Action Plan for Clean River Ghaggar

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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 Punjab – Land of Rivers

1.1.1 The word Punjab is a compound of two Persian words, panj ("five") and āb ("water"), thus signifying the land of five waters. The erstwhile Punjab State had five rivers namely Beas, Chenab, Jhelum, Ravi, and Sutlej. However, after the partition of India in 1947, only two rivers, the Sutlej and the Beas, lie within Punjab's territory, while the Ravi flows only along part of its western border.

1.1.2 The rivers in the State have been used as a source of irrigation, drinking purpose especially in southern Punjab, development of hydro-electric projects to meet the energy requirements in the State and various activities including industrial purposes. The rivers have played a significant role in the socio-economic and industrial development of the State.

1.2 Rapid Urbanization and Industrialization – Main cause of River Pollution

1.2.1 The rapid urbanization and industrialization during the last few decades has adversely impacted the environment of the State. The quantum of sewage and sullage generated from the habitation areas has significantly increased and finding its way into natural drains, eventually leading to riverine system of the State. In the rural areas, due to increase in the population, the capacity of most of the ponds has been exhausted due to which this sewage and sullage has also started flowing into the natural drains and finally becoming a part of river waters.

1.2.2 Therefore, the quality of water flowing in the water bodies has deteriorated as these water bodies lack sufficient assimilation capacity for self-purification not only due to increase in the quantum of discharge of untreated sewage/ sullage, but, also due to decrease in the quantum of water in the water bodies owing to construction of check dams on the upstream side.

1.3 About Ghaggar

1.3.1 The Ghaggar, an intermittent, Endorheic river flows only during the monsoon season. The river is known as Ghaggar before the Ottu barrage near Sirsa and as the Hakra downstream of the barrage. The basin is classified in two parts, Bangar and Khadar. The higher area which is not flooded in rainy season is called Bangar and the lower flood-prone area is called Khadar.

1.3.2 It originates in the village Dagshai in the Shivalik Hills of Himachal Pradesh at an elevation of 1,927 metres (6,322 ft) above mean sea level and flows through Punjab and Haryana states into Rajasthan just southwest of Sirsa, Haryana and by the side of Talwara Lake in Rajasthan. From Ottu barrage near Sirsa, Ghaggar feeds two irrigation canals that extend into Rajasthan.

1.3.3 Initially, it receives municipal sewage of various towns located in Himachal Pradesh and Haryana namely Parwanoo, Kalka and Pinjore through Sukhna Nallah merging into Kaushalya river tributary of Ghaggar near Amravati Enclave. Besides, Ghaggar river also receives the sewage of various towns of Haryana including that of Panchkula before entering into the State of Punjab. It enters Punjab near Village Mubarikpur, District Mohali.

1.3.4 After passing through District Mohali, District Patiala and District Sangrur, river Ghaggar carrying sewage of some of the towns of Punjab, re-enters State of Haryana and then enters Sardulgarh, District Mansa of Punjab before finally re-entering into Haryana. The total stretch of the river Ghaggar in the state of Punjab is 165 kms.

1.3.5 The drains meeting with the river are non-perennial and treated / partially treated / untreated sewage / sullage of some of the cities, towns and villages situated nearby these drains as well as surface run off from fields falling in their catchment area during rainy season is discharged into river Ghaggar directly or indirectly through various drains / choes etc.

1.4 State's past efforts to control pollution in Ghaggar

1.4.1 Keeping in view deterioration in the water quality of Ghaggar, the Government of Punjab (GOP) initiated action in 2008 to identify the sources of its pollution in coordination with Punjab Pollution Control Board (PPCB). Meetings were regularly held under the chairmanship of Chief Minister, Punjab from the year, 2008 onwards. Eight meetings have been held by the higher authorities of the State of Punjab, UT Chandigarh, Haryana, and Himachal Pradesh.

1.4.2 The State Government is serious to control the pollution in river Ghaggar and the concerned departments have already identified the sources of wastewater falling into river Ghaggar at various towns and cities located in the catchment area of the river. As of now, out of 30 towns, which are discharging their wastewater into river Ghaggar, a total of 46 STPs need to be installed out of which 20 STPs have already been installed, 10 are under installation and remaining 16 are under various stages of planning for establishment.

1.5 Directions issued by NGT

1.5.1 National Green Tribunal (NGT) vide its order dated 7.08.18 passed in case OA no. 138 of 2016 and O.A. no. 139 of 2016 directed to restore the standard of water quality in the river Ghaggar to the prescribed level. NGT also constituted an 'Executing Committee' under Chairmanship of Justice Pritam Pal, State level Special Task Force under Chief Secretary and District level Special Task Force under Deputy Commissioner to monitor the compliance of the order.

1.5.2 NGT vide another order dated 20.09.18 passed in OA no. 673/2018 titled as news item published in "The Hindu" authored by Shri. Jacob Kosuhy titled "More river stretches are now critically polluted: CPCB" has directed to prepare Action Plans within two months for bringing all the polluted river stretches to be fit at least for bathing purposes (i.e BOD <3 mg/l and FC< 500 MPN/100 ml) within six months from the date of finalization of the action plans.

1.5.3 There are 4 number of polluted rivers stretches falling under the jurisdiction of State of Punjab as per the details given in the judgement:

(i) Ghaggar (Sardulgarh to Mubarkpur)
(ii) Sutlej (Roopnagar to Harike bridge)
(iii) Kali Bein (SultanpurLodhi to Confluence point to Beas)
(iv) Beas (along Mukerian)

1.5.4 It has been directed that the action plans be prepared by four-member Committee comprising Director, Environment; Director, Urban Development; Director Industries; Member Secretary, State Pollution Control Board of concerned State. This Committee will also be the Monitoring Committee for execution of the action plan. The Committee may be called "River Rejuvenation Committee" (RRC). The RRC will function under the overall supervision and coordination of Principal Secretary, Environment. The Chief Secretaries of the State and Administrators / Advisors to Administrators of the Union Territories will be personally accountable for failure to formulate action plan, as directed.

Chapter 2 – Vision, Mission and Strategy

2.1 Overarching Vision of the State - Mission Tandrust Punjab

The Government of Punjab has launched Mission Tandrust Punjab to make Punjab a healthy State with healthy people by ensuring the quality of air, water, food and a good living Environment. Mission Tandrust Punjab comprises of nine sub missions namely Clean Air, Clean Water, Improve Waste Management, Safe Food, Safe Drugs, Preventive Health, Khedo Punjab, Green Punjab, Conservation Agriculture.

2.2 Vision for Clean Ghaggar

To restore the quality of water in Ghaggar to prescribed standards to ensure ecological balance and socio-economic wellbeing of the people.

2.3 Mission Clean Ghaggar

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

(i) Creating awareness about the adverse impact of water pollution
(ii) Identifying the sources of water pollution
(iii) Setting up facilities for treating the pollutants
(iv) Ensuring effective operations of the facilities
(v) Ensuring effective monitoring of the quality of water
(vi) Mitigating adverse impact on health of the people in the surrounding areas

2.4 Strategy for Clean River Ghaggar

The strategy for clean River Sutlej includes:

(i) Identification of Stakeholders
(ii) Identification of sources of pollution
(iii) Measures to control pollution and timelines
(iv) Nodal Department
(v) Integration of Departmental Plans
(vi) Monitoring and Review
(vii) Risk Mitigation Plan

2.5 Identification of the Stakeholders and their roles

The State of Punjab envisages a comprehensive plan for cleaning of River Ghaggar by involving all the Stakeholders namely:

2.5.1 Department of Science, Technology and Environment

The Directorate of Environment and Climate Change and Punjab Pollution Control Board will be responsible for the following:

(i) Overall coordination of the Action Plan and ensuring its successful implementation
(ii) Setting up comprehensive online monitoring portal connecting all the executing and monitoring agencies
(iii) Setting up of Infrastructure to monitor the quality of water
(iv) Monitoring of quality of water of River Ghaggar & ground water
(v) Monitoring of discharge from Industries including ETPs

(vi) Monitoring of discharge from STPs and other disposal facilities
(vii) Monitoring of management of solid waste and other waste

2.5.2 Department of Local Government

As per the policy decision of the Department of Local Government, all Muncipal Corporations are responsible for execution of their water supply and sewerage works including setting up of STPs while all Municipal Council will get the works executed through Punjab Water Supply and Sewerage Board. The policy is yet to be fully implemented as some Corporations are still relying on PWSSB for execution of works, on the other hand, some Municipal Councils are executing works on their own instead of PWSSB.

Design

(i) Design projects to cover entire population with sewerage network system and its connection with STP.
(ii) Design Sewage Treatment Plants of adequate capacity
(iii) Design as per the prescribed standards

Construction

(iv) Monitor land acquisition closely as it is pre-requsite for setting up of STPs
(v) Ensure reputed professional contractors
(vi) Construction of STPs as per timelines mentioned in the action plan
(vii) Ensuring regular flow of funds during construction

Operation and Maintenance

(viii) Arranging funds for operation and maintenance of STPs to ensuring regular operation and maintenance of STPs in a professional manner
(ix) Providing proper in-house laboratory facilities at each STP for maintaining record of characteristics of analysis of untreated as well as treated waste water
(x) Installation, operation & maintenance of online continuous effluent monitoring system as well as CCTV cameras for the existing STPs as well as new STPs to be installed

Solid Waste

(xi) Proper management & handling of municipal solid waste so as not to be thrown in river

2.5.3 Department of Housing and Urban Development

The Department and all the Development authorities under its control are responsible for various Urban Estates developed by them. In addition, the Government has entrusted construction and subsequent operation and maintenance of Sewerage network and Sewage Treatment Plants in some of the cities to various Urban Development Authorities. In all cases, where the Urban Development Authorities are discharging the functions, they shall have all the responsibilities listed out in clause 2.5.3 for Department of Local Government.

2.5.4 Department of Industries and Commerce

Department of Industries and Commerce through Punjab Small Industries & Export Corporation is responsible for management of Industrial Focal Points set up by it or transferred to it. PSIEC shall have all the responsibilities listed out in clause 2.5.3 for Department of Local Government in respect of Industrial Focal points.

2.5.5 Department of Rural Development and Panchayat

The Department of Rural Development has to provide for necessary treatment facilities in village ponds so that no untreated or polluted water enters river directly or indirectly through various drains or creeks. The Department has the following responsibilities:

(i) Finalization of appropriate technology
(ii) Arrangement of Funds for treatment technology in various villages identified in the Action Plan
(iii) Reuse of water for agriculture purpose
(iv) Proper operation and maintenance of treatment facilities installed in village ponds

2.5.6 Department of Water Supply and Sanitation

The Department of Water Supply and Sanitation along with Department of Rural Development and Panchayat will be responsible for treatment and sanitation facilities in rural areas. It has also been givensome of the works in urban areas. It will accordingly discharge relevant responsibilities for rural and urban areas in respects of projects, which may be assigned to the Department.

2.5.7 Department of Agriculture

The Department of Agriculture through the Directorate of Soil and Water conservation is responsible for implementation of various schemes for utilizing the treated wastewater from urban and rural treatment facilities for irrigation by the farmers. It has the following responsibilities:

(i) Design the project as per the standards
(ii) Follow up with various funding agencies to arrange funds
(iii) Executing the schemes as per the timelines provided in the plan

2.5.8 Department of Health and Family Welfare

The Department of Health and Family Welfare has the following responsibilities:

(i) Checking of health indices of the in-habitants & maintaining database
(ii) Holding awareness camps in the catchment area of River Sutlej to make the public aware regarding water borne diseases

2.5.9 Department of Water Resources

The Department of Water Resources through the Chief Engineer, Drainage has the following responsibilities:

(i) Measurement of flow at different locations
(ii) To stop unauthorised discharge in the drains
(iii) Watershed Management
(iv) Protection and Management of Flood Plain Zones
(v) E.Flow (Ecological/Environment Flow)

2.5.10 **Department of Forest & Wildlife Preservation & Punjab Biodiversity Board**

Department of Forest & Wildlife Preservation & Punjab Biodiversity Board will be responsible for the following:

(i) Plantation on both sides of river and in the Flood Plain Zones
(ii) Biodiversity Conservation

2.5.11 **District Administration**

District Administration will be responsible for monitoring of activities of the action plan at district level.

2.6 **Nodal Department**

The Department of Science, Technology and Environment is the nodal department for coordinating and monitoring activities of the plan.

2.7 **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 and will coordinate its execution by tracking the progress through a centralized IT platform.

2.8 **Monitoring and Governance**

(i) There will be rigorous monitoring of implementation of the comprehensive plan:
    (a) Monitoring of physical and financial progress of works being executed
    (b) Monitoring of operations and management of facilities set up
    (c) Monitoring of quality of water
    (d) Monitoring of health and diseases in the surrounding areas
    (e) Monitoring of awareness campaign

(ii) Setting up of IT platform for tracking progress and analysis

(iii) The monitoring will be done at the District level & State Level.

Chapter 3 – Current Status of Water Quality, Biodiversity & Watershed Management

3.1 Monitoring Locations

The water quality of river Ghaggar is being monitored at 14 locations, starting from upstream of Mubarikpur (where it enters State of Punjab) upto Sardulgarh in Distt. Mansa on monthly basis:

(i) Ghaggar at Mubarikpur Rest House
(ii) Ghaggar at Bhankarpur, Dera Bassi
(iii) Ghaggar at D/s Chattbir
(iv) Ghaggar at U/s Jharmal Nadi
(v) Ghaggar at D/s Jharmal Nadi
(vi) Ghaggar at U/s Dhakansu Nallah
(vii) Ghaggar at D/s Dhakansu Nallah
(viii) Ghaggar at Rattanheri D/s of Patiala Nadi
(ix) Ghaggar at 100 m D/s of Khanauri
(x) Ghaggar at Moonak
(xi) Ghaggar at U/s Sardulgarh
(xii) Ghaggar at D/s Sardulgarh
(xiii) Ghaggar at U/s Sagarpara (wef May 2018)
(xiv) Ghaggar at D/s Sagarpara (wef May 2018)

3.2 CPCB's norms for designated best use

The Central pollution Control Board has laid down criteria for designated best use class of the water of the water bodies, which is as under:

S.N.	Constituent Parameters	Designated Best Use Class				
		A	B	C	D	E
1.	Dissolved oxygen, mg/l, Min	6	5	4	4	-
2.	Biochemical Oxygen Demand, mg/l, Max	2	3	3	-	-
3.	Total coliform Organisms MPN/100 ml, Max	50	500	5000	-	-
4.	pH value	6.5-8.5	6.5-8.5	6-9	6.5-8.5	6-8.5
5.	Free ammonia (As N) mg/l, Max	-	-	-	1.2	-
6.	Electrical conductivity µs/cm max.	-	-	-	-	2250

7.	Sodium absorption ratio, Max.	-	-	-	-	2.6
8.	Boron, mg/l, Max	-	-	-	-	2

Note:

Class A: Drinking water sources without conventional treatment, but, after disinfection.
Class B: Organized outdoor bathing.
Class C: Drinking water sources with conventional treatment followed by disinfection.
Class D: Propagation of wild life and fisheries.
Class E: Irrigation, Industrial cooling and controlled water disposal.

3.3 **Current Status of Quality of Water in Ghaggar**

3.3.1 The representative quality of water of river Ghaggar at 14 locations for the month of October, 2018 is given in **Annexure-A**. The quality of water at few locations has degraded which may pose threat of water borne diseases to the health of people residing in the catchment area of river Ghaggar. The river Ghaggar being an unlined water body and the polluted water flowing in it might have deteriorated the groundwater quality in the catchment area. In order to ascertain the extent of effect of polluted water of river Ghaggar on the health of inhabitants, the State Government has planned to hold health check camps in the catchments areas of river Ghaggar.

3.3.2 The details of analysis results of surface water monitoring under National Water Monitoring Program (NWMP) for the year 2015-16, 2016-17 & 2017-18 are given in **Annexure-B**. It is evident that Class-D quality of water enters the State of Punjab, which becomes Class-E, thereafter, while travelling a distance of approximately 165 Km. The deterioration of water quality is due to untreated waste being discharged in the river directly or indirectly.

3.3.3 It is pertinent to mention here that earlier the river Ghaggar was a perennial water body, but, due to construction of check dams and watersheds, it has become a non-perennial water body carrying sewage and sullage of the habitation areas located in its catchment area. It finally terminates near Sardulgarh.

3.4 **Ground Water Quality in the catchment area of river Ghaggar**

3.4.1 **Sampling by Central Ground Water Board**

The Central Ground Water Board (CGWB) has carried out ground water sampling in the catchment area of river Ghaggar and the information supplied by CGWB regarding quality of ground water is as under:

(i) **Ground Water Quality**

During the month of May, 2017 ground water samples were collected from the structures spread uniformly over the area. The water samples were analyzed for major cations (Ca, Mg, Na, K) and anions (CO_3, HCO_3, Cl, NO_3, SO_4) in addition to pH, EC, F, SiO_2, PO_4 and TH as $CaCO_3$ and Heavy Metals such as Cd, Cu, Mn, Pb, Zn in the Regional Chemical Laboratory by following 'Standard analytical procedures' as given in APHA 2017.

(ii) **Composition of Water**

Chemical analysis shows that the ground water is slightly to moderately alkaline in nature. The pH values range from 7.44 at Sirsini in SAS Nagar district to 9.71 at Fatta Maluka in Mansa district. Hardness reported in terms of CaCO3 ranges from 31 at Bhikhi in Mansa to 936 mg/l at Raipur in Mansa district. EC value of ground water in the area varies from 233 at Dehri in SAS Nagar district to 4898 µS/cm at Raipur in Mansa district. Chloride content of ground water normally follows the distribution pattern of EC and it ranges from 14 mg/l to 681 mg/l in the Ghaggar Basin of the State. Chloride concentration above 400 mg/l gives salty taste to water, Nitrate in ground water above 5.0 mg/l reflects contamination at some stage of its percolation and circulation. Nitrate in water samples varies from traces to 208 mg/l at Burj Bhalaike in Mansa district, whereas the fluoride concentration in ground water ranges from BDL to 5.63 mg/l at Bhateri in Fatehgarh Sahib District. Fluoride concentration upto 1.0 mg/l in drinking water is desirable, upto 1.5 mg/l is permitted and above 1.5 mg/l is injurious.

(iii) **Heavy Metals**

Presence of heavy metals in ground water is also monitored by CGWB and studies were carried out during the year 2017. Some elements such as Fe, Mn, Zn, Cu, Se, Sn, Mo are essential in trace amounts for growth and development of living organisms as well as plants. Nevertheless, these are hazardous in large amounts. The details are as under:

(a) Cadmium in shallow ground water varies from 0.00006 mg/l at Goga in district SAS Nagar to 0.02 mg/l at Raipur in district Mansa. Copper in shallow ground water has been found to be within permissible limits of 1.5 mg/l (as per BIS Limit) except at Issapur in Dera Bassi Block of district SAS Nagar.

(b) Manganese in shallow ground water ranges from 0.0024 mg/l at Sunam in district Sangrur to 1.457 mg/l at Bassama Pipla in district Patiala. Concentration of Lead in shallow ground water ranges from 0.0008mg/l at Handesra in district SAS Nagar to 1.896 mg/l at Lachru Kalan in district Patiala.

(c) Zinc in shallow ground water ranges from 0.002 mg/l at Patran in district Patiala to 5.615 mg/l at Bhutan in district Sangrur. All locations show that Zinc has been observed within permissible limit of 15 mg/l (as per BIS Limit). Arsenic in shallow ground water at all locations has been observed within permissible limits.

3.4.2 **Ground water sampling in the vicinity of river Ghaggar**

The Punjab Pollution Control Board has carried out ground water sampling at 79 locations in and around 62 industries (in some industries, more than one sample was drawn) to ascertain the quality of ground water in respect of parameters such as fluoride, sulphate, cadmium, copper, lead, nickel, zinc, arsenic, mercury and oil & grease. Out of these, 71 samples were found conforming to the prescribed standards as laid down in IS: 10500 – 2012. In 8 samples, the concentration of either fluoride or sulphate or both was found beyond the

prescribed standards. The Board will take necessary action and monitor the quality of ground water regularly and the same will be reviewed at the district and state level.

3.4.3 Environmental Flow (E. Flow) of river Ghaggar

'Environmental Flows' is minimum quantity of continued availability of water in the river to ensure downstream environmental, social & economic benefits as well as sustainability of its aquatic ecosystem. Presently, no information is available about the E. Flow of river Ghaggar. It should be measured at different locations and records be maintained by Department of Water Resources, Punjab. Fresh water flowing through escape channels/small barrages should be checked. Good quality of water may be used for dilution to reduce concentration of pollutants to meet the desired level of water quality and extent of flow as per prescribed norms. Dilution of pollution will be used only after achieving degree of required treatment for municipal sewage and industrial effluents.

3.4.4 Biodiversity Profile of river Ghaggar

Physiographically, the whole Ghaggar river basin area in Punjab, except foot hills of the Shivalik in the north, has undulating to flat topography. The soils of the area consist of alluvial deposits and ranges from looms to sandy looms. Seven (7) Wildlife Sanctuaries namely Sukhna, Chandigarh; Bir Moti Bagh; Bir Bhunerheri; Bir Dosanjh; BIr Mehas Wala; Bir Gurdialpura; Bir Bhadson, Patiala and Bir Aishwan, Sangrur having rich biodiversity fall under the Ghaggar River Basin area in Chandigarh (UT) and Punjab.

The biodiversity in the Ghaggar river catchment area is under threat due to growing population, intensive & extensive agriculture, reclamation of barren land, pollution and habitat loss. The forest cover in the Ghaggar catchment ranges from the category of northern dry deciduous mixed forest, dry deciduous scrub forest and tropical desert throne comprising many tree species with dominance of Khairi (Acacia Senegal), Beri (Zizphus mauritiana), Reru (Acacia Leucophloea), Bohar (Ficus bengalensis), Peepal (Ficus religiosa), Mesquite (Prosopis Juliflora), Lasura (Cordia dichotema), Shisham (Dalbergia sissoo), Kikar (Acacia nilotica) and 10 species of shrubs including Castor (Ricinus Communis), Mallah (Zizyphus nummularia), Karir (Capparis deciduas), Ak (Calotropis procera), Vasaka (Adhatoda vasica), etc.

Further, 14 species of mammals, 9 species of fish , 5 species of amphibians and around 35 species of aquatic & terrestrial birds are also reported from Ghaggar and its adjoining areas

3.4.5 Watershed Management in the Catchment Area of Ghaggar

Integrated Watershed Management Programme (IWMP) is one of the flagship programmes of the Government of India and aims at prevention of soil run-off, regeneration of natural vegetation, rain water harvesting & recharging of the ground water table for restoring the ecological balances of an area. This programme also enables multi-cropping & introduction of diverse agro-based activities, which help in providing sustainable livelihoods to the people residing in the watershed area.

The Nodal Department for IWMP in Punjab i.e. Department of Soil & Water Conservation has implemented 6 projects amounting to Rs. 4395.84 Lacs in the catchment area of river Ghaggar in 2 Districts i.e. SAS Nagar and Patiala in F.Y. 2011-12 and 2013-14 for treatment

of 36,632 hectare area. The major activities included construction of check dams/water harvesting structures, rain water storage and recharging, silt detention structures, stream bank protection, contour bunding, runoff check and drop structures, retaining walls & percolation tanks, vegetative hedges, efficient conveyance of water through underground pipeline system, artificial roof-top rainwater harvesting & recharging, renovation of village Ponds, agro forestry plantation, etc. The llivelihood and farm production support was extended through formation of Self help Groups for pickle and food processing etc., distribution of improved varieties & agriculture inputs and livestock support programmes to develop additional source of income for farmers and landless. Regular trainings were provided to all the beneficiaries to enhance their capacities

The infrastructure for 282.81 Kms long flood protection embankments along river Ghaggar has been created by Department of Water Resources, Punjab

Chapter 4 – Sources of Water Pollution in River Ghaggar

4.1 Major Drains

4.1.1 There are 13 major drains/ choes/ nallahs which are directly discharging into the river Ghaggar. The details of these drains/ choes/ nallahs are given in **Annexure-C**. There are 29 creeks which are discharging into 13 major drains, which are given in **Annexure-D**. The 244.51 MLD waste water from 30 urban bodies is being directly/indirectly discharged into river Ghaggar (**Annexure –E)**. Further, 389 villages are also discharging 99.43 MLD waste water directly/indirectly in the river Ghaggar (Annexure-**F).**

4.1.2 There are following major sources polluting the river Ghaggar:

(i) Sewage/ sullage generated from Urban Areas

(ii) Sewage/ sullage generated from Rural Areas

(iii) Industrial sources

4.2 Sewage/ sullage generated from Urban Areas

4.2.1 There are 30 local bodies which are discharging their wastewater either directly or indirectly into river Ghaggar. 14 STPs of 139.9 MLD capacity have been installed and commissioned in 14 towns meeting their full requirements. 6 STPs of 81.5 MLD capacity have been installed in another 4 towns meeting their partial requirement. The details of fully completed and partially completed STPs are given in **Annexure-G (A) and G(B).** Status regarding total sewage generation, available capacity of the STPs, additional STPs to be installed and balance quantity of sewage to be treated is given in **Annexure-G (C)**.

4.3 Sewage/ sullage generated from Rural Areas

There are 389 villages, which are discharging 99.43 MLD waste water through various creeks and drains into Ghaggar. In order to install necessary treatment facilities to treat the wastewater of rural areas, 389 villages will be prioritise into following phases:

Phase 1: 87 Villages having total discharge of 32.17 MLD

Phase 2: 152 Villages having total discharge of 43.49 MLD

Phase 3: 150 Villages having total discharge of 23.76 MLD

4.4 Industrial Sources

4.4.1 Industrial units located at Dera Bassi and adjoining areas

(i) There are 41 water polluting industries in the catchment area of river Ghaggar at Dera Bassi and adjoining areas. None of the industries is allowed to discharge the untreated / treated wastewater into the drains/ choes leading to river Ghaggar. A list of these industries is as per **Annexure-H.** The brief detail about these industries is as under:

Sr. No.	Type of industry	No. of units	No. of industries installed ETPs	No. of industries installed online continuous monitoring system
1)	Pharmaceutical industries	11	11	5

2)	Pharmaceutical formulation units	3	3	0
3)	Dyeing units	8	8	0
4)	Pulp & Paper mills	2	2	2
5)	Electroplating industries	5	CETP*	0
6)	Engineering goods units	3	CETP	
7)	Pesticide manufacturing	1	1	1
8)	Distillery unit	1	1	1
9)	Brewery unit	1	1	0
10)	Meat Plant	2	2	0
11)	Gelatine manufacturing unit	1	1	0
12)	Organic Chemical manufacturing units	2	2	0
13)	Resin Manufacturing	1	1	0

** Tied up with M/s JBR Technologies (P) Ltd., Ludhiana, who is the operator of the CETP at Ludhiana meant for treatment of wastewater containing heavy metals.*

(ii) However, the screening plants of Dera Bassi area are partly discharging their wastewater into river Ghaggar, but, their wastewater neither contains any organic materials contributing BOD/ COD nor any chemicals. Therefore, the PPCB envisages to pursue the industries to devise a mechanism for 100% recirculation of the wastewater generated from the washing of river bed material.

4.4.2 **Industrial units located in the catchment area of Patiala Nadi**

(i) There are 7 water polluting industries in Distt. Patiala in the catchment area of river Ghaggar. A list of these industries is attached herewith as **Annexure-I**. The break-up of these industries is as under:

Sr. No.	**Type of industry**	**No. of units**	**No. of industries installed ETPs**	**No. of industries installed online continuous monitoring system**
1	Pulp & Paper mills	4	4	3

2	Distillery unit	1	1	1
3	Board mills	2	2	0

(ii) Since, all these industries are located near the bank of Patiala Nadi/ Jacob drain, as such, there is need to monitor all these industries in odd hours to rule out the possibility for discharge of wastewater into said drains during odd hours.

Chapter 5 – Other sources of pollution and their management

5.1 Bio Medical Waste

5.1.1 The bio-medical waste of all the Healthcare Facilities in the State is collected, transported, treated and disposed of by 4 authorized Common Bio-Medical Waste Treatment Facilities (CBWTF) located at Ludhiana, SAS Nagar, Amritsar and Pathankot. The Bio-Medical Waste generation in the State is in the range of 14-15 tons per day (TPD) depending upon patient load. The status of HCFs operating in towns falling in catchment areas of river Ghaggar is given in **Annexure-J.**

5.1.2 The collection vehicles of the CBWTF operators are equipped with Global Positioning System (GPS) with access to Punjab Pollution Control Board (PPCB). The CBWTF operators are using Bar-code based software system for collection of bio-medical waste from Healthcare Facilities since 2012 and the data of collection of bio-medical waste from the healthcare facility is sent online to server within 1-2 minutes and the access of same is available with PPCB. CCTV cameras are also installed in the processing areas of all the 4 CBWTF operators with access to PPCB to monitor the working of the facility.

5.1.3 The stack of the incinerator installed in all the 4 CBWTFs have been provided with Online Continuous Emission Monitoring System and the data is transferred online to PPCB and CPCB. This system helps in observing/monitoring the emissions discharged while treatment of bio-medical waste is being done.

5.1.4 Since, the Bio-Medical Waste generated in the catchment area of River Ghaggar is handled and managed in proper manner through the Common Bio-Medical Waste Treatment Facilities (CBWTF), as such, there is no impact of this waste on the water quality of River Ghaggar.

5.2 Hazardous Waste

5.2.1 The Government of India has framed Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 for the scientific handling of hazardous waste. The occupier of the facility is to apply for authorization for handling, generation, collection, storage, packaging, transportation, use, treatment, processing, recycling, recovery, pre-processing, co-processing, utilization, offering for sale, transfer or disposal of the waste to the Board. A pass book is issued along-with authorization to the actual user of the hazardous waste.

5.2.2 As per the interim order dt. 14-10-2003 of Hon'ble Supreme Court in Writ Petition (Civil) No. 657 of 1995, regarding handling of hazardous waste and development of common treatment, storage and disposal facility, a Common Treatment, Storage and Disposal Facility (CTSDF) at Village Nimbuan, Tehsil Dera Bassi, Distt. SAS Nagar was constructed by M/s Nimbuan Green Field Punjab Limited (NGPL) and commissioned in October 2007.

5.2.3 The facility has been designed for 15 years capacity considering the generation of storable quantity of hazardous waste as 36,000 MTA based on the assessment study carried out by M/s Tetratech India Limited. The total capacity of the facility is 5,40,000 MT. The capacity to store hazardous waste in the existing CTSDF is sufficient upto year 2030 at the present

rate of generation. The vehicles used by the common facility operator for transportation of hazardous waste are equipped with GPS system.

5.2.4 At present no common incinerator has been installed at CTSDF and the same is under planning. All the major industries generating incinerable hazardous waste have installed captive incinerator in their premises for disposal of incinerable waste. Eighteen such captive incinerators are in operation for the disposal of incinerable waste. In addition to the above, the incinerable waste from the remaining industries is received by the operator of CTSDF and is incinerated at the incinerator installed by the CTSDF at its another unit at Kanpur.

5.2.5 Since, the Hazardous Waste generated by the industries in the catchment area of River Ghaggar is handled and managed in proper manner through the Common Treatment, Storage & Disposal Facility installed at Vill. Nimbuan, Tehsil Dera Bassi, Distt. SAS Nagar, as such, there is no impact of this waste on the water quality of River Ghaggar.

5.2.6 Data of quantity of hazardous waste generated during the period January, 2018 to December, 2018 is as under :

S.N.	**Name of District**	**Quantity of hazardous waste generated (in TPA)**		
		Incinerable	**Disposable**	**Recyclable**
1	Sangrur	72.53	664.176	332.426
2.	Mansa	92.08	2.2	170.33 & 8400 drums
3.	SAS Nagar	1453.148	7263.23	120
4.	Patiala	243.18	1053.39	5355.75

5.3 **E-Waste**

5.3.1 Government of India has framed E-Waste (Management & Handling) Rules, 2016 as amended on 22.3.2018. PPCB has granted NOC / 'Consent to Operate' to one dismantling facility, M/s Ramky Enviro Engineers Limited, Vill. Nimbua, Tehsil DeraBassi, Distt. SAS Nagar with capacity to handle 4 TPD of E-waste.

5.3.2 PPCB has granted 'Consent to Establish' to two industries i.e. M/s Black Diamond Cements Pvt. Ltd., Tehsil Dera Bassi, district SAS Nagar and M/s Spreco Recycling, Tehsil Raikot, District Ludhiana to establish E-Waste recycling facility of capacities 30 TPD and 0.8 TPD respectively. These said industries have yet not commissioned the said facility. Two parties each in Amritsar and Jalandhar, have also been given go ahead by PPCB for setting up of the E-Waste recycling facilities.

5.3.3 Although, the channelization of E-Waste has recently been started, disposal of such waste has never been noticed in the River Ghaggar.

5.4 **Solid Waste**

5.4.1 The Department of Local Government (DLG) vide notification dated 09.07.2018 has notified the Punjab State Solid Waste Management Policy, 2018. In view of the past experience, it

has been decided to adopt both decentralized and centralized solid waste management approach depending upon the profile of the locality.

5.4.2 Further, in compliance to the orders of the Hon'ble Punjab and Haryana High Court in CWP No. 7039 of 2010, a Common Action Plan containing 10 points was prepared in 2012 for viable alternative measures for disposal of garbage till setting up of Solid Waste Management Plants. The Directorate of Local Government is the implementing agency for this Action Plan and PPCB is monitoring the status of compliance. Out of 167 Urban Local Bodies (ULBs), 113 ULBs are partially complying with the Common action plan and remaining 54 ULBs are yet to comply with the same.

5.4.3 The Ministry of Environment and Forests, GOI has notified Solid Waste Management Rules, 2016. Implementation of these Rules is being monitored by the Board. As per Rule 24 of the Solid Waste Management Rules, 2016, the local body shall submit its annual report to the Board on or before the 30th day of June every year. Further, the Board is required to submit the consolidated annual report to the Central Pollution Control Board and Ministry of Urban Development by the 31st day of July of each year. The same are regularly uploaded on the official website of the Board also.

Chapter 6 – Utilization of Treated Wastewater and Sludge from STPs

6.1 The State Treated Waste Utilization Policy

6.1.1 The Department of Local Govt. has notified "The State Treated Waste Policy -2017" to promote the recycling and reusing the treated sewage for non-potable applications and to make sewage project economical and environmentally sustainable.

6.1.2 The policy envisages to tackle the issues pertaining to the provisions of adequate wastewater collection and treatment facilities, consideration of treated effluents as resource for reuse in irrigation/ industrial/ other fields and thereby improvement of the socio-economic conditions in the areas to serve by the proposed systems.

6.1.3 The Department of Soil and Water Conservation, Punjab is executing projects for utilization of treated wastewater for irrigation of various towns/cities across the State by laying network of underground pipelines in agricultural fields.

6.2 Utilization of treated wastewater in the catchment area of Ghaggar River

6.2.1 The Department of Soil and Conservation has already commissioned irrigation projects from 8 STPs to utilise the treated wastewater of the STPs located in the catchment area of River Ghaggar. These projects utilise about 33 MLD of treated wastewater and about 959 hectares of agricultural land is being irrigated. The details are given in **Annexure-K.**

6.2.2 From the experience of using STP's treated wastewater for irrigation purposes, following issues emerge, which need to be addressed:

(i) In case of STPs based on SBR technology, the discharge of treated wastewater is not continuous and for the gap period of about 45 minutes, the pump through which the treated wastewater is pumped for utilization onto land for irrigation is required to be shutdown, which discourages the farmers to utilize the treated wastewater. Therefore, there is a need to provide a storage tank of sufficient capacity for treated wastewater so that without shutting down the pumping station, the wastewater can be made available to the farmers.

(ii) The payment of electricity bill is required to be regulated by fixing the responsibility of the concerned department and funds for this purpose need to be made available with the operating agency.

(iii) The farmers need to be educated and made aware about the advantages of use of treated wastewater for irrigation purpose.

6.3 Management of sludge from STPs

The management of sludge from STPs will be carried out as per the standards laid down by the Board from time to time. The quality of sludge and compliance will be monitored by the Board and reported for review at the district and State level.

Chapter 7 – Measures for control of water pollution and timelines

7.1 Categories of Projects

7.1.1 The action plan envisages the following facilities to be set up/ upgraded to meet the challenges of pollution in river Ghaggar:

(i) Setting up of treatment facilities for sewage/sullage in Urban areas

(ii) Setting up of online system for monitoring STPs

(iii) Setting up of treatment facilities for sewage/sullage in Rural areas

(iv) Setting up of facilities for reuse of treated wastewater

(v) Setting up of treatment facilities in Industrial Areas

(vi) Setting up of online system for monitoring industrial effluents

7.1.2 Each project will have timelines for various stages of the project. Following stages have been identified to monitor the progress:

Name of the Project			
Brief Scope of the Project			
Sr. No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR		
2	Financial Closure		
3	Tendering of the Work including allotment		
4	Commencement of Work		
5	Quarterly Milestones during the construction Stage		
6	Completion and Commissioning		

7.2 Timelines for Setting up of treatment facilities for sewage/sullage in Urban areas

(i) **Department of Local Government**

The Department of Local Government has chalked out plans for setting up of new 15 STPs, upgrading of 1 STP and laying down sewerage system for left out areas. The details are given in **Annexure-L.**

(ii) **Military Engineering Service, Patiala**

Military Engineering Service, Patiala has given the plan for completing one STP, which is given at **Annexure-M**.

7.3 **Timelines for installing online continuous monitoring system for STPs**

In order to get real time data of the quality of treated wastewater, there is need to install Online Continuous Monitoring System with facility of flow meter at the outlet of all the STPs of the towns / cities located in the catchment area of River Ghaggar and this system should be attached with server of the concerned department as well as PPCB so that quality of treated wastewater can be put in the public domain. Further CCTV cameras will be installed to monitor the operation of STPs. All concerned agencies, which are operating the facilities will ensure online system as per the timelines. The timelines for installing online systems and CCTVs are given in **Annexure –N (A) and N(B), respectively.**

7.4 **Timelines for Setting up of treatment facilities for sewage/sullage in Rural areas**

The Department of Rural Development and Panchayat has to prioritise the villages for setting up of treatment facilities. The timelines for setting up treatment facilities in rural areas is given in **Annexure-O**. The Department has yet to finalize the treatment technology to be adopted in rural areas.

7.5 **Timelines for setting up of Reuse of treated wastewater**

The Department of Soil and Water Conservation has given the timelines for setting up of reuse of treated waste water. The details are given in **Annexure-P.**

7.6 **Timelines for setting up of treatment facilities in Industrial Areas**

The Department of Industries and Commerce through Punjab State Industries & Export Corporation (PSIEC) is currently executing two projects. The details are given in **Annexure-Q.**

7.7 **Timelines for installing online continuous monitoring system by Industries**

All the 17 categories of industries have installed online continuous monitoring system, which are attached with server of CPCB as well as PPCB. Therefore, out of 48 industries, 15 fall in the list of 17 categories of industries, have already installed online continuous monitoring system. As such, the remaining industries having discharge of trade effluent 50 KLD or more are required to install Online Continuous Monitoring System with facility of flow meter at the outlet of their ETPs. The time schedule for installing online system is given in **Annexure -R**

Chapter 8 – Monitoring Requirements and Formats

8.1 Monitoring Requirements

There are following key components of monitoring

(i) Monitoring of progress of projects for setting up of new/ upgraded facilities
(ii) Monitoring of operations and management of STPs
(iii) Monitoring of ETPs and Industrial Effluents
(iv) Monitoring of Quality of Water of River Ghaggar
(v) Monitoring of Ground Water quality
(vi) Monitoring of adverse impact on health of the people in surrounding areas due to water pollution
(vii) Monitoring of Awareness campaign
(viii) Monitoring of other violations of laws/ regulations

8.2 Monitoring of Progress of projects for setting up of new/up graded facilities

In order to ensure that the stakeholder departments adhere to the timelines given for setting up of new/upgraded treatment facilities, the departments shall submit progress of the project on monthly basis in the proforma attached as **Annexure-S** for monitoring.

8.3 Monitoring of operations and management of STPs

To ensure proper functioning of the STPs, regular availability of funds for operation and maintenance has to be ensured. All the STPs should also have standby source of power. The O&M contracts shall have the responsibilities of the Operator clearly defined. Monthly reports as per **Annexure-T & U** will be submitted for monitoring.

8.4 Monitoring of ETP's and Industrial Effluents

Punjab Pollution Control Board shall visit the industries located in the catchment area of River Ghaggar as per protocol regarding frequency of visit to the industries to carry out monitoring of Effluent Treatment Plants & ground water and maintain proper record of all these visits. PPCB will submit report as per the proforma given in **Annexure-V.**

8.5 Monitoring of Quality of Water of River Ghaggar

The Punjab Pollution Control Board shall continue to monitor the quality of water of River Ghaggar at 14 locations under National Water Monitoring Programme and shall report to State Level Special Task Force on monthly basis in the proforma as per **Annexure-W**. Further, the 6 continuous monitoring systems will be installed to get the real time data regarding quality of water of river Ghaggar, which will be put in public domain for information of public in general.

8.6 Monitoring of Ground Water Quality

The Punjab Pollution Control Board will monitor the ground water quality by taking samples in the Industrial areas. The data from Central Ground Board will also be taken. The reports will be presented for review at the district and state level.

8.7 Monitoring of adverse impact on health of the people in surrounding areas

The District Level Special Task Force shall get organized / conducted the health check-up camps of the people in the catchment area of River Ghaggar and shall submit the monthly report in proforma as per **Annexure-X**, which will be reviewed by State Level Special Task Force and the Executing Committee.

8.8 Monitoring of Awareness campaign

The PPCB will organize awareness programme in partnership with the Department of Health & Family Welfare and other stakeholders in the habitation area falling in the catchment area in River Ghaggar to educate them about the harmful effects of water pollution. The PPCB shall submit monthly report in the proforma as per **Annexure-Y**.

8.9 Monitoring of other violations of laws/ regulations

The PPCB will monitor any violation not covered above and shall take appropriate action against the violator and report in this regard to the State Level Special Task Force and Executing Committee.

8.10 Role of Nodal officers of Stakeholder departments

The Nodal officers of the stakeholder departments will be responsible to send the status reports of the projects related to their departments and monitoring reports in the prescribed proformas. The Departments will appoint Nodal Officers, who would have necessary authority and influence to collect and provide reports. Once the centralised web-based IT system is developed, the relevant officers shall directly update the information on the portal and Nodal officer shall monitor the same.

Chapter 9 – Governance and Supervision

9.1 Three Tier Monitoring

9.1.1 Monitoring will be done by the concerned Departments/ Agencies, which are executing or responsible for particular activities and it will be their primary responsibility to ensure compliance of the Action Plan.

9.1.2 In addition, there will be three level of Committees to review and monitor the status:

(i) District Level Special Task Force
(ii) River Rejuvenation Committee
(iii) State Level Special Task Force / Executing Committee

9.1.3 PPCB will set up a dedicated team for supporting coordination and monitoring of the Action Plan. The team will collate and analyse data from all the concerned agencies and escalate the issues and challenges to the appropriate level for resolution.

9.1.4 A dedicated Management Information System (MIS) for Environment Protection Monitoring System (EPMS) for collecting online information from all the stakeholder departments to monitor their progress with respect to all the actionable components of the Action Plan will also be jointly prepared by Directorate of Environment & Climate Change and Punjab Pollution Control Board.

9.2 District Level Special Task Force (DLSTF)

(i) The mandate of this task force as per order dated 14.11.2018 issued by the Govt. of Punjab, Deptt. of Science, Technology & Environment is as under:

(a) It shall identify all persons responsible for violation of law and norms relating to pollution in Ghaggar river and the drains joining it.
(b) It shall review action by the Competent Authority w.r.t. Civil and Criminal action against the violators as well as those who fail to perform their duties in this regard.
(c) It shall submit a monthly report on all actions taken by it to the State Level Special Task Force (SLSTF), by first week of every month.
(d) It shall assist the SLSTF in preparation of the action plan and finalizing the timelines.
(e) It shall involve Civil Society Organizations and public participation in preparing the action plan in all the relevant areas.
(f) It shall ensure periodic sampling of river water as well as ground water to check water quality.

9.3 River Rejuvenation Committee

The River Rejuvenation Committee will monitor the Status of implementation of the Action Plan at the State Level.

9.4 State Level Special Task Force

(i) The mandate of this task force as per order dated 14.11.2018 issued by the Govt. of Punjab, Deptt. of Science, Technology & Environment is as under:

(a) It shall finalize the Action Plan with firm timelines and review the same.

(b) It shall submit quarterly report on action taken during the quarter to the Central Pollution Control Board.

(c) It will also ensure that the quarterly Action Taken Reports are uploaded on the website of Punjab Pollution Control Board.

(d) It shall Co-ordinate with the Executing Committee, appointed by NGT

(ii) The State Level Special Task Force will accordingly hold regular meetings to review the progress and taken necessary action against the defaulters.

9.5 **Executing Committee**

(i) The National Green Tribunal (NGT) has constituted an 'Executing Committee' with the following mandate:

(a) The Committee is entitled to issue appropriate directions to concerned authorities for ensuring compliance of the orders of the Hon'ble Tribunal.

(b) The target of the Committee will be to restore the standard of water quality in the river to the prescribed level.

(c) The Committee may carry out personal visits, if necessary or call for information or reports.

(d) The Committee may also consider need for getting organised health camps and need for providing clean drinking water for the affected inhabitants.

(e) The sampling of ground water may also be done apart from the sampling of the river water periodically.

(f) Submit fortnightly basis report to the Hon'ble NGT through e-mail i.e. filing.ngt@gmail.com

(ii) The Executing Committee will accordingly review the progress from time to time and issue necessary directions to the concerned authorities.

Chapter 10 – Risk Mitigation Plan

10.1 Identification of Major Risks in the Action Plan

10.1.1 The Action Plan to clean Ghaggar and restore the quality of water to the prescribed standards is a complex multi sectoral and multi-agency action plan. Successful implementation would face many challenges. Following major risks have been identified

(i) Accuracy and completeness of Baseline Data

(ii) Accuracy and completeness of Project timelines

(iii) Financial closure and timely releases of funds

(iv) Discharge from unapproved habitation areas

(v) Tracking the Progress and program management

(vi) Resolution of Administrative and Technical Issues

10.2 Mitigation Plan for identified Risks

It is important to devise strategies and plans to mitigate the identified risks. Action plan will remain on paper if the bottlenecks and the risks are not dealt satisfactorily. Mitigation plan for each of the identified risk has been prepared in the following paras.

10.3 Accuracy and completeness of Baseline Data

Due to paucity of time, the information about the sources of pollution, current treatment facilities, quantity and quality of discharges etc. could not be properly validated and there could be gaps in the same, which may lead to substantial alterations in the plans. In order to ensure accuracy and completeness of baseline data, another round of validation of the same would be got done through the respective Administrative Departments and Action plan updated accordingly. This will be completed in 30 days.

10.4 Accuracy and completeness of Project timelines

Due to paucity of time, the information about the project timelines could not be properly validated and deliberated and there could be gaps in the same. In order to ensure accuracy and completeness of Project timelines, each Administrative Department would be asked to validate the project timelines carefully after taking into account all the relevant factors. The needful will be done in 45 days in parallel to the activity in para 10.3 and Action plan updated accordingly.

10.5 Discharge from unapproved habitation areas

There are certain unapproved colonies or villages, which have come under municipal limit, which are currently not covered in the plans but are discharging their untreated sewage directly or indirectly into river Ghaggar. The concerned authorities for urban and rural areas will be asked to identify such localities and plan for their connectivity with the main sewer or development of the sewer system shall be worked out.

10.6 **Financial closure and timely releases of funds**

Availability of funds for completing the projects on time is a major risk. Some of the projects have still not achieved financial closure. It has also been observed that the release of funds is often not regular even though the project had appropriate financial approval. In case of operation and maintenance of the facilities, substantial blame has been apportioned to lack of regular release of funds for maintenance, which resulted in failure of STPs to treat the wastewater and as a result untreated water has been discharged in the drain. In order to overcome the challenges, efforts will be made towards:

(i) Seeking a firm commitment of Department of Finance to release the funds for the projects on priority.

(ii) In case of operation and maintenance, seeking firm commitment of ULBs/ Department of Local Government to treat this as committed expenditure according it highest priority and release the funds regularly. Further, arrangement may be worked out with the Administrative Department and Department of Finance that in case of default of ULB to pay to the operator, funds will be deducted from the grant to be released to ULB and paid directly to the Operator.

10.7 **Tracking the Progress and program management**

The action plan for clean Ghaggar is a complex, multi department and multi-agency program and the current capacity and skill sets in PPCB are not adequate to track the progress of various milestones and carry out effective program management for successfully implementing the program. In order to mitigate the risk, a dedicated team with requisite Program Management and IT skills will be positioned to collate data, analyse the same, prepare status updates, escalate issues and assist various committees in review and issue resolution.

10.8 **Resolution of Administrative and Technical Issues**

There are some other administrative and technical issues, which may hold up the progress of the implementation of the Action Plan:

(i) Acquisition of land,

(ii) Usage of water being more than the designed norm of 135 lpcd

(iii) Mixing of treated/ untreated industrial effluents with domestic sewage system

(iv) Left out residential pockets need to be integrated with the System

(v) Treatment technologies

The Program management team will continuous track and identify such issues and escalate to the appropriate level. The three-tier monitoring and review system will help in resolving the issues.

Annexure A - Representative Quality of Water for the month of October 2018

S. N.	Point of Sample Collection	pH	DO mg/l	BOD mg/l	T.Coli MPN/ 100ml	Cond µs/Cm	Boron mg/l	DBU Classification
1.	Ghaggar at Mubarikpur Rest House	7.9	5.2	6	24000	528	0.08	D
2.	Ghaggar at Bhankarpur	7.7	4.2	11	35000	623	0.10	D
3.	Ghaggar at Chattbir	7.7	3.3	9	28000	606	0.10	E
4.	U/s Jharmal Nadi	7.4	3.9	8	22000	610	0.11	E
5.	D/s Jharmal Nadi	7.6	3.7	10	28000	756	0.09	E
6.	U/s Dhakanshu Nallah	7.6	4.3	10	15000	877	0.09	D
7.	D/s Dhakanshu Nallah	7.5	3.9	13	21000	898	0.10	E
8.	Ghaggar at Rattanheri	7.5	3.7	14	22000	774	0.11	E
9.	U/s Sagar Para	7.5	4.0	14	21000	760	0.11	D
10.	D/s Sagar Para	7.7	2.9	36	28000	1069	0.12	E
11.	Ghaggar at Khanauri	7.3	3.4	42	35000	987	0.10	E
12.	Ghaggar at Moonak	7.4	3.0	39	28000	755	0.15	E
13.	U/s Sardulgarh	7.8	3.5	9	21000	871	0.14	E
14.	D/s Sardulgarh	7.8	3.3	11	24000	991	0.14	E

Annexure B - Analysis Resuts of Surface Water Monitoring 2015-16 to 2017-18

Sno.	Sampling points at river Ghaggar	2015-16	2016-17	2017-18	2015-16	2016-17	2017-18	2015-16	2016-17	2017-18	2015-16	2016-17	2017-18	2015-16	2016-17	2017-18
		DO (mg/l)			pH			BOD (mg/l)			T.Coliform (MPN/100 ml)			D.B.U. classification		
1	Mubarkpur Rest House	6.2	5.6	5.13	7.4	8.1	7.9	8.8	4.2	6.07	6862	16642	21000	D	D	D
2	Bhankarpur, DeraBassi	4.7	4.6	3.61	7.5	7.6	7.5	13	7.9	12.93	19485	25667	26417	D	D	E
3	D/S Chattbir	4.9	4.5	4.17	7.4	7.6	7.6	12	6.5	8.11	19825	24273	19417	D	D	D
4	U/S JharmalNadi	4.7	3.9	2.83	7.4	7.6	7.6	14	10.2	14.92	17350	21583	20083	D	E	E
5	D/S JharmalNadi	3.9	2.4	1.97	7.7	7.6	7.7	21	17.8	25.58	27625	26917	25250	E	E	E
6	U/S Dhakansu Nallah	4.3	3.6	3.24	7.4	7.6	7.7	16	9.6	10.25	22100	14091	14500	D	E	E
7	D/S Dhakansu Nallah	3.7	3.1	2.94	7.3	7.7	7.7	18	11.8	12.23	30375	20709	18667	E	E	E

8	Rattanheri D/S of PatialaNadi	3.7	2.9	1.76	7.5	7.7	7.7	20	51.7	33.06	31500	24333	24333	E	E	E
9	100 m D/s of Khanauri	3.5	2.1	1.42	7.6	7.7	7.8	25	30.3	41.08	39200	26833	34083	E	E	E
10	Moonak	3.2	2.2	1.75	7.6	7.8	7.9	33	25.5	25.50	52625	29333	24000	E	E	E
11	U/S Sardulgarh	3.7	2.7	2.23	7.4	7.9	7.8	18	19.4	18.83	56700	19258	17417	E	E	E
12	D/S Sardulgarh	3.6	2.5	2.03	7.4	7.9	7.9	20	19.8	20.83	55975	24733	21583	E	E	E

Annexure C - List of 13 major drains directly discharging into river Ghaggar

Sno.	Name of the drain	Point of origin	Approx. Length (in Km)	Coordinates at which the drain meets river Ghaggar	Location at which it meets river Ghaggar	Approx. Discharge (MLD)
1.	Sukhna Choe	Sukhna Lake	8.17	30^{O} 36'49'' N 76^{O} 50'09'' E	450 m upstream of Bhankhapur Bridge	105
2.	Dera Bassi Choe	Near Village Haripur Hinduan, Dera Bassi	8.75	30^{O} 36'13'' N 76^{O} 48'51'' E	Near upstream of Village Satabgarh	17.5
3.	Jharmal Choe	Near village Rampur Sainian, Tehsil Dera Bassi, Distt. SAS Nagar	22.86	30^{O} 28'27'' N 76^{O} 46'11'' E	Near Village Tiwana	17.5
4.	Basauli Drain	Near Village Jaula Khurd, Distt. SAS Nagar	24.39	30^{O} 26'39'' N 76^{O} 44'54'' E	Near Village Sadhanpur	12.5
5.	Bagna Drain	Near Village Salempur, Distt. SAS Nagar	19.5	30.3397 76.6986	Village Nanheri, Rajpura	-
6.	Pachisdara Drain (Dakansu Choe)	Near PCS, Sector-2, Chandigarh under the name of N-choe	22	30.305197 76.627918	Near Village Sarala-Khurd	125
7.	Patiala Nadi	Village Cholti Kheri, Distt. Fatehgarh Sahib	73	30.078934 76.243909	Village Ratanheri	150
8.	Sagarpara Drain	Kurkshetra (Haryana)	7.92	29.8975741 76.169735	Village Sagara	180
9.	Kaithal Drain	From Keorak, Distt. Kaithal (Haryana)	6.4	29^{O} 50'50'' N 76^{O} 06'00'' E	Near Khanauri Bridge	15
10.	Jhambowali choe	Village Chanarthal Kalan, Distt. Fatehgarh Sahib	72	29.8291 76.0011	Village Chandu, Tehsil Moonak	32.5
11.	Lehragagga Main	Near Kalajar	67	29^{0}50'03'' 75^{0} 45' 41''	Near Village Bakshiwala, Distt. Sangrur	82.5
12.	Sirhind Choe	Near Bassi Pathana	166	29.7460 75.4726	Near Village Kheri, Haryana	245
13.	Miranpur Choe	Near Village Haripur, Sub Tehsil Ghanour	58.69	30.0980 76.3069	Near Village Khambera, Haryana	125

Note: Analysis of water of two points of origin i.e. at Sr. No. 1 & 8 has been carried out, whereas, for other points the same is to be determined in due course of time.

Annexure D - List of 29 creeks discharging into main drains

Sr. No.	Name of the creek
1.	Drain passing through K-area
2.	Singh Nallah
3.	Gazipur Drain
4.	Dhabi Nallah
5.	Banur Drain
6.	Chhoti Nadi
7.	Khadoli Drain
8.	Jacob Drain
9.	Model Town Drain
10.	Kalwano Drain
11.	L-6 Drain
12.	Nabha Drain
13	Sangrur Drain
14	Bareta Drain
15	Ladal Drain
16	Mander Drain
17	Toderpur Drain
18	Hargobindpura Datewas Drain
19	Khiwa Sahajada Drain
20	Dodra Drain
21	Bahadur Singh Wala Drain
22	Balian Drain
23	Bhagwanpura Link Drain
24	Dhuri Drain
25	Sahoke Main Drain
26	Jassarwal Drain
27	Buggar Link Drain
28	Shekhupura Adalatipura Drain
29	Hassanpura Drain

Annexure E - List of urban areas discharging directly/indirectly into river Ghaggar

Sr No	Name of the source	Approx. Discharge (KLD)	Remarks
1	MC, Zirakpur, SAS Nagar Mohali	15000	STP of 17 MLD capacity installed
2	M.C., Moonak, Distt. Sangrur	1500	STP of 3 MLD capacity installed
3	MC, Sardulgarh, Distt. Mansa	4000	STP of 4 MLD capacity installed
4	K Area & Ghazipur, Zirakpur	1180	To be connected to STP of 17 MLD capacity at Ziralpur
5	M.C., Dera Bassi	2500	STP of 4 MLD capacity installed
6	MC, SAS Nagar	45000	STP of 45 MLD capacity installed
7	MC, Banur	4000	STP of 4 MLD capacity installed
8	MC, Rajpura and Focal Point area of Rajpura	3700	STP of 7 MLD capacity installed and STP of 10 MLD capacity is being set up
9	MC, Bassi Pathana	2000	STP of 3.0 MLD is being set up
10	MC, Amloh	2000	STP of 3.0 MLD capacity is proposed
11	MC, Bhadson, Distt. Mansa	730	--do--
12	MC, Nabha	7200	STP of 12.0 MLD capacity is proposed
13	MC, Bareta	2000	STP of 3 MLD capacity is installed
14	MC, Budhlada, Distt. Mansa	5300	STP of 6.5 MLD capacity installed
15	M.C., Dhuri, Distt. Sangrur	2000	STPs of 5 MLD is being set up and & STP of 6 MLD capacity is proposed
16	M.C., Bhikhi, Distt. Mansa	2500	STP of 3.0 MLD capacity is installed
17	M.C. Sangrur	7200	STP of 4 MLD capacity is being set up and STP of 11 MLD capacity is proposed
18	M.C. Sunam	8000	STP of 8 MLD capacity installed
19	MC Samana	7500	STP of 10 MLD capacity installed
20	MC Patran	2800	STP of 4 MLD capacity installed
21	MC Mandi Gobindgarh	19000	STP 25 MLD capacity installed and STP of 3 MLD capacity is being set up
22	MC Lehra	1500	STP of 4 MLD capacity installed
23	MC Shermajra, Distt. Patiala	46000	STP of 46 MLD capacity installed
24	Nagar Panchayat, Longowal, Distt. Sangrur	1000	STP of 3.0 MLD capacity is proposed
25	Nagar Panchayat, Sanour, Distt. Patiala.	2500	STP of 4 MLD capacity is proposed.
26	Sewage of Nagar Panchaya, Khanauri	1500	STP of 3 MLD capacity is installed

Sr No	Name of the source	Approx. Discharge (KLD)	Remarks
27	Nagar Panchayat, Boha, Distt. Mansa	1200	STP of 2 MLD capacity is being set up
28	Nagar Panchayat, Lalru, Distt. SAS Nagar.	2500	STP of 1.5 MLD capacity installed and one STP of 1.5 MLD is proposed
29	Nagar Panchayat, Cheema Distt. Sangrur	500	STP of 2.0 MLD capacity is proposed
30	Sirhand Mandi, Sirhind	2200	3 STPs of 11 MLD capacity (2+4+5) are being set up
31	Green City, Mamta Enclave / Baltana Area	50	Not connected to STP of 17MLD capacity
32	Domestic effluent of industry through storm water sewer of Focal Point	20	The industries will connect by 15.1.19.
33	Industrial Area, Focal point Dera Bassi	500	STP of 2 MLD capacity installed
34	Silver City	480	STP installed
35	Dappar Colony	100	STP of 0.2 MLD capacity proposed
36	Focal Point, Patiala	1250	STP not installed
37	Outlet of Shanti Nagar & Virk Colony within MC limits of Patiala	150	STP not installed
38	Outlet of treated sewage of Urban Estate Patiala	5000	STP of 13 MLD capacity installed
39	Outlet of Storm water carrying sewage / sullage of habitation area near Patiala Nadi	1875	STP not installed
40	Two no. Nalas falling into Badi Nadi from Internal area of Patiala City	3000	STP not installed
41	Badha Road, Tej Bagh Colony, Patiala (Near slaughter House)	1250	This outlet is to be connected with existing STP
42	SST Nagar, Patiala Near, Chotti Masjid Muslim Colony	750	-do-
43	Shree Santoshi Mata Mandir area	1675	-do-
44	A part of the sewage of Rajpura town located towards Patiala side	6000	STP of 10 MLD capacity is being set up
45	Outlet of Dhillon Colony & Kesar Bagh, Patiala	6	To be connected to STP of Shermajra, Patiala of 46 MLD capacity
46	Moti Bagh, Patiala &Darru Kutia area	6	-do-
47	Dakala, Terin, Bhanari, Main Road, Sullar Colony, (From Military Area) Within MC limit, Patiala	30	STP not installed
48	Outlet of MES Patiala	5500	STP of 6 MLD capacity is proposed
49	Outlet of STP Ablowal (10 MLD)	7000	STP of 10 MLD capacity installed
50	Outlet of Patran STP	2800	STP of 4 MLD capacity installed

Sr No	Name of the source	Approx. Discharge (KLD)	Remarks
			at Patran
51	Focal Point Mandi Gobindgarh	3000	STP of 3 MLD capacity is being set up
52	Bhindran (Th. B/pura Drain) (Distt. Sangrur)	159	STP not installed
	Total	**244611**	

Annexure F - Summary of rural areas discharging (directly/indirectly) into river Ghaggar

Sr. No	Village category	No. of Villages	Discharge (MLD)
1.	Discharge more than 300 KLD	113	62.952
2.	Discharge between 100 KLD and 300 KLD	171	31.272
3.	Discharge less than 100 KLD	105	5.213
Total		389	99.437

Note: The complete list of villages is available on website of PPCB

Annexure G - (A) Local Bodies which have installed STPs of full capacities

Sr. No	Name of Town	Capacity of STP (MLD)	Technology of STP
1.	Banur	4.0	MBBR
2.	Baretta	3.0	WSP
3.	Bhikhi	3.0	WSP
4.	Budhlada	6.5	MBBR
5.	Khanauri	3.0	SBR
6.	Lehragaga	4.0	SBR
7.	Moonak	3.0	SBR
8.	SAS Nagar	45.4	UASB
9.	Pattran	4.0	SBR
10.	Samana	10.0	SBR
11.	Sardulgarh	4.0	WSP
12.	Sunam	8.0	MBBR
13.	Zirakpur	17.0	SBR
14.	Mandi Gobindgarh	25.0	SBR
	Total	**139.9**	

Annexure G - (B) Local Bodies which have installed partially completed STPs

Sr. No.	Name of the Town	Capacity of the STP already installed (MLD)	Capacity of the STP yet to be installed/ commissioned (MLD)	Status of STP yet to be installed/ commissioned
1.	MC, Dera Bassi	4	2	Construction will be completed by 31.03.2020.
2.	MC Lalru	1.5	1.5	The nearby residents have filed a suit against MC for change of site of 1.5 MLD capacity STP. Construction of 0.3 + 0.3 MLD STP will be completed by 31.12.2020 and 1 MLD STP by 31.10.2020.
3.	Rajpura	7	10	Commissioned for Stablization
4.	Patiala	46	15	Additional module of 15 MLD is likely to be installed by 31.12.2020.
		10.0	-	Sufficient capacity
		13	-	Sufficient capacity
	Total	**81.5**	**28.5**	

Annexure G - (C) Status regarding sewage treatment in urban areas

S.N.	Name of the Town	Population in year 2018	Water consumption (MLD)	Wastewater generation (MLD)	Existing capacity of STP (MLD)	Proposed capacity of the STP (MLD)	Balance quantity yet to be treated (MLD)
1.	Banur	22052	2.98	2.53	4.0	0.0	0.0
2.	Baretta	18533	2.50	2.13	3.0	0.0	0.0
3.	Bhikhi	21937	2.96	2.52	3.0	0.0	0.0
4.	Budhlada	47953	6.47	5.50	6.5	0.0	0.0
5.	Khanauri	15882	2.14	1.82	3.0	0.0	0.0
6.	Lehragaga	25457	3.44	2.92	4.0	0.0	0.0
7.	Mandi Gobindgarh	87323	11.79	10.02	25.0	0.0	0.0
8.	Moonak	20431	2.76	2.34	3.0	0.0	0.0
9.	Mohali	212242	28.65	24.35	45.4	0.0	0.0
10.	Patiala	506012	82.35	70.00	46	Additional module of STP of 15 MLD yet to be installed	14.0
					10		
				6.0	13		
11.	Pattran	32255	4.35	3.70	4.0	0.0	0.0
12.	Rajpura	124821	16.85	14.32	7.0	10.0	7.32
13.	Samana	60591	8.18	6.95	10.0	0.0	0.0
14.	Sardulgarh	23417	3.16	2.69	4.0	0.0	0.0
15.	Sunam	72963	9.85	7.00	8.0	0.0	0.0
16.	Zirakpur	120867	16.32	13.87	17.0	0.0	0.0
17.	Bassi Pathana	22090	2.98	2.53	-	3.0	2.5

S.N.	Name of the Town	Population in year 2018	Water consumption (MLD)	Wastewater generation (MLD)	Existing capacity of STP (MLD)	Proposed capacity of the STP (MLD)	Balance quantity yet to be treated (MLD)
18.	Boha	14206	1.92	1.63	-	2.0	1.63
19.	Lalru	41330	5.58	4.74	1.5	1.5, 1.0, 0.3 & 0.3	3.24
20.	Dera Bassi	50277	6.79	5.77	4.0	2.0 & 2.0	1.77
21.	Sirhind	65706	8.87	7.54	-	5.0, 4.0 & 2.0	7.54
22.	Amloh	19837	2.7	2.28	-	3.0	2.28
23.	Cheema	13087	1.8	1.50	-	2.0	1.5
24.	Dhuri	62614	8.6	7.19	-	5.0 & 6.0	7.19
25.	Sangrur	98671	13.6	11.32	-	11.0 & 4.0	11.32
26.	Nabha	68031	9.4	7.81	-	12.0	7.81
27.	Longowal	28418	3.9	3.26	-	3.0	3.26
28.	Sanaur	24390	3.36	2.80	-	4.0	2.80
29.	Bhadson	8063	1.11	0.93	-	3.0	0.93
30.	Ghanour	7500	1.0	0.8	-	2.0	0.8
	TOTAL		**276.36**	**238.76**	**221.4**	**103.10**	**75.92**

Annexure H - List of Industries located in Dera Bassi area

Sr. No.	Name and Address of industry	Type of industry	Water consump-tion (KLD)	Effluent discharge (KLD)		ETP component	Mode of Disposal of treated wastewater authorized by the Board.
				Trade (KLD)	Domestic Effluent		
1.	T.C. Terrytex Limited, Village Sarsini, PO Lalru, Dera Bassi	Dyeing	2200	1800	50	Physico chemical followed by aerobic biological treatment and tertiary treatment	Onto land for plantation
2.	Bhandari Export Industries Ltd., Village Sarsini, Dera Bassi	Dyeing	200	160	10	Physico chemical followed by aerobic biological treatment and tertiary treatment	Onto land for plantation
3.	Rana Polycot Ltd. (Dyeing Unit), Village Alamgir, Dera Bassi	Dyeing	600	500	3	Physico chemical followed by aerobic biological treatment and tertiary treatment	Onto land for plantation
4.	Nahar Spinning Mills Ltd.(M & D Unit), Village Lehli, PO Dappar, Lalru, Dera Bassi	Dyeing	1850	1700	50	Physico chemical followed by aerobic biological treatment.	Onto land for plantation
5.	Nahar Industrial Enterprises Ltd. (Process House-I), Village Jalalpur, PO Dappar, Dera Bassi	Dyeing	2800	2300	200	Aerobic biological treatment followed by tertiary treatment.	Onto land for plantation
6.	Nahar Industrial Enterprises Ltd. (Process House-2), Village Jalalpur, PO Dappar, Dera Bassi	Dyeing	3500	2750	200	Aerobic biological treatment.	Onto land for plantation
7.	Oswal Denims, Village Dappar, Lalru, Dera Bassi	Dyeing	1100	710	150	Physico chemical followed by aerobic biological treatment and tertiary treatment.	Onto land for plantation
8.	Rainbow Denim Ltd., Village Chaundheri, Dera	Dyeing	590	455	55	Physico chemical followed by aerobic biological treatment	Onto land for plantation

	Bassi (98140-88924)					and tertiary treatment.	
9.	Mirha Exports (P) Ltd., Village Jaula Khurd, Dera Bassi (84276-77844)	Meat Plant	1910	1620	23.5	An-aerobic followed by aerobic biological treatment and tertiary treatment.	Onto land for plantation
10.	SHL Agro foods INC, Village Jaula Khurd, Dera Bassi	Meat Plant	100	75	13.68	Aerobic biological treatment and tertiary treatment.	Onto land for plantation
11.	Cad Chem Laboratories Ltd Village Jaula Kalan, Dera Bassi	Pharmaceutical	36	11	2.6	The industry is generating two type of effluent stream i.e. High TDS and Low TDS. The industry has installed MEE for the treatment of High TDS and installed ETP based on physio-chemical treatment for the low TDS.	Onto land for plantation
12.	Parabolic Drugs Ltd., Village Chachrouli, Dera Bassi	Pharmaceutical	15	12	1.5	MEE for high TDS stream and aerobic biological treatment system for low TDS stream.	Lying closed.
13.	Punjab Chemical & Crop Protection Ltd (Pharma Division), (Old name Alpha Drugs Ltd.), Village Samalheri, Dera Bassi	Pharmaceutical	118	27	10	MEE installed.	ZLD
14.	Nectar Lifesciences Ltd. Unit-2 (Old Name Surya Medicare Ltd.), Village Saidpura, Dera Bassi	Pharmaceutical	220	200	15	MEE for high TDS stream and aerobic biological treatment system for low TDS stream.	Onto land for plantation
15.	Allychem Laboratories (P) Ltd, E-68-69, focal point, Dera Bassi	Pharmaceutical	38	12	3	MEE installed.	The unit was closed by the Hon'ble NGT vide order dated 25.10.2018 passed in OA no. 30 & 33

							of 2013.
16.	Essix Biosciences Ltd., B-4 & 5, Focal Point, Dera Bassi	Pharmaceutical	10	7.2	2	Single stage evaporator for high TDS stream and aerobic biological for low TDS stream.	Onto land for plantation
17.	Vardhman Chemtech Ltd., Focal Point, Dera Bassi.	Pharmaceutical	50	39.5	4.5	MEE installed.	Lying Closed.
18.	Anuja Healthcare Ltd. (Old name Anuja Impex (P) Ltd.), C-26 & C-31, Focal Point, Dera Bassi	Pharmaceutical	176.5	9.5	1.764	MEE installed.	The unit was closed by the Hon'ble NGT vide order dated 25.10.2018 passed in OA no. 30 & 33 of 2013.
19.	Nectar Lifesciences Ltd. Unit-1 (Old Name Surya Medicare Ltd), Village Saidpur, Dera Bassi	Pharmaceutical	175	29	6	ETP common with Nectar Life Sciences Unit-2.	Please see the status of Nectar Life Scineces Unit-2 at S.No. 14.
20.	ARK Healthcare, D-12, Focal Point, Dera Bassi	Pharmaceutical	2.4	1.07	0.5	Low TDS treated through ETP based on physico chemical followed by biological treatment and high TDS teated through Single effect evaporator	The unit was closed by the Hon'ble NGT vide order dated 25.10.2018 passed in OA no. 30 & 33 of 2013.
21.	Panacea Biotech Ltd., Village Samalheri, Near Lalru, Dera Bassi	Pharmaceutical	100	83	13	The industry has installed ETP based on biological treatment.	Onto land for plantation
22.	Punjab Chemicals & Crop Protection Ltd (Agro Division)., Village Bhankharpur, Dera Bassi	Pesticide	193	21	10	MEE installed.	ZLD
23.	Sarwal Pharmaceuticals, F-14, Focal Point, Dera	Pharmaceutical Formulation	3.4	0.2	1.2	Pan type evaporator	The unit was closed by the Hon'ble NGT

	Bassi						vide order dated 25.10.2018 passed in OA no. 30 & 33 of 2013.
24.	Austin Pharmaceuticals, E-40, Focal Point, Dera Bassi	Pharmaceutical Formulation	7	0.1	0.8	Pan type evaporator	The case of this industry has been fixed for next hearing on 9.1.19 before the Hon'ble NGT.
25.	Ticoma Pharmacia, E-47, focal Point Dera Bassi	Pharmaceutical Formulation	1.2	0.06	0.4	Pan type evaporator	ZLD
26.	Steel Strips Wheels Ltd., Village Smalheri, Dera Bassi	Engineering Goods	500	293	75	Physico-chemical treatment.	Onto land for plantation
27.	Prerna Strips, Village Bhankharpur, Dera Bassi	Engineering Goods	1.2	0.5	0.3	Joined CETP	Closed temporarily
28.	A.R. Fastners, E-71, Indl. Focal Point, Dera Bassi	Engineering Goods	2	0.35	0.5	Joined CETP	-
29.	Kiran Industries (Vipan Kumar), F-19, Focal Point, Dera Bassi	Electroplating	0.45	0.15	0.3	Joined CETP	-
30.	Kamal Hi-tech Engineers (P) Ltd, B-10-11, Focal Point, Dera Bassi	Electroplating	10	7.5	2	Joined CETP	-
31.	Morff International, E-27, Focal Point, Dera Bassi	Electroplating	1	0.1	0.4	Joined CETP	The unit was closed by the Hon'ble NGT vide order dated 25.10.2018 passed in OA no. 30 & 33 of 2013.
32.	Kaura Inds.Corp., D-2, Focal Point, Dera Bassi	Electroplating	0.525	0.4	0.1	Joined CETP	-

33.	Yashwani Enterprises, F-28, Focal Point, Dera Bassi	Electroplating	0.5	0.24	0.1	Joined CETP	-
34.	Piyanshu chemicals (P) Ltd., D-22A & D-23, Focal Point, Dera Bassi	Resin manufacturing	5	0.3	0.5	No ETP installed as the quantity of generation of effluent is quite less. Therefore, the industry has installed electric heater.	ZLD
35.	Varindra Organica (P) Ltd., D-24, Focal Point, Dera Bassi	Organic Chemical industry	12	8	2.4	Physico-chemical treatment.	Treated wastewater is used in cooling water as make up water.
36.	Power Chem Plast Ltd.(Formerly Power Drugs Ltd), C-25, Focal Point, Dera Bassi	Organic Chemical industry	1	0	1	Reuse in Cooling Tower	The unit was closed by the Hon'ble NGT vide order dated 25.10.2018 The next date of hearing in the case is 9.1.19.
37.	Vishal Papertech (India) Ltd., Village Mubarikpur, Dera Bassi	Pulp & Paper	1250	1224	8	Primary treatment followed by secondary aerobic biological treatment.	Onto land for plantation
38.	Nachiketa Papers Ltd., Village Mubarikpur, Dera Bassi	Pulp & Paper	196	6	5	Settling tank and sedi cell.	Reused
39.	Molson Coors india (P) Ltd. (Old name Mount Shivalik Breweries), Village Bhankharpur, Dera Bassi	Brewery	800	700	72	The industry has installed ETP based on physico chemical followed by biological treatment.	Onto land for plantation
40.	Chandigarh Distillers & Bottlers Ltd., Banur	Distillery	2500	2310	120	MEE followed by drier for spent wash. Aerobic	ZLD

						Biological treatment system for other streams.	
41.	Rama Industries Ltd., Village Chaundheri, Lalru, Dera Bassi	Gelatine	4810	1615	10	Physico chemical followed by aerobic biological treatment and tertiary treatment.	Onto land for plantation

Annexure I - List of Industries located in Patiala area

S. No.	Name and Address of industry	Type of industry	Water consumption (KLD)	Effluent discharge (KLD)		ETP component	Mode of Disposal of treated wastewater authorized by the Board.
				Trade (KLD)	Domestic (KLD)		
1	Vishal Coater Pvt. Ltd., Vill. Khusropur, Patiala	Pulp & Paper	627	510	6	Aerobic biological treatment.	Onto land for plantation
2	Vishal Paper Industries Pvt. Ltd., Vill. Khusropur, Patiala	Pulp & Paper	1075	510	9	Aerobic biological treatment.	Onto land for plantation
3	SSG Paper Mills, Vill. Khusropur, Maine Road, Patiala	Pulp & Paper	235	90	10	Aerobic biological treatment.	Onto land for plantation
4	Shree Swami Card Board Mills, Bhanri Road, Vill. Main, Distt. Patiala	Paper Board	21	0	0.5	Recirulation system provided.	Reused in the process
5	Mittal Card Board Mills, Vill. Main, Tehsil and Distt. Patiala	Paper Board	18	0	0.5	Recirulation system provided.	Reused in the process
6	DSG Paper Mill, Vill. Bhanri	Pulp & Paper	1076	1000	18	Aerobic biological	Onto land for

	Road, Maine Road, Patiala					treatment	plantation
7	Patiala Distillers & Mfrs. Pvt. Ltd., Vill. Main, Patiala	Distillery	4000	3000	5	Anaerobic treatment followed by aerobic biological treatment	Onto land for plantation

Annexure J - Status of HCFs operating in catchment areas of Ghaggar

Sr. No	Name of the town	No. of HCFs covered	No. of bedded HCFs	No. of non-bedded HCFs	No. of HCFs not made agreement with CBWTF
1	SAS Nagar	170	119	51	33
2	Patiala	499	319	180	39
3	Sangrur	151	125	26	57
4	Mansa	147	92	55	7
5	Fatehgarh Sahib	138	100	38	0

Annexure K - List of schemes commissioned for utilization of treated waste water for irrigation

Sr no.	Name of Town where STPs operational	Capacity of STP (MLD)	STP Technology	Area Irrigated (Hectares)
1	Banur	4	MBBR	65
2	Baretta	3	WSP	130
3	Bhikhi	3	WSP	145
4	Moonak	3	SBR	88
5	Pattran	4	SBR	120
6	Sardulgarh	4	WSP	108
7	Lehragaga	4	SBR	138
8	Sunam	8	MBBR	165
	Total	**33**		**959**

Annexure L - Timelines for setting up of treatment facilities by Local Bodies

(1) PWSSB			
(i) Name of the Project: Providing Sewerage & Construction of 10 MLD STP at Rajpura			
Brief Scope of Work		**1 No. STP of 10 MLD**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	Prepared	Approved
2	Financial Closure	Funds tied up under HUDCO loan (Rs.7.42 crore)	
3	Tendering of the work including allotment	Started	Completed
4	Commencement of work	Started	31.03.2019
5	Quarterly milestones during the construction stage	-	-
6	Completion and commissioning	01.04.2019	30.6.2019
(ii) Name of the Project: Providing Sewerage & Construction of 2 MLD STP at Boha			
Brief Scope of Work		**1 No. STP of 2 MLD**	
1	Preparation of DPR	Prepared	Approved
2	Financial Closure	Funds tied up under HUDCO loan (rs. 23.45 crore)	
3	Tendering of the work including allotment	Tender allotted	
4	Commencement of work	Started	31.03.2020
5	Quarterly Milestones during the construction stage	-	-
6	Completion and Commissioning	01.04.2020	31.07.2020
(iii) Name of the Project: Providing Sewerage & Construction of 2 MLD STP at Cheema			
Brief Scope of the Project		**1 No STP of 2 MLD**	
Sr. No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds being tied up under HUDCO loan (Rs.7.32 crore)	
3	Tendering of the work including allotment	Started	31.07.2019
4	Commencement of work	01.08.2019	31.07.2020

5	Quarterly Milestones during the construction stage	25%	25%
6	Completion and Commissioning	01.08.2020	31.10.2020
(iv)	**Name of the Project: Providing Sewerage & Construction of 2 MLD STP at Bhadson**		
1	Preparation of DPR	07.01.2019	30.05.2019
2	Financial Closure	Funds not tied up. Expected source- Govt. of Punjab. Approximate funds required- Rs. 25 Crore.	31.03.2020
3	Tendering of the work including allotment	01.04.2020	30.09.2020
4	Commencement of work	01.10.2020	31.03.2022
5	Quarterly Milestones during the construction stage	25%	
6	Completion and Commissioning	01.04.2022	30.06.2022
(v)	**Name of the Project: Providing Sewerage & Construction of 12 MLD STP at Nabha**		
	Brief Scope of the Project	**1 No STP of 12 MLD**	
1	Preparation of DPT	Prepared	Already approved
2	Financial Closure	Funds being tied up under HUDCO Loan (Rs.19.15 crore)	
3	Tendering of the work including allotment	Land being finalized and tendering will be started after possession of land – 01.06.2019	30.09.2019
4	Commencement of work	01.10.2019	31.03.2021
5	Quarterly Milestones during the construction stage	25%	
6	Completion and Commissioning	01.04.2021	30.06.2021
(vi)	**Name of the Project: Providing Sewerage & Construction of 5 MLD & 6 MLD STP at Dhuri**		
	Brief Scope of the Project	**Scope: 1 No. STP of 5 MLD**	

Sr. No.	Stage	Start Date	Completion Date
1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds tied up under HUDCO loan (Rs. 56.81 crore)	
3	Tendering of the work including allotment	Tender allotted	
4	Commencement of work	Started	31.03.2020
5	Quarterly Milestones during the construction stage	-	-
6	Completion and Commissioning	01.04.2020	31.07.2020
	Brief Scope of the Project	**Scope: 1 No. STP of 6 MLD**	

Sr. No.	Stage	Start Date	Completion Date
1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds tied up under HUDCO loan	
3	Tendering of the work including allotment	Tender allotted but land is being finalized. Work already allotted.	
4	Commencement of work	Work will be started after possession of land-expected -01.09.2019	31.08.2020
5	Quarterly Milestones during the construction stage	25%	-
6	Completion and Commissioning	01.09.2020	30.11.2020

(vii) Name of the Project: Providing Sewerage & Construction of 11 MLD & 4 MLD STP at Sangrur

	Brief Scope of the Project	**Scope: 1 No. STP of 4 MLD**	
1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds tied up under HUDCO loan (Rs. 100.33 crore)	
3	Tendering of the work including allotment	Tender allotted	
4	Commencement of work	Started	31.03.2020
5	Quarterly Milestones during the construction stage	-	-
6	Completion and Commissioning	01.04.2020	31.07.2020
	Brief Scope of the Project	**Scope: 1 No. STP of 11 MLD**	

1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds tied up under HUDCO loan	
3	Tendering of the work including allotment	Tender allotted but land is being finalized.	
4	Commencement of work	Work will be started after possession of land-expected -01.09.2019	31.08.2020
5	Quarterly Milestones during the construction stage	25%	-
6	Completion and Commissioning	01.09.2020	30.11.2020
(viii)	**Name of the Project:- Providing Sewerage & Construction of 3 MLD STP at Bassi Pathana**		
	Brief Scope of the Project	**Scope:- 1 No. STP 3 MLD**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds tied up under HUDCO loan (Rs. 20.30 crore)	
3	Tendering of the work including allotment	Tender allotted	
4	Commencement of work	Started	31.03.2020
5	Quarterly Milestones during the construction stage	-	-
6	Completion and Commissioning	01.04.2020	31.07.2020
(ix)	**Name of the Project: Providing Sewerage & Construction of 2 MLD STP at Longowaal**		
	Brief Scope of the Project	**1 No STP of 2 MLD**	
1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds being tied up under HUDCO loan (Rs.9.67 crore)	
3	Tendering of the work including allotment	Started	31.07.2019
4	Commencement of work	01.08.2019	31.07.2020
5	Quarterly Milestones during the construction stage	25%	
6	Completion and Commissioning	01.08.2020	31.10.2020
(x)	**Name of the Project: Providing Sewerage & Construction of 3 MLD STP at Amloh**		
	Brief Scope of the Project	**1 No STP of 3 MLD**	

Sr. No.	Stage	Start Date	Completion Date
1	Preparation of DPT	Prepared	Already approved
2	Financial Closure	Funds being tied up under HUDCO Loan (Rs. 12.58 crore)	
3	Tendering of the work including allotment	Land being finalized and tendering will be started after possession of land-01.06.2019	30.09.2019
4	Commencement of work	01.10.2019	30.09.2020
5	Quarterly Milestones during the construction stage	25%	25%
6	Completion and Commissioning	01.10.2020	31.12.2020
(xi) Name of the Project:- Providing Sewerage & Construction of 2 MLD STP at Issapur & Mirpur, Mubarakpur at Derabassi			
	Brief Scope of the Project	**2 No STP of 2 MLD**	
Sr. No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds being tied up under HUDCO loan (Rs. 5.44 crore)	
3	Tendering of the work including allotment	Started	31.07.2019
4	Commencement of work	01.08.2019	31.07.2020
5	Quarterly Milestones during the construction stage	25%	
6	Completion and Commissioning	01.08.2020	31.10.2020
(xii) Name of the Project:-Providing Sewerage & Construction of 1MLD STP at Dappar Lalru			
	Brief Scope of the Project	**1 No STP of 1 MLD**	
Sr. No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	Prepared	Approved.
2	Financial Closure	Funds being tied up under HUDCO loan (Rs. 6.44 crore)	
3	Tendering of the work including allotment	Started	31.07.2019
4	Commencement of work	01.08.2019	31.07.2020
5	Quarterly Milestones during the construction stage	25%	

6	Completion and Commissioning	01.08.2020	31.10.2020

(xiii) Name of the Project: Construction of 1.5 MLD STP at Lalru Mandi

	Brief Scope of the Project	**1 No STP of 1.5 MLD**	
1	Preparation of DPR	Prepared	Approved
2	Financial Closure	Funds being tied up with GMADA (Rs. 3.0 crore)	
3	Tendering of the work including allotment	The residents of Village Lalru have filed a suit in the Court of Law at Dera Bassi for change of site to another location.	
4	Commencement of work		
5	Quarterly Milestones during the construction stage		
6	Completion and Commissioning		

(xiv) Name of the Project:- Providing Sewerage & Construction of 3 MLD STP at Sanour

Brief Scope of the Project		**1 No STP of 3 MLD**	
Sr. No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	Land for STP yet not available. DPR will be prepared after identification of land	
2	Financial Closure	Funds not tied up. Expected source- Govt. of Punjab. Approximate funds required- Rs. 25 Crore .	31.03.2020
3	Tendering of the work including allotment	01.04.2020	30.09.2020
4	Commencement of work	01.10.2020	31.03.2022
5	Quarterly Milestones during the construction stage	25%	
6	Completion and Commissioning	01.04.2022	30.06.2022

(xv) Name of the Project: Providing Sewerage & Construction of 2 MLD STP at Ghanaur

Brief Scope of the Project		**1 No STP of 2 MLD**	
Sr. No.	**Stage**	**Start Date**	**Completion Date**

1	Preparation of DPR	Prepared	Already approved
2	Financial Closure	Funds being tied up under HUDCO Loan (Rs. 3.10 crore)	
3	Tendering of the work including allotment	Started	31.07.2019
4	Commencement of work	01.08.2019	31.07.2020
5	Quarterly Milestones during the construction stage	25%	
6	Completion and Commissioning	01.08.2020	31.10.2020

(xvi) Name of the Project: Providing Sewerage & Construction of 2 MLD, 4 MLD and 5 MLD STPs at Sirhind

Brief Scope of the Project		**3 No. STPs of 2 MLD, 4 MLD and 5 MLD capacity at Sirhind**	
Sr. No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	Prepared	approved
2	Financial Closure	Funds tied up under HUDCO Loan (Rs.74.65 crore)	
3	Tendering of the work including allotment	Tender allotted	
4	Commencement of work	Started	31.03.2020
5	Quarterly Milestones during the construction stage	25%	
6	Completion and Commissioning	01.04.2020	31.07.2020

(xvii) Name of the Project: Providing Sewerage & Construction of 2 STPs of 300KLDeach at Gholumajra and Chaundhehri & Samalheri, Lalru

Brief Scope of the Project		**2 No. STPs of capacity 300KLDat Gholu Majra and Chaundhehri & Samalheri, Lalru**	
Sr. No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPT	Prepared	Approved
2	Financial Closure	Funds being tied up under HUDCO Loan	
3	Tendering of the work including allotment	01.07.2019	30.09.2019
4	Commencement of work	01.10.2019	30.09.2020

5	Quarterly Milestones during the construction stage	25%	
6	Completion and Commissioning	01.10.2020	31.12.2020

(xviii) Name of the Project: Upgradation of existing WSP based STPs to achieve latest CPCB norms at Baretta, bhikhi & Sardulgarh

Brief Scope of the Project		**Upgradation of existing 3no.STPs**	
Sr. No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	01.02.2019	30.05.2019
2	Financial Closure	Funds not tied up. Expected source- Govt. of Punjab. Approximate funds required- Rs. 15 Crore .	31.03.2020
3	Tendering of the work including allotment	01.04.2020	30.09.2020
4	Commencement of work	01.10.2020	30.09.2021
5	Quarterly Milestones during the construction stage	25%	-
6	Completion and Commissioning	01.10.2021	31.12.2021

Annexure M - Timelines for setting up of treatment facilities by MES, Patiala

Name of the Project: Military Engineering Services, Patiala – STP of 6 MLD capacity

Brief Scope of Work		**STP based on MBBR Technology of capacity 6 MLD.**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	August, 2016	January, 2017
2	Financial Closure	Govt. sanctioned Final Report for provision of 6 MLD STP on 27th March, 2017	August, 2020
3	Tendering of the work including allotment	Technical sanction issued for tendering by CECZ (Chief Engg. Chd Zone) on 18th October, 2018	February, 2019
4	Commencement of work	15th March, 2019	August, 2020
5	Quarterly milestones during the construction stage	1st Quarter = 15% 2d Quarter = 20% 3rd Quarter = 30% 4th Quarter = 20% 5th Quarter = 20% In remaining time = 5%	
6	Completion and commissioning	August, 2020	August, 2020

Annexure N - (A) Times lines for installation of online continuous effluent monitoring system

(1)	PWSSB for the STPs already in operation in the towns nanely Banur, Baretta, Bhikhi, Budhlada, Khanuari, Lehragaga, Moonka, Pattran, Rajpura, Samana, Sardulgarh, Sunam, Zirakpur and Mandi Gobindgarh.		
Name of the Project		**All Existing STPs where maintenance is with PWSSB**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Financial Closure	7.1.2019	31.3.2019
2	Tendering of the work including allotment	1.4.2019	30.6.2019
3	Commencement of the work	1.7.2019	30.9.2019
4	Completion and commissioning	1.10.2019	30.11.2019
(2)	**GMADA**		
	Name of the Project	**STP of 45.4 MLD capacity at Sector 83, SAS Nagar.**	
1	Financial Closure	10.1.2019	31.3.2019
2	Tendering of the work including allotment	5.4.2019	10.5.2019
3	Commencement of the work	15.5.2019	30.6.2019
4	Completion and commissioning	30.6.2019	30.6.2019
	Name of the Project	**STP of 4 MLD capacity at Dera Bassi.**	
1	Financial Closure	10.1.2019	31.3.2019
2	Tendering of the work including allotment	5.4.2019	10.5.2019
3	Commencement of the work	15.5.2019	30.6.2019
4	Completion and commissioning	30.6.2019	30.6.2019
Name of the Project		**STP of 1.5 MLD capacity at Lalru**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Financial Closure	10.1.2019	31.3.2019
2	Tendering of the work including allotment	5.4.2019	10.5.2019
3	Commencement of the work	15.5.2019	30.6.2019

4	Completion and commissioning	30.6.2019	30.6.2019
(3) PSIEC			
	Name of the Project	**STP of 2 MLD capcity at Focal Point, Dera Bassi**	
1	Financial Closure	15.2.2019	31.3.2019
2	Tendering of the work including allotment	1.4.2019	20.4.2019
3	Commencement of the work	21.4.2019	20.5.2019
4	Completion and commissioning	21.5.2019	30.5.2019
	Name of the Project	**STP of 3 MLD at Focal Point, Mandi Gobindgarh**	
1	Financial Closure	15.2.2019	31.3.2019
2	Tendering of the work including allotment	1.4.2019	30.4.2019
3	Commencement of the work	1.5.2019	31.5.2019
4	Completion and commissioning	1.6.2019	15.6.2019

Note : For STP to be installed for Focal Point, Nabha, the installation of online continuous effluent monitoring system is a part of the main project and the same will be installed alongwith installation of STP.

(4) Municipal Corporpation, Patiala			
Name of the Project		**STP Shermajra and STP Ablowal**	
Brief Scope of the Project		**Online Continuous Monitoring System**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	11.1.2019	18.1.2019
2	Financial Closure	About 50 lakh	-
3	Tendering of the work including allotment	Within one month	Within four months
4	Commencement of the work	Within four months	Within four months
5	Completion and commissioning	11.4.19	11.5.19
(5) Patiala Development Authority			
	Name of the Project	**STP of 13 MLD capacity at Urban Estate, Patiala**	
	Brief Scope of the Project	**Online Continuous Monitoring System**	
1	Financial Closure	1.1.2019	31.1.2019
2	Tendering of the work including	1.2.2019	15.2.2019

	allotment		
3	Commencement of the work	20.2.2019	15.3.2019
4	Completion and commissioning	16.3.2019	31.3.2019

Annexure N - (B) Times lines for installation of CCTV cameras in already operational STPs

(1) PWSSB for the STPs already in operation in the towns namely Banur, Baretta, Bhikhi, Budhlada, Khanuari, Lehragaga, Moonka, Pattran, Rajpura, Samana, Sardulgarh, Sunam, Zirakpur and Mandi Gobindgarh.

Name of the Project		**All Existing STPs where maintenance is with PWSSB**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Financial Closure	5.1.2019	15.2.2019
2	Tendering of the work including allotment	15.2.2019	31.3.2019
3	Commencement of the work	1.4.2019	15.4.2019
4	Completion and commissioning	15.4.2019	30.4.2019
(2) **GMADA**			
	Name of the Project	**STP of 45 MLD capacity at Sector 83, SAS Nagar.**	
1	Financial Closure	10.1.2019	31.3.2019
2	Tendering of the work including allotment	5.4.2019	10.5.2019
3	Commencement of the work	15.5.2019	30.6.2019
4	Completion and commissioning	30.6.2019	30.6.2019
	Name of the Project	**STP of 4 MLD capacity at Dera Bassi.**	
1	Financial Closure	10.1.2019	31.3.2019
2	Tendering of the work including allotment	5.4.2019	10.5.2019
3	Commencement of the work	15.5.2019	30.6.2019
4	Completion and commissioning	30.6.2019	30.6.2019
Name of the Project		**STP of 1.5 MLD capacity at Lalru**	
1	Financial Closure	10.1.2019	31.3.2019
2	Tendering of the work including allotment	5.4.2019	10.5.2019
3	Commencement of the work	15.5.2019	30.6.2019
4	Completion and commissioning	30.6.2019	30.6.2019
(3) PSIEC			

	Name of the Project	**STP of 2 MLD capacity at Focal Point, Dera Bassi**	
1	Financial Closure	15.2.2019	15.3.2019
2	Tendering of the work including allotment	16.3.2019	31.3.2019
3	Commencement of the work	1.4.2019	20.4.2019
4	Completion and commissioning	21.4.2019	30.4.2019
	Name of the Project	**STP at Focal Poinat, Mandi Gobindgarh**	
1	Financial Closure	1.3.2019	15.3.2019
2	Tendering of the work including allotment	16.3.2019	15.4.2019
3	Commencement of the work	16.4.2019	15.5.2019
4	Completion and commissioning	16.5.2019	31.5.2019
	Name of the Project	**STP at Focal Point, Nabha**	
1	Financial Closure	1.4.2019	15.4.2019
2	Tendering of the work including allotment	16.4.2019	15.5.2019
3	Commencement of the work	16.5.2019	31.5.2019
4	Completion and commissioning	1.6.2019	15.6.2019

(4) **Municipal Corporpation, Patiala**			
Name of the Project		STP (Shermajra and Ablowal)	
Sr.No.	Stage	Start Date	Completion Date
1	Financial Closure	20-25 thousands	10-15 days
2	Tendering of the work including allotment	CCTV cameras and monitor already have been installed and the new wiring work will be completed within 10-15 days.	
3	Commencement of the work		
4	Completion and commissioning		

(5) Patiala Development Authority			
Name of the Project		**STP of 13 MLD capacity at Urban Estate, Patiala**	
Brief Scope of the Project		CCTV camera	
Sr.No.	**Stage**	Start Date	Completion Date
1	Financial Closure	1.1.2019	31.1.2019

2	Tendering of the work including allotment	1.2.2019	15.2.2019
3	Commencement of the work	20.2.2019	15.3.2019
4	Completion and commissioning	16.3.2019	31.3.2019

Annexure O - Timelines for setting up of treatment facilities in Rural areas

The phase wise timelines are given as under:

Phase – I			
Brief Scope of Work		**Treatment facilities 87 villages having total discharge of 32.17 MLD**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	1.03.2019	30.06.2019
2	Financial Closure	1.07.2019	31.08.2019
3	Tendering of the work including allotment	1.09.2019	30.10.2019
4	Commencement of work	1.11.2019	31.05.2020
5	Quarterly milestones during the construction stage	-	-
6	Completion and commissioning	1.06.2020	30.06.2020
Phase – 2			
	Brief Scope of Work	**Treatment facilities 152 villages having total discharge of 43.49 MLD**	
1	Preparation of DPR	1.03.2020	30.06.2020
2	Financial Closure	1.07.2020	31.08.2020
3	Tendering of the work including allotment	1.09.2020	30.10.2020
4	Commencement of work	1.11.2020	31.05.2021
5	Quarterly milestones during the construction stage	-	-
6	Completion and commissioning	1.06.2021	30.06.2021
Phase – 3			
Brief Scope of Work		**Treatment facilities 150 villages having total discharge of 23.76 MLD**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	1.03.2021	30.06.2021
2	Financial Closure	1.07.2021	31.08.2021

3	Tendering of the work including allotment	1.09.2021	30.10.2021
4	Commencement of work	1.11.2021	31.05.2022
5	Quarterly milestones during the construction stage	-	-
6	Completion and commissioning	1.06.2022	30.06.2022

Note: Phase-wise list of villages is uploaded on website of PPCB.

Annexure P - Timelines for providing irrigation schemes to utilize the treated sewage

Name of Project		Utilization of Treated Water from Sewerage Treatment Plants (STP's) situated in Ghaggar Catchment	
Projects Details/Funds		Amount of 7111.00 lakhs is required for creation of Irrigation Infrastructure from all STP's whether completed, under progress and proposed.	
Brief Scope of Project		The project involves laying network of underground pipelines from Sewerage Treatment Plants for conveyance of treated water for irrigation in agricultural fields.	
S.No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	Under Progress	30.6.2019
2	Financial Closure	Projects already proposed to GoI and State for funding (71.11 cr required)	T
3	Tendering of Work including allotment	T+1 month	T+4 months
4	Commencement of Work	T+5 months*	T+11 months*
5	Quarterly Milestone during construction Stage	NA	NA
6	Completion and Commissioning	T+11 to T+18 months	T+14 to T+20 months

*Delay in commencement of work after funding and tendering process is mainly because as irrigation pipeline has to be laid in agricultural fields, due to which irrigation projects can be installed during harvest season. It shall depend upon month of availability of funds for projects, i.e. why period of 1-month upto 6 month has been identified in commencement of work.

Fund Requirement for Individual Irrigation Projects from STP's

S No.	Name of Town	Capacity of STP (MLD)	STP Technology	Irrigation system Cost (Rs. In Lakh)
	STP's Operational			
1	Khanauri	3.0	SBR	110.00
2	Mandi Gobindgarh	25.0	SBR	673.00
3	Patiala	46.0	SBR	2800.00
	Total (A)	**74.0**		**3583.00**
	STP's under Construction			
	PWSSB			
1	Bassi Pathana	3.0	SBR	115.00
2	Boha	2.0	SBR	65.00
3	Sirhind	5.0	SBR	225.00
		4.0	SBR	109.00
		2.0	SBR	80.00
4	Rajpura	10.0	SBR	390.00
5	Dhuri	5.0	--	175.00
6	Sangrur	4.0	--	150.00
	PSIEC			
1	Industrial Focal point, Mandi Gobindgarh	3.0		82.00
2	Industrial Focal Point, Nabha	2.5		--
	GMADA			
1	Lalru (GMADA)	3.0	SBR	85.00
2	Dera Bassi (GMADA)	3.5	SBR	108.00
	Total (B)	**47.0**		**1584.00**
	STP's Proposed to be Constructed			
	PWSSB			
1	Amloh	3.0	--	115.00
2	Bhadson	3.0	--	85.00
3	Cheema	2.0	--	70.00
4	Dera Bassi (Issapur & Amirpur)	2+2	--	145.00
5	Dhuri	6.0	--	225.00
6	Ghanaur	2.0	--	74.00
7	Sangrur	11.0	--	385.00
8	Nabha	12.0	--	325.00
9	Lalru	1.5	--	60.00

10	Longowal	3.0	--	105.00
11	Lalru Dappar	1.0	--	25.00
12	Gholu Majra	0.3	--	10.00
13	Sanour	4.0	--	125.00
14	Chandheri & Samlheri	0.3	--	10.00
	Total (C)	**53.1**		**1759.00**
	MES Patiala (D)			
1	Patiala	6.0	--	185.00
GRAND TOTAL (A+B+C+ D)		**176.5**		**7111.00**

Irrigation Projects from STP Mohali (46 MLD), Zirakpur (17 MLD), Patiala (10MLD), Budhlada (6.5 MLD) a not feasible because of non-availability of Irrigation command as STP is located in urbanized area

Annexure Q - Installation of STPs by PSIEC

Name of the Project		**Operation and Maintenance STP, IFP, Mandi Gobindgarh (3 MLD)**	
Sr.No.	**Stage**	**Start Date**	**Completion Date**
1	Preparation of DPR	NA	NA
2	Financial Closure	NA	NA
3	Tendering of the work including allotment	NA	NA
4	Commencement of the work	In progress	31.3.2019
5	Quarterly Milestones during the construction stage	-	-
6	Completion and commissioning	1.4.2019	30.5.2019
	Name of the Project	**Operation and Maintenance of STP, IFP, Nabha of 2.5 MLD(work already in progress)**	
1	Preparation of DPR	NA	NA
2	Financial Closure	NA	NA
3	Tendering of the work including allotment	NA	NA
4	Commencement of the work	In progress	30.9.2019
5	Quarterly Milestones during the construction stage	-	-
6	Completion and commissioning	1.10.2019	30.11.2019

Annexure R - Timelines for Online Continuous Monitoring System for Industries

Sr No.	Activity	Date of Start	Date of completion
1	Procurment Process	01.02.2019	28.02.2019
2	Finalization of Supply orders	01.03.2019	31.03.2019
3	Installation of online continuous monitoring system	01.04.2019	31.05.2019
4.	Caliberation of online continuous monitoring system	01.06.2019	30.06.2019
5.	Connecting the online continuous monitoring system with the server of PPCB	01.07.2019	31.07.2019

Annexure S - Monitoring of Progress of projects for setting up of new/up graded facilities

Name of the Project		**Progress achieved at the end of the month**		
Brief Scope of the Project				
S. no.	**Stage**	**Start Date**	**Completion Date**	**Current Status**
1	Preparation of DPR			
2	Financial Closure			
3	Tendering of the Work including allotment			
4	Commencement of Work			
5	Quarterly Milestones during the construction / development Stage			
6	Completion and Commissioning			

Annexure T - Performa for operational record of the STP

Location of STP	Capacity of STP (MLD)	Reading of Water meter at 8 am	Quantity of waste water treated (in KLD)	Sludge wasted (kg/day)	Qty. of Chlorine used/ DAY (Kg/day)	Details of chemical used for dozing purpose and the component at which the same was imparted.	Name of the component remained out of order during the day and reasons thereof.	Qty of treated w/w reused for irrigation of agricultural land / irrigation of green area / construction purpose (KLD)	Qty of treated w/w discharged into drain leading to river Ghaggar (KLD)

Annexure U - Performa for keeping reocord of analaysis result of STP

Date of Sampling	Point of sampling	Values of the parameters in mg/l except pH				
		pH	TSS (mg/l)	BOD (mg/l)	T.Coli (MPN/100 ml)	F.Coli (MPN/100 ml)

Annexure V - Proforma regarding inspection of industries by PPCB

S.No.	Name & location of the industry	Date of visit	Observations noticed during visit	Analysis results of trade effluent samples	Whether meeting with the effluent standards or not	Remarks, if any

Annexure W - Proforma for monitoring of water quality of River Ghaggar

Sr. no.	Sampling points at river Ghaggar	Date of Sampling	DO (mg/l)	pH	BOD (mg/l)	T.Coliform (MPN/100 ml)	D.B.U. classification

Annexure X - Proforma for submission of report regarding Health Check Camps

Sr. No.	Location of the camp	Date on which camp was organized	Name of the Doctor(s) & name of their organization	No. of people examined	No. of people found effected with water borne disease

Annexure Y - Proforma for submission of report regarding awareness programme

Sr. No.	City / Town / Location where the awareness programme is organized	Name of the Officer(s) who hold this programme	Date	No. of participants	Brief detail about awareness detail