Action Plan for Clean Air, Khanna

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Department of Science, Technology and Environment,
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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 plant or property or environment. Air pollution means the presence of air pollutants in the atmosphere. The most common sources of air pollution include particulates, ozone, oxides of nitrogen, and sulphur dioxide.

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 Khanna

1.2.1 History

(i) Khanna is an ancient town which came into existence 500 years back. History reveals that Sher Shah Suri built a number of Sarais (inns) at every 12 to 15 miles along the Delhi-Lahore road. One of the Sarais was built in this area which is still known as the Purani Sarai.

(ii) After the decline of Mughal rule in the Punjab, Baba Banda Singh Bahadur captured the area from Sirhind to Hoshiarpur. After that a Jathedar of Dahedu controlled and occupied the whole of the area from Dahedu to Nabha. He married his daughter, Daya Kaur, to the King of Nabha. When a family dispute arose between the King and his new wife, she left Nabha for good and went back to live with her parents in Dahedu. According to Indian conventions she could not remain there forever. Therefore, her father gave her a "kann", or a "small portion", of the territory between Dahedu and Nabha that was well known for its agriculture. Over time, the pronunciation of the name changed from "Kann" to "Khanna".

(iii) The city is 40 km from the city of Ludhiana on the Grand Trunk Road (National Highway 1) and is home to Asia's 2nd largest grain market. The city is intermixed with Mandi Gobindgarh, which is known as "Steel City". Like Mandi Gobindgarh, Khanna became a free trade zone for steel. The town experienced growth along with Mandi Gobindgarh.

1.2.2 Area and Population

Khanna is located 40 Km from Ludhiana city in a stretch of about 12 Km on National Highway-I. The City is spread over an area of about 28 Sq. Km and currently accommodates a population of about 1, 30,000.The city is home to Asia's 2nd largest grain market. The city is intermixed with Mandi Gobindgarh, which is known as "Steel City". Like Mandi Gobindgarh, Khanna became a free trade zone for steel. The town experienced growth along with Mandi Gobindgarh.

1.2.3 Industry and Trade

At present, the city contributes handsomely to the total recycled steel production of India. Industrialization in Khanna began at the start of the 20th century along with Mandi Gobindgarh as various categories of steel manufacturing units are operating in this town.Khanna has the largest grain market in Asia followed by the grain market of Rajpura (Punjab).

1.2.4 Topography

The topography of the Khanna is typical representative of an Alluvial plain, it owes its origin to the aggravation work of the Sutlej River. The alluvium deposited by the river has been worked over by the wind which gave rise to a number of small dunes and sand mounds. Most of these dunes have been levelled by the brave hard-working agriculturists of the district.

1.2.5 Climate

The climate of the Khanna is characterized by dryness except a brief spell of monsoon season in a very hot summer and a bracing winter. The winter season is from middle of November to the early part of March. The succeeding period up-to the end of June is the hot season. July, August and half of September constitute the south west of monsoon, the period of mid-September to about the middle of November may be termed as post monsoon or transitional period. June is generally the hottest month. Hot and scorching dust laden winds blow during summer season. December & January are the coldest months. The mean daily temperature varies in the range of 5 degree centigrade to 42 degree centigrade.

1.2.6 Rainfall

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 rainfall during December to March accounts for 16% of the rainfall and the remaining 14% rainfall is received in other months of the year. The average annual rainfall is 859.4 mm.

1.3. Government's past efforts for control of Air pollution

1.3.1 Punjab Pollution Control Board had taken this as a challenge and also as an opportunity in order to achieve significant improvement in environmental quality and pave the way for sustainable development in the area. As Khanna is sister city of Mandi Gobindgarh, similar industries are established in these twin cities. Therefore, Khanna faces the similar challenges as Mandi Gobindgarh. The efforts being made by the Government in Mandi Gobindgarh are being replicated in Khanna city.

1.3.2 Punjab Pollution Control Board in consultation with Punjab State Council for Science & Technology, Chandigarh has evolved side suction hood technology for effective control of fugitive emissions generated by induction furnaces. Punjab Pollution Control Board has

asked the induction furnaces to upgrade their existing APCDs with side suction hood technology and bag filter house.

1.3.3 There are 90 steel rolling mills located in the Khanna city. At present, coal is being used as fuel in the re-heating furnaces, which is major cause of pollution, therefore, like Mandi Gobindgarh the Board is pursuing the steel rolling mills of Khanna to shift their furnaces from coal to piped natural gas (PNG).

1.4. About National Green Tribunal directions

1.4.1 Nine cities of Punjab namely DeraBassi, Nangal, Patiala, Mandi Gobindgarh, Khanna, Ludhiana, Jalandhar, Pathankot and Amritsar 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 are 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 Tandarust 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, Khanna

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

2.3. Mission Clean Air, Khanna

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

(i) Creating awareness about the adverse impact of air pollution
(ii) Identifying the sources of airpollution, their apportionment
(iii) Identifying action steps related to Awareness, Enforcement, Infrastructure or Policy for control of various sources of Air Pollution
(iv) Designing effective systems for monitoring the progress of the implementation of action steps
(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, Khanna

The key elements of strategy for Clean Air campaign for Khanna 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) Provide canopies on the existing D.G sets

(ii) **Department of Local Government/ MC, Khanna**

(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 enforcement 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) **Department of Industries and Commerce / PSIEC**

(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 agro 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 Khanna/Mandi Gobindgarh in this plan. Following Industry Associations will be associated with the plan:

(i) President, Gobindgarh Steel Chamber of Commerce & Industries, Mandi Gobindgarh.
(ii) President, All India Steel Re-Rollers Association, Mandi Gobindgarh
(iii) President, Small Scale Steel Re-Rollers Association, Mandi Gobindgarh
(iv) President, Mandi Gobindgarh Induction Furnace Association, Mandi Gobindgarh

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 / furnace oil to PNG
(v) To shift over the industries from coal to PNG
(vi) To modify the existing APCD consisting of canopy hood to the new APCD designed by PSCST, Chandigarh with side hood collection system

2.6.3. Apart from Industry Associations, the support of various NGOs in the city such as Environmental Protection & Social Welfare Organisation (NGO), Khanna 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 Khanna 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 Khanna 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 Khanna

3.1. Monitoringof Air Quality

Khanna is an industrial hub in the District Ludhiana and has the second largest grain market in the Asia. The ambient air quality monitoring is being carried out regularly at 2 no. manually operated stations installed under National Air Monitoring Program (NAMP). The year wise data of PM_{10}, SO_2 and NO_x for the period 2014-18 is placed at **Annexure-A**. Further, the Board has also commissioned one Continuous Ambient Air Quality Monitoring Station (CAAQMS) at Khanna and the real time data of the same is being displayed at Samrala-Khanna Road. The AQI data of 2018 has been given in **Annexure-B.**

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:

S.N.	Pollutants	Time weighted average	Concentration of Ambient Air	
			Industrial, Residential, Rural and other areas	Notified Ecologically sensitive area
1	Sulphur Dioxide (SO_2) $\mu g/m^3$	Annual	50	20
		24 hours	80	80
2	Nitrogen Dioxide (NO_2) $\mu g/m^3$	Annual	40	30
		24 hours	80	80
3	Particulate Matter (size<10 µm) or PM_{10} $\mu g/m^3$	Annual	60	60
		24 hours	100	100
4	Particulate Matter (size<2.5 µm) or $PM_{2.5}$ $\mu g/m^3$	Annual	40	40
		24 hours	60	60
5	Ozone (O_3) $\mu g/m^3$	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. Based on 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 Khanna and the real time data of the same is being displayed at Samrala-Khanna Road. Annual average of AQI for the last year 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
2018	103.60	42.68	12.93	47.39	95

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-B** clearly indicates that air quality index of Khanna generally remains moderate (101-200) and sometimes satisfactory (51-100). The sources of pollution and their apportionment are given in the next chapter.

Chapter 4 – Sources of Air Pollution in Khanna

4.1. Major Sources

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

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

4.1.2. Due to paucity of time, detailed studies regarding source apportionment and carrying capacity could not be done, however, the Board has made some projections based on its in-house projections for Khanna. The estimated contribution of various sources in air pollution is given as under:

1.	Industrial Emissions	40%
2.	Road Dust	30%
3.	Vehicular Pollution	20%
4.	Burning of Garbage and Biomass	5%
5.	Construction and Demolition Activities	4%
6.	Other Sources	1%

4.1.3. The source apportionment studies will be carried out in due course.

4.2. Vehicular Emissions

4.2.1. Transport sector is one of the significant contributors to air pollution in Khanna due to movement of heavy goods vehicles carrying raw materials and products of the industries located in and around the city and as the second largest grain market is located in Khanna, therefore, vehicles carrying produces of farmers are plying into the city from nearby Districts. At present about 16,000 vehicles (heavy transport vehicles, LMVs, cars & jeeps, two wheelers and three wheelers) are plying on the roads of Khanna. National Highway NH-1 passes through Khanna, which is connecting tourist destination like Amritsar and industrial hubs like Ludhiana and Jalandhar.

4.3. Road Dust

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. Some of the factors contributing to road dust are:

(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
(vii) Grain market

4.4. Burning of Biomass and Garbage

4.4.1. There are only small patches of agricultural land within the Khanna 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 95 TPD, which is being dumped unscientifically in the present dumping site. 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 rolling mills, cupola furnaces and other units are using coal / furnace oil 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 inand around Khanna area are given as under:

Sr. No.	Category	Number of Units
1.	Induction Furnaces	16
2.	Steel Rolling Mills	93
3.	Cupola/ Foundry Units	07
4.	Forging Industry	02
5.	Lead Extraction Unit	01
6.	Milk Plant /Dairy unit	02
7.	Rice Shellers	51
8.	Cattle feed units	27

Sr. No.	Category	Number of Units
9.	Solvex plants	05
10.	Vanaspati unit	01
11.	Brick Kilns	06
12.	Pyrolysis plant	01
Total		**212**

4.5.3. It is pertinent to mention here that emission standards for most of the above industries are the most stringent for such type of industries i.e. 150 mg/Nm3.

4.6. **Mining**

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

4.7. **Construction and Demolition Activities**

Khanna area is a small city having population about 1,30,000. No major construction projects are being set up in the city. However, 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.

4.8. **Others**

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

Chapter 5 –Control on 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

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

Infrastructure Related

(i) CVE 6 - Widening of road and infrastructure for decongestion of road
(ii) CVE 7 - Introduce intelligent traffic systems
(iii) CVE 8 - Install weigh in motion bridges at the borders of cities
(iv) CVE 9 - Construction of expressways/ bypasses to avoid congestion

Policy Related

(i) CVE 10 – Phasing of vehicles more than 15 years old
(ii) CVE 11 – Promotion ofbattery-operated vehicles
(iii) CVE 12 – Introduction of CNG based public transport
(iv) CVE 13 – Retrofitting of particulate filters in diesel vehicles for BS-V fuels

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

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, Khanna, 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

Presently, vehicles are being parked in a haphazard manner and on the roads as well, which leads to traffic congestion, thus, causing vehicular pollution. Traffic police shall impound vehicles parked in non-designated areas. Traffic police shall compile the list of prominent areas of such violations and special attention shall be paid. 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

Regular monitoring will be carried out to check adulteration of fuel and heavy fines may be imposed on the violators. Department of Food and Civil Supplies will be responsible and number of inspections carried out and action taken against the violators will be monitored on regular basis.

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

The roads constructed within the city having traffic congestion shall be identified by the MC. The concerned department like PWD (B&R), Mandi Board and Municipal Council shall widen these roads suitably to decongest the traffic.

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

PWD (B&R) shall examine the need for any expressways/bye-passes 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 Km. The traffic lights shall be placed at various intersection, so as to avoid traffic jams and smooth operation of the vehicles. Municipal Council in consultation with Traffic Police shall identify such places and provide traffic lights.

5.10. **CVE 9 - Install weigh in motion bridges at the borders of cities**

Municipal Council shall set up weigh bridges at each entry and exit of the city to avoid entry of overloaded vehicles to prevent generation of excess emissions of gases and dust.

5.11. **CVE 10 – Phasing of vehicles more than 15 years old**

The Department of Transport will ensure phasing out of vehicles more than 15 years old.

5.12. **CVE 11 - Promotion of battery-operated vehicles**

The Department of Transport shall bring out the policy to promote battery operated vehicles.

5.13. **CVE 12 – Introduction of CNG based public transport**

The Department of Transport shall promote CNG based public transport.

5.14. **CVE 13 - Retrofitting of particulate filters in diesel vehicles for BS-V fuels**

The Department of Transport shall bring the policy for the same once BS-V fuels are introduced.

Chapter 6 – Control onRoad 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) CRD 1 – 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 traffic corridors
(ii) CRD5 - Water fountains at major traffic intersections
(iii) CRD 6 - Greening of open areas community places, schools and housing societies
(iv) CRD 7 - Blacktopping of metaled road including pavement of road shoulders

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-D**.

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

All the agencies such as MC/ PWD/ 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

Municipal Council 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.

6.4. CRD 3 – Mechanical sweeping

Municipal Council 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 Council.

6.5. **CRD 4 – Creation of green buffers along the traffic corridors**

Municipal Council shall identify the trees with the help of Department of Horticulture which may be grown along the roads without any obstruction to the traffic. These trees shall be planted at the suitable places. The maintenance of these trees shall be done by the Municipal Council.

6.6. **CRD 5 – Water fountains at major traffic intersections**

Municipal Council 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.

6.7. **CRD 6 – Greening of open areas community places, schools and housing societies**

In order to increase greenery in the city, the Municipal Council 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.

6.8. **CRD 7 – Blacktopping of metaled road including pavement of road shoulders**

Some of the roads of Khanna are unpaved, which are the source of dust and gaseous emissions. These roads shall be converted into metaled road and the berms along these roads shall be stabilized with interlocking tiles or any other method.

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 Khanna 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 onopen burning of bio-mass in City
(ii). CBGB 2 – Controlon burning of municipal solid waste
(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-E**.

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

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 Council shall deploy its staff to have a check on various areas so as to forbid the inhabitants for open burning of the biomass.

A whatsapp number shall provide to the publicalong with the setting up of the dedicated control room for receiving complaints of public through this system.

CCTV cameras shall be installed at the important locations to monitor such incidents.

7.3. CBGB 2 – Control on burning of municipal solid waste

Presently, Municipal Council has one municipal waste dumping site, 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.

Municipal Council 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

There are only small patches of agricultural land within the Khanna city, however, 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. 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 after 6.00 p.m to 6.00 a.m during crop harvesting seasons and attaching of the super SMS with the combine harvesters.

Chapter 8 – Control onIndustrial 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 rolling mills, cupola furnaces and ceramic units are using coal / furnace oil 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 side-hood suction in furnaces
(ii) CIE 2 – Conversion to CNG/PNG from coal

Enforcement Related

(i) CIE 3–Conversion of natural draft brick kilns to induced draft
(ii) CIE 4 – Action against non-complying industrial units

Infrastructure Related

(i) CIE 5 – Shifting of industries from non-designated areas to industrial areas

8.1.2. CIE 6 - 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**.

8.2. CIE 1 – Conversion to side-hood suction in furnaces

PPCB with the technical support from Council for Science and Technology has improvised technology to provide for side-hood suction in furnaces to reduce the emissions. The side-hood suction shall be implemented in a time bound manner and shall be monitored by the Board monthly.

8.3. CIE 2 – Conversion to CNG/ PNG from Coal

A large number of units in Gobindgarh are using 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.

8.4. CIE 3 - Conversion of natural draft brick kilns to induced draft

There is no brick kiln in the city. However, 6 nos. brick kilns are located within 10 km of out skirts of MC limits of Khanna. Out of these, one brick kiln has converted its conventional brick kiln into induced draft with zig-zag firing technology. 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 area will be monitored for conversion to the new technology in a time bound manner.

8.5. **CIE 4 – 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 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.

8.6. **CIE 5 – Shifting of industries from non-designated areas to industrial areas**

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

Chapter 9 – Control on Construction and Demolition activities

9.1. Key Activities

9.1.1. Khanna area is a small city having population about 1,30,000. No major construction projects are being set up in the city. However, 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 Rules.
(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-G**.

9.2. CCDA 1 – Enforcement ofConstruction & Demolition Rules

The necessary provisions of the C&D Rules, 2016 shall be implemented in the city to ensure proper management of these wastes. Municipal Council shall identify suitable land for effective disposal of C&D waste. Municipal Council 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.

9.3. CCDA 2 – Control measures for fugitive emissions

Municipal Council shall develop a site for scientific disposal of C&D waste within six months. Municipal Council 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 all anti-pollution gears during the course of construction.

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 on Other Sources

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 Air Quality Index

Infrastructure

(ii) COS 2 – Establish an Air Quality Management Division at SPCB HQ

(iii) COS 3 – Setup helpline in each city/town as well as SPCB HQ

Policy

(i). COS 4 - Coverage of LPG/PNG for domestic and commercial cooking

Enforcement

(i). COS 5 - Monitoring of DG sets and action against violations

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-H**.

10.2. COS 1 – Dissemination of 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 of 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 - Coverage of LPG/PNG for commercial cooking

Municipal Council shall identify the sources where the coal / wood are used as fuel at domestic and commercial cooking level. Municipal Council shall formulate a mechanism to eliminate the use of coal / wood in these activities. UjwalaYojna of the Central Government shall be facilitated to the beneficiaries.

10.6. **COS 5 - Monitoring of DG sets and action against violations**

Municipal Council shall identify the commercial activities where the DG sets have been set up without fulfilling the norms for control of emissions and noise. Time bound action plan shall be prepared by the Municipal Council for removal of these DG sets. 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.

Chapter 11 –Graded Response Action Plan for Khanna

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 Khanna 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 between 401 to 500)

Following action shall be taken by the concerned authorities:

S.N.	Severe (AQI value becomes 401-500)	Agency responsible / Implementing Agency
1	Temporary closure of brick kilns, hot mix plant, induction furnaces, rolling mills etc.	PPCB
2	Stop construction activity	MC, Khanna
3	Alert in newspapers / local cable TV to advice people with respiratory and cardiac patients to avoid polluted areas and restrict outdoor movement.	MC, Khanna, Distt. Administration & PPCB
4	Sprinkling of water at the various dust emission points	MC, Khanna
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, Khanna
7	To increase the frequency of mechanized sweeping on roads with heavy traffic and water sprinkling also on unpaved roads.	MC, Khanna
8	Stop entry of heavy good vehicles except essential commodities into Khanna	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:

S.N.	Very Poor (AQI value becomes 351-430)	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, Khanna
3	Stop of garbage burning in the landfill areas or in the open fields	MC, Khanna
4	Water sprinklings at the dust emission points etc.	MC, Khanna
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, Khanna 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)**

Following action shall be taken by the concerned authorities:

S.N.	Poor (AQI value becomes 201-300)	Agency responsible / Implementing Agency
1	Strictly enforce garbage burning in landfill and other places and impose heavy fines on person responsible	MC, Khanna
2	Increase frequency of mechanized cleaning of road and sprinkling of water on roads. Identify road stretches with high dust generation.	MC, Khanna
3	Stop use of coal / firewood in open eateries	MC, Khanna
4	Strictly enforce rules for dust control in construction activities and close non-complaint sites.	MC, Khanna

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:

S.N.	**Moderately polluted (AQI value becomes 101-200)**	**Agency responsible / Implementing Agency**
1	Increasing the frequency of mechanized cleaning the roads etc.	MC, Khanna
2	Sprinkling of water at the dust emitting points	MC, Khanna
3	To stop open burning of garbage and municipal solid waste	MC, Khanna
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 Monitoring System

12.2.1 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.

12.2.2 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

District Level Committee will be constituted under the chairmanship of Additional Deputy Commissioner, Khanna 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. The district level committee shall constitute the followings:

1	The Additional Deputy Commissioner, Khanna	Chairman
2	The Senior Superintendent of Police, Khanna	Member
3	The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Fatehgarh Sahib	Convener
4	The Regional Transport Authority, Ludhiana	Member
5	The Divisional Forest Officer, Ludhiana	Member
6	Sub Divisional Magistrate, Khanna	Member
7	The Executive Officer, Municipal Council, Khanna	Member
8	The Executive Engineer, PWD (B & R), Ludhiana	Member
9	The District Town Planner, Ludhiana	Member
10	The Executive Engineer, Punjab Small Industries & Export Corporation, 18, Himalya Marg, Udyog Bhawan, Sector-17-A, Chandigarh	Member
11	The General Manager, District Industries Centre, Ludhiana	Member
12	The Asstt. Executive Engineer, Punjab Small Industries & Export Corporation, Khanna	Member
13	The District Agriculture Officer, Deptt. of Agriculture, Ludhiana	Member
14	The General Manager-cum- Project Director, NHAI, 17-L, Model Town, Ambala City.	Member

15	The Vertical Head – Projects, IRM Energy Pvt. Ltd., C.G. Road, Navrangpura, Ahmedabad 380009, Gujrat	Member
16	The President, Gobindgarh Steel Chamber of Commerce & Industries, Mandi Gobindgarh	Member
17	The President, All India Steel Re-Rollers Association, Mandi Gobindgarh	Member
18	The President, Small Scale Steel Re-Rollers Association, Mandi Gobindgarh	Member
19	The President, Mandi Gobindgarh Induction Furnace Association, Mandi Gobindgarh	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, Environment	Member
7	Chairman, PPCB	Member
8	Representatives of NGO/ Expert Members	Member
9	Representatives of NGO/ Expert Members	Member
10	Joint Director, Environment	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, Environment	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. This will be done within next thirty days.

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.

Annexure A – Trends in Air Quality of Khanna

1. Station atMarkfed Vanaspati, Khanna

Month	RSPM (µg/m^3)					NO_x (µg/m^3)					SO_2(µg/m^3)				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
January	160	133	119	113	173	23	20	24	25	29	11	9	9	12	8
February	154	166	129	140	131	23	23	22	22	29	10	10	13	11	7
March	159	128	138	138	120	21	22	22	20	33	9	9	11	10	8
April	216	150	164	170	124	21	22	20	22	36	9	10	11	12	10
May	185	132	145	176	132	21	23	22	21	38	9	10	11	12	10
June	129	135	161	148	137	21	26	21	20	43	9	12	11	8	12
July	124	105	99	120	-	20	19	17	18	-	9	9	8	8	-
August	111	99	107	100	-	21	17	17	20	-	9	7	8	8	-
September	140	128	88	158	159	23	23	17	23	26	10	9	8	11	8

October	175	103	106	239	230	27	23	18	24	27	12	10	8	10	9
November	203	_	128	216	272	25	_	24	35	26	12	_	11	9	7
December	148	83	107	135	246	21	22	22	32	25	8	12	12	8	7
AnnualAvg.	**159**	**124**	**124**	**154**	**172**	**22**	**22**	**21**	**24**	**31**	**10**	**10**	**10**	**10**	**9**

2. Station atA.S. Secondary School, Khanna

Month	**RSPM (µg/m^3)**					**NO_x (µg/m^3)**					**SO_2(µg/m^3)**				
	2014	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**
January	151	116	83	96	182	22	21	13	19	32	10	9	8	8	8
February	140	148	111	110	90	21	23	15	19	29	9	10	9	8	7
March	164	156	143	110	119	23	23	17	20	33	10	10	8	8	8
April	195	134	146	127	126	22	22	16	20	35	10	10	9	8	9
May	193	137	101	129	130	20	23	23	19	36	8	10	9	9	8

June	141	133	95	91	124	21	28	22	20	35	9	13	10	8	9
July	119	108	87	87	124	22	19	16	19	35	9	12	9	7	8
August	118	86	72	76	80	20	15	18	21	20	9	9	9	7	5
September	127	91	87	86	79	24	22	19	21	23	10	11	8	9	6
October	229	-	104	175	133	26	-	20	22	25	13	-	9	7	7
November	230	_	109	231	229	27	_	20	34	25	13	_	10	7	7
December	181	105	96	168	243	22	14	19	35	26	10	9	9	8	7
AnnualAvg.	**166**	**121**	**103**	**124**	**138**	**23**	**21**	**18**	**22**	**30**	**10**	**10**	**9**	**8**	**7**

Annexure B – AQIdata for the year 2018 depicting the air quality in Khanna

Month	AQI	Category
Apr-18	125	Moderate
May-18	120	Moderate
Jun-18	124	Moderate
Jul-18	49	Satisfactory
Aug-18	55	Satisfactory
Sep-18	54	Satisfactory
Oct-18	113	Moderate
Nov-18	111	Moderate

Dec-18	107	Moderate
Annual avg.	95	Moderate

Annexure C – Action Plan for Control on Vehicular Emissions

Sr. No.	Activity	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)
1	CVE 1 - Public awareness campaign for control of vehicular emissions	Deptt. of Transport and Traffic Police	Presently, awareness is being done in the Educational Institutes under SadakSurakhyaAbhiyan	The public has to be motivated to play their role in curbing the air pollution	One year	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 4. Awareness drives in educational institutions-Monthly 5. Public meetings-Monthly 6. Nukarnataks-Quarterly
2	CVE 2 - Remote sensor based PUC system	Deptt. of Transport	Presently, manual system exists	All PUC centres will be made online	One year	1. Policy Decision that online system is to be installed. 2. Tendering to select the agency 3. Transition to the online system 4. Commissioning of the online system
3	CVE 3 - Extensive drive against polluting vehicles	Traffic police	No CCTV camera installed	Online system will be adopted for challaning the violators	One year	1. Installation of CCTV cameras along the road sides. 2. Purchasing of remote sensor based and CCTV equipped pollution checking equipment. 3. Linking of CCTV data with registration details of vehicles, so that challans be issued.

4	CVE 4 - Prevent parking of vehicles in non-designated areas	Department of Local Government, Municipal Council	1. No systematic parking arrangement exists. 2. No Transport Nagar exists	1. Provide adequate number of public parking. 2. To provide two additional transport nagar.	One year	1. Identification of sites for public parking and transport Nagar-One month. 2. DPR-Two months 3. Tendering-One month 4. Development of parking spaces-Eight months
5	CVE 5 - Check fuel adulteration	Department of Food and Civil Supplies	Manual system exists	Prepare a fool proof online system for monitoring on random basis	One year	1. Develop methodology-Six months 2. DPR-Two months 3. Tendering-One month 4. Execution/ Commissioning-Three months
6	CVE 6 - Widening of road and infrastructure for decongestion of road	Municipal Council	Widening of Roads/ Streets of Ward no. 1, 16, 27, 29, 3, 21, 23, 19, 24, 02, 18, 29, 11, 26, 32, 30, 4, 25, 14, 33, 20, 13, 22, 28, 10, 17, 12, 06, 31	Laying of Interlocking tiles at the cost of Rs. Rs. 12.25 Cr. approx.	One year	1. Identification-Done 2. DPR-Done 3. Tendering-Done 4. Work allotment-One month 5. Completion-Eleven months
		PWD/ Mandi Board	No such identification made	Widening of identified roads	One year	1. Identification-One month 2. DPR-One month 3. Tendering – One month 4. Completion-Nine months

		NHAI	Six lane highway already exists, but the berms of service roads are not maintained	To maintain service roads / berms regularly upto the mark	6 months	1. Identification-One month 2. Regular maintenance
7	CVE 7 - Introduce intelligent traffic systems	Traffic Police & Municipal Council	Presently, conventional traffic light exists	To replace existing conventional traffic lights with intelligent traffic systems.	One year	1. Exploration of intelligent Traffic lights 2. Replacement of traffic lights
8	CVE 8 - Install weigh in motion bridges at the borders of cities	NHAI, Municipal Council and PWD (B&R), Mandi Board	No such system exists	Provide weigh bridges at each entry and exit of the city.	One year	1. Identification-One month 2. DPR-Two months 3. Tendering-Two months 4. Completion-Nine months
9	CVE 9 - Construction of expressways/ bypasses to avoid congestion	Municipal Council & PWD (B&R)	Presently, six lane National Highway exists and no bye-pass	Providing bye-pass to connect Malerkotla Road-G.T. Road	One year	1. Identification-One month 2. DPR-One month 3. Tendering-One month 4. Completion-Nine months
10	CVE 10 – Phasing of vehicles more than 15 years old	Deptt. of Transport	Presently, very old vehicles could be seen plying on the roads of the city.	Phasing of vehicles more than 15 years old	One year	1. Identification-Six months 2. Strict implementation of the phasing out policy –Six months after identification

11	CVE 11 – Promotion of battery operated vehicles	Deptt. of Transport	Presently, most of the vehicles are running on diesel and petrol.	To introduce electric passenger vehicles	One year	1. Creating policy for battery operated vehicles. 2. Awareness among public regarding benefits of battery-operated vehicles. 3. To ensure availability of electric passenger vehicles on subsidized rates. 4. Providing public charging points for battery operated vehicles.
12	CVE 12 – Introduction of CNG based public transport	Deptt. of Transport/ Municipal Council	Presently, most of the vehicles are running on diesel and petrol. One no. mother station for CNG exists at Mandi Gobindgarh.	To provide adequate CNG dispensing station	One year after laying of pipeline	1. Awareness among public regarding benefits of CNG operated vehicles. 2. Commissioning CNG stations within one year after laying of pipelines. 3. Ensure availability of service centers for CNG operated vehicles.
13	CVE 13 – Retrofitting of particulate filters in diesel vehicles for BS-V fuels	Deptt. of Transport	Presently, India is implementing BS-IV standards for diesel vehicles	To implement latest BS standards for all the vehicles	One year	1. Awareness among public regarding latest BS standards and requesting public not to buy vehicles which are not complying with the BS standards. 2. To stop passing of vehicles which are not meeting with the BS standards.

Annexure D – Action Plan for Control on Road Dust

Sr. No.	Activity	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)
1	CRD 1 – Maintain potholes free roads for free-flow of traffic	Municipal Council, PWD (B&R), Mandi Board, NHAI and PSIEC	Roads such as G. T. Road,Samrala Road, Malerkotla Road ,AmlohRoad,Service lanes, Bullepur Road, Rattanheri Road, Bhadla Road, Roads near GTB Market, Roads near Bus Stand, Grain Market internal roads, Lalheri road and Khamanon Road identified	Potholes free roads	Nine months	1. Identification-one month 2. Tendering-One month 3. Completion-Six months 4. Regular maintenance 5. A web based/ mobile app shall be set up for Public to lodge complaint against the potholes-Six months
2	CRD 2 – Water sprinkling	Municipal Council	Presently, no water sprinkling is being done	Regular sprinkling of treated wastewater to supress dust emissions.	Immediately	1. Identification-One month 2. Hiring of vehicles for sprinkling of water-Three months.
3	CRD 3 – Mechanical	Municipal Council	Presently, manual sweeping is done.	Mechanical sweeping of all	One year	1. Identification-One month 2. Tendering-Six months

	sweeping			the roads / streets of the city.		3. Purchasing-One month 4. Commissioning-Four months
4	CRD 4 -Creation of green buffers along the traffic corridors	Municipal Council, PWD (B&R), PSIEC &Deptt. of Forests	No such buffer exists	Provide buffers along roads / traffic corridors	One year	1. Identification of roads-Three months 2. Providing buffer-Nine months 3. Regular maintenance
5	CRD 5 - Water fountains at major traffic intersections	Municipal Council	No water fountains at intersection of roads	Exploring requirement and installation	One year	1. Identification-One month 2. Tendering-Two months 3. Development & Commissioning-Nine months
6	CRD 6 - Greening of open areas community places, schools and housing societies	Municipal Council	Parks in poor condition exists (12 no.)	All parks / open areas to be made upto mark	Six months	1. Identification-Done 2. Development-Six months 3. Regular maintenance
7	CRD 7 - Blacktopping of metaled road including pavement of road	Municipal Council, PWD (B&R), Mandi Board, NHAI and PSIEC	Focal Point Roads and designated industrial area roads, Service lanes near Khanna City Center and Atwal Palace Road are in	Blacktopping these roads	One year	1. DPR-One month 2. Tendering-Two months 3. Completion-Nine months

	shoulders		pathetic conditions			

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

SrNo.	Activity	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)
1	CBGB 1 – Control on open burning of bio-mass in City	Municipal Council	Complaint based check	Zero burning	Regular activity	Identification of sites, monthly review in District Level Air Quality Monitoring Committee meeting
2	CBGB 2 – Control on burning of municipal solid wastes	Municipal Council	Presently, the MC has no dumping site for MSW. Also no monitoring system is in place for checking of burning of MSW.	To develop scientific dumping site as per MSW Rules, 2016, to achieve no open burning of MSW.	Within six months and Regular	1. Development of dumping site as per MSW Rules, 2016-Three months. 2. To create awareness among the general public-Regular. 3. A whatsapp number shall be generated and publicized –One month 4. Setting up of the dedicated control room-Three months. 5. CCTV cameras at the important locations –Two months. 6. 100% collection of municipal solid waste from secondary collection centre and dumping of MSW at dedicated developed dumping site-Daily.
3	CBGB 3 – Control on burning of agriculture waste and crop residue	District Administration, Department of Agriculture, Police,	Identification of sites by PRSC (PAU) Regular	Zero stubble burning	Seasonal activity	1. Identification of sites 2. To create awareness among farmers regarding health effects of residue burning 3. Deptt. of Agriculture to provide subsidy for equipment/ machinery as per Govt. policy 4. PSPCL shall ensure electricity for in-situ management 5. Progress review in District Level Air Quality Monitoring

		PSPCL, Revenue Department & PPCB	monitoring under supervision of DC			Committee meeting

Annexure F – Action Plan for Control on Industrial Emissions

SrNo.	Activity	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)
1	CIE 1 – Conversion to side-hood suction in furnaces	Punjab Pollution Control Board	Total 16 induction furnace require up gradation of their APCD. Out of which 06 have already up-graded their APCDs. 2 Induction furnaces are of capacity less than 1 TPH.	08 Induction furnaces are required to upgrade the APCD.	31-3-2019	-
2	CIE 2 – Conversion to CNG/PNG from coal	Punjab Pollution Control Board &Think Gas/ MC	No industry have converted their furnace from coal to PNG fuel	93 units will shift to PNG subject to reduction of VAT by State Govt.	One year after laying of pipelines	1. The matter to be taken with the Government to reduce VAT. 2. Providing pipeline for transportation of PNG-One year. 3. Procurement of instruments 4. Installation 5. Commissioning
3	CIE 3 - Conversion of natural draft brick kilns to induced draft.	Punjab Pollution Control Board	6 nos. brick kilns located within 5 km of MC limits. One brick kiln has already adopted induced draft technology.	5 nos. brick kilns yet to be converted	31-03-2019	-
4	CIE 4 – Action against non-complying industrial units	Punjab Pollution Control Board	Regular inspection as per policy of the Board	• Action against defaulting industries. • Checking the	Regular activity	Regular inspections by PPCB

				adequacy of APCD installed by the industries		
5	CIE 5 – Shifting of industries from non-designated areas to industrial areas	Municipal Council/ Deptt. of Town & Country Planning	30 industries exist in non-designated area	30 industries are required to be shifted to the designated area	To be shifted as per the provisions of notified Master Plan	As per the provisions of by-laws of notified Master Plan

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

SrNo.	Activity	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)
1	CCDA 1 – Enforcement of Construction & Demolition Rules.	Municipal Council	No site is identified for disposal of C&D Waste	Setting up of processing/ recycling plant for C&D Rules, 2016.	Three years	1. Identification-Three months 2. Land acquisition-One year 3. DPR-Three months 4. Tendering-Six months 5. Development & Commissioning-One year
2	CCDA 2 – Control measures for fugitive emissions	Municipal Council	At present, minimal measures being taken by the building contractors.	Preventive measures to comply with the C& D Rules	Regular activity	1. Identification of construction sites 2. Checking for compliance of C&D Rules 3. Challaning of violators
3	CCDA 3 – Ensure carriage of construction material in closed/covered vessels.	Municipal Council	At present non-documented activity being carried out	MC shall make record of C&D activities on day to day basis	Regular activity	Monthly review meetings at District Level

Annexure H – Action Plan for Control on Other Sources

Sr no.	Activity	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)
1	COS 1 – Dissemination of Air Quality Index	Punjab Pollution Control Board	One CAAQMS installed.	--	--	Public awareness
2	COS 2 – Establish an Air Quality Management Division at SPCB HQ	Punjab Pollution Control Board	No such division exists	One required	One year	1. Develop methodology-Three months 2. Providing infrastructure-Six months 3. Implementation-Three months
3	COS 3 – Setup helpline in each city/town as well as SPCB HQ	Punjab Pollution Control Board	No such helpline exists	Providing helpline	One year	1. Develop methodology-Three months 2. Providing infrastructure-Six months 3. Implementation-Three months
4	COS 4 - Coverage of LPG/PNG for domestic and commercial cooking	Municipal Council	Domestic cooking-LPG Commercial cooking partially on LPG/ Wood/ Coal	Commercial cooking- LPG	One year	1. Identification-Two months 2. Awareness-Two months 3. Providing infrastructure-Six months 4. Implementation-Two months

5	COS 5 - Monitoring of DG sets and action against violations	Punjab Pollution Control Board for industries & MC for residential/ commercial areas.	Manual monitoring exists	Non-complying DG set should not be allowed	Six months	1. Identification-Three months 2. Implementation-Three months