ANNUAL REPORT
2016-17

Central Pollution Control Board

Ministry of Environment, Forest & Climate Change

Website: www.cpcb.nic.in

CPCB, 200 COPIES, 2018 (ENGLISH)

Prepared & Published by : PR Division, Central Pollution Control Board, Delhi-110032

Text Compilation & Editing : Sh. J.S Kamyotra and Smt. Anamika Sagar

Printing Supervision and Layout : Ms. Anamika Sagar and Sh. Satish Kumar

Printed at : Rakmo Press Pvt. Ltd., Okhla Phase-1, New Delhi-110020

CONTENTS

Chapter No.	Chapter	Page No.
I	Introduction	1
II	Constitution of the Central Board	3
III	Meetings of the Central Board	4
IV	Committees Constituted by the Board and their Activities	7
V	Air, Water and Noise Monitoring Network	9
VI	Present state of Environment, Environmental Problems and Counter Measures	44
VII	Environmental Research	86
VIII	Environmental Training	113
IX	Environmental Awareness and Public Participation	115
X	Environmental Standards Including Schedule for their Enforcement	121
XI	Prosecutions Launched, Convictions Secured and Directions Given for Closure of Polluting Industries	130
XII	Finance and Accounts	131
XIII	Annual Action Plan for the Year 2016 – 2017	132
XIV	Other Important Activities Dealt by CPCB	136
Annexure		
1.	Delegation of Powers by Central Pollution Control Board To Pollution Control Committees	163
2.	List of CPCB Board Members (as on 31.03.2017)	164
3.	Organization Structure of Central Pollution Control Board	166
4.	Sanctioned Staff Strength in CPCB and Number of Vacancies in Each Cadre as on 31.03.2017	167

CHAPTER - I

INTRODUCTION

Under the provisions of The Water (Prevention & Control of Pollution) Act, 1974, the Central Government constituted the **'Central Board for the Prevention and Control of Water Pollution'** on September 23, 1974. The name of the Central Board was amended to **Central Pollution Control Board (CPCB)** under the Water (Prevention & Control of Pollution) Amendment Act, 1988 (No. 53 of 1988). The Central Pollution Control Board has been entrusted with the added responsibilities of Air Pollution Control since May, 1981 under the provisions of the Air (Prevention and Control of Pollution) Act, 1981. The enactment of the Environment (Protection) Act, 1986, which is umbrella legislation for enforcement of measures for protection of environment and several notifications of Rules under the Act widened the scope of activities of the Central Board.

The CPCB has been continuously playing a key role in abatement and control of pollution in the country by generating, compiling and collating data, providing scientific information, rendering technical inputs for formation of national policies and programmes, training and development of manpower and through activities for promoting awareness at different levels of the Government and Public at large.

1.1 FUNCTIONS OF THE CENTRAL BOARD

The main functions of CPCB, as spelt out in The Water (Prevention and Control of Pollution) Act, 1974, and The Air (Prevention and Control of Pollution) Act, 1981, are:

(i) To promote cleanliness of streams and wells in different areas of the States through prevention, control and abatement of water pollution; and,

(ii) To improve the quality of air and to prevent, control or abate air pollution in the country.

In addition to the main functions of promoting cleanliness of streams and wells, improving the quality of air and to prevent, control or abate air pollution, CPCB has been assigned following National Level functions:

- Advise the Central Government on any matter concerning prevention and control of water and air pollution and improvement of the quality of air;
- Plan and cause to be executed a nationwide programme for the prevention, control or abatement of water and air pollution;
- Coordinate the activities of the State Boards and resolve disputes among them;
- Provide technical assistance and guidance to the State Boards, carry out and sponsor investigations and research relating to problems of water and air pollution, and for their prevention, control or abatement;
- Plan and organise training of persons engaged in programmes for prevention, control or abatement of water and air pollution;
- Organise through mass media, a comprehensive mass awareness programme on prevention, control or abatement of water and air pollution;
- Collect, compile and publish technical and statistical data relating to water and air

pollution and the measures devised for their effective prevention, control or abatement;

- Prepare manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks and ducts;
- Disseminate information in respect of matters relating to water and air pollution and their prevention and control;
- Lay down, modify or annul, in consultation with the State Governments concerned, the standards for stream or well, and lay down standards for the quality of air;
- Establish or recognize laboratories to enable the Board to perform, and;
- Perform such other functions as and when prescribed by the Government of India.

1.2 FUNCTIONS OF THE CENTRAL BOARD AS STATE BOARD FOR THE UNION TERRITORIES

- Advise the Governments of Union Territories with respect to the suitability of any premises or location for carrying on any industry which is likely to pollute a stream or well or cause air pollution;
- Lay down standards for treatment of sewage and trade effluents and for emissions from automobiles, industrial plants, and any other polluting source;
- Evolve efficient methods for disposal of sewage and trade effluents on land;
- Develop reliable and economically viable methods for treatment of sewage, trade effluents and air pollution control equipment;
- Identify any area or areas within Union Territories as air pollution control area or areas to be notified under The Air (Prevention and Control of Pollution) Act, 1981; and
- Assess the quality of ambient air and water, and inspect wastewater treatment installations, air pollution control equipments, industrial plants or manufacturing processes to evaluate their performance and to take steps for the prevention, control and abatement of air and water pollution.

1.3 DELEGATION OF POWERS BY CENTRAL POLLUTION CONTROL BOARD

As per the policy decision of the Government of India, the Central Pollution Control Board, delegated its powers and functions from time to time under Section 4, Sub Section 4 of The Water (Prevention and Control of Pollution) Act, 1974 and Section 6 of The Air (Prevention and Control of Pollution) Act, 1981 with respect to various Union Territories to respective Pollution Control Committees under the administrative control of local Administration (Annexure-I).

CHAPTER-II

CONSTITUTION OF THE CENTRAL BOARD

2.1 According to the provisions of The Water (Prevention & Control of Pollution) Act, 1974, the Central Board consists of the following members:

- A fulltime Chairman, being a person having special knowledge or practical experience in respect of matters relating to environmental protection or a person having knowledge and experience in administering institutions dealing with the matters aforesaid, to be nominated by the Central Government;
- such number of officials, not exceeding five, to be nominated by the Central Government to represent Government;
- such number of persons, not exceeding five, to be nominated by the Central Government, from amongst the members of the State Boards, of whom not exceeding two shall be from amongst the members of the local authorities;
- such number of nonofficials, not exceeding three to be nominated by the Central Government, to represent the interest of agriculture, fishery or industry or trade or any other interest which, in the opinion of the Central Government, ought to be represented;
- two persons to represent the companies or corporations owned, controlled or managed by the Central Government, to be nominated by the Government; and
- A fulltime Member Secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, to be appointed by the Central Government.

2.2 List of Board Members during the year 2016- 2017 is provided at Annexure-II. The organisation structure of the Central Pollution Control Board is provided at Annexure-III. Staff strength as on March 31, 2017 is furnished in Annexure-IV.

CHAPTER-III

MEETINGS OF CENTRAL POLLUTION CONTROL BOARD

3.1. MEETINGS OF THE CENTRAL BOARD

During the reporting period (i.e. April 1, 2016 to March 31, 2017), four meetings of the Central Board were held as under:

S.No.	Meeting No.	Date	Place
1.	173rd	June 28, 2016	CPCB, Delhi
2.	174th	September 21, 2016	CPCB, Delhi
3.	175th	December 21, 2016	CPCB, Delhi
4.	176th	March 23, 2017	CPCB, Delhi

3.2 MAJOR DECISIONS TAKEN BY THE BOARD

1. Approved the Annual Action Plan, 2016-17.
2. Approved the Setting up of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) in remaining million-plus cities and state / UTs capitals.
3. Approved the revision of sampling and analysis charges for Water, Soil, Hazardous Waste, Air and Source Emission samples at CPCB Laboratories.
4. Approved the Constitution of Technical Committee.
5. Approved the disposal of Lyophiliser currently established at Jajmau, Kanpur.
6. Approved the engagement of Experienced Person as Consultant for Monitoring of Air and Water Pollution.
7. Approved the proposal for Electronic Data Processing (EDP) Cadre in CPCB.
8. Approved the proposal to provide leaves to Project Employees (Casual/Consolidated Salary/Compassionate).
9. Approved the renewal of Recognition of Environmental Laboratories under the Environment (Protection) Act, 1986.
10. Approved the River Health Card.
11. Approved the execution of R&D Programmes for CPCB, Setting up of R&D Institutes and networking and MoU with R&D Institutes.
12. Approved for extending Air Quality Monitoring at All Districts.
13. Approved the revision of professional fee payable to the empanelled advocates of the Central Pollution Control Board and revision of terms and conditions for empanelment of Advocates.
14. Approved the monitoring of molecular markers in important cities.
15. Approved the revised Delegation of Powers (Administration and Financial).
16. Approved the revised Telephone Policy.
17. Approved the designation of In-charges of Zonal Offices of CPCB as Regional Directorate and Regional Director.

18. Resolved the anomaly in the Pay Band and Grade Pay of Administrative Cadres.
19. Approved the strengthening of Laboratories of SPCBs / PCCs with reference to Monitoring of heavy metals and pesticide micro-pollutants.
20. Approved the guidelines for deputing CPCB officials for Training and other programmes within and outside the country.
21. Approved the Annual Report of CPCB for the Year 2015-2016.
22. Approved the Annual Action Plan (AAP) for the Financial Year, 2017-18
23. Approved the expansion of National Ambient Noise Monitoring Network to 156 Noise Monitoring Stations.

3.3 NATIONAL CONFERENCES

1. The 60th Conference of Chairmen & Member Secretaries of Pollution Control Boards / Committees (SPCBs/PCCs) was organised during May 17 – 18, 2016, New Delhi. Over 90 participants from 32 SPCBs / PCCs, MoEF & CC, and CPCB attended the meeting.

   The major issues discussed during the meeting are as follows:

   - Restoration of water quality of 302 polluted river stretches – formulation of action plans, strengthening of monitoring network, analysis of micro-pollutants and maintaining biological/ ecological health of Rivers (WQI)
   - Action to be taken against municipalities for sewage and solid waste management in Class I cities/state capitals & in 118 Ganga towns.
   - Action taken against Municipalities for sewage management in metropolitan cities / state capitals.
   - Air Quality Management plans for cities / towns exceeding levels of PM_{10} – Strengthening of monitoring network, publishing (AQI)
   - Setting – up of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) in million-plus cities & state capitals.
   - Management of online data from 17 categories of industries and taking actions based on violations.
   - Categorization of industries & actions for control of pollution.
   - Monitoring progress on implementation of action plans in critically polluted area based on revised formula.
   - Capacity Building.
   - Implementation of new notified standards.
   - Online Consent Management.
   - Streamlining of Consent to Establish and Consent to Operate.
   - Granting permission under Rule 11 of Hazardous waste (Management, Handling and Trans-boundary Movement) Rule, 2008 w.r.t. co-processing and other processes.
   - Granting permission under Rule 9 of Hazardous and Other Waste (Management and Trans-boundary Movement) Rule, 2016.
   - Implementation of notified Rules relating to Solid Waste Management Bio-Medical, Construction and Demolition, Electronic, Plastic and Hazardous Waste

2. The 61st Conference of Chairmen & Member Secretaries of Pollution Control Boards / Committees (SPCBs/PCCs) was organised during on November 23, 2016 at Gulmohar Hall, India Habitat Centre, New Delhi. Over 120 participants from 32 SPCBs / PCCs, MoEF&CC, and CPCB attended the meeting.

The major issues discussed during the meeting are as follows:

- Compliance of directions issued by Central Pollution Control Board
- E-Governance Platform for Online Consent Management and other vital information / statistics.
- Dissemination of information in public.
- Organisational structure and strengthening of Boards/ Committees; issues relating to: (i) Budget & Expenditure, (ii) Staffing and vacancies, (iii) Regional / District Offices and Infrastructure.
- Cess reimbursement.
- Strengthening of laboratories.
- Requirement of Infrastructure for Monitoring.
- Infrastructure for Waste management.

CHAPTER-IV

COMMITTEES CONSTITUTED BY THE BOARD & THEIR ACTIVITIES

During the year 2016-17, following Committees have been Constituted at Centre Pollution Control Board:

4.1 EXPERT COMMITTEE FOR FINALIZATION OF GUIDELINES AS REQUIRED UNDER E-WASTE (MANAGEMENT) RULES, 2016.

CPCB has Constituted an expert committee for finalization of following guidelines:

- Estimation of E-Waste generation by producers for fixation of Targets in their EPR authorization;
- Random Sampling for testing of RoHS Parameters;
- Environmentally Sound Dismantling / Recycling operation;
- Refurbishing of electrical and electronic equipments as listed in Schedule–I of E-Waste (Management) Rules, 2016;
- Storage, Transportation, segregation and disposal of E–Waste; and
- Facilities for Collection Centre.

4.2 TECHNICAL EXPERT COMMITTEE FOR "EVALUATION OF PROPOSAL FOR UTILIZATION OF THE HAZARDOUS AND OTHER WASTES UNDER RULE 9 OF THE HAZARDOUS AND OTHER WASTES (MANAGEMENT AND TRANSBOUNDARY MOVEMENT) RULES, 2016".

CPCB has Constituted a Technical Expert committee for "Evaluation of proposal for utilization of the hazardous and other wastes under Rule 9 of the hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016". The Technical Expert Committee is a recommendatory body, who shall recommend acceptance or rejection of a proposal for utilisation proposal of hazardous wastes as a supplementary resource or for energy recovery, or after processing, received from various applicants or suggest improvement after its scientific evaluation to CPCB.

4.3 EXPERT COMMITTEE AT CPCB FOR RECOGNITION OF LABORATORIES UNDER THE ENVIRONMENTAL (PROTECTION) ACT 1986

The MOEF & CC has Constituted the Expert Committee at CPCB for consideration and recommendation for recognition of the Laboratories under the Environmental (Protection) Act 1986.

4.4 RESEARCH ADVISORY MONITORING COMMITTEE:

The Research advisory Committee was reconstituted by CPCB on December 12, 2016 comprising experts from leading environmental laboratories of CSIR, DST, IITs, MoEF&CC.

with a need to address environmental challenges with better scientific/technical knowledge, innovative & integrated approaches and research & development.

4.5 TASK FORCE ON GRADED RESPONSE ACTION PLAN (GRAP):

Task Force on Graded Response Action Plan (GRAP), is constituted in pursuant to the Hon'ble Supreme Court's order dated December 02, 2016 in the matter of M. C. Mehta vs. Union of India regarding air quality in National Capital Region Delhi on January 17, 2017, comprising Member Secretaries of Delhi-NCR, representative of MoEF&CC, IMD and Health Expert. 21 meetings of Task Force were conducted during this financial year, and recommendations forwarded to EPCA and concerned agencies.

CHAPTER - V

AIR, WATER AND NOISE MONITORING NETWORK

5.1 WATER QUALITY MONITORING

5.1.1 National Water Quality Monitoring Programme :

Central Pollution Control Board (CPCB) in association with State Pollution Control Boards and Pollution Control Committees (SPCBs & PCCs) has established a water quality monitoring network. The network presently comprises of 2500 stations in 28 states and 6 union Territories. 2101 locations are monitored on monthly basis whereas 893 locations on half yearly basis and 6 locations on yearly basis. Time series data of water quality was analyzed periodically and identified the issue of indiscriminate sewage discharge in 302 polluted stretches of rivers. Polluted river stretches throughout the country have been identified and concerned SPCBs have been requested for taking measures for restoration of water quality through identification of sources of pollution and interventions through treatment of municipal as well as industrial effluents.

5.1.2 National Ganga River Basin Authority (NGRBA) :

The Central Government has set up the 'National Ganga River Basin Authority' (NGRBA) vide gazette notification dated 20.2.2009 as a collaborative institution of Central and State Governments under the Environment (Protection) Act of 1986 for abatement of pollution of River Ganga.

The Apex Body of NGRBA is headed by the Prime Minister for policy decisions and the Standing Committee is headed by the Minister of Finance for periodical review of NGRBA programme implementation. The fast track mechanism for implementations of projects under NGRBA programme was constituted by the Union Cabinet in December, 2009. Creation of a Mission Directorate for Clean Mission Ganga and setting up of Empowered Steering Committee (ESC) for appraisal and approval of projects along with monitoring and coordination amongst various Central Ministries and Centre – State coordination were approved. The NGRBA including the Mission Directorate and other related matters of Ganga Rejuvenation was transferred and allotted to the Ministry of Water Resources, River Development & Ganga Rejuvenation vide 306th amendment in the Government of India (Allocation of Business) Rules, 1961 with effect from 1st August, 2014. Further, NGRBA has been reconstituted in September, 2014 with inclusion of additional four Central Ministries i.e. Union Minister of Rural Development, Union Minister for Drinking Water and Sanitation, Union Minister for Shipping and Union Minister of State, Tourism for better coordination to ensure effective abatement of pollution and rejuvenation of the River Ganga.

The objective of the authority is to ensure effective abatement of pollution and conservation of the river Ganga by adopting a holistic approach with the river basin as the unit of planning.

Key features of new approach are as follows:

- River basin will be the unit of planning and management. This is an internationally accepted strategy for integrated management of rivers.
- Accordingly, a new institutional mechanism in the form of National Ganga River Basin Authority (NGRBA) will spearhead river conservation efforts at the national level. Implementation will be by the State Agencies and Urban Local Bodies.
- The new strategy will take into account the competing demands on water and will seek to ensure minimum ecological flows. STPs minimise the pollution load up to discharge standard of BOD of 30mg/litre requiring dilution to achieve river water quality of 3mg/litre.
- The minimum ecological flows or the entire Ganga will be determined through modelling exercises.
- NGRBA will take appropriate measures to regulate water abstraction for maintaining ecological flows in the river.

Functions of NGRBA are as follows:

- The NGRBA would be responsible for addressing the problem of pollution in Ganga in a holistic and comprehensive manner. This will include water quality, minimum ecological flows, sustainable access and other issues relevant to river ecology and management.
- The NGRBA will not only be regulatory body but will also have developmental role in terms of planning & monitoring of the river conservation activities and ensuring that necessary resources are available.
- The NRGBA would work for maintaining the water quality of the river Ganga upto acceptable standards. The pollution abetment activities will be taken through the existing implementation mechanisms in the State and also through special Purpose Vehicles (SPVs) at the pollution hotspots.
- The NGRBA will ensure minimum ecological flow in the Ganga by regulating water abstraction and by promoting water storage projects.
- The NGRBA will plan and monitor programmes for cleaning of Ganga and its tributaries. To being with, it will concentrate on Ganga main stream.
- The NGRBA would draw upon professional expertise within and outside the Government for advice on techno-economic issues.
- The technical and administrative support to NGRBA shall be provided by the Ministry of Environment & Forests for advice on techno-economic issues.
- The technical and administrative support to NGRBA shall be provided by the Ministry of Environment & Forests.

Activities under different Projects running by NGRBA

There are three projects being carried out under the National Ganga River Basin Authority Programme are as follows:

Table : Details of Projects under NGRBA Cell

S. N.	Project	Funding Agency	Project Duration	Total Budget (Rs. Crores)	Status
1.1	Pollution Inventorization, Assessment and Surveillance on River Ganga (PIAS)	MoEF&CC	5 Years	34.77 (Sanctioned on 29th March, 2011)	Started from 1st April, 2011, ended on 28.03.2016
1.2	Pollution Inventorization, Assessment and Surveillance on River Ganga (PIAS)	MoEF&CC	3 Months	NIL (Sanctioned on 04.04.2016 w.e.f. 29.03.2016)	extended upto 28.06.2016
1.3	Pollution Inventorization, Assessment and Surveillance on River Ganga (PIAS) (Extended)	MoEF&CC	1 Years (Reviewed Proposal	3.8 (Sanctioned on 08.09.2016 w.e.f. 29.06.2016)	Extended upto 28.06.2017.
2.	Water Quality Monitoring (WQM) System for River Ganga	The World Bank	7 Years	94.45	Sanctioned on 19th July, 2013
3.	Strengthening of Environmental Regulators (SER)- CPCB	The World Bank	8 Years	69.26	Sanctioned on 19th July, 2013

1. Pollution Inventorization, Assessment & Surveillance on River Ganga (PIAS)

The "Pollution, Inventorization, Assessment & Surveillance on River Ganga (PIAS)" project is funded by the Ministry of Environment & Forests and was sanctioned for Rs. 34.77 crores on 29th March, 2011 for 5 Years. Further, the project was extended for 3 Months upto 28.03.2016. A review proposal was submitted to NMCG on 04.03.2016 and revised review proposal on 05.05.2016 for further extension of the PIAS (extended) project. The PIAS (extended) project was sanctioned on 08.09.2016 w.e.f. 29.06.2016 for 1 year. Under this project NGRBA Cell, CPCB has carried out different activities under monitoring, surveillance of Water quality of River Ganga from its origin to confluence to Bay of Bengal such as in-depth monitoring of Grossly Polluting Industries (GPI), Sewage Treatment Plants (STP), Common Effluent Treatment Plant (CETP) and major drains falling into the river of River Ganga and its tributaries, River Ramganga, River Kali East & River Pandu.

The objective of the project is to inventorise the pollution sources (both point and non-point) and to assess the pollution load being discharged into the River Ganga directly or indirectly through tributaries, namely Ramganga and Kali-East. The activities carried out under the project during the year 2016-17 are as follows:

Table : Details of different activities under PIAS

S. N.	Activities	No. of Inspections	Note		
			Complying	Non-complying	Non – operational/ closed
1.	Compliance verification of Grossly Polluting Industries (GPI)	443	201	135	107
2.	Adequacy Assessment of Common Effluent Treatment Plants (CETP)	6	-	5	Under construction
3.	Performance evaluation of Sewage Treatment Plants (STP)	40 (Apr. – Dec. 2016)	20	7	13
		47 (Jan. – Mar. 2017)	Analysis report awaited.		
4.	Periodic Pollution assessment of major drains falling into the river Ganga	257	-		

1.1 Compliance verification of Grossly Polluting Industries (GPI)

There are 764 GPIs located in the 5 Ganga states (Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal). In this year, 349 newly identified industries are added to Grossly Polluting Industries (GPIs) list. Total number of 509 GPI inspections are done by CPCB under NGRBA in this year.

Directions under section 5 of Environment (Protection) Act, 1986 & under section 18(1)(b) of Water Act, 1974 were issued to GPIs for the compliance of standards of prescribed water quality criteria during April, 2016 to March, 2017. Overall status of direction compliance of GPIs are as follows;

Status of 764 GPIs Inspections during (February 2016 – January 2017)

S. N.	Particulars of Inspection	No. of Inspections	Status observed during inspections		
			Comply	Non-Comply	Found Closed / Non-operational
1.	Regular Inspection (Feb. 2016 to April 2016)	102	43	30	29
2.	Crash Program-II (May 16 to June 2016)	127	66	39	22
3.	Regular Inspection (July 2016 to Nov 2016)	68	29	19	20
4.	Crash Program-III (Dec 2016 to Jan 2017)	149	35	57	57
	Sub Total	**446**	**173**	**145**	**128**

S. N.	Particulars of Inspection	No. of Inspections	Status observed during inspections		
			Comply	Non-Comply	Found Closed / Non-operational
Status of 349 Newly Identified GPIs Inspections during (February 2016 – January 2017)					
5.	Crash Program-III (Dec 2016 to Jan 2017)	63	7	18	38
	Sub Total	**63**	**7**	**18**	**38**
	Grand Total	**509**	**180**	**163**	**166**

Overall Action Taken Status of 212 GPIs inspected under Crash III Programme

Sector	Total	Closed	Complying	Non complying	Action taken		
					Closure	SCN	Letter issued
Distillery	39	15	11	13	10	3	3
Chemical	14	-	7	7	4	3	1
Fertilizer	4	1		3		3	
Oil & Refinery	1			1		1	
Petrochemical	2			2		2	
Pharmaceutical	4		2	2	1	1	1
Pulp & Paper	78	19	29	30	6	16	14
Sugar	70	7	26	37	13	22	11
Total	**212**	**42**	**75**	**95**	**34**	**51**	**30**

Action Taken Status of 149 GPIs out of 764 inspected under Crash III

Sector	Total	Closed	Complying	Non complying	Action taken		
					Closure	SCN	Letter issued
Distillery	26	10	8	8	5	2	1
Chemical	9	0	6	3	1	2	1
Fertilizer	4	1		3		3	
Oil & Refinery	1			1		1	
Petrochemical	2			2		2	
Pharmaceutical	2		1	1	1		
Pulp & Paper	54	17	21	16	2	9	10
Sugar	51	7	21	23	5	17	9
Total	**149**	**35**	**57**	**57**	**14**	**36**	**21**

Action Taken Status of 63 GPIs out of 349 inspected under Crash III

Sector	Total	Closed	Complying	Non complying	Action taken		
					Closure	SCN	Letter issued
Distillery	13	5	3	5	5	1	2
Chemical	5		1	4	3	1	
Fertilizer	0						
Oil & Refinery	0						

Sector	Total	Closed	Complying	Non complying	Action taken		
					Closure	SCN	Letter issued
Petrochemical	0						
Pharmaceutical	2		1	1		1	1
Pulp & Paper	24	2	8	14	4	7	4
Sugar	19		5	14	8	5	2
Total	**63**	**7**	**18**	**38**	**20**	**15**	**9**

Status of online monitoring system in Grossly Polluting Industries on River Ganga (as on 29-03-2017)

S. N.	Category	Total number of industries	Closed	Exempted	Installed	Connected	Under installation (Closure Issued)	Units yet to be connected
1.	Sugar	67	9	0	57	56	1	1
2.	Pulp & Paper	67	9	0	58	58	0	0
3.	Distillery	35	5	1	29	26	0	3 (1 closed + 1 closure)
4.	Fertilizer	5	0	0	5	5	0	0
5.	Oil Refinery	2	0	0	2	2	0	0
6.	Pharmaceutical	3	0	0	2	2	1	0
7.	Petro-chemical	3	0	0	3	3	0	0
8.	Pesticide	3	2	0	1	1	0	0
9.	Cement	3	0	3	0	1*	0	0
10.	Thermal Power Plant	4	1	0	3	3	0	0
11.	Tanneries	442	67	0	375	255	0	120
12.	Food & Beverages	21 (19)	1	0	14	14	4	0
13.	Slaughter House	12	6	0	6	6	0	0
14.	Textile	63 (62)	28	5	15	15	14	0
15.	Chemical (Org + Inorg.)	12	1	1	10	10	0	0
16.	Others (Locomotive, automobile, Paint, Electroplating, Galvanizing, waste recyclers & Engineering)	22 (21)	6	5	5	5	5	0
Total		**764 (760)**	**135**	**15**	**585**	**461**	**25**	**124**

**Final notice for closure issued to 292 units for installation of OCEMS till 31st March, 2017.*

Status of OCEMS connectivity of 349 GPIs (as on 28.03.2017)

Sector	Total industry	Connected	Under Process	Not connected
Tannery	42	20	2	20
Sugar	21	20	0	1 (closure issued)
Pulp & Paper	25	21	0	4 (2 SCN* + 2 closure issued)
FDB	24	5	0	19
Distillery	13	8	1	4
Chemical	5	1	0	4 (2 SCN* + 1 closure)
Dyeing & Textile	181	2	0	179
Cement	1	0	0	1
CETP	3	3	0	0
Fertilizer	1	1	0	0
Power	6	5	0	1
Slaughter House	10	7	0	3
Others	17	9	0	8
Total	**349**	**102**	**3**	**244**

** SCN - Show Cause Notice*

1.2 Compliance Verification of Directions and Adequacy Assessment of Common Effluent Treatment Plants (CETP) of 5 Ganga states

There are 4 Common Effluent Treatment Plants (CETPs) located at the bank of River Ganga at the following locations:

1) CETP at UEM-SIDCUL, Haridwar, Uttarakhand.
2) CETP Leather Technology Park, Banthar, Unnao
3) CETP at UPSIDC Industrial Area, Site – II, Unnao, Uttar Pradesh.
4) CETP at Jajmau, Kanpur, Uttar Pradesh.

All the four CETPs were monitored during the current year and found non - complying. Total number of 6 CETP inspections are done by CPCB under NGRBA in this year covering two more CETPs located in Sitarganj and Pant Nagar. CETP, Sitarganj was found non-complying and CETP, Pant Nagar was under construction. Overall status of inspection of CETPs are as follows;

Analytical Results of CETPS Inspected during (February - December, 2016)

S. N.	Location Of CETP	State	Type of Industries connected with CETP	Designed capacity/ day (in MLD)	Actual Treatment/ day in MLD	Status operation	Characteristics				Disposal of Treated Effluent	Month / Date of Inspection
							INLET (mg/l) (Mixing Tank)		OUTLET (mg/l)			
							BOD (mg/l)	COD (mg/l)	BOD (mg/l)	COD (mg/l)		
1.	Jajmau, Kanpur	UP	Tanneries	36 MLD	36 MLD	Operational	*1528 **1000	*2248 **1453	226	529	The treated effluent is being utilized for irrigation mixed with treated sewage of two STPs	02-02-2016

S. N.	Location Of CETP	State	Type of Industries connected with CETP	Designed capacity/ day (in MLD)	Actual Treatment/ day in MLD	Status operation	Characteristics				Disposal of Treated Effluent	Month / Date of Inspection
							INLET (mg/l) (Mixing Tank)		OUTLET (mg/l)			
							BOD (mg/l)	COD (mg/l)	BOD (mg/l)	COD (mg/l)		
2.	Unnao Tanneries Pollution Control Co., A-7, Site-II, UPSIDC Industrial Area, Unnao	UP	Tanneries	2.15 MLD with Upgraded 2.35 MLD ASP	2.15 MLD	Operational	1633	3557	193	581	Treated effluent disposed to River Ganga through Loni Drain, Unnao (17 Km away)	24-10-2016
3.	CETP, Leather Technology Park, Banthar, Unnao	UP	Tanneries	4.15 MLD	4.15 MLD	Operational	1805	2781	167	862	Treated effluent disposed to river Ganga through City Jail drain, Unnao	29-09-2016
4.	Jajmau, Kanpur	UP	Tanneries	36 MLD	19.05	Operational	191	1007	106	334	The treated effluent is being utilized for irrigation mixed with treated sewage of two STPs	26-12-2016

Note: All values are expressed in mg/l.
**Industrial ** Mixed influent*

Analytical Results of CETPS Inspected in June, 2016

S. N.	Location of CETP	State	Type of Industries connected with CETP	Designed capacity/ day in MLD	Actual Treatment/ day in MLD	Status Operation	Characteristics				Disposal of Treated Effluent	Month of Inspection
							INLET (mg/l)		OUTLET (mg/l)			
							BOD	COD	BOD	COD		
1.	CETP Sitarganj	Uttarakhand	Plywood, Starch and Soap.	4.0	2.0 to 2.50	Operational	737	281	543	166	Drain which meets Begul river	June 2016
2.	IIE SIDCUL CETP, Pant Nagar	Uttarakhand		4.0	Under construction							June, 2016 (19-6-2016)

** Note: All values are expressed in mg/l.*

1.3 Compliance Verification of Directions and Performance evaluation of Sewage Treatment Plants (STPs) located in the 118 towns of the 5 Ganga states

- 68 Sewage Treatment Plants (STPs) have been inventoried in 5 Ganga main stem states covering 40 cities/towns.
- Out of 40 cities/towns covered by 68 STPS, 07 are in Uttarakhand, 7 are in Uttar Pradesh, 2 are in Bihar and 24 are in West Bengal.

State	No. of STP	Installed Capacity of STPs (MLD)	Towns covered by 68 STPs
Uttarakhand	10	100	7
Uttar Pradesh	16	466	7
Bihar	6	153	2
Jharkhand	0	0	0

State	No. of STP	Installed Capacity of STPs (MLD)	Towns covered by 68 STPs
West Bengal	36	509.5	24
Total	**68**	**1228.5**	**40**

- Out of 68 STPs, during April-Dec, 2016, 40 inspection of STPs have been carried out. Out of 40 STPs, 20 are complying, 7 are non-complying and 13 were not in operation
- During the quarter Jan-March, 2017, CPCB has carried out monitoring of 47 STPs, however sewage sample analysis reports are still awaited.

1. 4 Periodic Pollution assessment of major drains falling into the river Ganga

Total 211 priority drains (River Ganga - 155, River Kali-East – 26, River Ramganga – 25 & River Pandu -5) carrying approximately 11374.3 MLD flow, discharging approximately 604.5 TPD organic load into river Ganga directly or through its tributaries River Kali-East, River Ramganga & River Pandu. Total number of 257 drain monitoring is done by CPCB under NGRBA in this year. State wise status of priority drains is as below;

Status of Priority Drains falling into main stem of River Ganga monitored during (Oct. to Dec.) Post monsoon, 2016

State	No. of priority drains*	Flow of priority drains in MLD	Organic Load of priority drains in TPD
Uttarakhand	12	132.77	77.11
Uttar Pradesh	60	2081.32	147.22
Bihar	22	636.18	27.36
Jharkhand	2	30.68	3.00
West Bengal	59	6419.14	190.41
Total	**155**	**9300.09**	**445.10**

Status of Priority Drains falling into River Ranganga, Kali East and Pandu monitored during (Oct. to Dec.) Post monsoon, 2016

Tributaries of River Ganga	No. of priority drains*	Flow of priority drains in MLD	Organic Load of priority drains in TPD
Ramganga	25	728.13	41.12
Kali East	26	996.53	99.70
Pandu	05	349.53	18.60
Total	**56**	**2074.19**	**159.42**

Note: No. of Priority drains are selected which having equal to or more than 1 MLD of flow.

Inspection of drains from Haridwar to Kanpur Region in compliance of NGT order

A committee comprising Member Secretary, CPCB, Chief Engineer of U.P. Jal Nigam, National Mission for Clean Ganga (NMCG), Senior most Chief Environmental Officer of U.P. Pollution Control Board and representative from the Ministry of Water Resources personally visited the area from Haridwar to Kanpur Region in compliance of National Green Tribunal (NGT) Order dated 19th October, 2016 to verify/monitor drains falling in Segment -B of Phase-I. Total 86 drains were identified, out of which, 30 priority drains were meeting into main stem of river Ganga and 56 priority drains meeting into tributaries (Ramganga, Kali East and Pandu river) of river Ganga during the post monsoon, 2016.

2. Water Quality Monitoring on River Ganga Basin:

The Ganga basin covers nearly one-fourth (26.3 per cent) of the country's total geographical area, and is the largest river basin with a catchment area of 760,407 km2. In India, the basin covers the whole of Uttarakhand, Uttar Pradesh, Bihar and the Union Territory of Delhi and parts of Punjab, Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh and West Bengal.

Ganga, rising in the northern most part of Uttarakhand (Gomukh), flows through Uttar Pradesh, Bihar and West Bengal and finally falls into the Bay of Bengal (Sagardweep). After traversing a length of 1450 km in Uttarakhand and Uttar Pradesh and 110 km in the boundary between U.P. and Bihar the river then enters Bihar and flows 445 km more or less through the middle of the State. The length of the river measured along the Bhagirathi and the Hugli during its course in West Bengal is about 520 km. The total length of Ganga is approximately 2525 km.

Sources: State boundaries (MLInfo Map, 2009), major lakes and rivers (RWDBII, CIA, 2006, and VMAP0, NIMA, 1997), populated places (GRUMP, CIESIN, Columbia University, IFPRI, the World Bank, and CIAT, 2004).

The Ganga Basin has an area of approx. 8,61,404 km2. Ganga has a large number of tributaries. Some of these are of Himalayan origin having considerably large water wealth. The important tributaries within India are the Kali-east, the Ramganga, the Yamuna, the Gomti, the Ghaghara, the Gandak and the Kosi. The Yamuna although a tributary of the Ganga, is virtually a river by itself. Its major tributaries are the Chambal, the Sind, the Betwa and the Ken. The main plateau tributaries of the Ganga are the Tons, the Son, the Damodar and the Kasai-Haldi.

Water quality monitoring of River Ganga is being carried out by two methods which is based on Manual Water Quality Monitoring system at specific locations and through Real Time Water Quality Monitoring Stations (RTWQMS) at few places.

2.1 Real time water quality monitoring

CPCB has been mandated with the responsibility of undertaking continuous Real Time Water Quality Monitoring (RTWQM) of river Ganga and during first phase, 36 RTWQM Stations have been set up under NGRBA Programme through a service provider. Each Stations has been specified a certain number of water quality parameters which is based on water quality trend of River Ganga at different locations (Figure 1 and Figure 2) . Upto 17 parameters are being displayed. Further, the parameters have been categorised in 4 different categories and specific weight has been assigned depending upon the relative significance of the parameters. Following parameters are displayed by RTWQM Stations: BOD DO EC pH, Temperature, Ammonia, Chloride, COD, TSS, Turbidity, Color, Fluoride, Nitrate, Potassium, BTX, TOC and Water level.

RTWQM Station at Narora (U.P.)

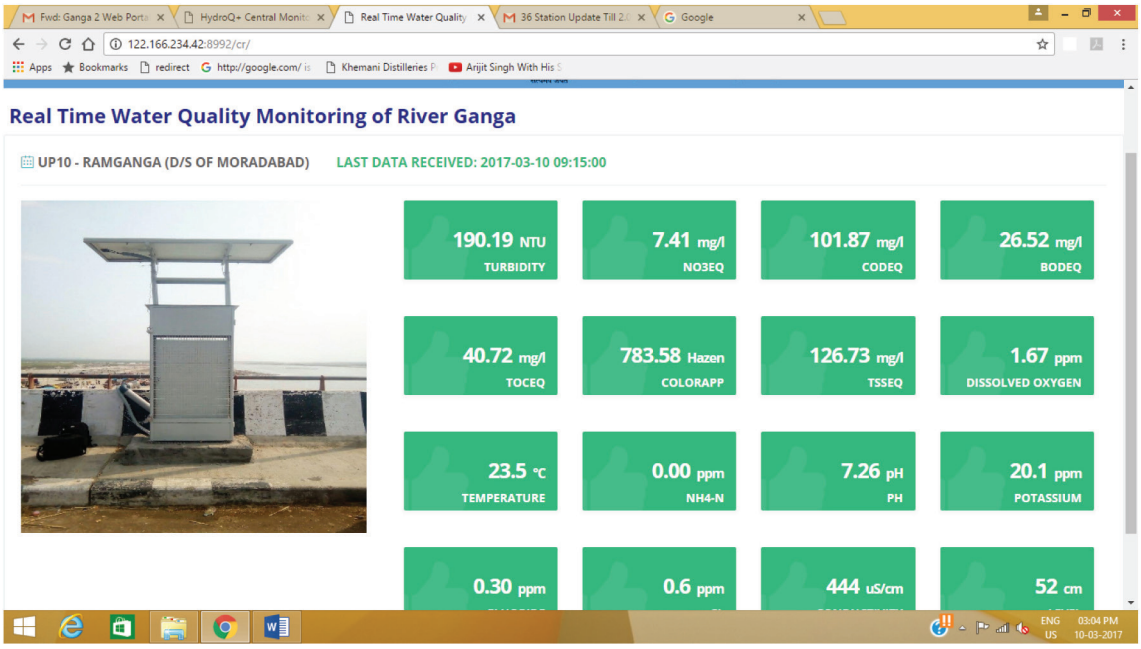
RTWQM Station at Kachlaghat (U.P.)

The criteria for setting up of RTWQM stations is to cover following aspects;

1. Generate base line data which refers to the clean and pristine water quality locations.
2. Impact stations referring to activities relating to sewage and industrial effluent disposal.
3. For establishing the trends because of dynamic nature.
4. Inter-state boundaries.
5. Religious functions/ mass bathing stations

The work of installation of Real Time Water Quality Monitoring Stations (RTWQMS) on River Ganga at 36 locations was awarded to the joint venture of M/s S::CAN Messtechnik, Ges.m.b.H and M/s Aaxis Nano Technologies Pvt. Limited on 11.07.2016. The installation of RTWQM stations at 36 locations is complete and data generation and transmission from RTWQM stations has commenced on 11.03.2017.

Screenshot of RTWQM Stations



State-wise details of RTWQM stations is provided in Table A:

2.2 Manual Water Quality Monitoring

Water quality is being monitored at 57 locations by CPCB and new locations have been allocated to SPCBs under National River Conservation Plan (NRCP) for monitoring in accordance to the Protocol (Table B).

State wise list of manual water quality monitoring locations at 57 locations is provided in Table C.

Water quality of River Ganga indicated minimum and maximum value of important water quality parameters at 57 locations at River Ganga during year 2016 is provided in Table D.

Table A: List of RTWQM Station locations

S. No	Location Code	Site	As per site Survey		
			Latitude	Longitude	Location
	Uttarakhand				
1	UK8	Hardwar Nallah	-	-	Jagjeet STP outlet drain within campus
	Uttar Pradesh				
2	UP2	Madhya Ganga barrage	29°22'26"	78°02'27"	Madhya Ganga barrage, Bijnor
3	UP3	Sukratal Ghat	29°29'31"	77°59'25"	Bridge on Sukratal Ghat at Ban Ganga after confluence (a/c) Saloni river and before confluence (b/c) to River Ganga
4	UP6	Bridge at Anupshahar	28.36452°	78.27184°	Road Bridge on River Ganga at Anupshar about 1 km u/s of bathing Ghat
5	UP8	Barrage at Narora (Ganga)	28.190361°	78.395345°	Barrage at Narora on River Ganga
6	UP9	Kachla Ghat Bridge Badaun	27.931056°	78.855289°	Road bridge on River Ganga near Kachla Ghat, Badaun
7	UP10	Ramganga (d/s of Moradabad)	28.5535°	79.04748°	Bridge on Ramganga (d/s of Moradabad) at Shahbad on MDR53W
8	UP13	Bridge on Kali River at Kanpur-Farrukhabad Road	27.108614°	79.883556°	Bridge at Khudaganj, Kannauj d/s of River kali on bridge at Khudaganj, Kannauj
9	UP14	Bridge at Ghatia Ghat Farrukhabad	27.398842°	79.627522°	Ghatia Ghat bridge , Farrukhabad on River Ganga
10	UP16	Bridge SH21 DS of Kannauj	27°00'45.06"	79°59'19.47"	Manimau bridge (Mehendi Ghat), Kannauj on River Ganga a/c Ram Ganga & River Garra
11	UP17	Bridge SH40 DS Kannauj	27.497972°	79.696139°	Allahganj bridge, Farrukhabad on River Ramganga
12	UP18	Bridge in Bithur	26°36.010'	80°16.446'	Pariyal bridge on River Ganga b/w Laxshman Ghat & Hanuman Ghat near Dhruv Teela, Bithoor, Kanpur
13	UP19	Barrage U/s Kanpur	26°30.482'	80°18.991'	Ganga Barrage bridge, Kanpur on River Ganga

S. No	Location Code	Site	As per site Survey		
			Latitude	Longitude	Location
14	UP24	U/s Bathing Ghat Kanpur	26°22.568'	80°29.549'	River Ganga d/s Kanpur; Deorighat (Maharajpur)
15	UP26	Bridge at Kanpur 1	26°27'42.01" / 26°28.339'	80°12'34.73" / 80°22.719'	Railway bridge culvert at Bhauti on river Pandu / New Road-bridge on R. Ganga b/w Shuklaganj & Kanpur
16	UP29	Bridge 2 at Kanpur NH25	26°22'14.1"	80°18'25.08"	Bridge on River Pandu (d/s of Kanpur), Bhingave (Hamirpur Road), Kanpur.
17	UP32	Bridge near Fatehpur	26.05487° / 26.19909°	80.90952° / 80.53726°	Bridge on River Ganga at Ansi, Fatehpur / Bridge on river Pandu, Fatehpur
18	UP40	Bridge DS of tributary near Sirsa	25.271°	82.093°	Pontoon bridge, Sirsa (Allahabad) on River Ganga
19	UP46	Nalla at Allahabad 4	25.3899°	81.90133°	Mawaiya nala (2.5mx0.5m) at Allahabad
20	UP54	Varanasi at Bathing Ghat 1	25°20'31.5"	83°01'22.5"	Barrage on river Varuna 5-6 Km up stream/before confluence with River Ganga.
21	UP55	Bridge on Tributary in Varanasi	25°30'24.6"	83°08'27.5"	Bridge on river Gomati b/c to Ganga at Rajwari, Varanasi U/s of River Gomati b/c to River Ganga
22	UP56	Tributary @ Rajwari	25°03'21.72"	83°11'57.6"	Bridge on Devkali Pump canal (Chaudhary Charan Singh Pump Canal), Jauhar ganj, Saidpur, Ghazipur D/s of River Ganga a/c River Gomati
	Bihar				
23	Bh7	Nalla in Patna 2	25°38'26.35"	85° 6'19.31"	Kurzi Nalla @ MPS
24	Bh9	Rajapul Nalla	25°37'24.66"	85° 7'28.59"	Rajapur old pump house near pantaloon
25	Bh10	Nalla in Patna 3a	25°37'19.81"	85° 8'1.11"	Mandiri Nalla near pumping station
26	Bh11	Nalla in Patna 3b	25°37'19.60"	85° 9'1.59"	Anta Ghat, drainage pumping Station
	West Bengal				
27	WB5	1 River u/s of Ganga- Nallah	24.505353°	88.030081°	First Influent Stream from Weast on Bridge over NH34
28	WB6	2 River u/s Ganga- Nallah	24.482371°	88.055535°	Second influence stream from West

S. No	Location Code	Site	As per site Survey		
			Latitude	Longitude	Location
29	WB10	Ganga River d/s Murshidabad (u/s Berhampore)	24.100378°	88.244281°	Road Bridge after Murshidabad, at Behrampore
30	WB11	Ganga River d/s of Murshidabad (d/s berhampore)	24.061719°	88.227575°	Ganga watercourse d/s of Murshidabad /Bridge if construction get completed
31	WB21	Ghat d/s of Srirampore	22.725772°	88.356118°	Ghat d/s of Srirampore
32	WB22	Nallah opposite Ghat d/s Srirampur	22.726286^0	88.364131^0	Nallah
33	WB23	Ganga River near Belgharia	22.670951°	88.359732°	Intake pumping Station of KMDA at Belgharia
34	WB24	Nalla @ Ballykhal	22.655029°	88.347635°	Bally Khal Bridge
35	WB26	Nalla @ Chitpur	22.607483°	88.369767°	Nullah (Circular canal) at Chitpur
36	WB27	Ganga R @ Howrah Bridge	22.585092°	88.346954°	Millennium Park

Table B: Water Quality Parameters

Field Observations

Weather, Approximate depth of main stream/depth of water table, Colour and intensity, Odor, Visible effluent discharge, Human activities around station Station detail.

Core Parameters

Temperature, pH, Conductivity, DO, BOD, Nitrate -N, ammonia- N, Total coliform, Faecal Coliform.

Bio Monitoring

Saprobity Index, Diversity Index, P/R ratio

General Parameters

COD, TKN, Total Dissolved Solids, Total Fixed Solids, Total Suspended Solids, Turbidity, Hardness, Fluoride Boron, Chloride, Sulphate, Total Alkalinity, P-Alkalinity, Phosphate, Sodium, Potassium, Calcium, Magnesium

Trace Metals

Arsenic, Nickel, Copper, Mercury, Chromium Cadmium, Zinc, Lead, Iron

Pesticide

Alpha BHC, Beta BHC, Gama BHC (Lindane), OP DDT, PP DDT, Alpha Endosulphan, Beta Endosulphan, Dieldrin, Carboryl (Carbamate), 2.4D, Aldrin, Malathion, Methyl Parathion, Anilophos, Chloropyriphos

Table C: List of 57 Manual Water Quality Monitoring Stations

S. No.	State	Water Body	Region	Latitude	Longitude	Location / Site
1.	Uttarakhand	Bhagirathi	Gangotri	30 55' 44.32"	78 40'58.05"	Bhagirathi at Gangotri
2.	Uttarakhand	Alaknanda	Rudraprayag	30 17' 15.39"	78 59'9.40"	Alkananda B/C Mandakini at Rudra Prayag
3.	Uttarakhand	Mandakini	Rudraprayag	30 17' 24.45"	78 58'50.13"	Mandakini B/C Alkalnada at Rudraprayag
4.	Uttarakhand	Alaknanda	Rudraprayag	30 17' 13.08"	78 58'43.14"	Alkananda A/C Mandakini at Rudraprayag
5.	Uttarakhand	Alaknanda	Devprayag	30 8' 41.68"	78 36'5.39"	Alkananda B/C to Bhagirathi at Devprayag
6.	Uttarakhand	Bhagirathi	Devprayag	30 8' 49.74"	78 35'53.31"	Bhagirathi B/C with Alaknanda at Devprayag
7.	Uttarakhand	Ganga	Devprayag	30 8' 26.50"	78 35'49.75"	Alkananda A/C with Bhagirathi at Devprayag
8.	Uttarakhand	Ganga	Rishikesh	30 6' 54.22"	78 18'24.64'	Ganga at Rishikesh U/S
9.	Uttarakhand	Ganga	Rishikesh	30°06'10"N	78°17'51"E	Ganga River D/S
10.	Uttarakhand	Ganga	Haridwar	30 1' 2.64"	78 13'46.56"	Ganga A/C of River Song
11.	Uttarakhand	Ganga Canal	Haridwar	29 51' 6.01"	77 52'47.07"	Upper Ganga River D/S Roorkee
12.	Uttar Pradesh	Ganga	Ghar-mukteshwar	28 47' 30.44"	78 4'57.29"	Ganga at Garhmukteshwar
13.	Uttar Pradesh	Ganga	Anoopshahar	28 21' 29.96"	78 16'0.72"	Ganga U/S, Anoopshahar
14.	Uttar Pradesh	Ganga	Anoopshahar	28 16' 23.18"	78 19'5.35"	Ganga D/S, Anoopshahar
15.	Uttar Pradesh	Ganga	Bulanad-shahr	28 11' 22.92"	78 23'45.16"	Ganga at Narora (Bulandsahar)
16.	Uttar Pradesh	Ganga	Aligarh	27 55' 40.09"	78 51'58.64"	Ganga at Kachhla Ghat, Aligarh
17.	Uttar Pradesh	Ganga	Kannauj	27 0' 39.43"	27 0' 39.43"	Ganga at Kannauj D/S, U.P
18.	Uttar Pradesh	Ganga	Bithoor	26 36' 39.26"	80 16'31.51"	Ganga at Bithoor (Kanpur)

S. No.	State	Water Body	Region	Latitude	Longitude	Location / Site
19.	Uttar Pradesh	Ganga	Kanpur	26 30' 19.67"	80 18'50.74"	Ganga at Kannauj U/S (Rajghat)
20.	Uttar Pradesh	Ganga	Kanpur	26 30' 19.95"	80 18'51.64"	Ganga at Kanpur U/S (Ranighat)
21.	Uttar Pradesh	Ganga	Kanpur	26 26'10.16"	80 24'34.87"	Ganga at Kanpur D/S (Jajmau Pumping Station)
22.	Uttar Pradesh	Ganga	Raibareili	26 4' 27.79"	81 1'26.67"	Ganga at Dalmau (Rai Bareilly)
23.	Uttar Pradesh	Ganga	Raibareili	25 47' 15.22"	81 22'8.42"	Ganga at Kala Kankar, Raebareli
24.	Uttar Pradesh	Ganga	Allahabad	25 30' 8.25"	81 51'19.55"	Ganga at Allahabad (Rasoolabad), U.P.
25.	Uttar Pradesh	Ganga	Allahabad	25 25' 35.74"	81°51'50.21"	Ganga at Kadaghat, Allahabad
26.	Uttar Pradesh	Ganga	Allahabad	25 25' 9.14"	81 54'1.88"	Ganga at Allahabad D/S (Sangam), U.P.
27.	Uttar Pradesh	Ganga	Mirzapur	25 14' 38.51"	82 25'5.78"	Ganga U/S, Vindhyachal, Mirzapur
28.	Uttar Pradesh	Ganga	Mirzapur	25 10' 37.41"	82 36'8.01"	Ganga D/S, Mirzapur
29.	Uttar Pradesh	Ganga	Varanasi	25 17' 21.69"	83 0'23.00"	Ganga at Varanasi U/S (Assighat)
30.	Uttar Pradesh	Ganga	Varanasi	25 19' 11.49"	83 2'11.58"	Ganga at Varanasi D/S (Malviya Bridge), U.P
31.	Uttar Pradesh	Ganga	Ghazipur	25 34' 41.43"	83 36'34.54"	Ganga at Trighat (Ghazipur)
32.	Bihar	Ganga	Buxar	25 34'24.63"	83 58'0.01"	Ganga at Buxar, Bihar
33.	Bihar	Ganga	Buxar	25 34' 34.11"	83 58'13.54"	Ganga at Buxar, Ramrekhaghat
34.	Bihar	Ganga	Chhapra	25 40' 35.37"	84 53'48.57"	Ganga at the Confluence of Sone River Doriganj, Chapra
35.	Bihar	Ganga	Patna	25 43' 19.85"	85 0'33.21"	Ganga at Khurji, Patna U/S
36.	Bihar	Ganga	Patna	25 37' 24.92"	85 9'2.37"	Ganga at Punpun, Patna
37.	Bihar	Ganga	Patna	25 36' 57.48"	85 12'21.90"	Ganga Darbhanga Ghat at Patna

S. No.	State	Water Body	Region	Latitude	Longitude	Location / Site
38.	Bihar	Ganga	Patna	25 36' 49.51"	85 12'14.87"	Ganga at Patna D/S (Ganga Bdg)
39.	Bihar	Son River		24⁰ 841637 N	84⁰138365"E	Ganga at Indrapuri, Dehri on Sone (Near Barrage)
40.	Bihar	Ganga	Fatuha	25 30' 41.84"	85 18'26.71"	Ganga at Fatuha
41.	Bihar	Ganga	Mokama	25 29' 10.22"	85 52'45.58"	Ganga at Mokama (U/S)
42.	Bihar	Ganga	Mokama	25.400922 N	85.923219 E	Ganga at Mokama (D/S), (Mahadev Asthan Road)
43.	Bihar	Ganga	Munger	25 23' 5.92"	86 27'32.32"	Ganga at Munger
44.	Bihar	Ganga	Sutangang	25 16' 13.42"	87 1'34.97"	Ganga at Sultanganj, Bhagalpur
45.	Bihar	Ganga	Bhagalpur			Ganga at Bhagalpur
46.	Bihar	Ganga	Kahalgaon	25.260628	87.225397	Ganga at Kahalgaon
47.	Jharkhand	Ganga	Rajmahal	25 3' 11.13"	87 49' 53.91"	Ganga at Rajmahal
48.	West Bengal	Ganga	Baharampur	24 6' 1.79"	88 14'43.83"	Ganga at Baharampore
49.	West Bengal	Ganga	Nabadip	23 24' 0.48"	88 22'24.24"	Nabadip on Ganga, Ghoshpara near Monipurghat
50.	West Bengal	Ganga	Tribeni	22.979310 N	88.401211E	Tribeni on Ganga near Burning Ghat
51.	West Bengal	Ganga	Palta	22 46' 48.68"	88 20'1.68"	Ganga at Palta West Bengal
52.	West Bengal	Ganga	Serampore	22 45' 40.70"	88 20'25.15"	Ganga at Serampore
53.	West Bengal	Ganga	Dakshine-shwar	22 39' 11.02"	88 21'27.32"	Ganga at Dakshineshwar
54.	West Bengal	Ganga	Vidyasagar	22 33' 29.85"	88 19'27.82"	Ganga at Howrah-Shivpur
55.	West Bengal	Ganga	Garden Reach	22 32' 58.98"	88 17'46.05"	Ganga at Garden Reach
56.	West Bengal	Ganga	Uluberia	22 27' 12.69"	88 6'55.18"	Ganga at Uluberia
57.	West Bengal	Ganga	Diamond Harbor	22 11' 0.18"	88 11'37.62"	Ganga at Diamond Harbour

Table D : Water Quality of River Ganga – 2016
(Minimum and maximum value of important parameters)

S. No.	STN CODE	LOCATIONS	STATE	TEMPER-ATURE °C		DIS-SOLVED OXYGEN mg/l		pH		CONDUC-TIVITY (µmhos/ cm)		B.O.D. (mg/l)		FECAL COLIFORM (MPN / 100 ml)		TOTAL COLIFORM (MPN / 100 ml)	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	WATER QUALITY CRITERIA (BATHING)					> 5 mg/l		6.5-8.5				< 3 mg/l		< 500 MPN/ 100 ml			
1.	1491	Bhagirathi At Gangotri	Uttarakhand	5	5	9.2	9.2	7.6	7.6			0	0				
2.	1484	Alkananda B/C Mandakini At RudraPrayag	Uttarakhand	15	19	8.4	9.4	7.5	7.9			1	1			0	0
3.	1485	Mandakini B/C Alkalnada At Rudraprayag	Uttarakhand	16	18	8.6	9.6	7.4	7.9			1	1			0	0
4.	1486	Alkananda A/C Mandakini At Rudraprayag	Uttarakhand	16	19	8.2	9	7.5	8.1			1	1			0	0
5.	1487	Alkananda B/C To Bhagirathi At Devprayag	Uttarakhand	17	19	8.6	9.2	7.5	7.8			1	1			0	0
6.	1488	Bhagirathi B/C With Alaknanda At Devprayag	Uttarakhand	17	19	9	9.6	7.6	7.9			1	1			0	0
7.	1489	Alkananda A/C With Bhagirathi At Devprayag	Uttarakhand	17	18	8.8	9.6	7.5	7.7			1	1			0	0
8.	1060	Ganga At Rishikesh U/S	Uttarakhand	16	20	9.2	10.6	7.2	7.8			1	1			12	40
9.	2725	A/C River Song Near Satyanarayan Temple D/S Raiwala	Uttarakhand	15	21	7.6	9.6	7.4	7.7			1	1.4			80	500
10.	1061	Ganga At Haridwar D/S	Uttarakhand	15	25	4	10.6	6.3	7.8			1	6.4			90	1600
11.	2727	Upper Ganga River D/S Roorkee	Uttarakhand	15	20	8.6	10.6	7.5	7.8			1	1.2			80	220
12.	1062	Ganga At Garh-mukteshwar	U.P	16	26	7.1	9.7	7	7.6	129	246	1.6	3.5	370	710	900	1200
13.	2488	Ganga U/S, Anoopshahar	U.P	18	21	7.0	9.4	7.1	7.5	138	254	1.8	3.1	210	450	550	700
14.	2489	Ganga D/S, Anoopshahar	U.P	18	23	7	9.4	7.3	7.6	115	252	1.4	3.2	140	430	410	650
15.	1145	Ganga At Narora (Bulandsahar)	U.P	19	22	6.2	9	7	7.8	115	254	2.1	3.8	200	610	550	9000
16.	2490	Ganga At KachhlaGhat, Aligarh	U.P	20	21	6.4	7.9	7	7.5	114	255	2	3.4	150	410	450	700
17.	1063	Ganga At Kannauj U/S (Rajghat)	U.P	17	33	7.4	9.7	6.9	8.4	201	397	2.4	4.1	1700	2700	2600	5400
18.	1066	Ganga At Kannauj D/S	U.P	17	33	7.5	9.4	7	8.3	202	492	2.8	4.7	2000	3900	3500	33000
19.	1146	Ganga At Bithoor (Kanpur)	U.P	16	33	7	9.9	6.9	8.4	202	398	2.4	3.6	2000	2800	2700	5400
20.	1067	Ganga At Kanpur U/S (Ranighat)	U.P	16	33	6.6	9.4	7	8.4	208	468	2.6	4.8	2200	3400	3200	6300
21.	1068	Ganga At Kanpur D/S (Jajmau Pumping Station)	U.P	16	33	4.6	8.8	7.1	8.2	227	819	4.1	8.8	9100	58000	34000	120000

S. No.	STN CODE	LOCATIONS	STATE	TEMPER-ATURE °C		DIS-SOLVED OXYGEN mg/l		pH		CONDUC-TIVITY (µmhos/cm)		B.O.D. (mg/l)		FECAL COLIFORM (MPN / 100 ml)		TOTAL COLIFORM (MPN / 100 ml)	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	WATER QUALITY CRITERIA (BATHING)					> 5 mg/l		6.5-8.5				< 3 mg/l		< 500 MPN/ 100 ml			
22.	1147	Ganga At Dalmau (Rai Bareilly)	U.P	13	28	6.1	8.5	7.8	8	181	244	3.9	4.9	4900	6100	7900	8700
23.	2498	Ganga At Kala Kankar, Raebareli	U.P	17	28	6.3	8.7	7.8	8	179	239	3.8	4.8	4700	5900	7700	8500
24.	1046	Ganga At Allahabad (Rasoolabad)	U.P	20.3	27.6	6.8	8.6	7.9	8.4	328	385	3.6	4.5	21000	26000	32000	58000
25.	1049	Ganga At Allahabad D/S (Sangam)	U.P	20.8	28	7.2	8.4	7.7	8.4	403	488	3.6	4.8	21000	33000	34000	63000
26.	2487	Ganga At Kadaghat, Allahabad	U.P	20.5	27.9	7	8.4	7.9	8.4	339	386	3.8	4.7	2700	27000	33000	54000
27.	2485	Ganga U/S, Vindhyachal, Mirzapur	U.P	19	23.8	7.7	8.4	6.5	7.9	346	381	2.1	2.4	1000	1300	2100	3200
28.	2486	Ganga D/S, Mirzapur	U.P	19	23	7.6	8.5	6.6	7.9	366	395	2.3	2.7	1100	1700	2400	3400
29.	1070	Ganga At Varanasi U/S (Assighat)	U.P	20.5	30.5	7.4	9.8	7.4	8.5	320	496	2.8	3.5	1300	2300	2200	3600
30.	1071	Ganga At Varanasi D/S (Malviya Bridge)	U.P	20.5	30.5	6.4	8.6	7.3	8.6	338	544	4.2	6.8	22000	33000	34000	63000
31.	1073	Ganga At Trighat (Ghazipur)	U.P	21	31	6.7	8.8	7.3	8.7	335	542	4.2	5.4	13000	31000	23000	46000
32.	1074	Ganga At Buxar	Bihar	22	33	6	9	7.5	8.2	320	750	2.4	2.9	900	2600	2600	5000
33.	2551	Ganga At Buxar, Ramrekhaghat	Bihar	22	32	5.5	8.8	7.4	8.3	288	756	2.4	2.8	1100	3000	3000	9000
34.	2564	Ganga At The Confluence Of Sone River Doriganj, Chapra	Bihar	19	30	7	9.6	7.7	8.4	204	534	2	2.8	500	2100	1100	4800
35.	1077	Ganga At Khurji, Patna U/S	Bihar	21	31	7.2	8.6	7.2	8.3	169	549	1.8	2.9	800	2600	2200	5000
36.	2552	Ganga DarbhangaGhat At Patna	Bihar	16	30	6.5	8.6	7.4	8.3	236	550	2.2	3	900	9000	3000	24000
37.	1079	Ganga At Patna D/S (Ganga Bridge)	Bihar	17	30	6.2	8.6	7.4	8.3	220	571	2.3	2.8	800	3000	2200	9000
38.	2555	Ganga At Punpun, Patna	Bihar	18	30	6.5	8.3	7.2	8.3	220	925	2.5	2.8	1100	2300	3000	5000
39.	2556	Ganga at Indrapuri, Dehri on Sone, Bihar	Bihar	14	33	7.2	9.4	7.41	8.06	158	376	1.8	2.9	500	1700	1100	4000
40.	2553	Ganga At Fatuha	Bihar	18	32	6.8	8.4	7.2	8.2	221	574	2	2.8	900	2600	3000	5000
41.	1817	Ganga At Mokama (U/S)	Bihar	17	29	7.6	9.8	7.8	8.6	227	473	2	2.8	800	2200	1700	5000
42.	1815	Ganga At Mokama (D/S)	Bihar	17	29	7.5	9.6	7.7	8	234	469	2.1	2.7	800	2200	1700	5000
43.	1818	Ganga At Munger	Bihar	16	29	6.9	9.7	7.6	7.9	254	519	2.4	2.7	500	2300	1700	8000
44.	2554	Ganga At Sultanganj, Bhagalpur	Bihar	16	29	6.5	9.4	7.6	8	221	509	2.2	2.8	900	3000	2200	9000

S. No.	STN CODE	LOCATIONS	STATE	TEMPER-ATURE °C		DIS-SOLVED OXYGEN mg/l		pH		CONDUC-TIVITY (µmhos/ cm)		B.O.D. (mg/l)		FECAL COLIFORM (MPN / 100 ml)		TOTAL COLIFORM (MPN / 100 ml)	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	WATER QUALITY CRITERIA (BATHING)					> 5 mg/l		6.5-8.5				< 3 mg/l		< 500 MPN/ 100 ml			
45.	1819	Ganga At Bhagalpur	Bihar	16	28	6.9	9.4	7.6	8.1	98	573	2.3	2.8	800	2600	2200	5000
46.	1816	Ganga At Kahalgaon	Bihar	14	28	7.2	9.6	7.8	8.1	236	536	2.4	2.8	900	2600	3000	5000
47.	1059	Ganga At Rajmahal	Jharkhand	25	25	9	9	7.1	7.1	340	340	2.9	2.9				
48.	1080	Ganga At Baharampore	West Bengal	19	31	5	9.1	7.6	8.3	204	376	1	5.3	70000	220000	90000	280000
49.	2506	Tribeni On Ganga, Near Burning Ghat	West Bengal	20	35	5.1	9.6	7.3	8.5	197	402	1.1	4.9	70000	170000	90000	220000
50.	1054	Ganga At Palta	West Bengal	22	33	4.7	9.4	7.1	8.3	201	388	1.5	5.5	90000	220000	110000	280000
51.	1472	Ganga At Serampore	West Bengal	19	34	4.6	8.9	7.1	8.3	208	406	2.3	6.3	70000	220000	110000	280000
52.	1053	Ganga At Dakshmineswar	West Bengal	22	35	3.8	8.2	7.6	8.2	125	392	2.3	6.1	23000	240000	50000	500000
53.	2511	Nabadip On Ganga, Gho-shpara Near Monipurghat	West Bengal	18.5	34	4.7	9.4	7.3	8.5	172	378	1	3.8	70000	130000	90000	170000
54.	1471	Ganga At Howrah-Shivpur	West Bengal	21	34	3.7	8.5	7.6	8.2	208	391	1.7	9	13000	80000	22000	240000
55.	1470	Ganga At Garden Reach	West Bengal	22	36	3.1	8.6	7.6	8.3	198	411	1.5	9.7	17000	300000	26000	500000
56.	1052	Ganga At Uluberia	West Bengal	20	32	2.5	7.1	7.3	8.2	217	783	1	6.5	4000	110000	11000	220000
57.	1469	Ganga At Diamond Harbour	West Bengal	22	33	4.4	7.4	7.8	8.4	211	13370	1.5	12	4000	30000	8000	50000

5.1.3 Water Quality status in Delhi stretch of Yamuna River in the year 2016

Central Pollution Control Board is regularly monitoring about 40 km. long Delhi stretch of Yamuna River from Palla to downstream of Okhla barrage at 4 locations i.e. Palla, Nizamuddin Bridge, Okhla at Kalindi Kunj (Okhla U/s) and Okhla D/s on monthly basis. Water quality trend of the river in this studied stretch during the year 2012-2016 in terms of Dissolved Oxygen (DO), Bio-chemical Oxygen Demand (BOD) and Total Coliform (TC) is depicted in Fig. 1 – 3. The values of DO observed during the year 2016 reflect that the level of this parameter was well above the prescribed limit 0f 4.0 mg/l at Palla and is in the range from 5.1 – 13.5 mg/l with annual mean of 8.6 mg/l which is less in comparison with 2015. DO in the river depletes significantly after Wazirabad barrage and remain critical in remaining part of the studied river stretch. The value of this parameter from Wazirabad D/s to Okhla barrage D/s, after joining Shahdara drain was observed in the range of 0.0 – 3.0 mg/l which reflects that DO is always violating the prescribed standard of 5.0 mg/l at Okhla D/s and 4.0 mg/l at other two locations. At all the four monitoring locations the annual average values of DO in 2016 are slightly low in comparison to previous year. BOD at Palla generally meets the prescribed standards of 3 mg/l and was found in the range of 1 – 9 mg/l with annual average of 4 mg/l which is on higher side comparing with 2015. At Okhla D/s BOD values were found well above the limit of 3 mg/l and was in the range of 4-67 mg/l with annual average of 38 mg/l, which indicates reduction in its value as compared with previous year. At remaining two locations i.e. Nizamuddin Bridge and Okhla U/s where BOD is not a criteria parameter, its values were found in the range of 4 – 45 mg/l and 3-49 mg/l respectively. Annual average values of BOD at these locations reflect inclining trend in comparison to previous

year. TC was found meeting the standard of 5000 MPN/100 ml at Palla on eight out of eleven rounds of analysis and its values were ranged between 490 - 54000 MPN/100 ml. At Okhla D/s TC with significantly high counts i.e. 230000 – 160000000 MPN/100 ml was always found violating prescribed standard of 500 MPN/100 ml. At Nizamuddin Bridge and Okhla U/s where TC is also not a criteria parameter, its vales were in the range of 79000-16000000 MPN/100 ml. Comparison of annual average values observed in the year 2015 and 2016 indicates that at all the monitoring locations TC reflect inclining trend except at Nizamuddin Bridge. Free ammonia (NH_3) which is a criteria parameter for two locations i.e. Nizamuddin Bridge and Okhla U/s, was found exceeding the prescribed limit of 1.2 mg/l except once at Nizamuddin Bridge. The annual average of this parameter at Nizamuddin Bridge and Okhla U/s was 16.0 mg/l and 15.5 mg/l respectively. At Palla free ammonia was in the range of Below detection limit (BDL) – 35.4 mg/l, whereas, at Okhla D/s it was in the range of 1.6 – 61.0 mg/l. In comparison to 2015, annual average of free ammonia was showing increasing trend in all the four locations. As observed in the year 2015, in 2016 also pH was the only parameter that meets the prescribed standards of 6.0 – 9.0 for Palla and 6.5 – 8.5 for the remaining three studied locations.

Yamuna River water quality in Delhi stretch is not only depends of wastewater that it received from various drains but also depends on other factors also e.g. quantity of water received from Western Yamuna canal through Najafgarh drain, input from Hindon cut canal, quantity of water released from Wazirabad and Okhla barrage, fluctuations in the intensity and duration of rainfall etc.

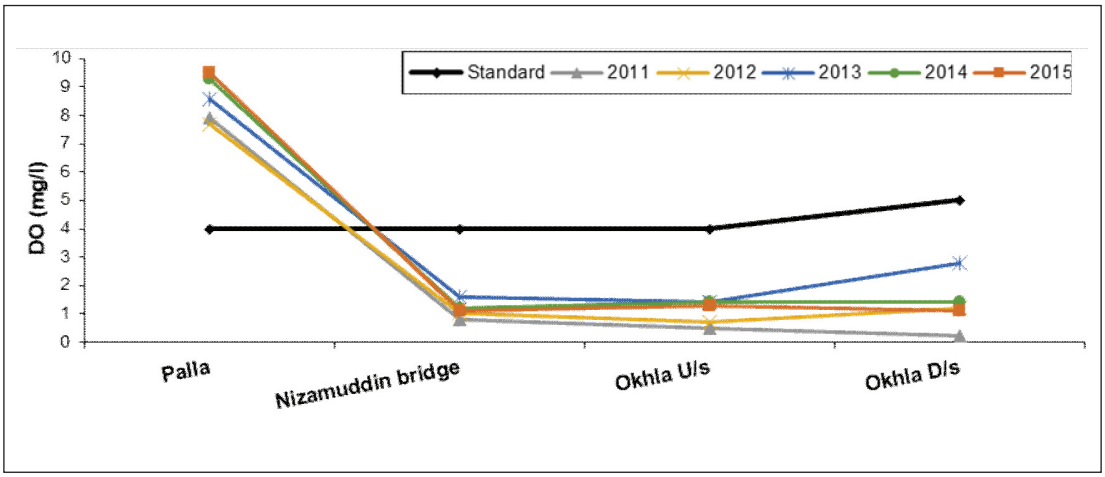


Figure: Water quality trend of river Yamuna in terms of DO

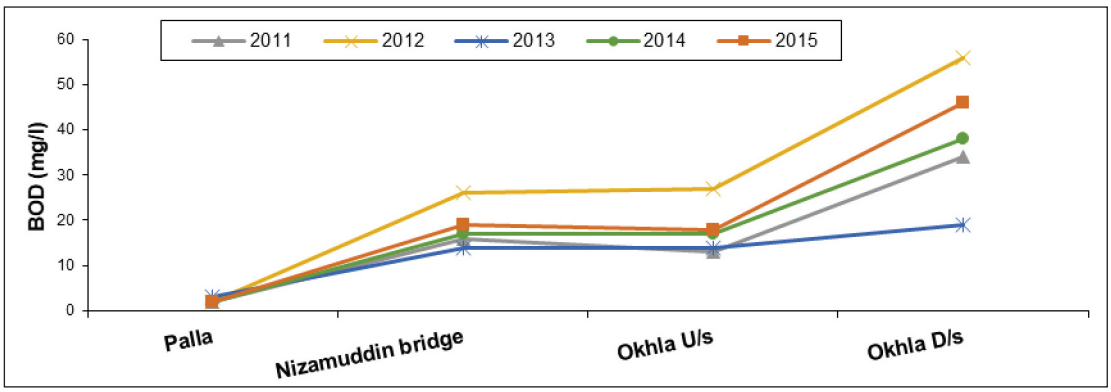


Figure: Water quality trend of river Yamuna in terms of BOD

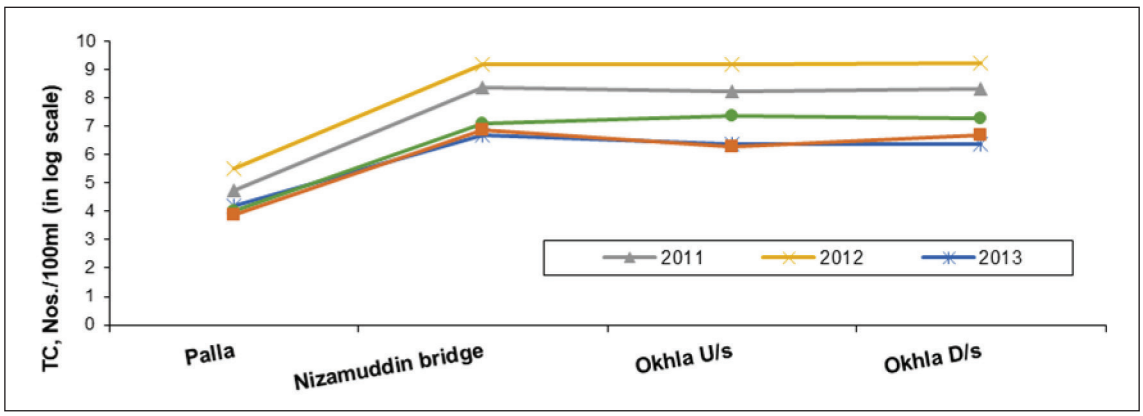


Figure: Water quality trend of river Yamuna in terms of TC

5.1.4 Discharge and pollution load contributed by major drains in 2016 at NCT- Delhi

There are twenty one major wastewater drains in NCT-Delhi, out of which 18 drains join Yamuna River and rest joins Agra/Gurgaon canal. These drains are being monitored regularly on monthly basis. Monthly trend of total discharge and load of Bio-chemical Oxygen Demand (BOD load) and received by the river and canals through these drains during the year 2016 is depicted in Fig. 4 and 5. Total discharge of these drains was fluctuated from 32 m^3/s (May) to 46 m^3/s (August) whereas, total BOD Load was ranged from 151 TPD (May to 263 TPD (February). The collective average of these drains for the year 2016 in terms of discharge and BOD load was about 37.67 m^3/s and 201 Tons/day (TPD) respectively. Out of total BOD load and discharge of the monitored drains, Yamuna River receives about 86 percent of BOD load and about 91 percent of discharge and rest joins canals. This contribution in river and canal is almost same as observed for previous year. Comparison with the year 2015 reflects decline in discharge by 2.6 % but incline by 3.9 % in total BOD Load of the studied drains. Najafgarh and Shahadara drain alone contributes about 67% of total Bod load and 75% of total discharge of the 21 major drains of Delhi.

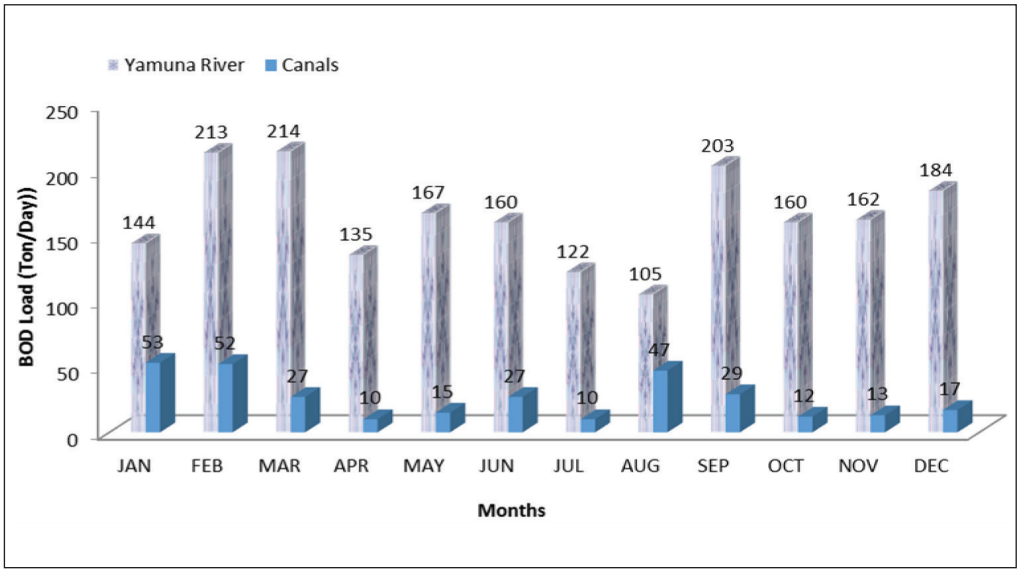


Figure: Trend in BOD load of major drains of NCT-Delhi (2016)

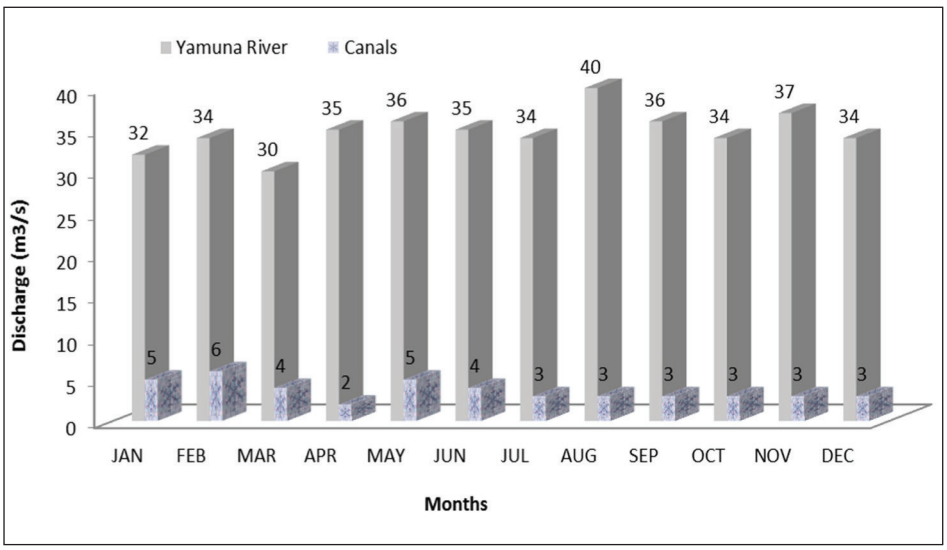


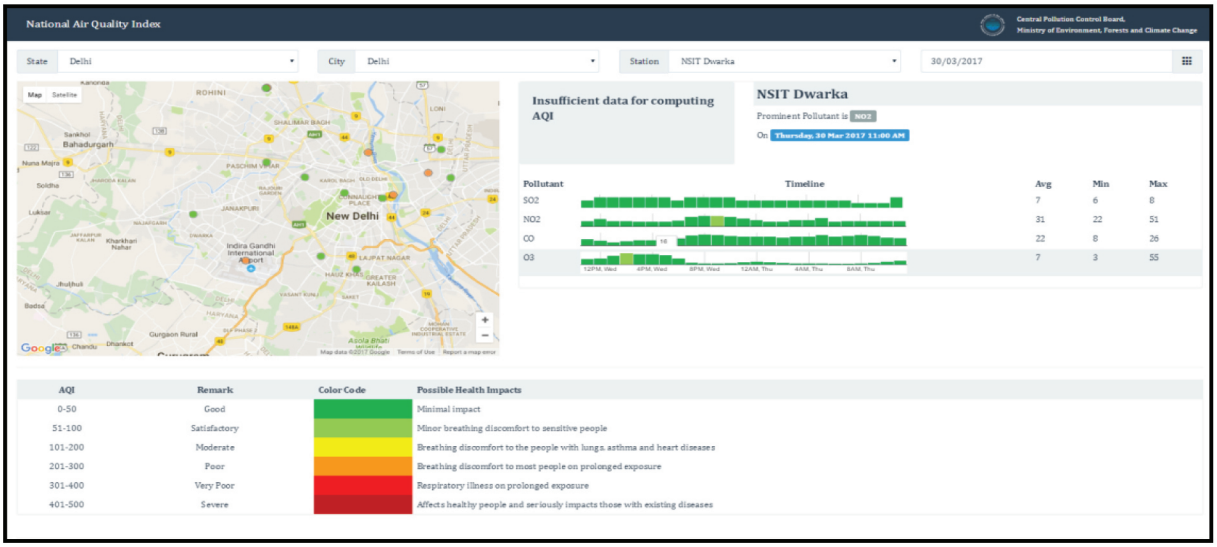
Figure : Discharge trend of major drains of NCT-Delhi (2016)

5.1.5 Integrated Data transmission from Real-time Systems to CPCB

(a) Continuous Ambient Air Quality Monitoring (CAAQM)

CPCB, SPCBs and PCCs monitor ambient air quality of different cities and publish real-time data in public domain for taking corrective measures in time. About 61 Continuous Ambient Air Quality Monitoring stations (CAAQMS) are operating in the country in this sector. CPCB has been working on continuous operation and connecting data of CAAQM stations on a network. The objective is to bring data from all the operating stations in the country.

In the beginning of the year 2016, CPCB network had data connected from 51 stations in 33 cities spread in 12 States. A National Air Quality Index, which combines the effect of all air quality parameters and generates a single number, has been developed by CPCB. The National AQI communicates air quality in simple terms of one number and one colour for general public.



Air Quality Index (AQI), inaugurated by the Hon'ble Prime Minister of India, is being continuously published on a web portal of CPCB, updated on hourly basis. The AQI software fetches the

ambient air quality data from the CAAQM stations and publishes the values of AQI for each parameter at each station. This application has become very popular and has created awareness in the field of environment. Media has also started reporting the air quality in the country on day-to-day basis, especially in Delhi city. Now this network has been expanded to include 58 stations located in 35 cities of 13 States.

AQI Bulletin containing the data for each city is published every day at 4:00 pm for further easy understanding of the citizens. The entire process of generating AQI values, publishing every hour, preparation of bulletin and uploading it on CPCB website are automated. One of the recent AQI Bulletins (March 31, 2017) is displayed in Table below:

Table: AQI Bulletin

Air Quality Index on Mar 31, 2017 @ 04:00 PM

(Average of past 24 hours)

City	Air Quality	Index Value	Prominent Pollutant	Based on number of monitoring stations
Agra	Moderate	162	$PM_{2.5}$	1
Amritsar	Moderate	114	$PM_{2.5}$	1
Bengaluru	Moderate	110	O_3, $PM_{2.5}$	3
Chandrapur	Moderate	146	PM_{10}	1
Chennai	Satisfactory	64	$PM_{2.5}$, CO	2
Delhi	Moderate	179	$PM_{2.5}$, PM_{10}	6
Durgapur	Moderate	138	PM_{10}	1#
Faridabad	Moderate	139	$PM_{2.5}$	1
Gaya	Poor	202	$PM_{2.5}$	1
Gurgaon	Moderate	176	$PM_{2.5}$	1
Hyderabad	Moderate	131	O_3, PM_{10}	5
Jaipur	Poor	297	$PM_{2.5}$	1
Jodhpur	Very Poor	301	O_3	1
Kanpur	Poor	215	$PM_{2.5}$	1

Possible Health Impacts

Good	Minimal impact
Satisfactory	Minor breathing discomfort to sensitive people
Moderate	Breathing discomfort to the people with lungs, asthma and heart diseases
Poor	Breathing discomfort to most people on prolonged exposure
Very Poor	Respiratory illness on prolonged exposure
Severe	Affects healthy people and seriously impacts those with existing diseases

Page 1

Notes

* AQI is not calculated for today's bulletin for Aurangabad, Patna, Ahmedabad, Haldia, Howrah as data was not available.

Some stations have data available at 3 PM.

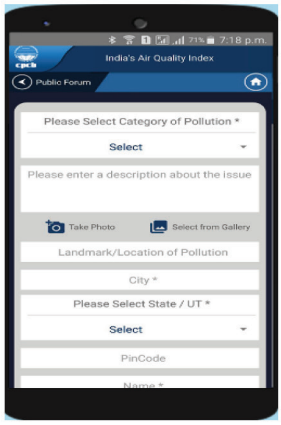
* In case of a city with multiple monitoring locations, average value is used to indicate air quality. Air quality may show variations across locations, and averaging is not a scientifically sound approach. However, for the sake of simplicity this method is being followed. For AQI of monitoring locations, website (http://cpcb.nic.in) may be referred.

Mobile APP 'SAMEER' for AQI display: An APP 'SAMEER' is developed and available for Android and iOS devices, to display of AQI at city and station level, AQI Bulletin. A Public Forum is available at the APP, which helps the public in submitting suggestions or complaints related to air pollution issues along with photos in support of complaint.

Home

Map View

Station Level View



Public Forum

State-wise Status: Following is the list of CAAQM stations installed at different states and data of these stations is being used to display the AQI by CPCB:

S. No.	State	Cities	No. of CAAQM stations
1	Andhra Pradesh	Visakhapatnam, Tirupati	02
2	Bihar	Muzzafarpur, Patna, Gaya	03
3	Delhi	Delhi	10
4	Gujarat	Ahmedabad	01
5	Haryana	Faridabad, Gurgaon, Panchkula , Rohtak	04
6	Karnataka	Bengaluru	05
7	Maharashtra	Aurangabad, Chandrapur, Mumbai, Navi Mumbai, Pune, Solapur, Nagpur, Nashik, Thane	10
8	Punjab	Amritsar, Mandi Gobindgarh	02
9	Rajasthan	Jaipur, Jodhpur	02
10	Tamil Nadu	Chennai	03
11	Telangana	Hyderabad	05
12	Uttar Pradesh	Agra, Kanpur, Lucknow, Varanasi	06
13	West Bengal	Durgapur, Haldia, Howrah, Kolkatta	05

(b) Industrial Emission and Effluent Monitoring Network

In view of advancements made in technology of pollution monitoring, automation in instrumentation/ equipment and e-Governance measures for effective action, CPCB has planned to bring in data of online measurements from industrial units for emissions and effluents discharged into the environment. This activity is started with highly polluting industries in 17 Categories of Industries and Grossly Polluting Industries located on the banks of River Ganga.

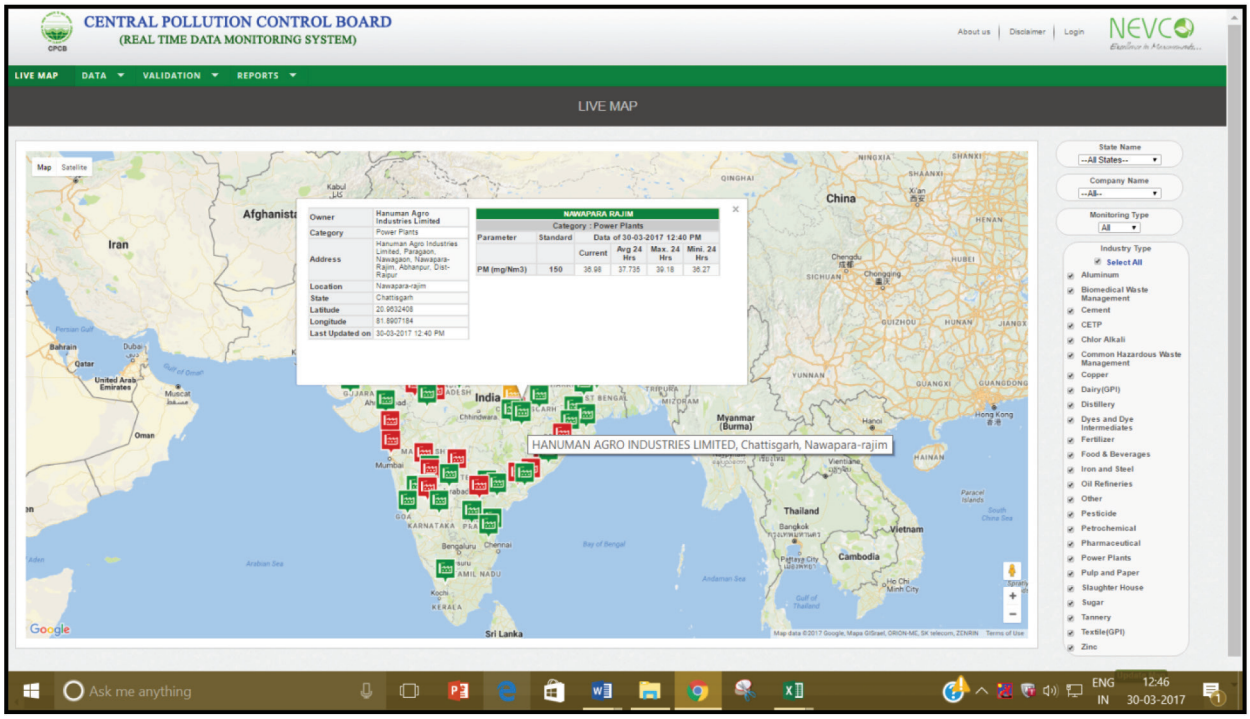
At present CPCB is getting information and data from 53 instruments' manufacturers and suppliers. As the protocols and technologies in this field of measurement vary, it is decided to

accept the data from individual firms through the cloud servers. In order to ensure a tamper-proof mechanism, efforts are being made to see that a comprehensive database is generated, wherein information is available on health of the instruments and calibration status. If required, the regulatory authorities could remotely audit the online system to know its functional efficiency.

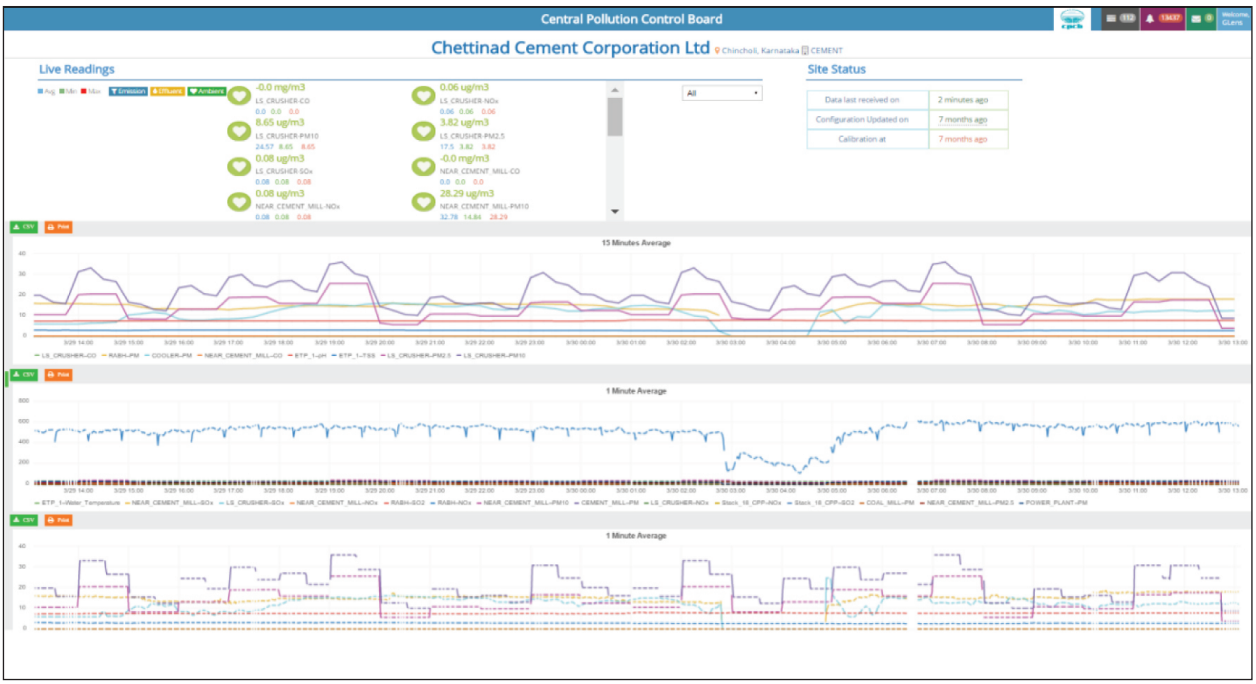
During the year CPCB made it mandatory to all 17 Categories of Industries and GPIs to install real-time emission and effluent monitoring systems, so that consistent information flows to all of its stake holders like SPCBs/PCCs, CPCB and industrial units. This work is being done with the help of various instrument suppliers as most of these instruments are imported with their own central software through which data could be continuously made available at a central location. More than 53 Instrument Suppliers are involved in this activity in the country assisting industries to install, operate and transmit data on regular basis (24X7) to CPCB & SPCBs/PCCs.

The system is heterogeneous as each industry installs instruments as per their requirement, availability and understanding. Presently 1878 industries under 17 Categories of industries and 562 GPI Industries have installed Emission and Effluent Monitoring Systems and data is being transmitted continuously to CPCB and various SPCBs. The online data is being scrutinized and alerts are generated for respective industrial representatives, officials looking after the specific sector/ category of industries at CPCB and SPCBs/PCCs. These alerts act as useful and timely information to act immediately to stop the identified pollution source within shortest possible time.

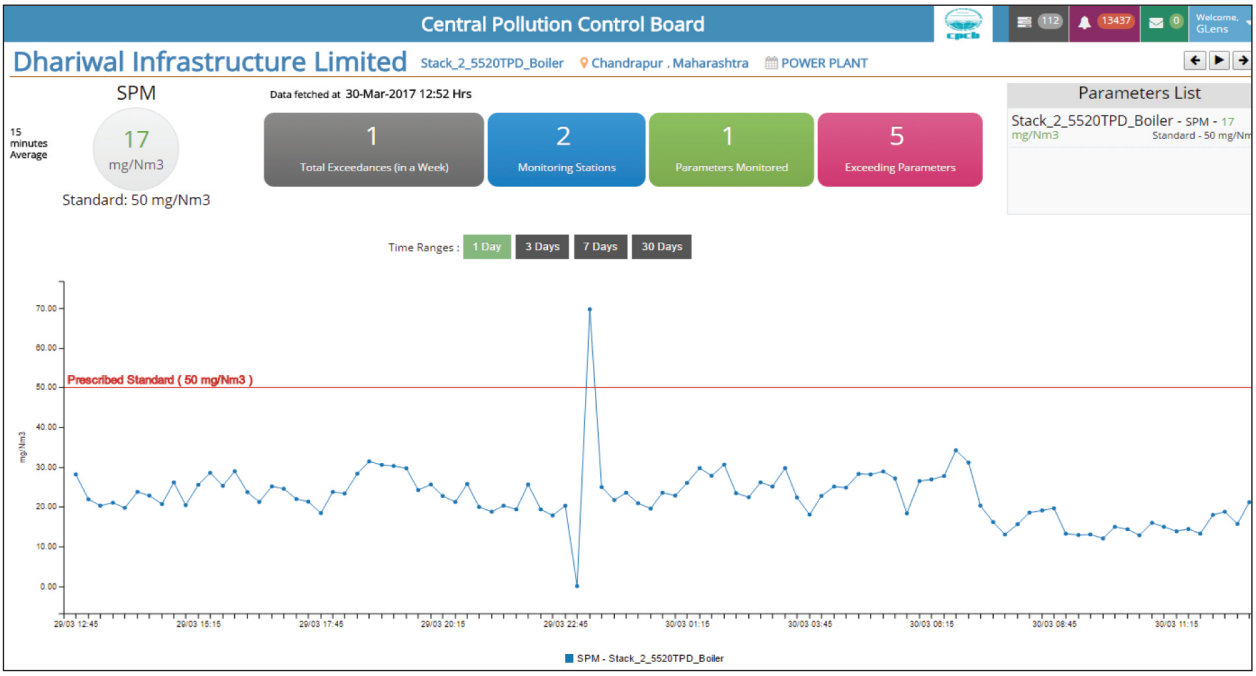
CPCB has developed a software to bring data from servers of all the instrument suppliers to CPCB's Central platform. The purpose of software is to bring data on a common platform for centralized data collection from all the Industries.



Latest data availability



Report



Exceedence Report

Monthly SMS and offline Reports:

SMS alerts are generated based on Limits prescribed for specific parameter in an industry through CPCB/SPCB guidelines. Alerts received from different industries are compiled category wise on monthly basis and action is initiated for self-compliance by the industries. Similarly list of offline units is also compiled every month and accordingly action is initiated. The system has been institutionalized and continuous processing and actions are being done.

Regional Directorates of CPCB	December'16	January'17	February'17	March'17
Regional Directorate West	9	6	7	6
Regional Directorate Central	4	4	3	5
Regional Directorate North	7	5	2	3
Regional Directorate South	5	6	7	2
Regional Directorate East	6	5	5	2
Regional Directorate North East	1	1	1	1
Total Units	**32**	**27**	**25**	**19**

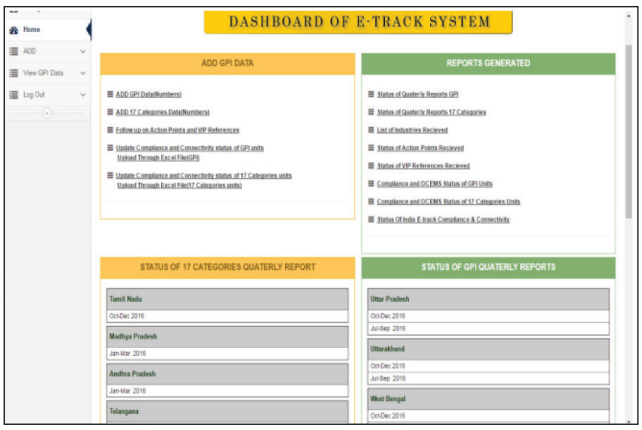
Category-wise Status: Following is the category-wise list of total number of industries,1878 industries under 17 Categories of industries and 562 GPI Industries whose data is being transmitted to CPCB.

17 Categories of Industries		
S. No.	**Category**	**Industries connected to CPCB**
1	Aluminium	12
2	Cement	182
3	Chlor-Alkali	32
4	Copper	3
5	Distillery	156
6	Dye	58
7	Fertilizer	74
8	Iron & Steel	109
9	Oil Refinery	22
10	Pesticides	49
11	Petrochemicals	23
12	Pharmaceuticals	322
13	Power	196
14	Pulp & Paper	172
15	Sugar	408
16	Tannery	57
17	Zinc	3
Total		**1878**

GPI Industries		
S. No.	**Category**	**Industries connected to CPCB**
1	Sugar	76
2	Pulp & Paper	77
3	Distillery	29
4	Fertiliser	7
5	Oil Refinery	2
6	Pharmaceuticals	2
7	Petro-Chemical	3
8	Pesticide	1
9	Cement	1
10	Power	7
11	Tannery	284
12	Food & Beverages	19
13	Slaughter house	12
14	Textile	17
15	Chemicals	10
16	Allied Industry	14
17	CETP	1
TOTAL		**562**

India E-Track for Industries :

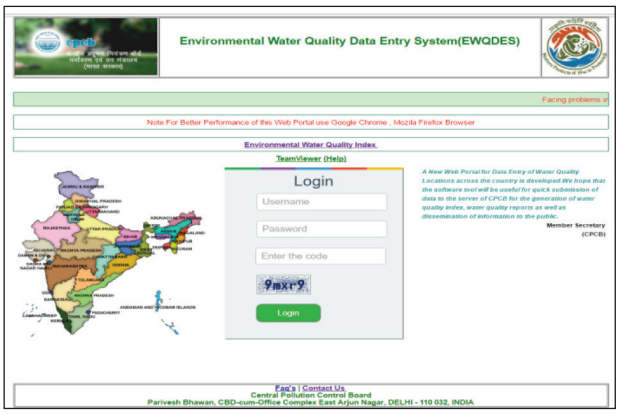
India E-Track Industries is an online portal and MIS System for GPI and 17 categories industries. In this portal there is a provision to enter GPI and 17 categories industries data/information in numbers. There is also provision for update compliance and connectivity status of GPI and 17 categories Industries through MS Excel file.

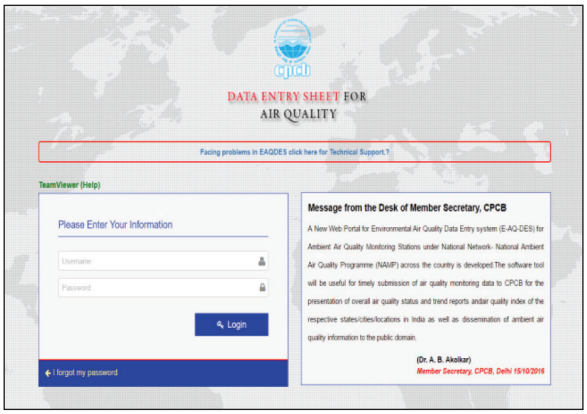


This portal facilitate to add GPI and 17 Categories Industries data in numbers, update compliance and connectivity status of GPI and 17 categories Industries through MS Excel file, quick view of status of GPI and 17 categories Industries through quarterly reports and uploading the list of 17 Categories and GPI Industries.

Environmental Data Entry System for Air and Water:

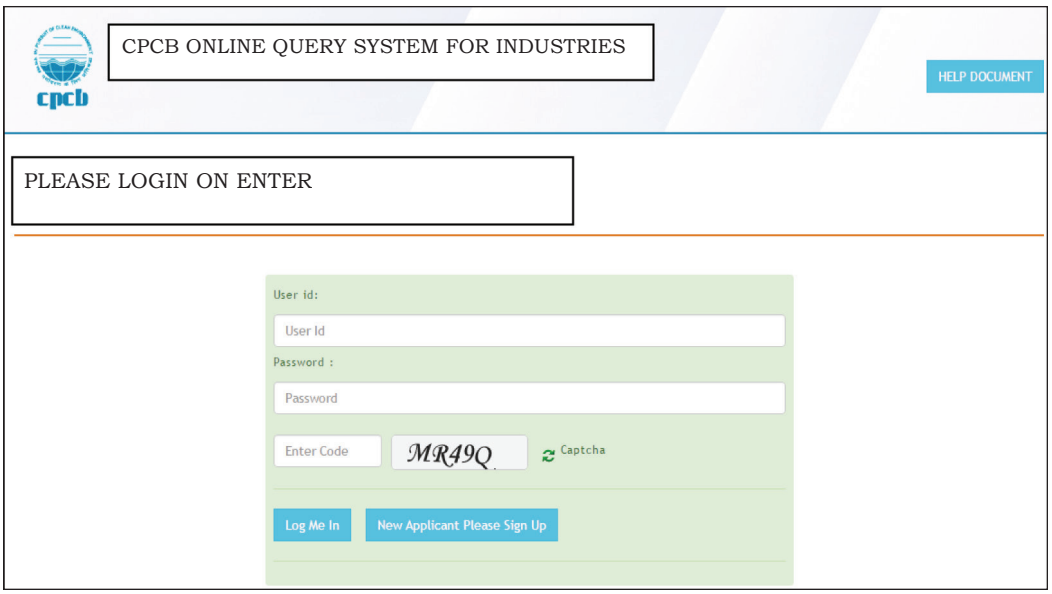
Web-enabled Environmental Data Entry System for Air and Water has been set up to facilitate online entry and quick retrieval of data on various environmental parameters. On-line entry for data on air quality monitored under National Air Monitoring Program and water quality monitored under GEMS/MINARS is being done regularly by SPCBs/PCCs. These portals could be accessed through CPCB's website (http://cpcb.nic.in). Raw as well as analyzed data could be viewed, downloaded & used for further analysis/ interpretation.





CPCB-Online Query System for Industries:

The "CPCB-Online Query System for Industries" Portal is developed to facilitate industries to get the clarification on their queries. The representatives of industries or the industrial associations can login and get the required information or clarification on the issues related to the category of industry he/ she represents.



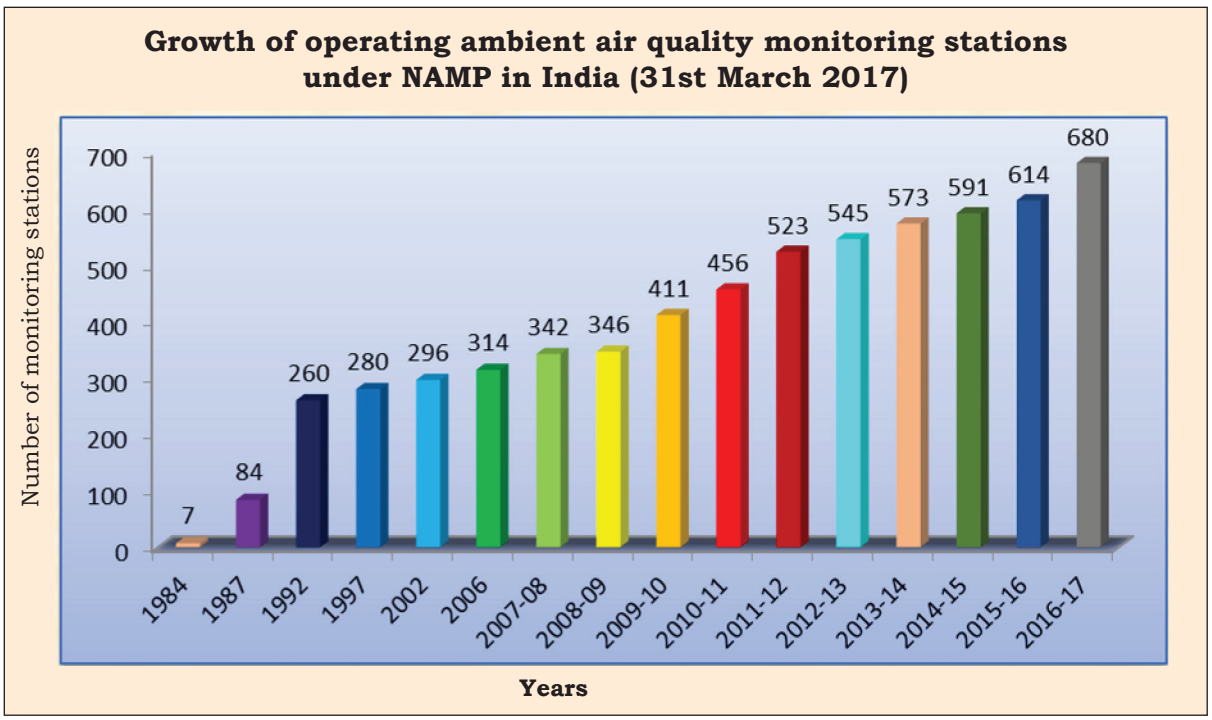
This portal is developed to facilitate representatives of industries or industrial associations to get clarification/ guidence on any industrial queries. In this portal the user can register with specific category and get login credentials through valid E-Mail ID. After registration, the user can login and raise query directly to his/her registered category and also any other category using other option and selecting the category. The raised query automatically marked to concerned officer based on the category for which the issue raised. The concerned officer can reply the query or forward it to RD or another officer. The user can check the status of his/her query online.

5.2 Ambient air quality status under National Air Quality Monitoring Programme (NAMP)

In order to prevent, control and abate air pollution, the Air (Prevention and Control of Pollution) Act was enacted in 1981. According to Section 2(b) of Air (Prevention and control of pollution) Act, 1981 '**Air pollution**' has been defined as 'the presence in the atmosphere of any air pollutant.' As per Section 2(a) of Air (Prevention and control of pollution) Act, 1981 '**Air Pollutant**' has been defined as 'any solid, liquid or gaseous substance [(including noise)] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment'. Therefore **ambient air quality standard** is developed as a policy guideline that regulates the effect of human activity upon the environment so that pollutant emission into the air can be regulated. Standards may specify a desired state or limit alterations.

National Ambient Air Quality Monitoring Programme

Central Pollution Control Board is executing a nation-wide National Air Quality Monitoring Programme (NAMP). NAMP was started in 1984 with 7 stations in Agra and Anpara. The growth of operating Ambient Air Quality Monitoring Stations in the country is given in figure below. The ambient air quality monitoring network has 680 operating stations covering 254 cities/towns in



28 States and 5 Union Territories as on 31st March 2017.

Parameters monitored under NAMP

Under NAMP three criteria pollutants viz. PM_{10} (Particulate Matter having an aerodynamic diameter less than or equal to 10 µm), Sulphur dioxide (SO_2) and Nitrogen dioxide (NO_2) were identified for regular monitoring at all locations. Other notified parameters like Carbon monoxide (CO), Ammonia (NH_3), Ozone (O_3), $PM_{2.5}$ (Particulate Matter having an aerodynamic diameter less than or equal to 2.5 µm), Benzo (a) pyrene {B(a)P}, Lead (Pb) and Nickel (Ni) are being monitored at selected locations. The monitoring of meteorological parameters such as wind speed, wind direction, relative humidity and temperature has been also integrated with the monitoring of air quality.

Objectives of NAMP

i) To determine the status and trends of ambient air quality;

ii) To ascertain whether the prescribed ambient air quality standards are violated;

iii) To identify non-attainment cities with respect to national standards and;

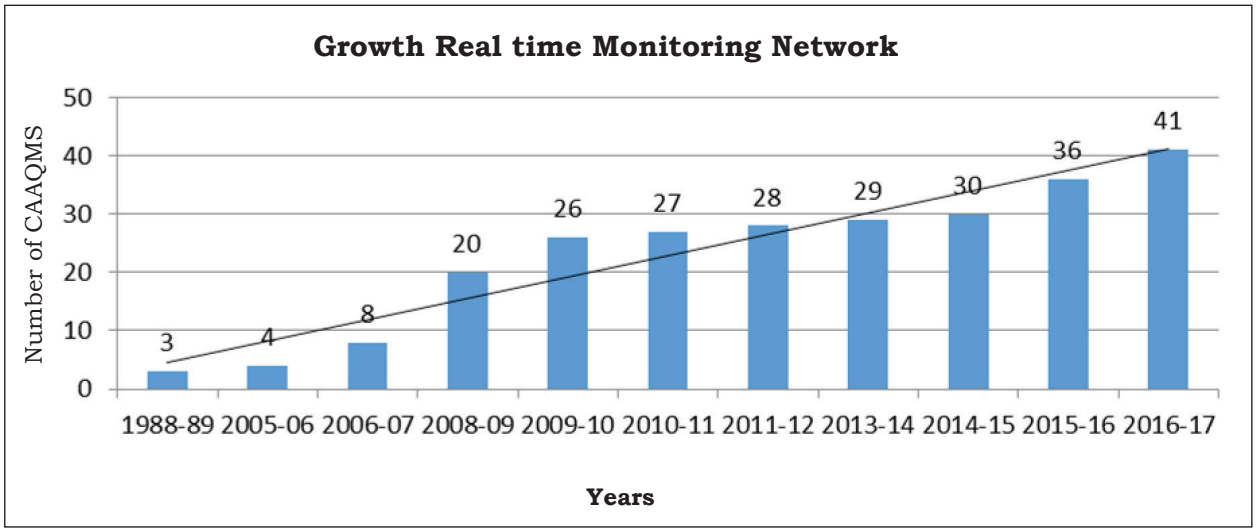
iv) To obtain the knowledge and understanding necessary for developing preventive and corrective measures.

Agencies involved in the Network (NAMP)

The monitoring under the NAMP is being carried out with the help of Central Pollution Control Board; State Pollution Control Boards; Pollution Control Committees and National Environmental Engineering Research Institute (NEERI), Nagpur. CPCB co-ordinates with these agencies to ensure uniformity, consistency of air quality data and provides technical and financial support to them for operating the monitoring station.

Growth of Continuous Ambient Air Quality Monitoring Station (CAAQMS) by CPCB & SPCBs in India

Central Pollution Control Board and SPCBs are continuously working to setup Continuous Ambient Air Quality Monitoring Stations on 50:50 sharing basis. The priority is given to set up stations at 46 identified million-plus cities in phase – I. On completion of this target, setting up of stations would start for 21 state capitals and UTs (except Delhi). In this direction, the growth of these stations is given in the graph below. The parameters monitored at most of the locations are SO_2, NO_2, NH_3, O_3, CO, Benzene, PM_{10} & $PM_{2.5}$ besides meteorological parameters. The AQI



(Air Quality Index) of all these stations are being prepared on daily basis and available at CPCB web site for information to public in general.

CPCB - Continuous Ambient Air Quality Monitoring Network in India

Sl. No.	CAAQMS Installed (21 cities)	Under installation (5 cities during years, 2017-18)	Proposed under CPSUs Project (18 cities during year, 2017-18)	Left over cities (Proposed under GOI Fund)	Coverage in 21 State Capitals including UTs – Phase II (17 cities Proposed under GOI Fund)
01.	Mumbai (01)	Howrah (01)	Vishakhapatnam (01)	Vasai - Virar	Amravati
02.	Pune (01)	Coimbatore * (01)	Dhanbad (01)	Kalyan-Dombivali	**Bhubaneswar (01)***
03.	Nagpur (01)	Ghaziabad * (01)	Ranchi (03)		Gandhi Nagar
04.	Nashik (01)	Srinagar (01)	Allahabad (03)		Dehradun (01)*
05.	Aurangabad* (01)	Vijayawada (01)	Meerut (03)		Panaji
06.	Ludhiana * (01)		Bhopal (03)		Shimla
07.	Amritsar (01)		Indore (01)		Thiruvananthapuram
08.	Jodhpur (01)		Gwalior (03)		Guwahati
09.	Jaipur (01)		Jabalpur (01)		Itanagar
10.	Lucknow (03)		Pimpri-Chinchwad (02)		Agartala (01)*
11.	Agra (01)		Navi Mumbai (01)		Shillong (01)*
12.	Kanpur (01)		Raipur (03)		Gangtok

Sl. No.	CAAQMS Installed (21 cities)	Under installation (5 cities during years, 2017-18)	Proposed under CPSUs Project (18 cities during year, 2017-18)	Left over cities (Proposed under GOI Fund)	Coverage in 21 State Capitals including UTs – Phase II (17 cities Proposed under GOI Fund)
13.	Varanasi (01)		Madurai (02)		Imphal
14.	Kolkata (01)		Surat (01)		Aizawl
15.	Patna (01)		Rajkot (02)		Kohima
16.	Ahmedabad (01)		Vadodara (02)		Chandigarh
17.	Faridabad (01)	* Common with CPAs	Thane (02)		Puducherry
18.	Bengaluru (05)		Kota (02)		Daman
19.	Chennai (04)				Port Blair
20.	Hyderabad (01)				Silvassa
21.	Delhi (06)				Kavaratti
*Note: * Common with CPAs*			*Notes: 04 state capital cities are also proposed under this Project*		*Notes: Out of 21 Nos., 04 state capitals are proposed under CPSUs Project)*
	21 cities	**05 Cities**	**18 Cities**	**02 cities**	**21 State Capitals**
TOTAL 46 MILLION PLUS CITIES					**STATE Capitals**

Continuous Ambient Air Quality Monitoring Station being set up in Critically Polluted Areas (CPAs)

S. No.	Name of CPA	S. No.	Name of CPA	S. No.	Name of CPA	S. No.	Name of CPA
01.	Ludhiana * #	05.	Bhiwadi #	09.	Aurangabad * #	13.	Coimbatore * ##
02.	Mandi Gobind Garh #	06.	Ankleshwar ##	10.	Chandra Pur #	14.	Angul Talcher #
03.	Ghaziabad * ##	07.	Vapi ##	11.	Dombivali #	15.	Jharsuguda (Ib Valley) #
04.	Noida ##	08.	Vatva ##	12.	Manali ##	16.	Asansol ** ##
*# CAAQMS Installed ## Stations are likely to be installed by June 2017 ** Air Severe*							

5.3 National Ambient Noise Monitoring Network (NANMN) Programme

Noise refers to the disturbing sound that may cause harm to human and animal life. It may affect the mind, health and behaviour. It may cause physically discomfort and temporary or permanent damage to hearing.

The indoor sources of Noise Pollution are loudly played music stereos, radio, televisions, grinding machines, etc. The outdoor sources of Noise Pollution commonly referred to as environmental noise comes from airplane, machines, trains, vehicles, industries, fire-crackers etc.

The following measures can be taken to prevent noise pollution:

- ✓ To prevent and control noise pollution it is necessary to create public awareness. Only law is not sufficient. People must be made aware of the harmful consequences of noise pollution.
- ✓ People should be made aware that excessive noise beyond certain limits may cause deafness.
- ✓ They should know that injuries caused by sound pollution are often irreversible.
- ✓ There should be minimum use of sound producing instruments. There should be proper regulations for the use of loudspeakers and other devices that produce noise beyond that are beyond the toleration limits of human-beings.

- ✓ The Pollution Control Board and the High Court have already taken effective measures to bring sound pollution under control. Adequate measures should be taken to ensure that noise related restrictions are not violated.
- ✓ Anti-pollution laws should be enacted and enforced.
- ✓ Ban of fire crackers should be imposed and electric horns should be replaced by bulb horns.
- ✓ The use of microphones should be controlled and regulated.

Under the Environment (Protection) Act, 1986 Noise Pollution (Regulation and Control) Rules, 2000 notified by MoEF&CC was last amended in January 2010. Database on noise level is required for policy formulation, setting standards and ensuring compliance of the existing rules. As per section 5.2.8 (IV) of National Environment Policy (NEP)-2006, Ambient Noise is included as environmental quality parameter and to monitor in specified urban areas regularly.

Road map declared during 2010 by Hon'ble Minister of Environment, Forest & Climate Change regarding setting up a systematic national noise monitoring network to make Indian cities less noisy. 70 National Ambient Noise Monitoring Network (NANMN) stations have been installed spreading over 10 cities and data is being disseminated.

CHAPTER - VI

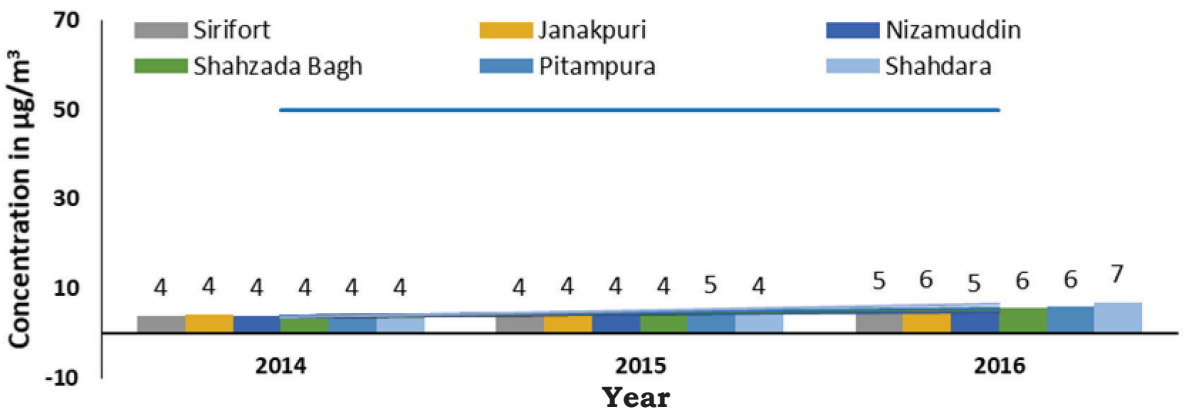
PRESENT STATE OF ENVIRONMENT, ENVIRONMENTAL PROBLEMS AND COUNTER MEASURES

6.1 AMBIENT AIR QUALITY OF DELHI (MANUAL STATIONS)

A comparative profile of ambient air quality being monitored in the city of Delhi at NAMP stations for the year 2014, 2015 & 2016 and presented in following paragraphs.

6.1.1 Sulphur dioxide (SO_2)

The annual mean concentration of Sulphur dioxideduring the year 2014, 2015 & 2016 is shown in Figure depicted below. The concentration of sulphur dioxide recorded at all the six locations was slightly above with respect to previous year and well within the national standard.



Sulphur dioxide concentration in Delhi (2014-2016)

6.1.2 Nitrogen dioxide (NO_2)

The annual mean concentration of Nitrogen dioxide during the year 2014, 2015 and 2016 is shown in Figure placed below this paragraph. The concentration of nitrogen dioxide recorded at one location shows a decreasing trend, four locations an increasing trend and at one location no change with respect to previous year. The concentration of NO_2 ranged between 40 µg/m³ (Pitampura) to 56 µg/m³ (Shahzada Bagh) during the year 2016. The concentration of NO_2 exceeded the national standards at all locations except one (Pitampura) during the year 2016.

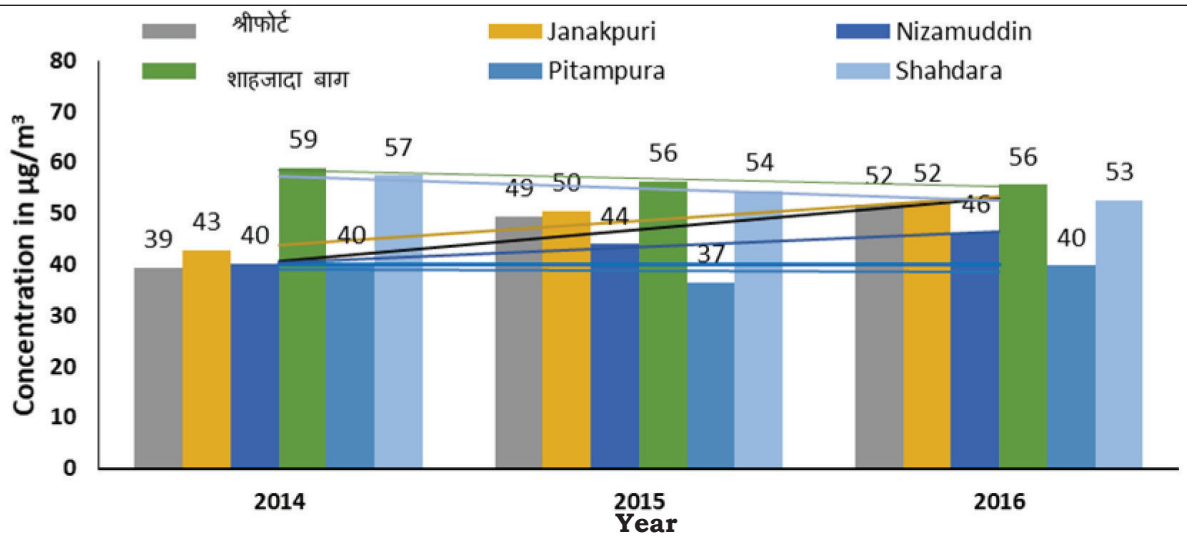


Figure : Nitrogen dioxide concentration in Delhi (2014-2016)

6.1.3 Particulate Matter (PM_{10})

The concentration of PM_{10} monitored at all locations shows an increasing trend in the year 2016 compared to previous two years in following Figure. The concentration of PM_{10} at all locations exceeded the annual national standard and ranged between 253 µg/m³ (Nizamuddin) to 348 µg/m³ (Shahzada Bagh) during the year 2016.

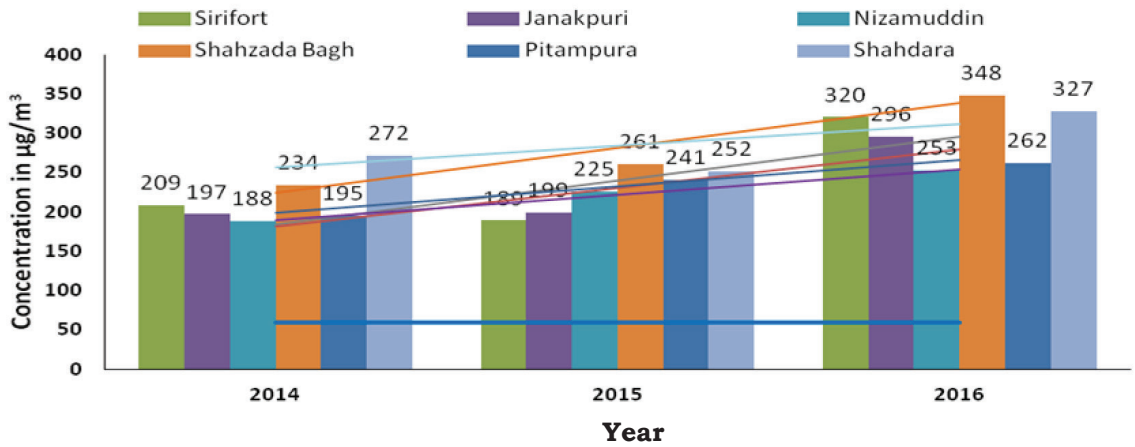


Figure : PM_{10} concentration in Delhi (2014-2016)

6.1.4 Particulate Matter ($PM_{2.5}$)

The annual mean concentration of $PM_{2.5}$ shows an increasing trend at all locations during the year 2016 in comparison to year 2014 & 2015 is depicted in Figure below. The annual mean concentration of $PM_{2.5}$ ranged between 102 µg/m³ (Sirifort) and 145 µg/m³ (Pitampura) during the year 2016 and exceeded the prescribed national annual standard at all the locations.

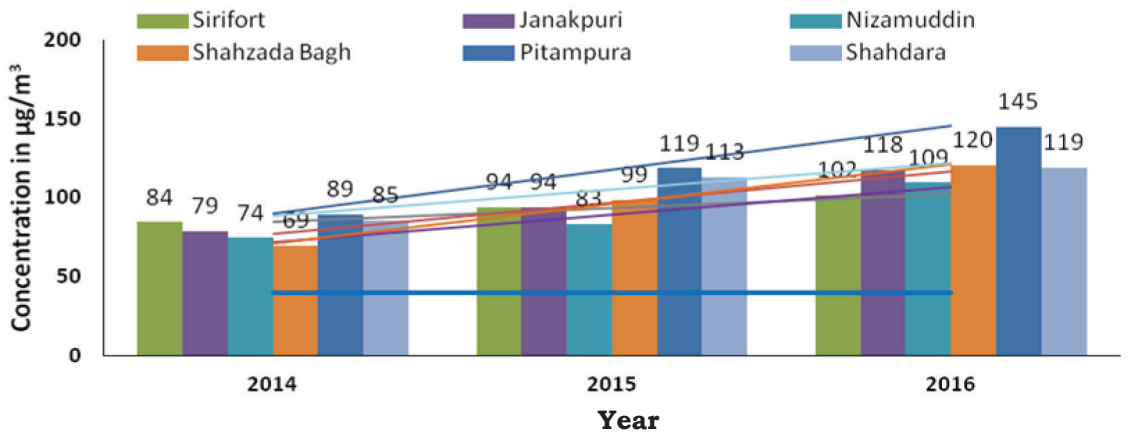


Figure : $PM_{2.5}$ concentration in Delhi (2014-2016)

6.2 AIR QUALITY AT ITO, DELHI

The air quality at ITO Traffic intersection is being monitored during the last many years. The location was temporarily shifted near to Pragati Maidan Metro Station during 2014 -15 and restored back to ITO intersection in 2016. The air quality during the last three years in traffic area is presented in Figure below.

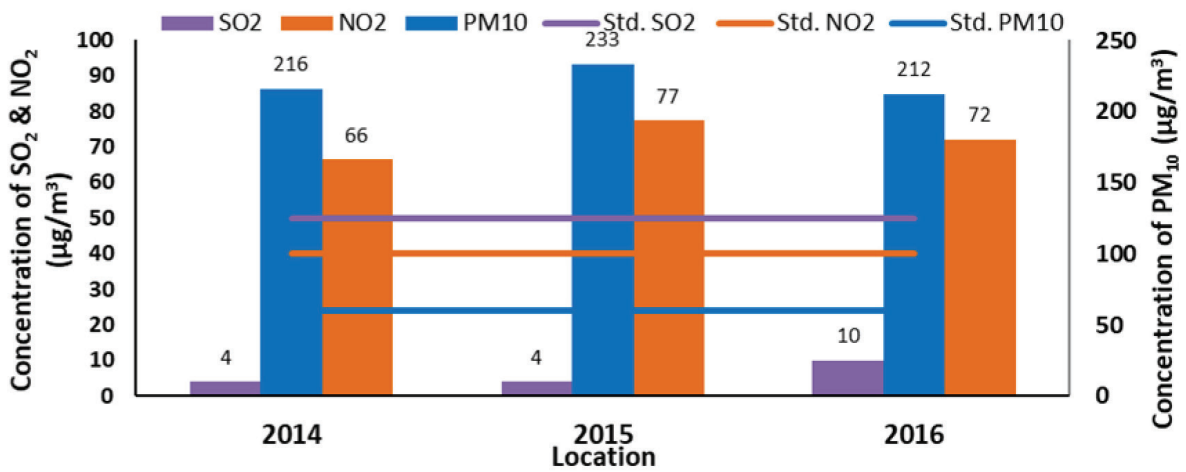


Figure : Pollutants concentration at ITO Intersection, Delhi (2014-2016)

6.3 PARTICULATE METALS AND METALLOIDS

In compliance to the mandate under the Air Act (1981), Central Pollution Control Board is monitoring the metal parameters included in NAAQS, 2009, lead, nickel and arsenic in PM_{10} at eight locations (Pitampura, Sirifort, Nizamudin, Janakpuri, Shahdara, Shahzadabagh, East Arjun Nagar and traffic intersection BSZ Marg ITO) in Delhi.

In ambient air, Lead arises from natural as well as anthropogenic sources. Human's exposure to lead can result in a wide range of biological effects depending on the level and duration of exposure. It affects synthesis of hemoglobin in blood and cause damage to kidneys.

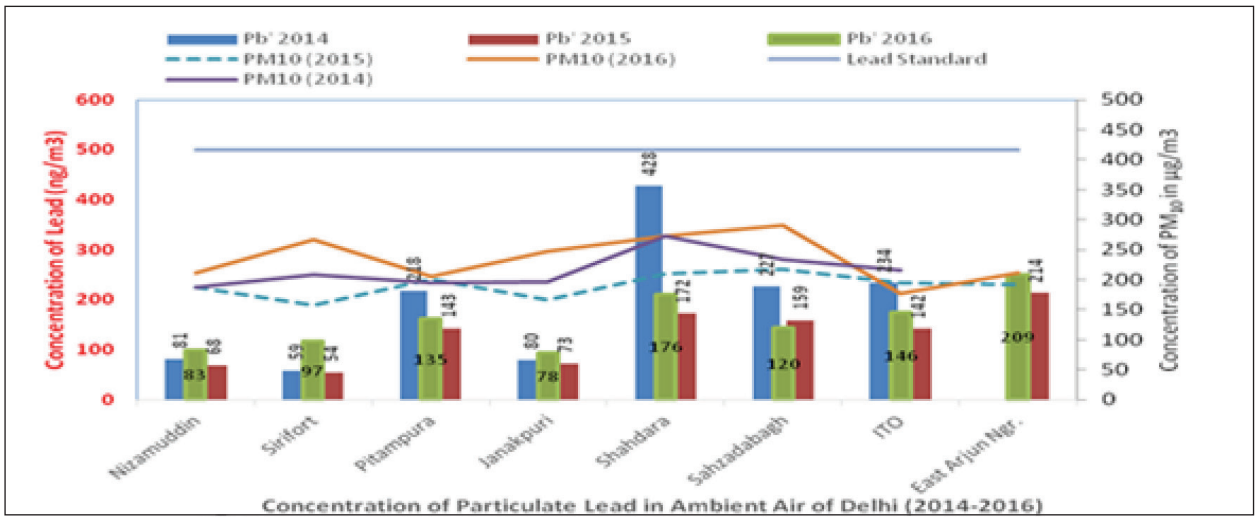
Nickel in ambient air mainly comes from combustion of fuel oil, coke in power plants, refineries and other industries like food processing, stainless steel utensils, cigarette smoking and natural re-suspension of dust. Excessive amount of Nickel can be mildly toxic. Long-term exposure can cause heart and liver ailments.

Arsenic has both natural and anthropogenic sources. Rock pyrite leaches Arsenic in soil through aberration and fossil fuel burning (coal) also add Arsenic in Environment.

These toxic metals have wide range of health effects in organisms and human being. Skin rashes, Lung ailments and finally kidney failure are common effects of Arsenic on human health. Major health an effect of Arsenic is through water route (contaminated ground water). The concentration of metals (Pb& Ni) and metalloid (As) data for the years 2014, 2015 and 2016 are described as follows:

6.4 PARTICULATE LEAD IN PM_{10}

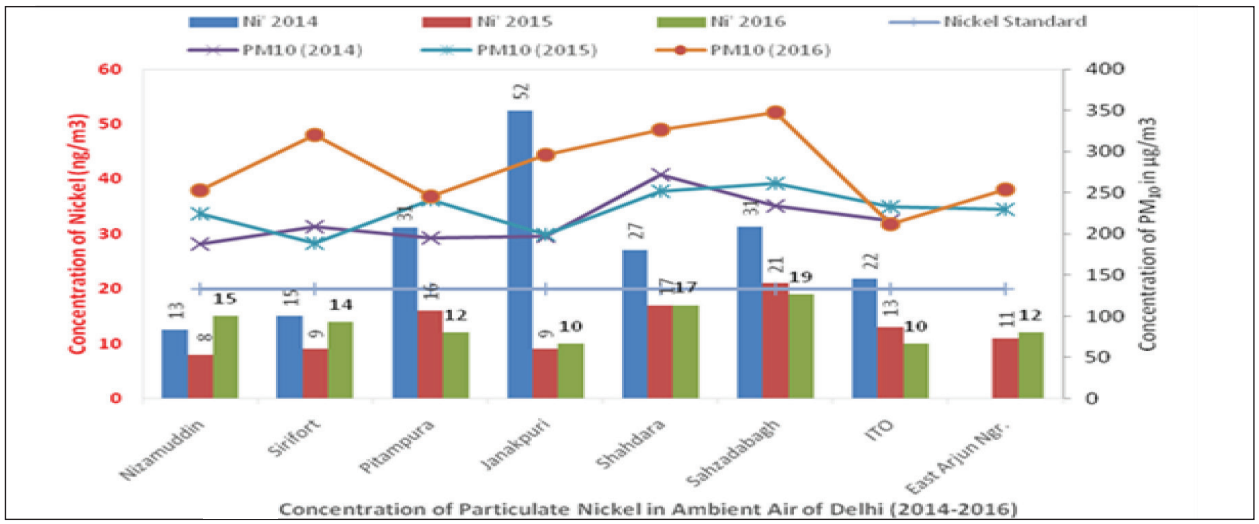
The annual mean concentration of particulate lead in the ambient air for the last three years in Delhi is shown in Following Figure.



The annual mean concentrations of particulate lead during the year 2014 to 2016 were observed in the range of 54.0 ng/m^3 to 428.0 ng/m^3. The maximum concentration of particulate lead were observed at Shahdara (428.0 ng/m^3) in 2014, East Arjun Nagar (214.0 ng/m^3) in 2015, and 209 ng/m^3 in 2016. The minimum concentration of lead found at Sirifort (59.0 ng/m^3) in 2014, (54.0 ng/m^3) in 2015 and Janakpuri (78.0 ng/m^3) in 2016. The overall city average of all monitored station during the reported period was 189 ng/m^3, 128 ng/m^{3}and 131 ng/m^3 respectively in 2014, 2015 and 2016. Concentrations of Lead in ambient air were found well within the limit (500 ng/m^3) prescribed in NAAQS, 2009, across Delhi during reported period. It is also encouraging that lead concentrations across the city have decreased over the years. Slight increase in Lead during 2016 may be attributed to resuspended particulate as it was also evident that PM10 concentration has increased in 2016.

6.5 PARTICULATE NICKEL IN PM_{10}

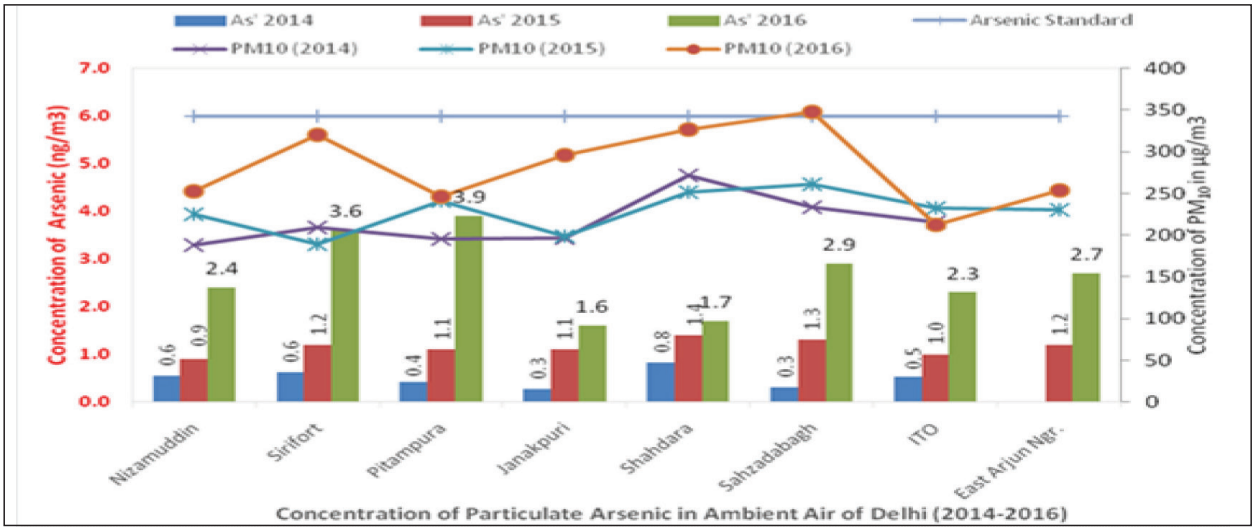
The annual mean concentration of particulate (PM_{10}) nickel in the ambient air for last three years (2014 to 2016) in Delhi is shown in Figure.



The annual mean concentration of particulate nickel (in PM_{10}) was observed in the range of 13.0 ng/m^3 to 52 ng/m^3 (2014), 08.0 ng/m^3 to 21.0 ng/m^3 (2015) and 10.0 ng/m^3 to 19.0 ng/m^3 (2016) in Delhi. The observed concentration value of Nickel is exceeded the permissible limits of 20.0 ng/m^3 at Pitampura, Janakpur, Shahdara, Shahzadabagh and ITO in the year 2014, Shahzadabagh in 2015. The Nickel concentrations reported in Delhi during 2016 were observed within permissible limit across Delhi; however, the concentrations reported are moderately high enough and almost still touching the limits. MSW containing waste batteries (cells) and auto burning of MSW in landfill sites may add on to the concentration in urban areas.

6.6 PARTICULATE ARSENIC IN PM_{10}

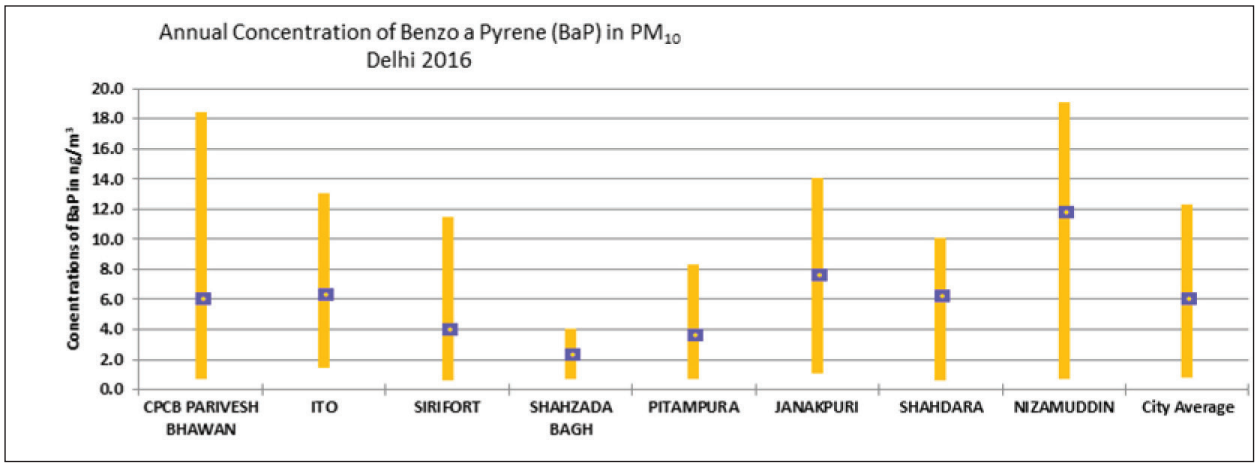
The annual mean concentration of particulate metalloid (arsenic) in the ambient air for last three years in Delhi is shown in Fig.-3.



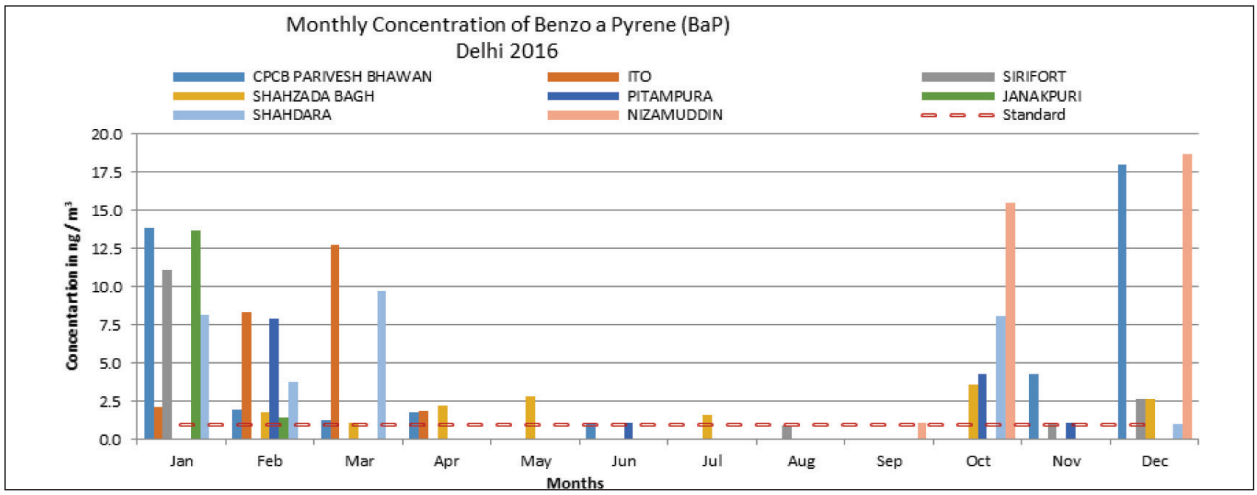
Concentrations of Arsenic were observed within the prescribed standard limit (6.0 ng/m^3) across Delhi. The mean values ranges from 0.3 ng/m^3 to 0.6 ng/m^3 (2014), 0.9 ng/m^3 to 1.4 ng/m$^{3.}$ (2015) and 1.6 ng / m^3 to 3.9 ng/m^3 (2016). The increasing trend of 'As' in ambient air needs to be investigated.

6.7 PARTICULATE PHASE (PM_{10}) BENZO (A) PYRENE IN DELHI

Central Pollution Control Board has notified Benzo (a) Pyrene in particulate phase (PM10) in ambient air. CPCB is conducting regular monitoring at 08 NAMP stations in Delhi. The representative samples are processed for the analysis of Benzo (a) Pyrene (PAH). The annual average concentration values of B(a)P varied spatially. The 24 hourly concentration range of B(a)P across the stations are lying between 0.9 to 18.0 ng/m3. 18ng/m3 was reported Nizamuddin station. The annual average concentrations at all the stations in the city varied widely between 2.3 to 11.8 ng/m3. Parivesh Bhawan and Nizamuddin have recorded maximum variation while Shahzadabagh had least. The average concentration of the city was reported high enough (6.0 ng/m3) compared to notified standard (1.0 ng/m3).



There is a limitation of this study. As the method IS 5182 Part 12: 2004 reaffirmed in 2009 was followed; the range of detection for B(a)P in this GC FID the method is 0.9 - 50 ng/m^3, many results of 24 hour samples were falling below detection limit and so the annual average may not represent the true picture in this case. As the Detection Limit and notified concentration are very close, the detected samples are mostly violating the NAAQS standards. So, here the highest concentrations reported are the major concern.



The monthly concentration value of B(a)P as represented in the above Figure; It shows marked seasonal variation. The building up of concentration of B(a)P was evident during October to January. February and March also get affected with existing load. December-January months are worst affected may be due to inversion effect coupled with burning of wood and trashes in winter for heat. April onward the concentrations go down, which may be correlated with better dispersion. The values reported during monsoon always low as usual due to flushing of particulate through precipitation.

6.8 CONTINUOUS AMBIENT AIR QUALITY MONITORING STATIONS (CAAQMS) IN DELHI

Delhi being capital city, the CPCB pays attention to monitoring ambient air quality since 2010 by automatic stations situated across the city. These stations are located at DMS-Shadipur, IHBAS-Dilshad Garden and NSIT Dwarka. The parameters monitored in these stations are: NO_2, CO, SO_2, O_3, PM_{10}, NH_3, Benzene, THC, along with meteorological parameters viz. Temperature, Humidity, wind speed, wind direction, vertical wind speed, solar radiation and barometric pressure. The online data from these stations are available on CPCB website on real time basis.

This data is also being displayed on real-time basis and used for online NAQI dissemination for public in general as well as release of NAQI bulletin for media on regular basis. The summarised data over the years for 3 stations are shown with respect to parameters.

Continuous Ambient Air Quality Monitoring Data

Annual Average - Delhi

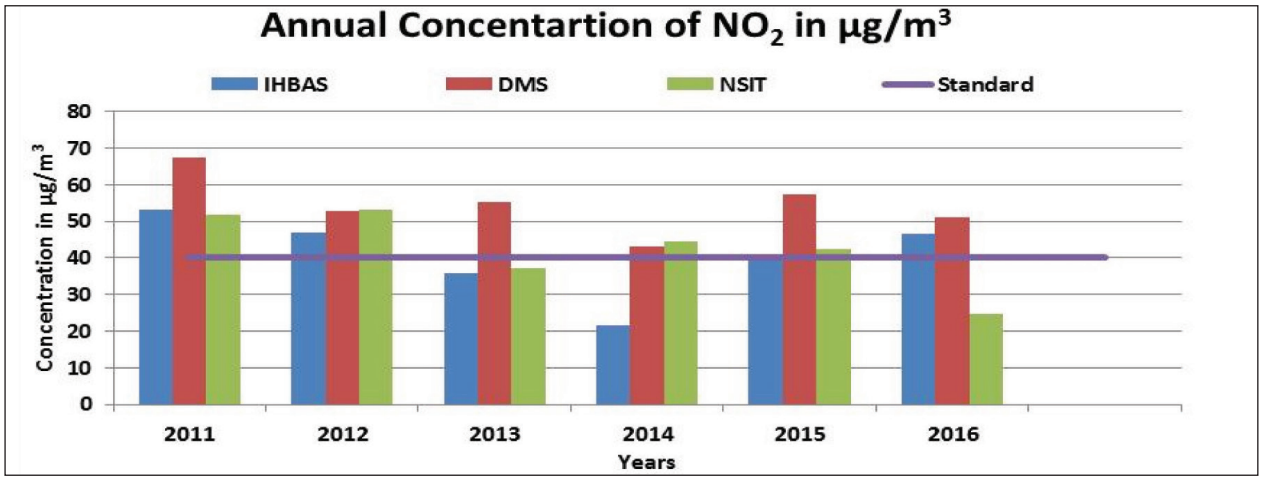
Station	Parameter	Standard	2011	2012	2013	2014	2015	2016
DMS, Shadipur	NO_2	40	67	53	55	43	57	51
	SO_2	50	12	12	12	12	10	13
	CO	2000 # 4000 ##	1666	1316	1265	750	772	920
	O_3	100 # 180 ##	37	32	27	31	38	35
	PM_{10}	60	219	216	205	202	ID	NM
	$PM_{2.5}$	40	NM	NM	NM	NM	88	135
	Benzene	5	11.5	11.9	9.0	4.5	2.7	3.9

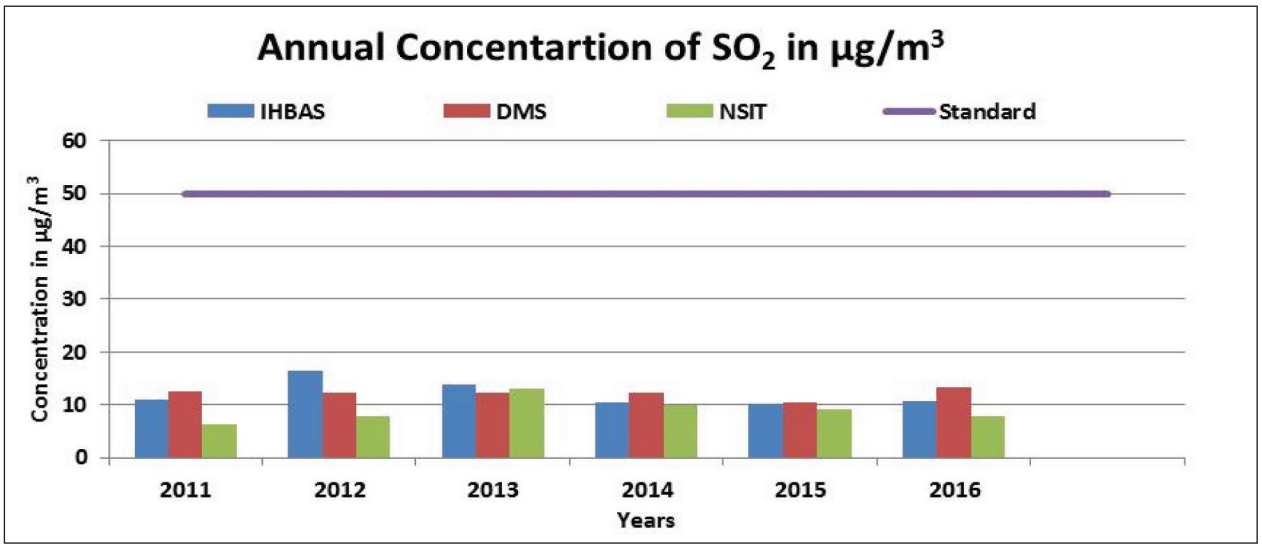
Station	Parameter	Standard	2011	2012	2013	2014	2015	2016
IHBAS, Dilshad Garden	NO_2	40	53	47	36	21	41	46
	NH_3	100	13	28	36	30	46	35
	SO_2	50	11	16	14	11	10	11
	CO	2000 # 4000 ##	1164	1060	901	673	546	789
	PM_{10}	60	199	243	222	193	ID	NM
	$PM_{2.5}$	40	NM	NM	NM	NM	93	133

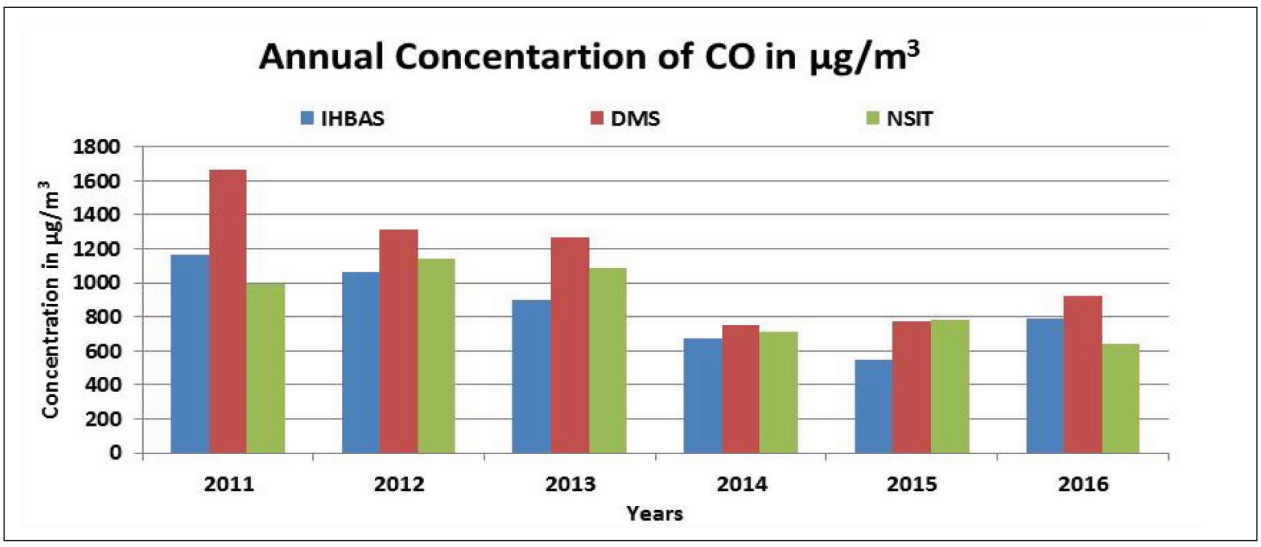
Station	Parameter	Standard	2011	2012	2013	2014	2015	2016
NSIT, Dwarka	NO_2	40	52	53	37	44	42	25
	SO_2	50	6	8	13	10	9	8
	CO	2000 # 4000 ##	997	1142	1086	709	786	639
	O_3	100 # 180 ##	26	28	32	33	39	40
	PM_{10}	60	178	185	166	214	ID	NM
	$PM_{2.5}$	40	NM	NM	NM	NM	90	125
	Benzene	5	9.8	10.0	8.4	4.4	2.7	3.3

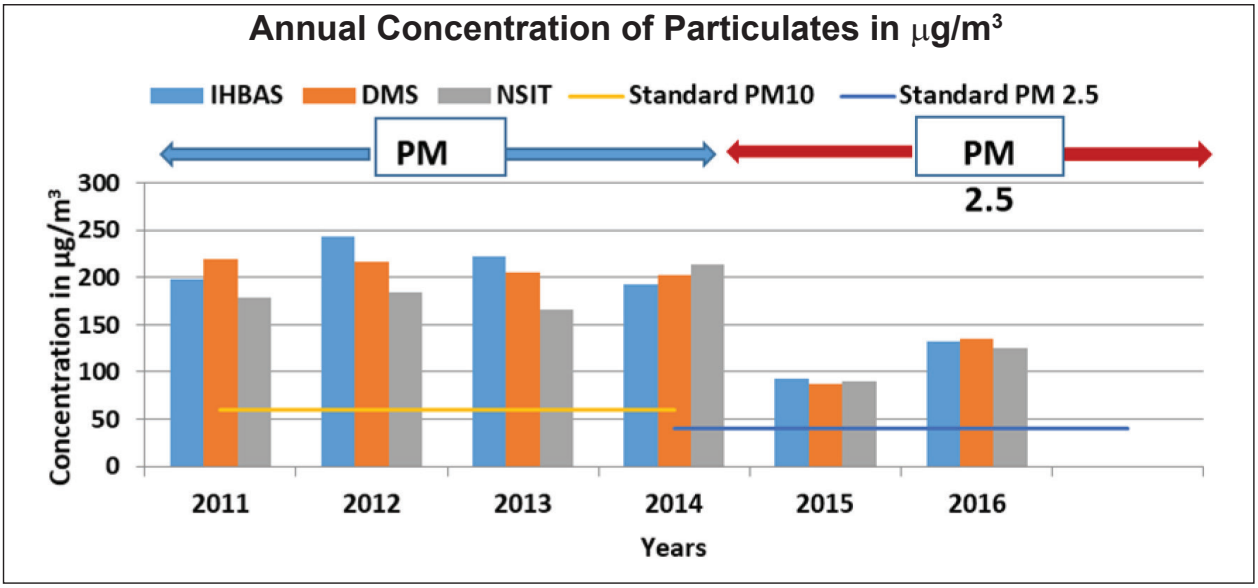
Notes:

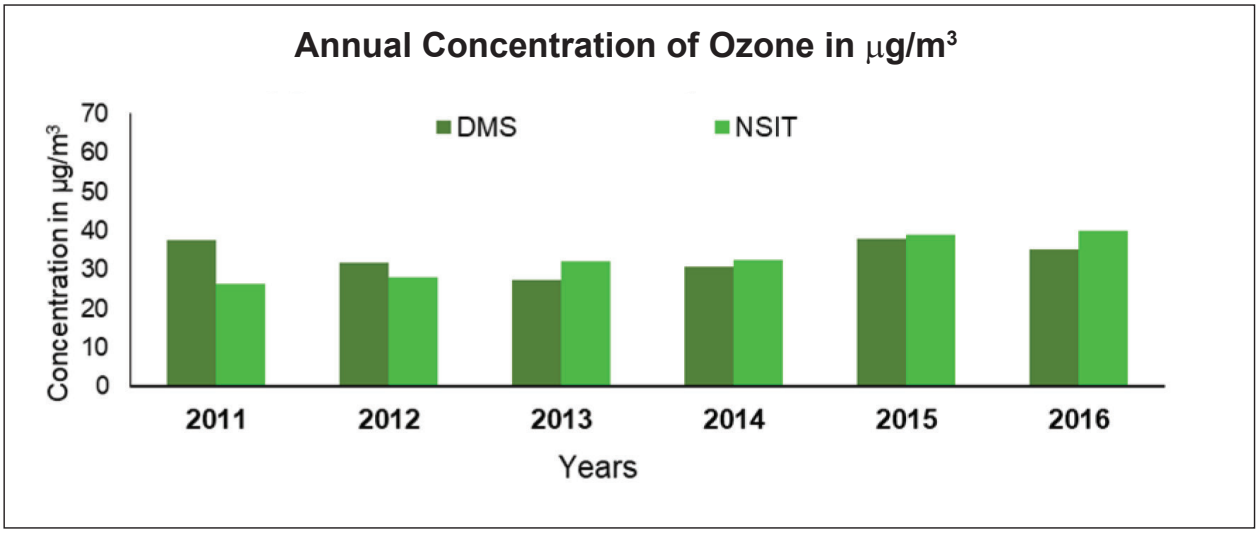
i. *All values expressed in µg/m³*
ii. *# 1 hourly standard*
iii. *## 8 hourly Standard*
iv. *$PM_{2.5}$ values from March to December 2015*
v. *ID – Inadequate Data for PM_{10} (January & February 2015)*
vi. *NM – Not Measured*

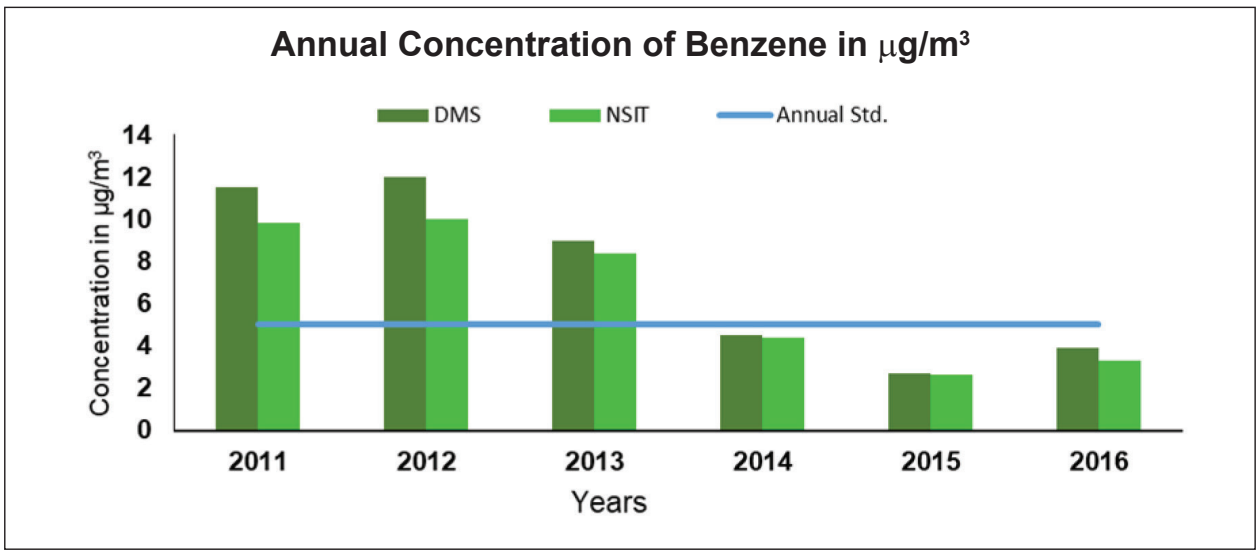





Annual Concentartion of CO in µg/m³
IHBAS
DMS
NSIT
Concentration in µg/m³
1800
1600
1400
1200
1000
800
600
400
200
0
2011
2012
2013
2014
2015
2016
Years


Annual Concentration of Particulates in µg/m³
IHBAS
DMS
NSIT
Standard PM10
Standard PM 2.5
PM
PM 2.5
Concentration in µg/m³
300
250
200
150
100
50
0
2011
2012
2013
2014
2015
2016
Years


Annual Concentration of Ozone in µg/m³
DMS
NSIT
Concentration in µg/m³
70
60
50
40
30
20
10
0
2011
2012
2013
2014
2015
2016
Years



At DMS Shadipur the Annual Mean concentration of NO_2 observed during 2011-2016 to range between 43 µg/m³ to 67µg/m³. The range of SO_2concentration was 10 µg/m³ to 13 µg/m³. The concentration of CO was observed to vary between 750 µg/m³ to 1667µg/m³. The concentration of O_3 ranged between 27 µg/m³ and 38 µg/m³. The Benzene concentration was recorded between 2.7 µg/m³ to 11.9 µg/m³. The concentration of PM_{10} was observed as 202 µg/m³ (Min) & 219 µg/m³ (Max). The concentration of $PM_{2.5}$ was observed as 88 µg/m³ & 135 µg/m³ in 2015 and 2016 respectively.

At IHBAS Dilshad Garden the Annual Average concentration of NO_2 observed during 2011-2016 ranging between 21 µg/m³ and 53 µg/m³. The SO_2 concentration was reported between 10 µg/m³ and 16 µg/m³. The concentration of CO was found to range between 546 µg/m³ and 1164 µg/m³. The NH_3 concentration was observed to vary between 13 µg/m³ and 46 µg/m³. The concentration of PM_{10} was observed in between 193 µg/m³ and 243 µg/m³. Similarly, concentration of $PM_{2.5}$ was observed as 93 µg/m³ (min) and 133 µg/m³ (max) during 2015 and 2016.

At NSIT Dwarka the Annual mean concentration of NO_2 was observed during 2011-2016 ranging between 25 µg/m³ to 53 µg/m³. The SO_2 concentration was reported between 6 µg/m³ and 13 µg/m³. The concentration of CO was varied between 709 µg/m³ and 1142 µg/m³. O_3 was observed to range between 26 µg/m³ and 40 µg/m³. The concentration of PM_{10} ranged between 166 µg/m³ and 214 µg/m³. $PM_{2.5}$ was found to range between 90 µg/m³ & 125 µg/m³ during 2015 and 2016. The Benzene value was observed between 2.7 µg/m³ and 10.0 µg/m³.

Ozone Data of Delhi Region Stations (DMS, Shadipur & NSIT, Dwarka) for the Year 2016

8-houriy ozone concentrations exceeded the NAAQS value i.e. 100 µg/m³ in the year 2016 during the 0600 to 1400 hrs. at DMS Shadipur on 3 occasions; however, the exceedance recorded during 1400 to 2200 hours here for 23 occasions. March to June was worst affected when 21 exceedance events occurred. More than 50% exceedance recorded in the month of May only. This may be attributed to the solar flux and the months (July to December) had no exceedance during the same time interval.

Exceedance at NSIT Dwarka had also similar pattern. There was 27 exceedance events during 1400 to 2200 hours, out of which about 41 % occurred in May. April to June had registered more

than 85% exceedance events. NIST Dwarka has also registered 9 exceedance events in the time interval 0600 to 1400 hrs in 2016. All of them occurred in April and May. The data Tables are presented below.

Exceedence Events of Ozone Concentration in Delhi

Months	DMS, Shadipur		NSIT, Dwarka	
	0600 – 1400 Hours	1400 – 2200 Hours	0600 – 1400 Hours	1400 – 2200 Hours
January	NIL	1	NIL	NIL
February	NIL	1	NIL	NIL
March	1	4	NIL	5
April	NIL	2	6	11
May	2	12	3	7
June	NIL	3	NIL	NIL
July	NIL	NIL	NIL	NIL
August	NIL	NIL	NIL	NIL
September	NIL	NIL	NIL	3
October	NIL	NIL	NIL	1
November	NIL	NIL	NIL	NIL
December	NIL	NIL	NIL	NIL

Carbon Monoxide (CO) at Shadipur; Dilshad Garden &Dwarka

Exceedence Events of Carbon monoxide Concentration in Delhi

Months	DMS			NSIT			IHBAS		
	6 AM to 2 PM	2 to 10 PM	10 PM to 6 AM	6 AM to 2 PM	2 to 10 PM	10 PM to 6 AM	6 AM to 2 PM	2 to 10 PM	10 PM to 6 AM
January	1	NIL	3	NIL	NIL	NIL	NIL	NIL	3
February	2	NIL	5	NIL	1	NIL	NIL	NIL	NIL
March	NIL	NIL	2	NIL	NIL	NIL	NIL	NIL	NIL
April	1	NIL	4	NIL	NIL	1	NIL	NIL	NIL
May	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
June	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
July	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
August	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
September	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
October	NIL	2	5	NIL	NIL	NIL	NIL	NIL	2
November	1	1	10	NIL	NIL	1	NIL	NIL	9
December	1	4	10	NIL	NIL	1	1	2	5

The 8-hourly CO concentrations have exceeded NAAQS value i.e. 2000 $\mu g/m^3$ for 51 occasions at DMS, Shadipur, 04 occasions at NSIT Dwarka and 22 occasions at HIBAS, Dilshad Garden in the year 2016. Maximum exceedance recorded at all the stations happened during 10 PM to 06 AM (at night). Hence, it may be attributed that lower temperature build up CO at ground level even if the contributing sources are minimized. The prevalent months when the values are exceeding are October to March, however it is also site specific. The pattern of exceedance among the stations indicate that NSIT is comparatively free from traffic related emission whereas, DMS Shadipur is worst affected by vehicular pollution.

Exceedence Events of Carbon monoxide Concentration in Delhi

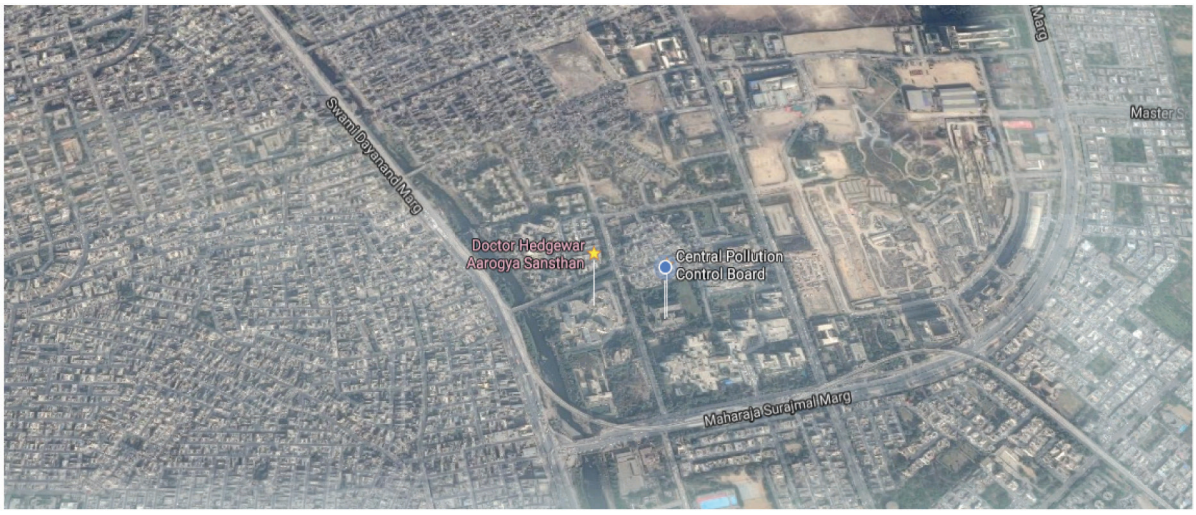
Months	DMS			NSIT			IHBAS		
	6 AM to 2 PM	2 to 10 PM	10 PM to 6 AM	6 AM to 2 PM	2 to 10 PM	10 PM to 6 AM	6 AM to 2 PM	2 to 10 PM	10 PM to 6 AM
January	1	NIL	3	NIL	NIL	NIL	NIL	NIL	3
February	2	NIL	5	NIL	1	NIL	NIL	NIL	NIL
March	NIL	NIL	2	NIL	NIL	NIL	NIL	NIL	NIL
April	1	NIL	4	NIL	NIL	1	NIL	NIL	NIL
May	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
June	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
July	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
August	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
September	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
October	NIL	2	5	NIL	NIL	NIL	NIL	NIL	2
November	1	1	10	NIL	NIL	1	NIL	NIL	9
December	1	4	10	NIL	NIL	1	1	2	5

6.9 MONITORING BY DIFFERENTIAL OPTICAL ABSORPTION SPECTROSCOPY (DOAS)

Central Pollution Control Board (CPCB) has setup the Continuous Air Quality monitoring station based on Differential Optical absorption Spectroscopy at Parivesh Bhawan, CPCB, Delhi (latitude 26.6553190 N and longitude of 77.2957250 E). Although the method was not notified in NAAQS, 2009, US EPA and TUV have approved the technology.

The system has been configured to monitor Sulphur Dioxide (SO2), Ozone (O3), Nitric Oxide (NO), Nitrogen Dioxide (NO2), Formaldehyde (FOR), Benzene (BEN), Toluene (TOL), p-Xylene (pXy), Mercury (Hg). The system is connected with the CPCB server for the public viewing. The measuring path was reorientated towards Hedgewar hospital (opposite CPCB building) in the month of March 2016 due to obstructions in the previous path alignment. The new Path length is 150 Mts. Earlier the same instrument was operation in the same area but the path was defined at other direction. The data collected through DOAS during is presented in following Table:

Location Map of DOAS System in Delhi

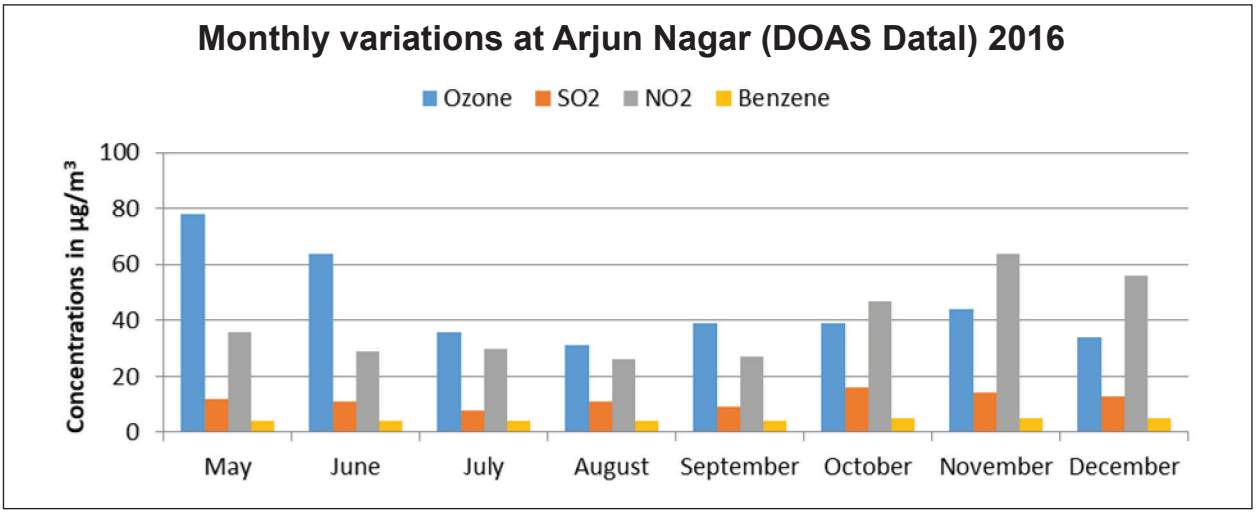


Annual averages of notified pollutants at Arjun Nagar (DOAS Data)

Years	O_3	SO_2	NO_2	BEN
2011	66.8	34.8	49.8	14.3
2012	64.4	30.2	47.2	10.9
2013	68.0	29.0	57.7	7.9
2014	58.4	26.7	61.7	8.9
2015	54.7	27.1	76.2	9.7
Min.	54.7	26.7	47.2	7.9
Max.	68	34.8	76.2	14.3
Avg.	62.46	29.56	58.52	10.34
2016*	45.5	11.7	39.0	4.1

All the values are in $\mu g/m^3$

* Average value during May to December 2016



The variation in concentrations of pollutants are also following the same trend as reported by other CAAQM stations, however the concentration of SO_2 reported here are little bit higher. Ozone reported maximum in May –June and NO_2 starts building up from October onward.

6.10 SODAR SYSTEM AND AUTOMATIC WEATHER STATION

A monostatic SODAR system and an automatic weather station are in continuous operation at Parivesh Bhawan. The data obtained from the SODAR system is analysed to get mixing height. Mean mixing height in different months and in periods of high/low convective activity are given in the following table.

Mixing height in Delhi

Month	Monthly Mean (m)			Mean mixing height in period of high convective activity (m)			Mean mixing height in period of low convective activity (m)		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
January	464	402	519	1164	1432	1469	269	326	292
February	559	645	577	1234	1496	1528	236	373	318
March	588	742	683	1177	1595	1522	294	346	356

Month	Monthly Mean (m)			Mean mixing height in period of high convective activity (m)			Mean mixing height in period of low convective activity (m)		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
April	620	895	667	1216	1890	1339	289	358	301
May	635	842	829	1194	1777	1483	261	327	411
June	661	870	923	1206	1880	1677	259	380	495
July	702	-	727	1288	1617	1547	205	333	401
August	-	621	696	-	1468	1487	-	273	419
September	717	869	774	1363	2087	1508	273	372	380
October	658	696	647	1369	1540	1507	263	268	332
November	511	513	504	1274	1359	1288	228	223	281
December	466	522	478	1451	1447	1324	311	260	303

In 2014 the monthly mean mixing height was minimum in January ie. 464 meters. In 2014 mean mixing height in the period of low convective activity was minimum in July i.e. 205 meters followed by November i.e. 228 meters.

In 2015 the monthly mean mixing height was minimum in January ie. 402 meters. In 2015 mean mixing height in the period low convective activity was minimum in November i.e. 223 meters followed by December i.e. 260 meters.

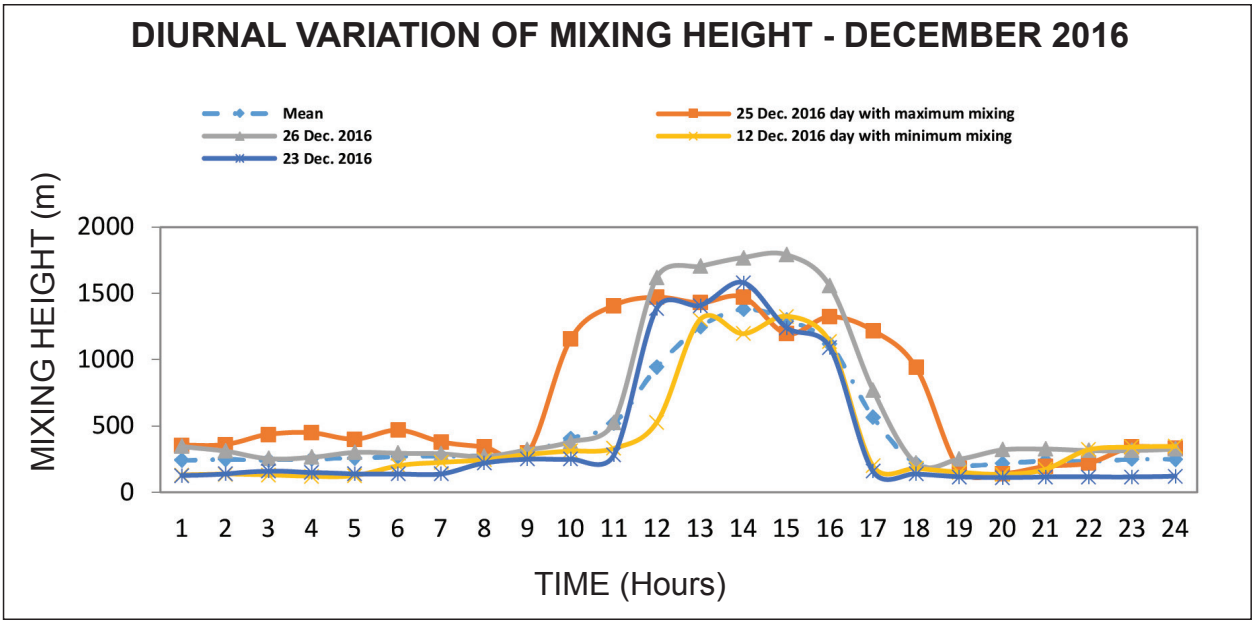
In 2016 the monthly mean mixing height was minimum in December ie. 478metres. In 2016 mean mixing height in the period of low convective activity was minimum in November i.e. 281 meters followed by January i.e. 292 meters.

Mostly occurring period of high convective activity

Month	2014	2015	2016
January	Between 10 am & 12 pm to 5 pm	Between 10 am & 01 pm to 4 pm or 6 pm	11 am or 12 noon to 4 pm or 5 pm
February	Between 9 am & 11 am to 5 pm or 6 pm	11 am or 12 pm to 5 pm or 6 pm	10 am or 11 am to 4 pm or 5 pm
March	9 am or 10 am to 6 pm	10 am or 11 am to 5 pm, 6 pm or 7 pm	10 am to 5 pm or 6 pm
April	9 am or 10 am to 6 pm	9 am or 10 am to 6 pm	9 am to 6 pm
May	8 am or 9 am to 6 pm	9 am or 10 am to 6 pm or 7 pm	8 am or 9 am to 6 pm or 7 pm
June	Between 7 am & 9 am to 6 pm or 7 pm	Between 8 am & 10 am to 6 pm	8 am or 9 am to 6 pm or 7 pm
July	7 am or 8am to 6 pm or 7 pm	9 am or 10 am to 6 pm or 7 pm	9 am or 10 am to 4 pm, 5 pm or 6 pm
August	-	9 am or 10 am to 6 pm or 7 pm	9 am or 10 am to 5 pm or 6 pm
September	8 am or 9 am to 6 pm	9 am to 6 pm	9 am or 10 am to 5 pm or 6 pm
October	Between 8 am & 10 am to 5 pm or 6 pm	9 am or 10 am to 5 pm or 6 pm	9 am or 10 am to 5 pm
November	Between 9am & 11 am to 4pm or 5 pm	10 am or 11 am to 4 pm or 5 pm	Between 10 am and 12 noon to 4 pm or 5 pm
December	11 am to 5 pm	11 am or 12 pm to 4 pm or 5 pm	11 am or 12 noon to 4 pm or 5 pm

In 2014 duration of high convective activity was lowest in January and December. In 2015 duration of high convective activity was lowest in January. Since thermal plumes were observed in SODAR echogram only in 9 days even though for considerable period layers were with more than usual height. In 2016 duration of high convective activity was lowest in January and December

Diurnal variation of mixing height for the month of December 2016 which was lowest in 2016 is shown in following figure.



The meteorological data collected by automatic weather station working at Parivesh Bhawan is given in the table.

Monthly Mean of Meteorological Parameters

Months	Wind Speed (m/s)	Prominent Wind Directions	Temperature (°C)	Relative Humidity (%)	Pressure (hPa)	Solar Radiation (W/m²) 6 AM - 6 PM
January	1.9	W, SE &NW	15.8	70.8	990	124
February	2.4	W, NW & SE	19.8	55.2	988.7	194
March	2.6	W & NW	25.2	49.4	985.2	356
April	2.6	W, SW & NW	32.5	27.1	979.3	524
May	3.1	SE, SW & E	33.7	40.6	975.5	455
June	3.0	S & E	33.4	56.4	973.9	449
July	2.5	SE, E & S	30.1	78.5	973.2	305
August	2.6	E & SE	29.8	77.1	974.6	355
September	2.4	W & SE	30.8	63.6	978.3	370
October	2.1	W & SW	28.9	48.5	982.3	288
November	2.1	W & SW	23.2	46.7	987	179
December	2.0	W, SE & SW	17.9	65.3	988.8	149

Variation of monthly mean mixing height versus wind speed and variation of monthly mean temperature versus relative humidity are shown in figures.

6.11 VEHICULAR EMISSION

In compliance of orders of Hon'ble National Green Tribunal (NGT) in respect of emission measurement of vehicles as well as checking the functioning of Pollution Checking Centres (PCC), authorised by Department of Transport (DoT), on random basis in Delhi. Following are the details of the NGT Court Cases:

S.No.	Case Detail	Order Content	Action taken
1.	OA No.27 of 2016 Dt.29.01.2016 K. Manoharan Vs UOI & Ors (Hearing on 4.4.2016)	Emission survey of Two Stroke engines of 2 Wheelers using oil with petrol	Total 95 nos. of 2 stroke engines were tested during 15.03.2016 to 18.03.2016 and report submitted on 31.03.2016.
2.	OA No.27 of 2016 dt.29.01.2016 (Hearing on 26.02.2016)	Check the emission of two stroke engines of 2 wheelers including CNG buses	Total 40 nos. CNG buses tested and 3 nos. two stroke two wheelers tested and report submitted on 23.02.2016.
3.	OA No.21 of 2014 Vardhman Kaushik Vs UOI & Ors. (Order dt. 06.01.2016)	The Pollution Control Board of the respective States in consultation with the CPCB shall prepare a report and analyze the ambient air quality samples forthwith in the related cities as indicated.	National Ambient Air Quality Index value data compiled for the cities connected with CPCB server and forwarded on 05.02.2016 for submission in Hon'ble NGT.
4.	OA No.561/2015 Cherub Singh vs. UOI & Ors. (Order dt.21.12.2015)	Joint inspection of any 10 petrol pumps in different parts of Delhi and at least 50 two or four wheelers running on petrol & diesel for fuel sampling, to check adulteration with reference to Naphtha and Kerosene	Sampling performed during 07.01.2016 to 13.01.2016 with the officials of Ministry of Petroleum officials.
5.	OA (Order dt. 27.02.2015)	Check the vehicular emission of CNG operated DTC buses	Total 27 number of DTC buses (12 nos. low floor & 15 nos. standard) were checked and report submitted on 02.03.2015
6.	OA 21 of 2014 Vardhman Kaushik vs UOI & Ors. (Order dt. 04.12.2014) Recd. Through Dept of Transport, Delhi 23 (1293) /CAP/ TPT/ PCD/ 2014 / 3117 dt.18.12.2014	Checking of functioning of PUC Centres	Checked the various PUC Centres all over Delhi with the officials of DoT, DPCC, and DoE, Delhi and submitted the report on 20.02.2015

6.12 SPECIAL INDUSTRIAL SOURCE AND AMBIENT MONITORING:

The laboratory services are provided to all divisions to examine the compliance of emission norms. Extensive supports are provided to comply the monitoring (ambient and Source) as and when entrusted by the Hon'ble Supreme Court of India, Hon'ble National Green

Tribunal, Delhi Principle Bench etc. In this effect, some special monitoring is highlighted, as under:

(i) Source emission monitoring in M/s Bharat Oil & Waste Management Kanpur Dehat to comply the Hon'ble NGT directions in association with UPPCB.

(ii) Ambient Air Quality monitoring at three locations in U.P. to comply with the Hon'ble NGT directions.

(iii) Fugitive Emission monitoring in Stone Crusher Units at Saharanpur UP State to comply the Hon'ble NGT directions.

(iv) Ambient Noise Monitoring in Sector-4, Gurgaon, Haryana to comply the direction of Hon'ble NGT

(v) Noise Monitoring at Municipal Solid Waste dumping site & Waste to Energy Plant in Delhi for preparation of guidelines on "Waste processing and disposal facility"

Source emission monitoring

Fugitive emission monitoring

6.13 AMBIENT AIR QUALITY OF DELHI-NCR

Central Pollution Control Board is monitoring the ambient air quality in Delhi on real time basis along with DPCC, SPCBs and IMD. Ambient air quality data of year 2016 from all stations in Delhi and NCR (Gurugram and Faridabad) are compiled station wise and annual average values of monitored parameters are also presented in a Map. The colour code has been assigned to all the stations based on annually calculated Air quality Index values.

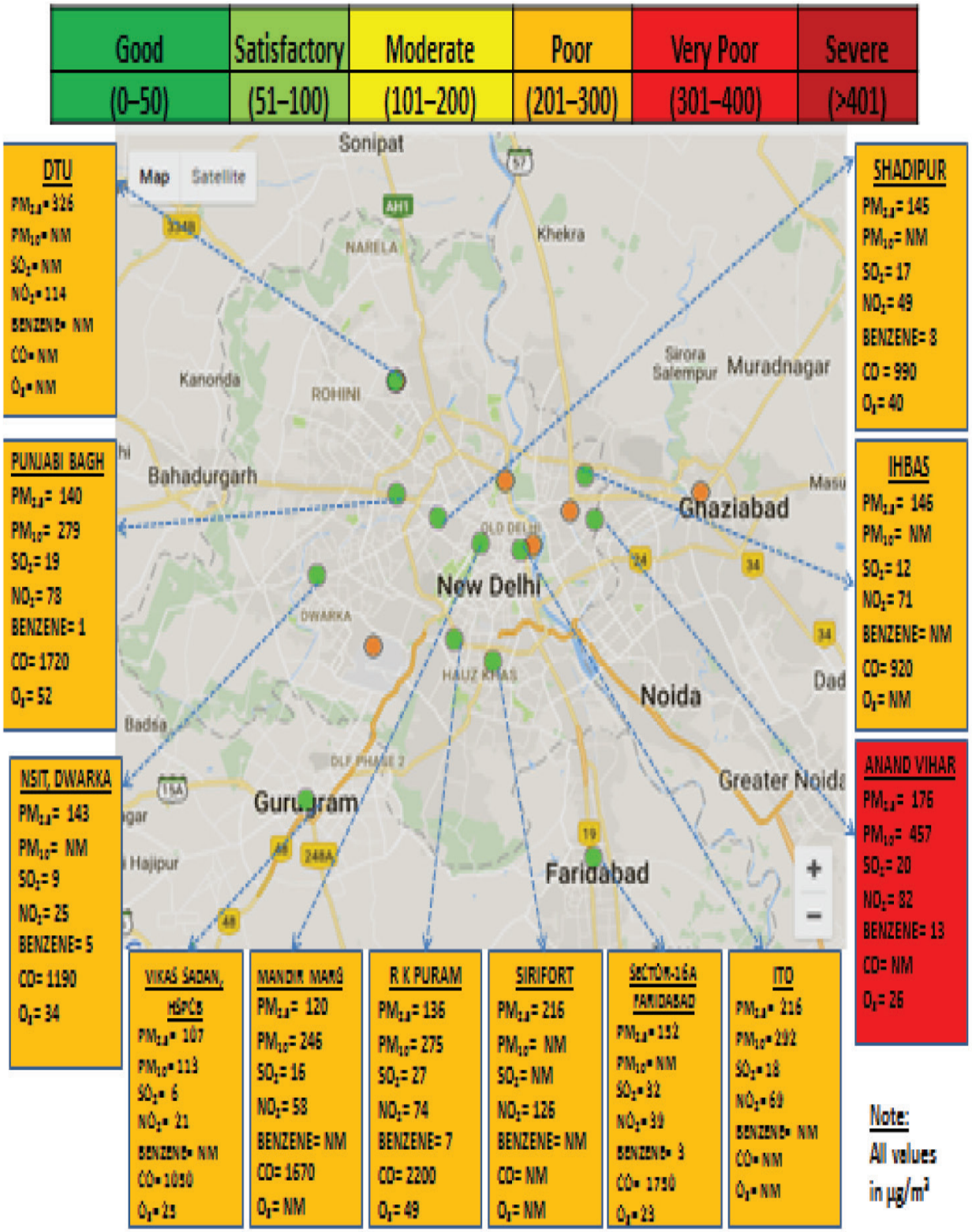


Figure: Location Map of CAAQMS along with Annual mean Concentrations in Delhi-NCR

Monthly average AQI values at CAAQM Stations, Delhi, in 2016

Month	CAAQM Stations						
	DMS	IHBAS	NSIT	Mandir Marg	Anand Vihar	R.K Puram	Punjabi Bagh
January	268	398	331	364	439	399	404
February	354	323	310	253	323	284	298
March	332	*	181	205	263	212	205
April	283	256	261	204	330	266	240
May	262	256	230	155	331	222	212
June	240	251	236	122	251	185	180
July	185	157	214	81	183	102	109
August	94	106	106	*	168	83	118
September	102	138	138	*	288	139	129
October	243	245	274	211	417	285	257
November	357	348	350	360	469	378	382
December	352	330	323	359	430	348	374

**Insufficient data to calculate AQI*

Good (0–50)	Satisfactory (51–100)	Moderate (101–200)	Poor (201–300)	Very Poor (301–400)	Severe (>401)

Possible Health Impacts

Good	Minimal impact
Satisfactory	Minor breathing discomfort to sensitive people
Moderate	Breathing discomfort to the people with lungs, asthma and heart diseases
Poor	Breathing discomfort to most people on prolonged exposure
Very Poor	Respiratory illness on prolonged exposure
Severe	Affects healthy people and seriously impacts those with existing diseases

OBSERVATIONS:

Based on tabulated data, following can be inferred:

A) The annual average AQI values at most of the Delhi stations during November to January fall in **Very Poor** category except Anand Vihar, which falls in **Very Poor to Severe** Category.

B) The bad air quality **(Very Poor)** phase extends to February even at more than half of the stations, however, It improves with changing weather condition and during monsoon period (July to September), AQI of all the stations falls in **Satisfactory** and **Moderate** category as shown in . Hence, it may be concluded that Air quality is basically governed by weather and meteorological condition in a land lock northern India particularly in NCR.

6.14 AMBIENT AIR & NOISE MONITORING DURING DEEPAWALI FESTIVAL 2016

The Noise and air hazards are a cause of concern due to busting of fire crackers during Deepawali. It is, therefore, necessary to conduct ambient noise and air quality monitoring during this festival to understand the level of pollution and correlate with the effectiveness of different abatement programs. Like every year, CPCB has coordinated the monitoring

of ambient noise levels at more than 321 locations, ambient air quality at about 203 locations across the country this year during Deepawali festival. Meteorological data was also collected during the monitoring programme.

This Report is a compilation of ambient noise (321 locations) and ambient air quality (203) locations) data covering 23 states/UTs in the country. The decrease in Noise level only at 74 locations was recorded in 2016 compared to 2015 Deepawali day. SO_2, NO_2 and PM_{10} levels were reported less at 27, 37, and 40 locations respectively as compared to last year Deepawali.

6.14.1 Manual Noise Monitoring:

With respect to noise levels on the festival day, there was decrease in noise levels at 74 locations as compared to 2015. The details of these locations are described in following Table:

Stations Recorded Decrease in Noise level in 2016 at different locations

Name of the State	City	Locations	Noise Deepawali Day	
			2015	2016
Andaman & Nicobar	Port Blair	Dairy Farm (C)	66	63
Andhra Pradesh	Kakinada	JNTU Campus (S)	75	74
		Ramanayyapeta (R)	87	81
	Vishakapatnam	Pandu Rangapuram (R)	81	80
		Kurpam Market (C)	95	89
		RTC Complex (C)	79	32
	Vijayawada	Autonagar (I)	84	74
		Benz Circle (C)	87	76
	Guntur	Laxminagar (R)	84	63
		Brundavan Gardens (S)	74	62
		Brodipet (C)	84	80
	Nellore	Near Narthaki Theatre (C)	82	80
		Chandramouli Nagar(R)	80	74
	Kurnool	Old Town (R)	78	75
		Krishna Nagar (C)	81	76
		Montessori School (R)	77	67
	Eluru	RR Pet (C)	78	73
Delhi	Delhi	Kamla Nagar (R)	86	74
		Janakpuri (R)	79	75
Himachal Pradesh	Dharmshala	Dharmshala (R)	68	67
	Una	Govt. Hospital (S)	61	60
	Rampur	Recongpeo (C)	83	75
		Bhushar (C)	83	82
	Baddi	Phase-I(R)	71	61

Stations Recorded Decrease in Noise level in 2016 at different locations

Name of the State	City	Locations	Noise Deepawali Day	
			2015	2016
Karnataka	Bangaluru	Basaweshwar Nagar (R)	82	78
		R T Nagar (R)	92	79
Madhya Pradesh	Bhopal	North T.T. Nagar (C)	79	70
Meghalaya	Shillong	Upper Mawprem (C)	88	82
Nagaland	Dimapur	Bank colony (R)	71	70
		District Hospital (S)	63	61
Odisha	Angul	Hakimpada (I)	67	66
	Paradeep	PPT colony (R)	78	75
		Badpadia Market (C)	90	71
	Rourkela	Sec- 4 (R)	64	63
		Bisra Chowk (C)	83	74
		IGH, Steel Township(S)	58	46
		RSPL Sail (I)	82	52
	Sambalpur	Ainthapalli (R)	100	61
		Goal Bazar Chowk (C)	82	71
Tamil Nadu	Chennai	Besant Nagar (R)	87	73
	Vellore	Gandhi Nagar (R)	85	78
		Thirunagar (C)	88	73
	Tripur	Rayapuram- (R)	71	70
	Trichy	Thillai Nagar (R)	90	88
	Madurai	Thirunagar (R)	84	80
		Madurai Corporation South (M)	73	71
	Tirunelveli	Samathanapuram (C)	83	78
		Pettai Nearer to nursing home (S)	85	75
Telangana	Hyderabad	Abids (C)	88	82
		JNTU - Kukatpally (C)	74	73
		Jubilee Hills (R)	74	72
		Pragathi Nagar (R)	81	70
		Tarnaka (R)	75	73
		Zoopark (S)	67	62

Stations Recorded Decrease in Noise level in 2016 at different locations

Name of the State	City	Locations	Noise Deepawali Day	
			2015	2016
Tripura	Dharmangar	SDM and judges quarter (R)	74	72
		Hospital Area (S)	89	55
		D.N. Vidyamandir (S)	76	72
	Ambassa	BhawaliyaBasti (R)	55	51
		Dalubari Gate (S)	63	57
Tripura	Agartala	Ashram chowmuhani (C)	87	75
		Capital complex (R)	59	56
		Circuit House (R)	76	54
		Indranagar (R)	76	71
		G.B Hospital (S)	68	57
		M.B.B. Collage (S)	64	53
		Battala (C)	78	71
		Astabal(C)	75	65
		Duraga Chowmuhani (C)	81	67
		Netaji Chowmuhani (C)	88	78
		A. D. Nagar (R)	74	65
		I.G.M Hospital (S)	66	61
	Udaipur	Hospital Area (S)	58	53
Uttar Pradesh	Agra	Kamla Nagar(R)	94	77
	Lucknow	Vikas Khand, Gomti Nagar(R)	78	71
Total number of stations recorded decrease in noise level				**74**
All data are in dB (A) Leq				

6.14.2 AMBIENT AIR MONITORING

The most signification observation during Deepawali monitoring in 2016 was decrease in Ambient Air Quality concentration levels as compared to last year Deepawali day with respect to SO_2 NO_2, PM_{10}, and at 27, 37 and 40 locations, respectively. The cities recorded decrease in above mentioned pollutants are as under:

Cities recorded decrease in Pollutants levels during Deepawali, 2016

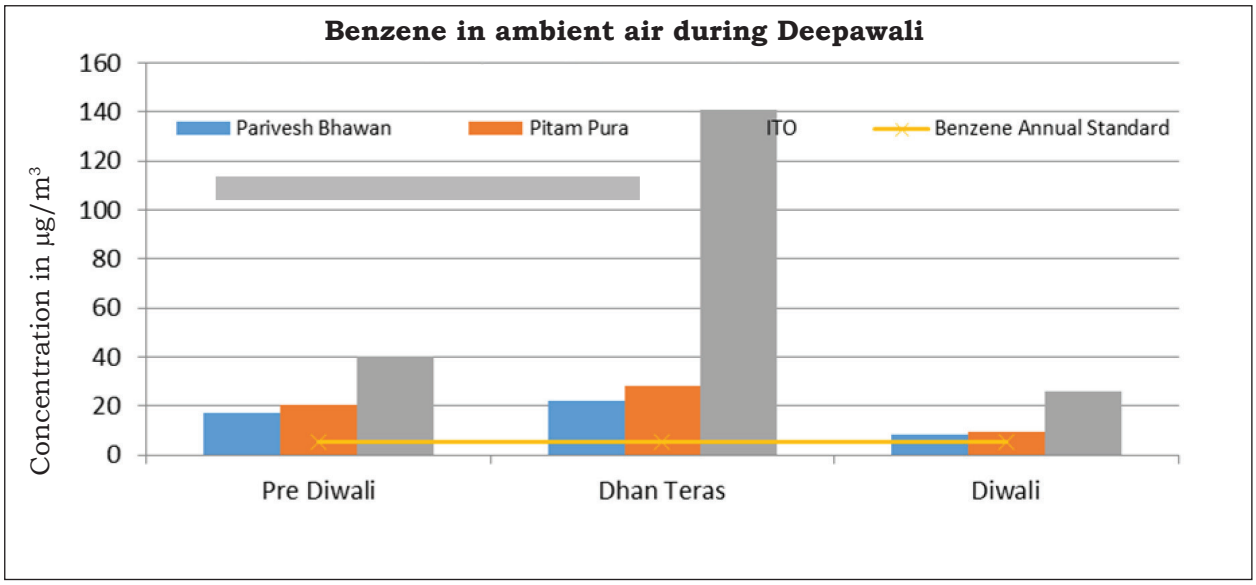
SO_2	NO_2	PM_{10}
Andhra Pradesh		
-	Krishna Nagar	Krishna Nagar
-	Old Town	Old Town
-	-	Montessori School
Police Barracks	Police Barracks	Police Barracks
ESI	-	-
Gnanapuram	Gnanapuram	Gnanapuram
Pedagantyada		Ramy
Ramanayyapeta	Ramanayyapeta	Ramanayyapeta
Near BhanuGudi Jn.	Near BhanuGudi Jn.	Near BhanuGudi Jn.

SO_2	NO_2	PM_{10}
ASRAM Diagnostics	ASRAM Diagnostics	-
		Bobbli Growth Center
Pydibheemavaram	Pydibheemavaram	-
	Autonagar	Autonagar
Benz Circle	Benz Circle	-
Chandramouli Nagar	Chandramouli Nagar	-
Saibab Road	Saibab Road	-
Arunachal Pradesh		
-	-	Itanagar
-	-	Naharlagun
Delhi		
ITO	-	-
Pitampura	-	-
Gujarat		
		B M S University
Harinagar	Harinagar	
Himachal Pradesh		
-	Damtal	Damtal
-	Manali	-
-	Sunder Nagar	-
-	Kala Amb	Una
Karnataka		
-	Basaweshwar Nagar	-
-	R T Nagar	-

Cities recorded decrease in Pollutants levels during Deepawali, 2016

SO_2	NO_2	PM_{10}
Madhya Pradesh		
-		North T.T. Nagar
-	Sahajanabad	Sahajanabad
Nagaland		
		Dimapur
Tamil Nadu		
-	Chennai	-
-	Cuddalore	Cuddalore
-	-	Salem
Trippur	Trippur	Trippur
Coimbatore	Coimbatore	Coimbatore
-	-	Trichy
Madurai	-	Madurai
Tirunelveli	Tirunelveli	-
Telengana		
-	-	Abids
-	-	Paradise

SO_2	NO_2	PM_{10}
-	Charminar	Charminar
-	-	Balanagar
-	Uppal	Uppal
-	Jubile Hills	Jubile Hills
-	-	Jeedimetla
-	-	JNTU-Kukatpally
Tripura		
Dharmanagar	Dharmanagar	Ambassa
Ambassa	Ambassa	Agartala
Agartala	Agartala	-
Udaipur	Udaipur	-
Uttar Pradesh		
		Faizabad
West Bengal		
Behala	Behala	Behala
Tollygunge	Tollygunge	Tollygunge
Salt Lake	Salt Lake	Salt Lake
Shyambazar	Shyambazar	Shyambazar
Kasba	Kasba	Kasba
27 locations	**37 locations**	**40 locations**



6.14.3 Benzene in ambient air during Deepawali

Central Pollution Control Board has notified revised NAAQS in 2009 and Benzene is included as one of the 12 notified parameters. The annual prescribed standard for Benzene is 05 µg/m^3. There is no short-term standard for benzene. Unfortunately, this neuro-toxic organic pollutant is a constituent of gasoline and urban areas are facing the threat of vehicular pollution. Tremendous increase in vehicle number and consumption (Filling station) of gasoline in a tropico-temerate climate has aggravated the problem. India is having the most stringent standard for Benzene.

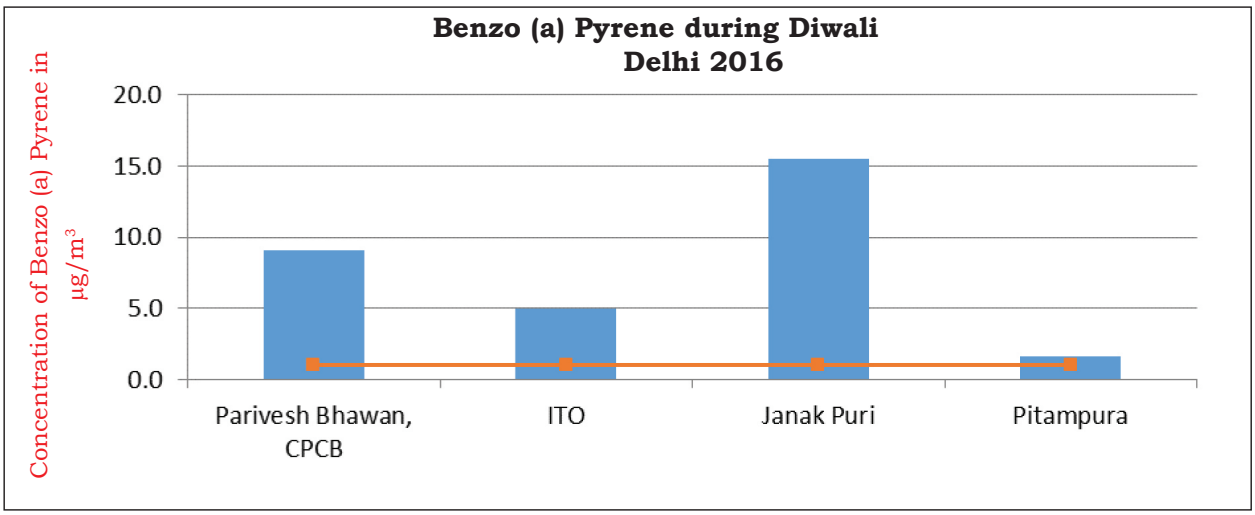
Although Benzene can be monitored by both manual and real time method, use of manual method for Benzene is manpower intensive and an expensive proposition to satisfy the requirement of NAAQS (104 days 24 hourly data). Real time analyzers in CAAQM stations are more suitable for benzene monitoring under NAMP.

In 2016, CPCB undertook a study to measure Benzene during Deepawali. The Pre-Deepawali monitoring was conducted on 24th October (a week before Deepawali) and similar monitoring at three stations was conducted on DhanTeras (28th October) and Deepawali day (30th October). Three selected stations are Parivesh Bhawan, ITO and Pitampura.

It was observed that during all three days the Benzene concentrations at selected stations has violated the annual standard. It is also pertinent to mention that the 24 hourly values reported are not justified to be compared with annual standard, however; it may be noted from the health perspective that during these festive days people get exposed to critically high benzene concentrations. The data shows that Dhan Teras day is the worst one as traffic movement gets maximum sluggishness and jam in all routes in Delhi. As there is sharp increase in number of vehicle plying and duration of idling increases highly, causing more emission of Benzene. Among the three stations ITO got worst affected on Dhan Teras day. It was also evident that Deepawail day was comparatively better in case of Benzene and it may be attributed that vehicular emission is more responsible and bursting of crackers may not contribute to Benzene emission.

6.14.4 Benzo (a) Pyrene on Deepawali day

This year the particulate phase (PM_{10}) of Benzo (a) Pyrene was monitored on Diwali day at four locations in Delhi. The reported values suggest no increase in PAH values on Diwali day if compared with the normal values reported during the month of October - November, It was also evident from the detail characterisation of PM_{10} and $PM_{2.5}$ that the carbonaceous contribution decreases sharply on Diwali day which suggest that sources of organic pollutants are decreased. This may be attributed to the fact that bursting crackers does not resemble a combustion process it simply instantaneously oxidise some metals and other constituent and mostly fly in air as it was in larger fraction.



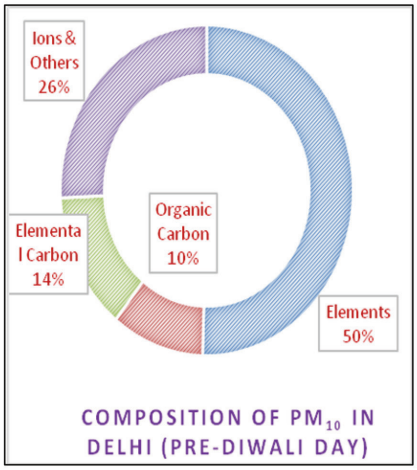
6.14.5 Characterisation of Particulate matter during Deepawali, 2016

The air laboratory has carried out monitoring to find out the various species contributing to the particulate matter. The speciation sampling is done at Parivesh Bhawan ambient air quality

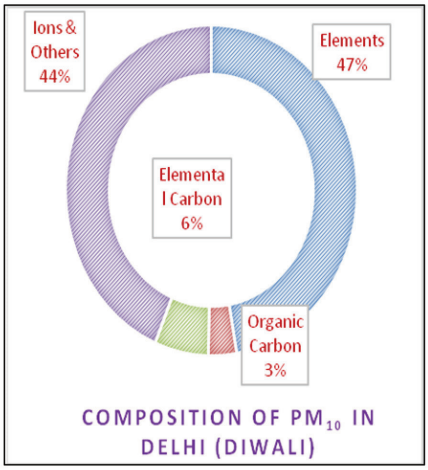
monitoring station in Delhi. The characterization of $PM_{2.5}$ and PM_{10} is done employing various analytical techniques. The Elemental Carbon and Organic Carbon, Elements (25 in Number) and Inorganic Ions were measured in the collected samples of PM_{10} and $PM_{2.5}$. On pre-diwali day PM_{10} and $PM_{2.5}$ concentrations were 245 μg/m³ and 90 μg/m³ respectively; whereas on Diwali day PM_{10} and $PM_{2.5}$ concentrations were reported 2158 μg/m³ and 1291 μg/m³ respectively.

Element	Purpose of various elements used in Fireworks	Percentile contribution of individual element in Total element	
		PM_{10}	$PM_{2.5}$
Barium	Create green colours in fireworks	16.7	13.4
Calcium	Calcium salts produce orange fireworks	0.61	0.11
Chlorine	An important component of many oxidizers	5.20	5.74
Copper	Produces blue-green colours and its halides are used to make shades of blue	0.15	0.13
Iron	Produce sparks, heat of the metal determines the colour of the sparks	1.14	0.07
Potassium	Its content can impart a violet-pink colour	35.6	38.8
Sulphur	It is propellant and fuel	35.6	38.8
Strontium	Its salts impart a red colour.	0.81	0.58
Titanium	It is burned to produce silver sparks	0.23	0.29
Zinc	Create smoke effects	0.91	0.81
Antimony	Create firework glitter effects.	0.04	0.02

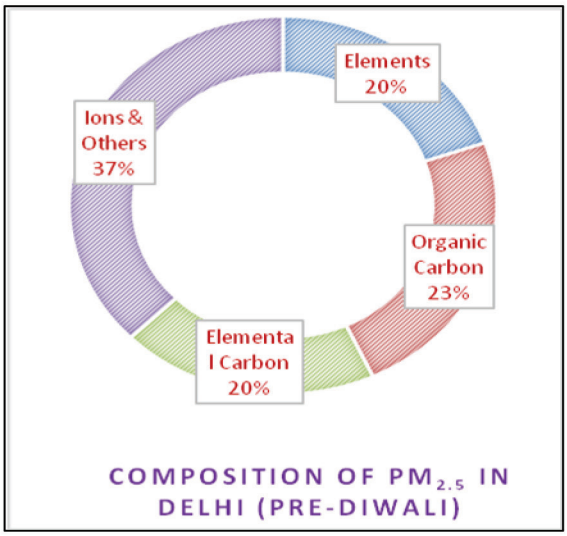
The analysis of above table shows that the particulate matter collected on Diwali day have high concentration of Potassium and Sulphur (70-80% of total element), which forms the bulk ingredient of the firecrackers. Potassium compounds help to oxidize firework mixtures. Potassium nitrate, potassium chlorate, and potassium perchlorate are all important oxidizers. Sulphur is a component of black powder and work as a propellant/fuel in fire crackers. Several of the metal salts that produce colours contain chlorine. Barium is found in substantial concentration, it produces colour and also help stabilize other volatile elements. Calcium is used to deepen firework colours. Strontium compounds are also important for stabilizing fireworks mixtures besides imparting particular colour to crackers.

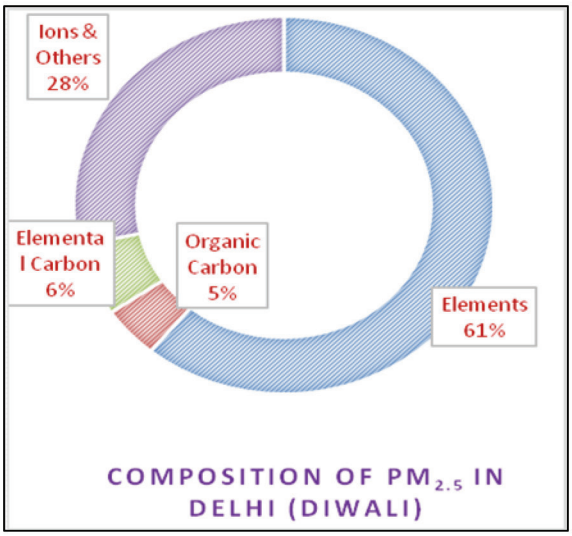


COMPOSITION OF PM_{10} IN DELHI (PRE-DIWALI DAY)



COMPOSITION OF PM_{10} IN DELHI (DIWALI)



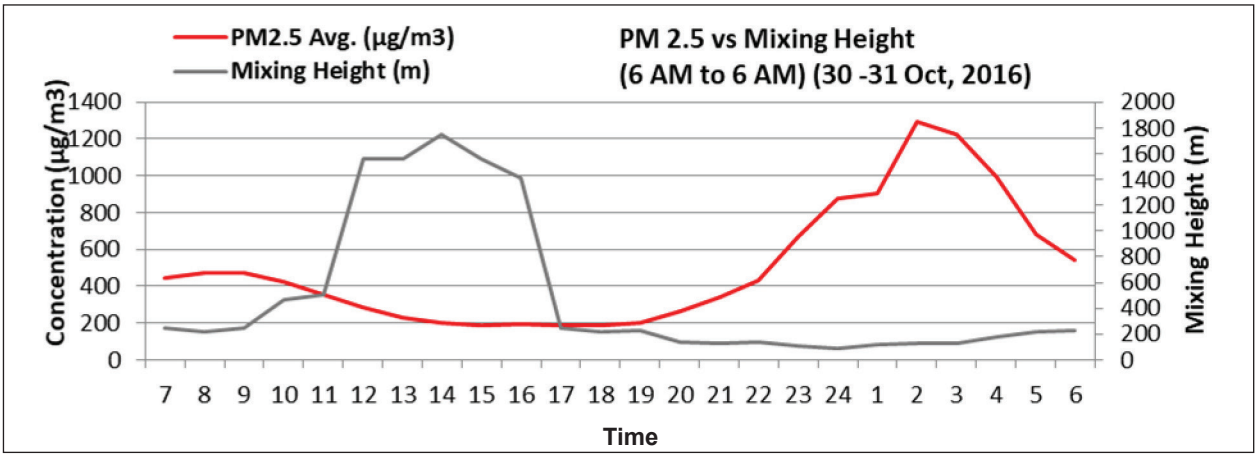


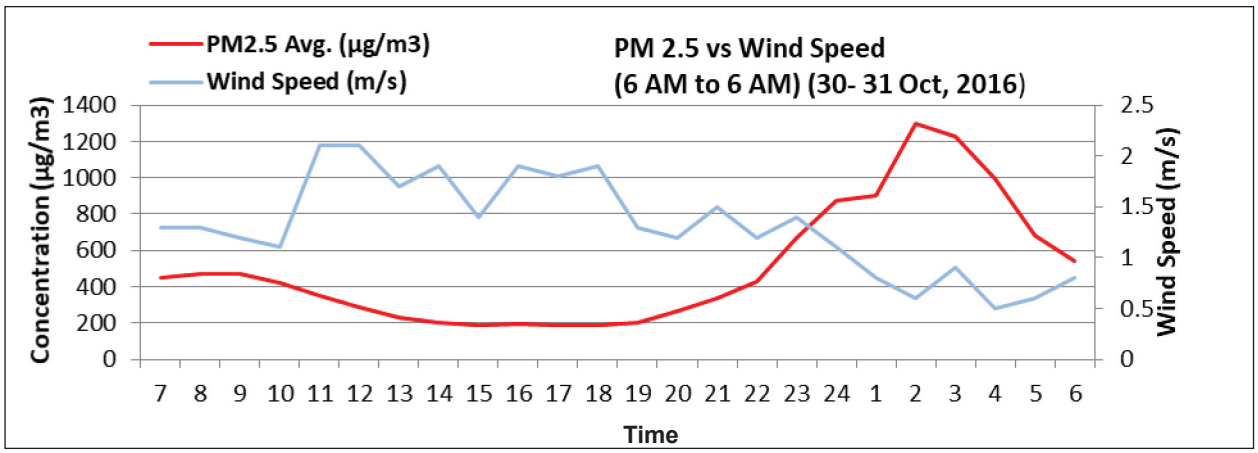
The pie diagrams of composition of particulate matter clearly reflects that increase in the concentration of PM_{10}& $PM_{2.5}$ can be attributed to the bursting of fire cracker around the air quality monitoring station. The share of elemental and organic carbon in the particulate matter is 43% in $PM_{2.5}$ and 24% in PM_{10} observed on Pre-Diwail day are like normal days; this share has been reduced to 11% & 9% on Diwali day. The major portion of fine particulate matter is the elements used in fireworks and inorganic ions which were produced during the combustion of different types of cracker.

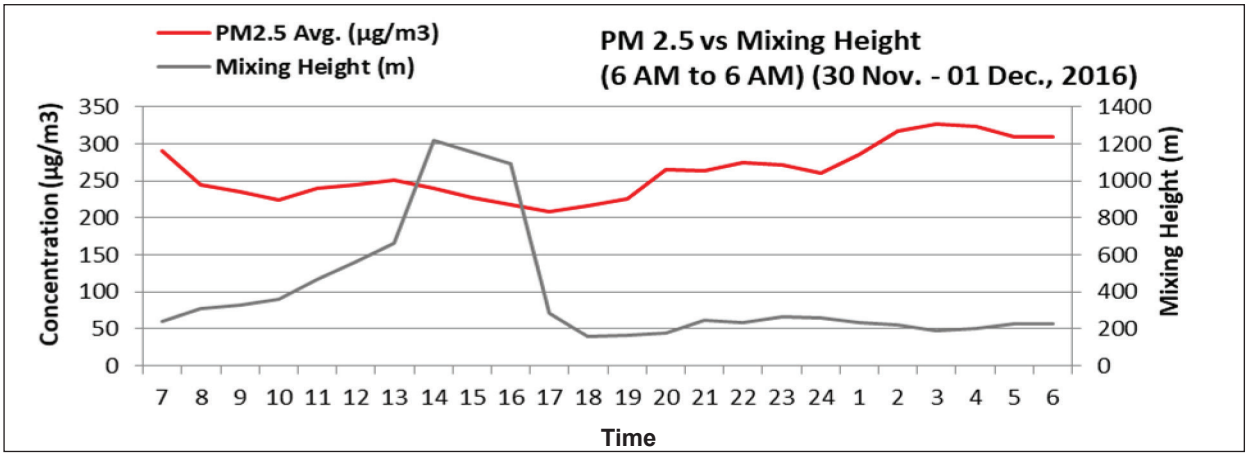
Hence, it may be concluded that dust being added in Diwali day differs in characteristics in terms of elemental composition. Lowered Carbon values may be attributed to the fact that bursting crackers does not resemble a combustion process it simply instantaneously oxidise some metals and other constituent and mostly fly in air as it was in larger fraction.

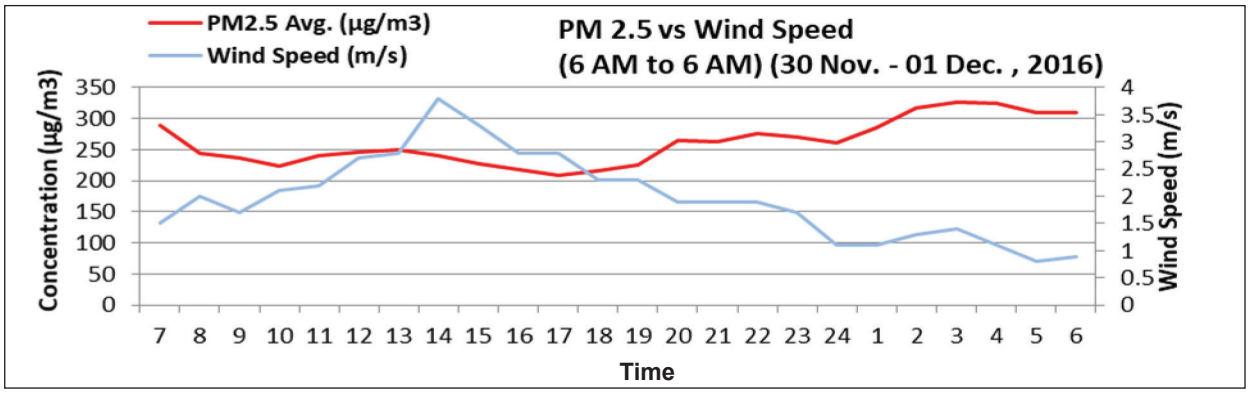
6.14.6 $PM_{2.5}$ concentration with mixing height and wind speed:

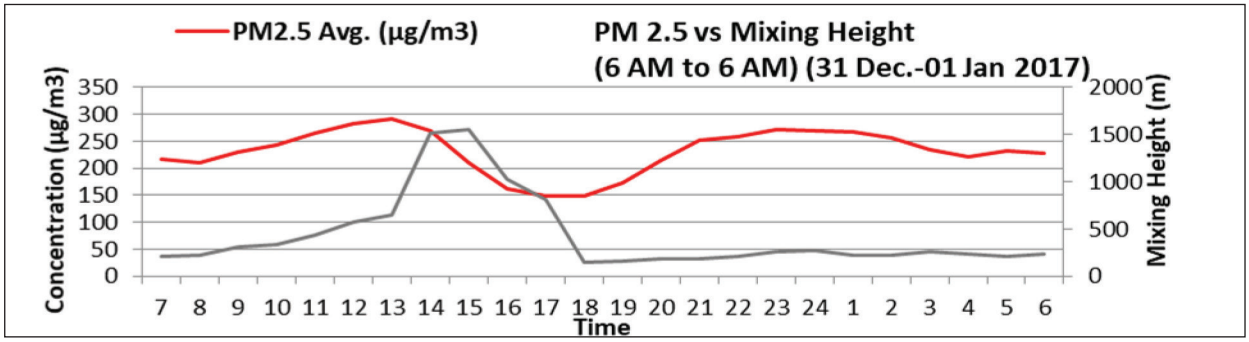
Variation of $PM_{2.5}$ concentration with mixing height and wind speed in Delhi are shown in following figures. On 30th October 2016, Deepawali day it was found that $PM_{2.5}$ concentration increased in the night due to the crackers and also due to atmospheric condition unfavourable for dispersion of pollutants such as low mixing height and wind speed. Other figures shows the variation of $PM_{2.5}$ concentration with mixing height and wind speed in later dates.

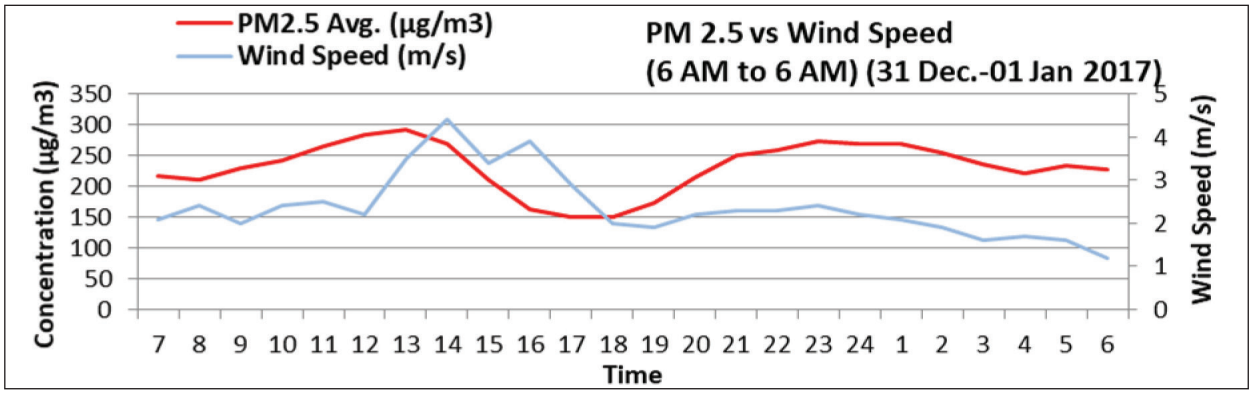


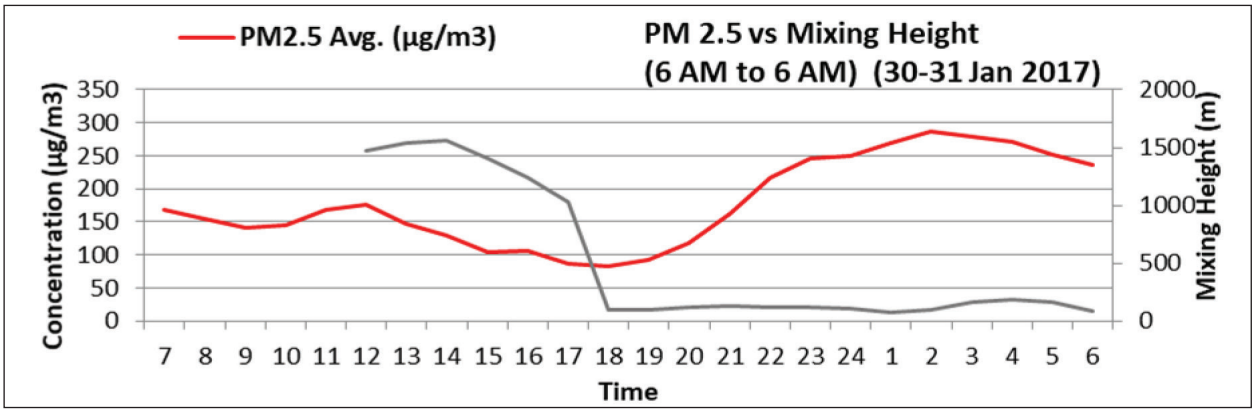

PM2.5 Avg. (µg/m3)
Wind Speed (m/s)
PM 2.5 vs Wind Speed
(6 AM to 6 AM) (30- 31 Oct, 2016)
Concentration (µg/m3)
Wind Speed (m/s)
Time

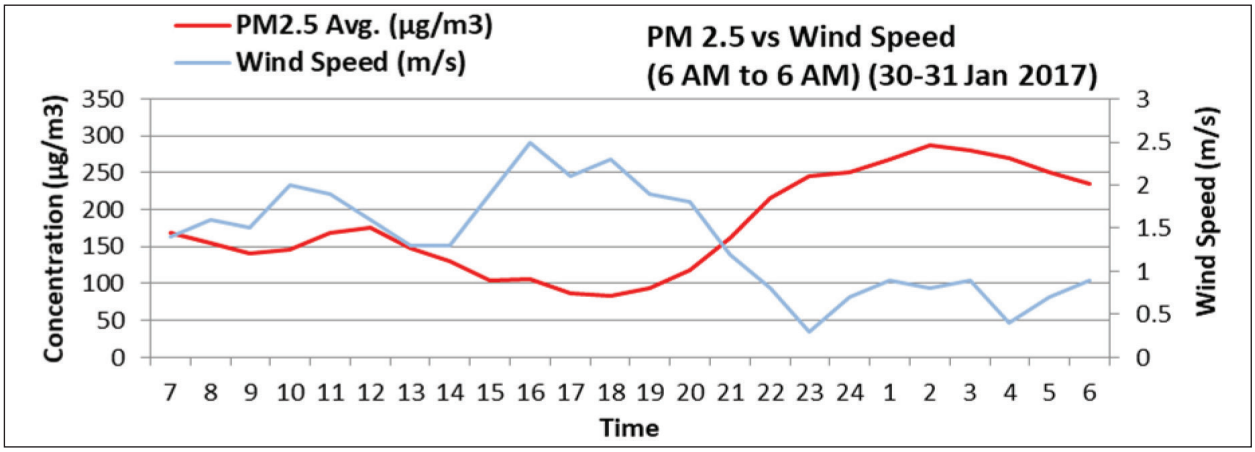

PM2.5 Avg. (µg/m3)
Mixing Height (m)
PM 2.5 vs Mixing Height
(6 AM to 6 AM) (30 Nov. - 01 Dec., 2016)
Concentration (µg/m3)
Mixing Height (m)
Time

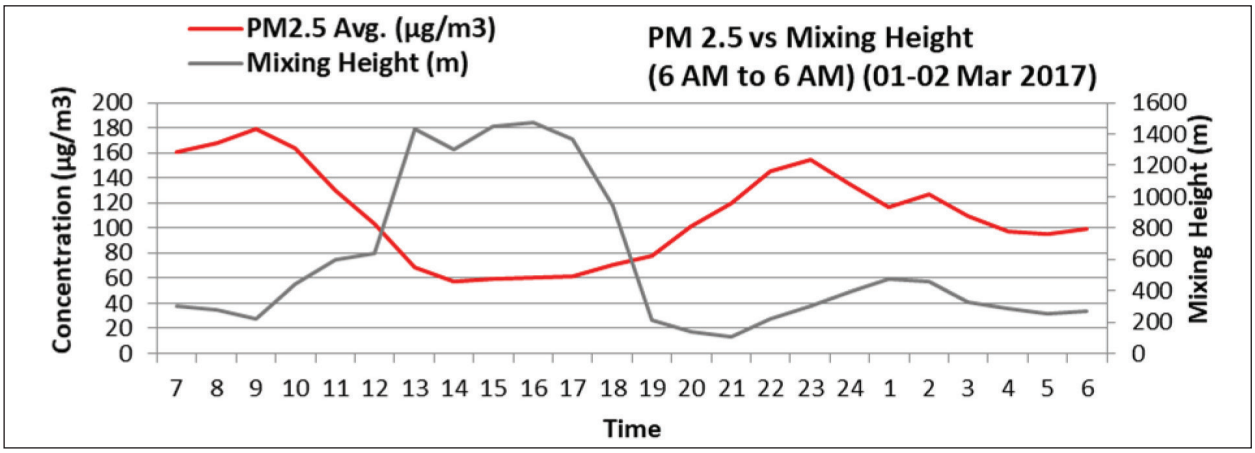

PM2.5 Avg. (µg/m3)
Wind Speed (m/s)
PM 2.5 vs Wind Speed
(6 AM to 6 AM) (30 Nov. - 01 Dec. , 2016)
Concentration (µg/m3)
Wind Speed (m/s)
Time

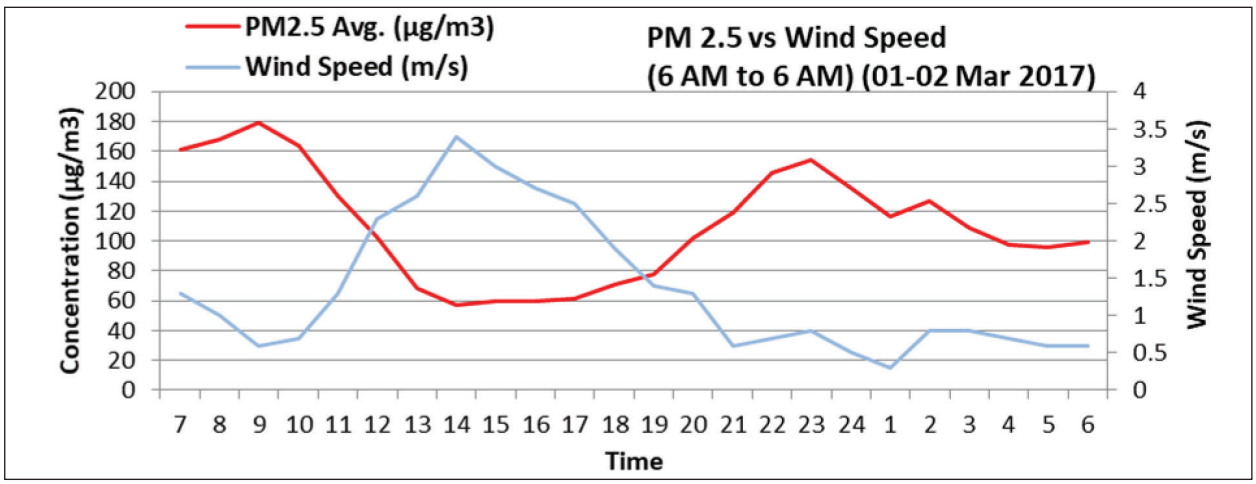

PM2.5 Avg. (µg/m3)
PM 2.5 vs Mixing Height
(6 AM to 6 AM) (31 Dec.-01 Jan 2017)
Concentration (µg/m3)
Mixing Height (m)
Time


PM2.5 Avg. (µg/m3)
Wind Speed (m/s)
PM 2.5 vs Wind Speed
(6 AM to 6 AM) (31 Dec.-01 Jan 2017)
Concentration (µg/m3)
Wind Speed (m/s)
Time


PM2.5 Avg. (µg/m3)
PM 2.5 vs Mixing Height
(6 AM to 6 AM) (30-31 Jan 2017)
Concentration (µg/m3)
Mixing Height (m)
Time


PM2.5 Avg. (µg/m3)
Wind Speed (m/s)
PM 2.5 vs Wind Speed
(6 AM to 6 AM) (30-31 Jan 2017)
Concentration (µg/m3)
Wind Speed (m/s)
Time


PM2.5 Avg. (µg/m3)
Mixing Height (m)
PM 2.5 vs Mixing Height
(6 AM to 6 AM) (01-02 Mar 2017)
Concentration (µg/m3)
Mixing Height (m)
Time



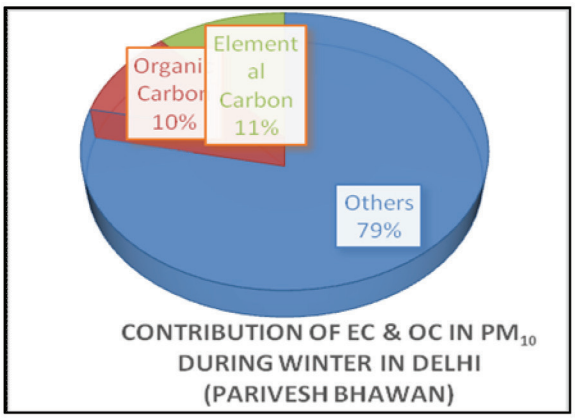
6.15 CHARACTERIZATION OF PM_{10}& $PM_{2.5}$ DURING PEAK WINTERS IN DELHI

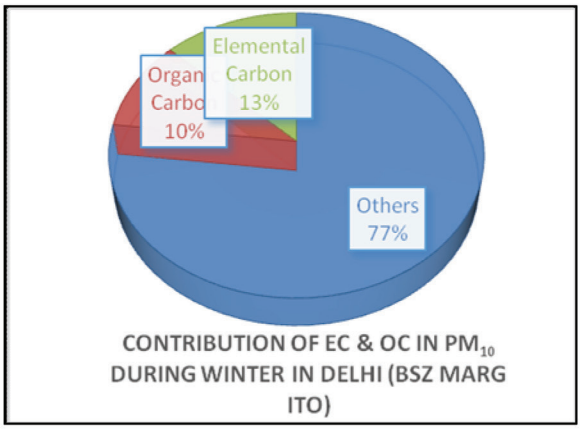
The high particulate concentration in ambient air is a serious issue in urban areas in particular. Physical as well as chemical characteristics of particulate matter in ambient air are directly related with haze formation having a direct impact on health, crop yield and aesthetic air quality.

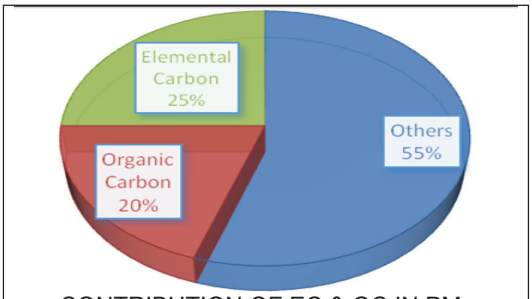
The CPCB Air Laboratory had carried out special investigation for characterization of PM_{10} and $PM_{2.5}$ during peak winters in Delhi. The study is taken up at two locations Bahadur Shah Zafar Marg ITO intersection and Parivesh Bhawan East Arjun Nagar in Delhi. The ITO intersection is a kerbside air quality monitoring stations and one of the busiest traffic intersection of Delhi. Parivesh Bhawan location is characterised by residential cum offices/institutional activities around the monitoring location.

Speciation monitoring for $PM_{2.5}$& PM_{10} is conducted by employing 4-channel Partisol 2300 samplers using specific filter media for further analysis of samples by ED-XRF, Thermal Optical Carbon Analyser and Ion Chromatographs. Samples were collected for 24 hour covering different days of the week including holidays.

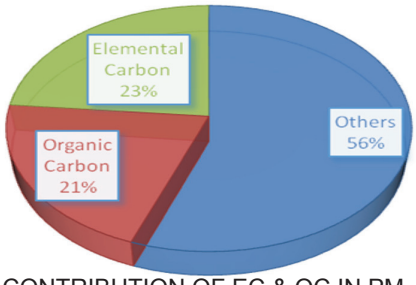
Two classes of carbon to be measured in ambient aerosol samples collected on quartz-fiber filters: (1) organic, volatilized, or non-light absorbing carbon and (2) elemental or light-absorbing carbon. Filter transmission analysis is often performed to estimate particle light absorption, which is proportional to the level of elemental carbon in the atmosphere.







CONTRIBUTION OF EC & OC IN $PM_{2.5}$ DURINIG WINTER IN DELHI (BSZ MARG ITO)



CONTRIBUTION OF EC & OC IN $PM_{2.5}$ DURINIG WINTER IN DELHI (PARIVESH BHAWAN)

The observed values of elemental carbon and organic carbon in the particulate matter shows that contribution in PM10 ranges from 21 to 23 % at both locations. Whereas contribution in $PM_{2.5}$ ranges 44-45%. Comparatively the carbon contribution in particulate matter is almost equal at both the locations.

INORGANIC IONS IN PM_{10} OF DELHI

Location/Month	PM_{10}	Cl^-	NO_2^-	NO_3^-	SO_4^{2-}
Parivesh Bhawan (December & January)	284	1.21	BDL	21.1	14.2
	361	1.08	0.69	27	23
	484	15.08	0.19	55.4	62.5
	381	19.44	0.11	20.9	29.1
	177	3.84	0.15	16.6	35.5
	237	17.75	BDL	21	31.1
ITO, BSZ Marg (December & January)	221	9.61	BDL	14.7	13.2
	344	22.33	0.15	8.7	24.6
	467	12.66	BDL	53.7	45.6
	245	7.3	BDL	15.5	20.3
BDL: Below Detection Limit All values of concentrations are in µg/m³ of air					

The water-soluble portion of suspended particles associates itself with liquid water in the atmosphere when relative humidity increases, thereby changing the light scattering properties of these particles. Different emissions sources may also be distinguished by their soluble and non-soluble fractions. Polyatomic ions such as sulfate, nitrate, ammonium and phosphate can be quantified by Ion chromatography.

The inorganic Ions were determined using Ion Chromatography for PM_{10}& $PM_{2.5}$ of samples collected on 47 mm Teflon filters.

The concentration values observed after the investigation reveals that the Sulphate is the major anion present in PM_{10} as well as $PM_{2.5}$. The Nitrate is also found in substantial concentration in both fractions of particulate matter.

The high sulphate concentration indicates towards the conversion of sulphur dioxide or other sulphur compounds through dry deposition or other factors influencing dispersal of pollutants.

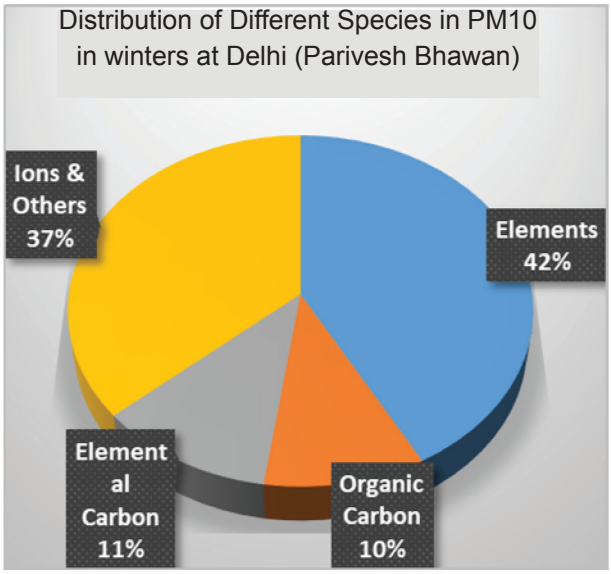
INORGANIC IONS IN PM $_{2.5}$ OF DELHI

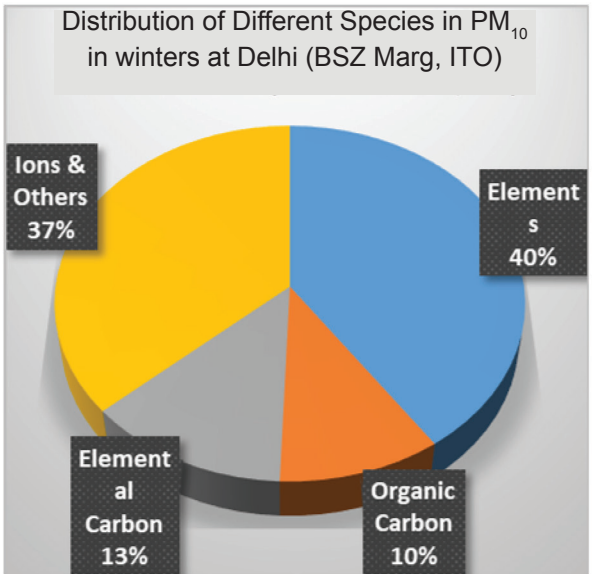
Location/Month	$PM_{2.5}$	Cl^-	NO_2^-	NO_3^-	SO_4^{2-}
Parivesh Bhawan (December & January)	116	10.6	0.06	12.4	8.7
	153	12.7	0.15	18.4	14.9
	337	12.4	0.36	46.5	48.5
	173	8.8	2.43	11.5	18.8
	93	2.3	0.09	8.1	17.2
	141	13.5	BDL	16.1	20.2
ITO, BSZ Marg (December & January)	115	6.5	BDL	10.2	10.3
	166	16.5	BDL	16.4	15.5
	236	8.0	BDL	34.5	28
	127	4.2	BDL	10	13.9
BDL: Below Detection Limit All values of concentrations are in µg/m³ of air					

Chloride is also present in both fraction of particulate matter. Further detail investigation is required to find out the contributing sources of nitrate, sulphate and chloride present in ambient air.

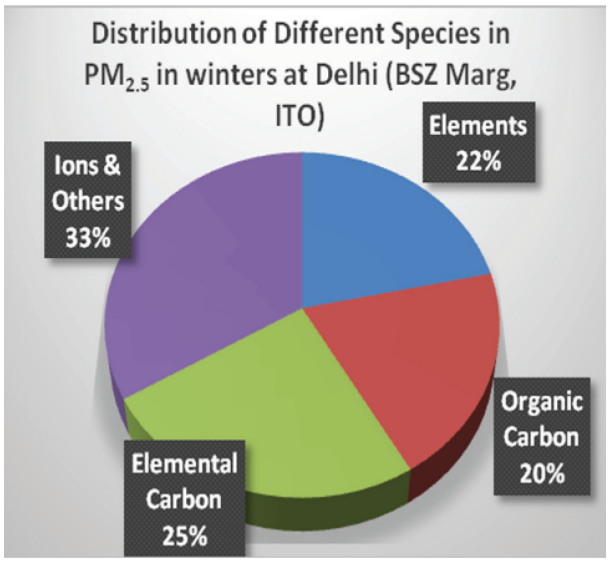
The most common interest in elemental composition derives from concerns about health effects and the utility of these elements to trace the sources of suspended particles. Elemental Analysis of Air Particulate by Energy Dispersive X-ray Fluorescence (EDXRF) applies to the analysis of ambient air particulate collected on 47mm diameter Teflon Filters.

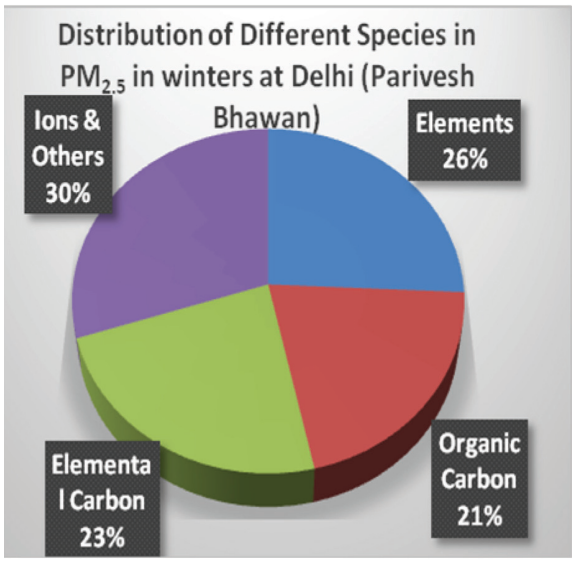
The measured concentrations of different elements found abundant in the particulate matter is evaluated and presented as percentage of PM_{10} and $PM_{2.5}$ in ambient air. In PM_{10} the highest contribution of silicon is observed out of total 23 measured elements. The percentage of silicon varies from 30% to 52% in PM_{10} which indicates natural contribution in this fraction.





The percentage of silicon varies from 20% to 30% in $PM_{2.5}$ which indicates substantial dust suspension contribution in fine fraction of particulate matter. The highest contributing species in $PM_{2.5}$ is chloride followed by sulphur and potassium in the 23 elements which were measured.





6.16 COLLABORATIVE PT EXERCISE WITH PTB GERMANY AND NPL

Central Pollution Control Board (CPCB) Delhi, has jointly conduct the Proficiency Testing (PT) exercise for Carbon Monoxide (CO) by Real Time Analyzers with NPL team during 7th-9th November, 2016 followed by workshop. The Participants from State Pollution Control Boards (SPCBs)/ Pollution Control Committee (PCC), those are already having Continuous Ambient Air Quality Monitoring Stations installed, participated in this exercise are listed below:

1) West Bengal state Pollution Control Board
2) Gujarat state Pollution Control Board
3) Haryana state Pollution Control Board
4) Maharashtra state Pollution Control Board
5) Tamil Nadu state Pollution Control Board
6) Delhi Pollution Control Committee
7) CPCB Regional Directorate- Bengaluru
8) CPCB Regional Directorate- Lucknow
9) CSIR-NPL, New Delhi
10) CPCB, H.O. (Air Laboratory)

S. NO.	PARTICIPANTS	MAKE OF THE ANALYSERS	MODEL NUMBER OF ANALYSERS	CITY LOCATION
1.	CPCB, DELHI	ENVIRONNEMENT SA	CO12M, Sr.No.487	DMS, SHADIPUR
2.	CPCB, ZO BANGALORE	ENVIRONNEMENT SA	CO12M, Sr. No.0494	BWSSB, Bangalore
3.	CPCB, ZO LUCKNOW	ENVIRONNEMENT SA	CO12M, Sr. No.0493	DN Park, Lucknow
4.	DPCC, DELHI			
5.	GPCB,JAMAGAR	ATTENDED, BUT NOT BRING THEIR ANALYSERS		
6.	HSPCB, FARIDABAD	ECOTCH	ECOTECH, EC9830, 09-1405	Sector-16A, FARIDABAD

S. NO.	PARTICIPANTS	MAKE OF THE ANALYSERS	MODEL NUMBER OF ANALYSERS	CITY LOCATION
7.	MSPCB, MUMBAI	TELEDYNE API	T300, sR.no.189	Navi Mumbai
8.	NPL,NEW DELHI	ATTENDED AS A ORGANISER, BUT NOT BRING THEIR ANALYSERS		
9.	WBPCB, KOLKATTA	ENVIRONNEMENT SA	CO12M, 2002, Sr. No.960	RBU, Kolkatta
10.	TNPCB,CHENNAI	ECOTECH	SERINUS 30 & 14-0700	THURAIPAKKAM
11.	REFERENCE ANALYSER(CPCB)	EENVIRONNEMENT SA	CO12M, Sr. No. 2191	AIR LABORATORY
12.	CALIBRATION LAB(CPCB)	HORIBA	APM 370, Sr.No. 4032600	CALIBRATION LABORATORY

Activities have been performed by the participants:

1. Checking of analysers and its associated system.
2. Checking of Calibration, Stability, and reproducibility of the analyser.
3. Zero Air Testing.
4. Conducting PT exercise by providing different concentrations of CO gas in lower range.
5. Conducting PT exercise by providing different concentrations of CO gas in higher range.
6. Checking of interference in the CO gas PT due to varying level of Humidity.
7. Calculation of Uncertainty (MU) in Excel sheets.
8. Compilation & Evaluation of PT results by the participants and final results by CPCB/ NPL for discussion in the workshop.
9. Discussion on PT Results.
10. Root Cause Analysis.
11. Workshop ended with discussion on issues related Uncertainty/ traceability in the measurement.

It has been observed that all the participants' analyzers measured the CO concentration value close to reference value provided by the CPCB except one participant whose result form in outlier range in this PT Exercise.

PT Exercise/ Workshop Organised at CPCB during 5th – 9th December, 2016

A second round of Proficiency Testing (PT) for the same parameter i.e. Carbon Monoxide by Real Time Analyzers in Ambient Air followed by Workshop on Traceability/ Uncertainty, PT & Quality Assurance jointly organised by CPCB, Delhi in Collaboration with CSIR-NPL, India and HLNUG/Germany (German Experts) under CEMI-PTB project. The following State Pollution Control Boards (SPCBs)/ Pollution Control Committee (PCC) participated in this exercise from 5th - 9th Dec 2016:

1. West Bengal State Pollution Control Board
2. Gujarat State Pollution Control Board
3. Haryana State Pollution Control Board
4. Maharashtra State Pollution Control Board
5. Tamil Nadu State Pollution Control Board
6. Delhi Pollution Control Committee
7. CPCB Regional Directorate - Bengaluru
8. CPCB Regional Directorate - Lucknow
9. CSIR-NPL, New Delhi
10. CPCB, H.O. (Air Laboratory)

S. NO.	PARTICIPANTS	MAKE OF THE ANALYSERS	MODEL NUMBER OF ANALYSERS	CITY LOCATION
1.	TSPCB, HYDERABAD	ECOTECH	ECOTECH, SERINUS 30 & 15-1530	ICRISAT, HYDERABAD
2.	MANDIGOBINDGARH	ENVIRONNEMENT SA	CO12M, Sr.No. 1907	MANDIGOBINDGARH
3.	CPCB, DELHI	ENVIRONNEMENT SA	CO12M, Sr. No. 0490	IHBAS, DELHI
4.	CPCB ZO MANALI, CHENNAI	ENVIRONNEMENT SA	CO12M, Sr.No. 0498	MANALI, CHENNAI
5.	RSPCB JODHPUR, RAJASTHAN	ENVIRONNEMENT SA	CO12M, Sr. No. 0795	JODHPUR, RAJASTHAN
6.	REFERENCE ANALYSER(CPCB)	EENVIRONNEMENT SA	CO12M, Sr.No. 2191	AIR LABORATORY, CPCB DELHI
7.	CALIBRATION LAB(CPCB)	HORIBA	APM 370, Sr. No. 4032600	CALIBRATION LABORATORY, CPCB DELHI

Before commencing this PT exercise, Air laboratory along with German expert checked the complete functioning of Ring Test and static injection system being used in this exercise. This includes the calibration reference analyser with primary and secondary calibration system. Stability and reproducibility test on the analyser etc.

Activities have been performed by the participants participating for various SPCBs & PCCs.

1. Checking of analysers and its associated system.
2. Checking of Calibration, Stability, and reproducibility of the analyser.
3. Conducting PT exercise by providing different concentrations of CO gas in lower range.
4. Conducting PT exercise by providing different concentrations of CO gas in higher range.

5. Checking of interference in the CO gas PT due to varying level of Humidity.

6. Calculation of Uncertainty (MU) in Excel sheets.

7. Compilation & Evaluation of PT results by the participants and final results by CPCB/ NPL for discussion in the workshop.

8. Discussion on PT Results.

9. Discussion on measurement of Uncertainty/ traceability, Quality assurance issues in the workshop.

It has been observed that the measured value of CO from the analyser of all the participants shows the value very near to the reference value provided by the CPCB. This exercise developed the confidence into participated laboratories that the results provided by their analyser are reliable and accurate.

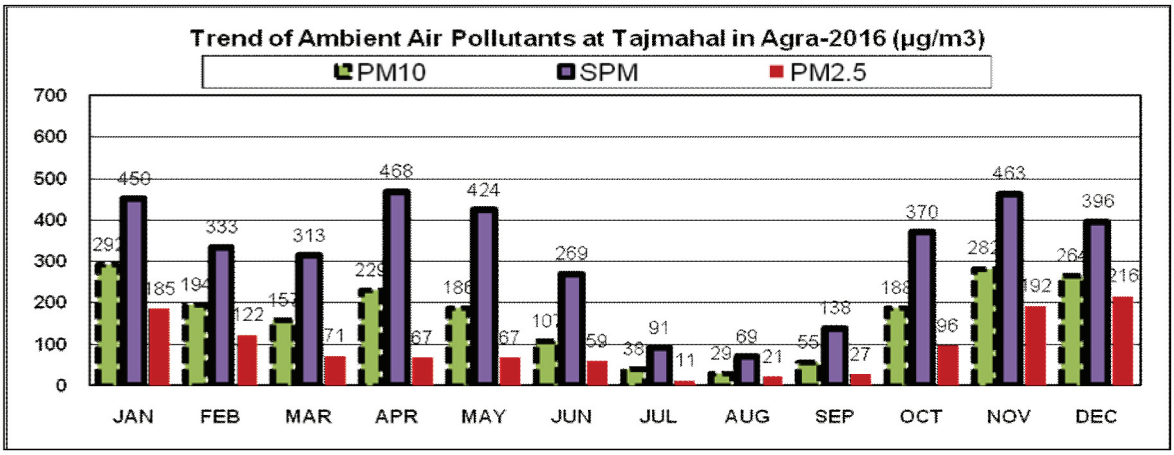
6.17 AMBIENT AIR QUALITY MONITORING (AAQM) AT AGRA:

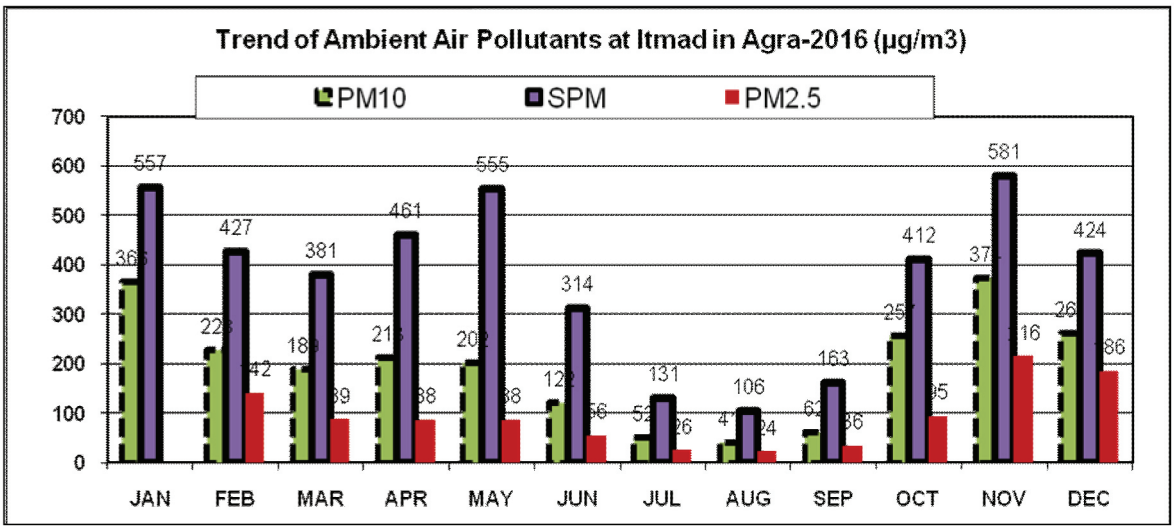
Ambient air quality is being monitored by CPCB in Agra at four location viz. Tajmahal, Etmad-ud-daulah, Rambagh (all protected monuments) and Nunhai (Industrial Area) since 2002. The summary of the AAQM during 2016 in Agra is presented at table-1:

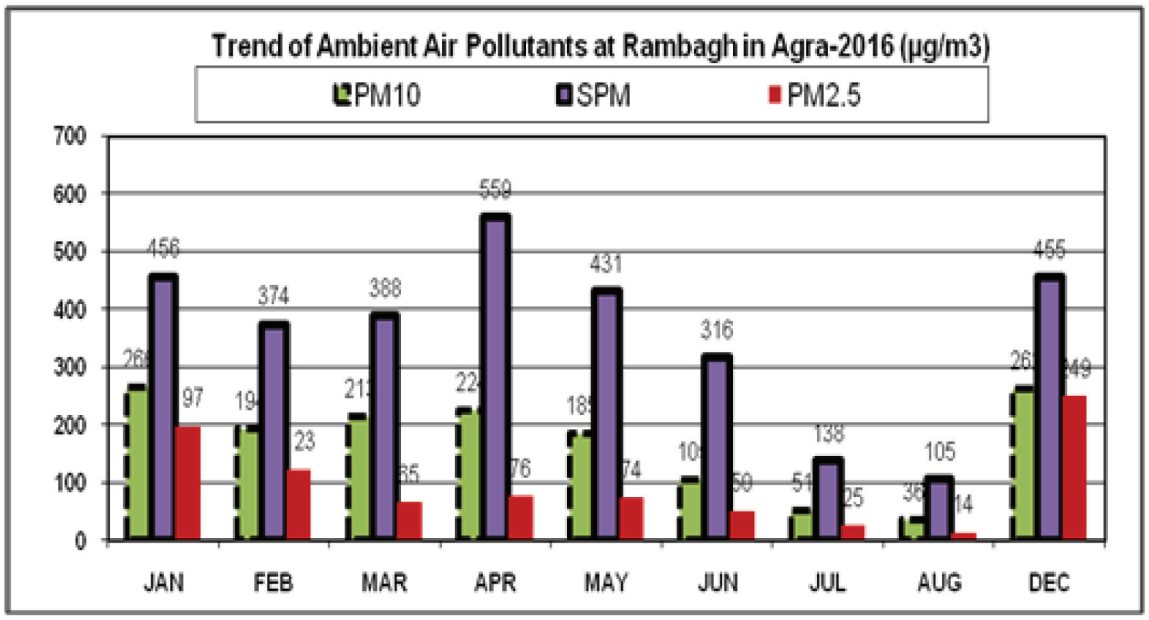
Table-1 : Summary of AAQM Data - 2016 (all values are in µg/m3 except EF)

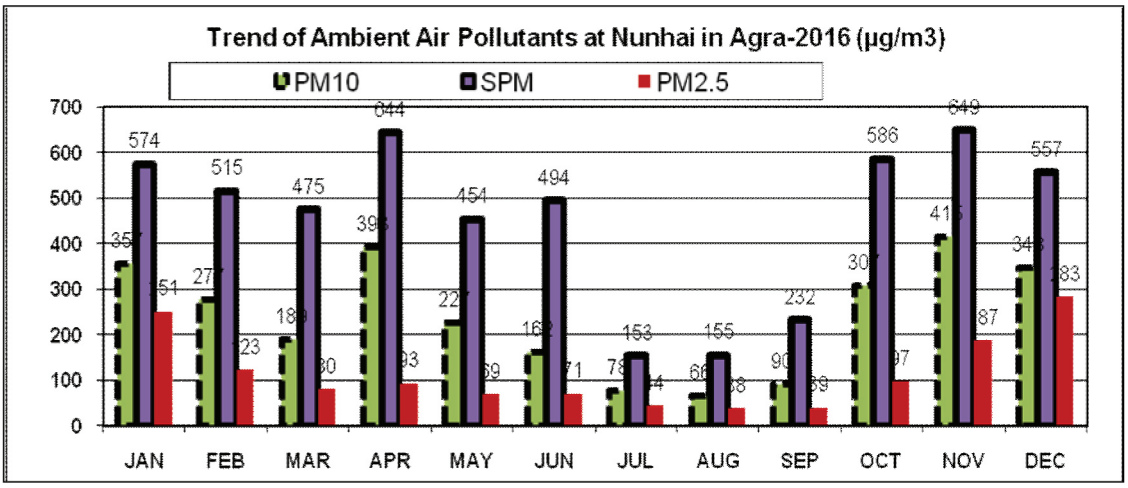
Monitoring stations	Parameters	SO_2	NO_2	PM2.5	PM10	SPM
Tajmahal	Avg	4	18	95	168	315
	max	5	28	216	292	468
	min	4	10	11	29	69
	EF	**0.2**	**0.6**	**1.4**	**2.8**	**4.5**
Etmad	Avg	5	25	95	197	376
	max	6	38	216	374	581
	min	4	12	24	41	106
	EF	**0.2**	**0.8**	**1.4**	**3.3**	**5.4**
Rambagh	Avg	5	27	97	171	358
	max	6	38	249	266	559
	min	4	17	14	36	105
	EF	**0.2**	**0.9**	**1.4**	**2.8**	**5.1**
Nunhai	Avg	5	36	115	242	457
	max	6	50	283	415	649
	min	4	20	38	66	153
	EF	**0.2**	**1.2**	**1.6**	**4.0**	**6.5**
	Annual Std.	**20**	**30**	**40**	**60**	**70****

PM2.5 has been found 1.4 - 1.6 times above the annual standard i.e. 40µg/m^3 in Agra; while PM10 has been found 2.8 - 4.0 times above the annual standard i.e. 60µg/m^3 at all stations. SO_2 is well within the annual standard limit i.e. 20µg/m^3. The level of NO_2 has been found below the annual standard at three stations, while at Nunhai monitoring stations, it was observed 1.6 times above the annual standard i.e. 30µg/m^3.


Trend of Ambient Air Pollutants at Tajmahal in Agra-2016 (µg/m3)
PM10
SPM
PM2.5
700
600
500
400
300
200
100
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC


Trend of Ambient Air Pollutants at Itmad in Agra-2016 (µg/m3)
PM10
SPM
PM2.5
700
600
500
400
300
200
100
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC


Trend of Ambient Air Pollutants at Rambagh in Agra-2016 (µg/m3)
PM10
SPM
PM2.5
700
600
500
400
300
200
100
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
DEC

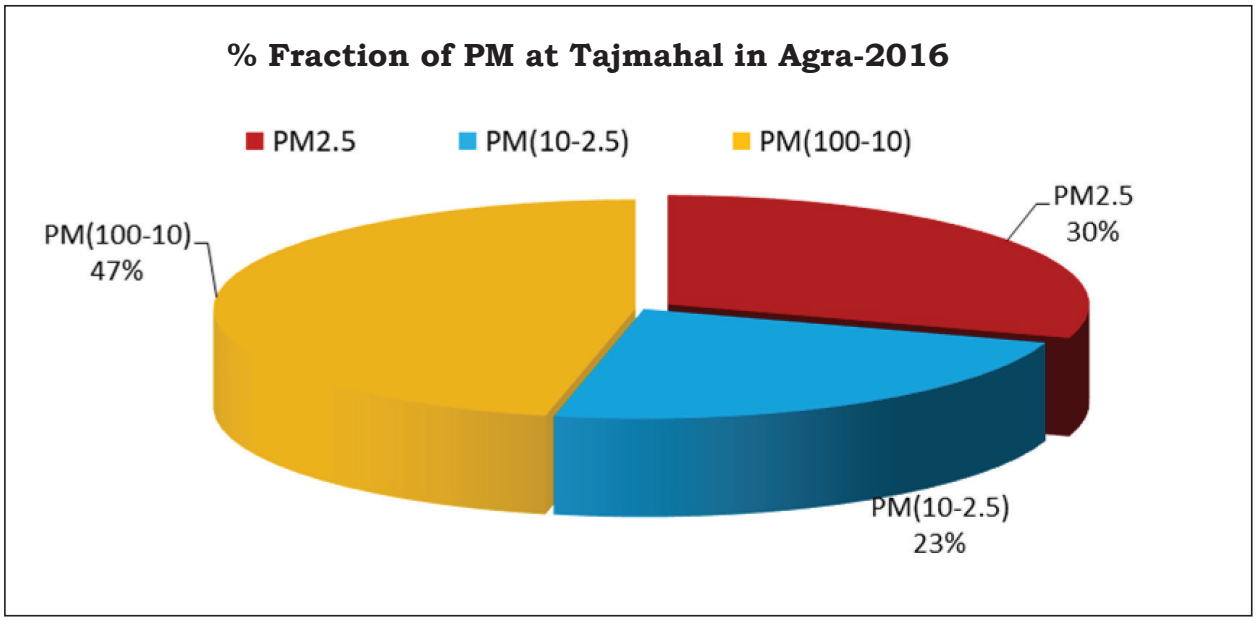


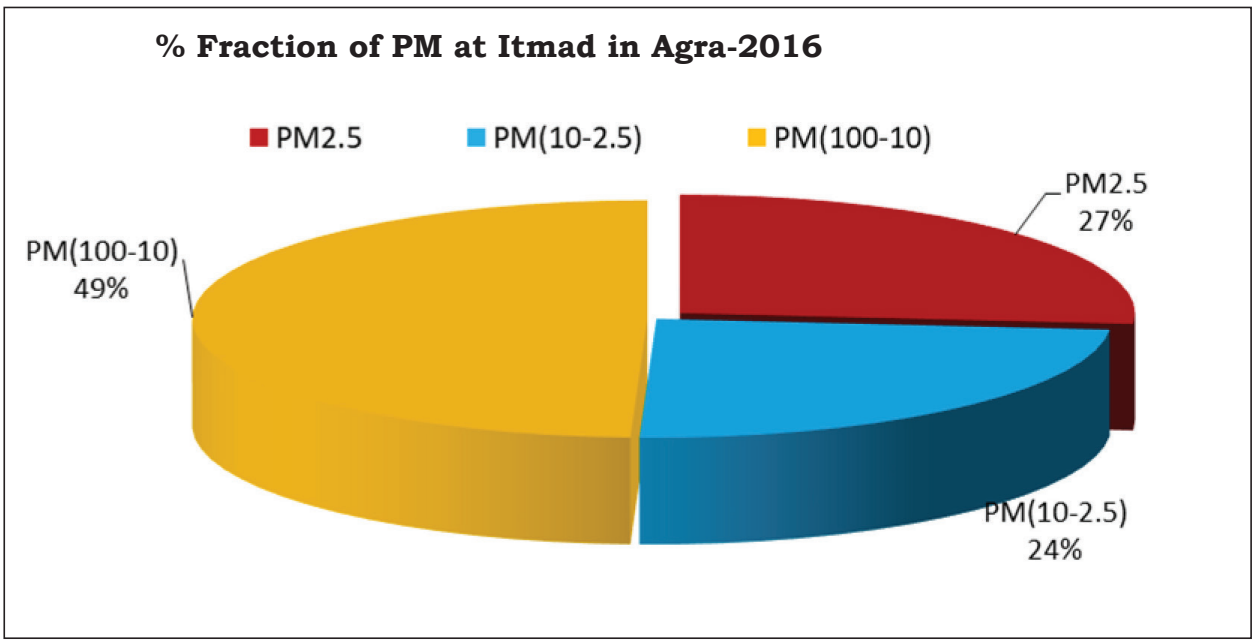
Particulate Matter Profile in Agra:

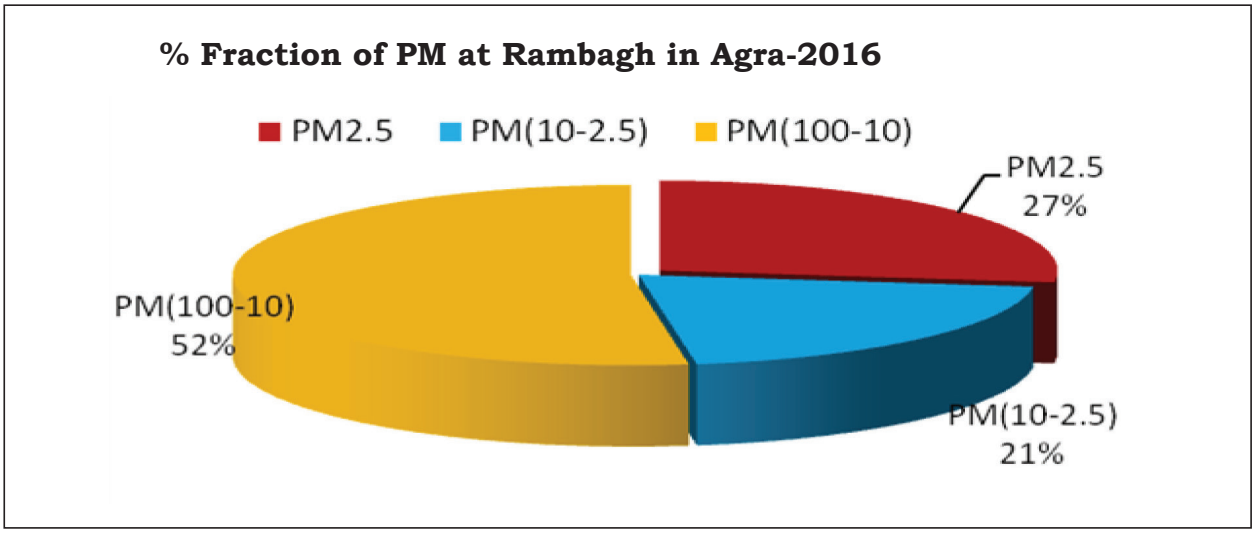
The monitoring of PM2.5 was also carried out at all four stations during the year (2016) along with PM10& PM100. The PM2.5 values exceed the annual standard of PM2.5 i.e. 40µg/m^3 at all locations in Agra.The data of PM2.5 as well as fractional distribution of particulate matter in Agra is presented below:

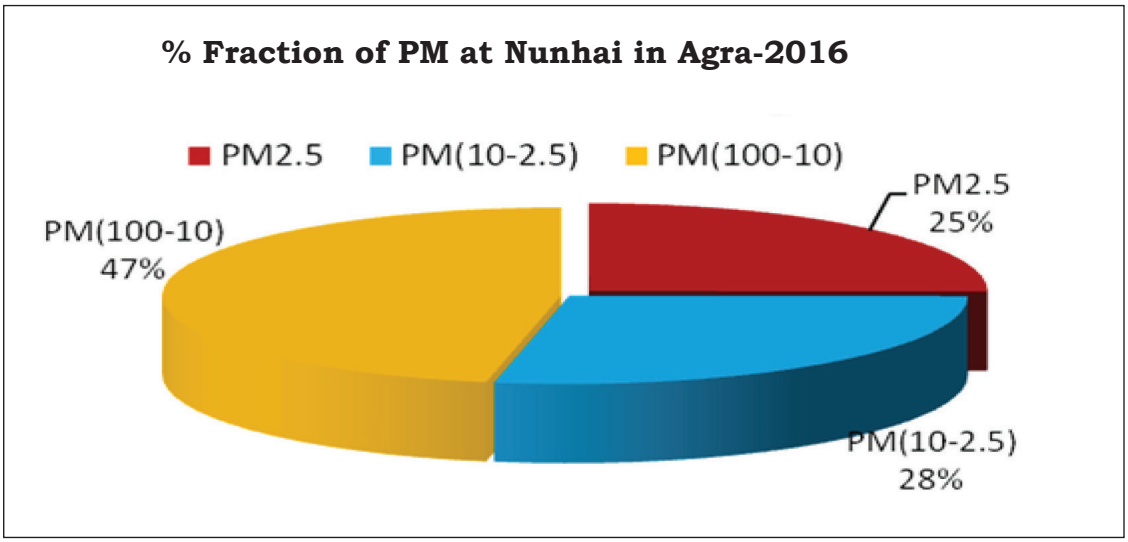
Fine Particulate Matter in Agra-2016

Monitoring stations	Annual Average (PM2.5)	Min.	Max.	PM2.5% in SPM	PM2.5% in PM10
Tajmahal	95	11	216	30	54
Itmad-ud-daula	95	24	216	27	52
Rambagh	97	14	249	27	52
Nunhai	115	38	283	25	48
	All values are in µg/m^3				



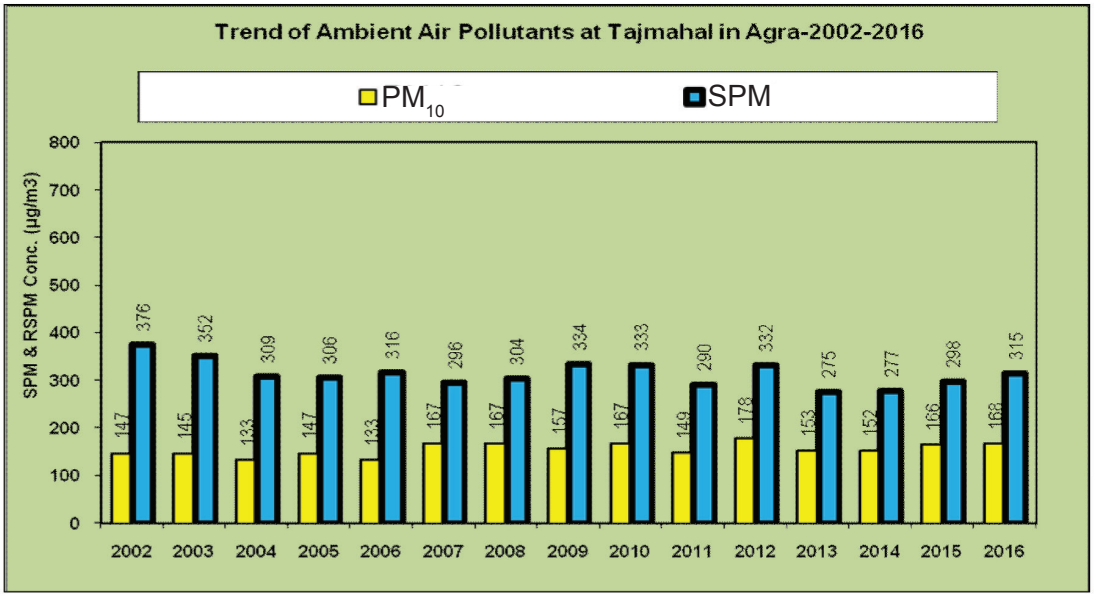

% Fraction of PM at Itmad in Agra-2016
PM2.5
PM(10-2.5)
PM(100-10)
PM2.5
27%
PM(100-10)
49%
PM(10-2.5)
24%

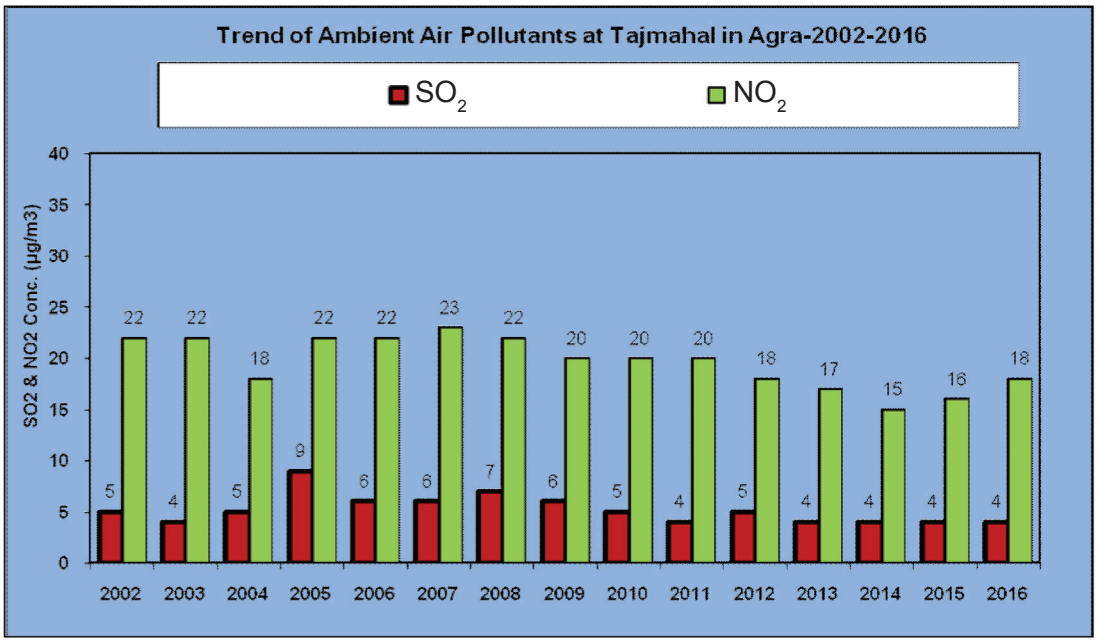

% Fraction of PM at Rambagh in Agra-2016
PM2.5
PM(10-2.5)
PM(100-10)
PM2.5
27%
PM(100-10)
52%
PM(10-2.5)
21%


% Fraction of PM at Nunhai in Agra-2016
PM2.5
PM(10-2.5)
PM(100-10)
PM2.5
25%
PM(100-10)
47%
PM(10-2.5)
28%

Yearly Trend of Air Quality in Agra (2002-2016):

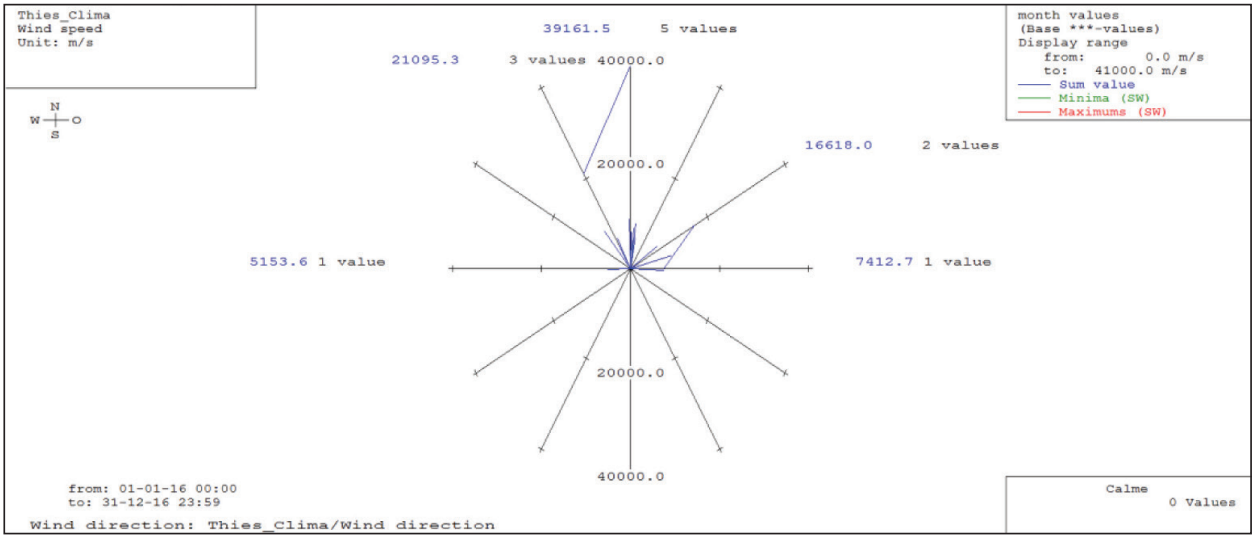
As per the direction of the Hon'ble Supreme Court, CPCB is monitoring the ambient air quality in Agra at Four location viz. Tajmahal, Etmad-ud-daulah, Rambagh (all are protected monuments) and Nunhai (Industrial Area) since 2002. The AAQM data collected during 2002 to 2016 of four monitoring parameters has been plotted as below. Decreasing trend in SPM was observed at all the four monitoring stations, while moderate increasing trend was observed in PM10 during these years. The SO_2 and NO_2 remained almost static with very little variation year to year. The annual average concentration of pollutants in all locations has increased during 2016 as compared to previous year (2015) except SO_2 at Tajmahal & Rambagh and NO_2 at Itmad-ud-daulah.





Meteorological data:

Met System has been installed in Agra office to collect real time metrological data. The monthly mean met values of the Temp., Humidity, Wind Speed; Wind Direction has been depicted in the picture. The temperature varied from 4.4^{0}C (Jan.) to 45.4^{0}C (May) and Relative Humidity (%) is higher during July-Sep. (during monsoon) & winter (Nov.-Dec.) due to thick fog. Prominent Wind direction is N & NW, except during June (E) & December (W) and wind speed recorded upto 23.7m/s (max.) during the year 2016.



Air Quality Monitoring in Rural Areas of TTZ:

Assessment of ambient air quality in remote/ rural area of Taj Trapazium Zone (TTZ) with simultaneous monitoring at two locations (Tajmahal & Nunhai Industrial Area) in Agra was carried out for assessment of air quality and extent of pollution in these areas during winter season. Air quality monitoring was carried at two locations (1) Barhaa, Kainzara Ghat near Chambal Sanctuary (2) Bidapur, Arnauta, Bah, about 70Km and 45 Km respectively from Agra city for PM2.5, PM10, SO_2 and NO_2 during January 09-10, 2017. The SO_2 levels have been found below detection limit at Tajmahal and Nunhai as well as other two rural locations also on the monitoring day. At Barhaa monitoring location NO_2 has been found 10µg/m^3 while at Bidapur it has been found 16µg/m^3. At Tajmahal it was 18µg/m^3 and at Nunhai is was found 36µg/m^3. At all locations NO_2 has been observed below notified 24 hour standards. The concentration of PM2.5 has been recorded as 116µg/m^3 at Barhaa and 192µg/m^3 at Bidapur. On the same day at Tajmahal it has been found 142µg/m^3.

It was found that the Ambient Air Quality in rural area is equally poor if compared with air quality of Agra. The lower concentration of gases in rural area indicate fairly well dispersion of gases and less impact of pollutants from local sources (fire wood, road construction etc.) as well as minimum transport of gaseous pollutants from city of Agra. However, the high concentration of PM2.5 in rural area indicate that it is well distributed spatially during winter even in rural areas around the city (even upto 70 km) where there are no major sources of air pollution. Though, some impact of vehicular traffic from Agra-Bah road which is 4-10 km from monitoring stations cannot be ruled out under favorable wind direction. More monitoring may be required with pollution source inventory for exact assessment of causes of air pollution, especially particulate matter in rural areas.

Monitoring locations	SO_2	NO_2	PM2.5
Barhaa, Kainzara Ghat Road, Bah, Agra	BDL	10	116
Bidapur, Arnauta, Bah, Agra	BDL	16	192
Tajmahal, Agra	BDL	18	142
Nunhai, Agra	BDL	36	--
All vales are in $\mu g/m^3$, BDL: below detection limit			

Inspection of NAMP stations:

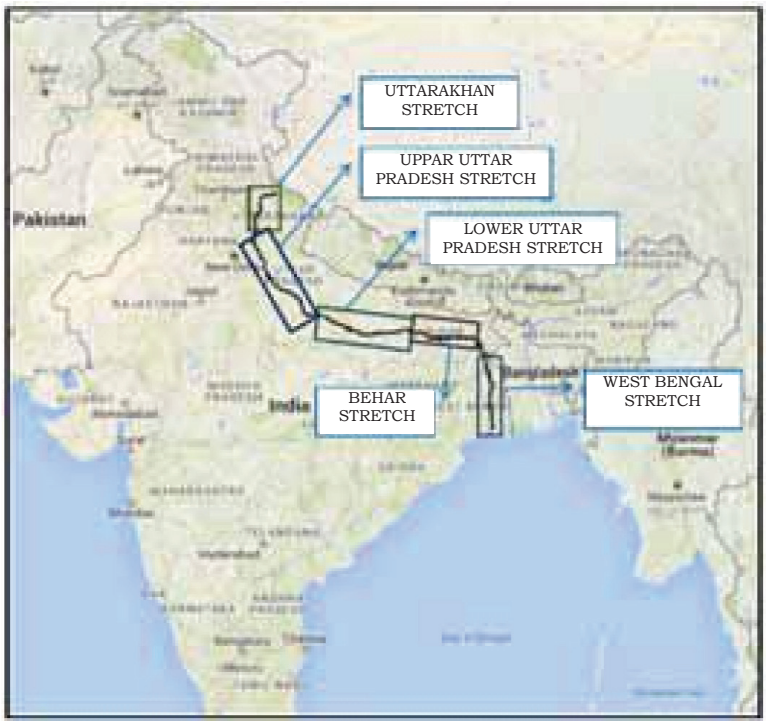
City	NAMPS locations	Operated by	Monitoring Parameters
Agra	UPPCB, Office, Bodla & Nunhai	RO, UPPCB	PM10, SO_2, NO_2
	CAAQMS, ANN, Agra	UPPCB (Through M/s Envirotech, Indore)	PM10/PM2.5, SO_2, NO_2, NO, NOx,O_3,Benzene, Toluene, Xylene, CO along with Met parameters
Firozabad	CDGI , Tilak Nagar , Raja KaTaal	UPPCB (through Centre For The Development Of Glass Industry (CDGI)	PM10, SO_2, NO_2

CHAPTER-VII

ENVIRONMENTAL RESEARCH

7.1 MICRO-POLLUTANTS (PESTICIDES + TRACE HEAVY METALS) IN GANGA RIVER FROM GAUMUKH (ORIGIN) TO GANGA SAGAR (CONFLUENCE TO SEA) AT RIVER GANGA

The National Reference Trace Organics Laboratory of Central Pollution Control Board had undertaken first round of systematic monitoring of micropollutants (pesticides + Trace Heavy Metals) in water and sediment of River Ganga at 69 locations form Gangotri (origin) to Ganga Sagar (confluence to sea) flowing through states of Uttarakhand, Uttar Pradesh, Bihar and West Bengal during year 2015-2016. While the study has been repeated for second round of monitoring of micro pollutants in entire stretch of river Ganga during year 2016-2017.



Maps showing Ganga River basin and monitoring stretch in Uttarakhand, Uttar Pradesh, Bihar and West Bengal states

During the study, a total number of 110 of water samples and 107 number of sediment samples have been collected from main stem of River Ganga. Sample collection were decided from pre-determined sampling locations with due consideration of findings during first round. Three samples (one composite and two replicate grab samples within 2 – 3 Km area of that sampling location) have been collected from those sampling locations, where detectable concentrations of micropollutants (pesticides + heavy metals) was found during first round of monitoring.

Table: State-wise Number of Locations Monitored during Year 2016 – 2017

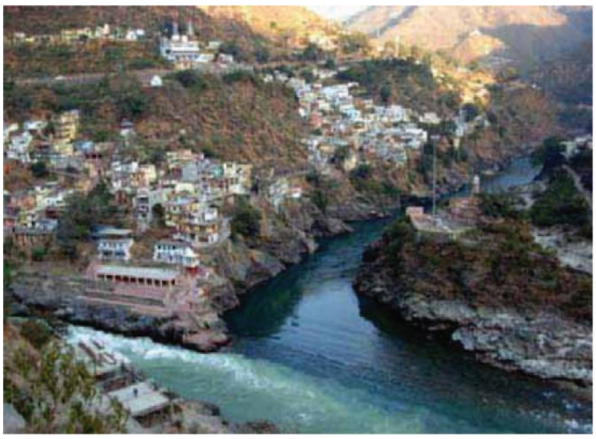
S. No.	State	Nos. of Monitored Locations	Nos. of Samples Collected		Monitoring Periods
			Water	Sediment	
1.	Uttarakhand	11	22	19	03 to 07 Oct., 2016
2.	Uttar Pradesh	20	28	28	13 to 18 Oct., 2016
3.	Bihar	22	34	34	15 to 24 Nov., 2016
4.	West Bengal	16	26	26	28 Nov. to 08 Dec., 2016
Total		**69 Locations**	**110**	**107**	**Oct., 2016 – Dec., 2016**

Sampling at Bhagirathi at Gaumukh

Confluence of Alakananda & Mandakini at Rudrapryag

Following four groups of pesticides (Total 31 Nos.) and heavy metals (Total 14 Nos.) have been monitored in water and sediment samples from Ganga River during the study:

Pesticides group and compounds analyzed	Heavy metals analyzed
Organochlorine Pesticides (13 Nos.): α-HCH, β-HCH, γ-HCH, δ-HCH, Endosulfan-I, Endosulfan-II, Endosulfansulfate, *p,p'*-DDE, *p,p'*-DDD, *p,p'*-DDT, Aldrin, Dieldrin, Heptachlor	**1.** Arsenic (As) **2.** Iron (Fe) **3.** Mercury (Hg) **4.** Manganese (Mn) **5.** Cadmium (Cd) **6.** Nickel (Ni) **7.** Lead (Pb) **8.** Selenium (Se) **9.** Chromium (Cr) **10.** Vanadium (V) **11.** Copper (Cu) **12.** Zinc (Zn) **13.** Cobalt (Co) **14.** Antimony (Sb)
Organo-phosphorous pesticides (8 Nos.): Chlorpyriphos, Dimethoate, Ethion, Malathion, Methylparathion, Phorate, Quinolphos, Profenophos	
Synthetic Pyrethroids (6 Nos.): α-Cypermethrin, Deltamethrin, Fenpropethrin, Fenvalerate, λ-Cyhalothrin, β-Cyfluthrin	
Herbicides (4 Nos.): Pendimethalin, Alachlor, Butachlor, Fluchloralin	



Confluence of Alakananda & Bhagirithi at Dev Prayag

Sampling at Alakananda A/c at RudraPryag

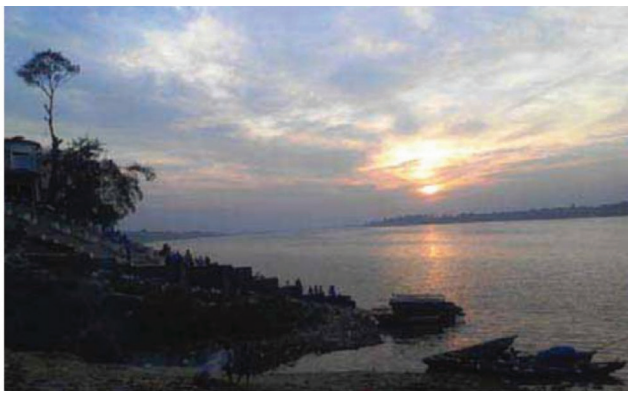
The consolidated findings of second round monitoring in the state-wise stretch of River Ganga are presented below:

Table : Pesticides and Heavy Metals in Ganga River in Different States Exceeding the Guideline limits

Ganga stretch	Pesticides	Heavy Metals
Uttarakhand	γ-HCH (Lindane), p,p'-DDT,	Arsenic, Lead, Iron, Manganese, Zinc
Uttar Pradesh	γ-HCH (Lindane), p,p'-DDT,	Chromium, Copper, Iron, Manganese
Bihar	γ-HCH (Lindane), δ-HCH, p,p'-DDT, Chlorpyriphos,	Lead, Copper, Cobalt, Nickel, Iron, Manganese
West Bengal	α-HCH, β-HCH, γ-HCH (Lindane), p,p'-DDT, p,p'-DDD	Chromium, Copper, Cobalt, Nickel, Lead, Selenium, Iron, Manganese, Vanadium, Zinc

The analytical results indicated that few pesticides were found present in Ganga River but these were found much lower than the guideline values at most of the locations. Some pesticide compounds such as HCH, DDT isomers and Chloropyriphos were found higher than the guideline values at some sampling locations.

Ganga at Varanasi U/s



Ganga at Buxar

Ganga at Farakka (West Bengal)

Ganga (Hugli) at Kolkata

7.2 STANDARDIZATION OF METHODOLOGY FOR DETERMINATION OF PHARMACEUTICALS AND PERSONAL CARE PRODUCTS (PPCP) IN WATER AND WASTEWATER USING SOLID PHASE EXTRACTION (SPE) AND ULTRA PERFORMANCE LIQUID CHROMATOGRAPHY – TANDEM MASS SPECTROMETRY (UPLC- MS-MS)

The pharmaceuticals and personal care products (PPCP) have been defined as "any product used by individuals for personal health or cosmetic reasons or used by agribusiness to enhance growth or health of livestock". Personal care products (PCPs) are the chemical based products having intended end use on human body and increasingly used by the population.

PPCP are the chemicals used for diagnosis, treatment, prevention of disease or alteration of structure/function of the human body. Their use is extended to veterinary formulations and also recreational drugs for significant benefits to society.

Groups of PPCP	Common Compounds
Nonsteroidal anti-inflammatory drugs	Diclofenac, Naproxen, Ibuprofen, Naproxen, Aspirin, Ketoprofen, Indomethacin, Paracetamol
Antidepressants	Fluoxetine, Paroxetine, Setraline (Citalopram, Escitalopram)
Azole antifungal drugs	Ketoconazole, Clotrimazole, Fluconazole, Terbinafin, Miconazole, Amphotericin
Beta blockers	Atenolol, Propranolol, Metoprolol, Celiprolol
Antibiotics	Sulfonamides, Penicillins, And Tetracyclins, (Noxacin, Gentamicin, Neomycin, Ciprofloxacin), Sulfamethoxine, Erythromycin, Neomycin, Streptomycin, Ampicillin,
Narcotics/anesthetics	Propoxyphene, Morphine, Heroin
Antihistaminic	Cetirizin, Benadryl, Tavest, Drixoral
Supplements	Zostavax, Golimumab, Ascorbic Acid (Vitamin C), Biotin (Vitamin D), Antioxidants (Vitamin E), Carotinoids (Vitamin A)
Birth control pills	Demulen, Desogen, Norinyl, Yasmin
Personal Care Products (PCPs	Triclosan, Triclocarbon, Methyl Paraben, Ethyl Paraben, Propyl Paraben, Butyl Paraben

The presence of PPCP in surface water is getting growing attention from environmental and health agencies all over the world and have been identified as one of the emerging pollutants due to their frequent presence in aquatic environment. Although the use of PPCPs is inevitable in our daily lives, the amount of pharmaceuticals and personal care products discharged into the aquatic and terrestrial environment through various point and non-point sources is a matter of concern. The pathway of PPCPs into the environment is typically associated with the waste stream-domestic wastewater (via septic systems or wastewater treatment plants), domestic solid wastes (via landfill leachate), commercial-industrial discharges (from hospitals, other healthcare facilities and drug manufacturing facilities) and animal husbandry such as animal feeding operations, aquaculture facilities and food production facilities.

There has been increasing concern of pollution of the environment resulting from increased use and discharge of conventional allopathic and veterinary medicines in parent or metabolite forms posing risk to the ecosystem. It has been realized that unintentional exposure to antibiotics, anti-parasitics, anti-fungals and anticancer medicines are the causes for harmful effect on human health. Antibiotics may induce resistance in humans and animals through prolonged exposures and also may cause lead to treatment ineffectiveness on a longer run.

The Central Pollution Control Board had procured Ultra Performance Liquid Chromatography - Tandem Mass Spectrometer (UPLC-MS-MS), which has been installed at National Reference Trace Organics Laboratory for intended use for analysis of complex PPCP, organic dyes and measurement of various trace organics compounds in hazardous waste and effluents.

During the year 2016-17, National Reference Trace Organics Laboratory of Central Pollution Control Board, Delhi has undertaken standardization of methodology for determination of selected Pharmaceuticals and Personal Care Products (PPCP) using Solid Phase Extraction (SPE) and Ultra Performance Liquid Chromatography- Tandem Mass Spectrometry (UPLC-MS-MS). Methodology for analysis has been standardized and practised with following Quality Control / Quality Assurance matrix:

S. No.	Compounds Name	Range (ng/mL)	Regression equation	R^2	Recovery (Mean±SD)	LOD (µg/L)	LOQ (µg/L)
1.	Ammoxicilline	50-250	y = 4.66 x - 33.2	0.991	93 ± 3.8	0.012	0.038
2.	Cefixime	50-250	y = 658.7 x - 299.4	0.997	91 ± 6.4	0.020	0.064
3.	Cefadroxile	50-250	y = 165.8 x - 38.7	0.999	96 ± 5.7	0.018	0.057
4.	Fluconazole	50-250	y = 2870.x + 15746	0.999	100 ± 6.6	0.021	0.066
5.	Diclofenac	50-250	y = 3110.x + 9772	0.998	91 ± 6.8	0.021	0.068
6.	Levofloxacin	50-250	y = 15409 x + 32432	0.999	100 ± 7.8	0.025	0.078
7.	Ciprofloxacin	50-250	y = 7909.x + 19743	0.999	99 ± 7.5	0.024	0.075
8.	Mefenamic Acid	50-250	y = 7819.x + 10989	0.998	98 ± 7.0	0.022	0.070
9.	Metronidazole	50-250	y = 1320.x + 27262	0.999	101 ± 6.2	0.019	0.062

The application of standardized methodology has been undertaken for field samples analysis of identified PPCP compounds in a phase wise development programme.

7.3 MEASUREMENT OF HAZARDOUS ORGANIC COMPOUNDS DIOXIN (PCDDs) AND FURAN (PCDFs) IN ENVIRONMENTAL SAMPLES

Polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzo-furans (PCDFs) are environmental contaminants usually present in diverse environmental matrices. Out of 75 theoretically possible PCDD congeners and 135 PCDF congeners, 7 PCDD congeners and 10 PCDF congeners are having considerable toxicity. During source emission monitoring of Dioxin & Furan, these congeners are monitored as per internationally practiced convention (WHO-TEF) in environmental matrices, which may vary from sub ppt level and may reach up to ppm level. The following sub-activities have been executed by National Reference Trace Organics Laboratory of Central Pollution Control Board under the purview of the project:

- **Ambient Air Dioxin Monitoring Study**

  The vapour phase and particulate phase Dioxin & Furan ambient air sampling has been performed by Polyurethane Foam High Volume Sampler (PUF-HVS) at Sujanpur Tira, Himachal Pradesh as Background Location for comparison of Ambient Air Dioxin-Furan Monitoring levels at four selected NAAMP Stations in Delhi.

- **Monitoring of Dioxin – Furan in Stationary Source Emissions**

  The monitoring of Dioxin – Furan in stationary source emission at Municipal Waste Incineration to Energy Generation (Waste to Energy) have been undertaken as per requirement of Hazardous Waste Management Division, Central Pollution Control Board, Delhi and also as per directions of Hon'ble High Court NGT.

Dioxin / Furan Source Emission Monitoring

High Resolution Chromatograph – High Resolution Mass Spectrometer for Dioxin / Furan Analysis

7.4 PROJECT MONITORING OF PESTICIDE RESIDUES AT NATIONAL LEVEL

Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, New Delhi and nodal department i.e. Project Coordinating Cell of All India Network Project (AINP) on Pesticide Residues, Indian Agricultural Research Institute New Delhi continuously sponsoring the project "Monitoring of Pesticide Residue at National Level" to Central Pollution Control Board, Delhi since October, 2006 alongwith other reputed 24 Pesticide Residue Analytical laboratories in the country. The objective of the study is to evaluate the levels of pesticides in water samples as envisaged in the technical programme for the Central Sector Scheme, "Monitoring of Pesticides Residues at National Level.

Since year 2009-2010 Department of Agriculture and Corporation has assigned the work of Monitoring of Pesticide Residue in Surface Waters and agricultural soils in National Capital Region Delhi. About 100 locations of surface water and 60 Locations for the Soil Samples were selected and Monitored in National Capital Region i.e. Uttar Pradesh (Ghaziabad, Guatam Budh Nagar & Baghpat), Haryana (Sonepat, Faridabad & Ballabhgarh) and Delhi

(Alipur Block, Kanjhawala Block, Najafgarh & Nizamuddin Bridge). During FY 2016-17, monitoring locations have been further extended to Amroha, Hapur and Bulandshahar districts in Uttar Pradesh. The Monitoring of Pesticide Residues is being undertaken in surface water samples collected from about 70 locations on monthly basis.

Pesticides Quantification on Gas Chromatographs

- The 32 pesticides under following groups are being monitored on regular basis:

  Organo-chlorine Pesticides (14 Nos.): α-HCH, β-HCH, γ-HCH, δ-HCH, Endosulfan-I, Endosulfan-II, Endosulfansulfate, Dicofol, *p,p'*-DDE, *p,p'*-DDD, *p,p'*-DDT, Aldrin, Dieldrin, Heptachlor.

  Organo-phosphorous Pesticides (8 Nos.): Chlorpyriphos, Dimethoate, Ethion, Malathion, Parathion-methyl, Phorate, Quinalphos, Profenophos.

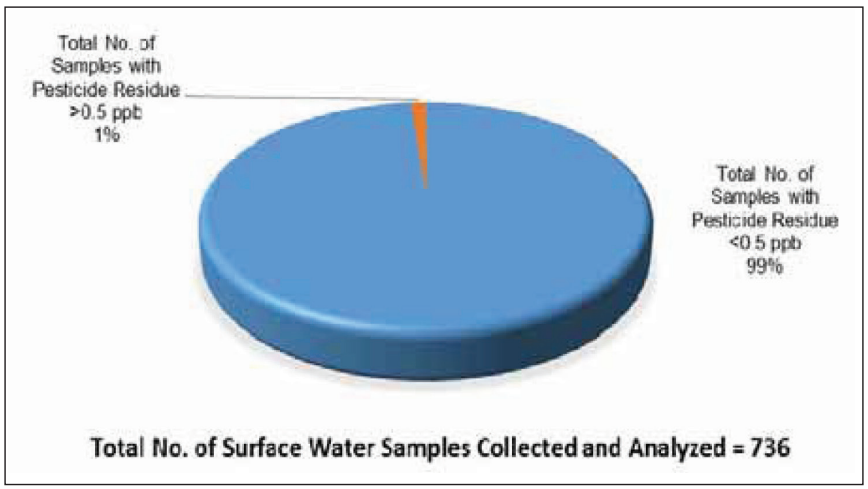
  Synthetic Pyrethroids (7 Nos.): Cypermethrin, Deltamethrin, Fenpropethrin, Fenvalerate, Cyhalothrin, β-Cyfluthrin, Pendimethalin

  Herbicides (4 Nos.): Pendimethalin, Alachlor, Butachlor, Fluchloralin

- The year wise budget allocated to Central Pollution Control Board as under:

Year	Sanctioned Budget Rs. In Lakhs	Analytical Instruments Received Under the Project
2009-10	10.0	1. Shimadzu GC with ECD & FTD (one) 2. HPLC with PAD Detector (one) 3. Turbo-vap Concentrator (one) 4. UPS System (10KVA) (one) 5. Rotary Evaporator (one) 6. Separatory Funnel Shaker (one)
2010-11	19.0	
2011-12	14.0	
2012-13	14.0	
2013-14	11.0	
2014-15	11.00	
2015-16	12.00	
2016-17	17.00	

- Department of Agriculture and Corporation have extended the Administrative Approval for continuation of project at National Reference Trace Organic Laboratory of Central Pollution Control Board Delhi for the financial year 2016-2017 i.e. 1st April, 2016 to 31st March, 2017. During the year, 736Nos. surface water samples have been collected and analysed for various identified pesticides. The monthly reports periodically submitted to project directorate.



7.5 MEASUREMENT OF IDENTIFIED PERSISTENT ORGANIC POLLUTANTS (POPs) IN AMBIENT AIR AT SELECTED URBAN AND RURAL AREAS

Persistent Organic Pollutants (POPs) are the toxic organic compounds, which resist photolytic, biological and chemical degradation and bio-accumulative. Stockholm Convention of United Nations Environmental Program (UNEP) has mandated to eliminate or restrict the production and use of persistent organic pollutants (POPs) and to conduct research on POPs. India ratified the Convention and submitted the National Implementation Plan (NIP) for persistent organic pollutants. Available data on POPs in ambient air for India are not conclusively reflective of POPs levels in ambient air. National Reference Trace Organics Laboratory of Central Pollution Control Board has been conducting studies on measurement of selected persistent organic pollutants (POPs) in ambient air at urban and rural locations in Delhi and NCR during year 2016-2017.

There are hardly any systematic study regarding POPs concentrations in ambient air. The available data on POPs in ambient air are not conclusively reflective of POPs levels in ambient air.In general, most of the available data are quite fragmentary with coverage of only one or two identified POPs such as DDT, HCH, Endosulphan, HCBs, and PCBs.

During the year 2016-2017, The National Reference Trace Organics Laboratory of Central Pollution Control Board has been undertaking systematic monitoring of selected persistent organic pollutants (POPs) in ambient air at urban and rural locations in Delhi and NCR.

Four urban and four rural (two each in NCT and NCR, UP) locations were selected for the study. All urban locations (Sirifort, Pitampura, Janakpuri and Shahadra) were in urban residential areas of Delhi, however two locations each are in rural area of NCT, Delhi

(Bakhtawarpur & Najhafgarh) and NCR and Utter Pradesh (Loni & Chhaprauli). For data comparison and to assess input of POPs in urban and rural environment, the background locations has been identified at remote location at Sujanpur in serene environment of Himachal Pradesh, where no polluting sources and urban impact is available.

NCT Urban Locations	NCT Rural locations	NCR Rural locations	Background Locations
Shahadra	Bakhtawarpur	Loni, Ghaziabad	Sujanpur in Himachal Pradesh
Pitampura	Najhafgarh	Chhaprauli, Noida	
Janakpuri	-	-	
Sirifort	-	-	

Two rounds of sampling had been carried out during the reporting period and samples were analysed for following 20 persistent organic compounds. The data collected is under processing and finalization of report:

POPs groups	POPs compounds monitored and analyzed
Organo-chlorine Pesticides (11 Nos.)	α-HCH, β-HCH, γ-HCH, δ-HCH, *p,p'*-DDE, *p,p'*-DDT, o,*p'*-DDT, *α*-Endosulfan, β-Endosulfan, Aldrin, Dieldrin
Polychlorinated biphenyl (PCBs) (7 Nos.)	PCB-28, PCB-52, PCB-101, PCB-138, PCB-153, PCB-180, PCB-209
Chlorobenzene (2 Nos.)	Pentachlorobenzene (PeCB) and Hexachlorobenzene (HCB)

7.6 DEVELOPMENT AND STANDARDIZATION OF METHODOLOGY FOR DETERMINATION OF SPECIFIC PESTICIDES IN AQUEOUS AND SOIL ENVIRONMENT SAMPLES

Organo-phosphate pesticides are group of insecticides causing irreversible nerve functions in insects, humans and many other animals. Even at relatively low levels, organo-phosphorus pesticides may be most hazardous for the brain development of foetuses and young children. The organo-phosphorous pesticides group have greater acute toxicity, poisoning risks to the people who may be exposed to large amount.

National Reference Trace Organics Laboratory, CPCB has been monitoring Organo-phosphorous pesticides namely – Phorate, Dimethoate, Parathion-Methyl, Chloripyriphos, Monocrotophos, Malathion, Ethion, Azinphos-Methyl, Chloripyriphos-Methyl, Diazinon, Disculfoton, Fenitrothion, Fonofos, Parathion-Ethyl, Anolophos and Phosmet around sixteen compounds in environmental matrixes under various project. To extend the scope of Organo-phosphrous pesticides monitoring in aqueous and soil samples, development of methodology for identified specific pesticides i.e. Acephate, Omethoate, Dichlorvos, Methamidophos and Edifenphos have been undertaken.

The calibration and verification phase of specific organo- phosphorous pesticides (Methamidophos, Dichlorvos, Acephate, Omethoate and Edefenphos) has been continued during the reporting year using GC-FPD method and it was completed successfully with

R^2 0.999 to 0.989. The analysis of Martix – spikes phases of aqueous and soil samples have also been undertaken during which the recovery of two compounds Dichlorvos and Edifenphos have been observed in the acceptable range of 70% to 130% while other organo-phosphorous compounds i.e. Omethoate, Methamidophos and Acephate the recovery was either on higher or lower side due to highly polar nature or organo-phosphorous compounds.

7.7 INTER-LABORATORY PROFICIENCY TESTING (PT) PARTICIPATION FOR ANALYSIS OF PHYSICO-CHEMICAL AND TRACE ORGANICS PARAMETERS INCLUDING DIOXIN & FURAN

Quality assurance and Quality Control ensures that the analytical data produced by any laboratory meets the high quality standards and also demonstrate the competence of the laboratory. Quality assurance is the definite programme for laboratory operation that specifies the measures required to produce reliable data of known precision and accuracy. The accuracy of analytical results plays an important role in correctness of decisions or action.

Analytical Quality Control (AQC) is one of the main components of Quality Assurance (QA) System, wherein the Quality of analytical data generated at a laboratory is controlled through minimizing analytical errors for achieving target analytical accuracy. To maintain analytical data quality, the laboratories have to undertake Internal Proficiency Testing / Quality Control (within the laboratory) as well as participate in Inter Laboratory Comparison (ILC) / Proficiency Testing (PT) Programme (conducted preferably by International PT provider / External agency). The satisfactory results in successful ILC / PT Participation provide direct evidence that the quality of analytical data generated at the laboratory is satisfactory & reliable.

During year 2016-2017, the Central Laboratory HQs and five Zonal Office Laboratories of Central Pollution Control Board, Delhi have participated in International PT programme conducted by M/s Environmental Resource Associates (ERA), USA (Accredited with American Association for Laboratory Accreditation, A_2LA) during the month of October / November, 2016. The PT samples have been analyzed adopting routine analytical procedure at respective laboratories and the analyzed data was reported to PT Coordinating Agencies at USA. The PT provider statistically processed the data reported by CPCB laboratories alongwith reported data from other participating laboratories located in various regions of world for Z Score calculations.

The Z score achieved by Central Pollution Control Board, Central Laboratory are mostly in good result range. The Z score between ± 00.00 to 2.00 are recognized as **Good Results**, Z Score between ± 2.00 to 3.00 are recognized as **Opportunity** and Z score above ± 3.00 are **Unsatisfactory**. In case of few parameters having Z score beyond ± 2.0, the Root Cause analysis and Corrective Action have been undertaken.

Table: Performance of National Reference Trace Organics Laboratory in Proficiency Testing / Inter Laboratory Calibration Participation during FY 2016-2017

S. No.	EQAS/ PT providers (or) ILC/ coordinating laboratory	Details of Test		Z Score
		PT No.	Parameters	
INSTRUMENTATION LABORATORY				
1.	M/s ERA (A Waters Company) 16341, Table Mountain Parkway Golden, CO 80403 United States of America Accredited with A 2 LA (American Association of Laboratory Accreditation) As per ISO/IEC 17043:2010	WS-243	Mercury Total	-1.71
			Antimony	0.809
			Arsenic	-0.475
			Cadmium	-0.414
			Chromium	0.0771
			Copper	0.175
			Iron	-0.466
			Lead	0.00207
			Manganese	-0.354
			Nickel	0.0201
			Selenium	-0.75
			Vanadium	0.0887
			Zinc	-0.142
NATIONAL REFERENCE TRACE ORGANICS LABORATORY				
1	M/s ERA (A Waters Company) 16341, Table Mountain Parkway Golden CO 80403 United States of America Accredited with A 2 LA (American Association of Laboratory Accreditation) As per ISO/IEC 17043:2010	WP-261	**Organo-Chlorine Pesticides (OCP)**	
			4,4'-DDE	-1.89
			Aldrin	-1.39
			alpha-BHC	-2.76
			beta-BHC	-0.341
			Dieldrin	-0.508
			Endosulfan I	-0.558
			Endosulfan II	-2.86
			gamma-BHC (Lindane)	-1.37
			Organo-Phosphorous Pesticides (OPP)	
			Chlorpyriphos	19.2
			Dimethoate	-1.41
			Ethion	-1.48
			Malathion	-4.23
			Methyl Parathion	-1.07
			Polychlorinated Biphenyls (PCBs)	
			Aroclor 1016	-1.95

Environmental Laboratories Development

Central Pollution Control Board, Delhi has been delegated the powers by Government of India vide Gazette Notification No. SO 145 (E) dated February 21, 1991 for recognition of environmental laboratories of Govt. / Semi Govt. organization Public Sector Undertaking and Educational Institutions under section 12(1)(b) & 13 to carry out the functions entrusted to the Environmental laboratories under the Environment (Protection) Act, 1986.

Ministry of Environment, Forest & climate chage has constituted the Expert Committee at Central Pollution Control Board for consideration and recommendation for recognition of the laboratories under the Environment (Protection) Act, 1986. The Central Pollution Control Board has organized four meetings of Expert Committee as below for assessment, review and recommendation of cases

of private / government sector laboratories for recognition under the Environment (Protection) Act, 1986 during the year.

Expert Committee Meeting	Meeting Date
46th Meeting of Expert Committee	25.05.2016
47th Meeting of Expert Committee	26.10.2016
48th Meeting of Expert Committee	06.02.2017
49th Meeting of Expert Committee	28.02.2017

Type of samples analyzed in Water Lab.

I. Wastewater samples from.....

- Domestic drains
- STP (Sewage Treatment Plants)
- ETP (Effluent Treatment Plants)
- Industrial waste water(Sample Received from, IPC -I, II, III, IV,V/UPCI.II.III,, etc)

II. Fresh water samples from.....

- River water (NGRBA,NGT, project, WQM-I ,& II)
- Ground Water (Delhi, NCT)
- Lakes, ponds

III. Hazardous waste samples for testing...

- Water leachate
- TCLP Extract
- CHNS Analysis
- Calorific Value
- Sample collected by HWM-Division

IV. Soil and solid wastes

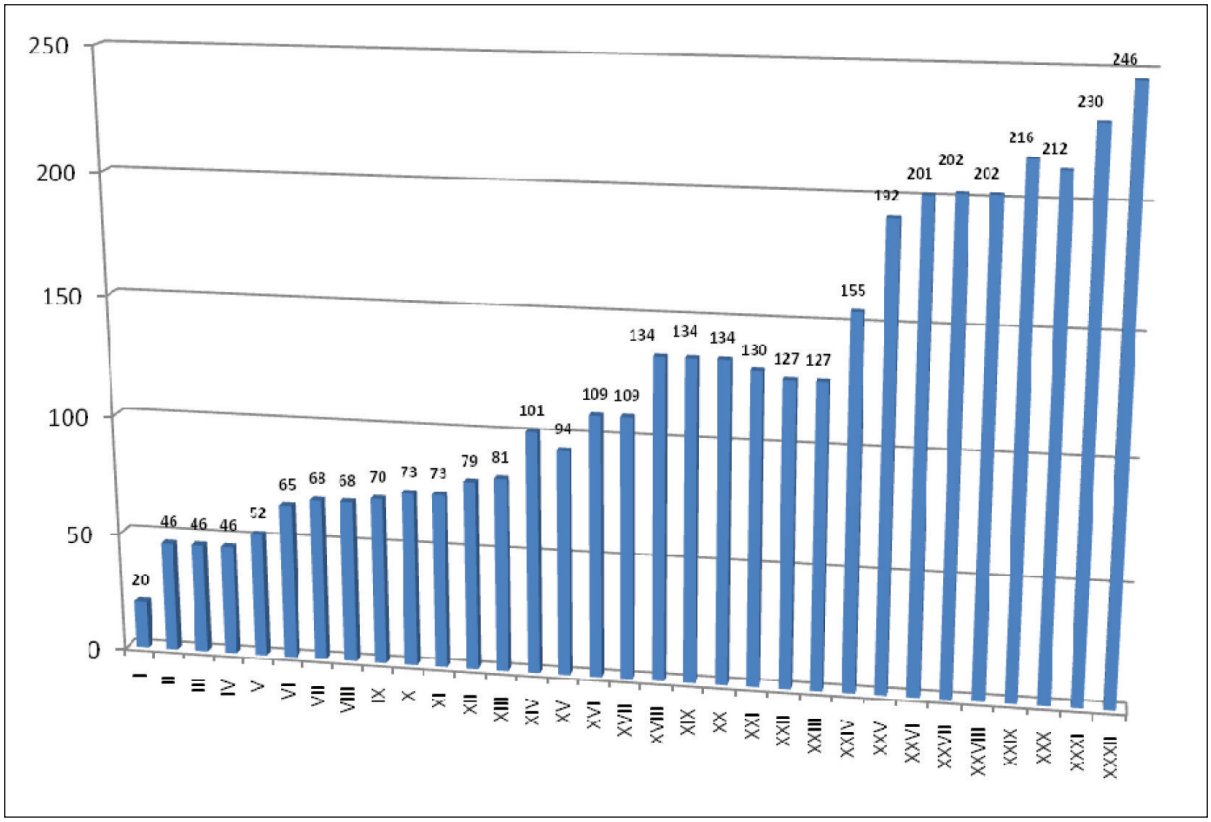
- Polluted soil
- MSW solid wastes/compost

Analytical quality control (AQC/ water) for Central and State Pollution Control Boards, Pollution Control Committees & for laboratories recognized under E. P. Act .

The most important mandatory task Central Pollution Control Board (CPCB) is to maintain vast water quality monitoring network with a aim to evaluate the status of water quality of different sources. In this programme the CPCB is monitoring 1019 water quality monitoring stations under GEMS, MINARS, GAP and YAP Programmes comprising rivers, lakes, wells, and ground waters spread over 27 States and 6 Union Territories through various State Pollution Control Boards (SPCB). Comparability of data within the collaborative programme becomes the key challenge to the water testing laboratories. The quality of data must be of the desired quality to formulate the policy by the decision maker based on the data generated in the monitoring programmes. Therefore, to obtain relevant and reliable data, the analytical process has to proceed under a well established quality assurance with external proficiency test as an inherent component. To ensure the reliability of the data, a programme called “Analytical Quality Control (AQC)” was initiated with 20 laboratories in 1991.

In 2016 – 17 AQC exercise was conducted for 246 number of laboratories in which SPCBs/PCCs Labs 103 number, Government / EPA Lab 07 number and 136 number of private E (P) Act, 1986 recognised laboratories. As on 24 February, 2017, 32nd round of AQC exercise in which 17 number of new laboratories participated first time in AQC programme. Exercise was conducted and preparation of performance report will be started after the closing date of the receipt the AQC sample testing report which April 17, 2017 for all the laboratories.

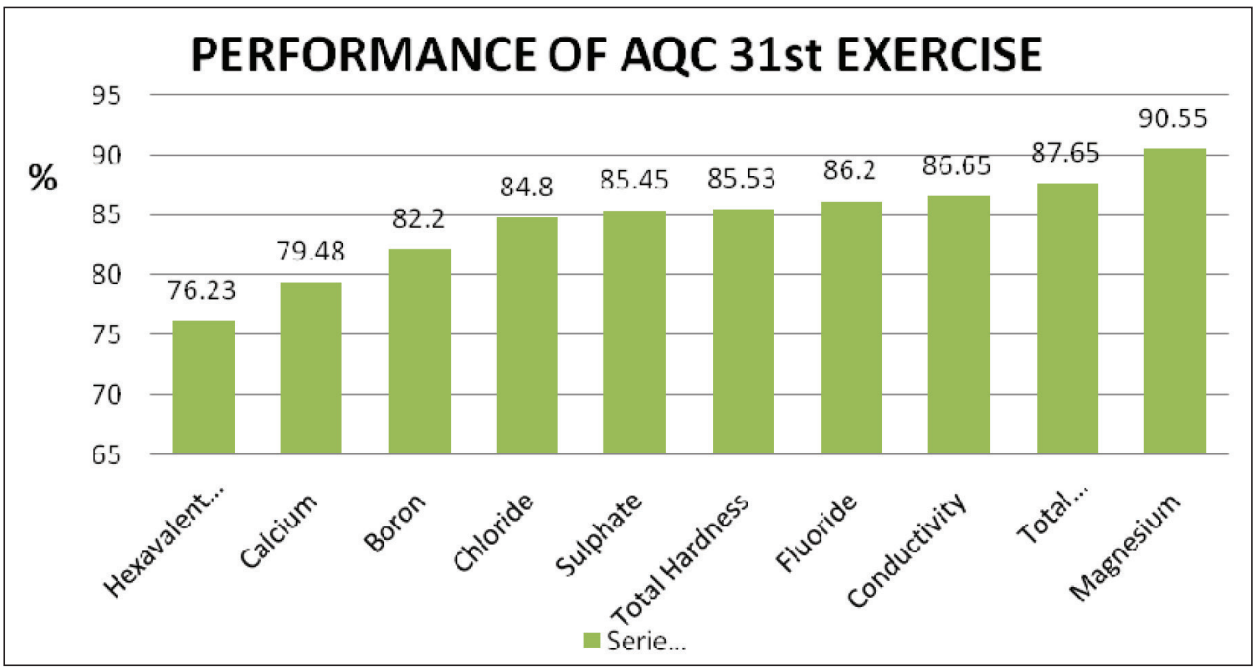
The growth of participation of labs in AQC programme conducted by CPCB i.e, Exercise no I to XXXII, shown in Figure



32nd AQC Exercise covers ten number of parameters which are given in Table

S.No.	Name of parameter	S.No.	Name of the parameter
1	NH3 – N	6	Potassium
2	TKN – N	7	pH
3	TDS	8	COD
4	FDS	9	BOD
5	Sodium	10	Phosphate as P

The performance of the laboratories in the 31st Exercise (year 2015-16) forphysico-chemical parameters ranged between 76.22 to 90.55% and overall performance was around 84.5 %.



Recommendations for AQC Scheme

The overall findings of the performance of AQC exercises reveal the fact that Internal AQC system in all the laboratory is to be strengthened. The analytical capability of these laboratories could be improved by adopting the following major steps.

- Strengthening of the Internal AQC System
- Periodic calibration of instruments
- Using high quality chemicals and providing adequate quantity of glassware
- Providing good quality distilled water
- Improving the laboratory work atmosphere
- Providing analytical training to laboratory analysts.
- Conducting Regional Workshop at various regions
- Adopting good quality assurance system
- Participating in Inter-laboratory AQC exercises by all laboratories of Pollution Control Boards and Committees.

RECOGNITION OF LABORATORIES UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986

During April 2016 to March 2017 six applications of Govt./Public Sectors Environmental Laboratories have been received, scrutinized and comments put-up before the Expert Committee and on recommendations of Expert Committee, approved in the Board Meeting. Gazette

notification for three environmental laboratories is under process while following three Govt., Public Sector Laboratories have been notified in Govt. of India Gazette for recognition under the Environmental (Protection) Act 1986 :

1. Zonal Office (West) Laboratory
   Central Pollution Control Board
   Parivesh Bhawan, Opposite-VMC
   Ward office No.-10,
   Subhanpura,
   Vadodara-390023
   Gujarat
2. Environmental Laboratory
   Central Mine Planning & Design Institute Limited (CMPDI)
   Gondwana Place, Kanke Road
   Ranchi- 834008
   Jharkhand
3. Central Environmental Laboratory
   Karnataka State Pollution Control Board
   Nisarga Bhawan, "B"Block,7th 'D' Main, Thimmaiah Road,
   Shivanagar, Bengaluru-560058
   Karnataka

ENVIRONMENTAL LABORATORIES WITH VALID RECOGNITION UNDER SECTION 12(1) B OF THE ENVIRONMENT (PROTECTION) ACT, 1986

S. No	State	Name of laboratory	Group of Parameters	Gazette notification no. and date	Validity up to
1.	**Assam**	Quality Control Laboratory Indian Oil Corporation Limited Bongaigaon P.O. Dhaligaon Dist. Chirang -783385 **Assam**	Physical, General andnon metallic, metals, organics, microbiological, toxicological, and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters.	Legal 42(3)/87 dated 7th March,2016	6th March 2021

S. No	State	Name of laboratory	Group of Parameters	Gazette notification no. and date	Validity up to
2.	**Delhi**	Central Laboratory Central Pollution Control Board, Parivesh Bhawan East Arjun Nagar **Delhi**-110032	Physical, General and non metallic, metals, organics, microbiological, toxicological, biological, Hazardous waste, soil, Sludge, Sediments, and air pollution parameters for analysis of ambient air, source emissions, noise and micrometeorological parameters.	Legal 42(3)/87 dated 11th December, 2015	10th December, 2020
3.	**Goa**	Goa State Pollution Control Board Laboratory Dempo Towers Ist Floor, EDC Patto Plaza, Panaji **Goa**-403001	Physical, General Chemical and non metallic, metals, organics, microbiological, toxicological, soil, Sludge, Sediments and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters.	Legal 42(3)/87 dated 14th August, 2014	13th August, 2019
4.	**Gujarat**	Zonal Office (West) Laboratory Central Pollution Control Board Parivesh Bhawan, Opposite-VMC Ward office No.-10, Subhanpura, Vadodara-390023 **Gujarat**	Physical, General and non metallic, metals, organics, microbiological, toxicological, biological, soil, Sludge, Sediments, and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters & vehicular emission Parameters.	Legal 42(3)/87 dated 3rd August,2016	2nd August 2021

S. No	State	Name of laboratory	Group of Parameters	Gazette notification no. and date	Validity up to
5.	**Jharkhand**	Environmental Engineering Laboratory MECON Ltd. Vivekananda Path, Doranda Ranchi- 834002 **Jharkhand**	Physical, General Chemical and non metallic, metals, organics, microbiological, toxicological, soil, sludge, sediments and air pollution parameters for analysis of ambient air, source emissions, noise & micrometeorological parameters.	Legal 42(3)/87 dated 14th August, 2014	13th August, 2019
6.		Environmental Laboratory Project and Development India Ltd. (PDIL) P.O. Sindri- 828122 District – Dhanbad **Jharkhand**	Physical, General Chemical and non metallic, metals, organics, microbiological, toxicological,soil, sludge and sediment, air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters.	Legal 42(3)/87 dated 14th August, 2014	13th August, 2019
7.		Environmental Laboratory Central Mine Planning & Design Institute Limited (CMPDI) Gondwana Place, Kanke Road Ranchi- 834008 **Jharkhand**	Physical, General and non metallic, metals, organics, microbiological, toxicological and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters.	Legal 42(3)/87 dated 3rd August,2016	2nd August 2021
8.	**Karnataka**	Central Environmental Laboratory Karnataka State Pollution Control Board Nisarga Bhawan, "B"Block,7th 'D' Main, Thimmaiah Road, Shivanagar, Bengaluru-560058 **Karnataka**	Physical, General and non metallic, metals, organics, microbiological, toxicological, biological, Hazardous waste, soil, Sludge, Sediments, and air pollution parameters for analysis of ambient air, source emissions, noise and micrometeorological parameters.	Legal 42(3)/87 dated 3rd August,2016	2nd August 2021

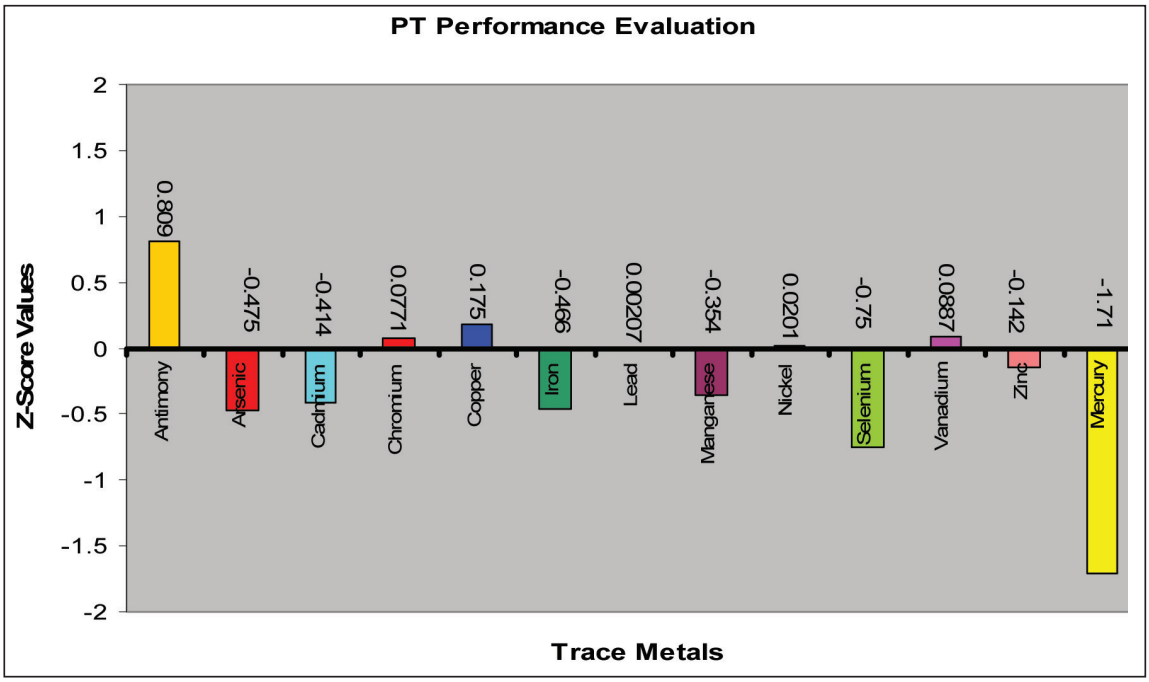
S. No	State	Name of laboratory	Group of Parameters	Gazette notification no. and date	Validity up to
9.	**Madhya Pradesh**	Central Laboratory M.P. Pollution Control Board Paryavaran Parisar E-5, Arera Colony, Bhopal- 462016 **Madhya Pradesh**	Physical, General Chemical and non metallic, metals, organics, microbiological, toxicological, soil, sludge, sediments and air pollution parameters for analysis of ambient air, source emissions, noise, & micrometeorological parameters	Legal 42(3)/87 dated 14th August, 2014	13th August, 2019
10.		Zonal Office Laboratory, Central Pollution Control Board, Central Zonal Office, Sahkar Bhawan , 3rd Floor North T.T. Nagar Bhopal – 462003 **Madhya Pradesh**	Physical, General and non metallic, metals, organics, microbiological, toxicological, biological, Hazardous waste, soil, Sludge, Sediments, Hazardous waste , and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters.	Legal 42(3)/87 dated 11th December, 2015	10th December, 2020
11.	**Maharashtra**	Central Laboratory Nirmal Bhawan, Plot No.3 Maharashtra Pollution Control Board Shil-Mahape Road, Mahepe Navi Mumbai-400710 **Maharashtra**	Physical, General Chemical and non metallic, metals, organics, microbiological, toxicological, biological, soil, Sludge, Sediments, Hazardous waste , and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters.	Legal 42(3)/87 dated 10th March,2015	9th March, 2020

S. No	State	Name of laboratory	Group of Parameters	Gazette notification no. and date	Validity up to
12.		Regional Laboratory Maharashtra Pollution Control Board , Jog Centre, 3rd Floor, Pune-Mumbai Road, Wakdewadi Shivagi Nagar, Pune- 411003 **Maharashtra**	Physical, General and non metallic, metals, organics, microbiological, toxicological, biological, Hazardous waste, soil, Sludge, Sediments, and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters.	Legal 42(3)/87 dated 11th December, 2015	10th December, 2020
13.	**Punjab**	Punjab Biotechnology Incubator SCO: 7 & 8, Phase –V SAS Nagar (Mohali) -160059 **Punjab**	Physical, General and non metallic, metals, organics, microbiological, toxicological, biological, soil, Sludge, Sediments, and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters & vehicular emission Parameters.	Legal 42(3)/87 dated 7th March,2016	6th March 2021
14.	**Telangana**	Environment Protection Training and Research Institute (EPTRI) Survey No.91/4, Gachibowli Hyderabad-500032 **Telangana**	Physical, General and non metallic, metals, organics, microbiological, toxicological, biological, Hazardous waste, soil, Sludge, Sediments, and air pollution parameters for analysis of ambient air, source emissions, noise and micrometeorological parameters.	Legal 42(3)/87 dated 7th March,2016	6th March 2021

S. No	State	Name of laboratory	Group of Parameters	Gazette notification no. and date	Validity up to
15.	**Uttarakhand**	Pollution Control Research Institute Bharat Heavy Electricals Limited Ranipur Haridwar-249403 **Uttarakhand**	Physical, General and non metallic, metals, organics, microbiological, toxicological, biological, soil, Sludge, Sediments and air pollution parameters for analysis of ambient air, source emissions noise and micrometeorological parameters & vehicular emission Parameters.	Legal 42(3)/87 dated 11th December,2015	10th December,2020

Participation in International Proficiency Testing Programme

The Instrumentation Laboratory in CPCB has participated in the International Analytical Quality Control (AQC) program through Proficiency Testing (PT) conducted by Environmental Resource Associates (ERA), Colorado, USA during November, 2016. The PT exercise is one of the major parts of a quality assurance system (QA), wherein the performance of laboratory analytical data is reflected to achieve a target of accuracy. This proficiency testing scheme is designed to evaluate laboratory performance against other participating laboratories throughout the world on the same set of environmental parameters. In this program, the Instrumentation laboratory has scored 100% results in the field of chemical parameters particularly trace metals including Arsenic and Mercury. It is one of the great achievements for the credibility of the laboratory. This indicates both the laboratory's customers and staff with confidence in the analytical ability of the laboratory. The laboratory is equipped with sophisticated instruments and expertise capable for handling of environmental samples for metal analysis. The performance of the laboratory in Proficiency Testing (PT) programme is graphically given below:



Analytical Services Provided To Other Organizations:

Environmental samples received from various organizations like Indian Institute of Technology Kanpur, New Delhi, State Pollution Control Boards were processed and analyzed for elemental analysis using EDXRF, heavy metals using AAS and ICP-AES and reports were forwarded to concerned organizations in time.

Invitation From United Nations Environment Programme (Unep) To Register For Global 'Mercury Laboratory Databank' :

Information's related with the **'Mercury Laboratory Databank'** was compiled and filled in a questionnaire as received from UNEP through MOEF & CC for laboratory analyzing Mercury. Duly filled questionnaire was forwarded to MOEF & CC for further transmission to UNEP.

Air Laboratory in CPCB

The Air Laboratory is recognized under the provisions of Environment (Protection) Act, 1986. To meet the requirements of recognitions, the laboratory activity and its operations are continually improved and maintained for quality data generation in environmentally safe conditions & systems. In this direction, the laboratory has enhanced the capability for quality data and systematic data generation by means enlarged its scope of operations.

Expansion of analytical scope under Accreditation

The scope under NABL accreditations has been increased this year to 47 from 22. The parameter-wise list is as under:

List of Parameters, Covered Under Scope of NABL Accreditation (ISO/IEC 17025:2005):

S. No.	Product/Material of Test	Specific Test Performed
1.	Central Air laboratory, Parivesh Bhawan, East Arjun Nagar, Delhi	
	Air & Gases	
(a)	Ambient Air	SPM, Particulate matter (PM_{10}), Particulate matter ($PM_{2.5}$) NH_3, Sulphur Dioxide (SO_2) (Chemical method), Nitrogen Dioxide (NO_2) (Chemical method), Particulate Benzo-a-Pyrene (BaP), Benzene
(b)	Metals in Particulate matter(PM_{10})	Pb, Cd, Ni, Cr, Cu, As
(c)	Cations in Particulate matter	Lithium, Sodium, Ammonium, Potassium, Magnesium, Calcium, Strontium, Barium
(d)	Anions in Particulate matter	Fluoride, Chloride, Nitrite, Sulphate, Phosphate, Bromide Nitrate
(e)	Ambient Noise Level	Equivalent Sound Level Leq in db(A) in ambient air
(f)	Meteorological Parameters	Temperature, Relative humidity, Atmospheric Pressure, Wind speed, Wind direction, Solar radiation, Rain fall

S. No.	Product/Material of Test	Specific Test Performed
(g)	Stack Emissions	Particulate Matter (PM), Sulphur Dioxide (SO_2) Chemical method, Carbon Monoxide (CO), Oxygen (O_2) and Carbon Dioxide (CO_2) (Instrumental Method), Oxides of Nitrogen (NO_2) Chemical method, HCl & HF
1.	Site 1, 1. BSZ Marg Near ITO	
	Ambient Air	Particulate matter (PM_{10}), Sulphur Dioxide (SO_2) Chemical method, Nitrogen Dioxide (NO_2) Chemical method
2.	Site 2, IHBAS, Dilshad Garden	
	Ambient Air	SO_2, Oxides of Nitrogen, Carbon Monoxide, Particulate Matter ($PM_{2.5}$) Analyser Method
	Site 3, DMS, Shadipur,	
3.	Ambient Air	SO_2, Oxides of Nitrogen, Carbon Monoxide, Particulate Matter ($PM_{2.5}$) Ozone, Benzene ,Analyser Method
	Site 4, NSIT, Dwarka,	
4.	Ambient Air	SO_2, Oxides of Nitrogen, Carbon Monoxide, Particulate Matter ($PM_{2.5}$), Ozone, Benzene, Analyser method

Total 16801 analyses were performed for ambient air quality assessment in stationery central air laboratory. This includes various parameters as listed in following Table:

A) Ambient Air Samples:

S. No.	Parameter	Location		Total
		Ambient air Samples	(NGT/Public complaint)	
1	Sulphur-Dioxide (SO_2)	5287	108	5395
2	Nitrogen-Dioxide (NO_2)	5295	108	5403
3	Particulate Matter (PM_{10})	2642	67	2709
4	Particulate Matter ($PM_{2.5}$)	573	10	583
5	Suspended Particulate Matter (SPM)	-	08	08
6	Metal (Pb, Ni) and metalloids (As) analysis	2334	10	2344
7	HCl	28		28
8	HF	12		12
9	Benzene	91	06	97
10	Benzo(a) Pyrene, Particulate Phase	103	06	109
11	Cations/Anions	72		72
12	EC/OC	48		48

Total 68 source emission samples were collected and processed during 2016. Parameter-wise list is as under:

b) Source Emission Samples

S. No.	Parameter	Source emission samples (NGT/Public complaint)
1	Sulphur-Dioxide(SO_2)	17
2	Oxides of Nitrogen(NO_2)	21
3	Particulate Matter(PM)	28
4	HCl, HF	
5	Sample processed for Metal and metalloids (As, Cd, Cr, Cu, Co, Mn, Ni, Pb, V, Sb, Hg)	02

Performance of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) under Air laboratory

The performance of operation and maintenance of CAAQMS was assessed based on data capture rate of individual analyser installed. The following table depicts the overall performance. Except Ozone and Benzene all analysers dedicated for all other parameters have registered more than 90% data capture rate on average.

Percentage data capture of Ambient air Quality monitoring station (online) in Delhi -2016:

S. No.	Parameter	IHBAS, DILSHAD GARDEN, DELHI	DMS, SHADIPUR, DELHI	NSIT, DWARKA, DELHI	Avg.
1	NO_2	98.34	93.29	93.45	95.02
2	SO_2	96.72	98.59	95.40	96.90
3	CO	97.50	94.72	95.67	95.96
4	O_3	NA	82.99	78.77	80.88
5	$PM_{2.5}$	98.03	97.27	95.38	96.89
6	Benzene	NA	94.70	94.27	94.48
7	NH_3	74.13	NA	NA	74.13

Note: NA – i) All values reported are in (µg/m³)
ii) Analyzer not installed

Performance of Meteorological and SODAR Stations under Air laboratory

The performance of operation and maintenance of Met station and SODAR have registered more than 94% data capture rate except for mixing height. The parameter-wise data capture rate of different sensor installed for meteorology and SODA at Parivesh Bhawan Delhi is as under:

Data Capture (%) of Meteorological parameters measured at Parivesh Bhawan – 2016

S. No.	Parameters	Percentage of data capture
1	Mixing Height	88.7
2	Wind Speed	97
3	Wind Direction	97
4	Temperature	98.2

S. No.	Parameters	Percentage of data capture
5	Relative Humidity	98.2
6	Pressure	98.2
7	Solar Radiation	98.2
8	Rainfall	94.5

Monitoring performed under Hon'ble Court's directives and Public Complaints

Air laboratory has established a mechanism to address the issues for ambient, source and noise monitoring on a war footing basis to comply with the direction of hon'ble courts and public complaints. The detail of cases addressed during 2016 is listed below:

List of Ambient and Source Monitoring during 2016 (NGT/Public Complaints)

S. No	Ambient Monitoring	S. No.	Ambient Monitoring
1	Sukhdev Vihar, Residential Area	12	M/s Shri Ram Khandigramudhyog Sansthan
2	Gazipur Waste to Energy Plant, DDA Flat Dairy Firm	13	M/s Uttam Gramodhyog Sansthan, Sunderpur
3	Gazipur Police Station, Gazipur,	14	M/s Sunderpur, Grids, Sunderpur,
4	NTPC Badarpur , ETP Plant	15	Sharda University, Greater Noida Near Pari Chowk
5	NTPC Badarpur , CISF colony	16	Sec-1, Noida, UPPCB
6	M/s Bhushan Steel P ltd., Sahibabad	17	J.P. Hospital, Sect-128
7	Community Centre, Kaushambi	18	Sharda University, Greater Noida Near Pari Chowk
8	DDA Flat Roof, Pocket-B, Sukhdev Vihar,	19	Sec-1, Noida, UPPCB
9	G.B. Pant Govt. Engg. College, Okhla	20	J.P. Hospital, Sect-128
10	STP, Okhla	21	Sharda University, Greater Noida Near Pari Chowk
11	M/s Shri Mahavir Stone Industry, Sunderpur	22	Rathi Steel Power Ltd.,
S. No	**Source Emission Monitoring**	**S. No**	**Source Emission Monitoring**
1	NTPC Badarpur	7	M/s Shimbholi Spirits Ltd.
2	M/s Timarpur Okhla Waste Management Plant, Okhla	8	M/s U.P. waste management, Kanpur Dehat
3		9	Plant M/s Bharat Oil & Waste Management Kanpur Dehat
4	M/s Bhushan Steel P ltd., Sahibad	10	Rathi Steel Power Ltd.,
5	M/s Timarpur Okhla Waste Management Plant, Okhla	11	M/s Star Paper Mills, Saharnapur, Himmat Nagar
6	M/s Dabur India Ltd. Sahhibabad		

OH & SMS (IS: 18001: 2007/2012)

Air laboratory in CPCB is responsible for operation and maintenance of OH & SMS established in central laboratory and also coordinating the implementation of OHSAS or OH & SMS for Regional Directorate laboratories. OH & SM System encompassing all activities of laboratory is functioning effectively in the Central Laboratory, CPCB. The Internal Audit (4th), Surveillance Audit and the Management Review of the system for the year 2016 have been conducted fruitfully. During November, 2016, primary health check-up has been done for about 45 laboratory personnel. Besides, first-aid training has also been organised for 10 laboratory staff. Other activities falling under the rubric of OH & SMS are being continually improved in letter and spirit. As a part of continual improvement the OH & SMS Policy of Central Pollution Control Board has been revised.

Central Pollution Control Board

[Ministry of Environment, Forest & Climate Change, Govt. of India]

Occupational Health and Safety Policy

[IS 18001:2007/2012]

Central Pollution Control Board (CPCB), the advisory scientific & technical organization to Ministry of Environment, Forest & Climate Change has the mandate for pollution control in the country.

CPCB is committed to maintain and provide safe and healthy working environment to all personnel (employees, visitors, suppliers, contractor's workers and students / trainees) as an integral part of activities of the organization through an operational and well maintained Occupational Health and Safety Management System (OH&SMS) in compliance with the requirements of IS 18001:2007/2012.

CPCB is committed to comply with applicable legal requirements, controlling and gradually reducing hazards and associated risks in its field and laboratory related activities, providing requisite resources and training to all concerned, periodic review of the system for adequacy, suitability, effectiveness and continual performance improvement.

This policy will be communicated to all concerned persons and parties from time to time.

CHAIRMAN

January 11, 2017
Issue : 01
Revision: 01

CHAPTER-VIII

ENVIRONMENTAL TRAINING

ETU Division Organised 20 Training Program through various Institutes for the officials of CPCB & SPCBs / PCCs during Financial Year 2016 – 17. About 20 Participants were nominated for each course. The names of various training programs their duration and training institutes are given in following table

Training Programme: Conducted During 2016-17

S. No.	Training Titles	Duration	Tentative Schedule	Training Institute
1.	Municipal Waste Management - Bio Composting, Landfill Gas Management & Control, Waste to Energy and Implementation of CD Waste Rules, 2016	5 days	Oct. 03-07, 2016	NPC, Chennai
2.	Effective Management of Hazardous Waste including E-Waste – Co-processing and Co-incineration – Hazardous Waste Rules	5 days	Oct. 17-21, 2016	IIWM, Bangalore
3.	New Development in Pollution Control Technologies (Water & Air) – Adequacy and Efficiency (with field visits)	3 days	Nov. 09-11, 2016	NSI, Kanpur
4.	Identification of Contaminated Sites and its Treatment Technologies, Interferences and Data Management using GIS – Hands-on-Training	5 days	Nov. 14-18, 2016	IIT-Roorkee
5.	Hands-on-Training on Sophisticated Instruments and GC/GC-MS Operation	3 days	Nov. 23-25, 2016	NGRI, Hyderabad
6.	Advanced Instrumentation Techniques – Hands-on-Training	3 days	Dec. 19-21, 2016	NIH, Roorkee
7.	Environment Management for Power Plants, Use and Disposal of Fly Ash – New Avenues, Opportunities, Constraints and Challenges	3 days	Jan. 05-07, 2017	CIMFR, Dhanbad
8.	Water & Air Quality Monitoring, Sampling, Analysis and Data Management – Hands-on-Training	5 days	Jan. 09-13, 2017	NEERI, Nagpur

S. No.	Training Titles	Duration	Tentative Schedule	Training Institute
9.	Environmental Management in Tanneries (including ZLD, Chrome Recovery), Slaughter Houses, Sponge Iron Plants, Pharma and Chemical Sector	5 days	Jan. 09-13 , 2017	CES, Chennai
10.	Occupational Health & Safety Management System (OHSMS) 18001: 2007/Updated Version and OHSAS	5 days	Jan. 09-13, 2017	NIOH, Ahmedabad
11.	Risk Management in Chemical Industries – Hands-on-Training	3 days	Jan. 11-13, 2017	DMI, Bhopal
12.	Emergency Response to Spillages/ Illegal Disposal/Fire of Hazardous Wastes	3 days	Jan. 18-20, 2017	DMI, Bhopal
13.	Environmental Data, Interpretation, Compilation, Analysis, Presentation and Reporting – Hands-on-Training and Case Studies	5 days	Jan. 30 - Feb-03, 2017	ISI, Delhi
14.	Air and Water Quality Index with respect to all parameters - National Scenario	3 days	Feb. 01-03, 2017	NEERI, Nagpur
15.	Environmental Pollution and its Health Impacts – Practical Sessions	3 days	Feb. 01-03, 2017	TERI, Delhi
16.	Environmental Legislations, Interpretation, Enforcement, Legal and Statutory Requirements – Case Studies (Middle & Senior Level)	5 days	Feb. 06-10, 2017	NLSIU, Bangalore
17.	Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025:2005/Updated Version and NABL Requirements	3 days	Feb. 08-10, 2017	NIOH, Ahmedabad
18.	Performance Monitoring of STPs/ CETPs – Practical Aspects	3 days	Feb. 14-16, 2017	ESCI, Hyderabad
19	Cleaner Production Technologies – Practical Aspects	3 days	Feb. 15-17 2017	IIT-Roorkee
20	Global Warming, Climate Change and Disaster Management – Future Perspective	3 days	Feb. 21-23, 2017	PGIMER, Chandigarh

2. CPCB organised Internship/Dissertation Industrial Training for about 50 Students of M.Sc., B.Tech, and M.Tech from various Institute & Universities during summer & winter in the Financial Year 2016-17.

CHAPTER-IX

ENVIRONMENTAL AWARENESS AND PUBLIC PARTICIPATION

9.1 LIST OF PUBLICATIONS PRINTED DURING THE YEAR 2016-17

1. Assessment &Characterisation of Plastic waste Generation in 60 Major Cities ;
2. Status of Pollution Generation Generated from Road Transport in Six Cities
3. Real time water Quality Monitoring system on River Ganga and Yamuna
4. System & Procedure for Compliance to emission Limits for petrol and kerosene Run Generator SetsUpto 19kw
5. System Procedure for Compliance to Emission Limits for Diesel Engines (up to Gross Mechanical Power 800kWm) for Genset Applications
6. Conservation of water Quality of GangaA Segmental Approach
7. Guidelines for Management ,Handling , Utilisation and Disposal of Phosphogypsum Generated from phosphoric Acid Plants
8. CPCB Initiatives and Achievements
9. Benthic Macro Invertebrates of river Ganga
10. Classification of industrial Sectors under Red Orange Green and White
11. Status Report on Compliance to the Bio-medical waste management rules, by the Armed forces Health Care Establishments
12. Technical Handbook for installation, Maintenance, calibration, Data connectivity and Data Quality Check of Continuous Ambient Air Quality Monitoring System (Real Time)
13. PARIVESH .New letter Matter –Fine Particulate
14. Parivesh NewsletterPhenol & Phenolic Compounds

9.2 STRENGTHENING OF COMPUTER NETWORK

Efforts are made for uninterrupted LAN and Internet connectivity to CPCB officials of various divisions and strengthening the Computer Network at Parivesh Bhawan. Total computers on LAN with Internet connectivity are about 450. The technical support was taken from NIC and vendors to ensure that the security issues are addressed in time to prevent the vulnerabilities attacking the network.

Activities undertaken during the financial year 2016-17:

- A 100 Mbps link established to facilitate CPCB users and 34 Mbps link as a backup to provide Internet in office premises.
- For strengthening of existing Wi-Fi network, hotspot server and radius server installed for Wireless Network Security.
- New Servers installed in CPCB Wireless Network for smooth WI-FI Network Operation for minimizing the down time.
- Maintenance of all network components including those installed for Wireless connection in CPCB premises.

- Antivirus servers and patch server are updated (Smart Scan Pattern) for continuous usage of LAN system.
- Senior officers are provided with laptop computers having latest configuration for effective work coordination and quality of output.
- More than 150 users are connected through Wi-Fi.
- More than 20 new LAN connections to facilitate online FTS (File Tracking System) and RTDMS.
- The number of IP conflict issues down in number using latest software, applications and updated IP data base.
- The Management of traffic monitoring and reporting of Internet and other complaints is improved.

Website Management

Website management & updation is continued activity to disseminate information/data among public through Internet.

- Prepared E-book version of CPCB bulletin.
- Uploaded a section on home page of link for "Daily Air Quality Index of Delhi".
- Developed new webpages in existing website like :
  i. Year wise categorization of "Directions issued by CPCB".
  ii. Re organize what's new section
  iii. Added new section of recruitment results under Jobs section.
- Regular updation of data and information on critically polluted areas, air quality, water quality, SOPs, status of compliance, etc.
- Made a provision of Gallery to upload the information related to various events held at Head Office/Regional Directorates.
- The work of redesigning of existing website is near to complete and will be launched soon.

CPCB's Website contains huge data and rich/useful information. The users' response/access to CPCB site has been very good. During the period from 1st January, 2016 to 31st December, 2016, number of hits were more than 6.89 crore, out of which 6.51 crore hits were successful. In total 27,82,311 visits were made to the site, 48.56% of these visits were by the international users. The average duration of visit lasted more than 8 minutes.

9.3 IMPLEMENTATION OF E-TENDERING SYSTEM IN CPCB

With reference to the OM from Department of Expenditure, Ministry of Finance, it has become mandatory that all the tenders above the value of Rs. 2.00 lakhs are be processed through e-Procurement system.

The e-Procurement system covers the complete tendering process starting from online publishing of tender, enquiries, online bid submission by the bidders, online bid opening, uploading of bid evaluation and publication of award of Contract.

CPCB has also implemented the E-tendering system in CPCB by using the NIC e-Procurement application called Govt. e-Procurement System of NIC (GePNIC) accessible at URL: http// eprocure.gov.in. Online structure is used for opening of Technical/financial bids and uploading

of evaluation results of the received bids Till date 13 tenders of CPCB are uploaded under this system.

9.4 CPCB E-SAMIKSHA

CPCB e-samiksha is an online, real time monitoring system for the follow up of actions, decisions taken during meetings chaired by chairman. The necessary results and progress of works will be updated by the concerned divisions at head office, Regional Directorates, state boards.

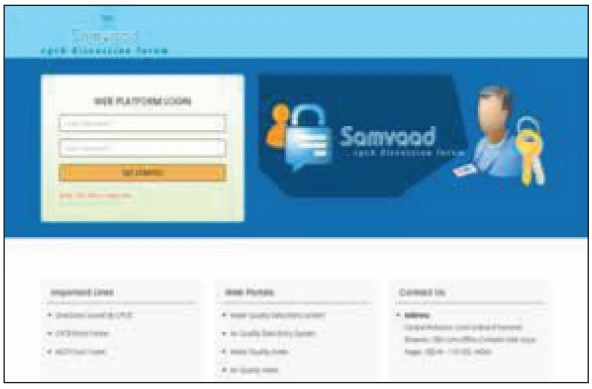
This portal is developed to redefine process for effective tracking and resolving issues, facilitate discussion on issues, provide detailed information on the progress or delay of various activities discussed in meeting, provide fast and accurate information to the government for strategic decisions and provide a common platform for regular follow-up of actions.

"Samvaad" CPCB discussion forum:

"Samvaad" is an Online Discussion Forum for CPCB officials to discuss internal activities and topics of CPCB. It also provides various information regarding directions, meetings, etc. in single platform.

This portal is developed to facilitate Online discussion on specific topic, share experiences and related information of inspections, access publications, directions, meetings, etc. It also acts

as single platform for knowledge Hub on various information and links related to CPCB to help officials.



9.5 केन्द्रीय बोर्ड में राजभाषा नीति का कार्यान्वयन

केंद्रीय प्रदूषण नियंत्रण बोर्ड अपने मुख्याभ्लय सहित छः क्षेत्रीय निदेशालयों और एक परियोजना कार्यालय में भारत सरकार की राजभाषा नीति का कार्यान्व यन कर रहा है। हिन्दी अनुभाग द्वारा भारत के संविधान में निहित संघ की नीति के अनुसार राजभाषा अधिनियम, 1963 और राजभाषा (संघ के शासकीय प्रयोजनों के लिए प्रयोग) नियमों के साथ–साथ इस संबंध में भारत सरकार द्वारा समय–समय पर जारी किए आदेशों का अनुपालन सुनिश्चित किया जाता है।

केन्द्रीय प्रदूषण नियंत्रण बोर्ड के क्षेत्राधिकार के अंतर्गत निष्पादित किए जाने वाले काम–काज का विवरण इस प्रकार हैः–

क. रिपोर्टाधीन वर्ष के दौरान केन्द्रीय बोर्ड में राजभाषा अधिनियम/नियम तथा राजभाषा नीति संबंधी सभी प्रावधानों/आदेशों का पालन सुनिश्चित किया जा रहा है। राजभाषा अधिनियम, 1963 की धारा 3(3) के तहत जारी सभी दस्तारवेजों को द्विभाषी रूप में ही जारी किया गया। कार्यालय में राजभाषा अधिनियम, 1976 के नियम 8(4) के तहत सभी प्रवीणता प्राप्त अधिकारियों/कर्मचारियों को अपना काम–काज हिन्दी में करने के लिए व्यक्तिशः आदेश जारी किए गए है।

ख. केन्द्रीय बोर्ड में कार्यरत 80 प्रतिशत से अधिक अधिकारियों/कर्मचारियों को हिन्दी में प्रवीणता/कार्य साधक ज्ञान प्राप्त होने पर कार्यालय को राजभाषा नियम, 1976 के नियम 10(4) के तहत अधिसूचित किया गया है। सभी अनुभागों में तैनात अधिकारियों एवं कर्मचारियों द्वारा टिप्पिणयां हिन्दी में की जा रही हैं। प्रवीणता प्राप्त अधिकारियों/कर्मचारियों को अपना काम–काज हिन्दी में ही करने के लिए कहा गया है। केन्द्रीय बोर्ड द्वारा 'क' 'ख' और 'ग' क्षेत्र के साथ पत्राचार हिन्दी में किया जा रहा है।

ग. केन्द्रीय बोर्ड में प्रतिवर्ष हिन्दी दिवस का आयोजन किया जाता है। गत वर्षों की भांति इस वर्ष भी बोर्ड में 14 सितंबर, 2016 को श्री जे एस कम्योत्रा, निदेशक, केन्द्रीय प्रदूषण नियंत्रण बोर्ड की अध्यक्षता में हिंदी दिवस समारोह का आयोजन किया गया।

चित्रः सरस्वमती वंदना प्रस्तुत करते स्कूली छात्र

चित्रः: हिन्दी दिवस समारोह में उपस्थित अधिकारी एवं कर्मचारी

चित्रः हिन्दी दिवस के अवसर पर कविता पाठ करते कविगण।

चित्रः हिन्दी दिवस समारोह के अवसर पर मंच पर उपस्थित अधिकारी गण

इस अवसर पर आयोजित विभिन्न प्रतियोगिताओं में केन्द्रीय बोर्ड के अधिकारियों एवं कर्मचारियों ने सक्रिय रूप से भाग लिया। सभी प्रतियोगिताओं के विजेताओं को नकद पुरस्कार से सम्मानित किया गया। हिन्दी दिवस कार्यक्रम की शोभा तब और अधिक बढ़ गई जब हिंदी के सुप्रसिद्ध ओजस्वी कवि श्री अली हसन मकरेडिया ने अपनी ओजस्वी कविताओं और हास्यकवि श्री अशोक शर्मा ने अपनी हास्य से परिपूर्ण कविताओं से उपस्थित अधिकारियों/कर्मचारियों को आनंदित किया।

इस अवसर पर हिन्दी टिप्पण/आलेखन, वैज्ञानिक एवं तकनीकी लेख, हिन्दी टंकण, हिन्दी संभाषण प्रतियोगिताएं आयोजित की गई, जिनमें अधिकारियों एवं कर्मचारियों को प्रथम, द्वितीय एवं तृतीय पुरस्कारों से पुरस्कृत किया गया।

घ. बोर्ड में प्रतिवर्ष प्रोत्साहन पुरस्कार योजना (टिप्पण/आलेखन) लागू की जाती है। रिपोर्टाधीन अवधि में भी प्रोत्साहन पुरस्कार योजना (टिप्पण/आलेखन) लागू की गई, इस प्रतियोगिता में 10 प्रतिभागियों को पुरस्कारों से सम्मानित किया गया। हिन्दी टंकण/आशुलिपि और डिक्टेशन आदि तथा जल, वायु और शोर प्रदूषण से संबंधित विषयों पर मूल रूप से पुस्तरक लेखन की योजनाएं भी लागू की गई।

ङ. बोर्ड में कार्यरत अधिकारियों के लिए वर्ष में चार हिन्दी कार्यशालाएं आयोजित की गई। विभागीय राजभाषा कार्यान्वयन समिति का गठन किया गया है, जिसकी इस अवधि में नियमित रूप से चार बैठकें आयोजित हो चुकी हैं। बोर्ड नगर राजभाषा कार्यान्वयन समिति (उत्तरी दिल्ली) का सदस्या है। इसकी वर्ष में दो बैठकें आयोजित हो चुकी है, जिनमें बोर्ड के उच्चाधिकारी ने भाग लिया। बोर्ड में हिन्दी प्रगति की तिमाही, छमाही व वार्षिक रिपोर्ट तैयार कर पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, राजभाषा विभाग व नराकास को भेजी जाती है। अनुपालन की निगरानी के लिए जांच बिंदु बनाए गए हैं। इसके अतिरिक्त विभागों का समय–समय पर निरीक्षण भी किया जाता है।

क्षेत्रीय निदेशालयों एवं परियोजना कार्यालय आगरा में हिन्दी संबंधी गतिविधियां

केन्द्रीय बोर्ड के मुख्यालय की भांति सभी छः आचंलिक कार्यालयों व परियोजना कार्यालय आगरा में भी वर्ष 2016–17 के दौरान राजभाषा अधिनियमों का अनुपालन सुनिश्चित किया गया। इस क्रम में सभी क्षेत्रीय निदेशालयों में क्षेत्रीय निदेशक की अध्यक्षता में विभागीय राजभाषा कार्यान्वयन समिति की नियमित बैठकें आयोजित की गई और कर्मचारियों एवं अधिकारियों को अपना सरकारी काम–काज हिन्दी में करते समय आने वाली कठिनाई व झिझक को दूर करने के लिए 04 कार्यशालाएं आयोजित कराई गई। इसके साथ ही सितंबर माह में हिन्दी दिवस के दौरान विभिन्न प्रतियोगिताएं जैसे हिन्दी टंकण प्रतियोगिता, टिप्पण आलेखन प्रतियोगिता, लिखित प्रतियोगिता एवं श्रुतलेख का आयोजन किया गया, जिसमें सभी अधिकारियों एवं कर्मचारियों ने सक्रिय रूप से भाग लिया। इस दौरान विजेताओं को पुरस्कामर प्रदान कर सम्मानित किया गया।

9.6 ACTIVITIES OF NGO CELL DURING THE YEAR 2016-17

An NGO Cell was set up in CPCB in the year 1992 to coordinate the following tasks:

- Enlist environmental NGOs involved in activities related to pollution control with CPCB;
- Establish NGO network in consultation with State Pollution Control Boards/Zonal Offices;
- Provide training to the NGOs and equip them with facilities, like water testing kits, analytical instruments, books, literature etc. in order to enhance their capabilities in the field of pollution control; and
- Organise mass awareness programmes and pollution control activities through NGOs.

During 2016-2017, 6 NGOs were additionally enlisted with CPCB subject to concurrence of concerned CPCB Zonal Offices apart from 789 NGOs enlisted during the previous years. A rebate @ 50% is extended for the purchase of CPCB publications, to NGOs enlisted with CPCB and several NGOs have availed this facility during 2016-2017.

Financial Assistance of Rs. 10,000/- each have been provided to 1 NGO for organizing Mass Awareness Programme on abatement of pollution during the year 2016 - 2017.

9.7 PUBLIC GRIEVANCE PORTAL IN CPCB

Total 1455 Public Grievances were disposed of during the Year 2016 – 2017 through portal at CPCB.

CHAPTER-X

ENVIRONMENTAL STANDARDS INCLUDING SCHEDULE FOR THEIR ENFORCEMENT

10.1 NOTIFICATION OF ENVIRONMENTAL STANDARDS

a. Environmental Standards for Fertilizer Industry

The approved standards by Peer and Core Committee were discussed in the 164th board meeting held on January 21, 2014. The new standards aim at harmonization of earlier standards. The proposed standards got approved by the Board and were discussed in the expert committee meeting on April 5, 2016 at MoEF&CC.

b. Preparation of Comprehensive Industry Document and the Status of Paint Industry

COINDS was prepared in 1990-1991 for development of effluent standards only. Since then sector has undergone fundamental changes in terms of raw materials consumption, technological up-gradation, and demand growth. There was a need to revise the existing effluent standards and to develop the emission standards (VOCs). This study was awarded to NPC, New Delhi in April 2009. Final report was submitted by NPC in 2013.

The proposed standards for effluent, VOCs & air emission were approved in the peer & core meeting & also got approved in the Expert Committee meeting at MoEF&CC on April 5, 2016 for notification under EPA, 1986.

c. Compliance & Testing Procedure for Measurement of Lead Contents in Household and Decorative Paints

MoEF& CC has notified vide G.S.R. 1030 (E), dated November 1, 2016 Regulation on Lead Contents in Household & Decorative Paints. As per Rule 7 of this notification, CPCB is requested to develop the compliance and testing procedure in association with Central Power Research Institute (CPRI). In this regard, a meeting is conducted on 17.1.2017 with representative of CPRI, Indian Paint Association. Based on that meeting, draft Compliance & Testing Procedure for Measurement of Lead Contents in Household & Decorative Paints has been prepared and placed at CPCB website.

d. Preparation of Comprehensive Industry Document and the Status of Pesticide Industry

Comprehensive Industrial Document (COINDS) for Pesticide Industry was prepared in 1988-89. Further, status of pesticide Industry was prepared in the year 1993-94. In these documents, aspects of air pollution and solid waste were not covered. Later, source emission standards for inorganic parameters like HCl, Cl_2, H_2S, P_2O_5, NH_3, HBr & PM and CH_3Cl (organic) were notified during year 2006 and also incinerator emission standards were notified in 2008 for pesticide industry. Since then the sector has undergone changes in terms of raw material consumption, technological up-gradation, demand growth. Also there is a need to re-look into the additional pollutants generated from pesticide industries other than the notified parameters & development of VOC emission standards. The existing

document therefore needs to be upgraded to include new and developing technologies and their efficacy to treat various pollutants, also to include status of pesticide industries. In this regard, a project on "Preparation of Comprehensive Industrial Document (COINDS) on Pesticide industry" had awarded to M/s Development Consultants Pvt. Ltd (DCPL), Kolkata in November, 2013. The duration of the study is 2 years. Draft Report was submitted by DCPL, Kolkata in 2015. Comments have been sent to DCPL, Kolkata and Final Report is under preparation.

e. Environmental Standard of Manmade Fiber Industry

Revision of emission standards for carbon disulphide (CS_2) and hydrogen sulphide (H_2S) is solicited by Association of Manmade Fibre Industry for new and expansion projects due to non-availability of desirable cost effective technologies to meet the existing emission norms for CS_2 and H_2S. The existing Comprehensive Industry Document (COINDS), first prepared in 1979-80 for liquid effluents in Manmade Fibre Industry and first COINDs document of CPCB.

The proposed standards were approved in the peer & core meeting & CPCB Board meeting &also got approved for notification on May 11, 2016 in the Expert Committee meeting at MoEF&CC.

f. Development of Emission Standards & Preparation of Comprehensive Document (COINDS) for Pharmaceutical sector

The revision of COINDS is required to include the status of pharmaceutical industries with production details of different types of bulk drugs with therapeutic use, number of units and their locations, type of pharmaceuticals and process adopted, raw materials used and effluent generation from different streams, segregation & its treatment presently adopted by industrial units, mode of disposal of wastewater, reduction & recycling of effluent, Best treatment technologies available, by- product recovery / utilization, solvent recovery, type and source of emissions from processes, BAT for control of emission, Cost of Treatment both for waste water as well as emission etc. In this regard, project on "Development of Emission Standards including VOCs & Preparation of Comprehensive Document (COINDS)" has been awarded to M/s Ramky Enviro Engineers Ltd., in October, 2013. The project is completed. The final draft report received and meeting was held on March 22, 2017 with stakeholders at CPCB to finalize the proposed emission standards.

10.2 ZERO LIQUID DISCHARGE CONCEPT/WASTE WATER MANAGEMENT PRACTICES/REVISION OF STANDARDS/ONLINE MONITORING for SUGAR, TEXTILE, DISTILLERY, PULP & PAPER & SLAUGHTER HOUSE SECTORS –

Standards for compliance for different industrial sectors have been notified under the Environment Protection Act, 1986. The notified standards permit industries to discharge the effluents only after compliance of standards. However it has been observed that many times industries failed to meet the standards and as a result, rivers like Ganga and its tributaries are carrying high pollution load and it is the dilution available in river water which helps in minimizing the pollution load. After recognizing the situation that many industrial sectors are not able to achieve notified standards, resulting in discharge of untreated/partially treated effluent in the drains/rivers, CPCB ultimately started working towards Zero Liquid discharge/water conservation and management in the feasible industrial sectors, as a regulatory requirement.

Zero Liquid Discharge concept refers to installation of facilities and system which will enable complete utilization of industrial effluent through absolute recycling of recovered water (permeate) and utilizing the solute/reject (dissolved organic and in-organic compounds/salts) by adopting method of concentration and thermal evaporation. ZLD is recognized and certified based on two broad parameters that is, water consumption versus waste water re-used or recycled (permeate) and corresponding solids recovered (percent total dissolved / suspended solids in effluents).

Adoption of Zero Liquid Discharge system aims to zero-down discharge of organic load, recovery of metals and other constituents and its reutilization and reduction in fresh water consumption by way of reuse of recovered water from effluent. Pre-requisite for ZLD accomplishment would include physical and chemical treatment and followed by biological system to remove organic load. The treated effluents can be then subjected for concentration and evaporation. The concentration process as applicable can be adopted at appropriate stage. The concentration method quite often involves the adoption of Reverse Osmosis (RO) and Nano Filtration (NF) methods. The evaporation methods involve incineration/ drying / evaporation of effluent in multi effect evaporators (MEE). Any combination of the above methods can be practiced, depending on the industrial sector and available technologies, for the achievement of ZLD. The waste water management practices encourage reuse of treated effluent in the process/irrigation with options for treatment, if required.

1. SUGAR SECTOR:

Sugar sector is the second largest agro based sector in India. A total of about 602 industries are presently operating in 16 different states of India. In Ganga main stem there are 84 industries in operation. Sugar mills are seasonal industries, thus ETPs are not operated in off season. Sugar cane itself generates about 600 to 700 liters/tone of cane crushed. It is estimated that raw water consumption is about 150-200 lit/t of cane crushed and waste water generation is around 200 to 400 lit/t of cane crushed.

The strength of wastewater is not very high but due to pollution load, (BOD = 800-1200 mg/l,COD = 2000 -3000 mg/l) sugar sector is classified as highly polluting industrial sector. The treatment system is well defined and is able to achieve the regulatory standards if the ETP is operated properly.

In order to ensure compliance in Sugar sector, especially to Ganga Region, an action plan was formulated for implementation of water conservation and management practices. Accordingly, directions under Section 18(1) (b) of Water Act, 1974 were issued to nine Ganga basin State Pollution Control Boards, directing to follow time targeted action plans. Based on the continued consultation in implementation of above action plans discussions with Industries, Associations and State Pollution Control Boards were carried out. On consultations draft national standard has been published for public comments in October 2015. Based on the comments/ MOEF & CC organized a meeting of experts for suggesting the final notification and the revised standard has been notified on 14-01-2016.

The salient features of the new standards are:

- ✓ Final wastewater discharge limit reduced from 400 l/tonneto 200 l/tonne of cane crushed. (Final treated effluent discharge restricted to 100 lit/tonne of cane crushed and Waste

water from spray pond overflow / cooling tower blow down to be restricted to 100 lit/ tonne of cane crushed and only single outlet point from unit is allowed.)

- ✓ Irrigation standard for discharging waste water to different types of soil.
- ✓ Establish cooling arrangement and polishing tank for recycling the excess condensate water to process/utilities/allied units.
- ✓ Effluent treatment plant to be stabilized one month prior to the start of the crushing season and continue to operate one month after the crushing season. During no demand period for irrigation the treated effluent to be stored in a seepage proof lined pond having 15 days holding capacity only.
- ✓ Flow meter to be installed in all water abstraction points and usage of fresh water to be minimized.
- ✓ Suitable Air pollution control devices to be installed to meet the particulate matter emission standard.
- ✓ Retained the existing standards for BOD and TSS. Oil & Grease and TDS as parameters are added in the revised standards.

Regarding installation of Online Effluent Monitoring System (OCEMS), the sector has done good progress. Around **408** industries have been installed the OCEMS and connected to CPCB central portal. Closure directions have issued to all non-compliance industries including the closed industries.

2. TEXTILE SECTOR:

Indian textile industry is the second largest producer of textiles and garments in the world after China; earning around 27% of the foreign exchange and about 14 % to industrial production. It is the second largest employer after agriculture and involves around 35 million workers (21% of the total employment) and contributes about 4% to GDP and about 12% of India's exports.

General process involves: - Preliminary process of Fiber production, Intermediate dry processes like Spinning, Weaving and Knitting. Intermediate wet processing like, Desizing (removing size material from woven fabric), Scouring (Cleaning fabric from impurities), Bleaching (eliminating unwanted colour matter decolorizing colour Impurities), Mercerizing (giving luster, more strength, and higher affinity for Dyes) and Dyeing (adding colour and intricacy to fabrics) and Finishing process like printing, cutting, stitching, packing etc. Being water intensive sector recycling and reuse of water is being practiced by the sector in all process levels.

As per the present policy, and new notification of standard dated 10-10-2016, more emphasis is given for meeting the standards and discouraging any disposal directly into rivers and lakes. Further studies are envisaged to technically suggest the ideal water usages depending upon the Best Available Technology.

Process of standard notification:

CPCB had issued directions under Section 18(1) (b) to nine Pollution Control Boards (SPCBs/ PCCs) of Ganga Basin states for seeking action plan from industries on implementation of ZLD in textile sector in March and April, 2015 as part of Ganga Rejuvenation and Action Plan. Based on this, CPCB has proposed draft environmental standards for notification to MoEF&CC wherein ZLD related aspects have been included.

The draft standards have been uploaded by the Ministry on its website for inviting public comments. The comments on the draft standards have been received and same were discussed with concerned stake holders including Ministry of Textile. Based on the discussions, modifications were done and emphasis was given on implementation of environmental discharge standards rather than advocating for blanket ZLD. Accordingly, new standards for textile industry were notified on 10-10-2016. All cluster based textile industries connected with CETPs has to implement CETP standards notified in January, 2016.

Earlier, there were three sets of standards notified for textile sector namely separate for cotton textile, woolen textile and general textile; now in new standards only one set of standards are notified for All Integrated textile units, units of Cotton / Woolen /Carpets/ Polyester, Units having Printing / Dyeing /Bleaching process or manufacturing and Garment units.

3. SLAUGHTER HOUSE:

Slaughter houses generate substantial quantity of effluent and solid waste requiring treatment before disposal. Given the highly organic degradable nature of the wastes, accumulation of the same leads to unhygienic atmosphere, unpleasant odour and chances of environmental pollution.Liquid waste from the slaughter including washing and cleaning effluent also carries high organic load due to mixing of blood and other organic matter and requires sufficient treatment before disposal. Previous standards for Slaughter House were notified during 1990 hence, CPCB awarded a project to Central Leather Research Institute (CLRI), Chennai for Review of effluent standards for Slaughter House. Taking inputs from the project revised standards were notified on 28-10-2016.

4. PULP AND PAPER SECTOR:

In India there are more than 700 pulp & paper industries. In India, the paper is manufactured from diverse raw materials such as (i) Wood, (ii) Agro-residues (bagasse/wheat straw etc) and (ii) waste paper/recycled paper/RCF. Pulp & Paper mills are categorised as Large (Above 24000 TPA), and Small (below 24000 TPA) scale.

The Pulp and paper industry is among the 17 categories of highly polluting industries. The significant environmental impacts of the manufacture of pulp and paper results from the pulping and bleaching processes. The major problems of the wastewaters are high organic content (BOD:300-1500 mg/l), dark brown coloration (due to lignin), adsorbable organic halide (AOX), toxic pollutants, etc. Water consumption changes depending on the production *process* and varies with *rawmaterial* used and quality of end product and can be as high as 80 m^3/ton of paper produced.

Implementation of the 'Charter for water recycling and pollution prevention in pulp & paper industries in Ganga River Basin' (2016-2017)

CPCB issued directions on 24.02.2015 under section 18(1)(b) of the Water Act to SPCBs of the nine Ganga River Basin States for issuance of directions under section 33 (A) of the Water Act to pulp & paper industries operating in their respective States for implementation of the 'Charter for Water Recycling & Pollution Prevention in Pulp & Paper Industry (Specific to Ganga River Basin States)' (hereinafter referred to as 'the Charter'). The Charter programme formulated short term and long term objectives to standardize process and ETP operations, reduce wastewater generation, promote recycling and reuse of water and improve environmental compliance.

Uttar Pradesh: In view of the direction dated 24.02.2015, CPCB along with UPPCB organized interactive meeting at Regional Offices (ROs) level to review the status of implementation of the Charter and present compliance with respect to the Short term objectives, namely norms for fresh water consumption, effluent generation and treated effluent quality in terms of pH, BOD, COD, TSS, TDS, Colour & AOx. Details of the review meetings held and participating mills are as under:

Date of Meeting	Venue	Name of Regional Offices covered	No. of participating pulp & paper mills
UTTAR PRADESH			
12/03/2016	Kanpur	Kanpur, Kanpur Dehat, Varanasi, Allahabad, Raibareli, Unnao, Lucknow, Gorakhpur, Basti & Faizabad	17
17/03/2016	Meerut	Meerut, Ghaziabad, Noida, Greater Noida, and Saharanpur	27
22/03/2016	Moradabad	Moradabad, Bijnor, Bareilly, Firojabad and Bulandshhahr	16
29/03/2016	Muzaffarnagar	Muzaffarnagar	31
WEST BENGAL			
22-23/09/2016	Kolkata		26
Total Operational Mills			**117**

Installation of bio-digester in Paper mill as part of meeting Charter norms:

West Bengal: As a follow-up for the implementation of Charter in the State of West Bengal, CPCB issued direction u/s 18(i)(b) of the Water Act vide letter dated 28.10.2016 to West Bengal SPCB for carrying out inspection of 11 identified pulp & paper mills and issuance of appropriate directions to pulp & paper mills operating in the State of West Bengal. West Bengal SPCB vide letter dated 24.11.2016 has asked identified pulp & paper mills for commissioning of adequate ETP system and completion of remaining action points of the Charter, in a time bound manner.

Installation of on-line monitoring systems in pulp & paper sector:

Across India, 173 Pulp & Paper mills have installed real-time online effluent monitoring system or camera and flow meter and out of it, 157 have connected to CPCB server for 24x7 real-time

online data transmission. All the 125 pulp & paper mills in Uttar Pradesh & Uttrakhand, which are operational, have installed online effluent monitoring system/web cameras in their plant.

Revision of standards: CPCB is in the process of revision of effluent and emission standards for pulp & paper industries. The standard prepared by CPCB has been forwarded to MoEF & CC for notification.

5. DISTILLERY SECTOR

Distillery sector is one of the 17 categories of highly pollution industries identified by the Government of India. In molasses based distilleries, waste water with very high pollution potential, termed as "spent wash" is generated after fermentation and distillation. Spent wash is characterized by its dark brown colour, low pH (3-4.5 - acidic) and containing very high organic loading BOD (40,000-60,000 mg/l) and COD (80,000-1,20,000 mg/l). The volume of spent wash generated is also very high and averages to about 8-15 times by volume of the alcohol produced.

In grain based distillery, the main effluent generated in the distillation is called as whole stillage. However, compared to the molasses based distillery effluent, the pollution load is less in grain based distillery effluent and the volume of effluent generated is also less.

ZLD action plan for Ganga Basin:CPCB had already circulated guidelines for adoption of Zero Liquid Discharge in feasible identified industrial sectors including Distillery and prepared an action plan for the Ganga basin states for the implementation of these guidelines. The Action plan for molasses based distillery involves adoption of Zero Liquid Discharge and reduction of fresh water consumption by following Concentration (by MEE) & Incineration or Concentration (by MEE) & bio-composting route for spent wash management along with reuse of recovered water and suitable recycling of other effluent streams.

Installation of Settlers (pre treatment) & Multi Effect Evaporator in distillery:

CPCB has timely reviewed the implementation of ZLD action plan in the Ganga Basin distilleries through crash inspections and reports from SPCBs. It was found from the date compiled from the visit reports and information received from respective SPCBs that 17 distillery units out of the 26 operating molasses based units in the 764 GPI units have implemented the action plan and are following ZLD route by the installation of multi

effect evaporator followed by bio composting/incineration. CPCB has issued direction u/s 18 (1)(b) of the Water Act, 1974 to SPCBs in case of the remaining 09 distillery unit for closing down operations till completing the implementation of ZLD action plan.

Installation of Online monitoring systems in Distilleries: CPCB had initiated action for the installation of real time effluent and emission monitoring systems in the 17 category of highly polluting industries, including Distilleries with data connectivity to CPCB/SPCBs for the purpose of self-monitoring and verification.

As per the information available (till 31st march, 2017), 193 units have installed the required real time monitoring systems. CPCB is also verifying the connectivity of the installed systems and random monitoring of industries, based on the alerts generated or no data submission have also been initiated.

Revision of standards: The notification/revision of environmental standards for various industrial sectors is also a mandated activity of CPCB and revision of standards for Fermentation sector is being taken up. Draft standard prepared by CPCB had already been published by MoEF&CC in the website on 28.03.2016, inviting comments from stakeholders. The comments received from the various stakeholders have been compiled and again sent to MoEF&CC, incorporating the views of CPCB and the final notification is under process. The revision of standards aims at incorporation of ZLD following the prescribed routes, as a National Standard for molasses and grain based distilleries.

10.3 Revised Environmental Standards for Slaughter Houses & Meat Processing Units

Based on the proposal from CPCB for revised Effluent Standards for Slaughter Houses & Meat Processing Units and Sea Food Industries, the MoEF&CC, after inviting suggestions from public, finalized the revised and published the revised standards vide MoEF&CC notification dated 28.10.2016

10.4 Finalization of the revised Environmental Standards for Brick Kilns

The suggestions received in response to the notification of draft revised Emission Standards for Brick Kilns were compiled and commented upon by CPCB and forwarded to MoEF&CC. The Expert Committee on Environmental Standards in MoEF&CC in its meeting held on 10.05.2016 discussed the proposed revised Emission Standards for Brick Kilns and finalized the proposal for consideration.

10.5 Notification of the draft revised Environmental Standards for standalone Leather Tanneries

Based on a proposal from CPCB, the MoEF&CC issued a notification of draft revised Emission Standards for standalone Leather Tanneries on 10.10.2016. The suggestion received in response to the notification were compiled and commented upon by CPCB and forwarded to MoEF&CC for finalization of the proposal by the Expert Committee on environmental standards in MoEF&CC.

10.6 Guidance Document for Drawing up of BAT Reference Documents for Environmental Compliance

Team of experts from UBA (German Environment Agency) and GIZ and officers from CPCB jointly prepared 'Guidance Document for Drawing up of BAT Reference Documents for Environmental Compliance for 3 Sectors – Textile, Tannery and Chemical (Pharmaceutical

& Dye). During the above study field visits with CPCB and SPCB carried out at Ankleshwar (for chemical sector), Kanpur and Banthar-Unnao (for tannery sector) and Pilkhua (for textile sector); and training programmes were conducted for CPCB

Draft 'Enforcement Protocol / Ordinance for Environmental Compliance in Leather tannery Sector in India'

Also, team of experts from UBA and GIZ in association with CPCB developed a draft 'Enforcement Protocol / Ordinance for Environmental Compliance in Leather tannery Sector in India'

Action taken to check compliance of primary standards by tanneries on Ganga

In Kanpur-Unnao region 66 tanneries units were inspected under Crash-II program and NGT orders and closure direction were issued to 29 non-complying units

Action Taken to Ensure Upgradation of Tanneries CETPs on Ganga

In view of non submission of the schedule for up-gradation of CETPs in Jajmau (Kanpur), Site-II Unnao and Banthar Unnao to attain compliance of norms, including TDS, CPCB issued Show cause Notices to 400 tanneries in Jajmau, 23 tanneries in Banthar and 14 tanneries in Unnao on 31.3.2016.

In response to the above mentioned Show cause notice, the Unnao and Bantha (Unnao) CETPs got prepared DPRs for improving the CETPs for all parameters except TDSi/FDS but no firm time schedule has been committed even for the proposed improvement to ensure compliance of all parameters except TDSi/FDS in treated effluent, and no concrete plan has been submitted to ensure compliance of TDSi/FDS in treated effluent at the out let of CETP. Therefore, CPCB issued Directions u/s 5 of Environment (Protection) Act 1986 to all member tanneries of Unnao CETP and Banthar (Unnao) CETP on 14.07.2016 directing them to comply the following:

1. *To submit undertaking to participate in the proposed improvement of the CETP*
2. *To submit firm time schedule, not exceeding beyond December 2016, for completing the proposed improvement in full.*
3. *To submit additional proposal for improving the CETP to address compliance of FDS parameter at the outlet of CETP, along with firm time schedule, not exceeding beyond June 2017 for completing the same.*

Whereas, no plan with firm time schedule was submitted for improvement of the Jajmau CETP to ensure compliance of all parameters including TDSi/FDS in treated effluent at the outlet of the CETP. Therefore, CPCB issued Directions u/s 5 of Environment (Protection) Act 1986 all member tanneries of the Jajmau CETP on 14.07.2016 directing them to comply the following:

1. *To submit proof of being member of the SPV to undertake or participate in the needed improvement of the CETP and submit undertaking to participate in the improvement of CETP.*
2. *To submit plan to improve the CETP to ensure compliance of all parameters including TDSi/FDS in treated effluent at the outlet of CETP with firm time schedule, not exceeding beyond June 2017.*

A collective reply from tanneries in Jamau indicated that a DPR has been prepared for Jajmau CETP. However, no plan with firm time schedule has been submitted to CPCB either by SPV or by U.P. Jal Nigam. UPPCB was then asked by letter dated 2.9.2016 to revoke consent of tanneries in Kanpur as no schedule has been submitted.

CHAPTER - XI

PROSECUTIONS LAUNCHED, CONVICTION SECURED AND DIRECTIONS GIVEN FOR CLOSURE OF POLLUTING INDUSTRIES

Status of OCMS in Chemical Industries

Out of 23 units, 22 units have provided OCMS and provide connectivity with CPCB. Closure direction has been issued u/s 5 of the E (P) Act, 1986 by Central Pollution Control Board to the One Refinery industry for non-compliance w.r.t to installation of online monitoring system.

In Dye and dye intermediate, 62 units have provided connectivity out of 72. Closure directions have been issued to 45 units u/s 5 of the E (P) Act, 1986 by Central Pollution Control Board to the Dyes and Dye Intermediate industries for non-compliance w.r.t to installation of online monitoring system.

In fertilizer sector 74 unit have provided connectivity out of 81 unit. Closure directions have been issued to 33 units u/s 5 of the E (P) Act, 1986 by Central Pollution Control Board to the Fertilizer industries for non-compliance w.r.t to installation of online monitoring system.

Direction has been issued u/s 5 of EPA, 1986 to 94 pesticide units on July 22, 2015. Out of which 52 units has installed OCEMs, 13 issued closure directions and 29 units have been exempted under installation of OCEMs.

In caustic sector 30 units have provided connectivity out of 33 units and rest three units have been issued closure direction**.**

In Petrochemical sector 26 unit have provided connectivity out of 30 unit and closure direction are being issued to the noncompliance unit.

Implementation of Online / real time Continuous/ (24x7) Monitoring Systems in Tanneries

CPCB had issued Directions cum Show cause notices u/s 5 of Environment (Protection) Act 1986 to 80 tanneries under 17 categories, and 4442 tanneries on Ganga in July 2015 regarding installation of Online (real time) Continuous (24x7) Effluent Monitoring Systems.The units which did not comply with CPCB's direction were directed to be closed.

Under 17 Category tanneries 48 units were issued closure directions, and 67 units were issued closure directions under Ganga. Total 375 tanneries (442 minus 67) on Ganga installed OCEMS but only 83 of these units completed connectivity of the OCEMS by December 2016. Therefore, the remaining 292 units (375-minus 83) were issued directions to either provide online connectivity by 31.1.2017 or closed by 1.2.2017

CENTRAL POLLUTION CONTROL BOARD, DELHI
RECEIPTS & PAYMENT ACCOUNT FOR THE YEAR ENDED 31.03.2017

(AMOUNT IN Rs.)

RECEIPTS	CURRENT YEAR	PREVIOUS YEAR	PAYMENTS	CURRENT YEAR	PREVIOUS YEAR
I. Opening Balance			I. Expenses		
a) Cash in hand	-	-	a) Establishment Expenses (corresponding to schedule 20)	434,504,495	391,533,641
b) Bank Balances	-	-	b) Administrative Expenses (corresponding to schedule 21 and 24)	179,396,875	198,124,198
i) In current accounts	159,101,300	325,703,866	c) Prior Period Exps	11,833,944	2,080,376
ii) In deposit accounts	51,502,691	136,112,506	II. Payments made against funds for various projects	-	-
iii) Savings accounts	49,760,503	132,740,008	Project Exps	118,979,595	330,490,214
II. Grants Received	-	-			
a) From Government of India - Mains	906,860,000	640,000,000	III. Investments and deposits made		
b) From State Government	-	-	a) Out of Earmarked/Endowment funds	-	-
c) From Government of India - Projects	421,555,287	43,080,616	b) Out of Own Funds (Investments-Others)	-	-
d) Others	-	5,089,880			
			IV. Expenditure on Fixed Assets &Capital Work in progress		
			a) Purchase of Fixed Assets-Own fund	12,672,828	15,950,117
III. Income on Investments from			b) Purchase of Fixed Assets- Earmarked/Endowment funds	-	-
a) Earmarked/Endow. Funds	13,356,622	21,107,058			
b) Own Funds	-	-	V. Refund of surplus money/Loans		
			a) To the Government of India	25,439,953	48,306,042
IV. Interest Received	-	-	b) To the State Government	-	-
a) On Bank deposits	2,892,998	-	c) To other providers of funds	-	-
b) Loans. Advances etc.	2,823,703	-	d) To the Government of India - Mains	-	-
			VI. Finance Charges (Interest & Bank charges Sch 23)	24,000	23,606
V. Other Income (Specify)					
a) Income from Royalty, Publications Etc.	134,000	144,520	VII. Other Payments (Specify)		
b) Other Income	3,037,013	2,746,838	a) Advances and other payments (Net) - Mains	497,291,968	166,694,580
c) Misc Income	295,099,361	-	b) Advances and other payments (Net) - Projects	14,712	63,410
VI. Amount Borrowed	-	-			
			VIII. Closing Balances		
VII. Any other receipts			a) Cash in hand	-	-
a) Other - Mains	455,452,255	110,417,129	b) Bank Balances	-	-
c) Sale of Fixed Assets	-	99,189	i) In current accounts	256,212,702	162,712,233
d)Advances and other payments (Net)-Mains	-	-	ii) In deposit accounts	32,514,752	51,502,691
			iii) In Savings account	792,689,909	49,760,503
Grand Total	2,361,575,733	1,417,241,610	Grand Total	2,361,575,733	1,417,241,610
				-	-

Schedules 1 to 26 forming part of accounts are annexed

As per our report of even date
For Prakash Jain & Co.
Chartered Accountants
Firm Reg. No. 007405N

(K C Jain)
M.NO. 015438
Partner
Place: Delhi
Date: 14/07/2018

Prakash Jain & Co. New Delhi Firm Reg. No. 007405N Chartered Accountants

For Central Pollution Control Board

(S. P. Singh Parihar, IAS)
Chairman

(Prashant Gargava)
Member Secretary

(Mohan Kapur)
Accounts Officer

(Virendra Bansal)
Assistant Accounts Officer

Page 22

CHAPTER - XIII

ANNUAL ACTION PLAN

Central Pollution Control Board (CPCB) is focusing on strengthening of ambient air quality monitoring network for assessment of air quality at national, regional and local level. NAMP stations operated through State pollution control Boards needs further strengthening to monitor all notified parameters for ambient air, besides emphasis is being given for establishment of Continuous Ambient Air Quality Monitoring Stations (CAAQM) in all major cities.

The manual water quality monitoring network is being expanded further, realizing the need for establishment of a network of real time water quality monitoring stations on river Ganga to ensure that the water quality is maintained. Efforts are being made for strengthening of the compliance mechanism, so that no untreated industrial effluent is discharged into the environment. Installation of online effluent and emission monitoring in polluting industry and data connectivity with SPCB/CPCB is a step towards self-monitoring and transparency.

Efforts are for improving the performance of existing sewage treatment plants (STPs) and adopting non-conventional technologies that are in synergy with the conventional methods for improving the water quality of river Ganga and its tributaries. Initiatives are being taken for water conservation in Industries trough process modification and adoption of state of art technology. Zero liquid discharge concepts shall be applied wherever possible to conserve the water and protect the environment.

Problem of Municipal Solid Waste and domestic sewage would be given utmost attention.

TARGETS AND ACHIEVEMENTS OF 2016-17

Outcome of various activities of CPCB during financial year 2016-17 is briefed as below:

13.1 Assessment of Pollution

- Operation and maintenance of 680 manual Ambient Air Quality Monitoring Stations (AAQMS)
- Operation and maintenance of 16 continuous ambient air quality monitoring stations (CAAQMS)
- CPCB has developed a network of real time data from CAAQM stations being operated by CPCB, SPCBs and PCCs. This data is provided to all stake holders and being published in public domain for taking corrective measures in time. In the beginning of the year 2016, CPCB network has data connected from 40 stations in 22 cities spread in 12 states, has been expanded to total 54 stations located in 33 cities of 12 states.
- Operation of 2500 Water Quality Monitoring Stations (WQMS) at various aquatic resources. Time series data of water quality was analysed and identified the issue of sewage disposal in 302 river polluted stretches.

- 70 National Ambient Noise Monitoring Network (NANMN) stations have been installed spreading over 10 cities and data is being disseminated.

13.2 Industrial Pollution Control

- During the year 03 standards (emission and effleunts standards of various industries) have been notified by MoES & CC and 11 developed standards referred to ministry for notification.
- Comprehensive Environmental Pollution Index (CEPI) has been revised based on detailed in-house discussions followed by consultation with SPCBs/PCCs and other concerned departments The revised version of CEPI eliminates the subjective issues and more emphasis has been given on field-based monitoring which includes air, water and land / sub-surface water. Field-based measurements are based on critical pollutants / parameters applicable to the given area. Revised concept of CEPI has been circulated to SPCBs / Govt. Institutions and uploaded on website of CPCB. Comments / views received have been considered and incorporated in the Final Draft Document referred to MoEF after approval of the Board.
- Action Plans with progress reports of 42 critically polluted areas have been prepared and compiled and placed on CPCB website.
- CPCB has finalized the criteria for classifying industries into Red, Orange, Green and White category. The classification is based on pollution potential and this classification will also bring uniformity for its adoption by SPCBs .Classification of industries may be linked with the siting criteria, consent mechanism and determining periodicity for inspections.

13.3 Control of pollution in Ganga

- CPCB has prepared segmental action plan for restoration of water quality of River Ganga which is based on dividing the entire River Ganga into 4 segments and for each segment, action points have been evolved for implementation. The main concern is pollution due to disposal of sewage and control of industrial pollution. CPCB has issued directions to all towns (118) which are along the Ganga for getting the action plans prepared for implementation for management of sewage and municipal solid waste.
- Inventory of grossly polluting industries have been prepared and Compliance verification to the existing standards for all the industries including MSMEs being undertaken as well as continuing with the action plan for ZLD and water conservation being implemented for 5 sectors (Sugar, Textiles, Distilleries, Pulp & Paper and Tanneries).

13.4 Waste Management

- Effort for Implementation of Co-processing of incinerable hazardous and non-hazardous waste in cement kilns has been made. CPCB granted permission to 47 cement plants for co-processing of hazardous wastes in cement kiln. Eighty Eight (88) types of hazardous waste such as spent organic solvent, paint sludge, spent carbon, ETP sludge are being co-processed.

- Disposal of UCIL hazardous waste (Bhopal)
- E-waste management at Moradabad and its environmental impact and the preparation of detailed report and expeditious implementation.

13.5 Training, Mass Awareness and Environment Data Bank:

- Implementation of Raj-Bhasha (Hindi) in CPCB and organizing Hindi Diwas, Workshop and Training Programmes for CPCB officials.
- Published technical and scientific reports and mass awareness.
- Conducted national training programmes on various environmental pollution and prevention areas.

13.6 Proposed Activities for 2017-18

- Strengthening of ambient air and water quality monitoring network.
- Establishing real time water quality monitoring stations on river Ganga and other major rivers to assess the water quality on real time basis.
- Expansion of continuous ambient air quality monitoring network to cover million plus cities and state capitals.
- Installation of real time effluent and emission monitoring systems in polluting industries to ensure that emissions/ effluent is meeting the prescribed norms. strengthening of the compliance mechanism, so that no untreated industrial effluent is discharged into the environment
- Improving the performance of existing sewage treatment plants (STPs) and adopting non-conventional technologies that is in synergy with the conventional methods for improving the water quality of river Ganga and its tributaries.
- Emphasis on Waste Management.
- Operation and maintenance of Laboratory and its management.

Priority Areas includes

13.7 Management of

- o Solid waste
- o Air Quality
- o Water Quality
- o Domestic Waste Water

13.8 Online monitoring of

- o Effluent/ emission quality of highly polluting industries
- o Monitoring of ambient air quality on real time basis in CEPI areas and million plus cities and state capitals
- o Monitoring water quality of river Ganga on real time basis

13.9 Budget Allocation for 2017-18

13.10 Project Head-wise Budget Allocation for 2017-18

The allocation made against each Project Head is summarized as under:

Budget Heads	Title of the Budget Head	Allocation (₹ in Lakh)		
		Head Office	Regional Directorate	Total
I	Pollution Assessment (Survey and Monitoring) Division covered AQM, WQM-I and WQM-II	**227.50**	**63.00**	**290.50**
II	Scientific, Technical Activities and R&D Activities Division covered Air Quality-I, Air quality – II, trace Organic, water and waste water, instrumentation, biological	**574.00**	**318.00**	**892.00**
III	Industrial Pollution Control (standards, enforcements and technologies): Division covered IPC-I, IPC-II, IPC-III, IPC-IV, IPC-V, IPC-VI, IPC-VII, building, Law-I & II, Quick response team			
	a) Standard Development	**45.00**	**0**	**45.00**
	b) Enforcement	**4157.00**	**1455**	**5612.00**
	c) Technology	**1.00**	**0**	**1.00**
IV	Training and Awareness: Division Covered Pollution Control Planning, Public Relation and Grievances, ETU			
	a) Training Programmes	**110.00**	**22.00**	**204**
	b) PR, Mass Awareness Programmes & Hindi	**62.00**		
	c) Library	**10.00**		
V	Information (Database) Management Division Covered Information technology,	**195.00**	**16.50**	**211.50**
VI	Waste Management and Urban Pollution Control (Plastic Waste, Hazardous Waste, Municipal Solid Waste, Bio-medical waste, E-waste & Vehicular Pollution) Division Covered WM-I, WM-II, WM-III, UPC-I, UPC-II, UPC-III,	**153.00**	**21.00**	**174.00**
	Total	**5534.5**	**1895.5**	**7430.00**

CHAPTER - XIV

OTHER IMPORTANT ACTIVITIES DEALT BY CENTRAL POLLUTION CONTROL BOARD

14.1 MUNICIPAL SOLID WASTE MANAGEMENT

Central Pollution Control Board (CPCB) co-ordinates with the State Pollution Control Boards (SPCBs) Pollution Control Committees (PCCs) and Urban development departments regarding implementation of the Solid Wastes Management Rules and timely submission of Annual Reports on implementation of the MSW Rules.

For implementation of Solid Waste Management Rules, 2016, CPCB has taken the following initiatives: -

A. Directions on 18.4.17 to Delhi Pollution Control Committee (DPCC) u/s 18(1)(b) of the Water /Air Act to direct authorities of Delhi for implementation of SWM Rules, 2016. The DPCC responded action taken report- i.e. Issued Directions under Section 5 of Environment (Protection) Act, 1986 to all ULBs , i.e. Urban Local Bodies.

a) CPCB issued Directions u/s 5 of the Environment (Protection) Act, 1986 to the Secretary-in-charge, State UD Departments of all States/UTs for constitution of State Level Advisory Body (SLAB) and convening its six monthly meeting.

b) CPCB issued Directions under Section 5 of Environment (Protection) Act, 1986 to East Delhi Municipal Corporation (EDMC), South Delhi Municipal Corporation (SDMC), North Delhi Municipal Corporation, New Delhi Municipal Corporation, Delhi Cantonment Board (DCB). and under section 18(1)(b) to the DPCC for implementing SWM Rules, 2016 including ensure structural stability of landfill sites.

c) CPCB issued Directions under Section 5 of the Environment (Protection) Act, 1986 to the Commissioners of Municipal Authorities of 53 Metro-cities and 18 State Capitals for implementation of Solid Waste Management Rules, 2016.

B. In addition to above, CPCB has taken the following actions for implementation of MSW Rules, 2000 and SWM Rules, 2016:

I. Publications & Report/Guidelines:

a) CPCB published various Guidelines/Reports for proper implementation of MSW Rules

b) CPCB has also prepared Guidelines on Buffer Zone around waste processing and disposal facilities above 5 TPD capacity for implementation of SWM Rules, 2016. The report is available on CPCB's Website (www.cpcb.nic.in)

c) CPCB has prepared National Action Plan on Solid Waste Management for assisting to State/UTs for preparing the State Action Plan/ Policy/Strategy. The report is available on CPCB's Website.

d) CPCB has prepared Report "Selection Criteria for Waste Processing Technologies" for assisting Municipal authorities for selection of proper technology of waste processing and preparing Action Plan/ DPRs by Municipalities accordingly. The report is available on CPCB's Website

II. Workshop & Training

a) CPCB organized interactive meets with ULBs on implementation of Solid waste Management Rules, 2016.

b) CPCB conducted Interactive Meets with SPCBs, ULBs, NGOs & Technology Providers on capacity building for implementation of Waste Management Rules, 2016.

c) Further under the 'Swachh Bharat Mission', CPCB in collaboration with National Productivity council under the guidance of MoEF&CC and MoHUA, Govt. of India, initiated a project for conducting Nationwide Capacity Building Programme on implementation of Waste Management Rules, notified by the MoEF&CC in the year 2016 in 68 cities.

14.2 PLASTIC WASTE MANAGEMENT

In India approximately 15 Million tonnes (2016) plastic products are consumed every year. Its broad range of application is in packaging films, wrapping materials, shopping and garbage bags, fluid containers, clothing, toys, household and industrial products, and building materials. As per the study conducted by Central Pollution Control Board (CPCB) in 60 major cities of India, it has been observed that around 4059 T/day of plastic waste is generated from these cities. The fraction of plastic waste in total Municipal Solid Waste (MSW) is around 7% of MSW. With extrapolation of the plastic waste generation data from 60 major cities, it is estimated that around 25,940 T/day of plastic waste is generated in India. The data revealed that out of total plastic waste generated, around 94% waste comprises of thermoplastic content, which is recyclable such as PET, LDPE, HDPE, PVC etc. and remaining 6% belongs to the family of thermoset and other categories of plastics such as SMC, FRP, multi-layered, thermocol etc., which can be considered as non-recyclable.

Salient Features of Plastic Waste Management Rules, 2016

For effective plastic waste management, Government of India notified Plastic Waste Management Rules, 2016 on 18th March, 2016, superseding earlier Plastic Waste (Management and Handling) Rules, 2011. Following are the salient features of PWM Rules, 2016:

- PWM Rules, 2016 shall apply to every Waste Generator, Local Body, Gram Panchayat, Manufacturer, Importer, Producer and Brand Owner.
- Carry bag made of virgin or recycled plastic shall not be less than fifty microns in thickness. The provision of thickness shall not be applicable to carry bags made up of compostable material, complying IS/ISO: 17088.
- Waste Generators including institutional generators, event organizers shall not litter the plastic waste. They shall segregate waste and handover it to authorized agency and shall pay user fee as prescribed by ULB for waste management or spot fine in case of violation.
- Within a period of six months from publication of PWM Rules, 2016 in official Gazette, Producer, Brand Owner shall work out modalities for waste collection system for collecting back the plastic waste generated due to their products, in consultation with local authority/State Urban Development Department and implement it within two years thereafter.
- Promote use of plastic waste for road construction or energy recovery or waste to oil or co-processing in cement kilns etc.

- Only the registered shopkeepers or street vendors shall be eligible to provide plastic carry bags to the customers for dispensing the commodities after paying plastic waste management fees (minimum ₹48,000 per annum) to concerned Local Body.
- SPCBs/PCCs shall be the authority for enforcement of the provisions of PWM Rules, 2016, relating to registration, manufacture of plastic products and multi-layered packaging, processing and disposal of plastic wastes.

Prescribed Authorities for enforcement of Plastic Waste Management Rules, 2016

S. No	Prescribed Authority	Responsibilities
1	State Pollution Control Board (SPCB)/ Pollution Control Committee	Enforcement of the provisions of PWM Rules, 2016, relating to registration, manufacture of plastic products and multilayered packaging, processing and disposal of plastic wastes.
2	Secretary-in-Charge, Urban Development Department	Enforcement of the provisions of PWM Rules, 2016, relating to waste management by waste generator, use of plastic carry bags, plastic sheets or like, covers made of plastic sheets and multilayered packaging.
3	Gram Panchayat	Enforcement of the provisions of PWM Rules, 2016, rules relating to waste management by the waste generator, use of plastic carry bags, plastic sheets or like, covers made of plastic sheets and multilayered packaging in the rural area of the State or a Union Territory.
4	District Magistrate or Deputy Commissioner	Shall provide the assistance to SPCBs/PCCs, Secretary-in-Charge, Urban Development Department and Gram Panchayat under his jurisdiction, whenever required for enforcement of provisions of PWM Rules, 2016.

Responsibilities of CPCB as per PWM Rules, 2016

S. No.	Rule No. (as per PWM Rules, 2016)	Description
1	**4(h)**	The manufacturers or seller of compostable plastic carrybags shall obtain a certificate from the Central Pollution Control Board before marketing or selling their products.
2	**5(c)**	Thermoset plastic waste shall be processed and disposed of as per the guidelines issued from time to time by the Central Pollution Control Board.
3	**6(2)(d)**	The Local Bodies shall ensure processing and disposal of non-recyclable fraction of plastic waste in accordance with the guidelines issued by the Central Pollution Control Board.
4	**17(d)**	The CPCB shall prepare a consolidated Annual Report on the use and management of plastic waste and forward it to the Central Government along with its recommendations before the **31st August** of every year.

Status of implementation of PWM Rules, 2016:

As per the provision'17(3)' of PWM Rules, 2016, SPCBs/PCCs shall prepare and submit the annual report on implementation of these Rules to CPCB by 31st July every year. Based on information provided by SPCBs/PCCs, it has been observed that SPCBs/PCCs are not able to collect information from all Urban Local Bodies (ULBs) of the State, however, observations are given below:-

1. As per the provision '13(1)' of PWM Rules, 2016, all the plastic manufacturing/recycling units shall be registered with the concerned SPCBs/PCCs. There are around **312** unregistered plastic manufacturing/recycling units are still running in few States/UTs, namely: Andhra Pradesh, Assam, Jammu & Kashmir, Jharkhand, Manipur, Punjab, Tamil Nadu, Telangana, Uttarakhand and Uttar Pradesh. The concerned SPCBs/PCCs can be directed to take appropriate action against the unregistered units running in their States/UTs.

2. According to the Rule '6' of Plastic Waste Management Rules, 2016, Municipal Authorities shall be responsible setting up, operationalization and co-ordination of waste management system and performing the associated functions. It has been observed that most of the States/UTs have not established the organized system for Plastic Waste Management. Hence, resulting into widespread littering of plastic waste in towns & cities of the country. Few States/UTs namely: Goa, Chhattisgarh, Gujarat, Odisha and Tamil Nadu are transporting their plastic waste to the cement plants located in neighboring or same State for co-processing. Besides, few other States/ UTs namely: Nagaland, Tamil Nadu and West Bengal are using plastic waste for polymer bitumen road construction.

3. As per Rule '15(1)' of PWM Rules, 2016, shopkeepers and street vendors willing to provide plastic carry bags to the customers for dispensing any commodity shall register with local body on payment of plastic waste management fee of minimum rupees forty eight thousand @ rupees four thousand per month. Further, Local Body shall be responsible for registration of shopkeepers and street vendors, willing to provide plastic carrybags to the customers However, it is observed that most of the States/UTs have not included any provision under their appropriate state statute or byelaws for registration of shopkeepers and street vendors.

4. As per the Rule '14(1)' of PWM Rules, 2016, shopkeepers/retailers shall be responsible for use of properly marked and labeled plastic carry bags. Most of the States/UTs are not following the proper practice of plastic carry bag labelling, especially in case of the carry bags available with the street vendors and small retailers.

5. It is observed that most of the States/UTs have not set-up proper monitoring system for use of carry bags as per the specified guidelines. Besides, those States/UTs who have imposed complete ban on use and sell of plastic carry bags, the plastic bags are stocked, sold and used indiscriminately. Also, substandard carry bags (<50μ) are used widely in other States/UTs, violating PWM Rules, 2016.

6. As per Rule '16' of PWM Rules, 2016, the State Government shall constitute a State Level Advisory (SLA) Body to monitor the implementation of PWM Rules, however, majority of the States/UTs have not constituted such monitoring body yet. The States/UTs, who have constituted SLA Body are not convening meetings on regular basis to monitor the progress of implementation of these Rules.

CPCB's recommendations for effective implementation of PWM Rules, 2016:

Based on the observations of Annual Report 2015-16 on implementation of PWM Rules, 2016 CPCB has forwarded following recommendations to the MoEF&CC:

- SPCBs/PCCs may direct to UDDs to ensure setting-up of sources-segregation system for post-consumer plastic waste.
- SPCBs/PCCs may also ensure that no plastic manufacturing/recycling unit is running in non-conforming/residential areas. Besides, it is also ensured that <50μm plastic carrybags/films should not be manufactured, stocked, sold and used in cities/towns.
- SPCBs/PCCs and Municipalities should constitute squad to check illegal manufacturing, stocking, sale of <50μm plastic carrybags.
- SPCBs/PCCs shall ensure that Annual Report on implementation of PWM Rules, 2016 is complete in all respect as per **Form-VI** and submitted timely to CPCB i.e. on **31st July** each year.
- SPCBs/PCCs shall ensure that States/UTs under its jurisdiction have constituted State Level Advisory (SLA) Body to monitor implementation of PWM Rules, 2016 and meet at least once in six months to review implementation status.
- SPCBs/PCCs shall ensure that State Urban Development Departments have in-cooperated PWM Rules, 2016 in Municipal Bye-laws for its effective implementation & penal provision.
- SPCBs/PCCs, Local Bodies and UDDs shall ensure that open burning of plastic waste is totally prohibited as per Hon'ble NGT Order dated 22.12.2016 and 02.01.2017 in OA 199/2014.
- SPCBs/PCCs, Local Bodies and UDDs shall ensure that plastic waste in not littered in public places or dumped in open drains, river, banks, sea beaches etc.

Action taken by CPCB for Plastic Waste Management in the Country:

CPCB has taken following initiatives for effective plastic waste management:

- Circulated Plastic Waste Management Rules, 2016 to all SPCBs/PCCs and Secretaries-in-charge, Urban Development, for implementation.
- Circulated "Guidelines for disposal of Thermoset Plastic Waste including Sheet Moulding Compounds (SMC)/ Fibre Reinforced Plastics (FRP)" to all SPCBs/PCCs, for implementation.
- Circulated report on "Assessment and Characterization of Plastic Waste in 60 Major Cities" to all SPCBs/PCCs and Secretaries-in-charge of Urban Development and requested them to submit the action plan for proper plastic waste management.
- Issued Directions to Municipal Commissioners of 46 Million-Plus & 20 State Capitals cities and Executive Officers of 112 towns situated on the banks of river Ganga u/s '5' of Environment (Protection) Act, 1986 regarding closure of Unauthorized Plastic Manufacturing Industries and implementation of Plastic Waste Management as per PWM Rules, 2016.
- Published an advertisement in newspapers (English and Hindi) for awareness regarding use and sell of plastic carry bags not less than '50 microns' and other issues related to plastic waste management. Further, CPCB directed SPCBs/PCCs to publish advertisement in Hindi, English & Regional language for mass awareness.

- Finalized Standard Operating Procedure (SOP) for registration of Compostable carry-bag manufacturers, sellers and stockists as per Rules 4(h) of PWM Rules, 2016and uploaded on CPCB's website.
- CPCB has issued Indicative Guidelines on Plastic Waste Management to Executive Officers of Municipalities situated on the bank of river Ganga for efficient implementation of PWM Rules, 2016.

Way forward for Plastic Waste Management (to be followed by SPCBs/PCCs and State Governments):

- Setting-up of systematic mechanism for plastic waste collection, segregation and disposal.
- Extended Producer Responsibility (EPR)or Corporate Social Responsibility (CSR) in management of plastic waste.
- Closure of industries in non-conforming areas.
- Recycling of plastic waste in environment friendly manner and utilization of plastic waste in road construction, energy recovery, waste to oil or co-processing in cement kilns etc.
- Widespread mass awareness programme on use of plastic packaging, and its impact on environment, on littering.
- Restriction on use of petro-based plastic carrybags and promotion of carry bags made of Compostable material conforming IS/ISO: 17088.
- Formation of squad for surprise inspection by SPCB/PCC and Municipality for carrybag thickness, marking & labelling of carrybags, compostability certificate and registration of shopkeepers/vendors for providing carrybags to customers.

14.3 HAZARDOUS WASTE MANAGEMENT

As per the updated information received from SPCBs, about 7.23 million metric tons of hazardous waste is being generated from about 62, 406 industries in the country. About 2.85 million metric tons (39%) of the hazardous waste generated is recyclable, 3.51 million metric tons (49%) is landfillable and 0.87 milllion metric tons (12%) is incinerable hazardous waste. Statewise generation of Hazardous waste given below:

State-wise Status of Hazardous Waste Generation in the Country

S. No.	SPCB/PCC	Year of Inventory	No of HW generating Industry	Land-fillable	Incinerable	Recyclable	Total
1	Andaman and Nicobar Islands						No information
2	Andhra Pradesh	2015-16	2088	162023	21610	147476	331109
3	Arunachal Pradesh						No Information
4	Assam	2015-16	50	5039	326	16697	22062
5	Bihar	2015-16	95	55	108	6668	6831
6	Chhattisgarh	2015-16	215	8041	10044	24113	42198
7	Delhi	2008	1995	3338	1740	203	5281
8	Gujarat	2015-16	22418	974296	157099	566575	1697970
9	Goa	2012-13	1093	5514	28566	2474	36554

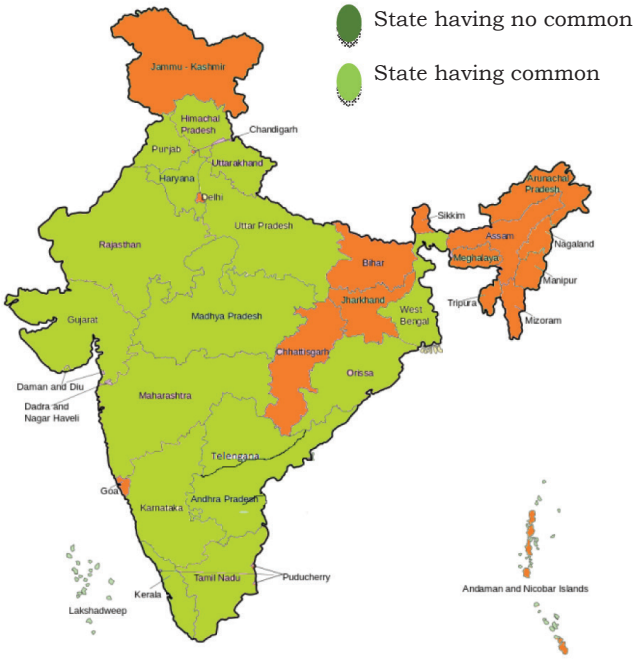
S. No.	SPCB/PCC	Year of Inventory	No of HW generating Industry	Land-fillable	Incinerable	Recyclable	Total
10	Haryana	2010	1646	14862	6745	7952	29559
11	H.P.	2015-16	2521	19315	-	9393	28708
12	J.& K.	2015-16	368	7032	163	8037	15232
13	Jharkhand	2015-16	573	382836	1262	9462	393560
14	Karnataka	2015-16	3832	67110	61338	118766	247214
15	Kerala	2009	442	46295	184	16750	63229
16	Lakshadweep	2015-16	0	0	0	0	0
17	Madhya Pradesh	2015-16	1792	167584	10350	109031	286965
18	Maharashtra	2015-16	5862	588839	313973	740826	1643638
19	Manipur	2015-16	0	0	0	0	0
20	Meghalaya	2015-16	11	309	0	42	351
21	Mizoram	2009-10	211	31	0	186	217
22	Nagaland	2015-16	2	61	0	11	72
23	Odisha	2014-15	674	33895	2804	166167	202866
24	Punjab	2015-16	3012	37210	6185	51007	94402
25	Rajasthan	2015-16	1090	598916	57484	217202	873602
26	Sikkim	2015-16	18	-	7253	-	7253
27	Tripura	2015-16	142	4	25	239	268
28	Tamil Nadu	2015-16	3513	66295	38401	256851	361547
29	Telangana	2015-16	1887	151967	120705	21020	293692
30	Uttar Pradesh	2015-16	2290	92725	15479	125792	233996
31	Uttarakhand	2012	984	5278	4824	45525	55627
32	West Bengal	2015-16	958	53189	6265	83747	143201
33	Dadra & NH	2008	1937	17219	421	56350	73990
34	Daman & Diu						
35	Puducherry	2015-16	112	136	27	39325	39488
36	Chandigarh	2015-16	575	99	24	3454	3577
	Total		**62406**	**3509513**	**873405**	**2851341**	**7234259**

There are 39 common Hazardous Waste Treatment, Storage and Disposal Facilities (TSDFs) in the country out of which 17 are integrated TSDFs with both Secured Landfills and incinerators; 9 TSDFs with only incinerators, and; 13TSDFs with only Secured Landfills located. Only 17 States/ UTs have common TSDFs in the country. The details of common facilities are given below:

S. No.	Name of the State/UT	Integrated TSDFs (with both SLF and Incinerator)	TSDFs with Only Common Incinerators	TSDFs with only Common Secured Landfills
1.	Andhra Pradesh	1	-	-
2.	Gujarat	4	2	2*
3.	Haryana	1	-	-
4.	Himachal Pradesh	-	-	1

S. No.	Name of the State/UT	Integrated TSDFs (with both SLF and Incinerator)	TSDFs with Only Common Incinerators	TSDFs with only Common Secured Landfills
5.	Karnataka	-	5	2
6.	Kerala	-	-	1
7.	Madhya Pradesh	1	-	-
8.	Maharashtra	3	-	1
9.	Odisha	-	-	1
10.	Punjab	-	-	1
11.	Rajasthan	-	1	2
12.	Tamilnadu	1	-	1
13.	Telangana	1	-	-
14.	UP	2	1	1
15.	Uttarakhand	1	-	-
16.	West Bengal	1	-	-
17.	Daman, Diu, Dadra & Nagar Haveli	1	-	-
	TOTAL	**17**	**9**	**13**

** Earlier 05 Common Secured Landfills of which 03 secured landfills have been capped and closed.*



The inventory indicates that only 17 States in the county have common facilities for disposal of hazardous wastes by secured landfill. These 17 states contribute 88% of the land-fillable hazardous waste generated in the country. The States not having common facilities does not have any option except to allow the hazardous waste generating industry to either store the hazardous waste generated within their premises for indefinite period or permit captive secured landfill facilities. However developing multiple captive facilities by industries is not desirable as it would be difficult to monitor and regulate large number of secued landfill sites in future. In order to ensure environmentally sound management of hazardous wastes, every State has to develop a common TSDF or have an agreement with other State to share a common TSDF. As per Hazardous Waste management Rules, the State Government, industry, operator of a facility or any association of industries shall individually or jointly or severally be responsible for identification of sites for establishing the facility for treatment, storage and disposal of the hazardous and other waste in the State. A per national inventory, the States of Assam, Bihar, Chhattisgarh, Delhi, Goa, J&K, Jharkhand, NE-States, Pondicherry, Chandigarh and A&N Islands should initiate setting up of common TSDFs on priority.

Recycling / utilization of Hazardous wastes

The Hazardous Waste Management Rules provides for recycling of commonly recyclable hazardous wastes (such as used oils, battery waste, zinc dross, etc. listed in Schedule-IV) for which guidelines for environmentally sound recycling are already published and circulated by CPCB. There are about 1190 such recycling facilities operating under authorisations issued by SPCBs/PCCs.

Apart from above, the Rule 9 of the hazardous waste management rules provide for utilization of hazardous waste as supplementary resource or for energy recovery including co-processing of the wastes in cement kiln. Such utilization can be authorised by SPCBs/PCCs for the wastes, for which Standard Operating Procedures (SOPs) or guidelines are prepared by CPCB.

In case of co-processing, CPCB has already published guidelines for co-processing of hazardous wastes in cement kiln and the said guidelines have been revised as per recently notified hazardous waste management rules, 2016, the draft guidelines have been circulated.

In case of utilization of hazardous wastes other than by co-processing in cement kilns, CPCB has prepared 34 Standard Operating Procedures (SOPs) for utilization of 28 different types of hazardous wastes after conducting successful trial runs on utilization. The list of such SoPs is given below:

S. No	Type of Hazardous Waste	Source of generation	Type of utilization/ Intended use
1	Spent Solvent – containing Toluene, Xylene, Cyclohexane, Acetone, Methyl isobutyl ketone, Methanol, Isopropyl alcohol, Methylene Dichloride, Tetra Hydro Furan, Ethyl Acetate, Iso Propyl Ether, Dimethyl formamide, Butyl acetate, Methyl Acetate, Butanol, Benzene, Ethanol and Methyl Ethyl Ketone	Industrial use of solvents, production/formulation of drugs/ pharmaceuticals, Petrochemical process and pyrolytic operations.	Recovered solvents/ mixed solvents for Industrial use
2	APCD Dust/ Residue	LD Furnace/Electric Arc Furnace (EAF)/Blast Furnace of Steel Plant/captive Blast Furnace and Ferro-Alloy Plant	As Briquettes for further use in blast furnace to produce pig iron.

S. No	Type of Hazardous Waste	Source of generation	Type of utilization/ Intended use
3	Spent Catalyst containing precious metals and ETP Sludge containing platinum	Petrochemical process and pyrolytic operation, petroleum refining, production of acids, production of nitrogenous and complex fertilizers, production/ formulation of drugs/ pharmaceuticals and ETP sludge	Recovery of Precious metals - Platinum, Iridium, Osmium, Palladium, Rhodium, Ruthium, Rhenium, Gold & Silver
4	Spent H2SO4	Pickling operations of MS rods / sheets	Ferrous Sulphate (Not to be used in drinking water purification and to be used only for industrial purposes)
5	Spent Acid - Containing Molybdenum	Filament and bulb Industry	Molybdenum Trioxide
6	Spent HCl	Metal surface cleaning in steel and rolling industry	Ferric Chloride (Not to be used in drinking water purification or agriculture applications and to be used only for industrial purposes)
7	Used Anode butt	Aluminum Smelter units	Carbon pellets and high energy coke for use in Steel furnaces/ foundries
8	Used Anode butt	Aluminum Smelter units	Carbon blended coke/ electrode carbon paste/ carburizer for use in Steel or Ferro Alloy furnaces
9	Used Anode butt (Pre-processed)	Aluminum Smelter units	Green anodes for use in Aluminum Smelters
10	Used Anode butt (Pre-processed)	Aluminum Smelter units	Carbon Electrode Paste for use in Ferro Alloy Plants
11	Coal Tar/Tarry Residue	Coal gasifier units	As supplementary fuel in furnace of sodium silicate units
12	Contaminated Container/ barrels/ drums	Pharmaceuticals, food processing, cosmetic, textile, paint formulation and beverages industries	Cleaned barrel and drums for industrial use and/or production of plastic granules.

S. No	Type of Hazardous Waste	Source of generation	Type of utilization/ Intended use
13	Process and primary sludge of ETP – Pulp and Paper	Paper & Pulp Industry	Paper Board/ Mill Board / Card Board
14	Aluminium Dross	Refining and casting house of Aluminium smelter units	To recover aluminium metal (captive use)
15	Aluminium Dross	Refining and casting house of Aluminium smelter units	To recover aluminium metal
16	Oil based iron sludge	Grinding mill section of Ball & Roller bearings	Ferrous Sulphate *(Not to be used in drinking water purification or agriculture applications and to be used only for industrial purposes)*
17	Spent catalyst - Containing Mercury and mercury waste	Various industry	Mercury
18	Spent H_2SO_4 containing organic compounds	Dye and Dye intermediates units	Chemical Gypsum for use in cement plants
19	Spent fixer (hypo) solution. Category A9 of schedule-II of HOWM Rules, 2016	Photography / X-rays films	Silver metal for various use
20.	Hydro fluoro silicic acid – Acidic scrubber solution.	Single Super Phosphate manufacturing industry	Recovered Sodium Silico Fluoride (Sodium fluorosilicate) Na2SiF6 for use in Glass industry.
21.	Spent Sulphuric Acid	Para Nitro Toulene Ortho Sulfonic Acid/Oxadiargyl Anthrquinone manufacturing industry	Ferrous Sulphate
22.	Vanadium Sludge	Alumina refineries	Vanadium metal
23.	Phenolic Waste water	Coal Gasifier condensate water	Quenching of hot gases in After Burning Chamber of Direct-reduced iron (DRI) kiln of Sponge Iron Industry
24.	Chemical sludge (Primary sludge) of ETP	Pulp & Paper Industry	For energy recovery in Atmospheric Fluidized Bed Combustion (AFBC) Boiler/Pressurized Fluidized Bed Combustion (PFBC)

S. No	Type of Hazardous Waste	Source of generation	Type of utilization/ Intended use
			Boiler/Circulating Fluidized Bed Combustion (CFBC) Boiler for steam or electricity generation
25.	Spent Carbon (Carbon Slurry)	Urea manufacturing plant	Quenching of carbon slurry in the reactor for manufacturing carbon black.
26.	Spent Acid containing Molybdenum compound	Bulb filament manufacturing industries	Ammonium Molybdate
27.	Resin Waste (mixture of Bisphenol A and Epichlorohydrin)	Resin impregnation of electrical coils power/hydro equipments industries	For manufacturing of High Tension/Low Tension Insulators
28.	Spent Alumina	Polymerization in SWING unit of Petrochemical Plant	For manufacturing of Refractory material like Insulation bricks, Mortar, Castables, High Alumina bricks
29.	Spent Ion Exchange Resin	Demineralization (DM) Plant	For energy recovery in boiler for steam or power generation
30.	Spent Ion Exchange Resin	Demineralization (DM) Plant	For energy recovery in Direct-reduced iron (DRI) kiln of Sponge Iron Industry
31.	Tungsten Scrap	Metal cutting operation (using Tungsten carbide insert), mining tool buttons and worn out drills	For manufacturing Tungsten Carbide Powder.
32.	Spent Pot Lining	During production of Primary Aluminium from Alumina Smelting Industries	As a supplementary resource for manufacturing of Carbon Mineral Fuel
33.	Spent Sulphuric Acid	During manufacturing of 4,4 Diaminobenzene Sulphanilide	Isolation and purification of 2-NADSFA & 6-Acetyl APSA
34.	Coal Tar/Tarry Residue	Coal gasifier units	As supplementary fuel in furnace for energy recovery in Frit manufacturing units

Escrow Account

Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, stipulate that the operator of the Treatment, Storage and Disposal Facility shall be responsible for safe and environmentally sound operation of the Treatment, the Storage and Disposal Facility and its closure and post closure phase. In this regard MoEF&CC, in April, 2009, asked all SPCBs/PCCs to ensure deposition of 5% of the annual turn-over of the landfillable wastes towards Escrow Account enclosing tripartite agreement format for the said Escrow Account. However, at present 03 states (i.e. Andhra Pradesh, Haryana and Telangana) are maintaining Escrow Account as per tripartite agreement with the said 5% of annual turnover whereas Punjab is maintaining with a different rate.

The matter has been deliberated in the 175th Board meeting of the Central Board held on 21st December 2016 and it was resolved that all SPCBs/PCCs shall implement the provision of Escrow Account at the uniform rate of 5 % of annual turnover as per the tripartite agreement shall be implemented w.e.f commencement of the operation of common secured landfill site or 16.04.2009, the day the office memorandum was issued by MoEF & CC, whichever is later. SPCBs/PCCs have been requested by CPCB to ensure operation of Escrow account by all common TSDFs by April, 2017.

Thrust Areas

The following thrust areas have been identified by CPCB for effective implementation of hazardous waste management in the States/UTs;

- Setting-up of Treatment Storage and Disposal Facilities.
- Setting-up or operation of of pre-processing Facilities as per the guidelines issued by CPCB
- Stricter and effective implementation of guidelines/SOPs prepared by CPCB for utilization/ recycling of hazardous wastes
- Augmenting waste Stabilization units installed at TSDFs and pre-processing facilities.
- Augmenting the facilities for testing and characterisation of hazardous wastes
- Upgrading the facilities for Leachate management from Secured landfills
- Installation of online Continuous Emissions Monitoring Systems in hazardous waste incinerators
- Inventory of probably contaminated sites

14.4 Implementation of Batteries (Management & Handling) Rules, 2001

The Batteries Management and Handling Rules were notified in the year 2001 with the primary objective of channelizing the used lead acid batteries for environmentally sound recycling. The Rules mandates State Pollution Control Boards to seek data on sale, import, generation, collection and recycling of used batteries from manufacture, assembler, re-conditioners, importer, auctioneers and batteries recyclers for keeping track of used batteries.

Responsibilities have been fixed on manufacturers, importers, re-conditioners and assemblers to ensure that used batteries are collected back and sent to registered recyclers. Responsibilities were also fixed on other stake holders such as dealers, recyclers, bulk-consumers and auctioneers to maintain records and file annual returns. The regulatory authorities involved are State Pollution Control Boards, Customs authorities, Central Pollution Control Board and Ministry of Environment, Forest and Climate Change.

Annual Compliance Status Reports

SPCBs/PCCs have the responsibility of submitting annual compliance status reports on their own to Central Pollution Control Board by 30th April every year on CPCB circulated formats. Central Board issued several reminders to SPCBs/PCCs to ensure compliance and submission of compliance status reports. However, it has been observed that very few SPCBs/PCCs have complied by filing annual reports. The number of SPCBs filed annual reports over the past 3 years is given at Table below. During the year 2015-2016, CPCB has received ACSR information from only 04 States while the other States have not responded despite reminders.

Table: Number of SPCBs/PCCs submitted Annual Compliance Status Reports (ACSR)

Number of SPCBs/PCCs submitted ACSR	2013-14	2014-15	2015-16
	11	14	04

As per the information received from SPCBs, there are about 500 recyclers of used lead acid batteries waste in the country, having cumulative recycling capacity of about 41 lakh metric tonnes of batter waste. Some of these recyclers are also engaged in import of lead bearing waste for production of lead metal. State-wise details of the authorised recyclers of lead acid batteries us given below:

Status of authorised/registered recyclers of lead bearing waste

S. No.	State	Units	Capacity in MTA
1.	Andhra Pradesh	21	181118
2.	Arunachal Pradesh	Nil	Nil
3.	Assam	08	30942
4.	Bihar	04	6870
5.	Chhattisgarh	05	3308
6.	Goa	Nil	Nil
7.	Gujarat	41	381210
8.	Haryana	41	195563.5
9.	Himachal Pradesh	08	41650
10.	Jammu & Kashmir	09	74960
11.	Jharkhand	02	3000
12.	Karnataka	28	2137022
13.	Kerala	03	3700
14.	Madhya Pradesh	42	100730
15.	Maharashtra	63	232232
16.	Manipur	Nil	Nil
17.	Meghalaya	Nil	Nil
18.	Mizoram	Nil	Nil
19.	Nagaland	Nil	Nil
20.	Orissa	Nil	Nil
21.	Punjab	55	79446.06
22.	Rajasthan	75	317341
23.	Sikkim	Nil	Nil
24.	Tamil Nadu	14	77620

S. No.	State	Units	Capacity in MTA
25.	Telangana	Nil	Nil
26.	Tripura	Nil	Nil
27.	Uttar Pradesh	24	121900
28.	Uttrakhand	Nil	Nil
29.	West Bengal	57	114686
30.	Chandigarh	Nil	Nil
31.	Delhi	Nil	Nil
32.	Dadra & Nagar Haveli	Nil	Nil
33.	Daman & Diu	Nil	Nil
34.	Lakshadweep	Nil	Nil
35.	A & N	Nil	Nil
36.	Pondicherry	Nil	Nil
	Total No. of Units 500	**Total Capacityin MTA**	**4103298**

Status of Registered Importers of New Lead Acid Batteries

As per the provision under Rule 5 Batteries (M&H) Rules, 2001 and as amended in 4th May 2010, the responsibility of granting registration to importers of the new lead acid batteries. Accordingly, importer shall get registered with CPCB for a period of 5 years. As per rule 5(ii), Member secretary or any officer designated by the Central Pollution Control Board is the prescribed authority for issuance, cancellation or refusal of registration.

MoEF&CC and CPCB have granted registrations to 2573 importers of new lead acid batteries till March, 2017. The status of importers of new lead acid batteries is being maintained by CPCB on an online web-based application http://www.cpcbbrms.nic.in The status of importers granted registration are given below;

Table : Status of Registered Importers of New Lead Acid Batteries as on March, 2017.

No of registrations given by MoEF & CC prior to May, 2010	1066
No of registrations given by CPCB till March 2017	1507
No of registrations got expired	384
No registrations cancelled	944
Effective number of registered importers	1245
Total	**2573**

14.5 E-Waste (Management) Rules, 2016

In order to ensure effective implementation of Extended Producer Responsibility (EPR) by producers and to increase their role, in effective management of E-Waste, Ministry of Environment, Forest and Climate Change (MoEF&CC), GoI has notified the E-Waste (Management) Rules, 2016 vide G.S.R. 338(E) dated 23.03.2016 in supersession of E-Waste (Management & Handling) Rules, 2011. The E-Waste (Management) Rules, 2016 are effective from 01-10-2016.

In the 2016 rules the scope of EPR has been widened. Under the EPR target based collection of e waste has been mandated for effective implementation of Extended Producer Responsibly (EPR). Phase wise collection target has been fixed for producers for the collection of e-waste, which can be either in number or weight and shall be 30% of the quantity of waste generation as indicated in EPR Plan during first two year of

implementation of rules followed by 40% during third and fourth years, 50% during fifth and sixth years and 70% during seventh year onwards. The responsibility and options available to producers under EPR are given below:

- Producers have the sole responsibility for collection of e-waste and can set up collection centre or point or even can arrange buy back mechanism for such collection. No separate authorization for such collection centre is required, which are indicated in the EPR Plan of Producers.
- Producer may manage his responsibility through a Producer Responsibility Organisation (PRO). The producers also have options of e-waste exchange and e-retailer for channelisation of e-waste
- Deposit Refund Scheme (DRS) has been introduced as an optional economic instrument wherein the producer charges an additional amount as a deposit at the time of sale of the electrical and electronic equipment and returns it to the consumer along with interest when the end-of-life electrical and electronic equipment (e-waste) is returned back.

The salient features of E-Waste (Management) Rules, 2016 are given below:

i) Stakeholders to be covered under the rules have been expanded to manufacturer, dealer, refurbisher, e-retailer and Producer Responsibility Organization (PRO) to address leakage of e-waste to informal sector at any stage of the chain;

ii) Applicability of the Rules has now been extended to components, consumables and spare parts of EEE which makes the product operational;

iii) Compact Fluorescent Lamp (CFL) and other mercury containing lamps have been brought under the purview of rules.

iv) Only Micro Enterprises has been exempted whereas the Small and Medium enterprises as defined in MSME Developmental Act, 2006 has been covered under the purview of these Rules as manufacturer of EEE and their spare parts;

v) Collection is now exclusively Producer's responsibility, which can set up collection centre or point or even can arrange buy back mechanism for such collection.

vi) No separate authorization will be required for such collection centre which will be indicated in the EPR Plan of Producers.

vii) Bulk Consumer has been redefined in terms of turnover and the number of employees and they have been given responsibility of filing annual returns.

viii) Option has been given for setting up of PRO, e-waste exchange, e-retailer, Deposit Refund, as additional channel for implementation of EPR by Producers to ensure efficient channelization of e-waste;

x) Deposit Refund Scheme has been introduced as an optional economic instrument wherein the producer charges an additional amount as a deposit at the time of sale of the electrical and electronic equipment and returns it to the consumer along with interest when the end-of-life electrical and electronic equipment is returned back

x) Simplification in registration/ authorization for dismantling and recycling through one system i.e. Authorization instead of both registration and authorisation as was in the 2011 rules.

xi) Mandatory obligation has been introduced for dismantlers to supply non e-waste components to relevant registered recyclers of the product;

xii) The transportation of e-waste has to be carried out as per the manifest system whereby the transporter shall be required to carry a document (three copies) prepared by the sender, giving the details as per Form-6;

xiii) Provision on Reduction of Hazardous Substances (RoHS) and related Schedule II has been revised in line with existing EU regulatory framework which forms the basis of the provision;

xiv) In case the product not comply with the RoHS provision, provision has been introduced to withdraw or recall the product from market and take corrective measures to bring the product into compliance;

xv) The role of the State Government has also been introduced in the Rules in order to ensure safety, health and skill development of the workers involved in the dismantling and recycling operations including earmarking or allocation of e-waste dismantling/ recycling by the respective departments or government agency. These responsibilities include:

- To earmark or allocate industrial space or shed for e-waste dismantling and recycling in the existing and upcoming industrial areas
- To register workers involved in dismantling and recycling
- To assist skill development activities for the workers involved in dismantling and recycling
- To undertake annual monitoring and to ensure safety & health of workers involved in dismantling and recycling
- To submit annual report to Ministry of Environment, Forest and Climate Change

xvi) Liability for damages caused to the environment or third party due to improper management of e-waste including provision for levying financial penalty for violation of provisions of the Rules has also been introduced;

xvii) Urban Local Bodies (Municipal Committee/Council/Corporation) have been assigned the duty for collection and channelization of the orphan products to authorized dismantler or recycler;

Status of the E-waste Management

a. The E-Waste (Management) Rules, 2016 mandate CPCB to prepare guidelines on implementation of E-Waste Rules, which includes specific guidelines for extended producer responsibility, channelisation, collection centres, storage, transportation, environmentally sound dismantling and recycling, and refurbishment.

CPCB has prepared these guidelines in consultation with all the stake holders. The guidelines have also been placed on the web site of CPCB. The Implementation Guidelines include specific guidelines on:

1. Implementing Extended Producer Responsibility
2. Collection and Storage of E-Waste
3. Collection Centre
4. Transportation of E-Waste
5. Environmentally Sound Dismantling of E-Waste
6. Environmentally Sound Recycling of E-Waste
7. Refurbisher
8. Consumer and Bulk Consumer

b. Central Pollution Control Board has received 161 applications by 31-03-2017 seeking EPR authorisation.

c. MoU between Centre for Materials for Electronics Technology (C-MET), MeitY, Hyderabad and Central Pollution Control Board (CPCB) has been drafted to facilitate analysis of RoHS parameters in Electrical Electronic Equipment(EEE) listed in Schedule-I of E-Waste rules, 2016. The MoU between CPCB, Delhi and C-MET, Hyderabad has been signed on 13-02-2017.

d. Central Pollution Control Board issued direction under Section 5 of the Environment (Protection) Act, 1986 to District Magistrate of Moradabad for immediate closure of all illegal and unauthorized recycling units operating in the vicinity of Ramganga at Moradabad in UP.

e. In pursuant to Hon'ble NGT, Principal Bench, New Delhi, order dated 17.02.2017 in the matter of OA No. 58/2017 of Mahendra Pandey Vs. UOI & Others, a joint inspection team comprising of officials from Central Pollution Control Board (CPCB), Uttar Pradesh Pollution Control Board (UPPCB) and Ministry of Environment, Forests & Climate Change (MoEF & CC) carried out inspection of the areas on 17-03-2017 in the vicinity of river Ramganga at Moradabad and also other areas of Moradabad, UP to verify the actions taken in compliance of the directions under section 5 of the E (P) Act, 1986 issued by CPCB to District Magistrate (DM), Moradabad, UP vide its letter No. B-29016/1(E-Waste)16/ HWMD dated April 26, 2016 and November 22, 2016.

14.6 Bio-medical Waste Management

14.6.1 Bio-medical Waste Management Rules, 2016:

In order to improve the collection, segregation, processing, treatment and disposal in an environmentally sound management thereby, reducing the bio- medical waste generation and impact on the environment, the Ministry of Environment, Forests and Climate Change (MoEF & CC) vide GSR 343 (E) dated 28 .03.2016 notified The Bio-Medical Wastes Management Rules, 2016 (hereafter referred as BMWM Rules) under the Environment (Protection) Act, 1986 in supersession of the Bio-medical Waste (Management & Handling) Rules, 1998. These rules came into force with effect from the date of notification i.e., on 28.03.2016. Salient features of Biomedical Waste Management Rules, 2016 are detailed as under:

- BMWM Rules is applicable to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio medical waste (irrespective of their size and quantity of waste generation) in any form including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, ayush hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research labs.
- The rules categorize bio-medical waste into four categories (yellow, red, white and blue) and suggest treatment and disposal options as per Schedule I of the BMWM Rules.
- The Occupier or Operator of a Facility is required to take all necessary steps to ensure that bio-medical waste is handled without any adverse effect to human health and the environment in accordance with the rules.
- The rules prescribes requirement for segregation of wastes at source of generation in four colour coded container or bags and labeling as per schedule IV and its storage

in safe and designated place for further treatment and disposal in accordance with the rules.

- Bio-medical waste is required to treated and disposed of in accordance with Schedule I, and in compliance with the standards prescribed under Schedule-II by the HCFs or a Common Bio-medical Waste Treatment Facility (CBWTF).
- The rules permits HCF to have on-site treatment equipment (like incinerator, autoclave or microwave, shredder prior to commencement of its operation), as per the authorisation given by the prescribed authority, provided if there is no any CBWTF within 75 KM radial distance.
- The Occupier is required to ensure treatment & disposal of waste such as human anatomical waste, soiled waste and microbiology waste within 48 hrs and in case such waste is required to be stored beyond such a period, the occupier (HCF) is required to make necessary measures to store such waste and inform the prescribed authority along with the reasons for doing so.
- The prescribed authority for enforcement of these rules in the State is respective State Pollution Control Board (SPCB), Pollution Control Committee (PCC) in respect of the Union Territory and Director General Armed Forces Medical Services (DGAFMS) in case of the Armed Forces Health Care Establishments (AFHCEs).
- Every occupier of an institution or operator of a facility handling bio-medical waste irrespective of the quantity is required to obtain authorisation from the prescribed authority. In case of non-bedded hospitals, only one time authorisation is required and same is required to be granted within ninety days by the prescribed authority, other-wise same will be considered as deemed to be authorised under the BMWM Rules. DGAFMS is the prescribed authority and grants authorization under the BMWM Rules to the AFHCEs..
- The microbiology and other lab waste need to be treated by on-site by the Occupier as per National Aids Control Organization (NACO) or WHO Guidelines and then for final disposal as per BMWM Rules through a CBWTF.
- All the segregated bio-medical waste from the hospital has to be handed over to the CBWTF for final disposal in accordance with the BMWM Rules.
- The Occupier as well as Operator of a CBWTF is required to phase out use of chlorinated plastic bags, gloves and blood bags within 2 years (i.e. by 27.03.2018).
- Occupier is also required to establish a Bar-Code System for bags or containers for transportation of waste to any other place, within one year.
- *The Occupier or Operator is required to provide training to all its health care workers at the time of induction and thereafter atleast once in a year and to provide requisite PPEs as safety measures.*
- All the health care workers has to be immunized as per MoH & FW Guidelines by the Occupier or Operator of a Facility.
- The SPCBs/PCCs are required to make available the annual report on web-site within 2 years (i.e. by 27.03.2018).
- All the existing incinerator operators have to comply with the news standards with respect to residence time, Dioxins and Furans within two years (i.e., by 27.03.2018) by upgrading with suitable APCD.
- Any person including an occupier or operator of a common bio medical waste treatment facility, intending to use new technologies for treatment of bio medical

waste other than those listed in Schedule I may request the Central Government for laying down the standards or operating parameters and its notification under the E (P) Act, 1986.

- The recyclable treated bio-medical wastes such as plastics and glass is required to be sold to the recyclers having valid authorisation or registration from the respective prescribed authority (SPCB/PCC) and such records need to be maintained and submitted to the SPCB/PCC.
- An advisory committee should be constituted in every State and Union Territory by the respective State Governments or UT Administration to advise the Governments. The Advisory committee is required to review once in six months and suggest the government for steps to be taken for effective management of bio-medical waste. The district level monitoring committees also required to be constituted for monitoring of the HCFs at District Level.
- CPCB is required to monitor the AFHCEs with the prior intimation only.
- The annual report for the preceding year (calendar year) should be submitted by the occupier or operator of a facility to a prescribed authority in Form IV by June 30 th every year. The compiled annual report information is required to be submitted to CPCB by SPCB/PCC/DGAFMS by July 31st of every year for the preceding year (calendar year) whereas CPCB is required to submit the compiled annual report information along with recommendations to MoEF & CC by August 31st of every year.
- Disposal by deep burial is permitted only in rural or remote areas where there is no access to common bio-medical waste treatment facility with prior approval from the prescribed authority and as per the Standards specified in Schedule-II and shall be located as per the provisions and guidelines issued by CPCB from time to time.
- Schedule I specifies four colour coded categories of bio-medical waste as well as treatment and disposal options.
- Schedule II specifies standards (operating standards as well as emission norms) for incinerators, plasma pyrolysis or gasification, operating standards for autoclaving, microwaving, efficacy tests, standards for deep burial, standards for efficacy of chemical disinfections, standards for dry heat sterilization, standards for liquid waste discharge.
- Schedule III specifies prescribed authorities responsible for enforcement of these rules (Ministry of Environment, Forest and Climate Change (MoE F & CC), Central or State Ministry of Health and Family Welfare, Central Ministry for Animal Husbandry and Veterinary or State Department of Animal Husbandry and Veterinary, Ministry of Defence (MoD), Central Pollution Control Board (CPCB), State Government of Health or Union Territory Government or Administration , State Pollution Control Boards (SPCBs) or Pollution Control Committees (PCCs), Municipalities or Corporations, Urban Local Bodies and Gram Panchayats) and the corresponding duties.
- Schedule IV specifies label for bio-medical waste containers or bags as well as for transportation of waste.

CPCB vide letter dated 25.10.2016 requested all the SPCBs and PCCs for ensuring effective implementation of the BMWM Rules, 2016 and also requested for submission of the action taken report especially on the time bound activities to be complied under the BMWM Rules, 2016.

14.6.2 Bio-medical Waste Management Scenario:

As per BMW Rules, 1998, State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs) in the respective States/UTs and Director General Armed Forces Medical Services (DGAFMS) in respect of the Health Care Establishments (HCEs) under the jurisdiction of the Ministry of Defence (MoD) have been notified as the 'Prescribed Authority' for overall enforcement of the said Rules. As per Rule 10 of the BMW Rules, 'SPCBs and PCCs as well as DGAFMS are required to submit annual report information in a compiled form to the Central Pollution Control Board (CPCB), for the preceding year by 31st March of every year. Whereas as per BMWM Rules, 2016, the annual report for the preceding year (calendar year)) should be submitted by the occupier or operator of a facility to a prescribed authority in Form IV by June 30 th every year. The compiled annual report information is required to be submitted to CPCB by SPCB/PCC/DGAFMS by July 31st of every year for the preceding year (calendar year) whereas CPCB is required to submit the compiled annual report information along with recommendations to MoEF & CC by August 31st of every year. The annual Report Information on Bio-medical Waste Management for the year 2015 has been received from most of the SPCBs and PCCs except from Haryana State Pollution Control Board and Lakshadweep Pollution Control Committee. Based on the information received from the SPCBs/PCCs and DGAFMS, the bio-medical waste management scenario in the Country is given below:

- No. of healthcare facilities : 1,88,098
- No. of beds : 17,61,316
- No. of Common Bio-medical Waste Treatment Facilities (CBWTFs) : 203* + 32**
- No. of healthcare facilities (HCFs) using CBWTFs : 1,51,854
- No. of HCFs having treatment & disposal facilities : 21,462
- No. of healthcare facilities granted authorization : 99,945
- Total no. of on-site/captive treatment equipment installed (excluding CBWTFs) by the HCFs:
- No. of incinerators
  - i) With Air Pollution Control Device : 337
  - (ii) Without Air Pollution Control Device : 38
  - No. of autoclaves : 3,889
  - No. of microwaves : 143
  - No. of Hydroclave : 07
  - No. of Shredders : 7,662
  - No. of deep burial : 17,474
- Total no. of treatment equipment installed by the CBWTFs:
  - No. of incinerators : 227
  - No. of autoclaves : 233
  - No. of microwaves : 08
  - No. of Hydroclave : 04
  - No. of Shredders : 253
- Quantity of bio-medical waste generated in Tonnes/day : 501

- Quantity of bio-medical waste treated in Tonnes/day : 486
- No. of HCFs violated BMW Rules : 6,074
- No. of Show-cause notices/Directions issued to defaulter HCFs : 5,103

*Note: (i) * - CBWTFs in operation (ii) ** - CBWTFs under installation*
(iii) The information in respect of the Lakshadweep State has been included as per the Annual Report submitted for the year 2014.

14.6.3 Directions / Verifications of compliance of Directions issued under Section 5 of the Environment (Protection) Act, 1986:

Central Pollution Control Board is pursuing continuously for ensuring compliance to the Directions issued under Section 5 of the Environment (Protection) Act, 1986 to the CBWTFs/HCFs. Based on the monitoring / inspections conducted by CPCB during the period January, 2016 to March 10, 2017, following actions have been taken:

- Confirmed directions under section 5 of Environment (Protection) Act, 1986 issued to:
  - 01 Healthcare Facility (HCF) located at Aligarh
  - 03 no. of Common Bio-medical Waste Treatment Facilities (CBWTFs) located at Nashik, Puducherry and Mangalore.
- Show Cause Notice under section 5 of Environment (Protection) Act, 1986 issued to:
  - 02 CBWTFs located at Lucknow and Kanpur.
- Upon confirmation of compliance, revoking directions under section 5 of the Environment (Protection) Act, 1986 have been issued to:
  - 01 no. of CBWTF located at Gwalior, M.P.
- Recommendations / observations made during the inspection carried out by CPCB have also been communicated to 04 no. of CBWTFs located at Bhopal, Ratlam, Muzaffarpur and Meerut for taking necessary corrective measures for ensuring compliance to the Bio-medical Waste Management Rules.

14.6.4 Status report on Compliance to the Bio-medical Waste Management Rules by the Armed Forces Healthcare Establishments:

In order to regulate safe handling and management of wastes generated from Health Care Establishments and to protect human health and the environment, the Ministry of Environment, Forest & Climate Change (MoEF & CC) has notified the Bio-medical Waste (Management & Handling) Rules, 1998 under the Environment (Protection) Act, 1986. Further, these rules have been notified as the Bio-medical Waste Management Rules, 2016 in supersession of the earlier rules. These Rules stipulates 'The Director General, Armed Forces Medical Services (DGAFMS)" as the 'prescribed authority' for enforcing and effective management of Bio-medical Waste in Armed Forces Health Care Establishments (AFHCEs) under the Ministry of Defence (MoD). Also, as per Rule 12 (2) of the BMWM Rules, the Central Pollution Control Board (CPCB) is required to monitor compliance to the BMWM Rules by the AFHCEs. During the years 2008-2015, CPCB inspected about 52 no. of AFHCEs for verification of compliance to the BMWM Rules. To address various issues related to the bio-medical waste management and based on the verification reports, a compliance status report has been prepared highlighting the bio-medical waste management practices including the short comings and scope of improvements in AFHCEs.

This status report also provides recommendations for ensuring effective management of bio-medical waste in AFHCEs in line with the Bio-medical Waste Management Rules, 2016.

14.6.5 Revised Guidelines for Common Bio-medical Waste Treatment Facilities (CBWTFs)

BMWM Rules, 2016 which came to force with effect from 28.03.2016 emphasizes (i) disposal of generated bio-medical waste through the CBWTFs and discourages captive treatment facilities by the Health Care Facilities (HCFs) , (ii) stipulates CPCB to lay down criteria for establishing CBWTFs in the Country, (iii) prescribes new emission standards for bio-medical waste incinerators (applicable from 28.03.2016 for the upcoming incinerators) which include 'mercury and its compounds' as well as 'dioxins and furans' apart from stringent emission norms w.r.to particulate matter, NO_x and HCl etc., (iv) Bar code for bags and GPS provision for the vehicles used for transportation of bio-medical waste (v) website provision by the CBWTFs and (vi) frequency of monitoring of treatment equipment etc.,

In order to comply with the mandate given under the BMWM Rules, 2016, CPCB has initiated action for revision of the existing guidelines for Common Bio-medical waste Treatment Facilities (CBWTFs) which were issued in the year 2003. Though the Guidelines for CBWTFs have been issued in the year 2003, these guidelines are not mandatory under the Bio-medical Waste (Management & Handling) Rules, 1998 as amended and thus its implementation is not effective in most of the States/Union Territories. Now, under the new BMWM Rules, 2016, guidelines are mandatory and thus existing guidelines have been revised in consultation with the stakeholders with an aim to have uniformity in ensuring site selection, allowing and establishment of a state-of-the-art CBWTF, operation as well as verification of compliance to the BMWM Rules, 2016 throughout the country. The existing guidelines have been revised mainly w.r.to

(i) criteria for development of adequate no. of CBWTFs in a region keeping in view the gap analysis, feasibility as well as economic viable operation of the CBWTF,
(ii) clarity in distance criteria/ coverage area of a CBWTF,
(iii) various laws applicable for the CBWTFs including requirement of 'Environmental Clearance',
(iv) location criteria as well as measures in case of relaxation in the location criteria w.r.to the buffer zone,
(v) minimum land requirement of a CBWTF based on the population to ease in case of the metro cities,
(vi) adoption of new technologies including non-burn technologies as prescribed under the BMWM Rules, 2016,
(vii) GPS provision for vehicles used transportation of waste collection from the member HCFs of the CBWTFs;
(viii) provision of unit operations required for effluent waste treatment,
(ix) alternate arrangements in case of closure of a CBWTF is inevitable for violation of the various provision, (x) continuous emission monitoring provision requirement,
(x) details of information to be uploaded in the individual website of a CBWTF,
(xi) frequency of monitoring of treatment equipment for stack emissions,

(xii) efficacy test for autoclave and submission analysis results of the effluent from outlet of ETP,

(xiii) two wheeler provision for collection of bio-medical waste from the HCFs located in remote areas,

(xiv) disposal options of various waste generated from the CBWTFs,

(xv) levying of service charges based on the CPI or WPI once in a year with the approval of the advisory committee,

(xvi) suggested check list for compliance verification,

(xvii) formats for daily maintaining of the log books for treatment equipment and

(xviii) stack emission monitoring provision required for monitoring of the dioxins and furans etc.,

Above finalised version of the draft revised guidelines were also placed in 175 th Board meeting for concurrence and also subsequently CPCB vide letter dated February 20, 2017 circulated to all the stakeholders with a request to ensure compliance to the revised guidelines for CBWTFs and also submit the action taken report periodically to CPCB to apprise the MoEF & CC.

14.7 Performance evaluation of STPs of NCT-Delhi in terms of microbiological parameters in terms of Microbiological i.e. Total coliform, Fecal coliform and Fecal streptococci

The study was undertaken in the year 2016-17 to evaluate the performance of 10 sewage treatment plants (STPs) of NCT-Delhi in terms of Total coliform , Fecal coliform, *and Fecal streptococci.*

The selected 10 STPs were studied during September, 2016 to February, 2017. Two hourly grab samples were collected for 8 hours from inlet and outlet of each STP along with the measurement of quantity of sewage pumped into the plant for treatment. In laboratory, under sterilized conditions, flow based composite samples were prepared using of grab samples.

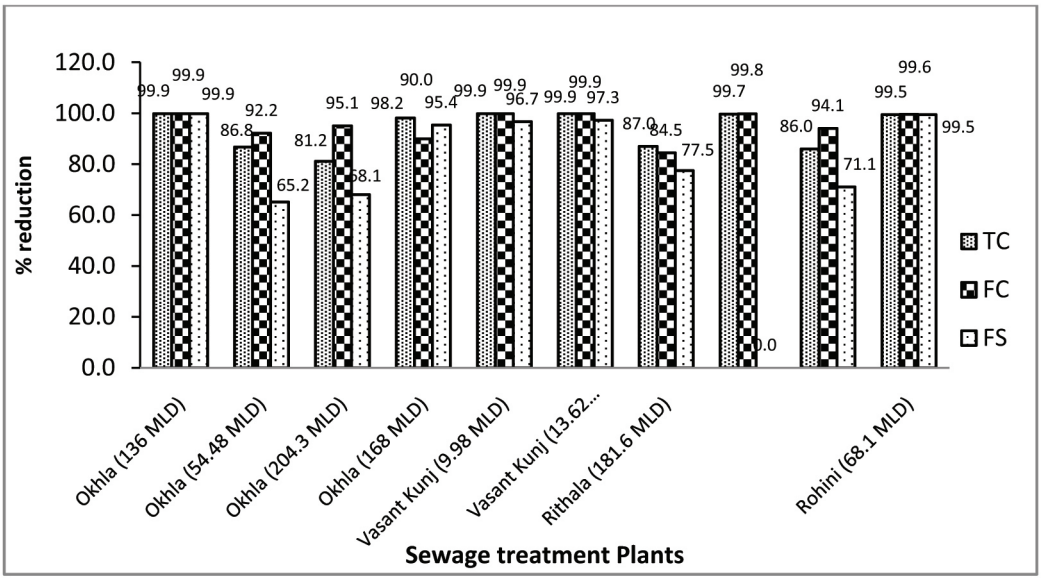


Figure: Performance of STPs in terms of reduction in microbiological contents

The observations reflect that out of 10 studied STPs, one STP was running over capacity (62%), six STPs were running under capacity (7.5 % to 54.5 %) and remaining three STPs were running as per installed capacity. Maximum reduction in Total coliform was found in STP at Vasant Kunj

(13.62 MLD), Fecal coliform and *Fecal streptococci were maximum reduced in* STP at Okhla (136 MLD). *Minimum reduction in Total coliform, fecal coliform and fecal streptococci was* observed after final treatment in Okhla STP (204.3 MLD, Rithala (181.6 MLD) and Keshopur (181.6 MLD) i.e. 81.224%, 84.545 % and 0%, respectively.

It is also noticed that the microbial content in untreated sewage was so high that even after more than 99% of reduction, the microbiological contents were quite high. In treated sewage, the range of Total coliform, Fecal coliform and fecal Streptococci was 3300-24X10^6,1300-21X10^6 and 230 to 24 X10^4 MPN/100 ml respectively.

14.8 Performance evaluation of CETPs in terms of toxicity reduction

Common Effluent Treatment Plants (CETP) generally receives effluent which contains both organic and inorganic contents which might be toxic either individually or in combinations with others. Presentlyperformance of CETPs is generally evaluated in terms of few physico-chemical parameters only. However, there is a possibility of persistence of toxicity in treated effluent even after meeting the prescribed standards. Thus, application of summary parameter e.g. Bioassay testwill not only provide information about the effect of all the chemicals present in the effluent but also provide their additive, antagonistic and synergistic effects on aquatic life of receiving water bodies. Considering this, a study was undertaken by selecting six CETPs of NCT, Delhi having physico-chemical treatment facility. Biological treatment facility was under installation in one STP which receives effluent with high organic load. The installed treatment capacity of these plants is in the range of 6-24 MLD whereas, actual capacity used was observed in the range of 2.5 5.5 MLD. This reflects that the plants were running under capacity and utilizing 12.5 – 50.0 % of installed capacity only. Composite samples were collected from inlet, primary and outlet of each CETP. The collected samples were analyzed for few physico-chemical parameters and also tested for bioassay using Zebra Fish (*Brachidenio rerio*).

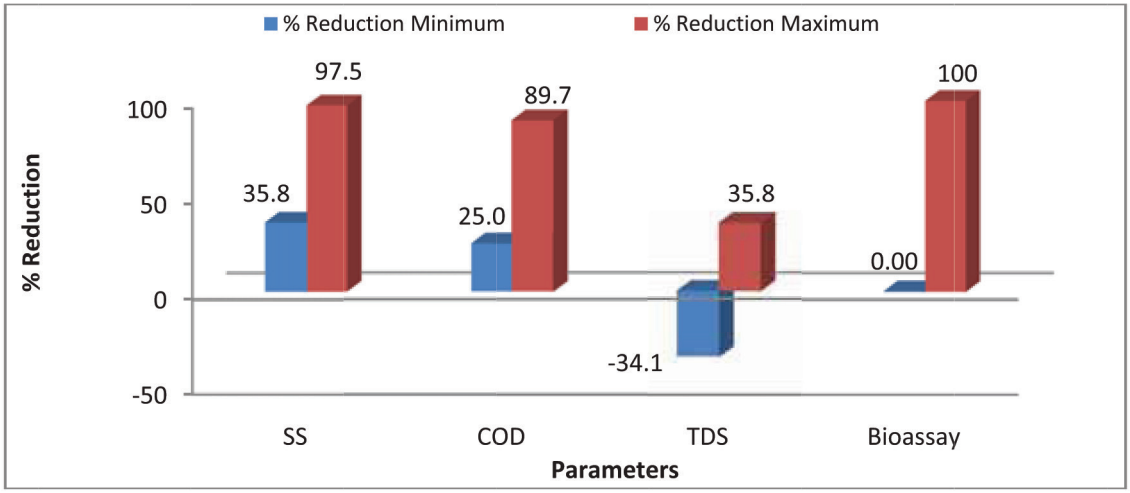


Figure: Performance of CETPs in terms of various parameters

Findings of the study as reflected in Fig. 6 that there was significant variation in the performance of selected CETPS in terms of Suspended solids (SS), Chemical Oxygen Demand (COD) and Total Dissolved Solids (TDS) and toxicity. In case of TDS, on two occasions the value of this parameter was found increasing in treated effluent. This is the parameter which reflects minimum reduction among the studied parameters. Only two CETPs reflect reduction in toxicity whereas, in

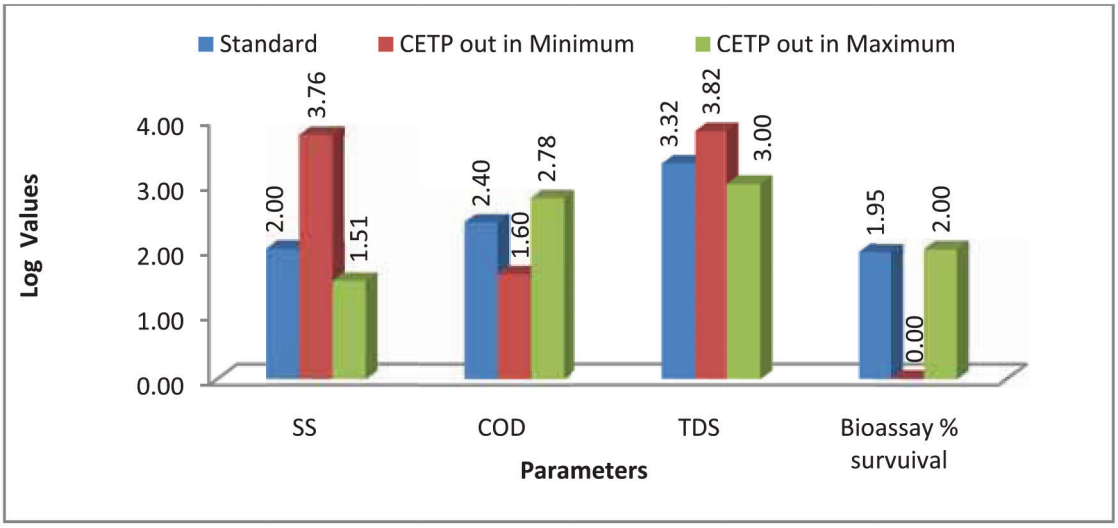


Figure: Compliance of CETPs treated effluent with various standards

remaining plants it was remain unchanged. The data of treated effluent were also compared with the prescribed standards (Fig. 7). In the absence of Bioassay standard for the CETPs, bioassay standard prescribed for discharges of environmental pollutants was used for comparison. pH was always found meeting the standard of 5.5-9.0 in the treated effluent of all the six CETPs. There were three CETPs where values of SS, COD and TDS values in treated effluent were found meeting the criteria limit but not meeting the criteria limit of Bioassay test and as such not safe for the aquatic life of the receiving water bodies. In contrast of this, in one CETP which was not meeting the standards for solids was found meeting the standard of bioassay test. Thus the study reflects that the chemicals present in the effluent, irrespective of their concentration have additive, antagonistic and synergistic toxic effect. This study also reflect the significance of bioassay test as a summary parameter and should be used as a criteria parameter to evaluate the performance of CETP.

14.9 GUIDELINES ON ELV WASTE MANAGEMENT

ELV is a 'product' of the automobile industry , though the vehicle loses its 'utility as an automobile' during active life cycle of the vehicle however there is no loss in 'weight' of the 'product' which becomes a waste i.e. **end of life vehicles (ELV)**. ELVs are rich secondary sources of material wherein the 3Rs (reuse, recover & recycle) principles apply. Most of 'ELV waste' management activities are being done in the semi-formal sector in an environmentally unsustainable manner, as was observed in the surveys done in CPCB's report '**Analysis of ELV sector in INDIA'** forthe FIVE identified automotive hubs – Pune, Chennai, Kolkata, Jamshedpur, Indore._Based on the findings of the above five hubs and the interest shown by entrepreneurs to be associated in ELV business, CPCB with support of GIZ Delhi prepared the ***'Guidelines for Environmentally Sound Management of ELVs in INDIA'*** so that waste streams generated from ELV operations are managed in an environmentally sustainable manner. The above Guidelines have been shared with MoRTH, MoHI & Automobile Research Association of India (ARAI) and Society of Indian Automobile Manufacturers (SIAM).

14.10 GUIDELINES ON C&D WASTES MANAGEMENT

In course of preparation of the Guidelines it was noted that there are uncertainties in estimating the quantum of C&D waste generation , this can be attributed to several reasons like different

methods adopted to estimate quantum of C&D waste generated, varying pace of developmental activities in cities, re-development of cities due to rapid urbanisation wherein demolition activities become necessary. Literature survey also indicated that the quantum and composition of C&D waste is project specific. CPCB has brought **'Guidelines on Environmental Management of C & D Wastes'** in compliance of Rule 10 sub-rule 1(a) of the C&D Waste Management Rules, 2016 and has addresses issues pertaining to abatement of adverse environmental impacts arising from C&D waste management activities. These issues were not discussed in the Guidelines on C&D wastes prepared by CPWD & BMTPC. The Swachh Bharat Mission (MoUD) envisages processing of 100% solid waste generated in cities / towns by 2nd October 2019as a key objective, which includes Construction and Demolition (C&D) wastes.

14.11 POLLUTION ABATEMENT MEASURES' IN BURSTING FIRECRACKER

Bursting firecrackers on festive occasions is not new to any state of the country including their public display. However, health concerns on bursting of firecrackers have frequently been raised not only due to high noise decibels but also due to the undesirable emissions released due to combustive properties of the non – stoichiometric ingredients of firecrackers. Under theNoise Pollution (Regulation and Control) Rules, 2000, firecrackers are recognized as one of the sources contributing to ambient noise inpublic places and some restrictions on their use have also been laid down. '***Firecrackers (patakas) - Status of pollution abatement measures***' is CPCB's first report containing information on the initiatives taken in compliance of the Hon'ble Supreme Court directions, the role of Bureau of Indian Standards (BIS) in harmonizing standards on firecrackers with International Organization (ISO) and some aspects relating to mass awareness on the subject.

Annexure - I

DELEGATION OF POWERS BY CENTRAL POLLUTION CONTROL BOARD TO POLLUTION CONTROL COMMITTEES

S. No	Union Territory	Pollution Control Committee	Gazette Notification No. for Power Delegation	Date of Notification
1.	**Andaman & Nicobar Islands**	The Pollution Control Committee Andaman & Nicobar Islands	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 33 Dated 16.01.1992 & Legal /156(4) 1990 dated 3.06.2004	16.01.1992
2.	**Chandigarh**	Chandigarh Pollution Control Committee	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 199(E) dated 15.03.1991 & S.O. 1131 (E) dated 23.10.2002	15.03.1991
3.	**Daman Diu & Dadra Nagar Haveli**	Pollution Control Committee Daman Diu & Dadra Nagar Haveli	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 862 (E) dated 26.11.1992; amended vide notification No. S.O. 384 (E) dated 19.2.1996 and S.O. 698(E) dated 03.07.1998 File No. B-12015/7/04/AS, dated 17.12.2004	26.11.1992
4.	**Delhi**	Delhi Pollution Control Committee	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 198 (E) dated 15.03.1991; amended vide Notification No. S.O. 640 (E) dated14.06.2002	15.03.1991
5.	**Lakshadweep**	Lakshadweep Pollution Control Committee	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No 842 (E) dated 31.08.1988 & legal /156(4) 1990 dated 23.03.2006	31.08.1988
6.	**Puducherry**	Puducherry Pollution Control Committee	Gazette of India Extraordinary, Part-II, Section-3, Sub-section (ii) S. O. No. 787 (E) dated 10.03.1992; amended vide Notification No. F.No. Legal/158/(4)/90 dated 01.05.2011	10.03.1992

Annexure - II

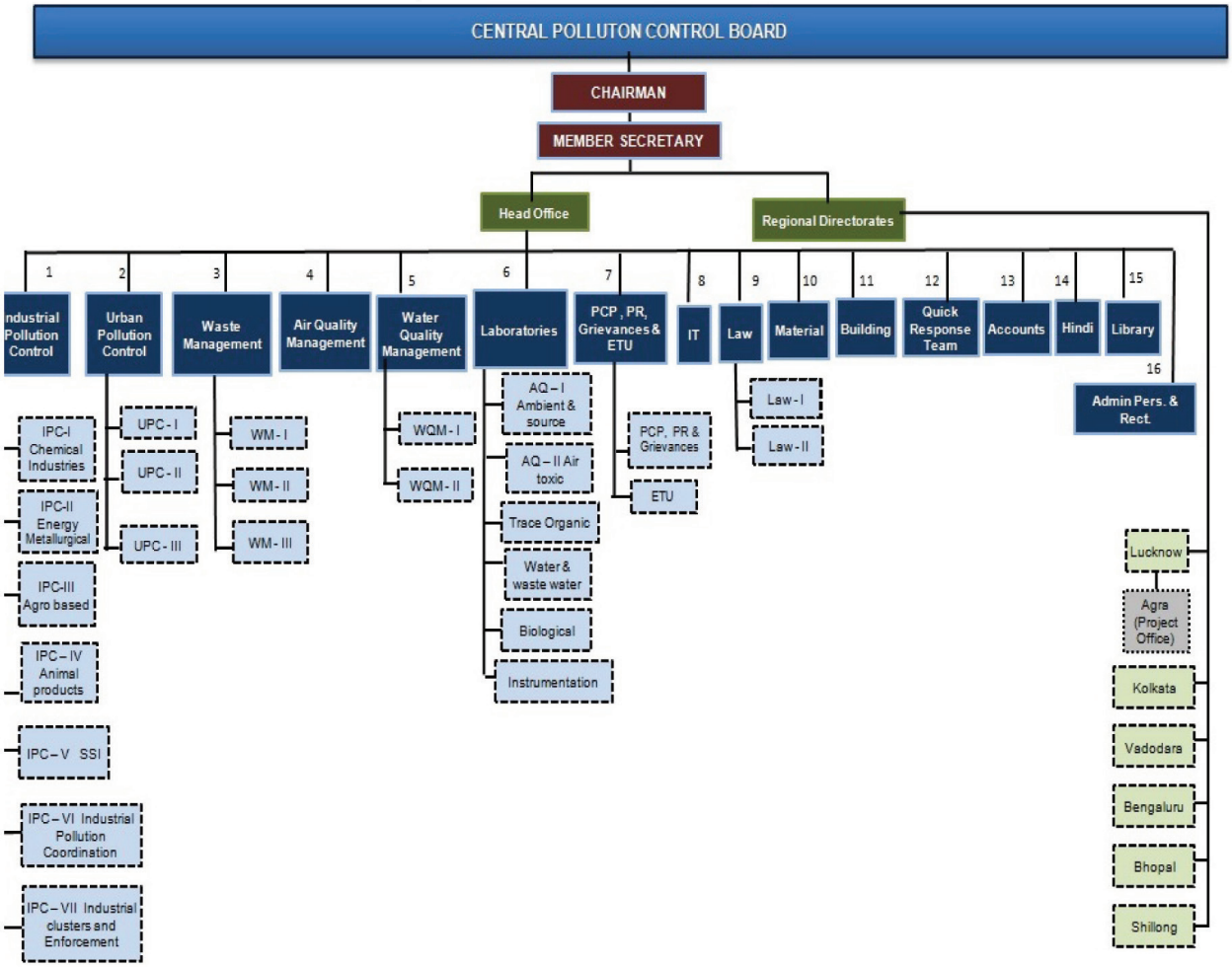
LIST OF CPCB BOARD MEMBERS (AS ON 31.03.2017)

S. No.	Name & Address
1.	Shri S.P.S Parihar Chairman, CPCB
2.	Shri Praveen Prakash, IAS Joint Secretary (SBM) Ministry of Urban Development, Room No. 140 / 124 'C' , Nirman Bhawan, New Delhi – 110011
3.	Shri Aniruddha Kumar Joint Secretary (Thermal), Ministry of Power, Room No. 209, Shram Shakti Bhawan, New Delhi – 110001
4.	Shri U.P. Singh Additional Secretary, Ministry of Water Resources, River Development & Ganga Rejuvenation, Room No. 403, 4th Floor, Shram Shakti Bhawan, Rafi Marg, New Delhi – 110001
5.	Shri P.K. Dash, Additional Secretary and Financial Adviser, Ministry Of Environment, Forests & Climate Change Indira Paryavaran Bhavan, R.No. 501, Jal Block, 5th Floor, Jor Bagh Road, New Delhi - 110 003, INDIA
6.	Dr. Manorajan Hota, Advisor, Ministry of Environment, Forests and Climate Change Indra Paryavaran Bhawan, Jor Bagh, Aliganj, New Delhi-110003, INDIA
7.	Shri Sanjiv Saran (IAS), Chairman, Uttar Pradesh Pollution Control Board, Building.No. TC-12V Vibhuti Khand, Gomti Nagar Lucknow-226 010
8.	Shri Lakshman, Chairman, Karnataka State Pollution Control Board No. 49, Parisara Bhavan, Church Street, Bangalore – 560 001, Karnataka
9.	Dr. Kalyan Rudra, Chairman. West Bengal Pollution Control Board, Paribesh Bhavan Building, No.10-A, Block –LA, Sector 3, Salt Lake City, Kolkata – 700 091, West Bengal

S. No.	Name & Address
10.	Shri Arvind Agarwal Chairman. Gujarat Pollution Control Board, Paryavaran Bhavan, Sector 10-A, Gandhinagar – 382 010, Gujarat.
11.	Shri Vivek Narayan Shejwalkar, Mayor, Gwalior Municipal Corporation, Krishna Kripa, Vivekanand Marg, Gwalior – 474 001, Madhya Pradesh
12.	Shri Ramakant Bhardwaj, National Vice President, Laghu Udyog Bharati, 214, Industrial Area, Phase – 1, Panchkula – 134 112, Haryana
13.	Shri Kanwal Singh Chauhan, Ex – Sarpanch C/o. Manager, State Bank of Patiala HSIIDC, Kundli Haryana – 131028 Tel: 09416320765
14.	Dr. Sukumar Devotta Former Director (NEERI, Nagpur) T2/301 Sky city Vanagaram-Ambattur Road, Vanagarm Chennai-600095
15.	Shri Sanjiv Singh, Director (Refineries), Indian Oil Corporation Limited, Scope Complex – Core 2, Lodhi Road, New Delhi – 110 003 (INDIA)
16	Dr. A.B. Akolkar, Member Secretary, Central Pollution Control Board, 'Parivesh Bhavan', East Arjun Nagar, Delhi – 110 032 (INDIA)

Annexure - III

ORGANIZATION STRUCTURE OF CENTRAL POLLUTION CONTROL BOARD



Annexure - IV

SANCTIONED STAFF STRENGTH IN CPCB AND NUMBER OF VACANCIES IN EACH CADRE AS ON 31.03.2017

S. No.	Name of the Post	Sanctioned Posts as on date	Filled	Vacant Post
			Regular/ Dep.	
1	Scientist 'F' (02)	02	02	-
2	Scientist 'E' (08)	44	40	04
3	Scientist 'D' (22)	35	35	-
4	Scientsit 'C' (60)	48	48	00
5	Scientist 'B' (75)	38	28	10
6	Senior Law Officer	01	00	01
7	Finance & Account Officer	01	00	01
8	Sr. Administrative Officer	01	01	-
9	Administrative Officer	07	06	01
10	Law Officer	02	00	02
11	Assistant Law Officer	02	02	-
12	Hindi Officer	01	01	-
13	Accounts Officer	02	02	-
14	Assistant Accounts Officer	05	04	01
15	Assistant Technical Officer	01	00	01
16	Section Officer*	08	07	01
17	Private Secretary*	18	17	01
18	Senior Technical Supervisor	09	07	02
19	Draughting Supervisor	01	01	-
20	Senior Scientific Assistant	32	28	04
21	Senior Hindi Translator	01	-	01
22	Technical Supervisor*	06	05	01
23	Assistant*	21	16	05
24	Data Processing Assistant	04	04	-
25	Senior Draughtsman	01	01	-
26	Junior Enginner (E & M)	01	00	01
27	Junior Enginner (Civil)	01	00	01
28	Personal Assistant *	03	03	-
29	Accounts Assistant	08	06	02
30	Junior Hindi Translator	01	01	-
31	Publication Assistant	01	01	-
32	Junior Scientific Assistant	27	13	14
33	Senior Technician*	11	04	07
34	Junior Technician	07	05	02
35	Senior Laboratory Assistant	29	29	-
36	Junior Laboratory Assistant	31	19	12
37	Field Attendant	07	06	01

S. No.	Name of the Post	Sanctioned Posts as on date	Filled	Vacant Post
			Regular/ Dep.	
38	Upper Division Clerk	24	19	05
39	Lower Division Clerk	20	06	14
40	Senior Attendant	15	14	01
41	Driver Special Grade	01	01	-
42	Driver Grade-I*	06	06	-
43	Driver Grade-II*	02	02	-
44	Driver (Ordinary)*	13	08	05
45	Data Entry Operator Grade-I	02	02	-
46	Data Entry Operator Grade-II	06	04	02
47	Stenographer	03	00	03
48	Pump & Wheel Valve Operator	01	01	-
49	Attendant	22	21	01
	Total	**533**	**426**	**107**

Figures shown in the brackets at Sl.No. 1 to 5 are the number of scientific posts at the time of induction of the Flexible Complementing Scheme in CPCB (Interchangeable)

04 post of Technical Supervisor have been adjusted to the lower posts of Sr. Technician (Vide Sl. No. 22, & 33), two posts of PS adjusted to the post of PA (Sl. No. 17 & 28) & two post of Section Officer adjusted to the post of Assistant (Sl. No. 16 & 23) 01 post of Driver Grade-I and 04 posts of Driver Grade-II adjusted to Driver (Ordinary) (vide Sl. No. 42, 43, and 44) under GFR - 254

Prakash Jain & Co.
Chartered Accountants

Flat No.6326, Sector B, Pocket 9,
Vasant Kunj, New Delhi-110070
Phone/Fax : 011- 41563827
Mobile : 9811373409
E-mail : rpshukla9@yahoo.com
rpshukla9@gmail.com

INDEPENDENT AUDITORS REPORT TO THE MEMBERS OF CENTRAL POLLUTION CONTROL BOARD-DELHI

1. We have audited the accompanying Financial Statements of **CENTRAL POLLUTION CONTROL BOARD, (Ministry of Environment Forests & Climate Change, Govt. of India), its Zonal Offices and sponsored projects which** comprise the Balance Sheet as at **31st March 2017** and Income & Expenditure Account and Statement of Receipts & Payments of the Board for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

2. Management of the Board is responsible for the preparation of these Financial Statements that give a true and fair view of the financial position, financial performance and Receipts & Payments of the Board in accordance with accounting principles generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.
3. The Balance Sheet, Income & Expenditure Account and Statement of Receipts & Payments have been prepared in accordance with **'Form of Financial Statements for the Central Autonomous Bodies'** circulated by **Controller General of Accounts, Ministry of Finance.**

Auditor's Responsibility

4. Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

5. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected

Prakash Jain & Co. New Delhi Firm Regn. No. 007405N Chartered Accountants

depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Board's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

6. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Basis for Qualified Opinion

7. Depreciation is charged on Assets on SLM basis as per rates prescribed by Income Tax Act 1961. Depreciation has been charged on full year basis irrespective of date of purchase of Assets. Further depreciation has not been charged on individual asset basis instead of charged on gross block basis which has resulted into excess charging of depreciation As such depreciation has not been charged as per Accounting Standard 6 (AS-6) issued by the Institute of Chartered Accountants of India.

8. Earmarked funds for capital assets received as grant in aid has been taken in Income & Expenditure account is not in accordance with the requirement of Accounting Standard 12.

9. Liability on account of LTC has neither been ascertained nor provided for. Accounting Standard 15 – "Accounts for Retirement Benefits – Revised" issued by the Institute of Chartered Accountants of India has not been complied with.

Emphasis of matters

10. We draw attention to the following points:

I). Reconciliation & Confirmation of various accounts

The balance under various accounts amounting to Rs. 1.38 crores in liabilities side, and advance of Rs. 61.36 crores in assets side of the Balance Sheet (refer note no. 4 in Schedule 26 – notes to accounts) are subject to confirmation and reconciliation thereof. Further, most of the advances are pending for adjustment of long time and financial impact are not ascertainable and this may have material effect on Balance Sheet, the Income & Expenditure, and Receipts & Payment Account of the Board.

Prakash Jain & Co. New Delhi Firm Regn. No.: 00[illegible]5N Chartered Accountants

II). Loans and advances include following accounts /balances which are being carried forward since long time. It appears that expenditure against these payments has already been incurred but advances have not been adjusted and as such realisability/adjustability of the same cannot be commented upon.

a) Publication Advance : Rs. 0.88 lacs.

b) Purchase and other Advance : Rs. 30.21 lacs.

c) Advance to State Boards : Rs. 56.22 lacs.

d) Advance of Rs 6.21 lacs to Telco and Rs 14.00 lac to GTZ for fabrication of van under the project Orissa Board fabrication of mobile Van

e). Loans and Advance include Rs.36,789/- shown as imprest balance with an employee of the Board and is outstanding for adjustment for a longtime. It has been noticed /explained that no such imprest /cash balance is available.

III). Fixed Assets Register

a). It has been observed that fixed asset register has not been properly maintained at Head office and its Zonal Office, with respect to depreciation charged, location and identification number, Further Fixed Asset register has not been reconciled with financial records and discrepancies if any has not been ascertained. Physical verification of fixed assets conducted, has not been matched with fixed assets register to identify short/excess.

b). Capital work in progress include Rs. 20.11 lacs being advance given to suppliers (Delhi Zone) since long and have not been adjusted/transferred to fixed asset Account. In absence of details, we are unable to comment on adjustability/ realisability of the same.

IV). Current Liabilities

Above account include a sum of Rs. 91.46 lacs under the head Deposit (work) which represent surplus fund to be refunded to various agencies after completion of project but have not been refunded and is being carried forward as liability since long time. In our opinion, an appropriate policy in this regard should be framed and should be accounted for accordingly.

V). Internal Audit System

There is no internal audit system in the Board and further the internal control system need to be significantly strengthened to make it commensurate with the size and nature of activities of the Board, particularly in respect of obtaining utilization certificates.

Prakash Jain & Co. New Delhi Firm Reg. No.: 007405N Chartered Accountants

VI). System of monitoring of projects assisted by the Board, obtaining utilization certificate and its adjustment needs to be strengthened.

VII). Central Pollution Control Board has created **Contributory Provident Fund (CPCB) under guidelines called The Central Board for the Prevention & Control of Water Pollution Employee's contributory Provident Fund since 1977-78** and the employee contribution is deducted from the salary of the employee and transferred to CPF Fund. **The accounts of CPF Fund are audited up to 31st March, 2007 only.** The shortfall in PF liability to be borne by Board, if any has not been ascertained.

Opinion

In our opinion and to the best of our information and according the explanations given to us the Balance sheet, Income & Expenditure Account and Statement of Receipts & Payments read together with the Accounting policies and notes to Accounts thereon, and subject to remarks Para 7 to 10 monetary impact of which is not ascertainable, give the information required by Law, in the manner so required and give true and fair view in conformity with the accounting principles generally accepted in India:

- In the case of Balance Sheet of the state of Affairs of the Board as at 31st March 2017.
- In the case of Income & Expenditure Account of the excess of Expenditure over income for the year ended on that date,
- In the case of Statement of Receipts & Payments of the Receipts & Payments for the year ended on that date.

FOR PRAKASH JAIN & CO.
CHARTERED ACCOUNTANTS
FIRM REGN. NO 007405N

Prakash Jain & Co. New Delhi Firm Regn. No.: 007405N Chartered Accountants

(K. C. Jain)
PARTNER (M. NO. 015438)
Place: New Delhi
Date:14/07/2018

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

BALANCE SHEET AS AT 31ST MARCH 2017

CORPUS/CAPITAL FUND AND LIABILITIES	SCHD.	CURRENT YEAR (AMOUNT IN Rs.)	PREVIOUS YEAR (AMOUNT IN Rs.)
CORPUS/CAPITAL FUND	1	8,863,034	(27,846,846)
RESERVE AND SURPLUS	2	-	-
EARMARKED/ ENDOWMENT FUND	3	1,168,977,774	590,623,008
SECURED LOANS AND BORROWINGS	4	-	-
UNSECURED LOANS AND BORROWINGS	5	-	-
DEFERRED CREDIT LIABILITIES	6	-	-
CURRENT LIABILITIES AND PROVISIONS	7	632,464,469	486,899,471
TOTAL		1,810,305,277	1,049,675,633
ASSETS			
FIXED ASSETS	8	96,265,475	160,075,563
INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS	9	-	-
INVESTMENTS-OTHERS	10	-	-
CURRENT ASSETS, LOANS, ADVANCES ETC	11	1,714,039,802	889,600,070
MISCELLANEOUS EXPENDITURE (to the extent not written off or adjusted)		-	-
TOTAL		1,810,305,277	1,049,675,633

Schedules 1 to 26 forming part of accounts are annexed

As per our report of even date
For Prakash Jain & Co.
Chartered Accountants
Firm Reg. No. 007405N

(K C Jain)
M.NO. 015438
Partner
Place: Delhi
Date: 14/07/2018

Prakash Jain & Co. New Delhi Firm Regn. No.: 007405N Chartered Accountants

For Central Pollution Control Board

(S. P. Singh Parihar, IAS)
Chairman

(Prashant Gargava)
Member Secretary

(Mohan Kapur)
Accounts Officer

(Virendra Bansal)
Assistant Accounts Officer

CENTRAL POLLUTION CONTROL BOARD

INCOME AND EXPENDITURE ACCOUNT

FOR THE YEAR ENDED 31ST MARCH 2017

INCOME	SCHD.	CURRENT YEAR (AMOUNT IN Rs.)	PREVIOUS YEAR (AMOUNT IN Rs.)
INCOME FROM SALES/ SERVICES	12	-	-
GRANTS/SUBSIDIES	13	906,860,000	640,000,000
FEES/ SUBSCRIPTIONS	14	-	-
INCOME FROM INVESTMENTS	15	-	-
(income on investments from earmarked/endowment funds		-	-
transferred to Funds)		-	-
INCOME FROM ROYALTY, PUBLICATIONS ETC.	16	134,000	144,520
INTEREST EARNED	17	5,757,521	703,366
OTHER INCOME	18	3,037,013	2,099,685
INCREASE/ DECREASE IN STOCK OF Consumables, Stores/ Spares	19	247,030	(3,079,373)
TOTAL(A)		916,035,564	639,868,198
EXPENDITURE			
ESTABLISHMENT EXPENSES	20	602,448,673	448,422,868
OTHER ADMINISTRATIVE EXPENSES ETC	21	127,164,424	124,579,013
EXPENDITURE ON GRANTS, SUBSIDIES ETC	22	-	-
INTEREST	23	24,000	23,606
MONITORING EXPENSES	24	56,574,006	92,820,134
DEPRECIATION	8	80,653,942	82,209,586
TOTAL(B)		866,865,045	748,055,206
BALANCE BEING EXCESS OF INCOME OVER EXPENDITURE (A-B)		49,170,519	(108,187,008)
TRANSFERRED TO SPECIAL RESERVE		-	-
TRANSFERRED TO /FROM GENERAL RESERVE		-	-
PRIOR PERIOD EXPS.		12,460,640	3,993,867
BALANCE BEING SURPLUS/ DEFICIT CARRIED TO CORPUS / CAPITAL FUND		36,709,879	(112,180,875)

Schedules 1 to 26 forming part of accounts are annexed

As per our report of even date

For Prakash Jain & Co.

Chartered Accountants

Firm Reg. No. 007405N

(K C Jain)

M.NO. 015438

Partner

Place: Delhi

Date: 14/07/2018

Prakash Jain & Co. New Delhi Firm Regn. No. 007405N Chartered Accountants

For Central Pollution Control Board

(S. P. Singh Parihar, IAS)
Chairman

(Prashant Gargava)
Member Secretary

(Mohan Kapur)
Accounts Officer

(Virendra Bansal)
Assistant Accounts Officer

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH 2017

		-		
SCHEDULE 1 - CORPUS / CAPITAL FUND	CURRENT YEAR (AMOUNT IN Rs.)		PREVIOUS YEAR (AMOUNT IN Rs.)	
BALANCE AS AT BEGINNIG OF THE YEAR	(27,846,846)		84,334,029	
Less:- DUE TO RECTIFICATION OF FIXED ASSETS	1		-	
LESS : REFUND OF CAPITAL	-		-	
Add:- OPENING BALANCE OF INCOME AND EXPENDITURE				
Add/LESS:- EXCESS OF INCOME OVER EXPENDITURE/ EXCESS OF	36,709,879	8,863,034	(112,180,875)	(27,846,846)
EXPENDITURE OVER INCOME				
BALANCE AS AT YEAR END		8,863,034		-27,846,846
		-		
SCHEDULE 2 - RESERVE & SURPLUS	CURRENT YEAR		PREVIOUS YEAR	
1. CAPITAL RESERVE		-		
AS PER LAST ACCOUNT	-	-	-	-
ADDITION DURING THE YEAR	-	-	-	-
Less:- DEDUCTION DURING THE YEAR	-	-	-	-
2. REVALUATION RESERVE		-		
AS PER LAST ACCOUNT	-	-	-	-
ADDITION DURING THE YEAR	-	-	-	-
Less:- DEDUCTION DURING THE YEAR	-	-	-	-
3. SPECIAL RESERVE		-		
AS PER LAST ACCOUNT	-	-	-	-
ADDITION DURING THE YEAR	-	-	-	-
Less:- DEDUCTION DURING THE YEAR	-	-	-	-
4. GENERAL RESERVE		-		
AS PER LAST ACCOUNT	-	-	-	-
ADDITION DURING THE YEAR	-	-	-	-
Less:- DEDUCTION DURING THE YEAR	-	-	-	-
		-		

Prakash Jain & Co. New Delhi Firm Reg. No. Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 3 - EARMARKED / ENDOWMENT FUNDS	FUND WISE BREAKUP				TOTAL	
	SPONSORED PROJECTS	FUND XX	FUND YY	FUND ZZ	CUURENT YEAR (AMOUNT IN Rs.)	PREVIOUS YEAR (AMOUNT IN Rs.)
a) OPENING BALANCE OF THE FUND	583,429,126	-	-	-	583,429,126	899,778,424
Add : Prior Period adjustment	-	-	-	-	-	-
b) ADDITION TO THE FUNDS	-	-	-	-	-	-
I. DONATION / GRANTS (NET OF REFUND)	421,555,287	-	-	-	421,555,287	43,080,616
II. INCOME FROM INVESTMENTS MADE ON ACCOUNT OF FUNDS	13,356,622	-	-	-	13,356,622	21,107,058
III. OTHER ADDITIONS (SPECIFY NATURE)	295,099,361	-	-	-	295,099,361	5,453,166
					-	-
TOTAL (A+B)	1,313,440,396	-	-	-	1,313,440,396	969,419,264
c) UTILISATION / EXPENDITURE TOWARDS OBJECTIVES OF FUND	-	-	-	-	-	-
I. CAPITAL EXPENDITURE	-	-	-	-	-	-
- FIXED ASSETS (Including Prior Period Adjustment)	-	-	-	-	-	-
- OTHERS	-	-	-	-	-	-
TOTAL	-	-	-	-	-	-
II. REVENUE EXPENDITURE						
- SALARIES, WAGES AND ALLOWANCES ETC.	2,194,833	-	-	-	2,194,833	63,162,023
- RENT	-	-	-	-	-	-
- OTHER ADMINSTRATIVE EXPENSES	116,827,836	-	-	-	116,827,836	267,328,191
TOTAL	119,022,669	-	-	-	119,022,669	330,490,214
TOTA (C)	119,022,669	-	-	-	119,022,669	330,490,214
D.) Refund to MoEF	25,439,953	-	-	-	25,439,953	48,306,042
NET BALANCE AS AT THE YEAR END (A+B-C-D)	1,168,977,774	-	-	-	1,168,977,774	590,623,008

Prakash Jain & Co. New Delhi Firm Regn. No.: 00[illegible]N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

	(AMOUNT IN Rs.)			
SCHEDULE 4 -SECURED LOANS AND BORROWINGS	CURRENT YEAR		PREVIOUS YEAR	
1.CENTRAL GOVERNMENT		-		-
2.STATE GOVERNMENT (Specify)		-		-
3.FINANCIAL INSTITUTION				
a) Term Loans	-		-	
b) Interest accrued and due	-	-	-	-
4.BANKS:				
a) Term Loans				
-Interest accrued and due	-		-	
b) Other Loans (specify)				
-Interest accrued and due	-	-	-	-
5.OTHER INSTITUTION AND AGENCIES		-		-
6.DEBENTURES AND B0NDS		-		-
7.OTHERS (Specify)		-		-
Total		-		-
Note: Amounts due within one year				

Prakash Jain & Co. New Delhi Firm Reg. No. 007405N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

	(AMOUNT IN Rs.)			
SCHEDULE 5 -UNSECURED LOANS AND BORROWINGS	CURRENT YEAR		PREVIOUS YEAR	
1.CENTRAL GOVERNMENT		-		-
2.STATE GOVERNMENT (Specify)		-		-
3.FINANCIAL INSTITUTION		-		-
4.BANKS:				
a) Term Loans	-		-	
b) Other Loans (specify)	-	-	-	-
5.OTHER INSTITUTION AND AGENCIES	-	-	-	-
6.DEBENTURES AND B0NDS		-		-
7. FIXED DEPOSITS		-		-
8.OTHERS (Specify)		-		-
TOTAL		-		-
Note: Amounts due within one year				

			(AMOUNT IN Rs.)	
SCHEDULE 6 -DEFERRED CREDIT LIABILITIES			CURRENT YEAR	PREVIOUS YEAR
a) Acceptence secured by hypothecation of capital equipment and other assets			-	-
b) Others			-	-
			-	-

Prakash Jain & Co. New Delhi Firm Regn. No. 007405N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

	(AMOUNT IN Rs.)			
SCHEDULE 7 - CURRENT LIABILITIES AND PROVISIONS	CURRENT YEAR		PREVIOUS YEAR	
A. CURRENT LIABILITIES				
1. Acceptances		-		-
2. Sundry Creditors:				
a) For goods	-		-	
b) Others	21,730,238	21,730,238	30,790,154	30,790,154
3. Advances Received		13,476,553		13,529,053
4. Interest accrued but not due on:				
a) Secured Loans/borrowings	-		-	
b) Unsecured Loans/borrowings	-	-	-	-
5. Statutory Liabilities:	-		-	
a) Overdue	-		-	
b) Others	-	-	-	-
6. Other current Liabilities (Sponsored Projects)		14,651,346		13,470,410
TOTAL (A)		49,858,137		57,789,617
B. PROVISIONS				
1. For Taxation		-		-
2. Gratuity		333,738,044		234,495,432
3. Superannuation/Pension		-		-
4. Accumulated Leave Encashment		248,868,288		194,614,422
5. Trade Warranties/Claims		-		-
6. Others (Specify)		-		-
		-		-
TOTAL (B)		582,606,332		429,109,854
TOTAL (A+B)		632,464,469		486,899,471

Prakash Jain & Co. New Delhi Firm Regn. No.: 107105N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD , DELHI-110032

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 8 -FIXED ASSETS

DESCRIPTION		GROSS BLOCK				AMORTISATION/DEPRECIATION					NET BLOCK	
	DEP. RATE	Cost/valuation as at beginning of the Year(original cost)	Addition during the year	Deductions/Adjustments during the year	Cost/valuation at the year end(originl cost)	As at the beginning of the Year	Prior Period Dep.	During the Year	On Deductions during the Year	At the end of the year	As at the current Year -end	As at the Previous Year -end
FIXED ASSETS:												
LAND:												
a) Freehold	-	-	-	-	-	-		-	-	-	-	-
b) Leasehold	-	12,505,904	-	-	12,505,904	1,334,578	-	95,530	-	1,430,108	11,075,796	11,171,326
BUILDINGS:												
a) On Freehold Land		-	-	-	-	-		-	-	-	-	-
b) On Leasehold Land	-	118,778,416	-	-	118,778,416	78,582,210	-	11,568,082	-	90,150,292	28,628,124	40,196,206
c) Ownership Flats/Premises		-	-	-	-	-		-	-	-	-	-
d) Superstructures on Land not belonging to the entity		-	-	-	-	-		-	-	-	-	-
PLANT, MACHINERY & EQUIPMENT	15%	444,018,443	8,348,664	6,008	452,361,099	353,556,280	-	60,844,260	901	414,399,639	37,961,460	90,462,163
VEHICLES	15%	13,748,748	3,567,011	-	17,315,759	7,005,806	-	2,525,196	-	9,531,002	7,784,757	6,742,942
FURNITURE, FIXTURES,	10%	19,697,681	1,267,598	-	20,965,279	11,981,996	-	2,096,529	-	14,078,525	6,886,754	7,715,685
OFFICE EQUIPMENT	15%	-	-	-	-	-		-	-	-	-	-
COMPUTER/PERIPHERALS	60%	27,591,703	3,615,186	15,218	31,191,671	26,212,118	-	3,419,971	9,131	29,622,958	1,568,713	1,379,585
ELECTRIC INSTALLATIONS	15%	-	-	-	-	-		-	-	-	-	-
LIBRARY BOOKS	15%	1,346,292	51,768	-	1,398,060	1,191,025	-	104,374	-	1,295,399	102,661	155,267
TUBEWELLS & W.SUPPLY	15%	-	-	-	-	-		-	-	-	-	-
OTHER FIXED ASSETS	15%	-	-	-	-	-		-	-	-	-	-
TOTAL OF CURRENT YEAR		637,687,187	16,850,227	21,226	654,516,188	479,864,013	-	80,653,942	10,032	560,507,923	94,008,265	157,823,174
CAPITAL WORK-IN PROGRESS		2,252,389	4,821	-	2,257,210	-	-	-	-	-	2,257,210	2,252,389
TOTAL		639,939,576	16,855,048	21,226	656,773,398	479,864,013	-	80,653,942	10,032	560,507,923	96,265,475	160,075,563
		639,939,576.00	16,855,047.64	21,226.00	656,773,397.64	479,864,013.00	-	80,653,942.00	10,032.00	560,507,923.00	96,265,474.64	160,075,563.00
		-	-	-	-	-	-	-	-	-	-	-

Prakash Jain & Co. New Delhi Firm Reg. No. 007405N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 9 -INVESTMENTS FROM EARMARKED/ ENDOWMENT FUNDS

	(AMOUNT IN Rs.)			
	CURRENT YEAR		PREVIOUS YEAR	
1. IN GOVERNMENT SECURITIES		-		-
2. OTHER APPROVED SECURITIES		-		-
3. SHARES		-		-
4. DEBENTURES AND NONDS		-		-
5. SUBSIDIARIES AND JOINT VENTURES		-		-
6. OTEHRS(TO BE SPECIFIED)		-		-
		-		-
Total		-		-

SCHEDULE-10 INVESTMENTS OTHERS	(AMOUNT IN Rs.)			
	CURRENT YEAR		PREVIOUS YEAR	
1. IN GOVERNMENT SECURITIES		-		-
2. OTHER APPROVED SECURITIES		-		-
3. SHARES		-		-
4. DEBENTURES AND NONDS		-		-
5. SUBSIDIARIES AND JOINT VENTURES		-		
6. OTEHRS(TO BE SPECIFIED)		-		-
Total				

Prakash Jain & Co. New Delhi Firm Regn. No. 107165N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 11- CURRENT ASSETS, LOANS, AND ADVANCES	(AMOUNT IN Rs.)			
	CURRENT YEAR		PREVIOUS YEAR	
A) CURRENT ASSETS				
1. INVENTORIES				
a) Stores , Spares and Consumables	-		-	
b) Loose Tools	-		-	
c) Stock-in- trade	-		-	
Finished Goods (Consumables, Stores/ Spares)	10,183,742		9,936,712	
Work -in- progress	-		-	
Raw materials	-	10,183,742	-	9,936,712
2. SUNDRY DEBTORS				
a) Debts outstanding for a period exceeding six months	-		-	
b) Others	-	-	-	-
3. Cash balances in hand (including cheques/drafts & imprest)		-		-
4.Bank Balances				
a)With scheduled banks				
-On current Accounts	256,212,702		162,712,233	
- On Deposits Accounts(including margine money)	32,514,752		51,502,691	
- On saving Accounts	792,689,909	1,081,417,363	49,760,503	263,975,427
b) with non- shceduled Banks				
-On current Accounts	-		-	
- On Deposits Accounts(including margine money)	-		-	
- On saving Accounts	-	-	-	-
5. Post office saving Accounts		-		-
TOTAL (A)		1,091,601,105		273,912,139

Prakash Jain & Co. New Delhi Firm Regn. No.: 007... Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 11- CURRENT ASSETS, LOANS, AND ADVANCES	(AMOUNT IN Rs.)			
	CURRENT YEAR		PREVIOUS YEAR	
B) LOANS, ADVANCES AND OTHER ASSETS				
1.LOANS & ADVANCES				
a) Staff	2,826,316		3,908,661	
b) other entities engaged in activities similar to that entity	259,602,480		215,627,970	
c) Other (Sponsored Projects Advances)	351,125,649	613,554,445	390,610,946	610,147,577
2.Advances and other amounts recoverable in cash or kind				
a) On capital account	-		-	
b) Prepayments	1,884,444		1,504,565	
c) Others	3,092,107	4,976,551	85,014	1,589,579
3. Income Accrued	-		-	
a) on investments from earmarked/endowment funds	1,551,325		1,551,325	
b) On investments (Sponsored Projects)	2,356,376		2,399,451	
c) On loans and advances	-		-	
d) Others	-	3,907,701	-	3,950,776
4. CLAIMS RECEIVABLE		-		-
TOTAL (B)		622,438,697		615,687,931
TOTAL (A+B)		1,714,039,802		889,600,070

Prakash Jain & Co. New Delhi Firm Regn. No. 007208N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 12- INCOME FROM SALES/SERVICE	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1.INCOME FROM SALES		
a) Sale of Finished goods	-	-
b) Sale of Raw material	-	-
c)Sale of Scrap		
2. INCOME FROM SERVICES		
a) Labour and processing charges	-	-
b) Professional/ consultancy service	-	-
c) Agency commission and Brokerage	-	-
d) Maintenance Services (Eqipment / property)	-	-
e) Others (specify)	-	-
TOTAL	-	-

SCHEDULE 13- GRANTS/ SUBSIDIES	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. Central Government	906,860,000	640,000,000
2. Fund Transfer to ZO'S	-	-
3. State Government	-	-
4. Government agencies	-	-
5. Institutions/ welfare Bodies	-	-
6. International Organisations	-	-
7. Others (specify)	-	-
TOTAL	906,860,000	640,000,000

Prakash Jain & Co. New Delhi Firm Regn. No.: 005705N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

			(AMOUNT IN Rs.)	
SCHEDULE 14- FEES/ SUBSCRIPTIONS			CURRENT YEAR	PREVIOUS YEAR
1. Entrance fees			-	-
2. Annual Fees/ Subscriptions			-	-
3. Seminar/ program Fees			-	-
4. Consultancy Fees			-	-
5. Others			-	-
			-	-

			(AMOUNT IN Rs.)	
SCHEDULE 15- INCOME FROM INVESTMENTS	CURRENT YEAR	PREVIOUS YEAR	CURRENT YEAR	PREVIOUS YEAR
1. INTEREST				
A) ON GOVT. SECURITIES	-		-	
B) OTHER BONDS/ DEBENTURES	-	-	-	-
2. DIVIDENDS				
A) ON SHARES	-		-	
B) ON MUTUAL FUND SECURITIES	-	-	-	-
3. RENTS		-		-
4. OTHERS (SPECIFY)		-		-
TRANSFERRED TO EARMARKED/ ENDOWMENT FUNDS		-		-

			(AMOUNT IN Rs.)	
SCHEDULE 16 - INCOME FROM ROYALTY, PUBLICATIONS etc.			CURRENT YEAR	PREVIOUS YEAR
1. INCOME FROM ROYALTY			-	-
2. INCOME FROM PUBLICATIONS			134,000	144,520
3. OTHERS (specify)			-	-
TOTAL			134,000	144,520

Prakash Jain & Co. New Delhi Firm Reg. No. 007405N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 17 - INTEREST EARNED	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. ON TERM DEPOSITS		
a) with scheduled Banks	2,892,998	161,988
b) with non scheduled Banks	-	-
c) with institution	-	-
d) others	-	-
2. ON SAVING ACCOUNTS	-	-
a) with scheduled Banks	-	-
b) with non scheduled Banks	-	-
c) with institution	-	-
d) others	-	-
3. ON LOANS	-	-
a) Employee/ staff - HBA	230,730	541,378
b) Others	-	-
4. INTEREST ON DEBTORS AND OTHERS RECEIVABLES	2,633,793	-
TOTAL	5,757,521	703,366

SCHEDULE 18- OTHER INCOME	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. PROFIT ON SALE/ DISPOSAL OF ASSETS		
a) Owned assets	-	91,299
b) Assets acquired out of grants, or received free of cost	-	-
2.EXPORT INCENTIVES REALIZED	-	-
3. FEES FOR MISCELLANEOUS SERVICES	-	-
4. MISCELLANEOUS INCOME	3,037,013	2,008,386
TOTAL	3,037,013	2,099,685

Prakash Jain & Co. New Delhi Firm Reg. No: 007405N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 19- INCREASE/DECREASE IN STOCK OF FINISHED GOODS & WORK-IN-PROGERESS	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
A. CLOSING STOCK		
- Finished Goods (Consumables, Stores/ Spares)	10,183,742	9,936,712
- Work in progress	-	-
B. Less:- OPENING STOCK	-	-
- Finished Goods (Consumables, Stores/ Spares)	9,936,712	13,016,084
- Work in progress	-	-
NET INCREASE/ DECREASE (A-B)	247,030	(3,079,373)

SCHEDULE 20- ESTABLISHMENT EXPENSES	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
1. SALARIES & WAGES	392,300,380	355,490,599
2. ALLOWANCES AND BONUS	18,062,999	14,668,450
3. CONTRIBUTION TO PROVIDENT FUND	16,501,037	15,624,636
4. CONTRIBUTION TO OTHER FUND - GIS	125,136	123,513
5. STAFF WELFARE EXPENSES	3,433,069	3,007,969
6. EXPENSES ON EMPLOYEE RETIREMENT & TERMINAL BENEFIT	172,000,452	59,472,536
7. OTHERS- WELFARE FUND	25,600	35,165
TOTAL	602,448,673	448,422,868

Prakash Jain & Co. New Delhi Firm Regn. No. 007105N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 21 - OTHER ADMINISTRATIVE EXPENSES			(AMOUNT IN Rs.)	
			CURRENT YEAR	PREVIOUS YEAR
ADVERTISEMENT AND PUBLICITY			1,181,362	3,566,624
AUDITORS REMUNERATION			-	-
CARTAGE AND CARIAGE INWARD			-	-
DISTRIBUTION EXPENSES			-	-
ELECTRICITY AND POWER			20,839,720	20,682,790
EXCISE DUTY			-	-
EXPENSES ON FEES			13,626	29,049
EXPENSES ON SEMINAR/WORKSHOP			8,302,011	10,093,301
FREIGHT AND FORWARDING EXPENSES			-	-
HOSPITALITY EXPENSES			56,109	11,759
INSURANCE			1,258,921	833,022
IRRECOVERABLE BALANCES WRITTEN OFF			-	-
LABOUR AND PROCESSING EXPENSES			-	-
OTHERS (specify)			5,379,242	12,816,132
PACKING CHARGES			-	-
POSTAGE, TELEPHONE AND COMMUNICATIONS			3,582,883	3,542,840
PRINTING AND STATIONARY			3,322,485	2,337,922
PROFESSIONAL CHARGES			6,307,649	2,815,300
PROVISION FOR BAD AND DOUBTFUL DEBTS			-	-
PURCHASES (Consumables, Stores/ Spares)			13,124,919	9,761,526
RENT, RATES AND TAXES			7,605,426	8,282,002
REPAIR AND MAINTENANCE			32,469,284	25,682,364
SUBSCRIPTION EXPENSES			-	-
TRAVELLING AND CONVEYANCE EXPENSES			16,080,044	16,401,448
VEHICLE RUNNING AND MAINTENANCE			5,889,866	5,492,314
WATER CHARGES			1,750,877	2,230,620
TOTAL			127,164,424	124,579,013

Prakash Jain & Co. New Delhi Firm Reg. No. 017765N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31ST MARCH, 2017

SCHEDULE 22- EXPENDITURE ON GRANTS, SUBSIDIES	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
GRANTS GIVEN TO INSTITUTIONS/ ORGANISATION	-	
SUBSIDIES GIVEN TO INSTITUTIONS/ ORGANISATION	-	
TOTAL	-	

SCHEDULE 23- INTEREST	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
ON FIXED LOANS	-	-
ON OTHER LOANS (including bank charges)	24,000	23,606
OTHERS (specify)	-	-
TOTAL	24,000	23,606

SCHEDULE 24- MONITORING EXPENSES	(AMOUNT IN Rs.)	
	CURRENT YEAR	PREVIOUS YEAR
AIR QUILITY MONITORING EXPENSES	51,595,308	70,750,469
WATER QUILITY MONITORING EXPENSES	-	48,685
ENVIRONMENT PROTECTION AND MONITORING EXP.	4,978,698	22,020,980
TOTAL	56,574,006	92,820,134

Prakash Jain & Co. New Delhi Firm Reg. No. 007405N Chartered Accountants

CENTRAL POLLUTION CONTROL BOARD, DELHI

RECEIPTS & PAYMENT ACCOUNT FOR THE YEAR ENDED 31.03.2017

(AMOUNT IN Rs.)

RECEIPTS	CURRENT YEAR	PREVIOUS YEAR	PAYMENTS	CURRENT YEAR	PREVIOUS YEAR
I. Opening Balance			I. Expenses		
a) Cash in hand	-	-	a) Establishment Expenses (corresponding to schedule 20)	434,504,495	391,533,641
b) Bank Balances	-	-	b) Administrative Expenses (corresponding to schedule 21 and 24)	179,396,875	198,124,198
i) In current accounts	159,101,300	325,703,866	c) Prior Period Exps	11,833,944	2,080,376
ii) In deposit accounts	51,502,691	136,112,506	II. Payments made against funds for various projects	-	-
iii) Savings accounts	49,760,503	132,740,008	Project Exps	118,979,595	330,490,214
II. Grants Received	-	-			
a) From Government of India - Mains	906,860,000	640,000,000	III. Investments and deposits made		
b) From State Government	-	-	a) Out of Earmarked/Endowment funds	-	-
c) From Government of India - Projects	421,555,287	43,080,616	b) Out of Own Funds (Investments-Others)	-	-
d) Others	-	5,089,880			
			IV. Expenditure on Fixed Assets &Capital Work in progress		
			a) Purchase of Fixed Assets-Own fund	12,672,828	15,950,117
III. Income on Investments from			b) Purchase of Fixed Assets- Earmarked/Endowment funds	-	-
a) Earmarked/Endow. Funds	13,356,622	21,107,058			
b) Own Funds	-	-	V. Refund of surplus money/Loans		
			a) To the Government of India	25,439,953	48,306,042
IV. Interest Received	-	-	b) To the State Government	-	-
a) On Bank deposits	2,892,998	-	c) To other providers of funds	-	-
b) Loans. Advances etc.	2,823,703	-	d) To the Government of India - Mains	-	-
			VI. Finance Charges (Interest & Bank charges Sch 23)	24,000	23,606
V. Other Income (Specify)					
a) Income from Royalty, Publications Etc.	134,000	144,520	VII. Other Payments (Specify)		
b) Other Income	3,037,013	2,746,838	a) Advances and other payments (Net) - Mains	497,291,968	166,694,580
c) Misc Income	295,099,361	-	b) Advances and other payments (Net) - Projects	14,712	63,410
VI. Amount Borrowed	-	-			
			VIII. Closing Balances		
VII. Any other receipts			a) Cash in hand	-	-
a) Other - Mains	455,452,255	110,417,129	b) Bank Balances	-	-
c) Sale of Fixed Assets	-	99,189	i) In current accounts	256,212,702	162,712,233
d)Advances and other payments (Net)-Mains	-	-	ii) In deposit accounts	32,514,752	51,502,691
			iii) In Savings account	792,689,909	49,760,503
Grand Total	2,361,575,733	1,417,241,610	Grand Total	2,361,575,733	1,417,241,610
				-	-

Schedules 1 to 26 forming part of accounts are annexed

As per our report of even date

For Prakash Jain & Co.

Chartered Accountants

Firm Reg. No. 007405N

(K C Jain)

M.NO. 015438

Partner

Place: Delhi

Date: 14/07/2018

Prakash Jain & Co. New Delhi Firm Reg. No. 007405N Chartered Accountants

For Central Pollution Control Board

(S. P. Singh Parihar, IAS)
Chairman

(Prashant Gargava)
Member Secretary

(Mohan Kapur)
Accounts Officer

(Virendra Bansal)
Assistant Accounts Officer

Schedule 'C'

CENTRAL POLLUTION CONTROL BOARD : DELHI - 110032

DEPOSITS RECEIVED FOR WORKS FROM OUTSIDE BODIES (OTHER SPONSORED PROJECTS) (2016-17)

(Amount in Rs.)

SL.NO.	NAME OF THE PROJECT	OPENING BALANCE	RECEIVED DURING THE YEAR						PAYMENT DURING THE YEAR					CLOSING BALANCE
			Grant Received	Grant- Others	Interest	Other Receipts	Adjusments	Total	Expenditure	Project Advance	Advances and other payment (Net)	Refund to MoEF	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9=4+5+6+7+8)	(10)	(11.)	(12)	(13)	(14=10+11+12+13)	(14=3+9-14)
1	**AAQM UP (Agra) Project**	-	-	-	-	-	-	-	-	-	-	-	-	-
2	**DOD Project**	**49,692**						-	646.50				**647**	**49,045.50**
3	**DTS Project (Bangluru)**	**539,784**						-	-				-	**539,784**
4	CAEA - Phase II Project	**57,317**	-	-	2,321	-	-	**2,321**	-	-	-	-	-	**59,638**
5	CPCB Clean Technology Project	**4,484,769**			172,674			**172,674**	-				-	**4,657,443**
6	Bank Guarantee Project	**32,672,012**		-	221,209	1,500,000		**1,721,209**	500,000.00		-		**500,000**	**33,893,221**
7	HWMD Dump Site Project	**52,596,960**			3,410,718	26,000		**3,436,718**	34,407,445.00				**34,407,445**	**21,626,233**
8	HWMD Waste of UCIL Project	-				-		-	-			-	-	-
9	VTT Finland Project	**36,046**	-		1,017	-		**1,017**	115.00	-	-		**115**	**36,948**
10	ENVIS-MOEF Project	**191,537**	1,119,897					**1,119,897**	1,130,664.00	14,712	-		**1,145,376**	**166,058**
11	IARI (MPRNL) Project	**748,150**	950,000		35,491	585,014		**1,570,505**	2,229,721.00		-		**2,229,721**	**88,934**
12	ICAQIS (CESS) Project	**41,198**			1,164			**1,164**	115.00		-		**115**	**42,247**
13	NSDI (DST) Project	**1,152,934**	-		27,407	20,000		**47,407**	755,542.00		-		**755,542**	**444,799**
14	Development of Monitoring Van-Orissa Boar	**95,180**						-					-	**95,180**
15	Paryavaran Darashan Project	**27,091,352**			997,440			**997,440**				-	-	**28,088,792**
16	Strengthening of NAQM Project	-						-				-	-	-
17	UNEP (MALE) Project	**2,727,630**				-		-	633.00				**633**	**2,726,997**
18	UNI DO Project	**7,683,557**			311,185			**311,185**	-				-	**7,994,742**
19	Workshop on BMW Project	-				-		-	-			-	-	-
20	Bakarganj Nala Patna Project	**3,546**	11,200,000		13,309			**11,213,309**	168.00		11,200,000		**11,200,168**	**16,687**
21	Budhanala Ludhiyana NRCP Project	**2,311,512**	14,600,000		29,041	44,017,000		**58,646,041**	60,926,672.00	-			**60,926,672**	**30,881**
22	Critically Polluted Areas - Cess Project	**222,705**			8,289	-		**8,289**	-				-	**230,994**
23	NAQMP Cess Project	-			-			-	-	-		-	-	-
24	WQMN Cess Project	**2,639,814**	-		861,184			**861,184**	-			3,500,998	**3,500,998**	-
25	NNMS Cess Project	**172,164**	-		1,938	600,000		**601,938**	-		768,574		**768,574**	**5,528**
26	Baseline Servey of Industires Project	**8,713,786**			137,858	3,090,000		**3,227,858**	8,964,559.00	-		-	**8,964,559**	**2,977,085**
27	Upgradation of Lab Project	**46,221,814**		-	2,141,412	-		**2,141,412**	9,626,446.00	-	28,235	21,938,955	**31,593,636**	**16,769,590**
28	CPCB-WQM WB Input cost of staff	**16,407,493**	21,193,500		1,341,762			**22,535,262**					-	**38,942,755**
29	CPCB-HWMD Waste of UCIL Pithampur			-	158,412	728,663		**887,075**	295,415.00				**295,415**	**591,660**
30	CPCB-Hydrology Project		7,800,000		43,595			**7,843,595**	36,403.00		2,974,677		**3,011,080**	**4,832,515**
31	CPCB-NGT 25		168,698,629		66,304	15,000		**168,779,933**					-	**168,779,933**
32	CPCB-NGT 75		7,242,661					**7,242,661**					-	**7,242,661**
33	Upgradation of Air Lab Project		18,000,000					**18,000,000**					-	**18,000,000**
34	CPCB-*PIAs*		55,700,000					**55,700,000**					-	**55,700,000**
35	CPCB-SNITI		12,000,000					**12,000,000**					-	**12,000,000**
36	CPCB-CPSU PROJ		103,050,600		71,858			**103,122,458**					-	**103,122,458**
37	CPCB-EPC			-	3,301,034	292,844,698		**296,145,732**	105,050.00				**105,050**	**296,040,682**
	Total	**206,860,952**	**421,555,287**	**-**	**13,356,622**	**343,426,375**	**-**	**778,338,284**	**118,979,595**	**14,712**	**14,971,486**	**25,439,953**	**159,405,746**	**825,793,491**

Annexure - 1 to Schedule C

CENTRAL POLLUTION CONTROL BOARD : DELHI - 110032

Closing Balance of capital fund - Other Sponsored Projects: (2016-17)

(Amount in Rs.)

SL.NO.	NAME OF THE PROJECT	Balance at Bank	Interest Accrued on Investments	Advances	Total	Less: Sundry Creditors	Closing Balance of captial fund
(1)	(2)	(3)	(4)	(5)	(6=3+4+5)	(7)	(8=6-7)
1	**AAQM UP (Agra) Project**	-	-	6,000	6,000		6,000
2	**DOD Project**	49,045.50	-	198,294.00	247,339.50	480,000.00	(232,660.50)
3	**DTS Project (Bangluru)**	539,784	-		539,784		539,784
4	CAEA - Phase II Project	59,638	-		59,638		59,638
5	CPCB Clean Technology Project	4,657,443	-		4,657,443		4,657,443
6	Bank Guarantee Project	33,893,221	2,356,376	58,473	36,308,070	10,000,000	26,308,070
7	HWMD Dump Site Project	21,626,233	-		21,626,233		21,626,233
8	HWMD Waste of UCIL Project	-	-	6,782	6,782		6,782
9	VTT Finland Project	36,948	-	-	36,948		36,948
10	ENVIS-MOEF Project	166,058	-	84,687	250,745		250,745
11	IARI (MPRNL) Project	88,934	-	-	88,934	500,000	(411,066)
12	ICAQIS (CESS) Project	42,247	-	10,469,370	10,511,617		10,511,617
13	NSDI (DST) Project	444,799	-	-	444,799		444,799
14	Development of Monitoring Van-Orissa Board Project	95,180	-	2,020,680	2,115,860		2,115,860
15	Paryavaran Darashan Project	28,088,792	-	142,500,000	170,588,792		170,588,792
16	Strengthening of NAQM Project	-	-	43,552,310	43,552,310		43,552,310
17	UNEP (MALE) Project	2,726,997	-	22,976	2,749,973		2,749,973
18	UNI DO Project	7,994,742	-		7,994,742		7,994,742
19	Workshop on BMW Project	-	-	415,263	415,263		415,263
20	Bakarganj Nala Patna Project	16,687	-	16,800,000	16,816,687		16,816,687
21	Budhanala Ludhiyana NRCP Project	30,881	-	-	30,881		30,881
22	Critically Polluted Areas - Cess Project	230,994	-		230,994	600,000	(369,006)
23	NAQMP Cess Project	-	-	88,000,000	88,000,000		88,000,000
24	WQMN Cess Project	-	-		-		-
25	NNMS Cess Project	5,528	-	91,605	97,133	1,571,707	(1,474,574)
26	Baseline Servey of Industires Project	2,977,085	-	184,519	3,161,604	-	3,161,604
27	Upgradation of Lab Project	16,769,590	-	46,714,780	63,484,370	105,802	63,378,568
28	CPCB-WQM WB Input cost of staff	38,942,755		-	38,942,755		38,942,755
29	CPCB-HWMD Waste of UCIL Pithampur	591,660			591,660		591,660
30	CPCB-Hydrology Project	4,832,515		2,974,677	7,807,192		7,807,192
31	CPCB-NGT 25	168,779,933			168,779,933	15,000	168,764,933
32	CPCB-NGT 75	7,242,661			7,242,661		7,242,661
33	Upgradation of Air Lab Project	18,000,000			18,000,000		18,000,000
34	CPCB-*PIAs*	55,700,000			55,700,000		55,700,000
35	CPCB-SNITI	12,000,000			12,000,000		12,000,000
36	CPCB-CPSU PROJ	103,122,458			103,122,458		103,122,458
37	CPCB-EPC	296,040,682			296,040,682		296,040,682
					-		-
					-		-
	Total	**825,793,491**	**2,356,376**	**354,100,416**	**1,182,250,283**	**13,272,509**	**1,168,977,774**
					-		-
		-					-

Prakash Jain & Co. New Delhi Chartered Accountants

SCHEDULES FORMING PART OF THE ACCOUNTS FOR THE YEAR ENDED 31st March 2017

SCHEDULE 25- SIGNIFICANT ACCOUNTING POLICIES

1. ACCOUNTING CONVENTION

The Financial Statements i.e., Balance Sheet, Income & Expenditure Account & Receipts and Payments Account are prepared on the basis of historical cost convention and on the basis of accrual method of Accounting unless stated otherwise. The Financial statements have been prepared as per 'Form of Financial Statement for the Central Autonomous Bodies' as per the directions of Ministry of Environment and Forest, Govt. of India vide their letter no.G25012/1/2010-CPW dated 10.02.10.as circulated by Controller General of Accounts, Ministry of Finance. The Financial Statement includes Financial Statement of Head Office Delhi and its six Regional Directorates located at Bangaluru, Bhopal, Kolkata, Lucknow, Shillong, and Vadodara and sponsored projects.

2. REVENUE RECONGNITION

2.1 Grants- in - Aid are accounted for on realization basis.
2.2 Interest on Bank Deposits is recognized on accrual basis.
2.3 Miscellaneous Receipts and other Incomes are recognized on receipts basis.

3. FIXED ASSETS

3.1 Fixed Assets are stated at cost of acquisition inclusive of freight inward, duties, taxes, incidental and other direct expenses related to acquisition.

3.2 Fixed Assets received by way of non-monetary grants, (other than towards the Corpus Fund), i.e., gifted assets are taken in the financial books at nominal value. The incidental expenses on such assets such as clearing & forwarding charges, duties & taxes and other incidental expenses are capitalized.

3.3. REGROUPING OF FIXED ASSETS

3.3.1 Laboratory Equipments & Scientific Equipments and other Project Equipments have been grouped under Plant, Machinery & Equipments.

4. DEPRECIATION

4.1. Depreciation during the year is provided on straight-line method as per rates given below limited to the extent of 95% value of assets. Lease hold land has been amortized over the lease period.

Prakash Jain & Co. New Delhi Firm Reg. No.: 007405N Chartered Accountants

Category of Assets	Rates (in %)
Free Hold Land	0
Building	10
Plant , Machinery & Equipments	15
Vehicles	15
Furniture & Fixtures	10
Computers	60
Library Books	15

4.2 In respect of additions to / deduction from the fixed assets during the year, depreciation is considered on full-year basis.

5. FOREIGN CURRENCY TRANSACTION

Transaction denominated in foreign currency is accounted for at the exchange rate prevailing at the date of transaction.

6. INVENTORY VALUATION

Stores and Spares including Chemicals, Glassware, Consumables & other Inventories have been valued at cost as at the close of the year.

7. RETIREMENT BENEFITS

The Board's contribution to Contributory Provident Fund is charged to Income & Expenditure Account. The Board also provides Gratuity benefits to its employees. Liability towards Gratuity payable on death/retirement is accrued at the year-end on the basis of actuarial valuation as at year end.

The Board has got actuarial valuation of provision for Gratuity as on 31 Mar, 2016 and 31 Mar, 2017. The increase in amount of actuarial valuation of provision made as on 31 Mar, 2017, as compared to actuarial valuation as on 31 Mar, 2016 (Rs. 33,37,38,044/- less Rs. 23,44,95,432/-) of Rs. 9,92,42,612/- has been charged to Income & Expenditure Account.

Provision for accumulated Leave Encashment benefit to employees is accrued and computed on the basis of actuarial valuation as at year end. The increase in amount of actuarial valuation of provision made for Leave Encashment as on 31 Mar-2017 as compared to actuarial valuation as on 31 Mar, 2016 (Rs. 24,88,68,288/- Less Rs. 19,46,14,422/-) of `Rs. 5,42,53,866 /- has been charged to Income & Expenditure Account.

8. EARMARKED FUNDS – SPONSORED PROJECTS

8.1. The Funds Received & utilized for Sponsored Projects have been identified as Earmarked Funds. The funds are utilized towards the objectives of the specific Projects. Income on account of bank interest is added to the Sponsored Projects and not treated as income of the Board.

Prakash Jain & Co. New Delhi Firm Reg. No. 002740N Chartered Accountants

8.2. The sponsored Project " **CPCB-HWMD Waste of UCIL Pithampur** , **CPCB-Hydrology Project** , **CPCB-NGT 25**, **CPCB-NGT 75** , **Upgradation of Air Lab Project** , **CPCB-*PIAs*** , **CPCB-SNITI** , **CPCB-CPSU PROJ** , **CPCB-EPC**" have been commenced during the current financial year.

SCHEDULE 26 - CONTINGENT LIABLITIES AND NOTES ON ACCOUNTS

S NO	PARTICULARS	CURRENT YEAR (Amount in Rs.)	PREVIOUS YEAR (Amount in Rs.)
1	**CONTINGENT LIABLITIES**		
1.1	Claims against the Entity not acknowledged as debts	NIL	NIL
1.2	In respect of		
	- Bank Guarantees given by/on behalf of Entity	NIL	NIL
	- Letter of Credit opened by Bank on behalf of the Entity	16,27,988	15,00,000
	- Bills Discounted with Banks	NIL	NIL
1.3	Disputed Demands in respect of		
	- Income Tax	NIL	NIL
	- Sales Tax	NIL	NIL
	- Municipal Tax	NIL	NIL
1.4	In respect of claims from parties for non-execution of orders, but contested by the entity	NIL	NIL
1.5	In respect of Court cases And Arbitration	NIL	1,06,430/-
2.	**CAPITAL COMMITMENTS**		
	Estimated value of contracts remaining to be executed on capital accounts and not provided for (net of advances)		
	(a) CESS Project - Upgradation and strengthening of lab.	54,68,303	NIL
	(b) Head office & Regional Directorates	1,98,713	NIL

Prakash Jain & Co. New Delhi Firm Regn. No.: 007405N Chartered Accountants

3. **LEASE OBLIGATIONS**

Future obligations for rentals under finance lease arrangements for plant and machinery	NIL	NIL

4. **CURRENT ASSETS, LOANS AND ADVANCES**

In the opinion of the Management, the current assets, loans and advances have a value on realisation in the ordinary course, equal to at least the aggregate amount shown in the Balance Sheet.

Particulars	**Current Year (Rs. in lacs)**	**Previous Year (Rs. in lacs)**
Staff Advances	19.36	29.31
Outside Projects Advances	94.55	82.07
State Pollution Control Board's Advances	56.22	56.22
Publications Advances	0.88	0.26
Purchase & other Advances	30.21	23.88
Advances for Capital Commitment	0.00	0.00
Other Advances – UC Required	2290.23	1846.73
Misc Advances	7.56	32.02
Total (A)	**2499.01**	**2070.49**
Advances made by Regional Directorates **(B)**	125.24	124.01
Project Advances **(C)**	3511.25	3907.16
Grand Total (A+B+C)	**6135.50**	**6101.66**

The Following credit balances are subject to confirmations:

Particulars	**Current Year (Rs. in lacs)**	**Previous Year (Rs. in lacs)**
Deposits (Work)	91.46	91.46
Earnest Money Deposit	16.18	31.73
Retention Money	0.73	0.73
Security Deposit	4.80	6.92
Others	24.97	14.59
Grand Total	**138.14**	**145.43**

Prakash Jain & Co. New Delhi Firm Reg. No. Chartered Accountants

5. **TAXATION**

In view of there being no taxable income under Income Tax Act 1961, no provision for Income tax has been considered necessary.

6. **FOREIGN CURRENCY TRANSACTIONS**

6.1 Value of Imports Calculated on C.I.F Basis:

	CURRENT YEAR (Rs.)	PREVIOUS YEAR (Rs.)
--Purchase of finished Goods	NIL	NIL
--Raw Materials & Components (Including in transit)	NIL	NIL
--Capital Goods, Stores, Spares and Consumables	38,48,749	NIL

6.2 Expenditure in foreign currency:

a) Travel	NIL	NIL
b) Remittances interest payment to Financial Institution/Banks in foreign Currency	NIL	NIL
c) Other expenditure:		
--Commission on Sales	NIL	NIL
--Legal and Professional Expenses	NIL	NIL
--Miscellaneous Expenses	NIL	NIL

6.3 Earnings:

Value of Exports on FOB basis	NIL	NIL

6.4 Remuneration to Auditors:

--As Auditors	1,12,100	1,09,250
--Taxation matters	NIL	NIL
--For Management services	NIL	NIL
--For certification	NIL	NIL
--Others	NIL	NIL

7. Corresponding figures for the previous year have been regrouped / rearranged, wherever necessary.

Prakash Jain & Co. New Delhi Chartered Accountants

) Fixed Assets Register

8.1 The Assets Registers have been maintained as per General Financial Rules (GFR) in respect of Laboratory Equipments, Instruments, Computers, Office Equipments and Furniture and Fixture on cost basis. However, the balance appears in the said registers may not tally with Financial Statement/Books of Accounts as depreciation is charged in the Financial Books of Accounts and no depreciation is charged in the fixed assets register as there is no column in fixed assets register for providing depreciation on fixed assets as per GFR.

8.2 The Physical Verification of assets of the board was carried out in the phased manner. However, the obsolete assets are to be disposed off / written off.

0 Outstanding Balances

9.1 The Balances under heading 'Deposit received for Works from Outside Bodies' & 'Amount due in Liability side' and 'Advances' in Assets side of the Balance Sheet are subject to reconciliation / confirmation. The old Balances appearing in advances / liabilities are in the process of Reconciliation, and the effect, if any, in the Books of Accounts will be given on reconciliation thereof.

). There are unspent balances in Sponsored Projects, which are outstanding for a long time for want of necessary instructions from Sponsors

. Contingent Liablity for Pension of CPCB employees:

CPCB employees recruited before 1.1.2004 are covered under Contributory Provident Fund (CPF) scheme. However the employees' union of CPCB is demanding coverage under Pension (Old) scheme and a court case is under progress in this regard. Contingent liability that may arise in the event of court's verdict goes in favour of employees' union demand, has neither been shown and nor been ascertained.

2. Current Liabilities include Rs. 5,29,718/- and Rs. 7,55,069/- under the head Misc Deposits- Stale Cheques and sundry Account espectively and efforts are being made to reconcile these figures.

Prakash Jain & Co. New Delhi Firm No. 00 Chartered Accountants

13. During the year, out of the total expenditure of Rs. 119,022,670/- incurred in sponsored project, Rs.6,47,979/- has been incurred on procurement of fixed assets.

14. Earmarked Funds- Sponsored Projects

During the year 37 Nos. of projects were carried out by Central Pollution Control Board as per details given in schedule 'C' (attached).

15. Schedules 1 to 26 are annexed to and form integral parts of the Balance Sheet as at 31st March 2017 and the Income and Expenditure Account for the year ended on that date.

For Prakash Jain & Co.
Firm Reg. No. 007405N
Chartered Accountants

(K. C. Jain)
Partner
M.No. 015438

Place: Delhi
Date: 14.07.2018

(S. P. Singh Parihar, IAS)
Chairman

For Central Pollution Control Board

(Prashant Gargava)
Member Secretary

(Mohan Kapur)
Accounts Officer

(Virendra Bansal)
Assistant Accounts Officer