Action Plan for
Reuse of Treated Wastewater

30th June, 2020

Directorate of Environment and Climate Change,
Department of Science, Technology and Environment,
Government of Punjab

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Chapter 1 - Introduction

1.1 Water

1.1.1 Water is vital for all life forms on earth. Though it is an abundant and renewable natural resource, yet only 2.7% of global water is available as fresh water, and of this, only 30% is available to meet the water demand of mankind and livestock. The era of surplus river basins, high water tables and generously yielding under-exploited aquifers, plentiful dispersed water availability, certainty of supplies and conservative lifestyle is fast transforming into a less certain future with increasing demand, emerging limits of available supplies, infrastructure constraints, competing users contesting the finite resource and consumptive lifestyle.

1.1.2 Climate change and global warming are just the latest entrants to a long list of variables that may enhance the temporal and spatial variation in resource availability. All forecasts point towards increasing water stress with exploding demand, especially urban, putting pressure on unevenly distributed, limited and increasingly variable resources. The receding glaciers, adverse effect on river flows, changing rainfall patterns with a trend towards extreme events is a pointer towards emerging challenges requiring deeply considered responses.

1.1.3 Additionally, the over-abstraction of water resources is adversely affecting ecosystem functions and resource sustainability. River base flows in lean season and monsoon driven floodwater recharge of floodplain aquifers have declined. River ecological functions have been affected with conditions no longer conducive for aquatic and riverine habitats negatively affecting a host of organisms and consequently their river cleansing function as well as availability of fish resources.

1.2 Punjab – Land of Rivers

1.2.1 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. The non-perennial river Ghaggar flows from eastern part to south- western part of the state.

1.2.2 The perennial rivers in the State with a water potential of about 14.54 Million Acre Feet(MAF) 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. However, demand of water is growing in agriculture, domestic, industrial and commercial sectors with growing population and their needs, leading to over- exploitation of water resources.

1.3 Rapid Urbanization and Industrialization – Main cause of Pollution

1.3.1 The rapid urbanization and industrialization during the last few decades have adversely affected 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 river line system of the State. In the rural areas, due to increase in the population, the capacity of most of the ponds have 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.

1.3.2 Therefore, the quality of water flowing in the water bodies has deteriorated as these water lack sufficient assimilation capacity for self-purification. This has been 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 dams & regulatory headworks on the upstream side.

1.3.3 The disposal of wastewater generated from cities or from industrial areas is a big challenge not only for Punjab state but also at national and international level. The improper disposal of wastewater into drains & rivers and its percolation to ground water could have adverse implications on public health and aquatic ecosystem.

1.4 Action Plans for Clean Rivers

1.4.1 Three comprehensive Action Plans for Clean River Sutlej, Beas and Ghaggar have been prepard by Department of Environment, Punjab in consultation with relevant stakeholder departments in compliance to directions of National Green Tribunal (NGT). The Action Plans aim to restore the river water quality to prescribed standards to ensure ecological balance and socio-economic well-being of the people. The identification of sources of pollution, measures to control pollution within prescribed timelines, integration of departmental plans, regular monitoring and review, etc. are the key components of Action Plans.

1.4.2 A separate chapter on reuse of treated wastewater for irrigation purposes giving present status and future projects along with timelines has been included in all the Action Plans.

1.4.3 The implementation of the Action Plans is being monitored on monthly basis by River Rejuvenation Committee under the Chairmanship of Principal Secretary, Science, Technology & Environment, State Apex Committee under the Chairmanship of Chief Secretary and NGT appointed Monitoring Committee for the State of Punjab under Chairmanship of Former Judge, Punjab & Haryana High Court.

1.5 Reuse of Treated Wastewater

1.5.1 The existing water resources of the State are under high stress due to intensive agricultural practices with cropping intensity of >190% (Highest in India). The alarming decline in groundwater table is one of the major environmental issues assailing the state. Moreover, the volume of wastewater generated by domestic,

industrial and commercial sources has increased with population, urbanization, improved living conditions and economic development. The treated wastewater produced by Sewage Treatment Plant (STPs) can act as additional source of water for utilizing for non-potable purposes to supplement limited fresh water resources available in the State.

1.5.2 Therefore, it is imperative to explore option for reusing the available treated wastewater for irrigation, construction purposes, green belts & urban landscaping, industrial use, thermal plants, construction activities, dust suppression, rejuvenation of water bodies and emergency services like fire brigade, etc.

1.6 State's Efforts to Reuse of Treated Water

1.6.1 The Government of Punjab has notified "The State Treated Waste Water Policy 2017" to promote recycling and reuse of treated sewerage for non-potable applications. Till date, 47 number projects have been completed by Department of Soil & Water Conservationfor using 243.3 MLD treated wastewater of STPs. These projects have been implemented by laying underground pipeline system for irrigation water conveyance covering an area of 7652 hectares.

1.6.2 The Department further proposes to utilize 1238.8 MLD of treated wastewater from 164 existing, under progress and proposed/new STPs for irrigation purposes for an agricultural area of 37,683 hecetare. Others relevant Departments are also exploring various options to promote utilization of the treated wastewater of STPs for non-potable use such as revival of water bodies & wetlands, domestic use, construction activities, industrial processes, urban landscaping & green belts, etc.

1.7 Directions issued by NGT

1.7.1 National Green Tribunal (NGT) in the matter of Original Application No. 148/2016 (M.A. No. 686/2017 dated 27.11.2018) titled as Mahesh Chandra Saxean Vs South Delhi Municipal Corporation & Ors. has directed all the States & Union Territories to prepare and furnish their Action Plans for utilization of treated wastewater in there respective States/UTs within three months. The Action Plans needs to be furnished to CPCB for further review and furnishing a report of compliance to NGT on or before 30th April, 2019.

1.7.2 Action Plan for Re-use of treated wastewater for the State of Punjab was prepared in consultation with stakeholder Departments and submitted to Central Pollution Control Board (CPCB) on 30th April, 2019 in compliance of NGT order dated 27.11.2018 in O.A. No. 148/2016 (M.A. No. 686/2017) titled, " Mahesh Chander Saxena) V/s. South Delhi Municipal Corporation & Others.

1.7.3 CPCB as per the directions of the NGT dated 10.05.2019 directed all States/ UTs to cover the following action points in the Action Plan for Re-use of Treated Sewage:

(i) Estimation of quantity of present & projected sewage generation
(ii) Estimation of Present and Planned treatment capacity

(iii) Identification of Bulk users (irrigation, horticulture, industries, PWD and Railways etc.) and to quantify the usage.
(iv) Estimation of quantity of treated sewage to be used by the bulk users
(v) Specification of timelines to meet the target.

The Action Plans submitted by all the States/UTs were reviewed by CPCB w.r.t. above mentioned action points.

1.7.4 NGT vide Order dated 21.05.20 in O.A. No. 593/2017 with O.A. No. 148/2016 w.r.t. formulation and execution of plans for sewage treatment and utilization of treated sewage effluent, directed as under.

(i) States, which have not addressed all the action points, may do so promptly latest before 30.06.20 reducing the timelines in the action plans. The timelines must coincide with the timelines for setting up of STPs since both the issues are interconnected. All the States may take steps accordingly. The CPCB may compile further information on the subject. The compliance for action plans will be the responsibility of the Secretaries of Urban Development/ other concerned, including Irrigation & Publich Health, Local Bodies, Rural Development Departments of all the States/ UTs and to be overseen by the Chief Secretaries.

(ii) Needless to say that since the issue of sources of funding has already been dealt with in the orders of the Hon'ble Supreme Court, the States was not put up any excuse on this pretext in violation of the judgment of the Hon'ble Supreme Court.

(iii) CPCB may furnish its report by 15.09.2020 giving the status of furnishing of action plans and their execution as on 31.08.2020.

1.7.5 In pursuance to the above-mentioned directions of NGT, the said Action Plan for Re-use of Treated Wastewater has been revised.

Chapter 2 - Vision, Mission and Strategy

2.1 Overarching Vision of the State - Mission Tandarust Punjab

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

2.2 Vision for Reuse of Treated Wastewater

To promote reuse of treated sewerage on sustainable basis for non-potable applications, therby reducing dependence on fresh water resources and enhancing water efficiency.

2.3 Mission for Reuse of Treated Wastewater

To prepare and implement a comprehensive action plan for reuse of treated wastewater:

(i) Creating awareness about the adverse impact of water pollution & conservation of water resources
(ii) Identifying the treated wastewater utilization avenues as per site specific conditions
(iii) Creating infrastructure for utilization of treated wastewater for various non-potable purposes such as irrigation, industrial use, urban landscaping, rejuvenation of water bodies, construction activities etc.
(iv) Mitigating adverse impact on health of the people
(v) Environment restoration & repleshiment of surface water

2.4 Strategy for Reuse of Treated Wastewater

The strategy for reuse of treated wastewater includes:

(i) Identification of Stakeholders
(ii) Identification of sources of treated wastewater
(iii) Measures to use treated wastewater 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 reuse of treated wastewater by involving all the Stakeholders namely:

2.5.1 Department of Science, Technology and Environment

The Directorate of Environment and Climate Change will be responsible for the following:

(i) Overall coordination of the Action Plan for ensuring its successful implementation
(ii) Regular review and monitoring

2.5.2 Department of Soil & Water Conservation

Department of Soil & Water Conservation is responsible for creating requisite infrastructure for utilization of treated wastewater of all the small & medium size STPs for irrigation purposes after conducting a detailed feasibility analysis based on the location of the STPs and availability of

adequate command area. In addition to this, the department also 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
(iv) Create awareness among farmers on reuse of treated wastewater for irrigation

2.5.3 Department of Water Resource

The Department of Water Resources is responsible for creating requisite infrastructure for utilization of treated wastewater of all the existing and proposed STPs of higher capacity for irrigation & other purposes such as rejuvenation of water after conducting a detailed feasibility analysis based site specific conditions.

2.5.4 Punjab Pollution Control Board

(i) Regulation of STPs
(ii) Laying down discharge standards for STPs suitable for their appropriate reuse
(iii) Explore the feasibility of reusing the treated sewage of nearby STPs for industries to meet their water demand.

2.5.5 Department of Local Government

Department of Local Government and Municipal Corporations are responsible for ensuring that the treated wastewater from various STPs setup by them be used appropriately for various non-potable purposes as feasible to reduce reliance on surface and ground water resources. The Department is also responsible for proper operation & management of various STPs to ensure regular supply of treated wastewater as per prescribed norms of PPCB.

2.5.6 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 STPs 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 2.5.5 for Department of Local Government. The Department would also explore the feasibility for utlilization of treated sewage for construction purposes.

2.5.7 **Department of Power**

Minstry of Power, Govt. of India has already made it mandatory for Thermal Power Plants (TPP) which are located within a 50 km radius of a STP to use treated water of STP for cooling purposes. The direction has been issued vide Tariff Policy notified by Govt. of India on 28th January, 2016 under para 6.2(5). Department of Power, Punjab would facilate & coordinate the implementation of Govt. of India directions for reuse of treated sewage for cooling purposes in Govt as well as private Thermal Power Plants of Punjab.

2.5.8 **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 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

(ii) The monitoring will be done at the District level, State Level and by the NGT appointed Monitoring Committee as and when required.

Chapter 3 – Current Status of Reuse of Treated Wastewater

3.1 The State Treated Wastewater Utilization Policy

3.1.1 The Department of Local Govt. has notified "The State Treated Waste Policy -2017" to promote the recycling and reuse of treated sewage for non-potable application and to make sewage projects economical and environmentally sustainable.

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

3.2 Standards for treated wastewater

3.2.1 Punjab Pollution Control Board vide Notification Dated 28.03.19 has laid down the following standards/guidelines for discharge of treated domestic effluents at the outlets of STPs in the state of Punjab:

Sr. No.	Parameters	Standards
1	pH	6.5-9.0
2	Biochemical Oxygen Demand (BOD)	30 mg/l
3	Total Suspended Solids(TSS)	<100 mg/l
4	Fecal Coliform (FC)	<1000 MPN/100 ml

Note

1. These standards shall be applicable for discharge into water bodies as well as land disposal/application
2. The standards fro FC shall not apply w.r.t use of treated effulent for industrial purposes
3. Reuse/recycling of treated effluents shall be encouraged and in case where part of treated effluent is reused and recycled involving possibility of human contact, standards as prescribed above shall apply.

3.2.2 Central Pollution Control Board has the following water quality criteria for utilization of wastewater for irrigation, industrial cooling and controlled waste disposal:

Sr. No.	Parameters	Standards
1	pH	6.0-8.5
2	Electrical Conductivity at 25°C micro mhos/cm	≤ 2250
3	Sodium Absorption Ratio mg/l	≤ 26
4	Boron mg/l	≤ 2

3.3 Present and Projected/Planned Sewage Generation and Treatment Capacity

The treated wastewater produced by STPs can act as reliable source of water. Hence, there is s need to adopt new perspective to wastewater and its reuse for various purposes as per the local conditions. There are 117 operational STPs in the catchment areas of 3 rivers and other towns of

the State having a total capacity of 1678.5 MLD. Further, 131 new STPs with treatment capacity of 883 MLD are being setup in the State with details as below:

S.No.	Catchment	Existing STPs		Proposed New STPs	
		No. of STPs	Capacity (MLD)	No. of STPs	Capacity (MLD)
1	Sutlej	51	962	32	477.0
2	Beas	17	102	13	32
3	Ghaggar	24	239	30	123
4	Other Towns	25	375.5	56	251
	Total	**117**	**1678.5**	**131**	**883**

The total projected sewage generation of the State is 2561.5 MLD, out of which 1678.5 MLD (65.52%) is presently being treated by 117 STPs and the remaining gap of 883 MLD (34.48%) would be addressed by 131 new STPs being setup in the State. The details of existing and new STPs to be setup along with timelines are at **Annexures A** & **B**, respectively.

The resue of treated wastewater from existing STPs for non-potable purposes can play a significant role in meeting the ever-increasing demand of water and decrease dependency on ground water.

3.4 Reuse of Treated Wastewater for irrigation purpose

3.4.1 Punjab is ranked first in India for utilizing treated water for irrigation purposes. The Department of Soil & Water Conservation initiated programme for conveyance of treated water from STPs for towns/cities in 2013-14 under Govt. of Punjab's mission for Cleaning of Rivers. Initially, the programme was launched in Nangal, District Ropar and Sultanpur Lodhi, District Kapurthala on pilot basis with the financial support of Local Bodies. The farmers were motivated to use treated water instead of ground water for irrigation purposes. The projects were very well received by farming community.

3.4.2 Department of Soil & Water Conservation, Punjab has till date completed 47 projects for using 243.3 MLD of STPs. Besides helping in conservation of underground water, the reuse of treated wastewater for irrigation has also reduced farmers input cost, it being rich in nutrient content. These projects have been implemented by laying underground pipeline system for irrigation water conveyancecovering an area of 5541 hectares in the catchment of river Sutlej, Beas, Ghaggar and other towns as per following details:

Catchment	No of STPs	Reuse of Treated Water (MLD)	Area Covered (hectares)
Satluj	23	125.7	3556
Beas	10	56.1	1555.8
Ghaggar	9	43	1427
Other Towns	5	18.5	558
Total	**47**	**243.3**	**5541**

Further, 4 projects are utilization of treated water for irrigation are under progress. These projects will cater an approximate area of 490 ha while irrigation projects from 10 STPs is not feasible. The STPs wise details of completed, under progress and not feasible irrigation projects form various STPs are at **Annexure C, D and E,** respectively.

3.4.3 The program has been major success story of Department and readily adopted by farming community as it assured continued water availability & minimized their dependence on limited electricity supply. The STP Phagwara (28 MLD) has been conferred Water Mission Award, 2019 by Ministry of Jal Shakti, Govt. of India

3.4.4 Further, a project amounting to Rs 94.49 cr has also been approved under NABARD-Rural Development Infrastructure Fund (RDIF-25) scheme for reuse of treated sewage of 23 STPs having the total capacity of 280.5 MLD for irrigation purposes in command area of 9,749 ha **(Annexure F).** NABARD has release a mobilization advance of Rs 17.79 cr to Finance Department, Govt. of Punjab and work will be commenced soon.

3.4.5 The lack of requisite command areas and interest of farmers due to easy availability of fresh water are alsomajor impediementsin case of some STPs for reuse of treated water for irrigation.

3.4.6 From the experience of using STP's treated wastewater for irrigation purposes, the 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 STP operating agency.

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

(iv) Further, as these projects are community projects, sometimes disputes between farmers lead to delay/strucking up of projects.

3.5 Reuse of Treated Wastewater for construction purpose

The treated water of 0.5 MLD of 13 MLD STP (MBBR) set up by Patiala Development Authoirity at Urban Estate Patiala is being provided for construction purposes through tankers.

Chapter 4- Various Measures for Reuse of Treated Wastewater & Timelines

4.1 Recycling and reuse of wastewater

4.1.1 Recycling and reuse of wastewater is an important aspect of water management providing a way to increase water availablilty. Nearly 90% of the wastewater generated in Israel is re-used, making it the leading nation in water recycling. Through water conservation and reuse, Israel has been able not only to survive drought and periods of water scarcity, it has been able to thrive and use reclaimed water as a fulcrum for creating new businesses and economic opportunities. The treated wastewater in Israel is predominantly used for irrigation and remaining for environmental purposes such as increasing river flow volume and for fire suppressions. Recycled water can satisfy most water demands, as long as it is adequately treated to ensure water quality appropriate for the use.

4.2 Indentification of Bulk Users

4.2.1 In order to promote resue of treated wastewater of STPs, the following potential users have been identified:

(i) Setting up of facilities for reuse of treated wastewater for Irrigation
(ii) Utilization of treated wastewater for rejuvenation of water bodies such as wetlands and drains
(iii) Promotion for reuse for other non-potable puposes
  (a) Industrial processes
  (b) Aquaculture
  (c) Urban lanscapping & Green belts
  (d) Construction activities
  (e) Domestic Reuse (Flushing, cleaning, lawns, etc.)
  (f) Thermal Power Plants (Cooling purposes)
  (g) Sprinkling for dust control
  (h) Washing of railway tracks
  (i) Fire brigades /hydrants

4.3 Reuse of Treated Wastewater for Irrigation

4.3.1 Based on sucesss of commissioned projects, Department of Soil and Water Conservation has prepared an Action Plan to utilize 1238.8 MLD of treated wastewater from 164 existing, under progress and proposed STPs in the catchment of rivers and other towns for irrigation purposes for an agricultural area of 37,683 hecetars. The ultimate aim of the Action Plan is to reduce the stress on fresh water resources of the state by creating an alternate source of irrigation. The nutrient value of treated wasterwater is also as important as the water itself.

4.3.2 Department of Soil and Water Conservation has also submitted project of Rs. 269 crores to Government of India (GOI) under Pradhan Mantri Krishi Sanchai Yojna (PMKSY) for re-using the treated sewage of 52 STPs for irrigation. GOI has informed that the proposal may be considered under a new scheme “Incentivising Scheme for Bridging Irrigation Gap (ISBIG)” proposed by Deptt. of Water Resources, RD&GR, Ministry of Jal Shakti. The scheme under process for approval at GOI level.

4.3.3 The proposed Physical & Financial targets of Action Plan are as under:

(i) As already explained in Chapter 3 (Sr. No 3.4), the irrigation schemes have already commissioned in 47 STPs **(Annexure C),** under progress in 4 STPs (**Annexure D**) & Non feasible in 10 STPs **(Annexure E).**

(ii) Further, irrigation schemes for reuse of treated sewage of 23 STPs having the total capacity of 280.5 MLD **(Annexure F)** has also been approved under NABARD-Rural Development Infrastructure Fund (RDIF-25).

(iii) The proposed physical and financial targets for reuse of remaining 163 existing/under construction and proposed STPs are as under:

STP Status		**No of STP's**	**Treated Wastewater (MLD)**	**Area to be benefitted (ha)**	**Funds Required (In Cr)**
Sutlej					
1	Existing/Under construction	17	170.9	5998	76.90
2	Proposed	31	473	10500	133.20
Beas					
1	Existing/Under construction	8	49	1664	16.65
2	Proposed	13	34.5	1182	15.52
Ghaggar					
1	Existing/Under construction	8	82	2871	42.85
2	Proposed	28	107.1	3690	48.20
Other Towns					
1	Existing/Under Construction	6	100.25	3579.5	45.52
2	Proposed	53	222.05	8199	100.81
Total		**164**	**1238.8**	**37,683.5**	**479.65**

The STPs wise details for river Sutlej, Beas, Ghaggar and other towns along with timelines and fund requirement for existing and proposed STPs is given at **Annexure G and H** respectively. Funds requirement has been calculated for preparing Comprehensive Irrigation Management Plan from STPs as per Guidelines for Utilisation of Effluent for Irrigation, 2019 issued by Central Pollution Control Board (CPCB) as per directions issued by Hon'ble NGT in O.A. No. 348/2017, Shailesh Singh Vs Al-Dua Food Processing Pvt. Ltd.

4.4 Reuse of Treated Wastewater for Rejuvenation of Water Bodies

4.4.1 Treated wastewater of STPs can be used for rejuvenation of defunct waterbodies and for maintaining Environmntal Flow of rivers by mixing with good quality water. World over, many natural waterbodies have been revived by using treated wastewater.

4.4.2 Department of Water Resources also need to explore ways to utilize the wastewater of others STPs for rejuvenating water bodies or recharging of groundwater after carry out scientific analysis.

4.5 Reuse of Treated Wastewater for Other Non-potable purposes

4.5.1 The resue of treated wastewater for various non-potable purposes such as domestic reuse (flushing, cleaning, lawns, etc.), watering of green belts & parks, sports grounds, golf courses, institutional use, offices, shopping malls, housing societies, sprinkling for dust control in urban areas need to be promoted by Department of Local Government and Department of Housing & Urban Planning on priority basis.

4.6 Reuse of Treated Wastewater for industrial Use

4.6.1 Reusing water in industry has the potential to reduce the costs of water supply and wastewater treatment by industries and reduces pressure on water resources. It also helps in increasing productivity per water input, lowering wastewater discharges and their pollutant load, reducing energy consumption and potentially processing cost. However, the reuse of wastewater in industries mainly depend upon the type of industry, specific industrial processes, available treatment technology as well as their efficiency targets. Some of the potential reuses are washing, cooling, fire protection, etc.

4.6.2 The use of ground water in excess of recharge is leading to fall in water table. Based on the ground water development, out of total 137 Administrative Blocks of Punjab, 110 Blocks have been categorized by Central Ground Water Board as Over Exploited/Red category Blocks. It implies that 80% of the total geopgraphical area of the State is over exploited in terms of stage of ground water development as exploitation in these blocks is >100%. Central Ground Water Authority has already prohibitated the extraction of groundwater through any energized means for any other purposes other than drinking water in 45 notifed Blocks/Areas of Punjab without prior approval. The complete list at **Annexure I**.

4.6.3 Punjab Pollution Control Board needs to explore the feasibility of reusing the treated sewage of nearby STPs in existing industries as well as for new industries to set up in notified blocks/areas, to meet their water demand.

4.7 Reuse of Treated Wastewater for Construction Activities & Thermal Power Plants

4.7.1 Department of Housing and Urban Development would explore the feasibility and provide timelines for utlilization of treated sewage for construction purposes.

4.7.2 Minstry of Power, Govt. of India has already made it mandatory for Thermal Power Plants (TPPs), which are located within a 50 km radius of a STP to use treated water of STP for

cooling purposes. The direction has been issued vide Tariff Policy notified by Govt. of India on 28th January, 2016 under para 6.2(5) as under:

"*The thermal power plant(s) including the existing plants located within 50 km radius of sewage treatment plant of Municipality/local bodies/similar organization shall in the order of their closeness to the sewage treatment plant, mandatorily use treated sewage water produced by these bodies and the associated cost on this account be allowed as a pass through in the tariff. Such thermal plants may also ensure back-up source of water to meet their requirement in the event of shortage of supply by the sewage treatment plant. The associated cost on this account shall be factored into the fixed cost so as not to disturb the merit order of such thermal plant. The shutdown of the sewage treatment plant will be taken in consultation with the developer of the power plant*.

4.7.3 As per Minutes of Meeting of Central Electricity Authority (CEA), Govt. of India held on 23rd September, 2019 to review the progress of implementation above mentioned directions of Tariff Policy, 2016, treated water of STPs located in the radius of 50 Kms of Thermal Power Plants(TPPs) atleast meet 30% water requirement of TPPs for cooling purposes. The status of various Thermal Power w.r.t to implemtation of Tariff Policy Directions, as reported by Deptt. of Power, Punjab are as under:

Sr.	**Name of TPP**	**Status**
1	Guru Gobind Singh Super Thermal Power Plant, Ropar (1260 MW)	The Plant not iidentified by CEA for use of treated water
2.	Guru Hargobind Thermal Power Plant Lehra Mohabbat, Bhatinda(920 MW)	Techno-economically not feasible to use treated sewage
3.	Talwandi Saboo Power Plant, Mansa (1980 MW)	All STPs located within the 50 Km radius of plant cannot cater the 30% requirement of plant
4.	Thermal Power Plant, Goindwal Sahib, Tarn Taran (540 MW)	Feasiblity study to be completed by July, 2020 and matter to be taken up with Punjab Sate Power Cprporation (PSPCL) Limited and Punjab State Electricity Regulatory Commission (PSERC)
5.	Nabha Power Limited, Rajpura Distt. Patiala (1400 MW)	Feasibilty study conducted & matter is being taken up with Punjab State Electricity Regulatory Commission (PSERC).

4.7.4 Department of Power, Punjab would facilate & coordinate the implementation of Govt. of India directions for reuse of treated sewage for cooling purposes in Govt as well private operational Thermal Power Plants of Punjab.

4.8 Consolidated Action Plan along with timelines for reuse of treated sewage for various purposes

The details are as under

S. No	Deptt/Agency	Quantity of Treated wastewater to be reused (MLD)	Purpose	Timelines*	Fund requirement (in Crores)	Remarks
1	Deptt. of Soil & Water Conservation	1519.3 MLD from 187 STPs (164 +23)	Irrigation	31.10.25	Rs 574.14 Cr. (Fund requirements have been calculated for preparing Comprehensive Irrigation Management Plans from STPs as per CPCB Guidelines-2019.	Timeline is subject to timely completion of STP, timely availability of funds, availability of agricultural command area, consent/willingness of farmers and project being feasible .
2	Deptt. of Local Government	52 MLD	Urban Landscapping, Green Belts, Sprinkling in dust control & Fire Brigades	31.12.2023	Rs. 13.00 Cr.	
4	Punjab Pollution Control Board	1.5 MLD	Industrial use for cooling purpose in rolling & induction furnaces and for use in agro based paper mills	31.03.22	Rs. 15.70 Cr.	Pilot study and stakeholder consultation to be conducted before the implemetation. The distribution network to be provided by ULBs. Details are at **Annexure J**.

*The zero date for implementation of reuse of treated wastewater in case of new STPs, starts on the day of commissioning of STPs & subject to availability of funds. The dates for completion of new STPs as reported by Deptt. of Local Government are given in **Annexure B.**

Chapter 5 – Monitoring & Governance

5.1 Key components of monitoring of reuse of treated wastewater

There are following key components of monitoring

(i) Progress for setting up of irrigation projects
(ii) Progress of rejuvenation of water bodies
(iii) Progress for other non-potable domestic use
(iv) Progress for industrial, construction and thermal power plants

5.2 Monitoring of progress

The progress of projects for resuse of treated for various non-potable puposes will be monitored on regular basis. In order to ensure that all the stakeholder departments adheres to the timelines given for various activities, the department shall submit progress of the project on monthly basis.

5.3 Three Tier Monitoring

5.3.1 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.

5.3.2 In addition, the implementation of Action Plan shall be reviewd and monitored by following Committees:

(i) District Environment Committes: Department of Science Technology & Environment, Government of Punjab vide no. 10/352/2018-STE(5)/1605949/16-17 dated 31.10.2019 constituted District Environment Committees under respective Deputy Commissioner in compliance of NGT Order Dated 26.09.19 in O.A No. 360/2018. Distt. Environment Committes would monitor the timelines for implementation of Action Plan in respective districts.

(ii) River Rejuvenation Committee (RRC) - Department of Science Technology & Environment, Government of Punjab vide order dated 19.11.2018 has constituted RRC in view of NGT orders dated 20.09.2018 in O.A. No. 673/2018 consisting of Director Environment, Director, Urban Development, Director, Industries and Member Secretary, Punjab Pollution Control Board as members. The RRC is functioning under the over all supervision & coordination of Principal Secretary to Government of Punjab, Department of Science, Technology & Environment. The state level monitoring of action plan would be carried out by RRC.

(iii) State Apex Committee: SAC under Chief Secretary and comprising of administrative Secretaries of relevant administrative departments for monitoring the progress of Environmental Action Plans, resolving issues and enforcing accountability has been constituted by Department of Environment vide order dated 10.12.2018

Chapter 6 – Training & Capacity Building

6.1 Importance

Training and capacity building of all the personnel of concerned department on various environmental, pollution and sanitation issues and related control measures with the active involvement of NGOs and communities are key to concerted actions for clean environment. Therefore, it is imperative to enhance the capability and skills of the officers of stakeholder departments for effective implementation of Action Plan on Reuse of Treated Wastewater. National Green Tribunal (NGT) in its various orders has also emphasised on training & capacity building of the all the concerned for improving the environment in urban as well rural areas.

6.2 Objectives

i) Raising awareness and changing the mindset.
ii) Capacity building on various Environment Protection Plans, environmental concerns, issues, roles and responsibilities of different stakeholders.
iii) Capacity building on existing policies, legal provisions, rules & regulations and NGT orders
iv) Improving skills regarding existing technical practices, procedures and methodologies.
v) Promoting an integrated and holistic approach for addressing the concerns.
vi) Enhancing core competencies of concerned stakeholders in relevant areas of wastewater treatment and resue .
vii) Strengthening institutional arrangements
viii) Reinforcing accountabilities and identifying aspects that require improvement
ix) Understanding new challenges and requirements
x) Fostering inter-departmental collaborations to achieve high performances

6.3 Need Assessment

The assessment of training needs of nodal and other responsible officers of various stakeholder departments involved in implementation of Action Plan will be made for development of specific training modules for different functionaries of relevant departments & organizations at various levels of hierarchies.

6.4 Involvement of Institutions and Experts

Organizations of national & international repute having expertise in the area of environment in general and wastewater resue in particular shall be involved for conducting need specific trainings & capacity building programmes for various target groups and officials of stakeholder departments. Experts would also be involved in developing knowledge products and information material on various issues & technologies for creating mass awareness to build a responsible society with an aim to promote reuse and recycling of water.

6.5 Comprehensive Training and Capacity Building Campaign

A comprehensive training and capacity building campaign will be launched on all aspects of reuse of treated wastewater including relevant technical and legal matters in a phased manner

for Senior, Middle and Junior Level Officers of all departments. The infrastructure, expertise and resources available with the key departments such as Local Govt., Training & Personnel, Department of Public Relations, PPCB, etc. will be pooled together for carrying out such capacity building activities.

Annexure A

Details of the Existing STPs in the catchment areas of rivers and other towns of Punjab

S. No.	River/Town	Distt.	ULB	Name of STP/Town	Deptt.	Cap. (MLD)	Tech.
1	Sutlej	Ludhiana	Ludhiana	Jamalpur	MCL	48	UASB*
2	Sutlej	Ludhiana	Ludhiana	Bhattian-I	MCL	111	UASB
3	Sutlej	Ludhiana	Ludhiana	Bhattian-II	MCL	50	SBR
4	Sutlej	Ludhiana	Ludhiana	Balloke-I	MCL	152	UASB
5	Sutlej	Ludhiana	Ludhiana	Balloke-II	MCL	105	SBR
6	Sutlej	Jalandhar	Jalandhar	Pholriwal-I	MCJ	100	UASB
7	Sutlej	Jalandhar	Jalandhar	Pholriwal-II (Girdhari Lal)	MCJ	25	SBR
8	Sutlej	Jalandhar	Jalandhar	Pholriwal-III (Eco Chem)	MCJ	25	SBR
9	Sutlej	Jalandhar	Jalandhar	Basti Peer Dad	MCJ	50	SBR
10	Sutlej	Jalandhar	Jalandhar	Bambian Wali Cantt	MCJ	10	SBR
11	Sutlej	Jalandhar	Jalandhar	Jaitawali	MCJ	25	SBR
12	Sutlej	Kapurthala	Phagwara	Phagwara-I (North)	PWSSB	20	UASB
13	Sutlej	Kapurthala	Phagwara	Phagwara-II (Hadibad)	PWSSB	8	MBBR
14	Sutlej	Kapurthala	Phagwara	Phagwara-III (Palahi Road)	PWSSB	8	MBBR
15	Sutlej	Jalandhar	Phillaur	Phillaur-I	PWSSB	3.0	MBBR
16	Sutlej	Jalandhar	Phillaur	Phillaur-II	PWSSB	2.6	WSP
17	Sutlej	Jalandhar	Nakodar	Nakodar	PWSSB	6	SBR
18	Sutlej	SBS Nagar	Nawashahar	Nawashahar	PWSSB	6	SBR
19	Sutlej	SBS Nagar	Banga	Banga	PWSSB	3	SBR
20	Sutlej	Hoshiarpur	Hoshiarpur	Hoshiarpur	PWSSB	30	MBBR
21	Sutlej	Rupnagar	Nangal	Nangal	PWSSB	8	ASP
22	Sutlej	Rupnagar	Nangal	Bruari Nangal	PWSSB	5	ASP
23	Sutlej	Ludhiana	Machhiwada	Machhiwada	PWSSB	4	SBR
24	Sutlej	Ludhiana	Sahnewal	Sahnewal	PWSSB	7	SBR

S. No.	River/Town	Distt.	ULB	Name of STP/Town	Deptt.	Cap. (MLD)	Tech.
25	Sutlej	Rupnagar	Ropar	Ropar-I	PWSSB	10	SBR
26	Sutlej	Rupnagar	Ropar	Ropar-II (Rasoolpur)	PWSSB	2.5	SBR
27	Sutlej	Rupnagar	Ropar	Ropar-III (Sadabarat)	PWSSB	2	SBR
28	Sutlej	Ludhiana	Jagraon	Jagraon-I	PWSSB	12	SBR
29	Sutlej	Ludhiana	Jagraon	Jagraon-II	PWSSB	16	SBR
30	Sutlej	Bathinda	Goniana	Goniana	PWSSB	3	WSP
31	Sutlej	Moga	Moga	Moga	PWSSB	27	SBR
32	Sutlej	Fazilka	Abohar	Abohar	PWSSB	25	SBR
33	Sutlej	Muktsar	Malout	Malout-I	PWSSB	3	WSP
34	Sutlej	Muktsar	Malout	Malout-II	PWSSB	10	MBBR
35	Sutlej	Moga	Dharamkot	Dharamkot	PWSSB	4	SBR
36	Sutlej	Ferozepur	Makhu	Makhu	PWSSB	4	SBR
37	Sutlej	Ferozepur	Talwandi Bhai	Talwandi Bhai	PWSSB	4	SBR
38	Sutlej	Ferozepur	Zira	Zira	PWSSB	8	MBBR
39	Sutlej	Fazilka	Jalalabad	Jalalabad	MC	8	WSP
40	Sutlej	Muktsar	Muktsar Sahib	Muktsar Sahib-I	DWSS	8.7	MBBR
41	Sutlej	Muktsar	Muktsar Sahib	Muktsar Sahib-II	DWSS	5.7	MBBR
42	Sutlej	Muktsar	Muktsar Sahib	Muktsar Sahib-III	DWSS	3.5	MBBR
43	Sutlej	Rupnagar	Anandpur Sahib	Anandpur Sahib	DWSS	8	MBBR
44	Sutlej	Mohali	Kurali	Kurali	GMADA	5	SBR
45	Sutlej	Rupnagar	Nangal	Nangal	BBMB	7	ASP
46	Sutlej	Jalandhar	Jalandhar	East Jalndhar Cantt-I	MES	3	MBBR
47	Sutlej	Jalandhar	Jalandhar	East Jalndhar Cantt-II	MES	3	MBBR
48	Sutlej	Jalandhar	Jalandhar	East Jalndhar Cantt-III	MES	0.4	MBBR
49	Sutlej	Jalandhar	Jalandhar	West Jalandhar Cantt-I	MES	2	MBBR
50	Sutlej	Jalandhar	Jalandhar	West Jalandhar Cantt-II	MES	2	MBBR
51	Sutlej	Rupnagar	Morinda	Morinda	PWSSB	5.5	SBR

S. No.	River/Town	Distt.	ULB	Name of STP/Town	Deptt.	Cap. (MLD)	Tech.
52	Sutlej	Muktsar	Gidderbaha	Gidderbaha	PWSSB	7	MBBR
53	Beas			Kapurthala	MES	1	
54	Beas	Pathankot	Pathankot	Pathankot	PWSSB	27	SBR
55	Beas	Gurdaspur	Sri Hargobindpur	Sri Hargobindpur	PWSSB	1	WSP
56	Beas	Hoshiarpur	Mukerian	Mukerian	PWSSB	5	MBBR
57	Beas	Hoshiarpur	Tanda	Tanda	PWSSB	4	SBR
58	Beas	Kapurthala	Begowal	Begowal	PWSSB	2.5	SBR
59	Beas	Kapurthala	Bhulath	Bhulath	PWSSB	4	WSP
60	Beas	Hoshiarpur	Dasuya	Dasuya	MC	4	WSP
61	Beas	Kapurthala	Kapurthala	Kapurthala	MC	25	UASB
62	Beas	Kapurthala	Sultanpur Lodhi	Sultanpur Lodhi	MC	2.6	WSP**
63	Beas	Hoshiarpur	Sham Chuarasi	Sham Chuarasi	MC	1	WSP
64	Beas	Hoshiarpur		Talwara	BBMB	8	SBR
65	Beas	Gurdaspur		GE, Air Force, Pathankot	MES	3	MBBR
66	Beas	Gurdaspur		GE, South, Mammon, Tikku Khad Area	MES	2	MBBR
67	Beas	Gurdaspur		GE, West, Pathankot	MES	8	MBBR
68	Beas	Gurdaspur		GE, South, Mammon, Bhaskar Area	MES	2	MBBR
69	Beas	Gurdaspur		GE, South, Basanter Line Area	MES	2	MBBR
70	Ghaggar	Mohali	Banur	Banur	PWSSB	4	MBBR
71	Ghaggar	Mansa	Baretta	Baretta	PWSSB	3	WSP
72	Ghaggar	Mansa	Bhikhi	Bhikhi	PWSSB	3	WSP
73	Ghaggar	Mansa	Budhlada	Budhlada	PWSSB	6.5	MBBR

S. No.	River/Town	Distt.	ULB	Name of STP/Town	Deptt.	Cap. (MLD)	Tech.
74	Ghaggar	Sangrur	Khanauri	Khanauri	PWSSB	3	SBR
75	Ghaggar	Sangrur	Lehragaga	Lehragaga	PWSSB	4	SBR
76	Ghaggar	Fatehgarh Sahib	Mandi Gobindgarh	Mandi Gobindgarh	PWSSB	25	SBR
77	Ghaggar	Sangrur	Moonak	Moonak	PWSSB	3	SBR
78	Ghaggar	Patiala	Patran	Patran	PWSSB	4	SBR
79	Ghaggar	Patiala	Samana	Samana	PWSSB	10	SBR
80	Ghaggar	Mansa	Sardulgarh	Sardulgarh	PWSSB	4	WSP
81	Ghaggar	Sangrur	Sunam	Sunam	PWSSB	8	SBR
82	Ghaggar	Mohali	Zirakpur	Zirakpur	PWSSB	17.3	SBR
83	Ghaggar	Patiala	Rajpura	Rajpura-I	PWSSB	7	SBR
84	Ghaggar	Patiala	Rajpura	Rajpura-II	PWSSB	10	SBR
85	Ghaggar	Mohali	Mohali	Mohali	GMADA	45.4	UASB
86	Ghaggar	Mohali	Lalru	Lalru	GMADA	1.5	SBR
87	Ghaggar	Patiala	Patiala	Patiala-I	MC	46	SBR
88	Ghaggar	Patiala	Patiala	Patiala-II	MC	10	SBR
89	Ghaggar	Patiala		Patiala-III	PDA	13	FAB
90	Ghaggar	Mohali	Dera Bassi	Dera Bassi	GMADA	4	SBR
91	Ghaggar	Mohali	Dera Bassi	Dera Bassi	PSIEC	2	MBBR
92	Ghaggar			Mandi Gobindgarh	PSIEC	3	
93	Ghaggar			Nabha	PSIEC	2.5	
94	Non river	Amritsar	Amritsar	Amritsar (North)	PWSSB	95	ASP
95	Non river	Amritsar	Amritsar	Amritsar (South)	PWSSB	95	ASP
96	Non river	Amritsar	Amritsar	Amritsar (South East Zone)	PWSSB	27.5	SBR
97	Non river	Bathinda	Bathinda	Bathinda	PWSSB	52	SBR
98	Non river	Bathinda	Bhucho	Bhucho	PWSSB	1.5	WSP
99	Non river	Bathinda	Kot Fatta	Kot Fatta	PWSSB	2	WSP
100	Non river	Bathinda	Maur	Maur	PWSSB	5	MBBR

S. No.	River/Town	Distt.	ULB	Name of STP/Town	Deptt.	Cap. (MLD)	Tech.
101	Non river	Bathinda	Rampura Phul	Rampura Phul	PWSSB	7	MBBR
102	Non river	Bathinda	Sangat	Sangat	PWSSB	1.5	WSP
103	Non river	Bathinda	Talwandi Sabo	Talwandi Sabo	PWSSB	3	MBBR
104	Non river	Fatehgarh Sahib	Khanna	Khanna	PWSSB	20	SBR
105	Non river	Tarn Taran	Tarn Taran	Tarn Taran	PWSSB	9	SBR
106	Non river	Fazilka	Fazikla	Fazilka	MC	8	MBBR
107	Non river	Gurdaspur	Dera Baba Nanak	Dera Baba Nanak	PWSSB	1.5	WSP
108	Non river	Jalandhar	Nurmahal	Nurmahal	GLADA	3	MBBR
119	Non river	Ludhiana	Maloud	Maloud	GLADA	1	MBBR
110	Non river	Ludhiana	Mullanpur Dhakha	Mullanpur Dhakha	PWSSB	3	SBR
111	Non river	Ludhiana	Payal	Payal	GLADA	1	MBBR
112	Non river	Ludhiana	Doraha	Doraha	GLADA	2.75	MBBR
113	Non river	Ludhiana	Doraha	Doraha	GLADA	1	MBBR
114	Non river	Ludhiana	Doraha	Doraha	GLADA	1	MBBR
115	Non river	Mansa	Mansa	Mansa	PWSSB	14	MBBR
116	Non river	Ropar	Chamkaur Sahib	Chamkaur Sahib	PWSSB	1.7	WSP
117	Non river	Sangrur	Bhawanigarh	Bhawanigarh	PWSSB	4	SBR
118	Non river	Mohali	Kharar	Kharar	PWSSB	11	SBR

*****48 MLD STP at Ludhiana (Sr. No.1) presently lying defunct, to be replaced with 225 MLD STP

**2.6 MLD STP at Sultanpur Lodhi (Sr. No.62) to be augumented to 4 MLD STP

Details provided in **Annexure B**

Abbreaviations

MCL- Municipal Corporation, Ludhiana; MCJ- Municipal Corporation, Jalandhar; PWSSB- Punjab Water Supply and Sewerage Board; MC- Municipal Corporation, DWSS- Department of Water Supply and Sanitation; GMADA- Greater Mohali Area Development Authority; BBMB- Bhakra Beas Management Board; MES- Military Engineering Services; PSIEC- Punjab Small Industries & Export Corporation Ltd; GLADA- Greater Ludhiana Area Development Authority.

Annexure B

Details of the new STPs to be setup in the catchment areas of rivers and other towns of Punjab

Sr. No.	River	Distt.	ULB	Location of STP	Deptt.	Cap. (MLD)	Completion date of STP
1	Sutlej	Ludhiana	Ludhiana	Jamalpur	MCL	225	30.04.23
2	Sutlej	Ludhiana	Ludhiana	Balloke	MCL	50	30.04.23
3	Sutlej	Jalandhar	Jalandhar	Pholriwal	MCJ	50	30.06.22
4	Sutlej	Jalandhar	Jalandhar	Basti Peer Dad	MCJ	15	30.08.22
5	Sutlej	Ferozepur	Ferozepur	Ferozepur	PWSSB	18	31.12.20
6	Sutlej	Ferozepur	Ferozepur	Ferozepur	PWSSB	1	31.12.22
7	Sutlej	Ferozepur	Guru Har Sahai	Guru Har Sahai	PWSSB	1	30.06.21
8	Sutlej	Ferozepur	Guru Har Sahai	Guru Har Sahai	PWSSB	4	30.06.21
9	Sutlej	Faridkot	Jaito	Jaito	PWSSB	6	31.12.20
10	Sutlej	Faridkot	Kotakpura	Kotakpura	PWSSB	8	31.03.21
11	Sutlej	Faridkot	Kotakpura	Kotakpura	PWSSB	6	31.03.21
12	Sutlej	SBS Nagar	Balachaur	Balachaur	PWSSB	4	30.06.22
13	Sutlej	Hoshiarpur	Garshankar	Garhshankar	PWSSB	3	30.06.22
14	Sutlej	Rupnagar	Kiratpur	Kiratpur Sahib	PWSSB	2	30.06.22
15	Sutlej	Bathinda	Maluka	Maluka	PWSSB	1	30.06.22
16	Sutlej	SBS Nagar	Rahon	Rahon	PWSSB	3	31.12.21
17	Sutlej	Faridkot	Faridkot	Faridkot	PWSSB	14	31.12.22
18	Sutlej	Tarn Taran	Patti	Patti	PWSSB	8	31.12.23
19	Sutlej	Fazilka	Arniwala	Arniwala	PWSSB	2	30.06.22
20	Sutlej	Muktsar	Barriwala	Barriwala	PWSSB	2	31.12.23
21	Sutlej	Bathinda	BhagtaBhaike	BhagtaBhaike	PWSSB	3	31.12.23
22	Sutlej	Bathinda	Bhai Roopa	Bhai Roopa	PWSSB	4	31.12.23
23	Sutlej	Bathinda	Kotha Guru	Kotha Guru	PWSSB	3	31.12.23
24	Sutlej	Hoshiarpur	Mahilpur	Mahilpur	PWSSB	2	31.12.23
25	Sutlej	Ferozepur	Mallanwala	Mallanwala	PWSSB	3	31.12.23
26	Sutlej	Ferozepur	Mamdot	Mamdot	PWSSB	3	31.12.23
27	Sutlej	Ferozepur	Mudki	Mudki	PWSSB	3	31.12.23

Sr. No.	River	Distt.	ULB	Location of STP	Deptt.	Cap. (MLD)	Completion date of STP
28	Sutlej	Moga	Nihal Singh Wala	Nihal Singh Wala	PWSSB	3	31.12.23
29	Sutlej	Ludhiana	Raikot	Raikot	PWSSB	7	30.06.22
30	Sutlej	Moga	Baghapurana	Baghapurana	DWSS	4.0	31.03.21
31	Sutlej	Muktsar Sahib	Muktsar Sahib	Muktsar Sahib	DWSS	15	01.12.21
32	Sutlej	SBS Nagar	Nawanshahr	Nawanshahr	PWSSB	4	31.12.23
33	Beas	Kapurthala	Sultanpur Lodhi	SultanpurLodhi	PWSSB	4	30.09.22
34	Beas	Kapurthala	Sultanpur Lodhi	SultanpurLodhi	PWSSB	1	30.09.22
35	Beas	Jalandhar	Kartapur	Kartarpur	PWSSB	4	30.06.22
36	Beas	Kapurthala	Dhilwan	Dhilwan	PWSSB	2.5	30.09.22
37	Beas	Pathankot	Pathankot	KothiPandita	PWSSB	2	31.12.22
38	Beas	Pathankot	Pathankot	Adarash Nagar	PWSSB	1.2	31.12.22
39	Beas	Hoshiarpur	Hariana	Hariana	PWSSB	2	31.12.21
40	Beas	Gurdaspur	Sujanpur	Sujanpur	PWSSB	5.5	30.06.22
41	Beas	Hoshiarpur	Talwara	Talwara	PWSSB	4	31.12.22
42	Beas	Tarn Taran		Goindwal Sahib	DWSS	1.3	31.12.20
43	Beas	Kapurthala	Kapurthala	Rawal & Colonies	PWSSB	3	30.06.22
44	Beas			FP, Pathankot	PSIEC	2	30.09.21
45	Beas			FP,Goindwal Sahib	PSIEC	2	30.09.21
46	Ghaggar	Mansa	Boha	Boha	PWSSB	2	31.03.21
47	Ghaggar	Sangrur	Cheema	Cheema	PWSSB	2	30.06.22
48	Ghaggar	Patiala	Bhadson	Bhadson	PWSSB	3	31.03.22
49	Ghaggar	Patiala	Nabha	Nabha	PWSSB	12	31.03.22
50	Ghaggar	Sangrur	Dhuri	Dhuri	PWSSB	5	31.12.21

Sr. No.	River	Distt.	ULB	Location of STP	Deptt.	Cap. (MLD)	Completion date of STP
51	Ghaggar	Sangrur	Dhuri	Dhuri	PWSSB	6	31.12.22
52	Ghaggar	Sangrur	Sangrur	Sangrur	PWSSB	4	31.12.21
53	Ghaggar	Sangrur	Sangrur	Sangrur	PWSSB	11	31.12.22
54	Ghaggar	Fatehgarh Sahib	Bassi Pathana	Bassi Pathana	PWSSB	3	31.12.21
55	Ghaggar	Fatehgarh Sahib	Bassi Pathana	Bassi Pathana	PWSSB	0.2	31.12.21
56	Ghaggar	Sangrur	Longowal	Longowal	PWSSB	5	30.06.22
57	Ghaggar	Fatehgarh Sahib	Amloh	Amloh	PWSSB	3	30.06.22
58	Ghaggar	Mohali	Dera Bassi	Mirpur, Derabassi	PWSSB	2	30.04.22
59	Ghaggar	Mohali	Dera Bassi	Issapur, Derabassi	PWSSB	2	30.04.22
60	Ghaggar	Mohali	Lalru	Dappar , Lalru	PWSSB	1	30.04.22
61	Ghaggar	Mohali	Lalru	Lalru Mandi	PWSSB	1.5	31.12.23
62	Ghaggar	Mohali	Lalru	Lalru	PWSSB	0.15	31.12.21
63	Ghaggar	Patiala	Sanour	Sanour	PWSSB	4	30.09.22
64	Ghaggar	Patiala	Ghanaur	Ghanaur	PWSSB	2	30.06.22
65	Ghaggar	Fatehgarh Sahib	Sirhind	Sirhind	PWSSB	2	31.12.21
66	Ghaggar	Fatehgarh Sahib	Sirhind	Sirhind	PWSSB	4	31.12.21
67	Ghaggar	Fatehgarh Sahib	Sirhind	Sirhind	PWSSB	5	30.09.21
68	Ghaggar	Mohali	Lalru	Gholumajra (Lalru)	PWSSB	0.3	31.12.21
69	Ghaggar	Mohali	Lalru	Chaundheri & Samalheri , (Lalru)	PWSSB	0.3	31.12.21
70	Ghaggar	Mohali	Zirakpur	Zirakpur	PWSSB	17	30.09.22
71	Ghaggar	Mohali	Banur	Banur (Bassi Isse Khan)	PWSSB	0.5	31.03.22
72	Ghaggar	Mohali	Banur	Banur (Fauji Colony)	PWSSB	0.15	30.09.22
73	Ghaggar	Patiala	Patiala	Shermajra	PWSSB	15	30.04.21
74	Ghaggar		Bahadurgarh	Bahadurgarh	DWSS	4	30.09.21
75	Ghaggar			Patiala	MES	6	31.01.20

Sr. No.	River	Distt.	ULB	Location of STP	Deptt.	Cap. (MLD)	Completion date of STP
76	Non River	Amritsar	Ajnala	Ajnala	PWSSB	4	30.09.21
77	Non River	Amritsar	Jandiala Guru	Jandiala Guru	PWSSB	5	
78	Non River	Amritsar	Majitha	Majitha	PWSSB	2	
79	Non River	Amritsar	Raja Sansi	Raja Sansi	PWSSB	2	30.09.22
80	Non River	Amritsar	Ramdass	Ramdass	PWSSB	1.5	30.09.22
81	Non River	Amritsar	Rayya	Rayya	PWSSB	3.5	
82	Non River	Barnala	Barnala	Barnala	PWSSB	20	30.06.20
83	Non River	Barnala	Bhadaur	Bhadaur	PWSSB	3	30.09.21
84	Non River	Barnala	Dhanaula	Dhanaula	PWSSB	3	30.09.21
85	Non River	Barnala	Handiaya	Handiaya	PWSSB	2	30.09.21
86	Non River	Barnala	Tappa	Tappa	PWSSB	3	30.09.21
87	Non River	Bathinda	Rama Mandi	Rama Mandi	PWSSB	3	30.09.21
88	Non River	Bathinda	Bathinda	Bathinda	PWSSB	4.5	31.03.21
89	Non River	Bathinda	Mehraj	Mehraj	DWSS	3	30.11.20
90	Non River	Bathinda	Ballian Wali	Ballain Wali	DWSS	1	30.09.22
91	Non River	Bathinda	Chauke	Chauke	DWSS	1.5	30.09.22
92	Non River	Bathinda	Kotshamir	Kotshair	DWSS	1.5	30.09.22
93	Non River	Bathinda	Lehra Mohabat	Lehra Mohabat	DWSS	1.5	30.09.22
94	Non River	Bathinda	Mandi Kalan	Mandi Kalan	DWSS	1.5	30.09.22
95	Non River	Bathinda	Nathana	Nathana	DWSS	1	30.09.22
96	Non River	Bathinda	Rampura	Rampura	DWSS	1	30.09.22
97	Non River	Amritsar	Budha Theh	Budha Theh	DWSS	2.8	31.03.21
98	Non River	Gurdaspur	Ghuman	Ghuman	DWSS	1.25	31.05.21
99	Non River	Fatehgarh Sahib	Khamano	Khamano	PWSSB	2	30.09.22
100	Non River	Gurdaspur	Dhariwal	Dhariwal	PWSSB	3	
101	Non River	Gurdaspur	Dina Nagar	Dina Nagar	PWSSB	5	
102	Non River	Gurdaspur	Fatehgarh Churrian	Fatehgarh Churrian	PWSSB	3.5	30.09.22
103	Non River	Gurdaspur	Gurdaspur	Gurdaspur	PWSSB	20	

Sr. No.	River	Distt.	ULB	Location of STP	Deptt.	Cap. (MLD)	Completion date of STP
104	Non River	Gurdaspur	Batala	Batala	PWSSB	28	
105	Non River	Gurdaspur	Quadian	Quadian	PWSSB	4	
106	Non River	Hoshiarpur	Gardhiwala	Gardhiwala	PWSSB	1	30.09.21
107	Non River	Jalandhar	Adampur	Adampur	PWSSB	3	30.09.21
108	Non River	Jalandhar	Alawalpur	Alawalpur	PWSSB	1	30.09.22
109	Non River	Jalandhar	Bhogpur	Bhogpur	PWSSB	2.5	30.09.22
110	Non River	Jalandhar	Goraya	Goraya	PWSSB	4	
111	Non River	Jalandhar	Lohian	Lohian	PWSSB	2	30.09.22
112	Non River	Jalandhar	Mahitpur	Mahitpur	PWSSB	3	30.09.22
113	Non River	Jalandhar	Bilga	Bilga	PWSSB	2	30.09.22
114	Non River	Jalandhar	Shahkot	Shahkot	PWSSB	3.0	30.09.20
115	Non River	Kapurthala	Nadala	Nadala	PWSSB	1	30.09.22
116	Non River	Ludhiana	Khanna	Khanna	PWSSB	29	30.06.20
117	Non River	Ludhiana	Samrala	Samrala	PWSSB	3	30.09.21
118	Non River	Mansa	Joga	Joga	PWSSB	0.5	30.09.22
119	Non River	Moga	Badhni Kalan	Badhni Kalan	PWSSB	2	30.09.22
120	Non River	Moga	Fatehgarh Panjtaur	Fatehgarh Panjtaur	PWSSB	1	30.09.22
121	Non River	Moga	Kot Ise Khan	Kot Ise Khan	PWSSB	3	30.09.22
122	Non River	Patiala	Ghagga	Ghagga	PWSSB	2	30.09.22
123	Non River	Ropar	Narot Jaimal Singh	Narot Jaimal Singh	PWSSB	3	30.09.22
124	Non River	Sangrur	Malerkotla	Malerkotla	PWSSB	22	30.09.21
125	Non River	Sangrur	Ahmedgarh	Ahmedgarh	PWSSB	5	30.09.21
126	Non River	Sangrur	Amargarh	Amargarh	PWSSB	1	30.09.22

Sr. No.	River	Distt.	ULB	Location of STP	Deptt.	Cap. (MLD)	Completion date of STP
127	Non River	Sangrur	Dirba	Dirba	PWSSB	3	30.09.22
128	Non River	SAS Nagar	Nayan Gaon	Nayan Gaon	PWSSB	8	
129	Non River	Tarn Taran	Bhikhiwind	Bhikhiwind	PWSSB	2	30.09.22
130	Non River	Tarn Taran	Khem Karan	Khem Karan	PWSSB	2	
131	Non River	Tarn Taran	Tarn Taran	Tarn Taran	PWSSB	4	30.06.20

Annexure C

Commissioned Irrigation Projects for Reuse of Treated Wastewater of STPs in Punjab

Sr. No.	River	District	Name of STP/Town	Agency	Tech.	Cap (MLD)	Command Area (Ha)
1	Sutlej	Kapurthala	Phagwara-I (North)	PWSSB	UASB	20	550
2	Sutlej	Kapurthala	Phagwara-II (Hadibad)	PWSSB	MBBR	8	95
3	Sutlej	Jalandhar	Phillaur-II	PWSSB	WSP	2.6	105
4	Sutlej	Jalandhar	Nakodar	PWSSB	SBR	6	180
5	Sutlej	Rupnagar	Naya/ Bruari Nangal	PWSSB	ASP	5	200
6	Sutlej	Ludhiana	Machhiwada	PWSSB	SBR	4	40
7	Sutlej	Rupnagar	Ropar-I Haveli kalan	PWSSB	SBR	10	100
8	Sutlej	Rupnagar	Ropar-II	PWSSB	SBR	2.5	80
9	Sutlej	Rupnagar	Ropar-III	PWSSB	SBR	2	72
10	Sutlej	Bathinda	Bhucho	PWSSB	WSP	1.5	135
11	Sutlej	Bathinda	Kot Fatta	PWSSB	WSP	2	108
12	Sutlej	Bathinda	Maur	PWSSB	MBBR	5	150
13	Sutlej	Bathinda	Talwandi Sabo	PWSSB	MBBR	3	150
14	Sutlej	Bathinda	Goniana	PWSSB	WSP	3	102
15	Sutlej	Muktsar	Malout-I	PWSSB	WSP	3	80
16	Sutlej	Moga	Dharamkot	PWSSB	SBR	4	45
17	Sutlej	Fazilka	Jalalabad	MC	WSP	8	200
18	Sutlej	Muktsar	Muktsar Sahib-I	DWSS	MBBR	8.7	480
19	Sutlej	Muktsar	Muktsar Sahib-II	DWSS	MBBR	5.7	185
20	Sutlej	Rupnagar	Anandpur Sahib	DWSS	MBBR	8	150
21	Sutlej	Mohali	Kurali	GMADA	SBR	5	130
22	Sutlej	Rupnagar	Nangal	BBMB	ASP	7	120
23	Sutlej	Rupnagar	Chamkaur Sahib			1.7	99
		Total Sutlej				**125.7**	**3556**
24	Beas	Gurdaspur	Sri Hargobindpur	PWSSB	WSP	1	96
25	Beas	Hoshiarpur	Mukerian	PWSSB	MBBR	5	100
26	Beas	Kapurthala	Begowal	PWSSB	SBR	2.5	66
27	Beas	Kapurthala	Bhulath	PWSSB	WSP	4	260
28	Beas	Jalandhar	Nurmahal	GLADA	MBBR	3	105
29	Beas	Hoshiarpur	Dasuya	MC	WSP	4	184.8
30	Beas	Kapurthala	Kapurthala	MC	UASB	25	484
31	Beas	Kapurthala	Sultanpur Lodhi	MC	WSP	2.6	100
32	Beas	Hoshiarpur	Sham Chuarasi	MC	WSP	1	90
33	Beas	Hoshiarpur	Talwara	BBMB	SBR	8	70
		Total Beas				**56.1**	**1555.8**
34	Ghaggar	Mohali	Banur	PWSSB	MBBR	4	120
35	Ghaggar	Mansa	Baretta	PWSSB	WSP	3	150
36	Ghaggar	Mansa	Bhikhi	PWSSB	WSP	3	165
37	Ghaggar	Sangrur	Lehragaga	PWSSB	SBR	4	110

Sr. No.	River	District	Name of STP/Town	Agency	Tech.	Cap (MLD)	Command Area (Ha)
38	Ghaggar	Sangrur	Moonak	PWSSB	SBR	3	70
39	Ghaggar	Patiala	Patran	PWSSB	SBR	4	120
40	Ghaggar	Patiala	Samana	PWSSB	SBR	10	324
41	Ghaggar	Mansa	Sardulgarh	PWSSB	WSP	4	128
42	Ghaggar	Sangrur	Sunam	PWSSB	SBR	8	240
		Total Ghaggar				**43**	**1427**
43	Others	Gurdaspur	Dera Baba Nanak	PWSSB	WSP	1.5	43
44	Others	Ludhiana	Maloud	GLADA	MBBR	1	75
45	Others	Ludhiana	Payal	GLADA	MBBR	1	45
46	Others	Ludhiana	Doraha	GLADA	MBBR	1	45
47	Others	Mansa	Mansa	PWSSB	MBBR	14	350
		Total Other Towns				**18.5**	**558**
		Grand Total				**243.3**	**5541**

Annexure D

Details of STPs where Irrigation projects are Under Progress

Sr. No.	River	District	Name of STP/Town	Agency	Cap (MLD)	Tech.	Command Area (ha)	Remarks
1	Ghaggar	Sangrur	Khanauri	PWSSB	3	SBR	110	Completion by 30.12.2020
2	Ghaggar	Patiala	Rajpura-I	PWSSB	7	SBR	140	Completion by 30.11.2020
		Total Ghaggar			**10**		**250**	
3	Others	Bathinda	Rampura Phul	PWSSB	7	MBBR	145	Completion by 30.12.2020
4	Others	Bathinda	Sangat	PWSSB	1.5	WSP	95	Completion by 30.12.2020
		Total Other Towns			**8.5**		**240**	
	Grand Total				**18.5**		**490**	

Annexure E

Details of STPs where Irrigation Projects are not feasible

Sr. No.	River	District	Name of STP/Town	Agency	Cap. (MLD)	Tech.	Remarks
1	Sutlej	Ludhiana	Bhattian-I	MCL	111	UASB	STP to be rehabiliated
2	Sutlej	Ludhiana	Bhattian-II	MCL	50	SBR	STP to be repaired
3	Sutlej	Ludhiana	Balloke-I	MCL	152	UASB	STP to be rehabliated
4	Sutlej	Ludhiana	Balloke-II	MCL	105	SBR	STP to be rehabliated
5	Sutlej	Jalandhar	Pholriwal-I	MCJ	100	UASB	Farmers not willing
		Total Sutlej			**518**		
6	Ghaggar	Mansa	Budhlada	PWSSB	6.5	MBBR	Agricultural Command area not available
7	Ghaggar	Mohali	Zirakpur	PWSSB	17.3	SBR	Agricultural Command area not available
8	Ghaggar	Mohali	Mohali	GMADA	45.4	UASB	Agricultural Command area not available
		Total Ghaggar			**69.2**		
9	Others	Amritsar	Amritsar (North)	PWSSB	95	ASP	STP under upgradation
10	Others	Amritsar	Amritsar (South)	PWSSB	95	ASP	STP under upgradation
		Total Other Towns			**190**		
		Grand Total			**777.2**		

Annexure F

Details of STPs covered under NABARD- RIDF Project for reuse of treated sewage for irrigation purposes

S. No.	River	District	Name of STP/Town	Agency	Tech.	Cap. (MLD)	Approx. Command Area (ha)	Timeline
	Existing STPs							
1.	Sutlej	Jalandhar	Bambian Wali Cantt	MCJ	SBR	10	370	30.06.2022
2.	Sutlej	Jalandhar	Jaitawali	MCJ	SBR	25	925	30.04.2023
3.	Sutlej	Jalandhar	Phillaur-I	PWSSB	MBBR	3	135	30.06.2022
4.	Sutlej	Hoshiarpur	Hoshiarpur*	PWSSB	MBBR	30	370	30.06.2022
5.	Sutlej	Ludhiana	Jagraon-II	PWSSB	SBR	16	592	30.06.2022
6.	Sutlej	Moga	Moga	PWSSB	SBR	27	999	30.04.2023
7.	Sutlej	Fazilka	Abohar	PWSSB	SBR	25	925	30.04.2023
8.	Sutlej	Muktsar	Malout-II	PWSSB	MBBR	10	370	30.06.2022
9.	Sutlej	Ferozepur	Talwandi Bhai	PWSSB	SBR	4	148	30.06.2022
10.	Sutlej	Ferozepur	Zira	PWSSB	MBBR	8	296	30.06.2022
11.	Sutlej	Muktsar	Muktsar Sahib-III	DWSS	MBBR	3.5	129.5	30.06.2022
		Total Sutlej				**161.5**	**5259.5**	
12.	Ghaggar	Fatehgarh Sahib	Mandi Gobindgarh	PWSSB	SBR	25	925	30.04.2023
13.	Ghaggar	Patiala	Patiala-II	MC	SBR	10	444	30.06.2022
		Total Ghaggar				**35**	**1369**	
14.	Others	Ludhiana	Khanna	PWSSB	SBR	20	740	30.06.2022
15.	Others	Ludhiana	Mullanpur Dhakha	PWSSB	SBR	3	111	30.06.2022
16.	Others	Sangrur	Bhawanigarh	PWSSB	SBR	4	148	30.06.2022
17.	Others	Mohali	Kharar	PWSSB	SBR	11	407	30.06.2022
		Total Other Towns				**38**	**1406**	
		Grand Total				**234.5**	**8034.5**	
	New STPs							
1	Sutlej	Moga	Baghapurana	DWSS		4	148	30.06.2022
		Total Sutlej				**4**	**148**	
2	Ghaggar	Sangrur	Dhuri	PWSSB		5	185	30.06.2022
3	Ghaggar	Sangrur	Sangrur	PWSSB		11	407	30.06.2022
		Total Ghaggar				**16**	**592**	
4	Others	Barnala	Barnala	PWSSB		20	740	30.06.2022
5	Others	Jalandhar	Shahkot	PWSSB		3	120	30.06.2022
6	Others	Sangrur	Dirba			3	115	30.06.2022
		Total Other Towns				**26**	**975**	
		Grand Total				**46**	**1715**	

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Action Plan/Fund Requirement of resuse of treasted sewage of existing/under construction STPs for irrigation purposes

Sr. No.	River	District	Name of STP/Town	Agency	Tech.	Cap. (MLD)	Approx. Command Area (ha)	Approx. Funds Required* (Rs in Lakhs)	Timeline**
1	Sutlej	Jalandhar	Pholriwal-II (Girdhari Lal)	MCJ	SBR	25	850	1125	31.03.2023
2	Sutlej	Jalandhar	Pholriwal-III (Eco Chem)	MCJ	SBR	25	850	1125	31.03.2023
3	Sutlej	Jalandhar	Basti Peer Dad	MCJ	SBR	50	1900	2250	31.09.2023
4	Sutlej	Kapurthala	Phagwara-III	PWSSB	MBBR	8	272	360	31.05.2022
5	Sutlej	SBS Nagar	Nawashahar	PWSSB	SBR	6	204	270	31.05.2022
6	Sutlej	SBS Nagar	Banga	PWSSB	SBR	3	125	135	31.05.2022
7	Sutlej	Rupnagar	Nangal	PWSSB	ASP	8	170	225	31.05.2022
8	Sutlej	Ludhiana	Sahnewal	PWSSB	SBR	7	238	315	31.05.2022
9	Sutlej	Ludhiana	Jagraon-I	PWSSB	SBR	12	408	540	31.05.2022
10	Sutlej	Ferozepur	Makhu	PWSSB	SBR	4	136	180	31.05.2022
11	Sutlej	Jalandhar	East Jalndhar Cantt-I	MES	MBBR	3	102	135	31.05.2022
12	Sutlej	Jalandhar	East Jalndhar Cantt-II	MES	MBBR	3	102	135	31.05.2022
13	Sutlej	Jalandhar	East Jalndhar Cantt-III	MES	MBBR	0.4	14	18	31.05.2022
14	Sutlej	Jalandhar	West Jalandhar Cantt-I	MES	MBBR	2	51	90	31.05.2022
15	Sutlej	Jalandhar	West Jalandhar Cantt-II	MES	MBBR	2	51	90	31.05.2022
16	Sutlej	Rupnagar	Morinda	PWSSB		5.5	187	247.5	31.05.2022
17	Sutlej	Muktsar	Gidderbaha	PWSSB		7	238	315	31.05.2022
		Total Sutlej				**170.9**	**5998**	**7690.5**	
18	Beas	Pathankot	Pathankot	PWSSB	SBR	27	918	675	31.03.2023
19	Beas	Hoshiarpur	Tanda	PWSSB	SBR	4	136	180	31.05.2022
20	Beas	Gurdaspur	GE, Air Force, Pathankot	MES	MBBR	3	102	135	31.05.2022
21	Beas	Gurdaspur	GE, South, Mammon, Tikku Khad Area	MES	MBBR	2	68	90	31.05.2022
22	Beas	Gurdaspur	GE, West, Pathankot	MES	MBBR	8	270	360	31.05.2022
23	Beas	Gurdaspur	GE, South, Mammon, Bhaskar Area	MES	MBBR	2	68	90	31.05.2022
24	Beas	Gurdaspur	GE, North	MES	MBBR	2	68	90	31.05.2022
25	Beas	Jalandahr	Kapurthala	MES	30.09.19	1	34	45	30.06.2022
		Total Beas				**49**	**1664**	**1665**	
26	Ghaggar	Patiala	Rajpura-II	PWSSB	SBR	10	340	390	31.05.2022
27	Ghaggar	Mohali	Lalru	GMAD	SBR	1.5	102	85	31.05.2022

Sr. No.	River	District	Name of STP/Town	Agency	Tech.	Cap. (MLD)	Approx. Command Area (ha)	Approx. Funds Required* (Rs in Lakhs)	Timeline**
				A					
28	Ghaggar	Patiala	Patiala-I	MC	SBR	46	1564	2800	31.09.2023
29	Ghaggar	Patiala	Patiala-III	PDA	FAB	13	481	585	31.05.2022
30	Ghaggar	Mohali	Dera Bassi	GMADA	SBR	4	119	108	31.05.2022
31	Ghaggar	Mohali	Dera Bassi	PSIEC	MBBR	2	70	70	31.05.2022
32	Ghaggar	Fatehgarh Sahib	Mandi Gobindgarh	PSIEC	SBR	3	102	135	30.04.2021
33	Ghaggar	Patiala	Nabha	PSIEC	SBR	2.5	93	112.5	30.04.2022
		Total Ghaggar				**82**	**2871**	**4285.5**	
34	Non river	Bathinda	Bathinda	PWSSB	SBR	52	1930	2340	31.09.2023
35	Non river	Fazilka	Fazilka	MC	MBBR	8	300	360	31.05.2022
36	Non river	Ludhiana	Doraha	GLADA	MBBR	2.75	162	165	31.05.2022
37	Non river	Ludhiana	Doraha	GLADA	MBBR	1	34	45	
38	Others	Amritsar	Amritsar (South East Zone)	PWSSB	SBR	27.5	1017.5	1237.5	31.12.2022
39	Others	Tarn Taran	Tarn Taran	PWSSB	SBR	9	136	405	31.05.2022
		Total Other Towns				**100.25**	**3579.5**	**4552.5**	
		Grand Total				**402.15**	**14112.5**	**18193.5**	

Anneuxre H

Action Plan/Fund Requirement for reuse of treated sewage of New STPs proposed to be set up

Sr. No.	River	District	Location of STP/ Town	Agency	Completion date of STP	Cap. (MLD)	Approx. Command Area (ha)	Approx. Funds Required * (Rs in Lakhs)	Timeline**
1	Sutlej	Ludhiana	Jamalpur	MCL	30.04.23	225	1850	2250	31.10.2025
2	Sutlej	Ludhiana	Balloke	MCL	30.04.23	50	1850	2250	31.10.2025
3	Sutlej	Jalandhar	Pholriwal	MCJ	30.06.22	50	1850	2250	31.12.2024
4	Sutlej	Jalandhar	Basti Peer Dad	MCJ	30.08.22	15	555	675	28.02.2025
5	Sutlej	Ferozepur	Ferozepur	PWSSB	31.12.20	18	612	810	31.08.2022
6	Sutlej	Ferozepur	Ferozepur	PWSSB	31.12.22	1	37	45	30.04.2024
7	Sutlej	Ferozepur	Guru Har Sahai	PWSSB	30.06.21	1	34	45	28.02.2023
8	Sutlej	Ferozepur	Guru Har Sahai	PWSSB	30.06.21	4	136	180	28.02.2023
9	Sutlej	Faridkot	Jaito	PWSSB	31.12.20	6	204	270	31.08.2022
10	Sutlej	Faridkot	Kotakpura	PWSSB	31.03.21	8	272	360	30.11.2022
11	Sutlej	Faridkot	Kotakpura	PWSSB	31.03.21	6	204	270	30.11.2022
12	Sutlej	SBS Nagar	Balachaur	PWSSB	30.06.22	4	136	180	28.02.2024
13	Sutlej	Hoshiarpur	Garhshankar	PWSSB	30.06.22	3	102	135	28.02.2024
14	Sutlej	Rupnagar	Kiratpur Sahib	PWSSB	30.06.22	2	68	90	28.02.2024
15	Sutlej	Bathinda	Maluka	PWSSB	30.06.22	1	34	45	28.02.2024
16	Sutlej	SBS Nagar	Rahon	PWSSB	31.12.21	3	102	135	31.08.2023
17	Sutlej	Faridkot	Faridkot	PWSSB	31.12.22	14	476	630	31.08.2024
18	Sutlej	Tarn Taran	Patti	PWSSB	31.12.23	8	272	360	31.08.2025
19	Sutlej	Fazilka	Arniwala	PWSSB	30.06.22	2	68	90	28.02.2024
20	Sutlej	Muktsar	Barriwala	PWSSB	31.12.23	2	85	90	31.08.2025
21	Sutlej	Bathinda	Bhagta Bhaike	PWSSB	31.12.23	3	102	135	31.08.2025
22	Sutlej	Bathinda	Bhai Roopa	PWSSB	31.12.23	4	102	180	31.08.2025
23	Sutlej	Bathinda	Kotha Guru	PWSSB	31.12.23	3	68	135	31.08.2025
24	Sutlej	Hoshiarpur	Mahilpur	PWSSB	31.12.23	2	102	90	31.08.2025
25	Sutlej	Ferozepur	Mallanwala	PWSSB	31.12.23	3	102	135	31.08.2025
26	Sutlej	Ferozepur	Mamdot	PWSSB	31.12.23	3	68	135	31.08.2025
27	Sutlej	Ferozepur	Mudki	PWSSB	31.12.23	3	68	135	31.08.2025
28	Sutlej	Moga	Nihal Singh Wala	PWSSB	31.12.23	3	68	135	31.08.2025
29	Sutlej	Ludhiana	Raikot	PWSSB	30.06.22	7	170	225	28.02.2024
30	Sutlej	Muktsar Sahib	Muktsar Sahib	DWSS	01.12.21	15	555	675	01.02.2025
31	Sutlej	SBS Nagar	Nawanshahr	PWSSB	31.12.23	4	148	180	31.08.2025
	Total Sutlej					**473**	**10500**	**13320**	

Sr. No.	River	District	Location of STP/ Town	Agency	Completion date of STP	Cap. (MLD)	Approx. Command Area (ha)	Approx. Funds Required * (Rs in Lakhs)	Timeline**
32	Beas	Kapurthala	Sultanpur Lodhi	PWSSB	30.09.22	4	136	180	31.05.2024
33	Beas	Kapurthala	Sultanpur Lodhi	PWSSB	30.09.22	1	34	45	31.05.2024
34	Beas	Jalandhar	Kartarpur	PWSSB	30.06.22	4	136	180	28.02.2024
35	Beas	Kapurthala	Dhilwan	PWSSB	30.09.22	2.5	85	112.5	31.05.2024
36	Beas	Pathankot	Kothi Pandita	PWSSB	31.12.22	2	68	90	31.08.2024
37	Beas	Pathankot	Adarash Nagar	PWSSB	31.12.22	1.2	41	54	31.08.2024
38	Beas	Hoshiarpur	Hariana	PWSSB	31.12.21	2	68	90	31.08.2024
39	Beas	Gurdaspur	Sujanpur	PWSSB	30.06.22	5.5	187	247.5	28.02.2024
40	Beas	Hoshiarpur	Talwara	PWSSB	31.12.22	4	136	180	31.08.2024
41	Beas	Tarn Taran	Goindwal Sahib	DWSS	31.12.20	1.3	44	58.5	31.03.2022
42	Beas	Kapurthala	Rawal & Colonies	PWSSB	30.06.2022	3	111	135	28.02.2024
43	Beas		FP, Pathankot	PSIEC	30.09.21	2	68	90	30.11.2022
44	Beas		FP,Goindwal Sahib	PSIEC	30.09.21	2	68	90	30.11.2022
	Total Beas					**34.5**	**1182**	**1552.5**	
45	Ghaggar	Mansa	Boha	PWSSB	31.03.21	2	68	90	30.11.2022
46	Ghaggar	Sangrur	Cheema	PWSSB	30.06.22	2	68	90	28.02.2024
47	Ghaggar	Patiala	Bhadson	PWSSB	31.03.22	3	102	135	30.11.2023
48	Ghaggar	Patiala	Nabha	PWSSB	31.03.22	12	408	540	30.11.2023
49	Ghaggar	Sangrur	Dhuri	PWSSB	31.12.22	6	204	270	31.08.2024
50	Ghaggar	Sangrur	Sangrur	PWSSB	31.12.21	4	136	180	31.08.2023
51	Ghaggar	Fatehgarh Sahib	Bassi Pathana	PWSSB	31.12.21	3	102	135	31.08.2023
52	Ghaggar	Fatehgarh Sahib	Bassi Pathana	PWSSB	31.12.21	0.2	10	9	31.10.2022
53	Ghaggar	Sangrur	Longowal	PWSSB	30.06.22	5	102	225	28.02.2024
54	Ghaggar	Fatehgarh Sahib	Amloh	PWSSB	30.06.22	3	102	135	28.02.2024
55	Ghaggar	Mohali	Mirpur, Derabassi	PWSSB	30.04.22	2	70	90	31.12.2023
56	Ghaggar	Mohali	Issapur, Derabassi	PWSSB	30.04.22	2	68	90	31.12.2023
57	Ghaggar	Mohali	Dappar ,	PWSSB	30.04.22	1	34	45	31.12.2023

Sr. No.	River	District	Location of STP/ Town	Agency	Completion date of STP	Cap. (MLD)	Approx. Command Area (ha)	Approx. Funds Required * (Rs in Lakhs)	Timeline**
			Lalru						
58	Ghaggar	Mohali	Lalru Mandi	PWSSB	31.12.23	1.5	51	67.5	31.08.2025
59	Ghaggar	Mohali	Lalru	PWSSB	31.12.2021	0.15	5	6.75	31.10.2022
60	Ghaggar	Patiala	Sanour	PWSSB	30.09.22	4	136	180	31.05.2024
61	Ghaggar	Patiala	Ghanaur	PWSSB	30.06.22	2	68	90	28.02.2024
62	Ghaggar	Fatehgarh Sahib	Sirhind	PWSSB	31.12.21	2	68	90	31.05.2023
63	Ghaggar	Fatehgarh Sahib	Sirhind	PWSSB	31.12.21	4	136	180	31.08.2023
64	Ghaggar	Fatehgarh Sahib	Sirhind	PWSSB	30.09.21	5	170	225	31.08.2023
65	Ghaggar	Mohali	Gholumajra (Lalru)	PWSSB	31.12.21	0.3	10	13.5	31.10.2022
66	Ghaggar	Mohali	Chaundheri & Samalheri , (Lalru)	PWSSB	31.12.21	0.3	10	13.5	31.10.2022
67	Ghaggar	Mohali	Zirakpur	PWSSB	30.09.22	17	630	765	31.05.2024
68	Ghaggar	Mohali	Banur (Bassi Isse Khan)	PWSSB	31.03.22	0.5	17	23	31.01.2024
69	Ghaggar	Mohali	Banur (Fauji Colony)	PWSSB	30.09.22	0.15	8	6.75	31.07.2021
70	Ghaggar	Patiala	Bahadurgarh	DWSS	30.09.21	4	148	180	28.02.2023
71	Ghaggar	Patiala	Patiala	MES	31.01.20	6	204	270	30.09.2022
72	Ghaggar	Patiala	Shermajra	PWSSB	31.01.20	15	555	675	
	Total Ghaggar					**107.1**	**3690**	**4820**	
73	Others	Amritsar	Ajnala	PWSSB	30.09.21	4	136	180	31.05.2023
74	Others	Amritsar	Jandiala Guru	PWSSB		5	102	225	Within 20 months from completion of STP
75	Others	Amritsar	Majitha	PWSSB		2	74	90	Within 20 months from completion of STP
76	Others	Amritsar	Raja Sansi	PWSSB	30.09.22	2	75	90	31.05.2024
77	Others	Amritsar	Ramdass	PWSSB	30.09.22	1.5	56	67.5	31.05.2024
78	Others	Amritsar	Rayya	Local Bodies		3.5	119	112	Within 20 months from completion of STP
79	Others	Barnala	Bhadaur	PWSSB	30.09.21	3	112	135	31.05.2023
80	Others	Barnala	Dhanaula	PWSSB	30.09.21	3	102	135	31.05.2023
81	Others	Barnala	Handiaya	PWSSB	30.09.21	2	68	90	31.05.2023

Sr. No.	River	District	Location of STP/ Town	Agency	Completion date of STP	Cap. (MLD)	Approx. Command Area (ha)	Approx. Funds Required * (Rs in Lakhs)	Timeline**
82	Others	Barnala	Tappa	PWSSB	30.09.21	3	102	135	31.05.2023
83	Others	Bathinda	Bathinda	PWSSB	31.03.21	4.5	153	202.5	30.11.2022
84	Others	Bathinda	Mehraj	DWSS	30.11.20	3	112	135	31.02.2024
85	Others	Bathinda	Ballain Wali	DWSS	30.09.22	1	40	45	31.01.2024
86	Others	Bathinda	Chauke	DWSS	30.09.22	1.5	56	67.5	31.05.2024
87	Others	Bathinda	Kotshair	DWSS	30.09.22	1.5	55	67.5	31.05.2024
88	Others	Bathinda	Lehra Mohabat	DWSS	30.09.22	1.5	55	67.5	31.05.2024
89	Others	Bathinda	Mandi Kalan	DWSS	30.09.22	1.5	55	67.5	31.05.2024
90	Others	Bathinda	Nathana	DWSS	30.09.22	1	39	45	31.05.2024
91	Others	Bathinda	Rampura	DWSS	30.09.22	1	40	45	31.05.2024
92	Others	Amritsar	Budha Theh	DWSS	31.03.21	2.8	102	126	30.11.2023
93	Others	Gurdaspur	Ghuman	DWSS	31.05.21	1.25	47	56.25	31.01.2023
94	Others	Fatehgarh Sahib	Khamano	PWSSB	30.09.22	2	75	90	31.05.2024
95	Others	Gurdaspur	Dhariwal	PWSSB		3	113	135	Within 20 months from completion of STP
96	Others	Gurdaspur	Dina Nagar	PWSSB		5	188	225	Within 20 months from completion of STP
97	Others	Gurdaspur	Fatehgarh Churrian	PWSSB	30.09.22	3.5	119	157.5	31.05.2024
98	Others	Gurdaspur	Gurdaspur	PWSSB		20	750	900	Within 20 months from completion of STP
99	Others	Gurdaspur	Batala	PWSSB		28	952	1260	Within 20 months from completion of STP
100	Others	Gurdaspur	Quadian	PWSSB		4	150	180	Within 20 months from completion of STP
101	Others	Hoshiarpur	Gardhiwala	PWSSB	30.09.21	1	40	45	31.01.2023
102	Others	Jalandhar	Adampur	PWSSB	30.09.21	3	111	135	31.05.2024
103	Others	Jalandhar	Alawalpur	PWSSB	30.09.2022	1	34	45	31.05.2024

Sr. No.	River	District	Location of STP/ Town	Agency	Completion date of STP	Cap. (MLD)	Approx. Command Area (ha)	Approx. Funds Required * (Rs in Lakhs)	Timeline**
104	Others	Jalandhar	Bhogpur	PWSSB	30.09.22	2.5	93	112.5	31.05.2024
105	Others	Jalandhar	Goraya	PWSSB		4	150	180	Within 20 months from completion of STP
106	Others	Jalandhar	Lohian	PWSSB	30.09.22	2	75	90	31.05.2024
107	Others	Jalandhar	Mahitpur	PWSSB	30.09.22	3	113	135	31.05.2024
108	Others	Jalandhar	Bilga	PWSSB	30.09.22	2	68	90	31.05.2024
109	Others	Kapurthala	Nadala	PWSSB	30.09.22	1	40	45	31.01.2024
110	Others	Ludhiana	Khanna	PWSSB	30.06.2020	29	1073	1305	30.04.2023
111	Others	Ludhiana	Samrala	PWSSB	30.09.21	3	111	135	31.05.2023
112	Others	Mansa	Joga	PWSSB	30.09.22	0.5	19	22.5	31.07.2023
113	Others	Moga	Badhni Kalan	PWSSB	30.09.22	2	75	90	31.05.2024
114	Others	Moga	Fatehgarh Panjtaur	PWSSB	30.09.22	1	37	45	31.05.2024
115	Others	Moga	Kot Ise Khan	PWSSB	30.09.22	3	113	135	31.05.2024
116	Others	Patiala	Ghagga	PWSSB	30.09.22	2	74	90	31.05.2024
117	Others	Ropar	Narot Jaimal Singh	PWSSB	30.09.22	3	112	135	31.05.2024
118	Others	Sangrur	Malerkotla	PWSSB	30.09.21	22	748	990	31.05.2023
119	Others	Sangrur	Ahmedgarh	PWSSB	30.09.21	5	190	225	31.05.2023
120	Others	Sangrur	Amargarh	PWSSB	30.09.22	1	40	45	31.01.2024
121	Others	SAS Nagar	Nayan Gaon	PWSSB		8	300	360	Within 20 months from completion of STP
122	Others	Tarn Taran	Bhikhiwind	PWSSB	30.09.22	2	72	90	31.05.2024
123	Others	Tarn Taran	Khem Karan	PWSSB		2	68	90	Within 20 months from completion of STP
124	Others	Tarn Taran	Tarn Taran	PWSSB	SBR	4	306	180	31.05.2022
125	Others	Bathinda	Rama Mandi			3	90	135	30.12.2020
	Total Other Towns					**222.05**	**8199**	**10081.75**	
	Grand Total					**836.65**	**23571**	**29774.25**	

Annexure I

List of 45 Blocks/Areas of Punjab notified by Central Ground Water Authority

Sr. No.	Block/Area	District	Date of Notification
1	Ludhiana City	Ludhiana	11.12.1998
2	Moga-I	Moga	02.12.2006
3	Moga-II	Moga	02.12.2006
4	Sangrur	Sangrur	02.12.2006
5	Mahal Kalan	Barnala	02.12.2006
6	Ahmedgarh	Sangrur	02.12.2006
7	Nakodar	Jalandhar	13.08.2011
8	Shahkot	Jalandhar	13.08.2011
9	Lohian	Jalandhar	13.08.2011
10	Pattran	Patiala	13.08.2011
11	Phagwara	Kapurthala	13.08.2011
12	Nihalsinghwala	Moga	13.08.2011
13	Dhuri	Sangrur	13.08.2011
14	Sunam	Sangrur	13.08.2011
15	Barnala	Barnala	13.08.2011
16	Sherpur	Sangrur	13.08.2011
17	Malerkotla	Sangrur	13.08.2011
18	Khanna	Ludhiana	13.08.2011
19	Ajnala	Amritsar	27.11.2012
20	Patti	Tarn Taran	27.12.2012
21	Tarn Taran	Tarn Taran	27.12.2012
22	Amloh	Fatehgarh	27.11.2012
23	Khamnao	Fatehgarh	27.11.2012
24	Khera	Fatehgarh	27.11.2012
25	Tanda	Hoshiarpur	27.11.2012
26	Bhogpur	Jalandhar	27.11.2012
27	Goraya/Rurka Kalan	Jalandhar	27.11.2012
28	Jalandhar East	Jalandhar	27.11.2012
29	Jalandhar West	Jalandhar	27.11.2012
30	Nurmahal	Jalandhar	27.11.2012
31	Phillaur	Jalandhar	27.11.2012
32	Nadala	Kapurthala	27.11.2012
33	Dhilwan	Kapurthala	27.11.2012
34	Kapurthala	Kapurthala	27.11.2012
35	Sultanpur	Kapurthala	27.11.2012
36	Pakhowal	Ludhiana	27.11.2012
37	Bhikhi	Mansa	27.11.2012
38	Budhlada	Mansa	27.11.2012
39	Sardulgarh	Mansa	27.11.2012
40	Aur	Nawanshahr	27.11.2012
41	Banga	Nawanshahr	27.11.2012
42	Patiala	Patiala	27.11.2012
43	Sanaur	Patiala	27.11.2012
44	Morinda	Ropar	27.11.2012
45	Bhawaniagarh	Sangrur	27.11.2012

Annexure J

Details of Reuse of Treated Sewage of STPs for Industrial Use

SN	Quantity of waste water to be reused (MLD)	Purpose	Implementation schedule	Timelines	Fund requirement (in lacs)	Remarks
1	0.5 MLD	Pilot Study	Phase-I: Pilot Study	31.12.2020	10	--
		Cooling in rolling mills and induction furnaces of Mandi Gobindgarh	Phase-II: Stakeholder consultation	30.06.2020	1000	ULB to provide the infrastructure for distribution of treated sewage
			Phase-III: implementation	31.03.2020		
2	1.0 MLD	Pilot Study	Phase-I: Pilot Study	31.12.2020	--	--
		Cooling in rolling mills and induction furnaces of Khanna	Phase-II: Stakeholder consultation	30.06.2021	500	ULB to provide the infrastructure for distribution of treated sewage
			Phase-III: implementation	31.03.2022		
3		Lab Study	Phase-I: Pilot Study	31.12.2020	10	--
		Plot Study for use as process water in Agro based paper mills	Phase-II: Stakeholder consultation	30.09.2021	50	There are five agro based paper mills in Punjab as under:- 1. Quantum paper Mills, Salia Khurd, Distt. Hoshiarpur 2. Satia Paper Mills, Muktsar 3. Shreyans Paper Mills, Mandi Ahemadgarh, Distt. Sangrur 4. Shreyans industries, VillBannah, Balachor Distt. Nawashahar 5. Trident Paper Mill, Barnala
			Phase-III: implementation	31.03.2022		