Action Plan for Clean Air, Amritsar

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Department of Science, Technology and Environment,
Government of Punjab

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Chapter 1 - Introduction

1.1 About Air Pollution

1.1.1 Air pollutant means any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human being or other living creatures or plants or property or environment. Air pollution means the presence of air pollutants in the atmosphere. The most common sources of air pollution include particulates, oxides of nitrogen, sulphur dioxide and ozone.

1.1.2 The health effects caused by air pollution may include difficulty in breathing, wheezing, coughing, asthma and worsening of existing respiratory and cardiac conditions.

1.2 About Amritsar

1.2.1 History

Amritsar is an important city of the State. It is a major commercial, cultural and transportation centre. It is also the centre of Sikhism and the site of the Sikh's principal place of worship. Amritsar, the city of Golden Temple symbolizes the spiritual heritage of Punjab. The epic stories of Golden Temple and Jallianwala-Bagh have given a unique place to this dynamic city in the history of the nation.

1.2.2 Area and Population

Amritsar is a district headquarters. The city is situated 217 km northwest of state capital Chandigarh and 455 km northwest of New Delhi, the national capital. It is near Pakistan, with the Wagah Border being only 28 km away. The City is spread in an area of 170 sqm. According to the 2011 census, the population of Amritsar was 11,32,761 persons.

1.2.3 Industry and Trade

Amritsar is hub of textiles industry, where many units are interdependent on each other for various processes, like, Spinning, dyeing, finishing, printing etc. Apart from Textiles, some of the other industries in the city are engaged in the production of various goods namely panel pins, paper-cutting, engineering goods, wood and machine screws, printing and machinery, electric fans and chemicals. The City is an important tourist attraction and receives on an average 1lacvisitorsper day.

1.2.4 Topography

At about an average height of 755 feet above sea level, Amritsar is prone to heavy rainfall. The city rests on a saucer shaped basin which also results in the indirect flow of the water coming in.

1.2.5 Climate

Divided into four seasons, the climate remains at an extreme during summers and winters. Winter season in Amritsar is from November to March. The months between April and June face hot air which also leads to a lot of humidity in the city. Monsoons calm the heat from July onwards till September, which is then followed by post monsoons which lasts just till the beginning of November. June remains one of the hottest months in Amritsar where the climate is very dry with temperatures going up to 40 degrees. The humidity too remains high in the mornings and starts diminishing towards evening. But all in all the hot waves make it uneasy.

1.2.6 Rainfall

Monsoons starts from July onwards and remains active till September, which is then followed by post monsoons period extending till the beginning of November. The rainfall in the city increases from south west towards the north east. About 70% of the rainfall is received during the period July to September. The wettest month (with the highest rainfall) is July (231mm). The driest month (with the lowest rainfall) is November (6mm).

1.3 Government's past efforts for control of Air pollution

1.3.1 The environment of Amritsar has degraded a lot during the last few years due to rapid urbanization, industrialization, increase in population, vehicles and commercialization of land available within the town.

1.3.2 A source apportionment study for controlling Air Pollution around Golden Temple was conducted by IIT, Delhi in collaboration with Punjab Pollution Control Board in compliance to High Court directions in CWP 3773 of 2011 in the year 2012-13. The concentration of PM_{10}, NO_2 and SO_2 is shown in **Annexure–A.**

1.3.3 The study found that various pollutants (except PM_{10}) fall within the prescribed standards. The major contributing source of PM_{10} was found to be re-suspension of road dust (47%) followed by industries (31%). The scenario developed based on control measures concluded that introduction of electricity vehicles (3 wheelers, 100% and 4-wheeler, 50%) will reduce PM_{10} and NO_2 concentrations at Golden temple by 14.5% and 21.7%, respectively.

1.3.4 The study recommended various measures to achieve the National Ambient Air Quality Standards such as

(i) Electric / CNG operated three-wheeler and four-wheelers shall only be allowed in phase manner to ply within the walled city
(ii) Kitchen of Golden Temple should be modified to hi-tech kitchen with cleaner fuel
(iii) Uninterrupted electric supply to reduce pollution load of DG sets
(iv) 15 years old commercial vehicles should be banned to enter within the walled city
(v) Entry of Heavy- duty vehicles must be regulated with strict implementation and monitoring

(vi) Daily road cleaning using heavy -duty vacuum cleaners along with sprinkling of water should be introduced to suppress the re-suspension by road dust

(vii) Vertical Garden and/or designing a layer of appropriate plants/trees using big sized pots placed around the Golden Temple at suitable places

(viii) Crop residue/biomass burning should be completely banned around the city

(ix) No new and/or expansion of existing heavy polluting industries (under 17 Red category) should be allowed within 2 km radius (aerial distance) of Golden temple

(x) Traffic movements around the Golden Temple must be redesigned introducing one-way traffic to avoid congestions

(xi) The ambient air quality within and around Golden temple should be continuously monitored by installing continuous ambient air quality monitoring station

1.3.5 Most of the recommendations have been implemented or in the process of implementation by the Government.

1.4 About National Green Tribunal directions

1.4.1 Nine cities of Punjab namely DeraBassi, Naya Nangal, Patiala, Amritsar, Khanna, Ludhiana, Jalandhar, Dera Baba Nanak and Mandi Gobindgarh were declared non-attainment cities by Central Pollution Control Board (CPCB) on the basis of Ambient air data for the period of 2011-2015 for not meeting the annual average of 60 $\mu g/m^3$ for PM_{10}.Directions were issued to the Board by CPCB to prepare action plans for the above stated non-attainment cities of Punjab.

1.4.2 Subsequently, National Green Tribunal has taken cognizance of draft National Clean Air Program and passed directions in the matter of application no. 681 of 2018 dated 8/10/2018. The important points of the said directions given as under:

(i) Action plans to be prepared within two months aimed at bringing the standards of air quality within the prescribed norms within six months from date of finalization of the action plans.

(ii) The action plans may be prepared by six-member committee comprising of Director of Environment, Transport, Industries, Urban Development, Agriculture and Member Secretary, State Pollution Control Board under the overall supervision of Principal Secretary, Environment and further supervised by Chief Secretary.

(iii) The Action plans may take into account the GRAP, the CAP and the action plan prepared by CPCB as well as all other relevant factors.

(iv) The Action Plan will include components like identification of source and its apportionment considering sectors like vehicular pollution, industrial pollution, dust pollution, construction activities, garbage burning, agricultural pollution including pollution caused by burning of crop residue, residential and indoor pollution etc.

(v) The Action plan shall also consider measures for strengthening of Ambient Air Quality (AAQ) monitoring and steps for public awareness including issuing of advisory to

public for prevention and control of air pollution and involvement of schools, colleges and other academic institutions and awareness programmes.

(vi) The Action plan will indicate steps to be taken to check different sources of pollution having speedy, definite and specific timelines for execution.

(vii) The Action plan should be consistent with the carrying capacity assessment of the non-attainment cities in terms of vehicular pollution, industrial emissions and population density, extent of construction and construction activities etc. The carrying capacity assessment shall also lay emphasis on agricultural and indoor pollution in rural areas. Depending upon assessed carrying capacity and source apportionment, the authorities may consider the need for regulating, number of vehicles and their parking and plying, population density, extent of construction and construction activities etc. Guidelines may accordingly be framed to regulate vehicles and industries in non-attainment cities in terms of carrying capacity assessment and source apportionment.

(viii) The CPCB and SPCBs shall develop a public grievance redressal portal for redressal of public complaints on air pollution along with a supervisory mechanism for its disposal in a time bound manner. Any visible air pollution can be reported at such portal by email/SMS.

(ix) The CPCB and all SPCBs shall collectively workout and design a robust nationwide ambient air quality monitoring programme in a revised format by strengthening the existing monitoring network with respect to coverage of more cities / towns. The scope of monitoring should be expanded to include all twelve (12) notified parameters as per notification no. B-29016/20/90/PCl-L dated 18th November of CPCB. The Continuous Ambient Air Quality Monitoring Stations (AAQMS) should be preferred in comparison to manual monitoring stations. The CPCB and States shall file a composite action plan with timelines for its execution which shall not be more than three months.

1.4.3 Earlier, NGT had also issued various directions in OA No. 21 of 2014 titled as Vardhaman Kaushik V/s Union of India and Others for combating air pollution.

Chapter 2 – Vision, Mission and Strategy

2.1 Mission Tandrust Punjab

The Government of Punjab envisions to make Punjab the healthiest State with healthy people by ensuring the quality of air, water, food and a good living Environment.

2.2 Vision for Clean Air, Amritsar

To restore the quality of air in Amritsar to the prescribed standards to ensure health of the people, ecological balance and socio-economic well-being of the people.

2.3 Mission Clean Air, Amritsar

To prepare and implement a comprehensive action plan for clean Amritsar:

(i) Creating awareness about the adverse impact of air pollution
(ii) Identifying the sources of Air pollution, their apportionment
(iii) Setting up facilities for treating the pollutants
(iv) Ensuring effective operations of the facilities
(v) Ensuring effective monitoring of the quality of air
(vi) Mitigating adverse impact on health of the people due to air pollution

2.4 Strategy for Clean Air, Amritsar

The key elements of strategy for Clean Air campaign for Amritsar will include:

(i) Identification of Government Stakeholders
(ii) Identification of Non-Government Stakeholders
(iii) Integration of Departmental plans – Creating synergies
(iv) Nodal Department
(v) Citizen Participation
(vi) Monitoring and Governance

2.5 Identification of Government Stakeholders

In order to combat the challenges of air pollution, all the Stakeholders will have to make concerted efforts. Following Departments and agencies have been identified along with their responsibilities:

(i) Punjab Pollution Control Board

(a) Monitoring of air pollution control devices installed by industries
(b) Up-gradation of existing air pollution control devices
(c) Monitoring of ambient air quality and stack emissions
(d) Provision of canopies on the existing D.G sets

(ii) Department of Local Government/ MC, Amritsar

(a) Development of engineered municipal solid waste dump site

(b) Improvement of road infrastructure for smooth traffic movement
(c) Regular and mechanical cleaning of roads
(d) Sprinkling of in the parks and maintenance of fountains
(e) Increasing green cover in city
(f) Upgrading traffic lights for smooth traffic movement
(g) Provide canopies on the existing D.G sets

(iii) Department of Transport

(a) Plan for effective traffic management
(b) Plan for phasing out old polluting vehicles
(c) Shift to cleaner fuels viz. CNG etc.
(d) Monitoring of vehicles without PUC certificate
(e) Banning of pressure horns

(iv) Department of Police

(a) Planning and Implementation of traffic management plan
(b) Checking of vehicles running without PUC certificate
(c) Impounding and challan of vehicles running without permission/ registration

(v) Department of Forests

(a) Preparation of afforestation plan
(b) Organizing awareness camps for Greener City
(c) Providing green belt around the industrial areas

(vi) Deptt. of Industries and Commerce / Punjab Small Industries & Export Corporation

(a) Shifting of industries from non-designated areas
(b) Provision of environment infrastructure in Industrial Areas

(vii) PWD (B&R)

(a) Improving road conditions for smooth movement of traffic
(b) Increasing green cover on roadside under their jurisdiction

(viii) Punjab State Council for Science and Technology

(a) Evolving cost-effective cleaner technologies

(ix) Department of Agriculture

(a) Promotion of bio-methanization and compost facilities for agri waste
(b) To provide Machinery for in-situ management
(c) To create awareness about ill-effects of stubble burning
(d) To create awareness regarding alternative crops to break wheat-rice cycle.

(x) District Administration

(a) Coordination with all the Stakeholders promoting collaboration and resolving local issues
(b) Public Awareness Campaign

2.6 Non-Government Stakeholders

2.6.1 There is need to involve various Industry associations of Amritsar in this plan. Following Industry Associations of Amritsar will be associated with the plan:

(i) The President, Focal Point Industries Association, Amritsar
(ii) The President, Amritsar Textile Dyeing & Processors Association

2.6.2 These association will help in the following activities:

Generic

(i) To stabilize the vehicular movement area within premises of the industries
(ii) To persuade the member industries to comply with emission norms by PPCB
(iii) To evolve more efficient machinery, boiler furnace and air pollution control devices which may be adopted by all the industries for better environment

Specific

(iv) To shift over the industries from coal / pet coke to CNG.
(v) To ensure the adequacy of APCD for coal fired industry & if found inadequate then, it shall be replaced/upgraded with scientifically designed new APCD.
(vi)

2.6.3 Apart from Industry Associations, the support of various NGOs in the city such as Missionaries Khudai Khidmat garan and Amritsar Vikas Manch (NGO), Amritsar will be sought. These NGOs will assist in the following:

(i) To create awareness among the public regarding ill-effects of air pollution
(ii) To motivate residents of city Amritsar for adopting the practices to minimize the use of fresh water, planting more trees, to promote pooling by minimal use of private vehicles. Parking of vehicles in the designated zones, minimum use of electricity etc
(iii) To give suggestions to District Level Committee to control or minimize the air pollution.
(iv) To give feedback on enforcement activities

2.7 Nodal Department

The clean air plan for Amritsar is part of State-wide campaign to control air pollution in non-attainment cities. In order to bring necessary impetus, support from other stakeholder departments, uniformity and consistency, there is need to have a Nodal Department. The Department of Science, Technology and Environment will be the nodal department for coordinating and monitoring activities of the plan. The Department has recently set up Directorate of Environment and Climate Change, which will provide necessary support at the headquarter for coordination and oversight and PPCB will provide necessary technical and field support.

2.8 Integration of Departmental plans

The Nodal Department will integrate plans of individual departments for control of pollution from various sources and prepare a comprehensive plan.

2.9 Citizen participation

Citizen participation will be key to the success of the plan. Effort will be made to seek citizen participation in various public awareness activities, feedback and support in various enforcement related activities. A strong social media and technology driven platform will be set up to seek citizens particularly youth participation.

2.10 Design of Monitoring System

2.10.1 Various measures envisaged under the action plan for control of pollution can be classified in the following categories:

(i) Public Awareness
(ii) Effective Enforcement
(iii) Creation of new Infrastructure
(iv) Maintenance related activities
(v) Policy Advocacy
(vi) Technology Support

2.10.2 Monitoring of various activities of the Action Plan will be key to achieve the outcomes envisaged under the Action Plan. Different kind of monitoring systems will be required for different categories of activities:

(i) Design of effective online platform including social media to disseminate air pollution related information and seek citizen feedback and participation in the campaign. It will have a monitoring mechanism to see the level of participation and measures to increase the same.

(ii) Design of effective online system to capture various enforcement activities by various agencies to monitor them, evaluate them and provide feedback and enforce accountability.

(iii) Design of an effective monitoring system to monitor the progress of various infrastructure related activities as envisaged under the plan.

(iv) Design of an effective monitoring system for policy advocacy within the Government for expediting formulation of various policies.

(v) Design of an effective monitoring system for various technological interventions to reduce the air pollution.

2.10.3 Directorate of Environment and Climate Change and PPCB will set up a dedicated team for design of monitoring system and setting up of IT platform for tracking progress of the plan.

2.11 Governance

The monitoring of progress, coordination of various activities, corrective measures required and fixing of accountability will be done by Air Quality Monitoring Committees at the District level under Deputy Commissioner, State Level under Principal Secretary, Environment and Apex Committee under Chief Secretary.

Chapter 3 – Current Status and Trends of Air Quality in Amritsar

3.1 Monitoring of Air Quality

Amritsar is the major tourist hub in the Punjab and the ambient air quality monitoring is being carried out regularly at 2 no. manually operated stations installed at Amritsar under National Air Monitoring Programme (NAMP). The year wise data of PM_{10}, SO_2 and NO_x for the period 2014-18 is placed at **Annexure-B**. Further, the Board has also commissioned one Continuous Ambient Air Quality Monitoring Station (CAAQMS) at Amritsar and the real time data of the same is being displayed near Golden Temple. The AQI data of 2017 and 2018 has been given in **Annexure-C.**

3.2 CPCB's norms for Air Quality

The CPCB on 18/10/2009 has revised National Ambient Air Quality Standards (NAAQS) which are reproduced as under:

Sr. No.	Pollutants	Time weighted average	Concentration of Ambient Air	
			Industrial, Residential, Rural and other areas	Notified Ecologically sensitive area
1	Sulphur Dioxide (SO_2) µg/m^3	Annual	50	20
		24 hours	80	80
2	Nitrogen Dioxide (NO_2) µg/m^3	Annual	40	30
		24 hours	80	80
3	Particulate Matter (size<10 µm) or PM_{10} µg/m^3	Annual	60	60
		24 hours	100	100
4	Particulate Matter (size<2.5 µm) or $PM_{2.5}$ µg/m^3	Annual	40	40
		24 hours	60	60
5	Ozone (O_3) µg/m^3	8 hours	100	100
		1 hour	180	180
6	Lead (Pb), µg/m^3	Annual	0.50	0.50
		24 hours	1.0	1.0
7	Carbon Monoxide (CO), mg/m^3	8 hours	02	02
		1 hour	04	04
8	Ammonia (NH_3), µg/m^3	Annual	100	100
		24 hours	400	400
9	Benzene (C_6H_6) µg/m^3	Annual	05	05
10	Benzo (a) Pyrene (BaP)-particulate phase only ng/m^3	Annual	01	01
11	Arsenic (As) ng/m^3	Annual	06	06
12	Nickel (Ni) ng/m^3	Annual	20	20

3.3 Air Quality Index (AQI)

3.3.1 Awareness of daily levels of air pollution is important to the citizens, especially for those who suffer from illnesses caused by exposure to air pollution. Further, success of a nation to improve air quality depends on the support of its citizens who are well-informed about local and national air pollution problems and about the progress of mitigation efforts. Thus, a simple yet effective communication of air quality is important. The concept of an air quality index (AQI) that transforms weighted values of individual air pollution related parameters into a single number is widely used for air quality communication and decision making.

3.3.2 The AQI system is based on maximum operator of a function (i.e. selecting the maximum of sub-indices of individual pollutants as an overall AQI). The objective of an AQI is to quickly disseminate air quality information (almost in real-time) that entails the system to account for pollutants which have short-term impacts. Eight parameters (PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, O_3, NH_3, and Pb) having short-term standards have been considered for near real-time dissemination of AQI.

3.3.3 The AQI has further been classified in six categories as shown below:

AQI	Quality	Impact on health
0-50	Good	Minimal impact
51-100	Satisfactory	Minor breathing discomfort to sensitive people
101-200	Moderate	Breathing discomfort to people with lungs, asthma and heart diseases
201-300	Poor	Breathing discomfort to most people on prolonged exposure
301-400	Very poor	Respiratory illness on prolonged exposure
>401	Severe	Affects healthy people and seriously impacts those with existing diseases.

3.3.4 Basedon this, the CPCB evolved a Graded Response Action plan (GRAP) which is implemented in the NCR, Delhi when the air quality deteriorates and various steps have been mentioned in GRAP to be taken to immediately control the deterioration of the air quality.

3.4 Trends of Quality of Air

3.4.1 The Board has commissioned one no. Continuous Ambient Air Quality Monitoring Station (CAAQMS) at Amritsar and the real time data of the same is being displayed near Golden Temple. Annual average of AQI for the last 2 years is given as under:

Year	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	AQI
2017	139.42	63.08	7.34	36.62	132
2018	122.97	49.08	5.07	38.66	115

3.4.2 The trend of AQI in the ambient air quality shows that the concentration of SO_2, $PM_{10}$and $PM_{2.5}$ in the ambient air has decreased in 2018 as compared to 2017.

3.5 Major parameters of concern

The major concern of the air quality is PM_{10}. All other parameters are within the prescribed limits. The perusal of data in **Annexure – C** clearly indicates that air quality index of Amritsar generally remains moderate (101-200) and sometimes satisfactory (51-100). The sources of pollution and their apportionment is given in the next chapter.

Chapter 4 – Sources of Air Pollution in Amritsar

4.1 Major Sources

4.1.1 The following are the major identified sources of air pollution:

(i) Vehicular Emissions
(ii) Road Dust
(iii) Burning of Bio-mass & Garbage
(iv) Industrial Emissions
(v) Mining
(vi) Construction and Demolition Activities
(vii) Other Sources

4.1.2 IIT Delhi had conducted source apportionment study w.r.t. PM_{10} around Golden Temple in 2012-13 with contribution of various sources as under:

Sr. No.	Source	Contribution of PM_{10}
1.	Industrial Emissions	32%
2.	Road Dust	47%
3.	Vehicular Pollution	7%
4.	Burning of Crop Residue	0.4%
5.	Kitchen	11%
6.	Tandoor	1.6%
7.	D.G. Sets	1%

4.1.3 At the time of carrying out the above study, lot of construction activities such as: BRTS, flyovers were being undertaken across the city leading to contribution of road dust. However, with the completion of these activities, the apportionment of PM_{10} of various sources has been changed considerably with their likely contribution as per the experience of PPCB is as under:

Sr.No.	Source	Contribution of PM_{10} as per the estimation of PPCB
1.	Industrial Emissions	20%
2.	Road Dust	25%
3.	Vehicular Pollution	30%
4.	Burning of Bio-mass & Garbage	10%
5.	Construction & Demolition Activities	10%
6.	Other Sources	5%

4.1.4 PPCB shall carry out source apportionment for the city involving Expert Agency. The estimated cost to be incurred on the Source Apportionment study is Rs. 5.00 lacs.

4.2 Vehicular Emissions

Transport sector is one of the significant contributors to air pollution in Amritsar due to movement of heavy goods vehicles carrying raw materials and products of the industries located in and around the city. At present about 809705 vehicles (heavy transport vehicles, LMVs, cars & jeeps, two wheelers and three wheelers) are plying on the roads of District Amritsar. Further, National Highway NH-1 passes through Amritsar also contributes to air pollution.

4.3 Road Dust

The particles of dust that deposit from the atmosphere and accumulate along road sides are called road dust particles and originates interaction of solid, liquid and gaseous metals. Two main sources of road dust are deposition of previously suspended particles (atmospheric aerosols) and displaced soil. Some other common factors are enlisted as under:

(i) Emissions from the vehicular traffic,
(ii) Construction and demolition activities, corrosion of metals structures etc.
(iii) Presence of potholes on the road
(iv) Absence of metaled roads / stabilized roads / un-stabilized movement area within industries
(v) Presence of un-stabilized berms along the roads
(vi) Movement of overloaded transport vehicles

4.4 Burning of Biomass and Garbage

4.4.1 There are only small patches of agricultural land within the Amritsar city, however, the city is surrounded by agricultural area and a lot of biomass is generated during post harvesting paddy and wheat seasons. During wheat season biomass burning is lesser than paddy season as the farmers use the wheat crop residue as cattle fodder. The effect of biomass burning in the paddy season is augmented due to the cold climate conditions.

4.4.2 At present, Municipal solid waste generation of the city is estimated as 680 TPD, which is being dumped unscientifically in the present dumping site at Bhagtan wala, Amritsar. The garbage burning increases during winter season as the general public tend to burn the waste for heating purposes.

4.5 Industrial Emissions

4.5.1 The main stationary sources of air pollution are the industrial units, which are emitting particulate matter, sulphur di-oxide and oxides of nitrogen etc. All the Textile Processing Industries, Cupola Furnaces and lead Extraction Units etc. are using pet coke / coal as fuel in their furnaces emitting the aforesaid pollutants, besides the process / fugitive emissions.

4.5.2 The category wise detail of air polluting industries situated within 5 km of outskirts of MC limits of Amritsar are given as under:

Sr. No.	Category	Number of Units
1.	Textile Processing Industries	58
2.	Paper Mills	07
3.	Cupola/ Foundry Units	43
4.	Brick Kilns	38
5.	Textile Finishing Units	14
6.	Hot Mix Plants	06
7.	Induction Furnaces	03
8.	Lead Extraction Units	05
9.	Milk Processing Units	04
10.	Rice Shellers	08
11.	Parboiling Plants	12
12.	Pharmaceutical Formulation Units	04
13.	Common Bio-Medical Waste Treatment Facility	01
14.	Railway Workshop	01
15.	Slaughter House	01
16.	Conveyor Belts Manufacturing Units	03
17.	Zinc Sulphate Manufacturing Units	07
18.	Other Air Polluting Units	32
Total		**247**

4.5.3 It is pertinent to mention here that emission standards for most of the above said industries are the most stringent i.e. 500 mg/Nm^3.

4.6 Mining

Mining activities also contribute to the AQI, however, in Amritsar area, no mining activity is carried out due to absence of mining sites. As such, it has no contribution in the air quality index of Amritsar.

4.7 Construction and Demolition Activities

Amritsar area is a large city having population of about 11,32,761 persons. Building construction projects are being set up in the city like Shopping Malls, Hotels etc.

4.8 Others

Other than above mentioned sources, episodic incidents like Holi, Dushera, Diwali, Gurupurab, New Year etc. are celebrated by bursting crackers, spraying colours etc. which also contribute to the ambient air quality, though very less.

Chapter 5 –Control of Vehicular Emissions

5.1 Key Activities

5.1.1 The vehicles are major pollution contributor, producing significant amount of nitrogen oxides, carbon monoxides and other polluting gases and particulate matter. To minimize the pollution generated from the vehicles, various actions have to be taken, which have been classified into following categories:

(a) Public Awareness related
(b) Enforcement related
(c) Infrastructure related
(d) Policy related

5.1.2 Some activities may have more than one category but they have been kept in the category where it has the major requirement. Following are the key activities for control on vehicular emissions:

Public Awareness

(i) CVE 1 - Public awareness campaign for control of vehicular emissions

Enforcement Related

(ii) CVE 2 -Remote sensor-based PUC system
(iii) CVE 3 - Extensive drive against polluting vehicles
(iv) CVE 4 - Prevent parking of vehicles in non-designated areas
(v) CVE 5 - Check fuel adulteration

Infrastructure Related

(vi) CVE 6 - Widening of roads and improvement of infrastructure for decongestion of roads
(vii) CVE 7 - Construction of expressways/ bypasses to avoid congestion
(viii) CVE 8 - Introduce intelligent traffic systems

Policy Related

(ix) CVE 9 – Phasing out commercial diesel vehicles more than 15 years old
(x) CVE 10 – Promotion of E-vehicles
(xi) CVE 11 – Introduction of CNG based public transport
(xii) CVE 12 – Retrofitting of particulate filters in diesel vehicles for BS-IV fuels

5.1.3 Various actions to be taken for the above activities are given below. Further, the details such as baseline, target, timeline, milestones have been given in **Annexure-D**.

5.2 CVE 1 - Public awareness campaign for control of vehicular emissions

Public support is essential for clean air mission to be successful. As part of overarching mission of clean air, Amritsar, the public must be made aware of ill effects of air pollution on health

and contribution of vehicular emissions in the same. The public has to be motivated to play their role in curbing the air pollution. Following action shall be taken:

(i) Public awareness campaign in print and electronic media
(ii) Use of Social Media facebook, twitter, Instagram
(iii) Jingles on air pollution on local radio and tv
(iv) Awareness drives in educational institutions
(v) Public meetings
(vi) Nukarnataks

5.3 CVE 2 - Remote sensor based PUC system

The Department of Transport will implement remote sensor based PUC system to eliminate the malpractices in the existing system of issuing PUCs. All PUC centres will be made online.

5.4 CVE 3 - Extensive drive against polluting vehicles

There is need to strictly enforce checking of PUC certificates so that unauthorized vehicles could be penalized. The traffic police shall place check points (Nakas) at differed locations and the performance of such check points shall be monitored. A Whatsapp number shall be dedicated and publicized among general public so that complaints of public regarding polluting vehicles may be received and action taken.

Traffic Police and Department of Transport will be responsible for the activity.

5.5 CVE 4 - Prevent parking of vehicles in non-designated areas

4(a) Creating parking infrastructure: Presently, vehicles are being parked in a haphazard manner and on the roads as well, which leads to traffic congestion, thus, causing vehicular pollution. Hence, local government shall develop designated parking lots, Multi storey parking facilities, parking area for trucks/ commercial vehicles and ear–mark roadside parking by yellow line.

4(b) Enforcement: Traffic police shall impound vehicles parked in non-designated areas and shall compile the list of prominent areas of such violations & pay special attention to these areas. CCTV cameras shall be installed in such areas to capture the evidence. Number of challans shall be monitored.

5.6 CVE 5 - Check fuel adulteration

Online Automated System has been adopted by the State Level Coordinator, Oil industry, Punjab for transportation & checking the density of Petrol/Diesel. In case of complaint, Department of Food and Civil Supplies in coordination with local oil company officials shall check fuel adulteration & if any discrepancy is noticed then action against the violator shall be taken by State Level Coordinator, Oil industry, Punjab.

5.7 CVE 6 - Widening of roads and improvement of infrastructure to decongest roads

6(a) Widening of roads: The major air pollution caused by dust emission along road sides as the condition of roads is very pathetic. Due to the movement of heavy goods vehicles like Trucks, tippers etc. carrying raw materials and final products of the industries, lot of dust / vehicular emissions are generated, which is affecting the ambient air quality of the city. Widening of Roads and construction of over-bridges, wherever possible, is required for smooth and speedy flow of traffic and the pending construction work should be completed in the time bound manner

6(b) Road design improvement: The roads constructed within the city having traffic congestion shall be identified by the MC. The concerned departments like NHAI, PWD (B&R), PUDA, PSIEC and Municipal Corporation shall suitably redesign identified roads to decongest the traffic.

5.8 CVE 7 - Construction of expressways/ bypasses to avoid congestion

PWD (B&R) shall examine the need for any expressway/bypass to avoid congestions

5.9 CVE 8 - Introduce intelligent traffic systems

The traffic lights installed in the area shall be synchronized in such a way so as to achieve minimal stoppage of vehicles for a stretch of at least 2 Kms. The traffic lights shall be placed at various intersection, so as to avoid traffic jams and smooth operation of the vehicles. Municipal Corporation in consultation with Traffic Police shall identify such places and provide traffic lights.

5.10 CVE 09 – Phasing out commercial diesel vehicles more than 15 years old

The Department of Transport will frame policy at State level to phase out commercial vehicles more than 15 years old.

5.11 CVE 10 - Promotion of E- vehicles

The framing of E-Vehicle policy is at an advance stage of finalization. The Department of Transport shall notifythe policy to promote battery operated vehicles.

5.12 CVE 11 – Introduction of CNG based public transport

11 (a) Infrastructure development: The Department of Food & Civil Supplies shall facilitate and expedite development of requisite infrastructure such as laying of pipe line and setting up of CNG filling station to promote CNG based public transport.
11 (b) CNG based City Bus Service: Local Government shall take necessary measures to promote CNG based City Bus service.
11 (c) CNG based Auto Rickshaws/Taxis: The Department of Transport shall take necessary steps to promote CNG based Auto Rickshaws/Taxis.

5.13 CVE 12 - Retrofitting of particulate filters in diesel vehicles for BS-IV fuels

State Level Coordinator (Oil Industry) has informed that as per Government of India guidelines, India is going to skip adopting BS-5 norms and progress directly to adopting BS-6 norms by 2020. The steps for retrofitting of particulate filters in diesel vehicles is to be undertaken by Automotive industry under directions from Government of India as and when BS-VI fuels are available.

Chapter 6–Control on Road Dust

6.1 Key Activities

6.1.1 The particles of dust that deposit from the atmosphere and accumulate along road sides are called road dust particles. Two main sources of road dust are deposition of previously suspended particles (atmospheric aerosols) and displaced soil. Additionally, the emissions from the vehicular traffic, building construction and renovation, corrosion of metals structures etc. contribute directly to the road dust. To minimize the pollution generated from the dust emissions, following key activities are proposed:

Maintenance Related

(i) CRD1– Maintain potholes free roads for free-flow of traffic
(ii) CRD 2 – Water sprinkling
(iii) CRD 3 – Mechanical sweeping

Infrastructure Related

(i) CRD4 -Creation of green buffers along the road sides
(ii) CRD 5 - Greening of parks, open areas, community places, schools and housing societies
(iii) CRD 6 - Water fountains at major traffic intersections
(iv) CRD 7 - Blacktopping of roads including pavement of road sides.

6.1.2 Various actions to be taken for the above activities are given below. Further, the details such as baseline, target, timeline, milestones have been given in **Annexure-E**.

6.2 CRD 1 – Maintain potholes free roads for free-flow of traffic

All the agencies such as MC/ PWD/PUDA/PSIEC/NHAI will put in place a system of regular inspections to identify the potholes and ensure its filled up. It shall be monitored on regular basis. A web based/ mobile app shall be set up for Public to lodge complaint against the pothole and it shall be monitored for repair.

6.3 CRD 2 – Water sprinkling

2(a) Water sprinkling on dust prone roads: Municipal Corporation shall identify the dust prone roads and shall prepare schedule for regular sprinkling of water on these roads to suppress dust emissions. This activity shall be started immediately. In order to save the water, the Municipal Corporation shall utilize the treated wastewater of STPs installed in the city.

2(b) Procurement of Water sprinkler: Municipal Corporation need to make arrangements for regular sprinkling of water on dust prone roads for which it may procure suitable number of water sprinklers.

6.4 CRD 3 – Mechanical sweeping

Municipal Corporation shall procure adequate number of automatic sweeping machines for efficient and fast sweeping of the road / streets. The frequency of the sweeping shall be fixed appropriately by the Municipal Corporation.

6.5 CRD 4 – Creation of green buffers along the road sides

Municipal Corporation/PSIEC shall identify the trees with the help of Deptt. of Horticulture which may be grown along the roads without any obstruction to the traffic. These trees shall be planted at the suitable places as decided by the Municipal Corporation.

6.6 CRD 5 – Greening of parks, open areas, community places, schools and housing societies

In order to increase greenery in the city, the Municipal Corporation shall identify open areas / lawns / vacant lands including community places and schools in the city and these places be allocated to the NGOs or Industrial Associations for tree plantation and their maintenance. The activity of identification of the suitable sites shall be completed in a time bound manner and shall be allotted to the NGOs or Industrial Associations

6.7 CRD 6 – Water fountains at major traffic intersections

Municipal Corporation shall explore the possibility of setting up of the water fountains at important traffic junctions to reduce the emission level including dust at these points.

6.8 CRD 7 – Blacktopping of roads including pavement of road sides

7 (a) Kaccha/Brick Paved Roads to be made Pucca road: Some of the city roads are not properly metalled, which are the source of dust and gaseous emissions. These roads shall be converted into metalled road. Municipal Corporation shall undertake this activity in a time bound manner.

7 (b) Existing roads requiring recarpeting: Roads require regular upkeep & re carpeting. The responsible agencies (MC/PWD/NHAI/PSIEC/PUDA) shall ensure re carpeting of damaged existing roads.

7 (c) Pavement of road side using interlocking tiles/ To prevent road dust emissions: Berms along the roads need to be stabilized with interlocking tiles/greening to prevent road dust emissions.

Chapter 7–Control on Burning of Garbage and Biomass

7.1 Key Activities

7.1.1 There are only small patches of agricultural land within the Amritsar city, however, the city is surrounded by agricultural area and a lot of biomass is generated during post harvesting paddy and wheat seasons. During wheat season biomass burning is lesser than paddy season as the farmers use the wheat crop residue as cattle fodder. The effect of biomass burning in the paddy season is augmented due to the cold climate conditions. To minimize the pollution generated from burning of garbage and biomass, following key activities are proposed:

Enforcement Related

(i) CBGB 1 –Control on open burning of bio-mass in City
(ii) CBGB 2 – Control on burning of municipal solid wastes
(iii) CBGB 3 –Control on burning of agriculture waste and crop residue

7.1.2 Various actions to be taken for the above activities are given below. Further, the details such as baseline, target, timeline, milestones have been given in **Annexure-F**.

7.2 CBGB 1 –Control on open burning of bio-mass in City

7.2.1 The burning of biomass like leaves of the trees creates lot of smoke in the area particularly during winter season, as such, the open burning of these biomass must be stopped. Municipal Corporation shall deploy its staff to have a check on various areas so as to forbid the inhabitants and sweepers from open burning of the biomass.

7.2.2 Municipal Corporation shall provide education to the educational institutions, government offices, residents welfare associations regarding horticulture waste collection and its benefits by way of disposing the waste in the form of composting and encouraging the organic farming in the gardens and fields

7.2.3 A Whatsapp number shall be generated and publicized by Municipal Corporation alongwith the setting up of the dedicated control room for receiving complaints of public through this system.

7.3 CBGB 2 – Control on burning of municipal solid wastes

7.3.1 Presently, Municipal Corporation has one municipal waste dumping site at Bhagtanwala, Amritsar, which has not been developed scientifically for the disposal of the municipal solid waste and consequently it has become the source of burning of waste on this dump. Lot of smoke is generated which contribute to the air pollution index. Similarly, at the collection point and after sweeping the streets, the garbage collected may be burnt, instead of transporting to the dumping site.

7.3.2 Municipal Corporation shall identify and develop municipal waste dumping site as per the provisions of Municipal Solid Waste Rules, 2016 and the construction work of the said site shall be completed.

7.4 CBGB 3 – Control on burning of agriculture waste and crop residue

7.4.1 The city is surrounded by agricultural area and a lot of agricultural waste is generated during post harvesting paddy and wheat season. During wheat season stubble burning is lesser than paddy season as the farmers use the wheat crop residue as cattle fodder.

7.4.2 Punjab Pollution Control Board shall engage Punjab Remote Sensing Centre, Ludhiana for real time monitoring and reporting of stubble burning incidents. The District Administration shall constitute District Level Committees to verify the reported sites and issue challans to the violators besides filing of proceedings u/s 133 CrPc. Necessary directions / instructions shall be issued by the District Administration u/s 144 IPC to restrict harvesting of crops between6.00 pm to 6.00 am during crop harvesting seasons and attaching of the super SMS with the combine harvesters. Department of Agriculture to promote mechanical reincorporation of paddy straw to prevent its burning.

Chapter 8 – Control on Industrial Emissions

8.1 Key Activities

8.1.1 The main stationary sources of air pollution are the industrial units, which are emitting particulate matter, sulphur di-oxide and oxides of nitrogen etc. All the Textile processing and Dyeing Industries are using pet coke / rice husk, cupola furnaces are using hard coke, Paper Mill and Milk Plant are using coal as fuel in their furnaces emitting the aforesaid pollutants, besides the process / fugitive emissions. To minimize the pollution generated from the industries, following key activities are proposed:

Technology Intervention

(i) CIE 1 – Conversion to CNG/PNG from pet coke / coal

Enforcement Related

(ii) CIE 2–Conversion of natural draft brick kilns to induced draft

(iii) CIE 3 – Action against non-complying industrial units

Infrastructure Related

(iv) CIE 4 – Shifting of industries from non-designated areas to industrial areas

8.1.2 Various actions to be taken for the above activities are given below. Further, the details such as baseline, target, timeline, milestones have been given in **Annexure-G**.

8.2 CIE 1 – Conversion to CNG/PNG from pet coke / coal

A large number of units in Amritsar are using pet coke / coal as source of energy. With the availability of CNG in the city, PPCB will motivate the industry to convert from Coal to CNG. The State government will be approached to reduce VAT to make it viable alternative.

8.3 CIE 2–Conversion of natural draft brick kilns to induced draft

There are 38 no brick kilns located within 5 km radius of M.C. limits of Amritsar. Punjab Pollution Control Board has issued directions to the existing brick kilns of the State to convert their conventional brick kilns to induced draft technology. The Brick kilns located in the district will be monitored for conversion to the new technology in a time bound manner.

8.4 CIE 3 – Action against non-complying industrial units:

The regular monitoring of industries is being carried out as per the policy of the Board. In case, any industry is found violating the provisions of the Air (Prevention and Control of Pollution) Act, 1981, action under the provisions of the said Act is initiated against the violating industries. The number of inspections carried out and action taken will be monitored regularly by the District Level Committee.

8.5 CIE 4 – Shifting of industries from non-designated areas to industrial areas

There are certain industries, which are located in non-designated areas and the PSIEC/ Department of Industries and Commerce shall develop new areas to shift the industries from

non-designated areas in coordination with Local Govt./ Deptt. of Town & Country Planning / Deptt. of Industries.

Chapter 9 – Control on Construction and Demolition activities

9.1 Key Activities

9.1.1 Amritsar area is a large city having population about 11,32,761 persons. Building construction projects are being set up in the city like Shopping Malls, Hotels etc. Also, small construction activities are being carried out by the individual house holders/industrial units/ commercial units and paving of streets by the MC on routine basis. To minimize the pollution generated from the construction and demolition activities, following key activities are proposed:

(i). CCDA 1 –Enforcement of Construction & Demolition (C& D) Rules,2016.

(ii). CCDA 2 – Control measures for fugitive emissions

(iii). CCDA 3 – Ensure carriage of construction material in closed/covered vessels.

9.1.2 Various actions to be taken for the above activities are given below. Further, the details such as baseline, target, timeline, milestones have been given in **Annexure-H**.

9.2 CCDA 1 –Enforcement of Construction & Demolition (C& D) Rules,2016:

1(a)- Enforcement: The necessary provisions of the C&D Rules, 2016 shall be implemented in the city to ensure proper management of these wastes. Municipal Corporation shall frame mechanism for challaning the violators found dumping the C&D waste on non-designated areas. The enforcement will be monitored through the use of technology and regular review.

1 (b) – Infrastructure Development: Municipal Corporation shall identify suitable land and set up the processing plant for effective disposal of C&D waste.

9.3 CCDA 2 – Control measures for fugitive emissions:

Municipal Corporation shall ensure that

(i) The builders provide proper curtains / sheets on the construction sites to avoid spreading of dust emissions into the environment.

(ii) No dust should be emitted during demolition.

(iii) No construction materials should be kept on the roads. The construction material inside the plots should also be kept in covered conditions and labour should be provided with required personal protective equipment's during the course of construction to safeguard from ill effects of fugitive emissions.

9.4 CCDA 3 – Ensure carriage of construction material in closed/covered vessels:

The relevant enforcement authorities will ensure that the construction material to be transported through trucks / vehicles shall be covered with tarpaulin to avoid the dust emissions.

Chapter 10 – Control through Other Steps

10.1 Key Activities

10.1.1 Apart from various measures being taken to control various sources of pollution, following activities will also be undertaken to control the pollution:

Public Awareness

(i). COS 1–Dissemination of information on Air Quality Index

Infrastructure

(i). COS 2 – Establish an Air Quality Management Division at SPCB HQ
(ii). COS 3 – Setup helpline in each city/town as well as SPCB HQ

Policy

(i). COS 4 - To provide uninterrupted power supply to commercial establishment within Walled City to avoid use of DG sets & reducing $PM_{2.5}$/SO_2 emission.
(ii). COS 5 - Conversion of Free Community kitchen of Golden Temple to hi-tech kitchen with cleaner fuel.

Enforcement

(i). COS 6 - Monitoring of DG sets and action against violations
(ii). COS 7 - Smooth traffic flow at Bhagtan wala Dump Site
(iii). COS 8 - Green belt provision at Bhagtan wala Dump Site

10.1.2 Various actions to be taken for the above activities are given below. Further, the details such as baseline, target, timeline, milestones have been given in **Annexure-I**.

10.2 COS 1 – Dissemination of information on Air Quality Index

Punjab Pollution Control Board shall display the air quality index of the city at its prominent places for the awareness of the public including website, social media and print media.

10.3 COS 2 – Establish an Air Quality Management Division at SPCB HQ

There is need to strengthen technical capability pertaining to air pollution. The Board will identify the requisite skill sets and number of technical staff required along with future roadmap for the Board's activities.

10.4 COS 3 – Setup helpline in each city/town as well as SPCB HQ

The Board shall set up a helpline system at headquarter and each city to receive the complaints from public and have effective feedback system.

10.5 COS 4 - Uninterrupted power to within Walled City to avoid use of DG sets

The PSPCL Authorities shall supply uninterrupted power supply to commercial establishments within Walled City to avoid use of DG sets and thereby reducing $PM_{2.5}$/SO_2 emission.

10.6 COS 5 - Conversion of Community kitchen of Golden Temple to cleaner fuel

The SGPC Authorities shall take up the matter with GSPL Authorities for the conversion of free community kitchen into Hi-Tech kitchen with cleaner fuel. The pipeline has been laid and only small portion of 50 meter is left.

10.7 COS 6 - Monitoring of DG sets and action against violations

The concerned agency shall identify the commercial activities where the DG sets have been set up without fulfilling the norms for control of emissions and noise. Punjab Pollution Control Board shall identify the illegal DG sets manufacturers and necessary directions for their non-operation / closure shall be issued. Punjab Pollution Control Board shall identify the industries where the DG sets have been set up without fulfilling the norms for control of emissions and noise.

10.8 COS 7 - Smooth traffic flow at Bhagtanwala Dump Site

The District Mandi Officer along with Traffic Police & DFSC shall make efforts to provide smooth traffic flow of the trucks plying within the grain market so as to reduce road dust emissions.

10.9 COS 8 - Green belt provision at Bhagtanwala Dump Site

The Municipal Corporation shall provide complete green belt along the Bhagtanwala Dump site in the available land so as to provide a barrier for dust emission from Bhagtanwala Dump Site.

Chapter 11–Graded Response Action Plan for Amritsar

11.1 Graded Responses

In order to mitigate the impact of higher level of pollution when AQI crosses satisfactory level, Graded Response Action Plan has been prepared for Amritsar for implementation under different Air Quality Index (AQI) categories namely, Moderate & Poor, Very Poor and Severe.

11.2 Agency Responsible for Graded Response

The concerned authorities responsible for taking action when AQI reaches various levels have been indicated against the proposed action. The authorities will work in coordination with and under the overall supervision of the District Level Committee.

11.3 Action in case of Severe AQI (Value ≥ 400)

Following action shall be taken by the concerned authorities:

Sr.No.	Activity	Agency responsible / Implementing Agency
1	Temporary closure of brick kilns, hot mix plant, induction furnaces, rolling mills etc.	PPCB
2	Stop construction activity	MC, Amritsar
3	Alert in newspapers / local cable TV to advice people with respiratory and cardiac patients to avoid polluted areas and restrict outdoor movement.	MC, Distt. Administration & PPCB
4	Sprinkling of water at the various dust emission points	MC, Amritsar
5	Deploy Traffic police for smooth traffic flow at the identified vulnerable areas	Traffic Police
6	Stringently enforce / stop garbage burning in landfills and other places and impose heavy fines on person responsible.	MC, Amritsar
7	To increase the frequency of mechanized sweeping on roads with heavy traffic and water sprinkling also on unpaved roads.	MC, Amritsar
8	Stop entry of heavy good vehicles except essential commodities in the city.	Traffic Police
9	To take decision regarding closing of schools	District Administration

11.4 Action in case of Very Poor AQI (Value between 301 to 400)

Following action shall be taken by the concerned authorities:

Sr.No.	Activity	Agency responsible / Implementing Agency
1	Restraining the operation of air polluting industries i.e. induction furnaces, rolling mills, brick kilns etc. for 8 hours/day	PPCB
2	Banning of construction activities	MC, Amritsar
3	Stop of garbage burning in the landfill areas or in the open fields	MC, Amritsar
4	Water sprinklings at the dust emission points etc.	MC, Amritsar
5	Strict vigil and enforcement of PUC norms	Traffic Police
6	Strict vigil and no tolerance for visible emissions from the vehicles and industries	PPCB and Traffic Police.
7.	Strictly enforce Supreme Court ban on fire crackers	MC, Amritsar and Distt. Administration
8	Strictly enforce all pollution control regulations in the air polluting industries like induction furnaces, rolling mills, brick kilns etc.	PPCB

11.5 Action in case of Poor AQI (Value between 201 to 300)

Sr.No.	Activity	Agency responsible / Implementing Agency
1	Strictly enforce garbage burning in landfill and other places and impose heavy fines on person responsible	MC, Amritsar
2	Increase frequency of mechanized cleaning of road and sprinkling of water on roads. Identify road stretches with high dust generation.	MC, Amritsar
3	Stop use of coal / firewood in open eateries	MC, Amritsar
4	Strictly enforce rules for dust control in construction activities and close non-complaint sites.	MC, Amritsar
5	Close / Strictly enforce all pollution control regulations in the air polluting industries like induction furnaces, rolling mills, brick kilns etc.	PPCB
6	Restricting air polluting industries i.e. induction furnaces, rolling mills, brick kilns etc. for 12 hours/day	PPCB

11.6 Action in case of moderately polluted AQI (Value between 101 to 200)

Following action shall be taken:

Sr.No.	Activity	Agency responsible / Implementing Agency
1	Increasing the frequency of mechanized cleaning the roads etc.	MC, Amritsar
2	Sprinkling of water at the dust emitting points	MC, Amritsar
3	To stop open burning of garbage and municipal solid waste	MC, Amritsar
4	Close / strictly enforce all pollution control regulations in the air polluting industries like induction furnaces, rolling mills, brick kilns etc.	PPCB

Chapter 12–Monitoring Requirements and Formats

12.1 Monitoring Requirements

12.1.1 Following are the key components of monitoring requirements of the Plan:

(i) Monitoring of activities for control on Vehicular Emissions
(ii) Monitoring of activities for control on Road Dust
(iii) Monitoring of activities for control on Burning of Garbage and Biomass
(iv) Monitoring of activities for control on Industrial Emissions
(v) Monitoring of activities for control on Construction and Demolition activities
(vi) Monitoring of activities for control on other sources

12.1.2 Further, various activities can be classified into one of the following categories:

(i) Public Awareness
(ii) Enforcement
(iii) New Infrastructure
(iv) Maintenance activities
(v) Policy Advocacy
(vi) Technology Support

12.2 Development of Environment Protection Monitoring System (EPMS)

In order to keep track of the progress made by concerned stakeholder departments on various projects, activities and initiatives, it is proposed to develop a dedicated IT platform namely Environment Protection Monitoring System (EPMS).

12.1.1 To work out detailed formats and setting up online system to track progress of various activities, a dedicated team of PPCB and NIC is working on it.

12.1.2 The system will ensure that information is captured at source and transmitted to the System and the system will be able to analyse and report it in the prescribed format. The system will generate different reports for use at different levels. The System will also have dashboard to present the key indicators and metrics.

Chapter 13 – Governance and Supervision

13.1 Three Tier Monitoring

13.1.1 Monitoring will be done by the Departments concerned, which are executing or responsible for particular activities. In addition, there will be three level of Air Quality Monitoring Committees (AQMC) to review and monitor the status:

(i) AQMC at District Level under Deputy Commissioner
(ii) AQMC at State level under Principal Secretary, Environment
(iii) Steering Committee under Chief Secretary

13.1.2 PPCB will set up a dedicated team for supporting coordination and monitoring of the Action Plan. It will also develop suitable IT platform for monitoring purposes.

13.2 AQMC at District Level

13.2.1 District Level Committee will be constituted under the chairmanship of Deputy Commissioner, Amritsar and the monthly meeting of the District Level Committee will be conducted to discuss / monitor the progress of the activities to be performed under the Action plan. The committee shall involve civil society organization and their participation will be ensured for achieving various targets mentioned in the Action plan.

13.2.2 The district level committee shall constitute the followings:

1	The Deputy Commissioner, Amritsar	Chairman
2	The Commissioner of Police, Amritsar	Member
3	The Commissioner, Municipal Corporation, Amritsar	Member
4	The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Amritsar	Convener
5	The Regional Transport Authority, Amritsar	Member
6	The Divisional Forest Officer, Amritsar	Member
7	Sub Divisional Magistrate – I / II, Amritsar	Member
8	The Civil Surgeon, Amritsar	Member
9	The Executive Engineer, Punjab Water Supply & Sewerage Board, Division No. 1 & 2, Amritsar	Member
10	The Superintending Engineer, PWD (B & R), Amritsar	Member
11	The Executive Engineer, (Drainage), Deptt. of Irrigation, Drainage Division, Amritsar	Member
12	The District Town Planner, Amritsar	Member
13	The Executive Engineer, Punjab Small Industries & Export Corporation, Jalandhar	Member
14	The General Manager, District Industries Centre, Amritsar	Member

15	The Sub Divisional Engineer, Punjab Water Supply & Sewerage Board, Amritsar (Near MC Office)	Member
16	The Asstt. Executive Engineer, Punjab Small Industries & Export Corporation, Amritsar	Member
17	The Chief Agriculture Officer, Deptt. of Agriculture, Amritsar	Member
18	District Mandi Officer, Amritsar	Member
19	The General Manager-cum- Project Director, NHAI, Jalandhar	Member
20	The Manager, Gujrat State Petronet Ltd., Ranjit Avenue, Near Passport Office, Amritsar	Member
21	The President, Focal Point Industries Association, Amritsar	Member
22	The President, Amritsar Textile Dyeing & Processors Association, Amritsar	Member
23	Shiromani Gurudrawa Prabandhak Committee	Member

13.3 AQMC at State Level

13.3.1 State Level Air Quality Monitoring Committee (AQMC) will comprise of the following:

1	Administrative Secretary, Department of Environment	Chairman
2	Director, Local Government	Member
3	Director, Transport	Member
4	Director, Industries and Commerce	Member
5	ADGP, Traffic	Member
6	Director, Directorate of Environment & Climate Change	Member
7	Chairman, PPCB	Member
8	Representatives of NGO/ Expert Members	Member
9	Representatives of NGO/ Expert Members	Member
10	Joint Director, Directorate of Environment & Climate Change	Convener

13.3.2 The State level Committee would meet every month to review the progress of the action plan and take corrective measures and also escalate issued to the Steering committee for intervention.

13.4 Steering Committee

13.4.1 There will be a Steering Committee under Chief Secretary and comprising of Administrative Secretaries of relevant administrative departments for monitoring the progress, resolving issues and enforcing accountability.

13.4.2 The Committee will comprise of the following:

1	Chief Secretary	Chairman
2	Administrative Secretary, Environment	Member
3	Administrative Secretary, Local Government	Member
4	Administrative Secretary, Industries and Commerce	Member
5	Administrative Secretary, Transport	Member
6	Administrative Secretary, PWD	Member
7	ADGP, Traffic	Member
8	Director, Directorate of Environment & Climate Change	Member
9	Chairman, PPCB	Member
10	Additional Secretary, Environment	Convener

Chapter 14 – Risk Mitigation Plan

14.1 Identification of Major Risks

Following are the major risks

(i) Lack of formal source apportionment study
(ii) Accuracy and completeness of baseline data, targets and milestones
(iii) Lack of formal analysis of implementation barriers

14.2 Source Apportionment Study

It is important to have the assessment of various sources and their contribution to the air pollution and accordingly focus on controlling those sources. Currently no such study has been done. In order to mitigate the risk, Punjab Pollution Control Board shall get source apportionment study of the city conducted to adjudge various sources contributing air pollution in the area and mitigation thereof. The same will be incorporated in the Action Plan.

14.3 Accuracy and completeness of baseline data, targets and milestones

The baseline data, targets and milestones are not very accurate or complete. During the course of implementation detailed surveys and analysis will be carried out and the baseline data, targets and milestones will be suitably updated and same will be reviewed in the AQMC meeting at District Level.

14.4 Lack of formal analysis of implementation barriers

Various activities included in the action plan need to be carefully analysed with respect to implementation challenges so that suitable remedial measures could be envisaged. Efforts will be made to study various barriers and improving the efficacy and effectiveness of the proposed activities by overcoming the shortcomings in the present system.

Chapter 15: Action plan for Training and Capacity Building

15.1 Importance

It is important to enhance the capability and skills of the officers of stakeholder departments for effective implementation of Air Action Plans. Therefore, training and capacity building programmes related to various technical aspects are required to be conducted for different functionaries of relevant departments & organizations at various levels of hierarchies.

15.2 Objectives

(i) Raising awareness and changing the mindset.
(ii) Building trust and appreciation for the purpose of various Environment Protection Plans, environmental concerns, issues, roles and responsibilities of different stakeholders.
(iii) Improving skills regarding existing practices, procedures and methodologies.
(iv) Promoting an integrated and holistic approach for addressing the concerns.
(v) Enhancing core competencies of concerned stakeholders in relevant areas of environment improvement.
(vi) Strengthening institutional arrangements
(vii) Reinforcing accountabilities and identifying aspects that require improvement
(viii) Understanding new challenges and requirements

15.3 Need Assessment

Specific modules for training of nodal and other responsible officers of various line departments involved in implementation of Air Action Plan are required to be developed for which need assessment would be carried out.

15.4 Involvement of Institutions and Experts

Organizations of national & international repute having expertise in the area of environment in general and air pollution in particular shall be involved for conducting need specific trainings & capacity building programmes for various target groups and officials of stakeholder departments. Experts would also be involved in developing knowledge products and information material on various issues & technologies for creating mass awareness to build a responsible society with an aim to reduce air pollution in cities. Further, the details such as baseline, target, timeline, milestones have been given in **Annexure-J.**

Annexure A – Source Apportionment Study by IIT Delhi

Table 1: Modelling Results (24 hour average GLCs) versus Observed Data

Pollutant	Predicted Conc. ($\mu g/m^3$)	Observed Conc. ($\mu g/m^3$)	Standards limits ($\mu g/m^3$)
PM_{10}	121.58	160.39	100
NO_2	45.96	25.97	80
SO_2	12.02	9.75	80

Table 2: Source Apportionment of air pollutants concentrations at Golden Temple (with Diesel Generator set).

Pollutants	Concentrations ($\mu g/m^3$) at Golden temple due to							Total Predicted Conc. ($\mu g/m^3$)	Background Conc. ($\mu g/m^3$)	Predicted + Background Conc. ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
	Industries	Vehicles exhaust	Re-Suspension of Road dust	Kitchen	Burning of crop residue	Tandoors	DG sets				
PM_{10}	21.31 (32%)	4.76 (7%)	30.95 (47%)	7.46 (11%)	0.24 (0.4%)	1.17 (1.6%)	0.69 (1%)	66.58	55.00	121.58	100.00
NO_2	-	9.42 (26%)	-	4.32 (12%)	0.13 (0.4%)	0.91 (2.6%)	21.18 (59%)	35.96	10.00	45.96	80.00
SO_2	2.45 (41%)	-	-	2.75 (46%)	0.01 (0.1%)	0.72 (11.9%)	0.09 (2%)	6.02	6.00	12.02	80.00

Note: (-) Absence of emission data for NO_2 in industry and SO_2 in Vehicles.

Annexure B – Trends in Air Quality of Amritsar

1. Station at M/s Vinod Milk Chilling Centre, Amritsar

Month	PM_{10} (µg/m³)						NO_X (µg/m³)						SO_2 (µg/m³)					
	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
January	181	177	204	224	316	198	38	36	40	40	37	40	11	13	14	18	13	15
February	180	170	198	208	213	211	37	36	39	39	35	35	12	13	13	17	13	13
March	182	168	187	218	225	179	40	35	38	40	34	34	13	13	12	18	12	12
April	194	198	211	313	206	158	41	38	39	40	36	37	14	14	13	15	12	13
May	188	215	212	-	167	143	42	42	39	-	37	36	14	15	14	-	12	13
June	171	202	181	205	151	293	41	43	38	37	35	36	12	14	13	12	12	13
July	132	191	178	201	148	109	39	39	38	36	30	33	13	13	13	12	10	13
August	-	182	145	225	180	159	-	38	37	36	31	35	-	12	13	12	11	13
September	-	184	156	261	156	141	-	40	37	35	29	31	-	12	13	12	10	11
October	173	199	161	263	206	137	39	45	37	37	32	29	14	14	13	13	12	13
November	181	191	182	267	261	118	40	41	39	36	41	16	15	14	15	12	16	8
December	189	202	181	316	176	125	41	39	39	37	38	28	15	13	15	13	14	11
Annual Avg.	**177**	**190**	**183**	**246**	**200**	**164**	**40**	**39**	**38**	**38**	**35**	**33**	**13**	**13**	**13**	**14**	**12**	**12**

2. Station at M/s Nagina Soap Factory, Amritsar shifted to Regional Office, Focal Point, Amritsar

Month	PM_{10} (µg/m^3)						NO_x (µg/m^3)						SO_2(µg/m^3)					
	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
January	178	175	202	246	310	170	39	38	39	40	41	29	12	13	14	17	14	11
February	174	171	195	225	135	173	36	38	38	38	34	30	11	13	13	17	12	13
March	172	170	184	225	198	146	38	38	37	39	35	35	12	12	12	18	12	12
April	205	201	208	239	213	159	41	39	39	39	36	37	13	14	14	17	13	13
May	197	209	210	-	192	205	42	44	40	-	36	39	13	14	14	-	12	13
June	180	199	188	208	-	230	37	42	39	36	-	38	12	14	13	14	-	12
July	160	189	181	128	153	168	37	41	37	33	28	33	12	13	13	12	12	12
August	155	129	141	152	143	133	36	39	37	32	30	34	12	12	13	11	12	13
September	163	178	153	217	140	128	37	39	38	34	30	35	13	13	14	11	11	11
October	169	201	180	211	216	198	40	48	37	40	34	30	13	15	13	13	13	12
November	177	188	194	231	361	252	39	42	38	40	43	32	14	14	14	13	14	12
December	185	201	190	310	188	194	40	41	39	41	30	31	14	14	15	14	11	12
Annual Avg.	176	184	186	217	204	180	39	41	38	37	34	34	13	13	14	14	12	12

Annexure C – AQI data from 2017 to 2018 depicting the air quality in Amritsar

AQI Data for year 2017			AQI Data for year 2018		
Month	**AQI**	**Category**	**Month**	**AQI**	**Category**
Jan-17	104	Moderate	Jan-18	162	Moderate
Feb-17	99	Satisfactory	Feb-18	118	Moderate
Mar-17	88	Satisfactory	Mar-18	111	Moderate
Apr-17	65	Satisfactory	Apr-18	116	Moderate
May-17	103	Moderate	May-18	144	Moderate
Jun-17	94	Satisfactory	Jun-18	176	Moderate
Jul-17	94	Satisfactory	Jul-18	61	Satisfactory
Aug-17	115	Moderate	Aug-18	62	Satisfactory
Sep-17	80	Satisfactory	Sep-18	53	Satisfactory
Oct-17	274	Poor	Oct-18	126	Moderate
Nov-17	263	Poor	Nov-18	132	Moderate
Dec-17	210	Poor	Dec-18	129	Moderate
2017 annual Avg.	**132**	Moderate	**2018 Annual Avg.**	**115**	Moderate

Annexure D – Action Plan for Control on Vehicular Emissions

Sr. No.	Activity	Implement-ation period (Short/Medium/ Long term)	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)	Financial Implications, if any (Estimated Cost)
1	CVE 1 - Public awareness campaign for control of vehicular emissions	Short Term	Department of Transport	Presently, awareness is being created in Educational Institutes under Sadak Surakhya Abhiyan.	The public to be educated & motivated to actively play their role in curbing the vehicular pollution.	Regular Activity	1. Public awareness campaign in print and electronic media-Twice a month 2. Use of Social Media Facebook, twitter, Instagram-Regular 3. Jingles on air pollution on local radio and TV-Local FM Radio will be hired- Fortnightly 4. Awareness drives in 5 no. educational institutions-Monthly 5. Public meetings-Monthly 6. Nukarnataks-Quarterly	Nil
		Short Term	Traffic Police	493 educational camps during year 2018 on traffic Rules including control of vehicular emissions by Traffic Education cell	Public awareness campaigns to be continued	Regular Activity	Monthly monitoring	Nil

2	CVE 2 - Remote sensor-based PUC system	Medium Term	Department of Transport	Manual checking at Pollution Check Centre (PCC) exists	All Pollution Checking Centres will be linked with VAHAN 4.0 software of the Transport deptt.	31.01.2020	1. Preparation of RFP for selection of vendors - Under Process 2. Allotment of work after selection of vendors – 2 Months 3. Development of software solution to link all PUC centres – 9 months 4. Linking of software to VAHAN 4.0 software of the transport Deptt.- 1 Month	Nil
3	CVE 3 - Extensive drive against polluting vehicles	ShortTerm	Traffic Police	2218 challans were issued during year 2018 to violating vehicles with regard to invalid PUC certificates / pressure horns etc.	Regular inspection to be continued and violators to be challaned	Regular activity	-	Nil
4	CVE 4 (a) – Prevent parking of vehicles in non-designated areas by creating parking infrastructure	Medium Term	Municipal Corporation	• Designated parking lots: 2 Nos	• Designated parking lots being identified: 3 Up gradation of parking sites at: i) Kairon Market, ii) Fish Market and	31.03.2021	1. Develop methodology – One month 2. DPR – Two months 3. Tendering – Three months 4. Execution – Fifteen months 5. Commissioning – Three months	Rs.56.20 Cr

				• Multi storey parkings : 4 Multi level parking already exists. • Parking for trucks/ commercial : 1 no. transport nagar exists.	iii) old SabjiMandi • Multi storey parkings to be made : 2 • Need based additional Parking areas for trucks			
	CVE 4(b) – Enforcement	Short Term	Municipal Corporation	• Roadside parking earmarked by yellow line :14 • "No Parking"sign Boards installed - 50	• Roadside parking for earmarking being identified: 6 • "No Parking" sign Boards- to be installed in non designated areas: 40.	30.09.2019	Tendering and Work allotment— After MCC	Rs. 1.5 lacs
			Traffic Police.	4201 no. of challans issued during year 2018	Regular inspection to be continued and violators to be challaned.	Regular activity		Nil
5	CVE 5 - Check fuel adulteration	Short Term	Department of Food and Civil Supplies/Oil Industry	As informed by Deptt.of Food & Civil Supplies, the Oil Companies have adopted	State Level Coordinator, Oil Companies will conduct inspections on	Regular activity	-	Nil

				Online Automated System for transportation & checking the density of Petrol/Diesel.	annual, quarterly & random basis. - In case of complaint, Department of Food & Civil Supplies in coordination with local oil company officials shall check fuel adulteration & if any discrepancy is noticed then action against the violator shall be taken by State Level Coordinator of Oil Company.			
6	CVE 6 - Widening of roads and improvement of infrastructure for decongestion of roads	Short Term	Municipal Corporation	Outer circular road of stretch 7 Km identified for widening.	Identified road to be widened	30.09.2019	1. Identification- Complete 2. DPR- Complete 3. Tendering&Workallotment - Complete 4. Execution – Six months	Rs. 14.70 Crore
7	CVE 7 - Introduce intelligent traffic systems	Short Term	Traffic Police	Presently, conventional traffic light exists	Nos of intelligent traffic systems to be installed : 21 Nos. (under smart city).	03.05.2019	Tendering & Work allotment- Complete	Rs.11.58 Crore

8	CVE8- Construction of expressways/ bypasses to avoid congestion	Short Term	NHAI	Seven Flyovers have been sanctioned at Daburjee Crossing, Verka Crossing, Majitha Crossing, Fatehgarh ChurianByepass Crossing, Ranjit Avenue, Crossing, Ram TirathByepass Chowk, Crossing, Ghanupur Kale Crossing and India Gate Crossing. Out of 7 flyovers, 5 flyovers have already been completed.	Construction of flyovers at i) Ram Tirath and ii) Ghanupur Kale crossing	30.06.2019	Work in progress and is likely to be completed by the target date.	Rs. 4.97 Crore
9	CVE 9 – Phasing out commercial diesel vehicles more than 15 years old	Long Term	Department of Transport	New commercial diesel vehicles is registered for 2 years and thereafter, fitness certificate is being issued every year.	Matter of fixing the age of commercial diesel vehicle is being examined legally.	-	-	Nil
10	CVE10 – Promotion ofE- vehicles	Medium Term	Department of Transport	Presently, most of the vehicles are running on diesel and petrol.	After approval from Competent Authority E-	31.12.2019	1. Framing & Notification of E-vehicle policy – 9 months 2. Providing public charging points for E-	NIL

				-Framing of the E-vehicle policy is in the final stages. -2500 E -rickshaw are plying.	Vehicle policy will be notified.		vehicles as per Govt. policy.	
11	CVE 11 (a) – Introduction of CNG based public transport (Infrastructure development)	Medium Term	Deptt. of food & civil supplies	• 03 nos. of CNG Stations exists • Survey by M/s GSPL	• To upgrade 10 no. conventional filling stations to CNG filling stations. • 01 no. new CNG station to be set up by GSPL	31.03.2020	Laying of pipeline & upgradation & commissioning of CNG filling stations within one year	Nil
	CVE 11 (b) – Introduction of CNG based city bus service	Long Term	Municipal Corporation	At present no CNG based city bus service exits.	To take measures to introduce CNG based city bus service.	-	-	Nil
	CVE 11 (c) – Introduction of CNG based autos / taxis	Long Term	Deptt. of Transport	At present,100 new auto rickshaws with CNG kits are operational. PPCB has issued direction vide letter no 05 dated 03.01.2019 under section 31-A of Air Act 1981 to stop registrationof new diesel / petrol driven auto	To take measures to introduce CNG based auto/ taxis.	-	Implementation of PPCB orders dated 03.01.2019.	Nil

				rickshaw (s), in 5 districts including Amritsar,w.e.f 01.02.2019.				
12	CVE 12 – Retrofitting of particulate filters in diesel vehicles for BS-IV fuels	Long Term	Department of Transport.	Presently, India is implementing BS-IV standards for diesel vehicles	India is going to skip adopting BS-V norms and shift directly to adopting BS-VI norms by 2020	-	The steps for retrofitting of particulate filters in diesel vehicles is to be undertaken by Automotive industry under directions from Government of India as and when BS-VI fuels are available	Nil

Annexure E – Action Plan for Control on Road Dust

Sr. No.	Activity	Implement-ation period (Short/ Medium/ Long term)	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)	Financial Implications, if any (Estimated Cost)
1	CRD 1 – Maintain potholes free roads for free-flow of traffic	Short Term	Municipal Corporation	4 km of roads have been Identified.	Identified roads to be repaired	30.09.2019	1. Tendering-done 2.Work to be completed Within 6 month	Rs. 12 Lacs
2	CRD 2 (a) – Water sprinkling	Short Term	Municipal Corporation	67.5 Km of Road length identified for Water sprinkling are : SabjiMandi Road, Sultanwind Road, Chamrang Road, Roads leading to Durgiana Mandir, Roads leading to Golden Temple,	Regular Water sprinkling on identified road	Regular Activity	-	Nil

				Dana Mandi, Mall Road				
	CRD 2 (b) – Procurement of Water sprinkler	Medium Term	Municipal Corporation	3 Nos water sprinklers exists.	2 more sprinklers of capacity 3.0 KL each to be procured.	31.12.2019	1. Estimation- Under process 2. Tendering - Under process.	Rs. 20 lacs
3	CRD 3 – Mechanical sweeping	Medium Term	Municipal Corporation, Improvement Trust	55.07 km of Road length identified for mechanical sweeping.	02 nos. mechanical machines of 28 Km/ day capacity are proposed for sweeping of identified roads.	31.03.2020	1. Identification -completed 2. Estimation - Under process (06 months). 3. Tendering – After estimation (02 months). 4. Procurement- After Tendering (04 months)	Rs. 2.10 Crore
4	CRD 4 - Creation of green buffers along road sides	Short Term	Municipal Corporation	04 Km of Road length identified for green buffer.	Around 2000 plants are to be planted in an around industrial,and	Regular Activity	1. Demand of plants sent to forest department	NIL

				1000 plants have already been planted.	residential arearoad sides.		for procurement. 2. Plantation of 2000 tress will be started soon	
		Short Term	PUDA	1268 nos. trees and shrubs to be planted at - UE, Old jail site: Trees -825 & Shrubs-443	1268 nos. of trees / shrubs to be planted in the identified areas.	Regular Activity	Plantation to be started after completion of civil work	NIL
5	CRD 5 - Greening of parks, open areas, community places, schools and housing societies	ShortTerm	Municipal Corporation	395 Nos of parks under MC 3000 plants have already been planted	To ensure all public parks have adequate green cover/ plantation.	Regular Activity	1. Identification of open areas- Completed 2. Plantation-To be started in rainy season	NIL
6	CRD 6 - Water fountains at major traffic intersections	Medium Term	Municipal Corporation	No water fountains at intersection of roads	03 nos. Water fountains to be Installed along Circular Road	31.03.2020	1. Identification-Completed 2. DPR-Under Process 3. Tendering- After DPR Completion 4. Work allotment and completion after 12 months of administrative approval	Rs. 15 Lacs
7	CRD 7 (a) Kaccha/Brick Paved	Medium Term	Municipal Corporation	Nil .	NIl	--	-	-

	Roadsto be made Pucca roads							
		ShortTerm	PUDA	Identified 5.92Km Katcha/ Brick Paved Road for making pucca roads at Urban Estate, Old Jail site	Identified Kaccha roads to be made puccafor control of road dust emissions	22.8.2019	Tendering and Work allotment - Completed	Rs. 10.26 Crore
		Medium Term	PUDA	2.55Km Katcha/ Brick Paved RoadatManawala need to be made pucca	Identified Kaccha roads to be made pucca roadsfor control of road dust emissions	31.03.2020	1. Identification -Completed 2. DPR -Completed 3. Tendering – Under Process	Rs. 1.05 Crore
	CRD 7 (b) Existing roads requiring recarpeting	Medium Term	Municipal Corporation	28 Km of existing road within MC limit requiring re-carpeting identified	28 km of existing road to be re-carpeted	31.03.2020	1. Identification-completed 2. Estimation-Under process. 3. Tendering, Work allotment and completion after 12 months of administrative approval	Rs. 20 Crore.
		Short Term	PWD	27.70 Km of existing roads requiring re-carpeting identified	27.70 Km Identified roads to be recarpeted	30.06.2019	DPR, Tendering And Work Allotment	Rs. 41.95 Crore

				BoparaiBaj Singh Khurmanian Road-6.10 Km, Amritsar ChogawanRanian Road - 14Km, Mudhal to Verka Canal-2.10 KM, Meerankot to Shri Guru Dass International Airport- 4 KM, JagdevKalan-Loharka Road-1.5 Km			- Done.	
		Medium Term	PUDA	• 0.06 Km existing road lengh identified at Manawalarequiring re-carpeting	0.06 Km Identified roads to be recarpeted	31.03.2020	1. Identification -Completed 2. DPR-Completed 3. Tendering – Under Process 4. Work allotment- After tendering	Activity will be taken up out of budget provision under activity 7(a).
		Medium Term	PSIEC	10 Km of existing roads in Industrial Focal Point (New) to be re-carpeted has been identified	10 Km identified road to be recarpeted	31.03.2020	1. Identification -Completed 2. Estimation-Completed 3. Tendering-Completed	Rs. 2.05 Crore

							4. Work allotment and completion after 12 months	
	CRD 7 (c) Pavement of road side using interlocking tiles/ To prevent road dust emissions	Medium Term	Municipal Corporation	28 Km of existing roads within MC limit identified for Berm stabilization	28 km of existing road to be paved by using interlocking tiles	31.03.2020	1. Identification-completed 2. Estimation-Under process. 3. Tendering, Work allotment and completion after 12 months of administrative approval	Activity will be taken up out of budget provision under activity 7(b).
		Short Term	PUDA	11.84 Kmof the road length identified for Berm stabilization	11.84 Km of the road to be paved by using interlocking tiles	22.08.2019	1. Identification -Completed 2. DPR-Completed 3. Tendering – Under Process	Activity will be taken up out of budget provision under activity 7(a).

Annexure F – Action Plan for Control on Burning of Garbage and Biomass

Sr. No.	Activity	Implement- ation period (Short/Medium/ Long term)	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)	Financial Implications, if any (Estimated Cost)
1	CBGB 1 – Control on open burning of bio-mass in City	Short Term	Municipal Corporation	Prepared 6 nos. of composting pits in different parks for collection of horticulture waste to avoid burning of bio-mass in city.	19 nos. of Pucca compost pits are to be constructed in parks and green belts for proper collection of horticulture waste and its disposal.	30.09.2019	Estimate - Completed Tendering - 2 months Work Allotment -1 month Completion –By six months	Rs. 2.28 lacs
2	CBGB 2 – Control on burning of municipal solid wastes	Short Term	Municipal Corporation	Burning of municipal solid wastes stands prohibited. Regular inspection and Challaning is being done. Awareness among MC staff/Safai Sewak is being created. Complaint based check&25 No. of challans issued during year 2018. 6 No. of inspections, 3 no. of challans and 3	Regular inspections to be continued for Control on burning of municipal solid wastes and Challans to be issued to the violators.	Regular activity	-	NIL

				awareness camps organized in March 2019.				
3	CBGB 3 – Control on burning of agriculture waste and crop residue	Short Term	District Administration, Department of Agriculture, Police, PSPCL, Revenue Department &PPCB	• Identification of sites by PRSC (PAU) • Regular monitoring under supervision of DC • 328challan issued in which total amount of Rs 8,70,000 imposed as Environmental compensation in year 2018 by PPCB • Rs.3,425,00/- Environmental compensation recovered upto Dec 2018.	Enforcement by Team	During wheat/rice harvesting season	1. To create awareness among farmers regarding health effects of residue burning 2. Deptt. of Agriculture to provide subsidy for equipment/ machinery as per Govt. policy 3. Teams will be constituted one month prior to start of each harvesting season. 4. Identification of no. of fire incidents by PRSC. 5. Visit to identified sites 6. Imposing Environmental	NIL

							compensation on defaulters 7. PSPCL shall ensure electricity for in-situ management 8. Progress review in District Level Air Quality Monitoring Committee meeting 9. Recovery of Environmental compensation	

Annexure G – Action Plan for Control on Industrial Emissions

Sr. No.	Activity	Implement-ation period (Short/ Medium/ Long Term)	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)	Financial Implications, if any (Estimated Cost)
1	CIE 1 – Conversion to CNG/PNG from pet coke / coal	Long Term	Punjab Pollution Control Board / GSPL	Presently industries are using pet coke / rice husk as fuel	95 no. industries are required to be converted into cleaner fuel	31.03.2021	Two years from providing of gas pipeline by the company.	NIL
2	CIE 2 – Conversion of natural draft brick kilns to induced draft	Short Term	Punjab Pollution Control Board	38 no. brick kilns are operating within 5 km radius of M.C. Limits, out of which 10 brick kilns have adopted Induced Draft Technology.	To convert remaining 28 brick kilns into Induced Draft Technology.	30.09.2019	No kiln to be operated without adopting Induced Draft Technology.	NIL
3	CIE 3 – Action against non-complying industrial units	Short Term	Punjab Pollution Control Board	Regular inspection as per policy of the Board	• Action against defaulting industries. • Checking the adequacy of APCD installed for small	Regular activity	Regular inspections by PPCB	NIL

					induction furnaces (4 no.).			
4	CIE 4 – Shifting of industries from non-designated areas to industrial areas	Long Term	Local Govt. / Distt. Town Planner/ Deptt of Industries.	Industries located in no designated areas need to be identified for shifting.	Identified Industries required to be shifted to the designated areas.	To be shifted as per the provisions of notified Master Plan	As per the provisions of by-laws of notified Master Plan	NIL

Annexure H – Action Plan for Control on Construction and Demolition Activities

Sr. No.	Activity	Implementation period (Short/Medium/ Long term)	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)	Financial Implications, if any (Estimated Cost)
1	CCDA 1 – Enforcement of Construction & Demolition Rules.	Long Term	Municipal Corporation	Inspection is being carried out as per needs for bigger/commercial & road projects.	Regular inspection will be made for Control of Construction & Demolition waste. -Counter verification to be done by ATP/EO	Regular Activity	--	Nil
	CCDA 1 (b) – Infrastructure of Construction & Demolition waste	Long Term	Municipal Corporation	5 sites identified for disposal of C & D waste	Presently there is no proposal of setting up of processing / recycling plant for C&D Rules, 2016.	-	--	-
2	CCDA 2 – Control measures for fugitive emissions	Short Term	Municipal Corporation	At present, minimal measures being taken by the building contractors.	Proper curtains / sheets on the construction sites to be provided &the construction material be kept in covered conditions Regular inspection to be made and challan issued to violators	Regular activity	Regular inspections to be carried out.	Nil
3	CCDA 3 – Ensure carriage of	Short Term	Municipal Corporation	MC has already directed all	Regular inspection will be made to ensure	Regular Activity	Monthly reviewed in District Level meetings	NIL

	construction material in closed/covered vessels.			contractors to carry building materials and malba in enclosed/ covered vessels.	implementation of directions given to contractors to carry the building materials and malba in enclosed/ covered vessels.			

Annexure I – Action Plan for Control through Other Steps

Sr. No.	Activity	Implement-ation period (Short/ Medium/ Long term)	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)	Financial Implications, if any (Estimated Cost)
1	COS 1 – Dissemination of Air Quality Index	Medium Term	Punjab Pollution Control Board	One No. CAAQMS installed.	Three No. additional CAAQM required	31.03.2020	1. 1. Expected Allotment of Station by CPCB on 50:50 sharing basis. 2. Finalization of specifications by CPCB 31.05.2019. 3. Tendering- 31.07.2019 4. Identification of site and its approval from CPCB (Simultaneously with tendering- 31.07.2019). 5. Procurement& installation of CAAQMS- 31.01.2020 6. Calibration, Commissioning& data	Rs 30 lacs

							procurement – 31.03.2020.	
2	COS 2 – Establish an Air Quality Management Division at SPCB HQ	Medium Term	Punjab Pollution Control Board	No such division exists	One required	31.03.2020	1.Develop Methodology-Three months 2.Providing infrastructure-Six months 3.Implementation-Three months	Rs 2 Lacs
3	COS 3 – Setup helpline in each city / town as well as SPCB HQ Policy	Medium Term	Punjab Pollution Control Board	No help line exists	One help line number required	31.03.2020	1. Develop methodology-Three months 2. Providing infrastructure-Six months 3. Implementation -Three months	Rs 0.5 Lacs
4	COS 4 - To provide uninterrupted power supply to commercial establishment within Walled City to avoid use of DG sets & reducing PM2.5/SO2 emission.	ShortTerm	Punjab State Power Corporation Limited / Shiromani Gurudwara Prabhandak Committee	GIS sub-station installed. Two transformers of 20 MVA installed.	Commissioning of 66 KVA Grid Station at Golden Temple, Amritsar	31.05.2019	Work in progress and is likely to be completed by the target date.	Rs. 13.5 Crore
5	COS 5 - Conversion of Free Community kitchen of Golden Temple to hi-tech	Short Term	SGPC / GSPL	CNG pipeline laid from Sultan wind Gate to Golden Temple- 730 m.	Remaining stretch of 50 m to be laid.	30.04.2019	Work in progress and is likely to be completed by the target date.	NIL

	kitchen with cleaner fuel.							
6	COS 6 - Monitoring of DG sets and action against violations	ShortTerm	Punjab Pollution Control Board	Manual monitoring exists	Non-complying DG set should not be allowed	Regular Activity	1. Identification- Three months 2. Implementation -Three months	Nil
7	COS 7 - Smooth traffic flow at Bhagtanwala Dump Site	ShortTerm	District Mandi Officer / Traffic Police / DFSC	Manual monitoring exists	Need based	Regular	Regular activity	Nil
8	COS 8 - Green belt provision at Bhagtanwala Dump Site	Short Term	Municipal Corporation	Land exist without green belt	100% coverage with green belt	Six months	1. Tendering - Two months 2. Work allotment – One month 3. Implementation – Three months	Nil
9	COS 09 – Source Apportionment Study	Short Term	PPCB	Source Apportionment Study have been conducted through PSCST & TERI	Not required	--	--	Rs.1.10 Cr.

Annexure J – Action Plan for Training & Capacity Building Programmes

Sr. No.	Activity	Implementation period (Short/ Medium/ Long term)	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)	Financial Implications, if any (Estimated Cost)
1	TCB1 – Training & Capacity Building Programmes	Short Term	PPCB	Officers get trainings under various programmes orgnanized by the concerned departments	• District/City level training programmes – 1 Nos. • State level training programmes – 1 Nos.	31.03.2020	Selecting agencies/ experts for organizing theme specific trainings. Organization of programmes at City/District and level.	Rs.2.00 lacs

Note: 'Short Term' refers to activities to be carried out during next 6 months, 'Medium Term' refers to activities to be carried out during next 2 years and 'Long Term' refers to activities to be carried out in more than 2 years time period.

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