 30 CETPs for textile sector 19 CETPs have achieved ZLD for lesser quantity than consented quantity, one CETP is in the progress of achieving ZLD and 1010 CETPs are under closure in view of not implemented/started ZLD systems
- All CETPs are having their own sludge storage area.

## 4.0 Sewage Treatment Plants

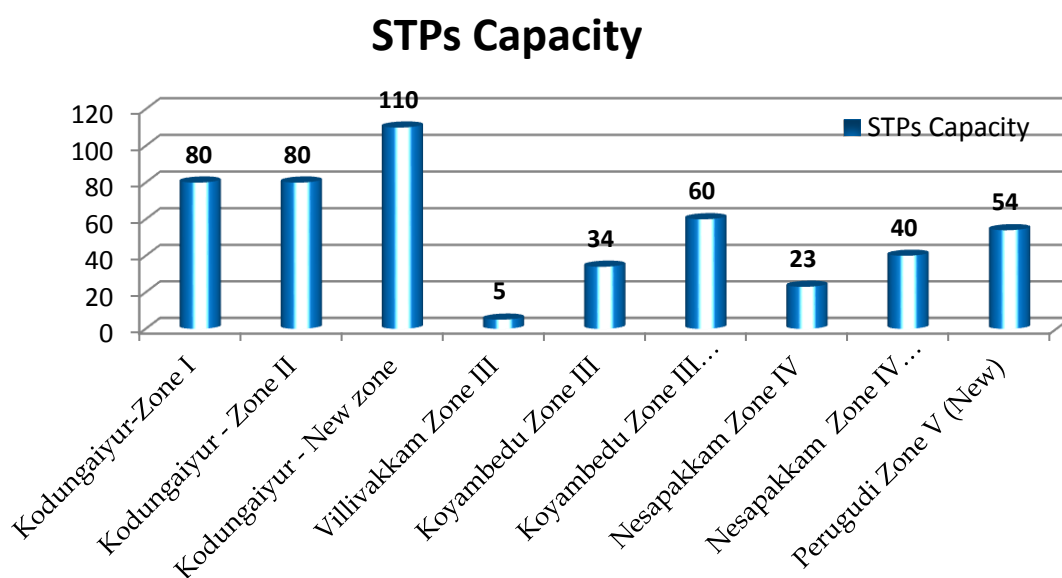
The total sewage generated in Class I (26 cities) and Class II (57 cities) cities of Tamil Nadu is 1172 MLD, of which treatment capacity is available for only 193 MLD, equal to only 16% of the sewage generation.

### Sewage Treatment Plants in Chennai City

As per the information of Chennai Water Supply and Sewerage Board total water supply for Chennai city is 760 MLD and Sewage generation is about 608 MLD. The available sewage treatment plant capacity is only 486 MLD. The sewage generated in Chennai city is being treated in the following nine number of treatment plants:

1. Kodungaiyur STP Zone I - 80 MLD
2. Kodungaiyur STP Zone II - 80 MLD
3. Kodungaiyur (New) STP Zone I & II - 110MLD
4. Villivakkam STP Zone - III -5 MLD
5. Koyambedu STP Zone - III - 34 MLD
6. Koyambedu (New) STP Zone - III - 60 MLD
7. Nessapakkam STP Zone - IV- 23 MLD
8. Nesapakkam (New) STP Zone - IV - 40 MLD
9. Perungudi (New) STP Zone - V - 54 MLD

Four new STPs were constructed under the Chennai City River Conservation Project (C.C.R.C.P) and were commissioned during 2005 and 2006, at Kodungaiyur (110 MLD), Koyambedu (60 MLD), Nesapakkam (40 MLD) and Perungudi (54 MLD) and the total addition to the treatment capacity was 264 MLD. In these new STPs new technology in sludge treatment and generation of power using bio-gas were adopted which significantly reduces electricity import from the State Electricity grid.



### General Status of STP:

- Discharge of untreated /treated sewage is most important cause for pollution of surface & ground water since there is a large gap between generation and treatment of domestic wastewater in India.
- Part of treated sewage is being reused by industries for green development in industry premises.
- Several sewage treatment plants are established under centrally funded National River Action Plan. However, their operation and maintenance is generally not satisfactory.
- The problem is not only of adequacy of treatment capacity but also operation and maintenance of treatment plants.



## 5.0 Bio Medical Waste Management

It is reported that out of 317 Government Hospitals and 1835 private hospitals having about 92000 beds all over the Tamil Nadu, There are 730 health care facilities having 42000 beds and 200 non bedded units which generates 9001 kgs bio medical waste every day in Chennai alone covering Chennai area, Chengelpet, Kanchipuram, Thiruvallur, Cuddalore Dt., and Villupuram Dt. To Treat and dispose these biomedical waste, there are two common biomedical waste treatment facilities namely M/s G.J Multiclave and M/s Tamil Nadu Waste Management Pvt Ltd located at Thenmelpakkam, Chengalpattu Taluk, and Chennakuppam, Sriperumbur T.K respectively. The common biomedical treatment and disposal facilities are regularly monitored by both CPCB and SPCB and meets the norms as per Biomedical Waste (Management and Handling) Rules, 1998.

The details of Common Biomedical Waste Management facilities which are handing the Biomedical wastes generated from Chennai are as below:

Sl. No.	Name & address of the Common Biomedical Waste Management	Cities /town covered	Treatment Facilities installed at CBMWT	Total Quantity of Waste received
1	M/s G.J. Multi Clave (India) Pvt. Ltd. Thenmelpakkam, Chengalapattu, Taluk, Kancheepuram Dist.	Chennai South , Kancheepuram (Part)	Incinerator- 200 kg/hr, Incinerator- 250 kg/hr, Autoclave- 764 Kg/hr, 2nos. Shredder - 50 and 75 kgs/h each ETP-25 KLD (Effluent Generation - 20 kld) Sharp pit - 8000 Sq. ft Power Back up- 64 KVA and 125 KVA each	5505 kgs /day
2	Tamilnadu Waste Management Ltd, Shriprumbedur Chennakuppam, Sriperumbur, Kanchipuram	Chennai South , Thiruvallur Dt. Cuddalore Dt. Villupuram Dt. Kancheepuram Dt (Part)	Incinerator- 200 kg/hr, Autoclave- 810 Kg/Cycle, Shredder - 50 kg/h, 2 Nos ETP capacity -24 KLD (Effluent Generation - 7 kld) Power Back up- 82.5 KVA.	3496 kgs/day

**Liquid Waste Disposal Practises:** The major health care facilities have provided treatment plants and the bio-medical liquid effluent is treated after disinfection. Smaller

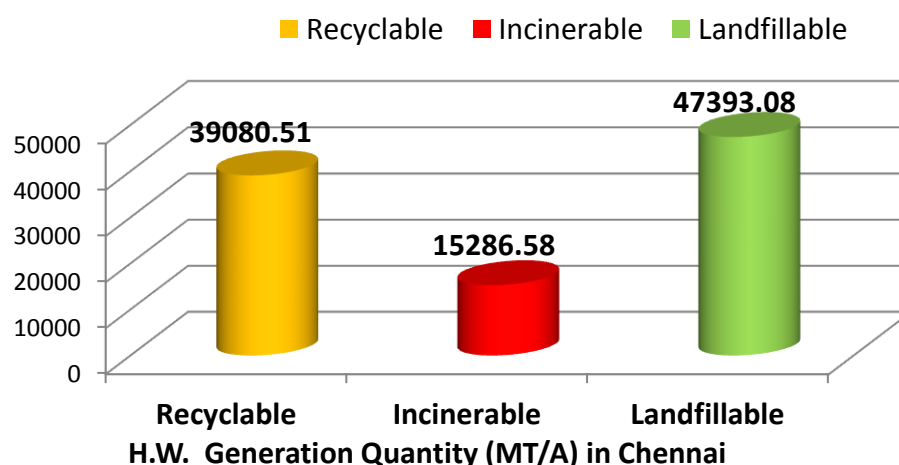
*hospitals are disinfecting their liquid effluents and discharge them into sewer system etc.*

### 6.0 Hazardous Waste Management

Inventory of estimated HW Generation in Chennai from Working Industries (assuming units are operating at 100% capacity) by TNPCB is given below:

**HW generation Chennai**

Region	No. of Industries	Land fillable (MT/A)	Recyclable (MT/A)	In-cinerable (MT/A)	Total Qty. (MT/A)
Chennai	1032	47393.08	39080.51	15286.58	118164.53



### 6.1. Hazardous Waste Recyclers

The number of hazardous waste recyclers registered with TNPCB for handling of various types of hazardous waste are:

S. No.	Reprocessing	No. of Units	Total Capacity Per Annam
1.	Lead waste Re-processor	3	13400 MTA
2.	Non - ferrous Metal Re-processor	8	25139 MTA

### 6.2. Common Hazardous Waste Incinerators

There is only one Common Hazardous Waste Incineration facility located and operating in Tamilnadu.



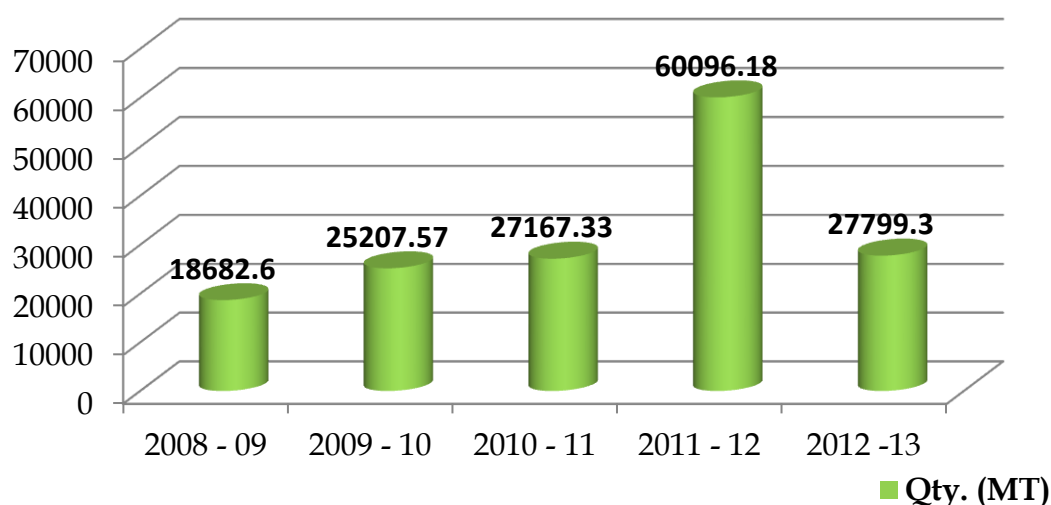
### 6.3. Treatment Storage Disposal Facilities (TSDF) for Hazardous Wastes

TNPCB has taken initiatives for developing the three sites in Tamilnadu initially. The sites are located at Gummidipoondi in Thiruvallur District, Nallur Village in Karur District, Maithigiri village in Tiruppur District. The facilitator for all three sites are M/s. Tamilnadu Waste Management Ltd (M/s Ramky Agencies, Hyderabad). The status is given in the Tabular Column below.

The facilitator for all three sites are m/s Tamilnadu waste management Ltd. (m/s ramky agencies Hyderabad)

	<b>Gummidipoondi</b>
<b>Area of the TSDF (acres)</b>	66
<b>Designed capacity(Tons)</b>	3,00,000
<b>Land fill generation capacity (Tons/yr)</b>	1 Lakh Ton/yr
<b>Incineration</b>	Quantity - 3364 T/A Capacity - 1 T/hr.
<b>Life span of each Facility</b>	25 years
<b>Indl. Estate which falls under the TSDF</b>	SIPCOT Ind. Complex Gummidipoondi & industries location in Chennai, Thiruvallur & Kancheepuram District
<b>Status</b>	Commissioned site notified Consent to operate authorization issued.

**Wastes Landfilled in MT**



### 7.0 Municipal Solid Waste Management in Chennai

## Environmental Status of Chennai

- The Chennai Corporation Area is divided into three region North, South and Central. It is further divided into 15 zones, consisting of 200 wards. The newly annexed areas were divided into 93 wards, and the remaining 107 wards were created out of the original 155 within the old city limits.
- The estimated Solid waste generation from all the zones of Chennai corporation is about 4500 TPD and building debris about 700 TPD. Per capita domestic waste generation is 700 gmpd. The segregation of waste at source is 10%.
- The house hold (Residential ) wastes contribute to about 68%, Commercial activities contribute to about 16%, Halls, Schools & institutions contribute to 14% and others 2% of total waste generation.
- Chennai Corporation has 11 Waste Transfer Stations and three Disposal sites. The corporation has planned to close these yards and create four new dumpyards at Malaipattu, Minjur, Vallur, and Kuthambakkam villages, ranging in size from 20 acres to 100 acres. Details of existing disposal sites are as follows;

Details of Disposal Sites	Name of Disposal Sites	
	Kodungaiyur	Perugudi
Area	200 acres	200 acres
Life Expectancy	Upto 2015	Upto 2015
Total number of years in use	30 years	25 years
Dsily waste disposed	2100 to 2300 MT	2200 to 2400MT
Neighbourhood	Within one KM ( are in existence)	Within 0.5 KM formed after dumping)

### 8.0 E - Waste Management

There are 15 e-waste recyclers are authorised by TNPCB for handling E- waste generated from Tamilnadu. Under the E-waste (M&H) Rules, 2011, following are the details of authorisation/Registration issued.

1. Dismantlers - 9 Nos.
2. Recyclers - 5 Nos
3. Collection centres - 7 Nos.

### 9.0 Ambient Air Quality Monitoring

Tamilnadu Pollution Control Board is operating eight ambient air quality monitoring stations in Chennai under National Air Quality Monitoring Programme (NAMP).

The eight ambient air quality monitoring stations in Chennai are:-

1. Kathivakkam - Industrial area
2. Manali - Industrial area
3. Thiruvottiyur - Industrial area
4. Kilpauk - Commercial (traffic inter-section)
5. Thiyagaraya Nagar - Commercial (traffic inter-section)
6. Vallalar Nagar - Commercial (traffic inter-section)
7. Anna Nagar - Residential area
8. Adyar - Residential area

In Chennai city, 5 monitoring stations functioned in the following places under Chennai ambient air quality monitoring programme (CAAQM) are now operated under NAMP from January'2013.

All the above stations are functioning on 24 hours basis, twice a week. The samples collected from NAMP stations are analysed for the Total Suspended Particulate Matter (TSPM), Respirable Suspended Particulate Matter (RSPM). (RSPM is particulate matter less than 10 microns) and gaseous pollutants such as Sulphur dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>2</sub>).

### 9.1 Ambient Air Quality Status at 3 Locations In Chennai Monitored By Continuous Ambient Air Quality Monitoring Stations Under Private Participation Project.

The continuous ambient air quality monitoring stations and its network established at 16 locations in the country under Private Participation Project. Among 16, 3 monitoring stations are being operated at 1. Alandur, 2. IITM & 3. Manali in Chennai under this project and supervised by Zonal office Bangalore. The location of monitoring stations are earmarked in fig-1

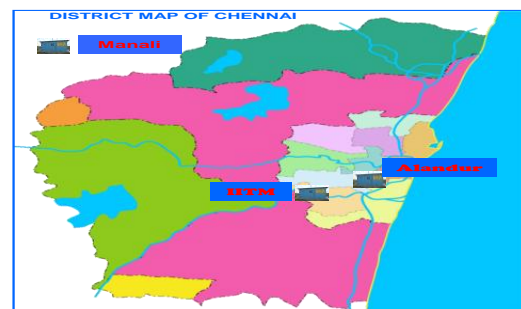


Figure-1



Figure-2 &3

These monitoring stations are equipped with various analyzers as to measure about 15 pollutants namely Ammonia (NH<sub>3</sub>), Benzene (C<sub>6</sub>H<sub>6</sub>), Carbon Monoxide (CO), Ethyl Benzene (C<sub>8</sub>H<sub>10</sub>), M+P+O Xylene: Meta, Para & Ortho Xylene (C<sub>8</sub>H<sub>10</sub>), Methane (CH<sub>4</sub>), Nitrogen Dioxide (NO<sub>2</sub>), Nitrous Oxide (NO), Oxides of Nitrogen (NO<sub>x</sub>), Non Methane Hydro Carbon (NMHC), Ozone (O<sub>3</sub>), Respirable Suspended

## Environmental Status of Chennai



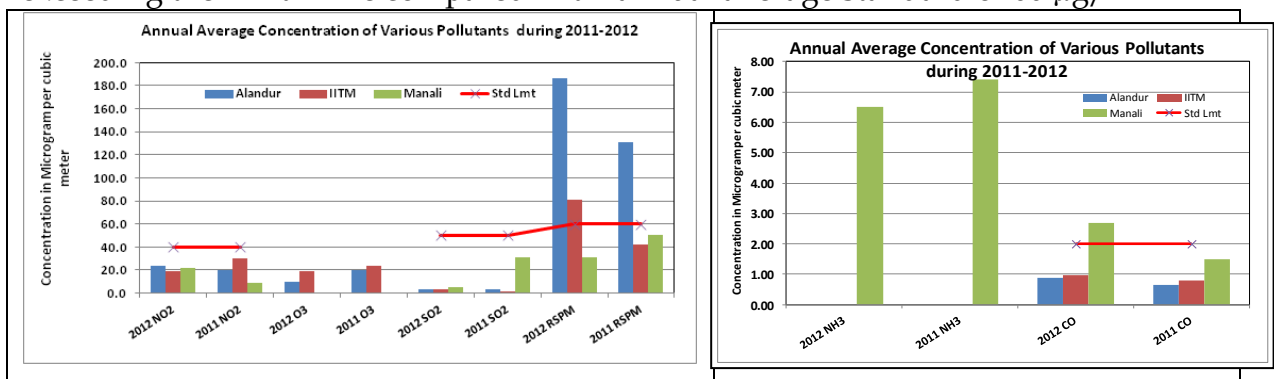
Particulate Matter (RSPM), Sulphur dioxide (SO<sub>2</sub>), Toluene (C<sub>6</sub>H<sub>5</sub>CH<sub>3</sub>) & Total Hydro carbon (THC) and 7 meteorological parameters namely Barometric Pressure (BP), Relative Humidity (RH), Solar Radiation (SR), Temperature (Temp),

Vertical Wind Speed (VWS) & Wind Direction (W DIR). All these instruments and sensors are working on approved techniques internationally. Monitoring stations are also equipped with multipoint calibrators by which each analyzer can be calibrated as and when required on schedule basis to correct the response of instrument and ensure the quality of data generated. The data generated by these monitoring stations are linked to local and central networking stations apart from disseminating online data through digital display board to public at each monitoring site.

The data generated during 2011 and 2012 are transferred to Central Net working system then validated and compiled. The compiled data for the critical pollutants are briefed as follows.

The annual average ambient air quality concentration depicted in figs with respect to Oxides of Nitrogen(NO<sub>x</sub>), Sulphur Dioxide(SO<sub>2</sub>), & Ammonia(NH<sub>3</sub>) are well within the annual average standard limit of 40 µg/m<sup>3</sup>, 50 µg/m<sup>3</sup>, and 100 µg/m<sup>3</sup> respectively in both years 2011 & 2012 against the prescribed National Ambient Air Quality Standard. The concentrations of Carbon Monoxide(CO) and Ozone(O<sub>3</sub>) in the ambient air are found to be within the standard limit while compared with 8 hrly average standard limit of 2mg/m<sup>3</sup> and 100 µg/m<sup>3</sup>

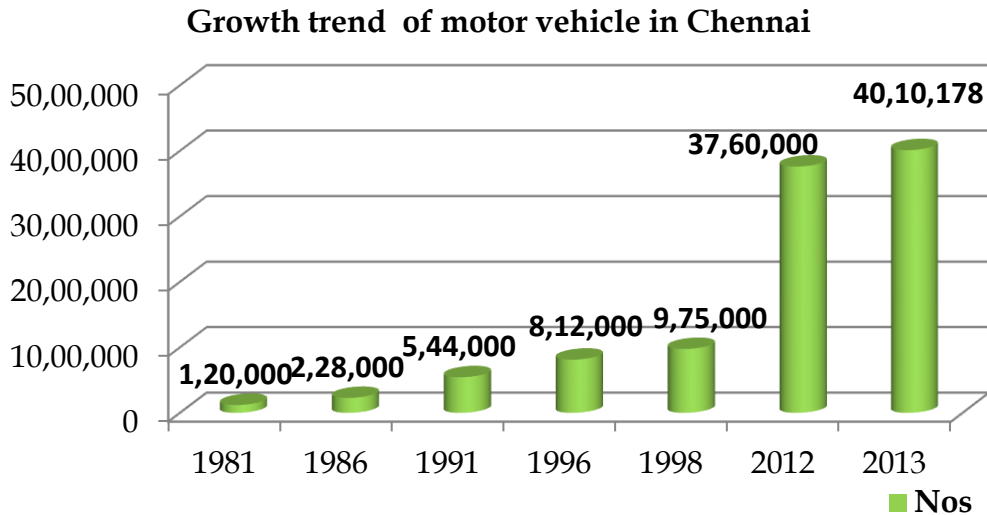
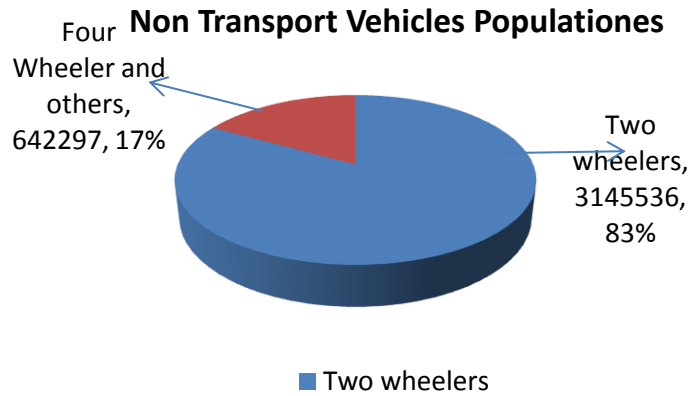
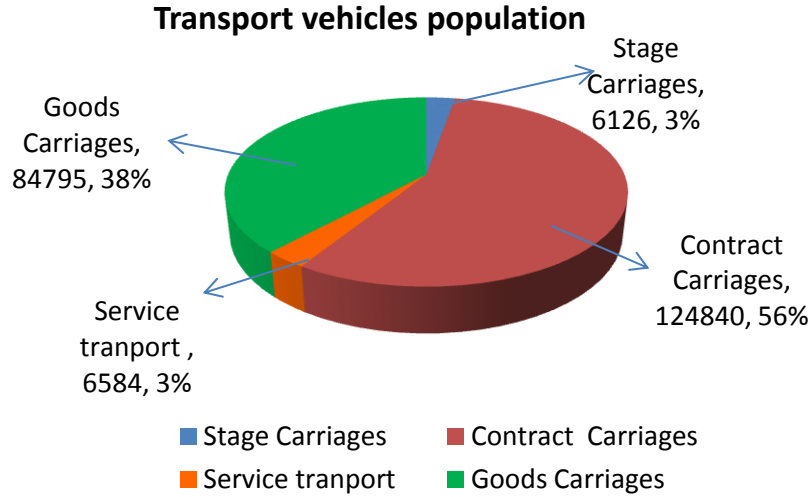
The Respirable Particulate Matter (RSPM) concentration measured in the ambient air at all three locations in Chennai during 2011 and 2012 as depicted in figures. The concentration of RSPM at Alandur and IITM during 2012 and at Alandur in 2011 are exceeding the limit while compared with annual average standard of 60 µg/m<sup>3</sup>



### 10.0 Vehicular Population and measures taken to control pollution

## Environmental Status of Chennai

Total Vehicle Population of Chennai as on 01.09.2013 is 40,10,178, out of which 2,22,345 are transport vehicles (Public, Private, school bus, Taxi cab, Omni bus, maxi cab, motor cab, Lorries etc) and 37,87,833 are Non Transport vehicles (Two wheeler, motor car, jeep, tricycle auto, tractor, three wheeler, four wheeler, Road roller. The distribution of transport and non transport vehicles are given below:



### 10.1 Measures taken to control Vehicular pollution

With the rapid increase in the number of vehicles, the problem of automobile pollution has assumed greater significance. Since the emission of smoke from motor vehicles is a major source of air pollution, specific standards for the permissible limits for such emission have been prescribed in the Motor Vehicles Act 1988 and Central Motor Vehicles Rules 1989. All vehicles which are in operation for more than a year should undergo emission tests every six months. The Government has authorized 248 Private Emission Testing Centers throughout Tamil Nadu as per rule 116(B) of Tamil Nadu Motor Vehicles Rules 1989 and has made it mandatory that at the time of every transaction with Regional Transport Offices, certificate of Pollution Under Control will be checked.

The following are some of the other measures taken for the control of vehicular pollution:

1. Prescription of a time schedule for converting petrol driven autorickshaws in Chennai city to autorickshaws run on Liquefied Petroleum Gas (LPG). Tamil Nadu Pollution Control Board has also agreed to offer a subsidy of Rs.3000/- for such conversion. In Chennai city, there are 23 Auto LPG Dispensing Stations for the supply of LPG to Motor Vehicles.
2. Banning of new petrol and diesel auto rickshaw permits.
3. In order to improve the Air Quality management LPG is permitted to use as an alternate fuel in motor vehicles. To minimize air pollution, motor vehicles running on petrol are being converted so that they can run on LPG. This is being done in a phased manner as per the directions of the Supreme Court in Metropolitan cities.
4. The emission standards have been tightened up and Bharat Stage III emission norms have been introduced for vehicles plying in Chennai city.

### 11.0 Other Environmental Issues in Chennai

- (i) **Contamination of Bore-wells in Varadaraja Perumal Koil Street in Tondiarpet, Chennai and mitigation measures taken by CPCB.**

#### Chronology of events and action taken

- Groundwater contamination caused due to petroleum oil leakage at Tondiarpet, Chennai, was reported in print and electronic media on July 14, 2013. CPCB Zonal Office, Bangalore, inspected the site and collected the samples on July 15-16, 2013.
- TNPCB officials along with BPCL & IOC officials continuously visited the affected area, interacted with people and collected samples from 11 bore wells out of the 15 affected Bore wells. The issue was intensively coverage in the Visual Medias. Hon Minister for Environment & Pollution Control, Tamilnadu state took a review on Pipeline leakage on 18/07/13 that was attended by TNPCB, CPCB, BPCL, IOC & CPCL. Oil Industry was asked to address the mitigation measures jointly.
- CPCB issued directions to M/s BPCL on, vide letter dated 19/07/13, to stop pumping of oil through pipelines in Tondiarpet area till ensuring no leaks and action to prevent



leaks in pipelines is put in place and time-bound action plan for mitigation was submitted. M/s BPCL received the directions on 20/07/13 and stopped using of three pipelines from TNP to Jetty from 20/07/13 and confirmed to CPCB.

- On 22/07/13, M/s BPCL replied to TNPCB show cause letter citing that the white oil pipelines were not in usage from July 2010 & Nov 2012 and are filled with water from the above period and pressure testing of BO lines was carried out in presence of CPCB officials on 17/07/13. M/s BPCL also submitted that the contamination could not be from BPCL pipelines, but could also be from the oil handling facilities of other oil companies including CPCL.
- A team of Professors from IIT, Madras was engaged by TNPCB to find source of oil leakage and suggest mitigation measures. Team from IIT Madras, TNPCB officials visited affected area and collected samples on 25/07/13. TNPCB issued letter to BPCL on 29/07/13 requesting BPCL to bear the cost of testing and studies carried out by IIT Madras and also to take up Geo- Physical study to assess the hydrology of the site.
- On 25/07/13 and 26/07/13, press reported the National Green Tribunal (NGT), Chennai's admission of petition by Mr V.P Krishnamoorthy of Washermanpet on the pipeline leaks and notice issued to MoPNG to enter appearance on 2<sup>nd</sup> August 2013. The pipeline leaks of BPCL, IOCL & CPCL were figured in the petition filed.
- BPCL Representatives met Member Secretary, CPCB at CPCB Head Office, Delhi, with the interim reply to CPCB's letter dated 19/07/13. Interim reply to CPCB was submitted on 26.07.2013.
- In the NGT hearing on 12/08/2013, IIT submitted their preliminary report where they concluded that the contaminant in bore well is diesel and had enumerated the further studies required. NGT gave time till 03/09/2013 for filing the counter affidavit.
- TNPCB Chairman convened meeting on 19/08/2013 with IIT team and industries namely IOC, CPCL, BPCL & HPCL and discussed further action plan in line with the IIT's recommendations.
- On 07/09/2013, M/s BPCL placed work order to IIT Madras for characterization of contaminants and geophysical survey of the affected area. Accordingly, IIT Madras carried out geo physical survey and soil resistivity survey in the affected area.
- CPCB officials further visited the site during 18-19/09/2013 for assessing the progress of remediation measures taken and collect the samples from the bore wells. The Chairman, TNPCB, vide letter dated 18/09/13, directed M/s BPCL to extend all support and coordination to IIT Madras to collect and analyze the soil samples from the contaminated site and made M/s BPCL as the sole responsible for the contamination and to bear the entire cost of the investigation and remediation.
- On 29/09/2013, M/s BPCL held meeting with IIT & TNPCB to decide on the methodology for conducting geophysical survey. Methodology for conducting geophysical study was partially finalized on 01/10/2013. Geophysical study was conducted since 03/10/2013 by IIT Madras and is in progress.
- 12.10.2013, Member Secretary, Central Pollution Control Board took a review meeting at Chennai, with all stake holders and directed M/s BPCL to complete the work immediately in consultation with other agencies involved.
- As informed, out of 18 contaminated bore wells, 14 bore wells are free from contaminant. In the 4 bore wells, around 3 litres of contaminant is still persisting and being collected. During December 2013 after obtaining consent from CPCB and TNPCB, M/s BPCL has cut the pipe lines around 10 mts and the lines were emptied and capped at both the ends and back filled the area, thus fulfilling the prayer

(removal of pipelines from the congested area) of the petitioner in NGT. This was done to ensure that no leaking is happening from these pipelines passing through Thondayarpet areas.

- M/s BPCL continued to clean the contaminated bore wells along with supplying portable water to the affected residents. As reported around 2070000 litres of water from 17.07.2013 to 10.12.2013 were supplied to affected areas. 10,040 man-hours are utilized for removal of contaminants from the affected bore wells. 3943 litres of contaminant is recovered from the contaminated area along with contaminated water of 118375 litres.
- The progress made by M/s BPCL is constantly monitored by CPCB and TNPCB.

### (ii) A Comprehensive Report on Air Quality Status at Chennai and Ennore Ports of Chennai, Tamil Nadu

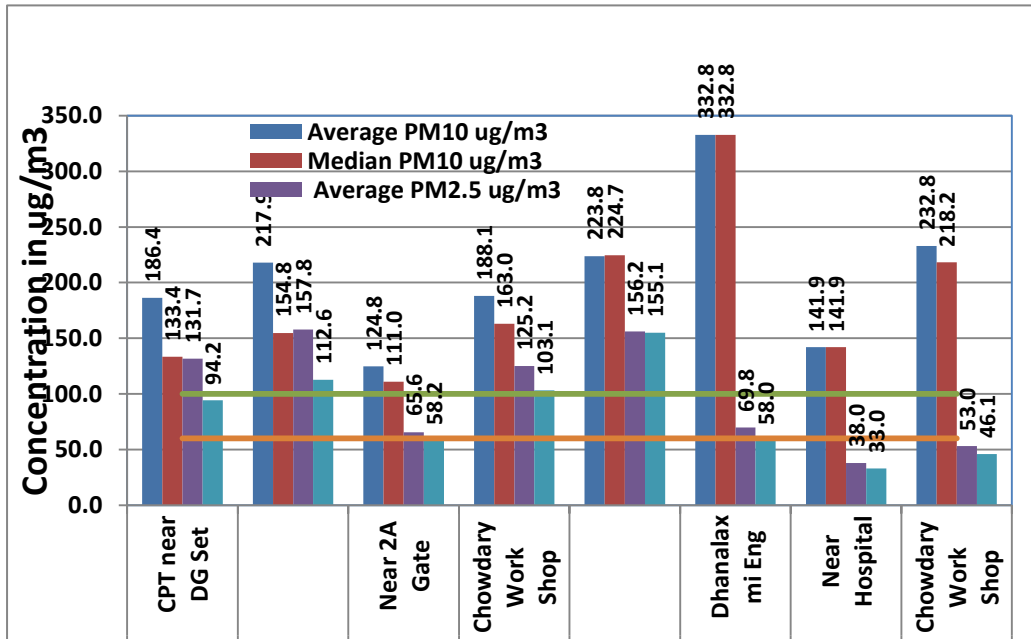
#### Background

Four writ petitions were filed in the Hon'ble High Court of Madras against the Chennai Port Trust and the Tamilnadu Pollution Control Board. The prayer in W.P.No.37081 of 2002 filed by The Registrar (Administration), High Court is to immediately stop dumping and handling of dusty powdered coal and to take effective steps to prevent pollution. The Hon'ble High Court had issued several directions to the Port to maintain ecology and to combat pollution, but the compliance reports filed by the Chennai Port have been disputed by the petitioners. The Hon'ble High Court constituted a Committee to inspect the Chennai Port and furnish a report indicating the status of compliance with the Directions of the Hon'ble High Court. The observations of the team were filed in the Hon'ble High court. Following this the Chennai Port Trust filed an affidavit listing the various steps taken by them to mitigate pollution. To verify the veracity of the compliances the Hon'ble High Court directed the Committee to inspect the Chennai Port Trust. Gist of the report is given below:-

#### Type of materials handled at Chennai port during 2007-08 to 2011-2012

Materials	2007-08	2008-09	2009-10	2010-11	2011-12
Pol	12.71	13.13	13.32	13.99	13.30
Iron ore	7.66	6.85	7.13	2.11	0.10
Fertilizer –finished	0.58	0.52	0.38	0.43	0.35
Fertilizer –raw	0.27	0.27	0.23	0.34	0.28
Non-coking coal	7.86	8.19	7.97	7.11	2.84
Coking coal	1.84	1.66	1.79	0.61	0.35
Containers	18.05	20.58	23.48	29.42	30.08
Others	8.18	6.29	6.76	7.45	8.41
Total	57.15	57.49	61.06	61.46	55.71

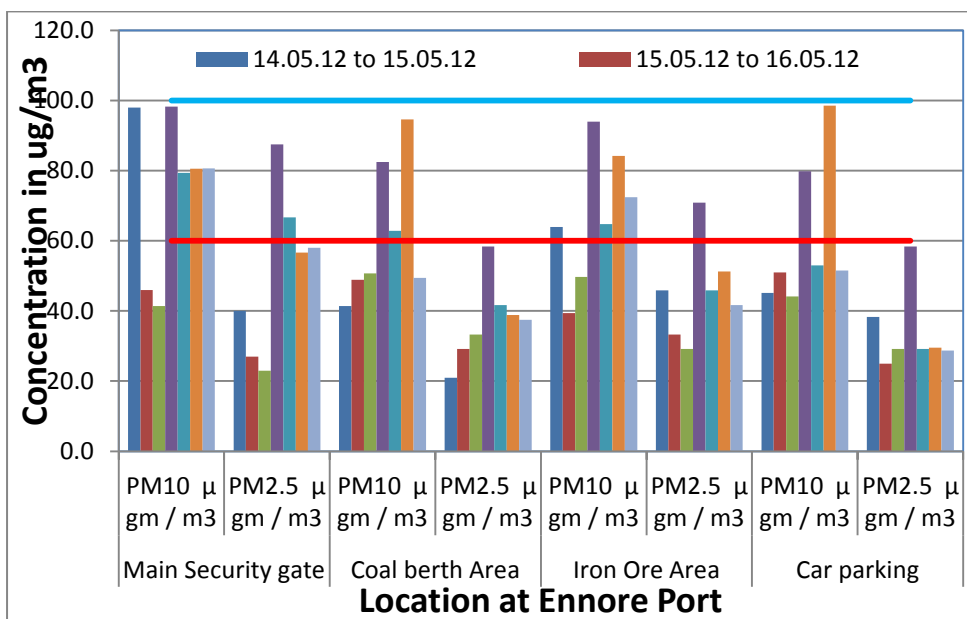
**Table 1. Summary of 24-hr averages PM10 and PM2.5 concentrations measured at selected locations inside the Chennai port during 15th to 26th May 2012.**



**Air Quality Status at Ennore Port Limited, Chennai**

The concentration PM10 measured manually at all the four locations in and around Ennore port during 14 to 21.05.12 are within the standard limit of 100 µg/m3 whereas the same for PM2.5 were also observed with in the limit of 60 µg/m3 except two days at Main security gate and one day at SICAL Iron Ore Security Gate.

**Table 2. 24 hrly Ambient air quality status in and around Ennore port monitored during 14.05.12 to 21.05.12 (Manual monitoring)**



### Continuous Online Monitoring

Out of 4 locations monitored for PM10 and PM2.5 during 7 days, the concentration of PM10 at all locations and days are within the standard limit except two days at main security gate and one day at iron ore area for PM2.5 which is exceeded against prescribed limit of 60  $\mu\text{g}/\text{m}^3$ . Out of six days monitored at three locations, the concentrations while compared with National Air Quality Standard for PM10 is exceeding on three days at places monitored near NCTPS and gaseous parameters are well within the standard limits at all locations.

### Observation with respect to Terms of Reference of The Hon' ble Supreme Court

The Hon'ble Supreme Court has called for a comprehensive report from the above empowered Committee on the following points:

#### Point No.1

#### **The impact and extent of pollution to the environment due to the handling of the cargo in question, namely, dusty coal and iron ore at the Chennai Port.**

Based on the historic air quality data (2009-2012) measured inside the Chennai port, the particulate matter (PM10) concentrations were found exceeding the National Ambient Air quality standard limit of 100  $\mu\text{g}/\text{m}^3$  with 69, 84, 100 & 49 % of times during 2009,2010, 2011 and 2012 respectively.

It may be noted that there was an increasing trend of the violations from 2009 to 2011 until the coal and ore handling was in operation and thereafter (October 2011 onwards) there is a declining trend of violations.

The present monitoring carried out during 14-26 May 2012 by the Technical Sub-committee also indicates that the 24-h mean as well as median values of PM 10 concentrations were exceeding the NAAQ standard values (PM10 – 100  $\mu\text{g}/\text{m}^3$ ) at all 6 locations inside the Chennai Port. Further, it is observed that PM2.5 concentrations were also exceeded at four locations. **It may be inferred that PM10 and PM2.5 concentrations were found to be exceeding the standard limit even after coal and ore handling were stopped from October 2011.**

#### Point No.2

#### **Suggestions regarding remedial / mitigative measures, which may be adopted at the Chennai Port to remedy / reduce the pollution, if any, caused by the handling of dusty cargo in question.**

The Technical Sub-committee suggested certain remedial / mitigative measures which may be adopted at Chennai port after detailed deliberations, literature survey and interaction with experts related organizations. The list of suggested measures on various aspects are presented at clause 3 and above.

#### Point -3

#### **Assessment of the standard of facilities available at the Ennore Port to handle dusty coal and iron ore cargo.**

The Technical Sub-committee visited and assessed the infrastructure facilities available with the Ennore port to handle coal and ore. The adopted modern equipments and machineries are ship unloader, Mobile wagon and truck loading system, Surge Hoppers and feeders, closed conveyer system, stacker cum reclaimers, Wind shield dust production wall, adequate sprinklers and cannons, and isolated wide area for stacking coal and ore etc and the detailed description is given in Part B of

the report (Part- B ENNORE PORT Infrastructure Facilities and Air Quality Status at Ennore Port Limited, Chennai)

### **(iii) Municipal Solid Waste Management in Chennai City**

Existing disposal sites life expectancy will be complete by 2015, hence the solid waste treatment and disposal is one of the issue to be tackled. The Corporation of Chennai shall develop a comprehensive plan to overcome the issue of solid waste management in Chennai city.

### **(iv) Sewage Treatment Plant**

The total sewage generated in Chennai city is 608 MLD, available STP capacity is 486 MLD. Discharge of untreated sewage may surface & ground water. The government shall take steps to upgrade the Sewage treatment plants to fill the gap and to achieve 100% of sewage treatment and utilization of treated sewage for industrial and irrigation purpose.

### **(v) Health Effect Vs Vehicular Pollution**

There are more than 47 lakh vehicles flying in Chennai city alone. Ratio of vehicle to person is works out around 1:1.16. Vehicles are an important source of the air pollutants carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM), volatile organic compounds (VOCs), etc. The change in environment (pollution) was having an impact on the health of the people. There is a need to conduct a study on health effect Vs Vehicular pollution in Chennai.