Action Plan for Clean Air, Jalandhar

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Directorate of Environment and Climate Change
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 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, 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 Jalandhar

1.2.1 History

Jalandharis famous for sports industry and items/goods manufactured in Jalandhar one used in many international sporting games including Olympics, Commonwealth Games, Asian Games. It is a hub for manufacturing of hand tools, leather items, pipe fitting, valves & cocks and print media (specially in Hindi and Punjabi language). Doordarshan, Jalandhar is also an important feature of the City.

1.2.2 Area and Population

Jalandhar is the most centrally located district which falls in the Doaba region of the State of Punjab. The city is located in a stretch of about 20 Km. on National Highway-I, spread over an area of about 148 Sq. Kms. and currently accommodates a population of about 8.62 lacs.

1.2.3 Industry and Trade

City of Jalandhar is famous for sports & Leather industry. Also in Jalandhar the hand tool, pipe fitting, valves & cocks industry has also developed.

1.2.4 Topography

The topography of the Jalandhar 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 Jalandhar 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 of5^0C to 41^0C.

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 769 mm.

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

1.3.1 The environment of Jalandhar 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 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. A comprehensive remedial environmental action plan was prepared in consultation with all the stakeholders. Action plan for abetment of pollution in Jalandhar was being reviewed for implementation of effective measures which included water & air pollution. The first meeting was held on 01.02.2015. Meetings were conducted to review progress made by various departments. No moratorium was ever imposed by MoEF. Punjab Pollution Control Board has been regularly keeping check on air polluting industries in Jalandhar town and regularly monitoring to bring down the level of air pollution.

1.4 About National Green Tribunal directions:

1.4.1 Nine cities of Punjab namely DeraBassi, Nangal, Patiala, MandiGobindgarh,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 µg/m3 for PM10.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 alongwith 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 roburst 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 VardhamanKaushik V/s Union of India and Others for combating air pollution.

Chapter 2 – Vision, Mission and Strategy

2.1 MissionTandarust 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, Jalandhar

To restore the quality of air in Jalandhar 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, Jalandhar

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

(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, Infrastruture 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, Jalandhar

The key elements of strategy for Clean Air campaign for Jalandharwill 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 the 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) Upgradation 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, Jalandhar**

(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) **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 Corporation 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 Jalandharin this plan. Following Industry Associations of Jalandharwill be associated with the plan:

i) The President, Industrial Focal Point (Extn) Association, Jalandhar.

ii) The President, North Chamber of small & medium industries.

iii) The President, Sports & Surgical Complex, Association (Regd), Sports & Surgical Complex,Jalandhar

iv) The President, Udyog Nagar Manufactures Association,UdyogNagar,Jalandhar

v) The President, Punjab Leather Federation, Leather Complex, Jalandhar

vi) The President Federation of Jalandhar Industrial & Traders Association, Dada Colony, Industry Area, Jalandhar.

2.6.2 These Associations 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 PAHAL (NGO), Jalandharwillbe 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 Jalandharfor 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 Jalandharis part of Statewide 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 activites 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. Monitroing 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 dessiminate 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, coorective measures required and fixing of accountability will be done by Air Qulaity 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 Jalandhar

3.1 Monitoring Mechanism

Jalandhar is the major industrial hub in the Doabaregionand the ambient air quality monitoring is being carried out regularly at 4 no. manually operated stations installed at Jalandhar under National Air Monitoring Programme (NAMP). The year wise data of PM_{10}, SO_2 andNO_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 Circuit House, Jalandhar and the real time data of the same is being displayed at Circuit House, Skylark ChowkJalandhar. 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 subindices 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 (PM10, PM2.5, NO2 , SO2 , CO, O3 , NH3 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	Moderately polluted	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 Jalandhar and the real time data of the same is being displayed at Circuit HouseSkylark ChowkJalandhar.Annual average of the various parameters 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	101	56.06	9.84	34.22	117

3.4.2 The trend of AQI in the ambient air shows that the quality of air remained moderately polluting&conc. of SO2 &NOxare within the limit notified by CPCB.

3.5 Major parameters of concern

The major concern of the air quality is PM_{10} and $PM_{2.5}$. All other parameters are within the prescribed limits. The perusal of data in **Annexure-B**clearly indicates that air quality index of Jalandhargenerally 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 Jalandhar

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 Due to paucity of time, detailed studies regarding source apportionment and carrying capacity could not be carried out, however, the Board has made some projections w.r.t the PM_{10}based on its in house projections for Jalandhar

1.	Industrial Emissions	15%
2.	Road Dust	40%
3.	Vehicular Pollution	25%
4.	Burning of Garbage and Biomass	8%
5.	Construction and Demolition Activities	9%
6.	Other Sources	3%

4.1.3 The projections are made on estimate basis andthe 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 Jalandhar due to movement of heavy goods vehicles carrying raw materials and products of the industries located in and around the city. At present about 10lacs vehicles (heavy transport vehicles, LMVs, cars & jeeps, two wheelers and three wheelers) are plying on the roads of Jalandhar. National Highway NH-1 passes through Jalandhar, which is connecting tourist destination like Amritsar, Pathankot, Kapurthala, Hoshiarpur and other industrial hubs like Ludhiana.

4.3 Road Dust

4.3.1 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 suspendedparticles (atmospheric aerosols) and displaced soil. Some of the factors contributing toroad 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

4.4 Burning of Biomass and Garbage

4.4.1 There are only small patches of agricultural land within the Jalandhar 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 385 TPD, which is being dumped unscientifically in the present dumping site at Wariana, Kapurthala road, Jalandhar. 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. The electric fired induction furnaces, coal fired cupola furnaces, lead smelting units &Boilersare emitting the aforesaid pollutants, besides the process / fugitive emissions.

4.5.2 The category wise detail of air polluting industries situated in Jalandharwithin 5 KM of outskirts of MC limit of Jalandhar are given as under:

Sr. No.	Category	Number of Units
1.	Industries with boilers	20
2.	Induction Furnaces (a) capacity upto 1 T/heat (b) capacity more than 1 T/heat	 132 3

Sr. No.	Category	Number of Units
3.	Cupola/ Foundry Units	20
4.	Forging Industry	32
5.	Brick Kiln	6
6.	Lead smelting Units	20
Total		**233**

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. 150 mg/Nm3. However, due to high concentration of industries in a small area, it is estimated that industrial source is contributing 10-15% in the Air Quality.

4.6 Mining

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

4.7 Construction and Demolition Activities

Jalandhar is a big city having population about 8.62 lacs. The residential colonies &commercial complexes are being setup in the city alongwith work being carried out by National Highway Authority. Further, small construction activities are also 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

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.

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:

(i). Public Awareness related,
(ii). Enforcement related,
(iii). Infrastructure related,
(iv). 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 of battery 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, timeline, 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, Jalandhar, 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 vechicles 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.

Traffice 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 & 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 Corporation 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/byepassestoavoid 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 atleast 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 9 - Install weigh in motion bridges at the borders of cities

Municipal Corporation 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 Trasport 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 of 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 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. 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–Maintainpotholes 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 metalled 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 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 STP of the city.

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 traffic corridors

Municipal Corporation 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. The maintenance of these trees shall be done by the Municipal Corporation.

6.6 CRD 5 – 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.

6.7 CRD 6 – Greening of 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.

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

Some of the roads of Jalandhararekatcha 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 Jalandhar 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 seasonis 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 of open burning of bio-mass in City
(ii) CBGB 2 – Controlof burning of municipal solid wastes
(iii) CBGB 3 –Control of 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 Corporation 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 provided to the publicalongwith 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 Corporation has one municipal waste dumping site at Wariana, 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 gardbage collected may be burnt, instead of transporting to the dumping site.

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

There are only small patches of agricultural land within the Jalandhar 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 of 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.The electric fired induction furnaces, coal fired cupola furnaces, lead smelting units &Boilersare 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 sidehood 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 sidehood suction in furnances

PPCB with the technical support from Council for Science and Technology has improvised technology to provide for sidehood suction in furnaces to reduce the emissions. The sidehood 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 very few number of units in Jalandhar 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 are 6 no. brick kilns falls within the radius of 5 KM beyond Municipal limit which have conventional technology. However, Punjab Pollution Control Board has issued directions to the existing brick kilns of the State to convert their conventional brick kilns to induced drafttechnology. The Brick kilns located in the district 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 Jalandhar is a big city having population about 8.62 lacs. The residential colonies & commercial complexes are being setup in the city alongwith work being carried out by National Highway Authority. Further, small construction activities are also 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 of Construction & 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 Corporation shall identify suitable land for effective disposal of C&D waste. 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.

9.3 CCDA 2 – Control measures for fugitive emissions

Municipal Corporation shall develop a site for scientific disposal of C&D waste within six months. 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 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

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

Enforcement

(v). 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 pertaing 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 domestic and commercial cooking

Municipal Corporation shall identify the sources where the coal / wood are used as fuel at domestic and commercial cooking level. Municipal Corporation 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 Corporation 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 Corporation 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 Jalandhar

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:

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

S.N.	Severe (AQI value becomes 401-500)	Agency responsible / Implementing Agency
1	Temporary closure of brick kilns, induction furnaces, boilersetc.	PPCB
2	Stop construction activity	MC, Jalandhar
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, Jalandhar
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, Jalandhar
7	To increase the frequency of mechanized sweeping on roads with heavy traffic and water sprinkling also on unpaved roads.	MC, Jalandhar
8	Stop entry of heavy good vehicles except essential commodities into Jalandhar	Traffic Police
9	To take decision regarding closing of schools	District Administration

Following action shall be taken by the concerned authorities:

S.N.	Very Poor (AQI value becomes 301-400)	Agency responsible / Implementing Agency
1	Restraining the operation of air polluting industries i.e. induction furnaces, boilers etc. for 8 hours/day	PPCB
2	Banning of construction activities	MC, Jalandhar
3	Stop of garbage burning in the landfill areas or in the open fields	MC, Jalandhar
4	Water sprinklings at the dust emission points etc.	MC, Jalandhar
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, Jalandhar and Distt. Administration
8	Strictly enforce all pollution control regulations in the air polluting industries like induction furnaces, brick kilns and boilers 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, Jalandhar
2	Increase frequency of mechanized cleaning of road and sprinkling of water on roads. Identify road stretches with high dust generation.	MC, Jalandhar
3	Stop use of coal / firewood in open eateries	MC, Jalandhar
4	Strictly enforce rules for dust control in construction activities and close non-complaint sites.	MC, Jalandhar
5	Close / Strictly enforce all pollution control regulations in the air polluting industries like induction furnaces,brick kilns and boilers etc.	PPCB
6	Restricting air polluting industries i.e. induction furnacesand boilers 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, Jalandhar
2	Sprinkling of water at the dust emitting points	MC, Jalandhar
3	To stop open burning of garbage and municipal solid waste	MC, Jalandhar
4	Close / strictly enforce all pollution control regulations in the air polluting industries like induction furnaces, brick kilns and boilers 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 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.

(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 Deputy Commissioner, Jalandhar 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 Deputy Commissioner, Jalandhar	Chairman
2.	The Commissioner of Police, Jalandhar	Member
3.	The Commissioner, Municipal Corporation, Jalandhar	Member
4.	The Environmental Engineer, Punjab Pollution Control Board, Regional Office, Jalandhar.	Convener
5.	The Executive Director, Punjab State Corporation for Science and Technology, MGIPA Complex, Sector 26, Chandigarh	Member
6.	The Regional Transport Authority, Jalandhar	Member
7.	The Divisional Forest Officer, Jalandhar	Member
8.	Sub Divisional Magistrate- 1, Jalandhar	Member
9.	Sub Divisional Magistrate- 2, Jalandhar	Member
10.	The Civil Surgeon, Jalandhar	Member
11.	The Superintendent Engineer, Punjab Water Supply & Sewerage Board, Jalandhar	Member
12.	The SuperintendentEngineer, PWD (B & R), Jalandhar.	Member
13.	The SuperintendentEngineer, (Drainage), Deptt. of Irrigation, Drainage Division, Jalandhar	Member
14.	The District Town Planner, Jalandhar	Member
15.	The SuperintendentEngineer, Punjab Small Industries &	Member

	Export Corporation, Focal Point, Jalandhar	
16.	The General Manager, District Industries Centre, Jalandhar.	Member
17.	The Superintendent Engineer, Punjab Water Supply & Sewerage Board, Jalandhar	Member
18.	The District Agriculture Officer, Deptt. of Agriculture, Jalandhar	Member
19.	The General Manager-cum- Project Director, NHAI, Kalia Colony, Jalandhar	Member
20.	The General Manager, GAIL, Jalandhar	Manager
21.	The President, North Chamber of small & medium industries, Jalandhar	Member
22.	The President, Industrial Focal Point Extn Association, Jalandhar	Member
23.	The President, Sports & Surgical complex Association, Jalandhar	Member
24.	The President, Udyog Nagar Manufactures Association, Jalandhar	Member
25.	The President, Punjab Leather Federation, Jalandhar	Member
26.	The President, Federation of Jalandhar Industrial &Traders Association Dada colony, Industrial Area ,Jalandhar	Member

13.3 **AQMC at State Level**

13.1.3 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

13.1.4 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 Jalandhar

1. StationatR.O, PPCB, GuruTegBahadur Nagar shifted to PWSSB Guest House near ManbroChowk in 2015, Jalandhar.

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	158	142	205	-	179	26	25	25	-	22	14	14	13	-	13
February	139	142	165	98	159	25	28	26	20	22	13	13	14	11	12
March	124	-	-	111	118	24	-	-	20	20	12	-	-	11	11
April	140	142	-	142	159	25	26	-	24	22	13	14	-	13	11

May	152	153	-	174	183	26	26	-	24	21	13	13	-	13	12
June	147	138	-	159	206	24	24	-	24	19	13	13	-	13	11
July	130	121	-	102	106	23	23	-	19	16	13	12	-	9	9
August	124	128	137	125	119	23	24	19	20	15	13	12	11	10	9
September	119	-	106	120	103	23	-	19	20	18	12	-	10	11	10
October	129	129	92	227	156	24	24	20	25	22	13	12	12	11	11

November	124	144	206	300	195	24	26	25	24	25	13	15	14	13	11
December	137	-	-	248	183	25	-	-	25	23	14	-	-	14	11
Annual Avg.	**135**	**138**	**152**	**164**	**155.5**	**24**	**25**	**22**	**22**	**20.4**	**13**	**13**	**12**	**12**	**10.9**

2. **Station at H.R International C-107-108 Focal Point, shifted to PPCB Office Building near water tank, Focal Point in year 2015, Jalandhar.**

Month	**RSPM ($\mu g/m^3$)**					**NO_x ($\mu g/m^3$)**					**SO_2($\mu g/m^3$)**				
	2014	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**
January	172	151	247	302	288	29	28	27	28	26	14	14	15	17	15

February	153	142	203	179	220	29	28	29	23	23	13	13	15	13	14
March	143	135	171	207	167	28	28	25	23	21	13	13	14	11	12
April	155	152	192	198	204	29	29	25	24	22	13	14	14	13	12
May	168	162	-	194	245	30	30	-	25	22	14	14	-	14	11
June	162	151	-	220	290	29	29	-	25	21	13	13	-	14	12
July	143	134	125	131	147	28	28	20	19	19	13	13	11	11	11

August	131	158	97	120	153	27	26	18	19	18	13	13	9	11	11
September	126	156	180	111	140	26	26	20	20	22	13	13	11	11	14
October	145	164	181	246	173	27	27	82	26	24	14	14	12	12	11
November	139	180	270	354	167	26	28	25	25	19	14	16	14	13	10
December	156	261	302	293	245	28	28	28	26	24	15	14	17	15	12
Annual Avg.	**149**	**162**	**197**	**213**	**203.2**	**28**	**28**	**30**	**24**	**21.75**	**14**	**14**	**13**	**13**	**12.1**

3. Station at Zonal Office, PPCB, Furniture market shifted to Municipal Corporation office premises at Nehru Garden in year 2015, Jalandhar.

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	161	138	70	-	193	27	25	22	-	23	14	13	11	-	13
February	146	131	71	123	206	26	25	20	20	22	13	13	12	12	13
March	135	-	-	88	152	25	-	-	20	21	12	-	-	12	11
April	148	-	-	144	161	26	-	-	23	21	13	-	-	13	12
May	167	158	-	155	203	27	27	-	24	21	14	14	-	13	11

June	155	143	-	112	244	25	25	-	22	20	12	12	-	13	11
July	134	-	-	113	75	24	-	-	20	17	12	-	-	11	9
August	124	-	98	92	100	22	-	19	18	16	12	-	10	10	10
September	115	-	103	-	112	23	-	19	-	18	13	-	10	-	11
October	133	109	138	258	102	24	26	19	28	21	13	13	11	14	9
November	128	125	166	289	72	24	26	24	24	18	13	16	13	13	9

December	142	-	-	278	192	26	-	-	25	22	14	-	-	15	10
Annual Avg.	**141**	**134**	**108**	**165**	**151**	**25**	**26**	**21**	**22**	**20**	**13**	**14**	**11**	**13**	**10.7**

4. Station at M/s G.K. International SSGC, shifted to ESI Hospital building in the year 2015, Jalandhar.

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	177	165	274	167	173	29	28	27	23	23	15	14	14	13	13

February	154	146	151	102	110	28	27	25	21	20	14	14	14	12	11
March	140	138	133	91	172	27	27	22	19	20	13	13	12	11	12
April	152	153	227	134	146	28	28	25	23	20	14	14	7	12	11
May	175	165	-	182	162	29	29	-	25	20	14	15	-	14	11
June	165	154	-	124	77	28	28	-	23	17	13	13	-	13	10
July	147	139	141	107	55	28	28	21	20	16	13	13	11	11	9
August	136	163	219	73	54	27	27	21	17	15	13	13	11	9	9

September	130	142	160	85	43	27	27	20	18	14	13	14	10	9	9
October	145	157	139	190	81	27	27	19	23	17	14	14	10	12	10
November	147	191	182	286	125	26	29	24	24	23	14	17	13	13	11
December	162	280	167	191	163	28	29	23	24	22	14	14	13	14	12
Annual Avg.	153	166	179	144	113.4	28	28	23	22	18.9	14	14	12	12	10.6

Annexure-B AQI data for the year 2018 depicting the air quality in Jalandhar

Month	AQI	Category

Jan-18	242	Poor
Feb-18	138	Moderate
Mar-18	99	Satisfactory
Apr-18	114	Moderate
May-18	117	Moderate
Jun-18	124	Moderate
Jul-18	50	Good
Aug-18	64	Satisfactory
Sep-18	56	Satisfactory
Oct-18	119	Moderate
Nov-18	160	Moderate
Dec-18	118	Moderate

2018 Annual avg.	**117**	Moderate

Annexure C – Action Plan for Control on Vehicular Emissions

S. 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	Department of Transport	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. 5 no. school and colleges to be covered every month to encourage the students to use E-rickshaws & public transport.	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 5 no. educational institutions-Monthly 5. Public meetings-Monthly 6. Nukarnataks-Quarterly
		Traffic Police	531Awareness/Educational program conducted in 2018 in the educational institutes etc. In this awareness programs total 90678 students, 8864 drivers and 3580 common man were educated .	5 schools and colleges to be covered every month to discourage the use of diesel driven auto-rickshaws thereby resulting in pollution level.	One year	As above
2	CVE 2 - Remote sensor based PUC system	Department of Transport and PPCB are working on putting online system in place.	Presently manual system exists	All PUC Centres to be made online	Two years	1. Identification - 3 months. 2. Tendering – 6 months 3. Commissioning – 15 months
3	CVE 3 - Extensive drive against polluting vehicles	Traffic Police& Department of Transport	1174vehicles challaned for invalid PUC certificates/ pressure horns etc.	Online system will be adopted for challaning the violators	One year	1. Identification of sites for installing CCTV cameras - 3 months 2. Tendering – 6 months. 3. Commissioning- 3 months.

4	CVE 4 - Prevent parking of vehicles in non-designated areas	Department of Local Government, Municipal Corporation& PWD	• Currently 3 no. public parking Zones exist on BOT basis (Opposite M.C Jalandhar, Company Bagh&OutsideNarinder CinemaRanglaVaida) • 6 no. public parking zones on Auction basis (Inside Bus Stand, BMC Chowk to Bus Stand, Opp. Vishal Mega Mart, Near Auto Stand, Bus Stand, Opp. Capital Local Area Bank,Opp Girls School, Model Town, Rainbow Road) • One Transport Nagar exists	• 6no. surface public parking zone proposed at 1. Opp MBD Mall Near Raddison Hotel 2. Backside M.C office, Company Bagh 3. PNB Bank to JyotiChowk, GT Road. 4. Near Shiv Mandir, Lajpat Nagar, Backside Passport Office. 5. Outside Shivani Park, Model Town 6. Outside Bus Stand Flyover • One additional Parking at Transport Nagar proposed	Two years Six months	1. Identification- Done 2. DPR – Two months 3. Tendering – Three months 4. Execution – Fifteen months 5. Commissioning – Four months

						1. Identification-One month 2. Tendering-Three months 3. Land Allocation-One month 4. Development of parking sites & Commissioning –One month
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.Developmethodology 2. DPR 3. Tendering 4. Execution 5. Commissioning
6	CVE 6 - Widening of road and infrastructure for decongestion of road	Municipal Corporation	Roads identified for widening	1. Appox. 1.5 Km stretch from MithapurChowk to M.C Limit at cost 60 lac 2. Appox. 1 Km stretch from Bank of Maharashtra to Army Land on Garha Road at cost of 1.5 cr. 3. Appox2 km stretch on Cool Road at cost of 72 lacs	Two years	1. Identification-Completed 2. DPR- Two Months 3. Tendering – Three months 4. Work allotment- One month 5. Completion- Eighteen months

				4. Appox 3.25 km stretch from NakodarChowk to M.C Limit at cost of 4 cr. 5. Appox3.75 km stretch from Kapurthala road to Wariana Dump at cost of 1.45 cr		
		NHAI	Six lane highway already exists on NH1 and four lane highway at NH1(A)	To maintain service roads / berms regularly upto the mark	One year	Regular maintenance
7	CVE 7 - Introduce intelligent traffic systems	Traffic Police& Municipal Corporation	Presently, conventional traffic light exists. Only one way flow of traffic is allowed at Railway Station Road, Jail Road, Brandrath, Court Road and in the evening at K.F.C –Model Town Road.	To replace existing conventional traffic lights with intelligent traffic systems.	One year	1.Indentification- One month 2. DPR – Two months 3.Tendering – Two months 4.Work allotment – One month 5.Completion – Six months
8	CVE 8 - Install weigh in motion bridges at the borders of cities	NHAI, Municipal Corporation and PWD (B&R)	No such system exists	Provide weigh bridges at each entry and exit of the city.	One year	1. Identification- One month 2. DPR- One month 3. Tendering &Work allotment-Four months

						4. Completion- Six months
9	CVE 9 - Construction of expressways/ bypasses to avoid congestion	NHAI	Six Lane Highway exist from Amritsar-Jalandhar-Delhi-NH 1 Four Lane from Jalandhar to Panthakot-NH 1(A)	Construction of road stretch between PAP Chowk& Rama Mandichowk on NH1. Service	Six months	1. Identification- Completed 2. DPR- Completed 3. Tendering- Completed 4. Work allotment- Completed 5. Execution &Completion- Six months
10	CVE 10 – Phasing of vehicles more than 15 years old	Department of Transport/ Traffic Police	Presently, some 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 3. Regular checking by vechicles by Traffic Police
11	CVE 11 – Promotion of battery operated vehicles	Department of Transport	Presently, most of the vehicles are running on diesel and petrol. However, more than 600 E-rickshaws are plying.	To introduce more 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	Department of Transport/Municipal Corporation	Presently, most of the vehicles are running on diesel and petrol. However, more than 200 new auto rickshaw with CNG kits are operational. One no. CNG station is functional at LaxmiPura, Shiv Nagar, Pathankot Road, Jalandhar.	Setting up of two CNG stations (Eachnear Kalai Colony and near IOCL depo.)	Six months	1. Awareness among public regarding benefits of CNG operated vehicles-Six months. 2. Allotment-Done 3. Survey-Done 4. DPR-Done 5. Work allotment-Done 6. Total time for commissioning for proposed two CNG stations- Six months
13	CVE 13 – Retrofitting of particulate filters in diesel vehicles for BS-V fuels	Department 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

S. 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 Corporation, PWD(B&R), NHAI& PSIEC	Regular activity by the departments under PradhanMantri Gram SadakYogna activity.	Potholes free roads	Six months	1. Regular Maintenance 2. A web based/mobile app shall be set up for public to lodge complaint against the pothole and it shall be monitored for repair- Six months
2	CRD 2 – Water sprinkling	Municipal Corporation	10 tankers have been deputed to sprinkle water in the city	Regular sprinkling of water to supress dust emissions	3 months	1. Identification of dust prone roads. 2. Setting up of terminal to fill tankers with treated waste water at STPs- 3 month
3	CRD 3 – Mechanical sweeping	Municipal Corporation	2 no. mechanical sweeping machines exist but not operational. Presently, manual sweeping is being regularly	Mechanical sweeping of identified roads/streets of	One Year	1. Identification of roads need mechanical sweeping- one month 2. Tendering& purchasing of

			carried out.	the city.		new mechanical machines/ To make operational existing machines- Seven months 3. Commissioning- Four months
4	CRD 4 - Creation of green buffers along the traffic corridors	Municipal Corporation, PWD(B&R), PSIEC &Deptt. Of Forests	Green buffer already exists on GT Road from PAP Chowk to Bus Stand, Workshop Chowk to Maqsudan, KapurthalaChowkto M.C Limit, Bastian Road and on one side of Tanda Road	Need based activity	Seven months	1. Identification of stretch- One month. 2. Tendering & work allotment- Three months 3. Execution of work-Three months 4. Regular maintenance of exiting and newly incorporated green buffer.
5	CRD 5 - Water fountains at major traffic intersections	Municipal Corporation	Water fountains provided at 6 no. traffic intersections (each at Guru Amar Das Chowk, Bhagwan Ram DassChowk,MasandChowk, Skylark Chowk, NamdevChowk&inside Company Bagh)	Exploring requirement and installation	One year	1. Identification- Two months 2. Tendering- Three months 3. Work allotment – One month 4. Development – Four months 5. Commissioning – Two months

6	CRD 6 - Greening of open areas community places, schools and housing societies	Municipal Corporation /PWD/ Department of Forest/PUDA	Total green cover provided in area appoxi. 9.75 sq km.	To cover remaining area of 14.265sq km.	One Year	1. Identification- Two months 2. Tendering- Three months 3. Work allotment – One month 4. Development –Six months
7	CRD 7 - Blacktopping of metalled road including pavement of road shoulders	NHAI, Municipal Corporation, PWD (B&R), Improvement Trust & PSIEC	NHAI, PWD (B&R), Municipal Corporation, Improvement Trust	Departments are regularly carrying the activity.	To make and maintain roads upto mark	Regular activity

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

S. No.	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 Corporation	Presently manual monitoring system exist to issue challans on complaint basis. Accordingly18 and 24 no. challans were issued in 2017 and 2018 respectively.	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 Corporation	Complaint based check	Zero burning	Regular activity	Identification of sites, monthly review in District Level Air Quality Monitoring Committee meeting.
3	CBGB 3 – Control on burning of agriculture waste and crop residue	District Administration, Department of Agriculture, Police, Revenue department, PPCB& PSPCL	Identification of sites by PRSC (PAU) Regular monitoring under supervision of DC	Zero stubble burning	Seasonal activity	1. Identification of sites 2. To create awareness among the frmers ill-effects of crop residue burning. 3. Agriculture Deptt. to provide subsidy for equipment/machinery as per the Government

						policy. 4. PSPCL shall ensure electricity for in-situ management. 5. Progress review in District Level Air Quality Monitoring Committee meeting

Annexure F – Action Plan for Control on Industrial Emissions

S. No.	Activity	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)
1	CE 1- Conversion to side hood suction in furnace	Punjab Pollution Control Board	Total132 no. induction furnaces are of capacity upto 1 ton/heat. However, 3 no. induction furnaces are of capacity more than 1 T/heat which require to up grade the suction system.	Adequacy of 132 furnaces be checked and 3 no. induction furnaces are required to the upgrade the suction system.	31.03.2019	-
2	CIE 2 – Conversion to CNG/PNG from pet coke / coal	Punjab Pollution Control Board /M/s Madhok Energy Pvt. Ltd.	Presently,5 industries are using coal as fuel in boilers.Conversion to CNG/PNG not feasible since these units are scatteraly located.	Regular monitoring of these industries shall be carried out.	Regular	Monthly review meetings.
3	CIE 3 – Conversion of natural draft brick kilns to induced draft	Punjab Pollution Control Board	6 no. brick kilnexists within 5 Km radius of M.C limit operating on conventional technology.	To convert6 no. brick kilnsto induced draft technology	31.01.2019	No kiln to be operated without adopting Induced Draft Technology.
4	CIE 4 – Action against non-complying industrial units	Punjab Pollution Control Board/ PSCST	Regular inspection as per policy of the Board	Action against defaulting industries.	Regular activity	Regular inspections by PPCB

				22 no. of industries to be monitored every month to check adequacy of APCD system	Six months	1. Monthly review 2. Action by PPCB against defaulters.
5	CIE 5 – Shifting of industries from non-designated areas to industrial areas	Municipal Corporation, Depatment of Town & Country Planning and JDA, Jalandhar	Appox. 110 industries are located in non-designated areas.	Appox. 110 industries are required to be shifted to designated industrial area	To be shifted as per the provisions of notified Master Plani.e before 2025.	This will be implemented as per the provisions of by-laws of notified master plan of Jalandhar, according to which industries operating in non-designated areas are required to shift to industrial areas before 2025.

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

S. No.	Activity	Responsible Agencies	Base Line	Target to be achieved	Target Date	Milestones (Monthly / Quarterly)
1	CCDA 1 – Enforcement of Construction & Demolition Rules.	Municipal Corporation	4 no. sites notified by M.C. Jalandhar for disposal of construction debris at 1. Vill. Ladhewali 2. Vill. SatampurMusalamana 3. Vill. Birring 4. BastiBewaKhel, Near Baba Tabe Shah Dargah (KabirVihar).	Setting up of processing/ recycling plant as per 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 Corporation	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 Corporation	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

S 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.	Three additional CAAQM required	One year	1. Expected Allotment of Station by CPCB on 50:50 sharing basis- 31.03.2019. 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 procurement – 31.03.2020.
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. Development 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 division exists	One required	One year	1. Development Methodology- Three months

	Policy					2. Providing Infrastructure- Six months 3. Implementation- Three months
4	COS 4 - Coverage of LPG/PNG for domestic and commercial cooking Enforcement	Municipal Corporation/ M/s Jai Madhok Energy Pvt. Ltd	Domestic cooking- LPG Commercial cooking- Partially on LPG & partially on Wood/Coal Survey completed by M/s Jai Madhok for laying of domestic &commercial PNG supply lines . Laying of PNG pipline completed in a stretch of appox. 1 km	100% use of LPG / PNG	One year	One year from the date of installation of pipe line
5	COS 7 - Monitoring of DG sets and action against violations	Punjab Pollution Control Board & Municipal Corporation 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