

**Hon'ble Supreme Court of India
In the matter Air Pollution of Delhi and NCR of
M.C. Mehta vs. Union of India CWP-13029 of 1985**

(Submission by Central Pollution Control Board, Delhi)

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Submission by Central Pollution Control Board, Delhi

Graded response action plan according to pollution levels in Delhi and NCR to inform public action and to take effective steps to combat public health emergencies

December 2, 2016

The Hon'ble Supreme Court in its order of November 10, 2016 directed framing and submission of graded response action plan for various categories of National Air Quality Index (AQI). It also directed Central Pollution Control Board (CPCB) to convene a meeting on November 19, 2016 to get the views and suggestions of petitioners and other respondents on such plan.

Accordingly, a meeting was convened on November 19, 2016 at CPCB. The minutes of the meeting along with suggestions made and list of participants is annexed. (Appendix – I) Prior to this meeting two more meetings were held with implementing and monitoring agencies on November 16 & 17, 2016, and their suggestions on proposed action plan were taken.

In the hearing of November 25, 2016, CPCB had presented the draft of graded responses to different levels of pollution. The Hon'ble Court has "handed over to the Counsel opposite and Sunita Narain, who is present in person, to enable her to look into the matter and suggest such improvements and changes as may be considered necessary and feasible." sought further assessment and refinement of the proposed graded measures for finalization. CPCB and Sunita Narain have carried out further consultation to improve the proposal.

The graded measures for each source have been framed according to the AQI

categories. It also takes note of the broad health advisory for each level of AQI that was adopted by the Government of India along with the AQI (See Table 1 and 2). The analysis of the past air quality trend shows that Severe and Very Poor air quality is anticipated throughout the winter months of November to February and largely poor category during the summer months of March to May (Appendix – II).

The proposal has been framed keeping in view the key pollution sources in Delhi and National Capital Region of Delhi (NCR). While major sources of pollution including vehicles, road dust, biomass burning, construction, power plants and industries remain continuous throughout all seasons, the episodic pollution from stubble burning, increase in biomass burning, etc. varies across seasons. During winter the relative share of vehicles, biomass burning, MSW burning, firecracker, stubble burning, construction, and secondary particles increase. During summer, the influence of road dust, fly ash, vehicles, biomass burning etc is high.

The proposed graded measure approach has considered all these aspects and includes appropriate measures for each level of pollution according to AQI.

Table 1: National Air Quality Index

AQI Category (Range)	PM ₁₀ 24-hr	PM _{2.5} 24-hr	NO ₂ 24-hr	O ₃ 8-hr	CO 8-hr (mg/m ³)	SO ₂ 24-hr	NH ₃ 24-hr	Pb 24-hr
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5-1.0
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1- 10	81-380	401-800	1.1-2.0
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0
Very poor (301-400)	351-430	121-250	281-400	209-748*	17-34	801-1600	1200-1800	3.1-3.5
Severe (401-500)	430 +	250+	400+	748+*	34+	1600+	1800+	3.5+

Table 2: Likely Health Impacts

AQI	Associated Health Impacts
Good(0–50)	Minimal Impact
Satisfactory (51–100)	May cause minor breathing discomfort to sensitive people
Moderately polluted (101–200)	May cause breathing discomfort to the people with lung disease such as asthma and discomfort to people with heart disease, children and older adults
Poor (201–300)	May cause breathing discomfort to people on prolonged exposure and discomfort to people with heart disease
Very Poor (301–400)	May cause respiratory illness to the people on prolonged exposure. Effect may be more pronounced in people with lung and heart diseases
Severe (401–500)	May cause respiratory effects even on healthy people and serious health impacts on people with lung/heart diseases. The health impacts may be experienced even during light physical activity

Key elements of the graded measures according to the pollution levels

The compliance to various rules and regulations must be ensured throughout the year. Set of actions is to be implemented with greater vigour and stringency as preventive measures to avoid emergency, severe, and very poor air quality.

The actions are to be implemented in the entire NCR, except the action related to stubble burning which is to be implemented in the states of Delhi, Haryana, Punjab, Rajasthan and Uttar Pradesh. For the purpose of the smog alert and pollution emergency action the data from the available monitoring grid in Delhi will be considered for action in the entire NCR as it is a common air shed.

All actions suggested for each category – moderate to poor, very poor, severe and emergency -- are cumulative and add up to the level of emergency.

Necessary preparations, including identification of sources and action plan, should be ready at least four weeks and actions initiated at least two weeks in advance of anticipated critical pollution days.

While the worst category according to the AQI is “Severe”, which in case of PM_{2.5} is 250

microgram per cubic meter ($\mu\text{g}/\text{m}^3$) and above and in case of PM_{10} $401 \mu\text{g}/\text{m}^3$ and above, another grade of health emergency level is proposed to be considered for more stringent action. The threshold for this category will be $300 \mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$ and $500 \mu\text{g}/\text{m}^3$ for PM_{10} , which are five times the standards. This is also consistent with the directive of the National Green Tribunal.

The institutional arrangement for the implementation is also presented here. The Hon'ble NGT vide its order of November 10, 2016, has constituted the Central and State level monitoring committees. Accordingly, the following structure will be set up.

A Task Force will be set up at the central level comprising representatives of CPCB, MOE&CC, DPCC, concerned SPCBs, IMD, health experts and other stakeholders. This Task Force will be set up and headed by CPCB. IMD will carry out forecasting and alert the Task Force. This Task Force will meet at least once a week or daily, if necessary during peak winter months of mid-October to mid-February, to review air quality status including weather and air quality forecast.

At the state level, each State Government in Delhi and NCR will set up Monitoring Committees under the Chairmanship of the Chief Secretary to oversee implementation, monitoring, and compliance with the graded response measures. The Central Committee, headed by the Secretary, Ministry of Environment, Forest & Climate Change, will review and coordinate actions taken and direct enforcement by concerned States.

Control rooms will be set up in Delhi Pollution Control Committee and concerned State Pollution Control Boards, traffic police and municipal bodies of NCT Delhi and NCR towns, for public to report on non-compliance. A central control room for overall monitoring will also be set up in Central Pollution Control Board.

The information about air quality will be sent to concerned Chief Secretaries of NCR, who are heading the State level committees so that the graded response, as detailed below, is implemented and enforced. This information about air pollution levels and the response required will also be communicated by the CPCB-headed Task Force directly and through the State governments to public so that they are informed about protective steps recommended for them as well as the steps required to be taken by governments.

During air quality emergencies, the CPCB-headed Task Force will suggest additional special measures that may be required to quickly bring down the air pollution levels to desired levels. The suggestion of the Task Force will be communicated to concerned Chief Secretary heading the State level committee, to ensure implementation. The Task Force may also suggest local measures in pollution hotspots. For example, Anand Vihar in Delhi that always shows up as very polluted area will require a local area plan in addition to the graded measure for the city. This information will also be communicated to the public, through public advertisements, installation of notice boards in different parts of the cities and other means by the respective State Governments.

The pollution emergency measures will have to be implemented under the Air (Prevention and Control of Pollution) Act, 1981 and the Environment Protection Act, 1986. In fact, earlier on December 29, 2015, the Action Plan to contain air pollution in Delhi and NCR was issued by the Central Pollution Control Board under the Section 18(1)(b) of the Air Act, 1981 and on November 1 and 2, 2016, under Section 5 of the Environment (Protection) Act, 1986.

The Monitoring Committee at the State government level will ensure implementation under section 31(A) of the Air Act, 1981.

As air quality analysis shows that most of the days during winter, between October 15 and February 15, fall in the AQI categories of Very Poor and Severe, it is appropriate to

implement the measures that have been proposed for the AQI categories of Severe and Very Poor all through the winter, to prevent occurrence of severe or emergency situations.

The CPCB-headed Task Force will monitor air quality levels carefully and if the situation persists in Emergency category for 48 hours or more, then action as required under emergency situations shall immediately be pressed into action through State level committees and various implementing agencies listed in the action plan. However, all efforts will be made to reduce the response time so that people’s exposure to toxic pollutants is reduced. This requires advance warnings and stringent implementation of actions required to reduce pollution before Severe or Emergency Level is breached.

The graded measures have been proposed for actions by the implementing agencies as well as by public for controlling of air pollution and reduction of outdoor exposures to protect health.

Table 3: Graded Response Action Plan for reducing air pollution

The graded measures according to AQI are listed from public health emergency level to downward. The measures are cumulative. Emergency and Severe levels include cumulatively all other measures listed in the lower levels of AQI including Very Poor, Poor and Moderate. It is also clear that the actions listed in the poor category need to be implemented though out the year. But during months when weather conditions turn more adverse there is need for greater scrutiny on enforcement.

Severe + or Emergency	Agency responsible/Implementing
When PM_{2.5} levels cross 300 µg/m³ or PM₁₀ levels cross 500 µg/m³ (5 times above the standard) and persist for 48	Agency

hours or more	
Stop entry of truck traffic into Delhi (except essential commodities)	Municipal Corporations and Traffic Police of Delhi and NCR Towns
Stop construction activities	Delhi Pollution Control Committee/Municipal Corporations of Delhi and NCR towns
Introduce odd and even scheme for private vehicles based on license plate numbers and minimize exemptions	Secretary cum Commissioner of Transport Department, NCT of Delhi, and Transport Commissioners of NCR towns
Task Force to take decision on any additional steps including shutting of schools	
Severe	
When PM_{2.5} levels are above 250 µg/m³	
or	
PM₁₀ levels are above 430 µg/m³	
Close brick kilns, Hot Mix plants, Stone Crushers	Chairpersons Delhi Pollution Control Committee, State Pollution Control Boards of Haryana, Rajasthan, and Uttar Pradesh
	Superintendent of Police and Deputy Commissioner of respective districts
Shut down Badarpur power plant and maximize generation of power from existing natural gas based plants to reduce operation of coal based power plants in the NCR.	Chairpersons Delhi Pollution Control Committee, State Pollution Control Boards of Haryana, Rajasthan, and Uttar Pradesh

Intensify public transport services. Introduce differential rates to encourage off-peak travel.	Secretary cum Commissioner of Transport Department, NCT of Delhi, and Transport Commissioners of NCR towns
	Chairperson, Delhi Metro Rail Corporation (DMRC)
	Chairpersons, State Transport Corporations
Increase frequency of mechanized cleaning of road and sprinkling of water on roads. Identify road stretches with high dust generation.	All road owning agencies including Municipal Corporations of NCT of Delhi and NCR towns, Public Works Departments and National Highway Authority of India
Very Poor	
When PM_{2.5} levels are between 121-250 µg/m³ or	
PM₁₀ levels are between 351-430 µg/m³	
Stop use of diesel generator sets	Chairpersons Delhi Pollution Control Committee, State Pollution Control Boards of Haryana, Rajasthan, Uttar Pradesh
Enhance parking fee by 3-4 times	Municipal Commissioner
	Municipal Corporations of NCT of Delhi and NCR towns
Increase bus and metro services by augmenting contract buses and increasing frequency of service	Principal Secretary, Department of Transport of NCT of Delhi
	Delhi Transport Corporation (DTC)
	Delhi Integrated Multi-modal Transit System Ltd (DIMTS)

	Delhi Metro Rail Corporation (DMRC)
	State Transport Corporations in NCR towns
Stop use of coal/firewood in hotels and open eateries	Municipal Corporations of NCT of Delhi and NCR towns
Residential Welfare Associations and individual house owners to provide electric heaters during winter to security staff to avoid open burning by them	Resident Welfare Associations
Alert in newspapers/TV/radio to advise people with respiratory and cardiac patients to avoid polluted areas and restrict outdoor movement.	Chairpersons, Delhi Pollution Control Committee, State Pollution Control Boards of Haryana, Rajasthan, and Uttar Pradesh
Moderate to poor	
Poor – When $PM_{2.5}$ levels are between 91-120 $\mu\text{g}/\text{m}^3$ or	
PM_{10} levels are between 251-350 $\mu\text{g}/\text{m}^3$	
Moderate – When $PM_{2.5}$ is between 61-90 $\mu\text{g}/\text{m}^3$ or	
PM_{10} is between 101-250 $\mu\text{g}/\text{m}^3$	
Stringently enforce/stop garbage burning in landfills and other places and impose heavy fines on person responsible	Municipal Commissioner Municipal corporations of Delhi and NCR towns
Close/stringently enforce all pollution control regulations in brick kilns and industries	Chairpersons, Delhi Pollution Control Committee, State Pollution Control Boards of Haryana, Rajasthan, and Uttar Pradesh

Stringently enforce pollution control in thermal power plants through PCB monitoring	Plant in-charge of power plants in NCR, and Delhi Pollution Control Committee and State Pollution Control Boards of Haryana, Rajasthan and Uttar Pradesh
Do periodic mechanized sweeping on roads with heavy traffic and water sprinkling also on unpaved roads every two days	Municipal Commissioner, Municipal Corporations of NCT of Delhi and NCR towns
	Commissioners, Traffic Police of Delhi and NCR towns to identify roads with heavy traffic and provide information to respective Municipal Commissioners
	Chief Engineers of officers in charge of CPWD, PWD of Delhi and NCR towns to identify unpaved roads with heavy traffic and provide information to respective Municipal Commissioners
Strict vigilance and no tolerance for visible emissions – stop plying of visibly polluting vehicles by impounding or heavy fine.	Commissioner or Officer in Charge, Transport Department and Traffic Police of NCT Delhi and NCR towns
Strict vigilance and enforcement of PUC norms	
Stringently enforce rules for dust control in construction activities and close non-compliant sites	Commissioner or Officers in charge of Police Departments of Delhi and NCR towns
Deploy traffic police for smooth traffic flow at identified vulnerable areas	Commissioners Traffic Police of Delhi and NCR Towns
Strictly enforce Supreme Court order on diversion of non-destined truck traffic and	Municipal Corporations of NCT of Delhi and NCR towns

ensure only trucks registered after 2005 are allowed entry into Delhi	Traffic Police of NCT of Delhi and NCR towns
Strictly enforce Supreme Court ban on firecrackers	Chief Controller of Explosives
	Petroleum and Explosive Safety Organizations (PESO)
	Commissioner of Officer in charge of licensing in the police departments of Delhi and NCR
Ensure fly ash ponds* are watered every alternate day during summer months (March – May).	Plant in charge of Power Plants in Delhi and NCR towns
Information dissemination Social media, mobile Apps should be used to inform people about the pollution levels, contact details of control room, enable them to report polluting activities/sources to the concerned authorities, and actions that will be taken by government based on the level of pollution.	Chairpersons, Delhi Pollution Control Committee, State Pollution Control Boards of Haryana, Rajasthan, and Uttar Pradesh

Note: * IIT Kanpur Report finds high fly ash in air during summer months. Therefore, action is necessary during this period. But long term action has to be removal of this source of pollution from Delhi and its vicinity through the reuse and removal of all fly ash dumps.

Action to be taken by public

While the CPCB headed Task Force will use the AQI and health advisory to inform people about the dangers of exposure, people are also expected to take precautionary measures to protect themselves. Suggested actions by public is listed below:

Level according to Air quality index	Action
Very poor, severe and emergency	Those suffering from heart diseases, asthma, and other respiratory disease may consider avoiding undue and prolonged exposure
	Schools to suspend all outdoor activities and sport events during Severe and Very Poor conditions
	Report visible emissions from vehicles, industries, power plants, garbage burning, and other non compliances to the respective control rooms
	Do not use diesel and kerosene generators
	Maintain vehicles properly (PUC certificate, replace car air filter, maintain right tyre pressure)
	Minimize unnecessary travel, use public transport and avoid using private vehicles

The compliance with various rules, regulations and action plans including short, medium and long terms measures must be ensured throughout the year. Directions were issued

by CPCB on December 29, 2015 to contain air pollution in Delhi and NCR that include 42 points action plan. Time bound strategy and action are needed to comply with these measures to prevent occurrence of emergency, severe and very poor air quality.

Draft 21.11.2016

**IN COMPLIANCE WITH THE DIRECTIONS OF
HON'BLE SUPREME COURT OF INDIA FOR SEEKING SUGGESTIONS OF THE PETITIONERS
&RESPONDENTS IN THE MATTER OF M.C. MEHTA V/S. UNION OF INDIA, MEETING HELD ON
19.11.2016 AT CPCB, DELHI**

MINUTES OF THE MEETING

In pursuant to the order, dated 10/11/2016 of Hon'ble Supreme Court of India in the matter of Air Pollution in Delhi and NCR (M.C. Mehta Vs. UOI), a stakeholder meeting to discuss graded response to various air quality situations in NCR Delhi was convened in Central Pollution Control Board (CPCB), Delhi on November 19, 2016. The meeting was chaired by Shri S.P. Singh Parihar, Chairman, CPCB, and attended by petitioners, representatives of concerned Government departments, and their counsel. List of participants is annexed.

The Chairman welcomed the participants. After brief round of introduction, a presentation on air quality scenario in Delhi was made by CPCB. The presentation covered information on air quality monitoring network, air pollution status including levels during recent episode of severe air quality, air quality index (AQI) categories and associated likely health impacts, and number of days in a month under various AQI categories for the past year.

Initiating the discussion, the Chairman observed that information on sources and contribution are available, and on the basis of this a broad action plan is already in place and has been conveyed to the concerned regulatory and implementing agencies in December 2015. Subsequently, specific directions have been issued on the 29th October, 1st and 2nd November 2016 to concerned agencies in Delhi and NCR. Meetings were also held by Chairman CPCB on the 30th September, Secretary Moefcc on the 4th November and the hon'ble Minister on the 7th November 2016 with Delhi and NCR State governments for effective compliance with the directions. He also observed that the air quality in Delhi is much inferior in winter months as compared to other months in the

year. The recent episode of extremely high air pollution levels was unprecedented and resulted due to adverse weather conditions as also local and other factors in the NCR States. However, recurrence of such an event in future cannot be ruled. Therefore, it is necessary that an action plan is put in place to prevent recurrence of such situations in future. Hon'ble Supreme Court and Hon'ble National Green Tribunal (NGT) have also expressed serious concerns and have desired that an emergency/graded response action plan is prepared to deal with such events. The Hon'ble Supreme Court has directed that a meeting with the petitioners in this case may be held on the 19th November at 11 AM in CPCB office and their suggestions for actions to improve the air quality of Delhi and NCR may be taken and incorporated in the proposed graded response action plan.

The views expressed by the participants are summarized below:

Shri Panjawani, CPCB Counsel:

- CPCB and SPCBs should be strengthened, and creation of three separate divisions for investigation, surveillance and compliance may be considered.
- Pollution Control Boards be renamed as Environment Protection Agencies
- Restriction be imposed on licensing, manufacturing, wholesale, and use of fire crackers with high noise levels and emissions
- Promote use of cleaner fuel and green technologies in crematoria

Dr. Kamat, Indian Medical Association:

- Strengthen implementation mechanism

Shri R. P. Singh, General Manager, National Highway Authority of India:

- Decongest arterial roads linked with national highways
- Install way motion bridges for trucks carrying goods at entry points to Delhi
- Remove bottlenecks for seamless flow of traffic

Student & Co-petitioner

- Restrictions be imposed on manufacture and sale of fire crackers
- Sprinkle water on MSW dumping sites to suppress gaseous emissions
- Implement waste management practices

Shri Arun Shah, Co-petitioner

- Adopt sectoral approach for controlling pollution – actions for each sectors such as construction, firecracker, disposal of debris, etc
- Ensure shouldering of roads & vacuum cleaning
- Invite open suggestions for innovative approaches to deal with stubble burning
- Appeal to Residential Welfare Associations to provide electric heaters during winter to the Security Staff to discourage open burning by them

Ms. Asavi, student & co-petitioner

- Spread awareness among children about harmful effects of firecrackers
- Seek suggestions from school & college students on measures to reduce pollution
- Ensure better monitoring and repairing of potholes for improving flow of traffic and reducing pollution
- Spread awareness on environmental laws among public

Dr Ramesh Kumar, Chief Medical Officer, NDMC

- Strengthen mechanism for implementation and take punitive action where necessary
- Encourage use of compost pits in public and residential gardens
- Integrate multimodal transport system to facilitate use of public transport
- Enhance use of mechanical sweepers to contain dust related pollution
- Encourage multi-level parking.

Transport Department

- Encourage sensor based probe for PUC measurements
- Encourage installation of particulate filters in diesel vehicles

- Mandate that all States/UTs ensure pollution check for vehicles registered in their jurisdiction
- Strengthen Public transport

Shri Rally, Counsel, DPCC

- Spread awareness about severe health impacts of air pollution, particularly among school and college students in language that is simple to understand
- Publicize DOs and DONTs and the role of citizens
- Ensure installation of more air quality monitoring stations in Delhi

Assistant Commissioner of Police, Delhi

- States of Haryana & Uttar Pradesh to provide alternate routes for non-destined vehicles
- Adequate U-turns to be provided by the PWD of Delhi for returning non-destined vehicles
- Lay down a Policy for scrapping old and impounded vehicles in Delhi
- Carry out a comprehensive study on road bearing capacity in Delhi
- Link purchase of vehicles with availability of parking space
- Public transport be made reliable, robust, and efficient
- Encourage multilevel parking.

Haryana SPCB

- Ensure alternate power supply arrangements in the event of shutting down Thermal Power Plants, as it may increase use of DG sets.
- Ban use of firecrackers during marriage functions
- Stop manufacture of firecrackers for five years
- Promote alternate use of Wheat/Paddy stock to prevent stubble burning
- Re-circulate leachate in landfill sites to contain Methane and extinguish fire at such sites

Shri Aniruddh Suri, Co-petitioner

- Technology and data from Google may be used to address issues related to traffic decongestion
- Impose complete ban on manufacture, sale and use of firecrackers, as it has no socio-economic benefits
- Ensure wide publicity of Air Quality Index using display boards across the city
- Ensure strict action against non-performers in government agencies
- Work out localized solutions to control air pollution and promote use of Ethanol in auto fuel
- For prevention of stubble burning, farmers should be sensitized that it not only affects health but also causes financial loss due to decline in soil fertility
- Encourage cooperation with agencies like USEPA and others for innovative solutions
- Do not permit a Polluting vehicle to ply even if it is being used to carry essential goods
- Undertake indigenous scientific studies on air pollution and health impacts
- Popularize mobile apps on various aspects of air pollution and CPCB to further improve its website to provide uninterrupted information
- Engagewith citizens more closely to seek suggestions for actions to control pollution.
- Action plan to indicate clearly the agencies and officers responsible for various activities and the plan be placed in public domain so that public can directly approach those responsible and hold them accountable

Dr Sarath Pallerla, Director, MoEF&CC

- For implementation of graded response there is a need to expand infrastructure, enhance manpower and augment funding
- Prepare specific action plan for festivals like Diwali

U.P. SPCB

- Directions of Pollution Control Boards are not being implemented specially by

government agencies such as development Authorities and ULBs

- Mechanism for coordinated response at the State Government level be put in place

Summary:

Summarizing the discussions, the Chairman, CPCB thanked the participants for their valuable suggestions and observed that the suggestions will be appropriately incorporated in the draft graded response action plan which is being prepared for submission to the Hon'ble Supreme Court. It was agreed that in order to prevent recurrence of higher levels of pollution it is important to sensitize public in general and school/college students in particular. For effective implementation of action plans, Public agencies will have to be better equipped and made more accountable. It was further agreed that government agencies such as CPCB and others should engage with public more closely to invite their suggestions for effective check on pollution as only a joint and concerted action can bring in meaningful solution to the recurrent problem of air pollution in Delhi and NCR.

The participants were then requested to visit the Air Laboratory, Central Data Monitoring Facility and Air Quality Monitoring Station established on the campus of CPCB.

The meeting ended with thanks.

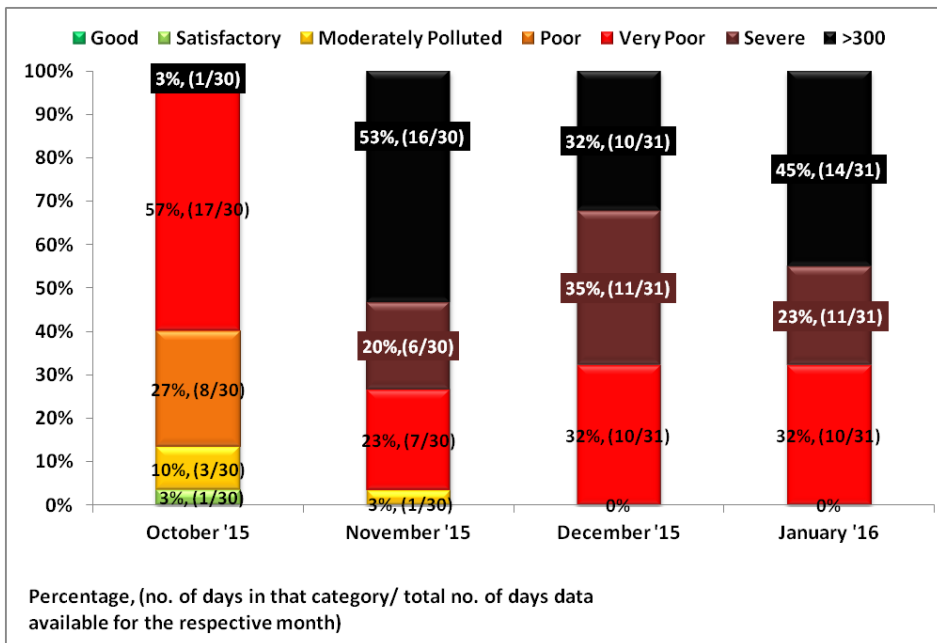
List of Participants

Sl. No.	Name of the Person	Designation	Organization	Mobile/Phone No.	E-Mail
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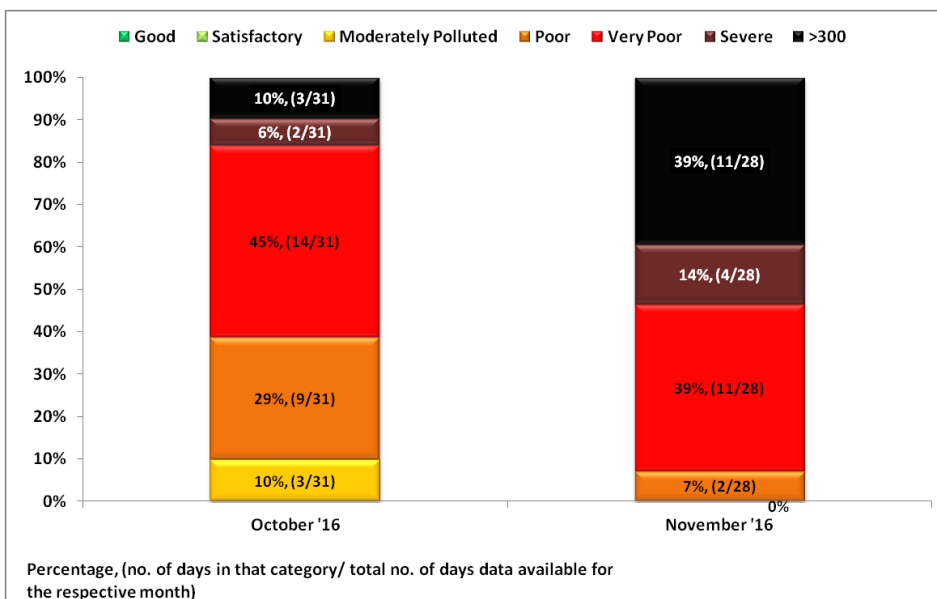
Appendix – II

Graph 1: Percentage share of days in different AQI categories (PM_{2.5} from October 2015 to January 2016)



Source: Based on CPCB data

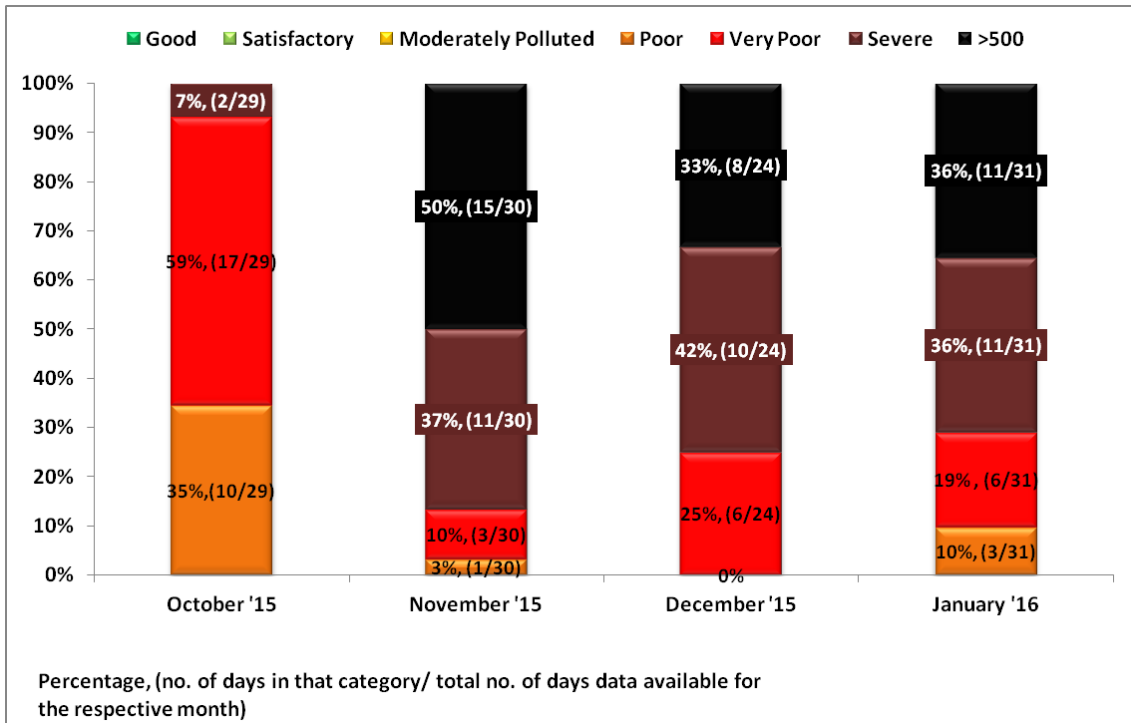
Graph 2: Percentage share of days in different AQI categories (PM_{2.5} from October- November 2016)



Source: Based on CPCB data

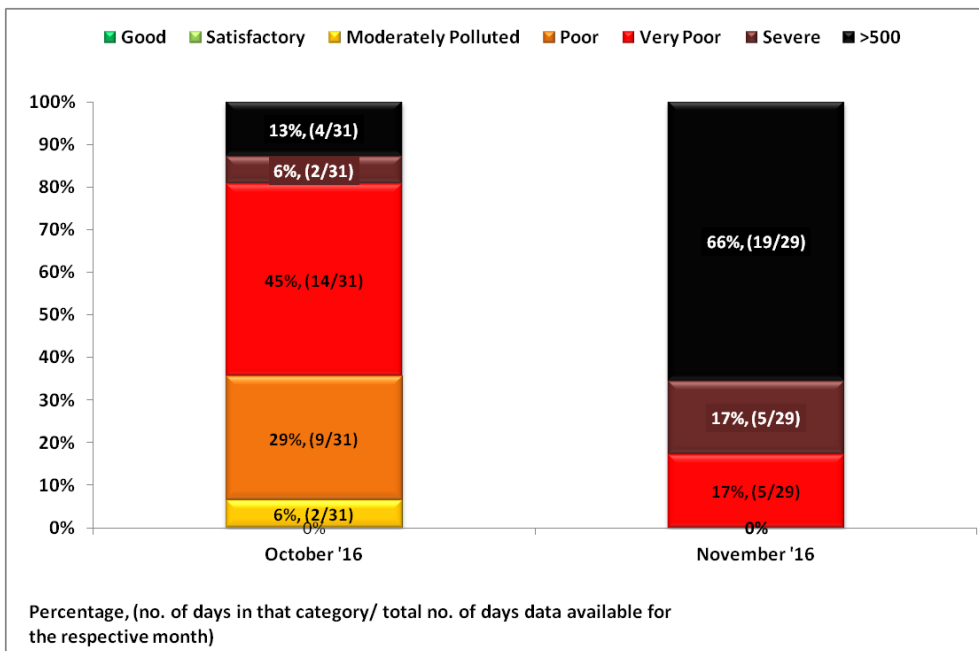
Graph 3: Percentage share of days in different AQI categories (PM₁₀ from

October 2015 to January 2016)



Source: Based on CPCB data

Graph 4: Percentage share of days in different AQI categories (PM₁₀ from October- November 2016)



Source: Based on CPCB data

Submission by Central Pollution Control Board, Delhi

CENTRAL CONTROL ROOM at CENTRAL POLLUTION CONTROL BOARD

Brief note in pursuance of the directions issued by Hon'ble Supreme Court

at the hearing dated 10/11/16

01 Central Pollution Control Board is presently monitoring ambient air quality in the country under **National Ambient Air Quality Monitoring Program (NAMP)** and **Continuous Ambient Air Quality Monitoring (CAAQM)** project. The manual monitoring under NAMP is carried out at a frequency of twice in a week and the continuous stations under CAAQM project generates data continuously in real time. The analytical data is captured separately from the manually operated stations through a data-entry portal and processed for periodical reports.

02 The data from the CAAQM stations is continuously transferred from the field locations to a Central Server, a **Virtual Machine (VM)** placed at NIC data center, through a communication protocol. The software platform receives the data on monitored parameters along with the health status of the instruments. After inbuilt checks the data is available for further use to be displayed in tabular and graphical forms. At present 53 CAAQM stations, operated by CPCB and SPCBs across the country are integrated in CPCB network. In Delhi, the data is received from 06 stations operated by CPCB and 04 stations operated by DPCC.

03 The central software of **National Air Quality Index (AQI)**, launched in April 2015, processes the ambient air quality data and generates sub-index value for each parameter, AQI values for each station and AQI for each city in the network. This central platform facilitates data publishing on CPCB website, updated hourly and on an Android web App **SAMEER**. A daily bulletin is also released based on the AQI data at 4 PM.

04 Other than CPCB & SPCBs, the ambient air quality is also being monitored by

the Indian Institute of Tropical Meteorology (IITM) - Pune, Ministry of Earth Sciences, Government of India. IITM monitors air quality at 08 stations in Delhi. The data is being separately published by IITM on their website.

THE PROPOSAL

05 It is proposed to bring all the data generated at CAAQM stations operated by CPCB, DPCC and IITM on one common platform at the Central Control Room (CCR) in CPCB. In this regard, two meetings were held on November 16 & 17, 2016 at CPCB with the concerned officers from Indian Meteorological Department (IMD) representing IITM and DPCC. It has been decided that the data will be fetched directly from each CAAQM station through the standard communication protocol of CPCB. Both the organisations, IMD and DPCC were requested to arrange the data transmission for which IMD requested 20 days' time.

06 It is expected that CPCB will be receiving the Ambient Air Quality data directly from all the CAAQM stations in Delhi from December 15, 2016. The data from IITM operated stations will be obtained through email on daily basis, till automatic data transmission starts. The data received through email will be analysed on daily basis.

07 The Central Control Room will be linked with other Control Rooms in the Region for tracking and redressal of the complaints received from the public. The CCR will provide centralised services on air quality for Delhi and NCR to enable various agencies to take further action as envisaged under Graded Response Plan.

TECHNICAL AND MANPOWER REQUIREMENTS

08 The present software and hardware set up at CPCB requires upgradation to support Central Control Room for generating automated actions and subsequent follow-up. The capital cost is estimated as Rs 57 lakh towards procurement of hardware, Internet on optical fibre and software development. Technical support from NIC will be taken for hosting the software. The recurring cost is estimated as Rs 5.0

Lakh per year.

09 The manpower requirement is estimated as seven – one supervisor (Research Associate) and six Junior Research Fellow (JRF) having adequate skills with IT background and understanding environmental monitoring. The annual budgetary support, towards salary and other allowances, is estimated to be about Rs 28 lakh (Appendix I).

STEPS TAKEN AFTER NOVEMBER 10, 2016

- i) A meeting with the monitoring agencies in the NCR held on November 16, 2016, wherein present monitoring system and future plans for strengthening were discussed.
- ii) A meeting with the CAAQM agencies held on November 17, 2016 to discuss the transmission protocols and the upgradation needs. The strengthening of air quality network in Delhi and criteria to consider data from representative stations were discussed.
- iii) A meeting was held on November 29, 2016 with the agencies in Delhi NCR on setting up of Control Rooms to attend the complaints and linking these control rooms with Central Control Room at CPCB.

BUDGET REQUIREMENTS

S.No.	Item	Cost, Rs in Lakh
01	Software development	40.0
02	Hardware procurement	17.0
03	Manpower	28.0
	Total	85.0

Submission by Central Pollution Control Board, Delhi

Establishment of Ambient Air Quality Monitoring Network in NCR

(In compliance to the Hon'ble Supreme Court Order dated 25.11.2016)

Delhi is located at 28.61°N 77.23°E, and lies in Northern India. It borders the Indian states of Haryana on the north, west and south and Uttar Pradesh (UP) to the east. Two prominent features of the geography of Delhi are the Yamuna flood plains and the Delhi ridge. The Delhi ridge originates from the Aravalli Range in the south and encircles the west, north-east and north-west parts of the city. It reaches a height of 318 m (1,043 ft) and is a dominant feature of the region. The neighbouring districts of Delhi are Ghaziabad and GautamBudh Nagar in Uttar Pradesh and Faridabad, Gurgaon and Sonipat in Haryana.

The National Capital Territory of Delhi covers an area of 1,484 km² (573 sq mi), of which 783 km² (302 sq mi) is designated rural, and 700 km² (270 sq mi) urban therefore making it the largest city in terms of area in the country.



The salient features of Delhi are

- It has a length of 51.9 km (32 mi) and a width of 48.48 km (30 mi).
- It has a population density of 11297 / sq. km.
- Population of Delhi has increased from 6.22 million in 1981 to 16.753 million in 2011 (as per Economic Survey of Delhi, 2012-13).
- The vehicle growth of Delhi has increased from 3.456 million in 2000-01 to 8.293 million in 2013-14. (140%)
- The road length growth increased from 28364 kms in 2001 to 33198 kms in 2013.

The population of neighbouring districts of Delhi in Uttar Pradesh and Haryana are increased in the last ten years and is tabulated below

State	District / City	Population		
		2001	2011	% increase
Uttar Pradesh	Ghaziabad	3,290,586	4,681,645	42.3
	Noida	305,058	637,272	108.9

Haryana	Faridabad	1,365,465	1,809,733	32.5
	Gurgaon	870,539	1,514,058	73.9
	Sonipat	1,279,175	1,450,001	13.4

Air Pollution

Air pollution can be broadly defined as the presence of any substance in the air that can affect the human health or the health of plants and animals or cause damage to property and environment.

Ambient air quality monitoring

Ambient air quality monitoring is required to determine the existing quality of air, evaluation of the effectiveness of control programme and to identify areas in need of restoration and their prioritization.

Objectives of air quality monitoring

- Background Data
- Status and Trend Evaluation
- Environment Exposure Level Determination
- Scavenging Behaviour of Environment
- Air Quality Management

Site selection criteria

In general the following requirement may be met for siting the monitoring station.

- Height of the inlet must be 3 – 10 m above the ground level.
- The sampler must be more than 20 m from trees.
- Distance of the sampler to any air flow obstacle i.e. buildings, must be more than two times the height of the obstacle above the sampler.
- There should be unrestricted airflow in three of four quadrants

- There should be no nearby furnace or incinerator fumes.

Representative sites

Residential Station

Locate station in the midst of a residential area or sub-urban area. Station should be more than 100 m away from any street having a traffic volume in excess of 500 vehicles/day. Station probe height must be 3 ± 0.5 m.

Commercial station

The purpose of the station is to determine the impact on air quality, at specified locations at places where commercial activity is high. Station probe height should be 3 ± 0.5 m unless special considerations of the survey require non – uniform height

Specialised source survey / Industrial station

Locate station very near a particular air pollution source scrutiny. The purpose of the station is to determine the impact on air quality, at specified locations, of a particular emission source of interest / industrial activity. Station probe height should be 3 ± 0.5 m unless special considerations of the survey require non – uniform height

Traffic intersection

Locate station in the central urban area in a congested, downtown street surrounded by building where many pedestrian walk. Average daily travel on the street should exceed 10000 vehicles with average speed of less than 6.7 m/s. Monitoring probe is to be located 0.5 m from the curb at a height of 3 ± 0.5 m

Non – urban / Background station

Locate station in a remote non- urban area having no traffic and no industrial activity. The purpose of this station is to monitor for trend analysis for non – degradation assessments and for large scale geographical surveys, the location or height must not

be changed during the period over which trend is examined. The height of the probe must be documented in each case. A suitable height is 3 ± 0.5 m.

Establishment of Ambient Air Quality Monitoring Network in NCR

This area has the highest population agglomerations and is also rapidly increasing day by day resulting increased emission load from various development activities including the cross connectivity among the NCR towns / semi urban areas. The ambient air quality monitoring network was not expanded considering the pace of development in this region.

Keeping the above issues in mind, CPCB in consultation with respective State pollution control board including Delhi has prepared a status report on the existing stations in operation and plan by respective boards / committee for which funds has been allocated / shall be made available from the existing budget of the respective boards. A summary chart in this effect is placed at Appendix I. The following air quality monitoring gap / adequacy may be seen as under.

State / UT	Existing stations		Stations Planned		Additional	Total
	Manual	Real Time	Manual	Real Time		
U.P (7 Districts)	10	1	12	8	Nil	31
Haryana (13 Districts)	5	4	Nil	9	24	42
Rajasthan (2 Districts)	9	Nil	Nil	2	Nil	11
Delhi	10	18	Nil	20	Nil	48

The above has been prepared taking in to considerations of minimum three or more stations in each district headquarters. The exact locations shall be decided based on the above said criteria so that air quality monitoring network can be established evenly in the entire NCR.

Budget

The budget for planned real time stations are already planned from the existing budget of respective SPCBs / DPCC. However, 24 additional manual stations are planned for the state of Haryana for which an amount of Rs.170 lakhs (@ 15 lakhs for two stations and 20 lakhs for three stations for the first year including the capital cost) is required.

Appendix - I

Central Pollution Control Board, Delhi	PLAN-A (District Headquarter Level)
Air Quality Monitoring Infra-structure in Delhi & NCR (as on 30/11/2016)	

States	S N	Name of District HQ town	Existing Stations		Stations Planned		Additional requirement Budget for Additional Station @ Rs.15 lakhs (for 2 stations) and Rs.20 Lakhs for 3 Stations)		Total Station
			Manua l	Real Time	Manua l	Real Time	Statio n	Budge t	
UP 1,45,76,000	1	Meerut	2	NIL	2	3 (CPSU)	NIL	No Cost	
	2	Ghaziabad	2	NIL	2	1 (CPCB)	NIL		
	3	Noida	2	1(IITM)	2	1 (CPCB)	NIL		
	4	Bulandsahar	2	NIL	2	NIL	NIL		
	5	Baghpat	NIL	NIL	2	1	NIL		
	6	Hapur	2	NIL	NIL	1	NIL		
	7	Muzzafarnagar	NIL	NIL	2	1	NIL		
Total			10	1	12	8	NIL		31

States	S N	Name of District HQ town	Existing Stations		Stations Planned		Additional requirement Budget for Additional Station @ Rs.15 lakhs (for 2 stations) and Rs.20 Lakhs for 3 Stations)		Total Station
			Manual	Real Time	Manual	Real Time	Station	Budget	
Haryana 1,10,31,000	8	Faridabad	2	1 (CPCB)	NIL	2 (CPCB + HSPCB)	NIL	No Cost	
	9	Gurugram	NIL	2 (HSPCB, IITM)	NIL	1 (HSPCB)	NIL		
	10	Mahendragadh	NIL	NIL	NIL	NIL	Manual -3	20	
	11	Bhiwani	3	NIL	NIL	1 (HSPCB)	NIL	No Cost	
	12	Mewat	NIL	NIL	NIL	1 (HSPCB)	Manual -2	15	
	13	Rohtak	NIL	1 (HSPCB)	NIL	NIL	Manual-2	15	
	14	Sonepat	NIL	NIL	NIL	1 (HSPCB)	Manual -2	15	
	15	Rewari	NIL	NIL	NIL	NIL	Manual -3	20	
	16	Jhajjar	NIL	NIL	NIL	1 (HSPCB)	Manual-2	15	
	17	Panipat	NIL	NIL	NIL	1 (HSPCB)	Manual -2	15	
	18	Palwal	NIL	NIL	NIL	NIL	Manual -3	20	
	19	Jind	NIL	NIL	NIL	NIL	Manual-3	20	
	20	Karnal	NIL	NIL	NIL	1 (HSPCB)	Manual-2	15	
Total			5	4	0	9	24		42

States	S N	Name of District HQ town	Existing Stations		Stations Planned		Additional requirement Budget for Additional Station @ Rs.15 lakhs (for 2 stations) and Rs.20 Lakhs for 3 Stations)		Total Station
			Manual	Real Time	Manual	Real Time	Station	Budget	
Rajasthan 36,74,000	21	Alwar	6	NIL	NIL	2(CPCB + RSPCB)	NIL	No Cost	
	22	Bharatpur	3	NIL	NIL	NIL	NIL		
Total			9	0	0	2	0		11

Delhi 1,50,00,000	23	Delhi	10 (CPCB)	6 (CPCB) + 4 DPCC + 8 (IMD)	NIL	20 (DPCC)	NIL	No Cost	
Total			10	18	0	20	0		48

Total for NCR			34	23	12	39	24	Total(in Lakhs)=	132
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								170	
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List of Data Display Systems in Delhi

S.No.	Location
OPERATING AGENCY : CPCB	
1	DMS, Patel Nagar
2	IHBAS, Dilshad Garden
3	NSIT, Dwarka
OPERATING AGENCY : DPCC	
4	Anand Vihar
5	Mandir Marg
6	R K Puram
7	Punjabi Bagh
OPERATING AGENCY : IMD	
8	IITM Delhi (PUSA)
9	Yamuna Sports Complex
10	Indira Gandhi Sports Complex
11	M Dhyan Chand National Stadium
12	Jawaharlal Nehru Sports Complex
13	Thyagraj Sports Complex
14	Common Wealth Game Village
15	University of Delhi
16	IGI Airport (Palam)
17	Talkatora Garden
18	NCMRWF (Noida)
19	Siri Fort Sports Complex
20	IMD (Lodhi Road)
21	MoES-HQ (CGO Complex)
22	New Delhi railway Station