**Action Plan**

**For**

**The Control of Air Pollution**

**in
Varanasi City**

****

**REGIONAL OFFICE**

**UTTAR PRADESH POLLUTION CONTROL BOARD**

**AVAS VIKAS OFFICE CUM COMMERCIAL COMPLEX, JAWAHAR NAGAR, BHELUPUR, VARANASI**

**1. INTRODUCTION**

 **Varanasi**, also known as **Benares**, **Banaras** or [**Kashi**](https://en.wikipedia.org/wiki/Kingdom_of_Kashi) , is a city on the banks of the river [Ganga](https://en.wikipedia.org/wiki/Ganga) in the [Uttar Pradesh](https://en.wikipedia.org/wiki/Uttar_Pradesh) state of [North India](https://en.wikipedia.org/wiki/North_India), 320 kilometers south-east of the state capital, [Lucknow](https://en.wikipedia.org/wiki/Lucknow), and 121 kilometers east of [Allahabad](https://en.wikipedia.org/wiki/Allahabad). Varanasi lies along [National Highway 2](https://en.wikipedia.org/wiki/National_Highway_2_%28India%2C_old_numbering%29), which connects it to [Kolkata](https://en.wikipedia.org/wiki/Kolkata), [Kanpur](https://en.wikipedia.org/wiki/Kanpur), [Agra](https://en.wikipedia.org/wiki/Agra), and [Delhi](https://en.wikipedia.org/wiki/Delhi), and is served by [Varanasi Junction railway station](https://en.wikipedia.org/wiki/Varanasi_Junction_railway_station) and [Lal Bahadur Shastri International Airport](https://en.wikipedia.org/wiki/Lal_Bahadur_Shastri_International_Airport). Varanasi is also one of 72 districts in the Indian state of Uttar Pradesh. At the time of the 2011 census, there were a total of 8 blocks and 1329 villages in this district. The main native languages of Varanasi are [Hindi](https://en.wikipedia.org/wiki/Hindi) and [Bhojpuri](https://en.wikipedia.org/wiki/Bhojpuri_language).

 Varanasi grew as an important industrial centre, famous for its [muslin](https://en.wikipedia.org/wiki/Muslin) and silk fabrics, perfumes, ivory works, and sculpture. Buddha is believed to have founded Buddhism here around 528 BCE when he gave his first sermon, "[The Setting in Motion of the Wheel of Dharma](https://en.wikipedia.org/wiki/Dhammacakkappavattana_Sutta)", at nearby [Sarnath](https://en.wikipedia.org/wiki/Sarnath). The city's religious importance continued to grow in the 8th century, when [Adi Shankara](https://en.wikipedia.org/wiki/Adi_Shankara) established the [worship of Shiva](https://en.wikipedia.org/wiki/Shaivism) as an official sect of Varanasi. During the Muslim rule through middle Ages, the city continued as an important centre of Hindu devotion, pilgrimage, [mysticism](https://en.wikipedia.org/wiki/Mysticism) and poetry which further contributed to its reputation as a centre of cultural importance and religious education.  [Guru Nanak](https://en.wikipedia.org/wiki/Guru_Nanak) visited Varanasi for [Maha Shivaratri](https://en.wikipedia.org/wiki/Maha_Shivaratri) in 1507, a trip that played a large role in the founding of [Sikhism](https://en.wikipedia.org/wiki/Sikhism).

 The [Kingdom of Benares](https://en.wikipedia.org/wiki/Benares_State) was given official status by the [Mughals](https://en.wikipedia.org/wiki/Mughal_Empire) in 1737, and continued as a dynasty-governed area until Indian independence in 1947. The city is governed by the Varanasi Nagar Nigam (Municipal Corporation). [Silk weaving](https://en.wikipedia.org/wiki/Silk_weaving_in_Varanasi), carpets and crafts and tourism employ a significant number of the local population, as do the [Diesel Locomotive Works](https://en.wikipedia.org/wiki/Diesel_Locomotive_Works).

 Varanasi is known worldwide for its many [ghats](https://en.wikipedia.org/wiki/Ghats_in_Varanasi), embankments made in steps of stone slabs along the river bank where pilgrims perform ritual ablutions. Of particular note are the [Dashashwamedh Ghat](https://en.wikipedia.org/wiki/Dashashwamedh_Ghat), the Panchganga Ghat, the [Manikarnika Ghat](https://en.wikipedia.org/wiki/Manikarnika_Ghat)and the Harishchandra Ghat, the last two being where Hindus cremate their dead and the [Hindu genealogy registers at Varanasi](https://en.wikipedia.org/wiki/Hindu_genealogy_registers_at_Varanasi) are kept here.

**2. ACTION TAKEN BY THE BOARD**

 Board has issued directions to Principal Secretary Urban Development, Principal Secretary Forests, Principal Secretary Transport, Principal Secretary Agriculture, Managing Director Central U.P. Gas Ltd., Managing Director Indraprastha Gas Ltd, and Managing Director Green Gas Ltd. under section 31 (A) of the Air (Prevention and Control of Pollution) Act, 1981 regarding prevention and control of air pollution in Varanasi city on dated 05.09.2016 in compliance of directions issued by Central Pollution Control Board, Delhi under section 18(1) (b) of the Air (Prevention and Control of Pollution) Act, 1981. Board has also issued directions under section31(A) of the Air (Prevention and Control of Pollution) Act, 1981 as amended regarding prevention and control of air pollution in Varanasi city on dated 14.11.2017.

 Ambient Air is being monitored regularly by the Board. At source emission monitoring i.e. stack monitoring of industries is also being done regularly and action is being taken accordingly on the basis of analysis report. If any industry is found violating the standards firstly show-cause notice is issued to the industry followed by closure under Air (Prevention and Control of Pollution) Act, 1981.

**3. ANNUAL AVERAGE DATA OF AMBIENT AIR QUALITY PM10 (µg/m3) OF VARANASI CITY** **(YEAR 2013-2018)**

 U.P. Pollution Control Board is monitoring ambient air quality of Varanasi city manually at 05 locations viz Jawahar nagar, Sigra, BHU campus, Saketnagar, Chandpur for PM10, SO2 and NO2 parameters. Annual Average data of Ambient Air Quality particularly PM10 (Particulate Matter size less than 10 microns) were observed during the year 2013-18 are as given below.

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| **S.No.** | **Name of Location** | **Category** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| 1 | Jawahar nagar | Residential | 145.1 | 142.2 | 144.1 | 195.5 | 242.1 | 202.09 |
| 2 | Sigra | Commertial | 150.7 | 142.7 | 146.2 | 203.0 | 233.4 | 202.33 |
| 3 | BHU campus | Residential | - | 190.2 | 178.1 | 218.1 | 222.9 | 171.65 |
| 4 | Saketnagar | Residential | - | 235.3 | 179.9 | 254.3 | 261.0 | 200.89 |
| 5 | Chandpur | Industrial | - | 239.2 | 226.7 | 199.7 | 294.9 | 226.65 |
|  | STANDARD(annual average)  | 60 µg/m3   |  |

**4. SOURCES OF POLLUTION IN VARANASI**

 Based on Spatial and Temporal GIS Based Emission Inventory of Air Pollutants and Green House Gases in Three Major Cities of Uttar Pradesh, the main sources of air pollution in Varanasi city are Vehicular (2%),Road dust (92%), Domestic Cooking (3%), Industries (Point source & Areas source), Garbage burning (2%) & Agriculture waste burning (2%) etc. Data obtained from Continuous Ambient Air Quality Monitoring System (2018) at Varanasi showed values of CO 1.00 (mg/m3); O3 24.80 (µg/m3); NO2 45.20(µg/m3); SO2 9.3 (µg/m3); PM2.5 95.0 (µg/m3); and Benzene 0.9(µg/m3), Toluene 1.93(µg/m3), Xylene 0.49(µg/m3).

**5. Short term & Long term Action Plan**

1. **Vehicle emission control**

**(a)Long Term Action Plan: Reduce congestion**

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| **Sl. No** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| i | Plying of electric buses for public transport including establishment of sufficient charging stations. | 360 days | Transport Department |
| ii | Prepare plan for construction of expressways/bypasses to avoid congestion due to non-destined vehicles. | 360 days | N.H.A.I. /PWD |
| iii | Construction of peripheral road around the city to avoid congestion. | 360 days | N.H.A.I./PWD |
| iv | Arrangement of Multilevel Parking Facilities | 360 days | Nagar Nigam/Development Authorities |
| vi | Development/Strengthening of Bike zone/Cycle zone at metro/railways/bus stations from where travelers hire bi- cycle to reach the destination. | 360 days | Nagar Nigam/Development Authorities |
| vii | Initiate steps for retrofitting of particulate filters in diesel vehicles, when BS-VI fuels are available | 360 days | Vehicle Manufacturing Companies/Ministry of Road Transport & Highways (MoRTH) |
| viii | Use of Bio-Ethanol in the city/urban transport system/waste to energy. | 360 days | Transport Department |

**(b)Short Term Action Plan**

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| **Sl. No** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| i | Launch extensive drive against polluting vehicles for ensuring strict compliance | As regular activity | R.T.O/Traffic Police |
| ii | Launch public awareness campaign for air pollution control, vehicle maintenance, minimizing use of personal vehicles, lane discipline, etc. | As regular activity | R.T.O/ Traffic Police |
| iii | Prevent parking of vehicles in the non-designated areas | As regular activity | Traffic Police/ Nagar Nigam |
| iv | Prepare & implement action plan to check fuel adulteration and random monitoring of fuel quality data | 30 days | District Supply Officer/Oil companies |
| v | Prepare & implement plan for widening of roads and improvement of infrastructure for decongestion of road | 90 days | Nagar Nigam |
| vi | Steps for promoting battery operated vehicles including establishment of charging stations. | 120 days | Transport Department/Nagar Nigam & Development Authorities |
| vii | Install weigh in motion bridges at the borders of cities/towns and States to prevent overloading of vehicles | 180 days | Transport Department |
| viii | Synchronize traffic movements/Introduce intelligent traffic systems for lane-driving | 180 days | Traffic Police |
| ix | Installation of remote sensor based PUC system | 180 days | Traffic Police |

1. **Suspension of road dust and other fugitive emissions control**

**(a)Long Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | All the canals/nullah's side roads should be brick lined. Proper plantation also carried out.  | 360 days | Irrigation Department/ Forest Department/NMCG |
| **ii)** | Implementation of maintaining at least 33% forest cover area in the city in master plan. | 180 days | Nagar Nigam/VDA/Forest Department |

**(b)Short Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Prepare plan for creation of green buffers along the traffic corridors. Plantation of specific types of species of plants which are helpful in pollution control. | 90 days | Forest Department/Horticulture/Nagar Nigam & Development Authorities |
| **ii)** | Maintain potholes free roads for free-flow of traffic | 90 days & as regular activity afterwards. | Nagar Nigam/ Development Authorities |
| **iii)** | Introduce water fountains at major traffic intersection, wherever feasible | 90 days | Nagar Nigam |
| **iv)** | Greening of open areas, gardens, community places, schools and housing societies | 90 days | Forest Department |
| **v)** | Blacktopping of metalled road including pavement of road shoulders | 180 days | Nagar Nigam |
| **vi)** | Use of treated effluent of STPs in Pollution Control Measure such as watering of Plants, sprinkling for dust suppression purposes. | 90 days | Nagar Nigam |
| **vii)** | Wall to Wall pavement for control of dust from road. Design the footpath pavement/tiles having capacity to grow grass in between.  | 180 days | Nagar Nigam |

1. **Control of emissions from biomass/crop residue/garbage/municipal solid waste burning**

**(b) Short Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Launch extensive drive against open burning of bio-mass, crop residue, garbage, leaves, etc. | 90 days | Nagar Nigam |
| **ii)** | Regular check and control of burning of municipal solid wastes and use of fire extinguisher for control of fire in municipal solid waste and bio mass. | Nagar Nigam |
| **iii)** | Proper collection of horticulture waste (bio-mass) and its disposal following composting-cum-gardening approach | Nagar Nigam |
| **iv)** | Ensure ban on burning of agriculture waste and crop residues and its implementation | 180 days | Agriculture Department & U.P. Pollution Control Board |
| **v)** | Door to Door collection of segregated waste by agency and then its disposal directly in plant without dumping it on land. | 90 days | Nagar Nigam |
| **vi)** | Establishment of composting pits in Parks/ residential societies etc for management of biodegradable waste. | 90 days | Nagar Nigam/VDA |
| **vii)** | No plot should be left open more than 02 years and planting of trees must be mandatory on vacant plots. | 90 days | Nagar Nigam/VDA |

1. **Control of industrial emissions**

**(a) Long Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| i) | Conversion of natural draft brick kilns to induced draft using zigzag technique in a phased manner. | 360 days | U.P. Pollution Control Board |
| ii) | Installation of Electrostatic precipitators and appropriate air pollution control devices in factory units/industries.  | 180 days | U.P. Pollution Control Board |
| iii) | Development of mobile facility/van for continuous ambient air quality monitoring for different localities. | 360 days | Nagar Nigam |

**(b) Short Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| i) | Identification of brick kilns and their regular monitoring including use of designated fuel, and closure of unauthorized units | 60 days | U.P. Pollution Control Board |
| ii) | Conversion of natural draft brick kilns to induced draft | 120 days | U.P. Pollution Control Board |
| iii) |  Monitoring of industrial emission including real time online monitoring through OCEMS (Online Continuous Emission Monitoring System) and live camera feed and to take action against non-complying industrial units | 60 days, and thereafter, regular activity | U.P. Pollution Control Board  |
| iv) | Bank guarantee should be taken for the compliance of conditions imposed in CTO/CTE for control of Environmental Pollution from industries. The bank guarantee shall be forfeited in case of any violation. Verification of these conditions to be carried out by UPPCB/selected Third Party Institutions/Quality control agencies etc. | 60 days, and thereafter, regular activity | U.P. Pollution Control Board  |
| v) | Installation of web cams and OCEMS in Grossly Polluting Industries.  | 60 days | U.P. Pollution Control Board |

1. **Control of air pollution from constructions and demolition activities**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
|  i) | Enforcement of Construction & Demolition Rules2016. Fine should be imposed on defaulting units. | 15 days , and thereafter, continue as regular activity | Urban Development/Development Authorities |
| ii) | Control measures for fugitive emissions from material handling, conveying and screening operations through water sprinkling, curtains, barriers and dust suppression units; | Urban Development/Development Authorities |
| iii) | Ensure carriage of construction material in closed/covered vessels | Development authorities/ Regional Transport Department |
| iv) | Environmental aspects should be included during preparation of master plan for development of city.  | Proposed Master Plan for Varanasi City 2021 | Urban Development/Development Authorities |
| v)  | Builders should leave 33% area for green belt in residential colonies. Plantation should be done as per Office order No. H16405/220/2018/02 dated 16.02.2018 available on website of the Board .i.e.,www.uppcb.com. | Within a reasonable timeframe | Urban Development/Development Authorities/ housing companies |
| vi) | All construction areas must be covered to avoid dispersion of particulate matter | 30 days | Nagar Nigam/ Traffic Police |
| vii) | Street vendors are to be controlled strictly in respect of removing their wastes and debris before leaving the site of operation | 30 days | Nagar Nigam/ Traffic Police |
| viii) | Street vendors are to be controlled strictly in respect of removing their wastes and debris before leaving the site of operation | 30 days | Nagar Nigam/ Traffic Police |

1. **Other Steps to control Air Pollution**

**(a)Long Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Dead Bodies of Animals should be disposed through proper treatment facility like rendering plant etc | 360 days | Nagar Nigam |
| **ii)** | Installation of CAAQMS by polluting units/institutions etc. under "Polluters Pay Principles". | 360 days | U.P. Pollution Control Board |
| **iii)** |  Source Apportionment, Emission Inventory & Carrying Capacity Assessment  | Source Apportionment Study has been done by IIT Kanpur funded by DOE | U.P. Pollution Control Board |
| **iv)** | Tree Plantation for mitigation of air pollution based open location of pollution sources and Wind rose data | 360 days | Forest department/Development Authority/IMD/Regional Office & UPPCB |

 **(b)Short Term Action Plan**

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| **Sl. No.** | **Action Points** | **Timeframe for implementation** | **Action Required to be Taken by Responsible Departments** |
| **i)** | Air Quality Index to be calculated and disseminated to the people through website and other media (on maximum fortnightly basis for manually operated monitoring stations and real time basis for continuous monitoring stations | 15days, and thereafter, continue as regular activity | U.P. Pollution Control Board |
| **ii)** | Establish an Air Quality Management Division at SPCB/PCC Head Quarters to oversee air quality management activities in the State and interact with CPCB | 30 days | U.P. Pollution Control Board |
| **iii)** | Set-up and publicize helpline in the city/town as well as SPCB/PCC HQ for complaints against reported non-compliance | 30 days | U.P. Pollution Control Board |
| **iv)** | Engage with concerned authorities on continual basis for maximizing coverage of LPG/PNG for domestic and commercial cooking with target of 100% coverage | 30 days | District Supply Officer |
| **v)** | Monitoring of DG sets and action against violations. Fine should be imposed on defaulters. | 30 days | U.P. Pollution Control Board/ Nagar Nigam |
| **vi)** | Street vendors are to be controlled strictly in respect of removing their wastes and debris before leaving the site of operation | 30 days | Nagar Nigam/Development Authorities |
| **vii)** | Complete ban on littering of streets with municipal solid wastes (MSW). Segregation & source collection at source of MSW to be implemented. | 30 days | Nagar Nigam/Development Authorities |
| **viii)** | If Air Quality Index found severe or above grade, ensure availability of masks to public for protection.  | 90 days | Nagar Nigam |