



SUPREME AUDIT INSTITUTION OF INDIA
लोकहितार्थ सत्यनिष्ठा
Dedicated to Truth in Public Interest

Report of the Comptroller and Auditor General of India on Performance Audit on Effectiveness of measures taken by the Government of West Bengal for containing Water Pollution



**Government of West Bengal
Report No. 3 of 2025
(Performance Audit – Civil)**

**Report of the
Comptroller and Auditor General of India on
Performance Audit on
Effectiveness of measures taken by the
Government of West Bengal for containing Water
Pollution**

Government of West Bengal

Report No. 3 of the year 2025

(Performance Audit-Civil)

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PREFACE

This Report of the Comptroller and Auditor General of India has been prepared for submission to the Governor of the State of West Bengal under Article 151 of the Constitution of India for being laid before the Legislature of the State. The report has been prepared in accordance with the Performance Auditing Guidelines, 2014 and Regulations on Audit and Accounts, 2020 of the Comptroller and Auditor General of India. The report contains results of Performance Audit on “Effectiveness of measures taken by the Government of West Bengal for containing Water Pollution” covering the period from 2018-19 to 2022-23.

The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Executive Summary

EXECUTIVE SUMMARY

The National Green Tribunal (NGT) passed an order in 2018 directing states to revise, prepare and implement Action Plans to restore polluted river stretches and to ensure 100 *per cent* treatment of sewage by 31 March 2020. The timeline for completing all steps of the Action Plans including completion of setting up of Sewage Treatment Plants (STPs) and their commissioning was 31 March 2021.

NGT passed another order in 2019 to check compliance with several statutory requirements related to waste and environment management and advisories issued to the States. CPCB had identified (2017) 17 polluted river stretches where River rejuvenation programme was to be implemented.

Goal 6 of the Sustainable Development Goals (SDGs) calls for access to safe and affordable drinking water, sanitation facilities, and hygiene for all by 2030. According to the SDG index-2020 of NITI Aayog, as regards the performance of West Bengal against SDG-6 (Clean water and sanitation), it was observed that the score of the State declined to 81 from 83 in 2019.

Further, research studies showed impact of water pollution on agriculture produce and aquatic animals in the State as well as risks to human health from water contamination *such as Diarrhoea, Enteric Fever, Vibrio cholera etc. and prevalence of Arsenicosis and Fluorosis.*

Thus, Audit decided to study the issue of water pollution through a Performance Audit.

(Paragraph 1.7)

Significant Audit Findings:

Planning for prevention and control of water pollution in Rivers, Lakes and Ground water.

- The State Water Policy for West Bengal had not been framed even after a lapse of 12 years of the finalisation of the National Water Policy, 2012. Further, a standardised State level water related information database system had not been established. In the absence of a State Water Policy, issues related to water governance such as water pollution, encroachments on water bodies, adequacy of infrastructure, conservation, management of water and water pricing could not be effectively addressed.

(Paragraph 3.2)

- The State Environment Plan-2020 aimed at preparation of inventory of water bodies as a Short term Action Plan. Audit, however, observed that the inventory of identified water bodies could not be completed within the stipulated time period of one year and was still in progress (March 2024).

(Paragraph 3.3.1)

- Strategies for conservation of identified water bodies had not been defined till March 2024. Due to non-inventorisation of water bodies and subsequent non-preparation of action plans for restoration, concerted efforts could

not be made for conservation and effective management of water bodies. Estimation of financial intervention needed for addressing issues related to restoration of those water bodies like weed infestation, sewage discharge, encroachments *etc.* was also not possible.

(Paragraph 3.3.2)

- Out of total 128 Urban Local Bodies (ULBs) in the State, only six ULBs were covered under Faecal Sludge and Septage Management, as of November 2023.

(Paragraph 3.3.3)

- WBPCB was yet (March 2024) to prepare a zero industrial wastewater plan. Joint inspection of the test checked industries showed that only five out of the 27 inspected industries had the facility to store and re-use treated wastewater.

(Paragraph 3.3.4)

- Out of 34 selected STPs and 65 industries, 09 STPs and 23 industries did not have provision for re-use of treated wastewater and the treated water was discharged directly into drains. The stipulated GIS enabled MIS for mapping sources of generation of wastewater and quality of wastewater production in urban West Bengal was not created till November 2023.

(Paragraph 3.3.5)

- The State did not have a database for non-point sources of pollution for assessment of pollution load and, therefore it was not included in the Action Plan for Rejuvenation of River Ganga.

(Paragraph 3.4.1)

- Action Plan for the Ganga was not revised in consideration of the updated estimated sewage from the 402 drains and the execution of the Action Plan continued with the initial estimation of 1,084 MLD from 29 towns consisting of 55 drains. Thus, remedial action for abatement of pollution of river Ganga was not commensurate with the actual extent of sewage discharged.

(Paragraph 3.4.1.1)

- According to the Action Plan for rejuvenation of river Ganga, 33 out of total 55 identified drains of the river Ganga were either connected or proposed to be connected to different STPs. For the remaining 22 drains, feasibility of work was to be completed by February 2021, but the same had not been completed, till December 2023. The implementing agency, Kolkata Metropolitan Development Authority (KMDA) was yet to prepare project proposals for connecting the drains, falling into the river Ganga, with STPs. As a result, untreated sewage was draining into the river Ganga directly causing pollution of the river. It is evident that the Action Plan approved in July 2020 was deficient as it did not adequately address the pollution load encompassing the actual number of drains falling into Ganga.

(Paragraph 3.4.1.2)

- WBPCB was yet to implement a plan for the Environmental Management of Dairy Farms and *Gaushalas* and bring these farms under consent management as stipulated in Guidelines for 'Environmental Management of Dairy Farms and *Gaushalas*' issued by CPCB in July 2020. Inability in bringing the Dairy Farms and putting *Gaushalas* under consent management coupled with laxity in charting out an appropriate sewerage management plan caused considerable organic load in the DVC canal. It also led to polluted discharge into the river Ganga, with BOD concentration at an average of 28 mg/l against the norms of 3 mg/l.

(Paragraph 3.4.1.3 (v))

- Risks to human health from water borne diseases and water-based diseases as a result of pollution of rivers and lakes were not assessed while preparing the Action Plans for rejuvenation of polluted water stretches.

(Paragraph 3.4.3)

- Water Quality Review Committee was not constituted in the State even after a lapse of 23 years from the establishment of Water Quality Assessment Authority.

(Paragraph 3.4.4)

Municipal Sewage treatment for restoration of Polluted River stretches and Lakes

- NGT set a deadline of March 2021 to take all steps for rejuvenation of polluted river stretches including setting up of STPs and their commissioning. As of March 2021, the estimated sewage generation for the State was 5,457 MLD and the total capacity for sewage treatment of the 29 existing and 36 proposed STPs was 1,202 MLD. However, installed capacity of STPs was only 897 MLD (16.44 *per cent*) causing a gap of 4,560 MLD. There was a huge gap between sewage generation and the capacity available for its treatment, leading to deterioration of water quality of rivers.

(Paragraph 4.2)

- The sewage treatment capacities were impaired in the absence of an adequate sewerage conveyance system including connecting to the household sewer line, non-installation of disinfection system, deficient co-ordination among different agencies and deficient functioning of established infrastructure *etc.*

(Paragraph 4.3)

- Out of 41 commissioned STPs, 26 STPs were in operation with an installed capacity of 383.8 MLD. Only 232.5 MLD was being utilized *i.e.* 60.60 *per cent* of 383.80 MLD. There was a gap of 1,339 MLD in treatment capacity and almost 85 *per cent* of total sewage generated was released into the river Ganga without treatment.

(Paragraph 4.3.1)

- Due to inadequate/inefficient sewage treatment facilities for drains discharging into the river Ganga, the pollutant load in the river water continuously exceeded the prescribed limits during the period 2018-23.

While the number of times BOD breached the prescribed limit ranged between 15-46 *per cent* of total tests conducted, FC was above norms in 74-97 *per cent* of test cases, and DO did not meet the prescribed standards in one to 18 *per cent* tests.

(Paragraph 4.3.4)

- In consideration of the ecological importance of the East Kolkata Wetland (EKW), WBPCB was supposed to carry out water analysis tests of EKW. Quality analysis of water of EKW at two outlets (*Bamanghata Jalpath* and *Uttar hatgachha*) had been carried out by WBPCB during June 2018 to May 2019, but thereafter, no such tests were carried out. Surveillance of physicochemical and biological properties of the wastewater that entered into EKW was not undertaken by WBPCB. In the absence of a continued monitoring mechanism, the qualitative nature of the sewage entering EKW and the efficiency of sewage treatment through aquaculture could not be assessed.

(Paragraph 4.4.1)

- Due to the delay in finalisation of project report of STPs for about 42 months, sewage treatment infrastructure for river *Mahananda* was non-operational. As a result, water quality of the river *Mahananda* got deteriorated. As per the water quality tests conducted by WBPCB during the period 2018–23, the BOD and FC exceeded the prescribed limits by CPCB.

(Paragraphs 4.5.1 & 4.5.3)

- Inability of the Public Health & Engineering Department (PHED) in timely taking up the integration of household sewage collection system with the STP coupled with inaction of WBPCB in restricting the hotels from unauthorisedly discharging directly into the river led to deterioration in the water quality of the river *Dwarka*.

(Paragraph 4.7)

- *Gorkhaland Territorial Administration* (GTA) had prepared DPR for improvement of drainage and sewerage system in *Mirik Lake*. The DPR envisaged construction of three STPs having sewage treatment capacity of 1,200 Kilo Litre Per Day. The STPs were completed in June 2019 after incurring an expenditure of ₹ 36.30 crore by the GTA. However, the STPs were not operationalized and pollution in the lake continued unabated.

(Paragraph 4.9)

Industrial Wastewater Management

- Five out of 51 sampled Seriously Polluting Industries (SPIs) were operating without valid Consent to Operate (CTO) which had already expired for periods ranging between 05 to 48 months.

(Paragraph 5.2)

- Mandatory 08 and 20 number of inspections in case of SPI and GPI respectively were not carried out by WBPCB during 2018-23 in case of nine industries.

(Paragraph 5.2.3)

Ground Water Quality Management

- The steady decline in water level and gradual transformation of safe and semi critical blocks into critical blocks during the period 2020-22 indicated that there was a sharp decline in ground water level.

(Paragraph 6.2)

- In the two-arsenic affected selected districts (*Nadia* and *North 24 Paraganas*), out of a population of 63.15 lakhs covered under ground water based Functional Household Tap Connection (FHTC), 46 lakh *i.e.* 73 *per cent* were not provided with Arsenic Iron Removal Plants (AIRP) under Piped Water Supply Schemes (PWSS), although the areas were arsenic affected.

(Paragraph 6.3.1.2)

- As of December 2023 under the PWSS, only 1.48 lakh, out of 4.61 lakh fluoride affected households of *Birbhum* district were provided with FHTC *i.e.* only 32 *per cent* of households are getting treated piped water.

(Paragraph 6.3.2.2)

- Out of 128 ULBs in the State, 79 did not have solid waste processing facilities and the waste got disposed at dumping grounds. As per the Annual Report of WBPCB for the year 2022-23 only 23 *per cent* of waste generated was processed as of March 2023. The unprocessed fresh waste was gradually getting converted into legacy waste and adding to dumpsites. As of August 2023, there were 123 dumpsites in the State having a legacy waste of 111.44 lakh MT, of which only 49.68 lakh MT of legacy waste was processed leaving a balance of 61.76 lakh MT.

(Paragraph 6.3.4)

Monitoring of Water Quality

- According to CPCB's guidelines, monitoring stations at both upstream and downstream of a river needed to be established by the State PCBs. There was only one monitoring station each against the stipulated two (upstream and downstream) for nine Polluted River Stretches. Thus, the monitoring of ground water quality was not satisfactory as the data generated was based on a limited number of testing locations.

(Paragraph 7.2.2)

- According to Solid Waste Management Rules, 2016, the ground water quality within 50 meters of the periphery of a landfill site shall be periodically monitored by State PCB covering different seasons in a year to ensure that the ground water is not contaminated. Out of 123 landfill/dumpsites, WBPCB had only one ground water monitoring station at one dumpsite (at *Dhapa*, Kolkata). In the absence of adequate number of ground water quality monitoring stations, around the periphery of dumpsites, the extent of ground water contamination due to leaching could not be assessed by Audit.

(Paragraph 7.2.3)

- According to CPCB’s status report for West Bengal STPs as of March 2023, there were 11 non-operational STPs out of a total of 41 on the river Ganga. Due to non-operation of STPs, the management of municipal sewage, as conceived in related action plans, could not be effectively undertaken, and the river Ganga continued to receive untreated sewage.

(Paragraph 7.4.1)

- Only 16 industrial units had the Online Continuous Emission Monitoring System (OCEMS), developed by CPCB, out of 65 sampled industries. Thus, real time tracking of discharge of pollutants could not be effectively implemented even after more than four years of CPCB’s instruction.

(Paragraph 7.5)

Recommendations:

1. *The Environment Department should complete the inventory of all wetlands and water bodies in a time bound manner and prepare Action Plans for their effective management.*
2. *WBPCB should ensure implementation of the State’s ‘Re-use of treated wastewater Policy’ and work towards achieving Zero industrial wastewater as envisaged in SEP 2020.*
3. *WBPCB should periodically update its database of pollution sources, including non-point sources for assessment of actual pollution load so that the pollution can be addressed before discharge into canals, rivers and other water bodies.*
4. *The Environment Department should consider risk to human health and environment while preparing action plans for mitigation of pollution of water.*
5. *Urban Development & Municipal Affairs (UD&MA) Department should complete the ongoing STPs as well as operationalize the non-functional STPs at the earliest and ensure strict compliance with environmental norms in their operations.*
6. *WBPCB should bring East Kolkata Wetlands into its regular monitoring schedule and plan for effective remedial measures.*
7. *Urban Development & Municipal Affairs (UD&MA) Department should complete the projects related to connections of household sewage with STPs and tapping of drains not connected with STPs on priority basis.*
8. *WBPCB should ensure that Industrial units are in possession of valid CTOs and impose penalties in case of lapses.*
9. *WBPCB should strengthen its monitoring mechanism to adhere to the required number of inspections and ensure compliance by polluting industries.*
10. *WBPCB needs to enforce, through consent management, treatment of all industrial effluents, with special emphasis on installation of CETPs in clusters for the unorganized small industries.*

- 11. Authorisation for groundwater abstraction should be strictly regulated and monitored through the consent administration of WBPCB.*
- 12. PHED should implement schemes in a time bound manner to reduce cases of arsenic and fluoride contamination and provide safe and clean drinking water to the entire affected population.*
- 13. UD&MA should take measures for effective implementation of Solid Waste Management Rules, 2016 and set up adequate waste processing facilities to prevent water contamination due to leaching.*
- 14. WBPCB should establish a representative number of stations/locations for water quality monitoring, particularly in the identified hot spots.*
- 15. Government should implement the proposal of the State Board on engagement of manpower and strengthen the water quality monitoring mechanism for effectively carrying out its mandate.*
- 16. WBPCB should develop and upgrade its laboratories and obtain National Accreditation Board for Testing and Calibration Laboratories (NABL) Accreditation, Occupational Health and Safety Management System (OH&SMS) certification and EPA recognition by Ministry of Environment Forest and Climate Change (MoEF&CC) to enhance assurance level.*
- 17. WBPCB should monitor all the STPs regularly and take action to ensure that the STPs were working and were complying with the discharge standards. It should also ensure installation of Online Continuous Emission Monitoring System (OCEMS) for STPs/ETPs and use the data for effective surveillance and monitoring.*

CHAPTER - I

Introduction

Chapter-I

Introduction

1.1 Introduction

“Water is life’s matter and matrix, mother and medium. There is no life without water.”¹ Goal 6 of United Nations’s Sustainable Development Goals (SDG) acknowledged that access to safe water, sanitation and hygiene is the most basic human need for health and well-being. Demand for water is rising owing to rapid population growth, urbanisation and increasing water needs from agriculture, industry, and energy sectors.

Large-scale water abstraction and discharge of untreated/partially treated wastewater into water bodies has substantially contributed to water pollution. Water pollution poses a significant challenge to human health and ecological balance of water bodies, thereby reducing productivity of aquatic environment.

1.2 Water Budget of the State

Water Budget is a hydrological tool used to quantify the flow of water in and out of a system. According to the available data² for 2015, total water availability for the State of West Bengal was about 160.35 billion cubic metre (BCM), out of which surface water was approximately 132.77 BCM and ground water 27.58 BCM. The total demand was 90.54 BCM, thus leaving a positive gap of 69.81 BCM in the State.

West Bengal, as per 2011 census, had a population of approximately nine crores with a decadal growth rate of 13.93 *per cent* (2001-11). With rise in population, the availability of water including for food production, may worsen unless an effective system of management of water is put in place.

1.3 Water pollution in West Bengal

The main causes of river water pollution in West Bengal are:

- (i) discharge of municipal wastewater,
- (ii) discharge of industrial wastewater,
- (iii) insufficient solid waste management,
- (iv) pollution from non-point sources³.

Central Pollution Control Board (CPCB), in 2018, identified 17 Polluted River Stretches (PRS)⁴ in West Bengal categorised under five Priority⁵

¹ Quoted by Albert Szent - Gyorgyi, a Hungarian Nobel Lauret (Physiology 1937).

² Paper published by Indian Council of Agricultural Research in February 2022.

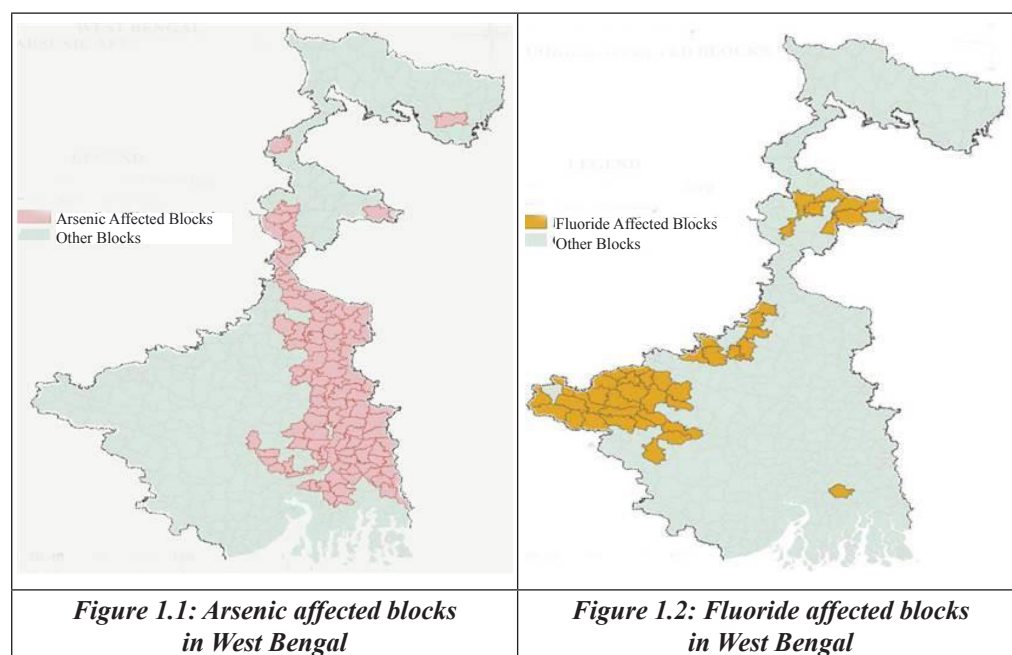
³ Pollution that originates from many diffuse sources, rather than a single, identifiable point, like a factory pipe, and is often carried into waterways by runoff or precipitation.

⁴ Ganga, Barakar, Churni, Damodar, Darakeswar, Dwaraka, Jalangi, Kaljani, Kansai, Karala, Mathabhanga, Mahananda, Mayurakshi, Rupnarayan, Silabati, Teesta and Vidyadhari.

⁵ The polluted locations in a continuous sequence are defined as polluted river stretches and categorised in five priority classes based on BOD concentration.

Classes (I to V)⁶ based on maximum Biological Oxygen Demand⁷ (BOD) level. Four rivers⁸ which were in the list of 17 PRS under Priority V, have since been excluded (2022) from the list of PRS.

In respect of ground water, 83 blocks in eight districts of the State, having a population of about 109.26 lakh were identified as arsenic affected, and 43 blocks with a population of 6.15 lakh in seven districts were identified as affected by fluoride, as shown in **Figure 1.1** and **1.2**.



(Source: State Environment Report-I, West Bengal 2021, WBPCB)

1.4 Budget Provision

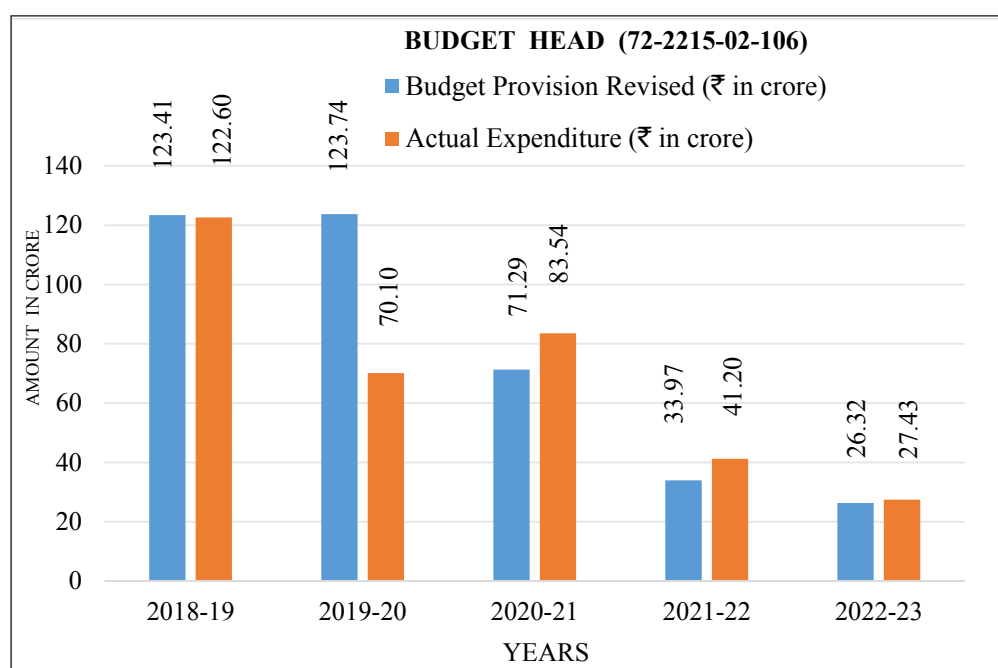
The Urban Development and Municipal Affairs (UD&MA) Department, Government of West Bengal (GoWB) was charged with management of municipal wastewater. For this purpose, the Department under State Plan made budget provisions for the Major Head ‘Water Supply and Sanitation’ for prevention of air and water pollution (Budget Head: 2215-02-106) under Revenue Head. The Budget provision *vis-a-vis* the actual expenditure incurred for prevention of air & water pollution during the period from 2018-19 to 2022-23 is shown in **Chart 1.1**.

⁶ Priority I - Monitoring locations exceeding BOD concentration 30.0 mg/l, Priority II - BOD between 20.0 – 30.0 mg/l, Priority III - BOD between 10.0 – 20.0 mg/l, Priority IV - BOD between 6.0 – 10.0 mg/l, Priority V - BOD between 3.0 – 6.0 mg/l.

⁷ Amount of dissolved oxygen needed by aerobic biological organisms to break down organic material present in a given water.

⁸ Kaljani, Karola, Mayurakshi and Silabati.

Chart 1.1: Budget provision vis-a-vis the actual expenditure incurred for prevention of Air and Water Pollution during the period from 2018-19 to 2022-23.



(Source: Budget Publications, GoWB)

Further, UD&MA made provisions under the budget head ‘Capital Outlay on Urban Development’ (Major head: 4217) for State Development Schemes which, *inter alia*, included projects for rejuvenation and augmentation of Sewage Treatment Plants (STPs) and the expansion of sewerage and drainage services.

Besides above budget provisions, the West Bengal State National Ganga River Basin Authority (NGRBA) Program Management Group (SPMG) during 2018-23 received an aggregate Central Share of ₹ 577.38 crore⁹ from National Mission for Clean Ganga (NMCG) under the *Namami Gange* scheme and also received State Share of ₹ 315.74 crore. Against the total receipt of ₹ 893.12 crore, total expenditure of ₹ 896.47 crore was incurred as of March 2023. The excess expenditure against fund received was sourced from additional State share and interest income of SPMG.

1.5 Water Pollution prevention and control mechanism

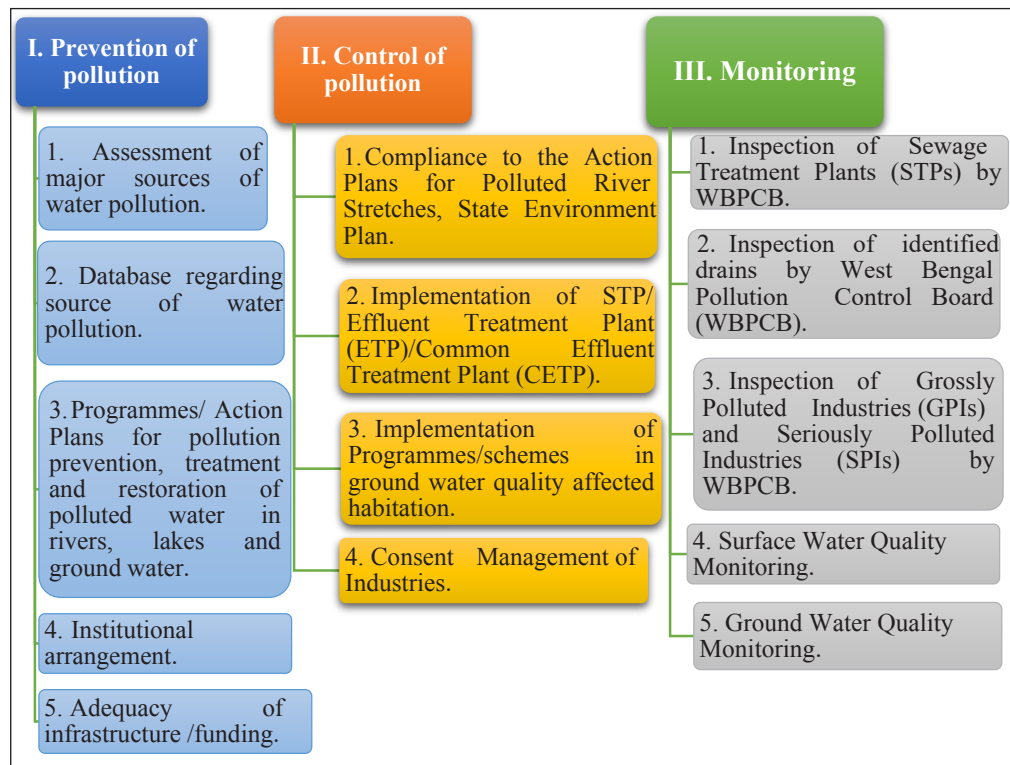
The Water (Prevention and Control of Pollution) Act, 1974, mandates setting up of a Pollution Control Board, both at Central and State levels, to restore and maintain the wholesomeness of water bodies; to plan a nation-wide programme for the prevention, control and abatement of water pollution; and to collect, compile and publish technical and statistical data related to water pollution. Protection and improvement of environment was also regulated under Government of India’s Environment Act, 1986.

⁹ Including an opening balance of ₹ 64.60 crore.

Control of water pollution may be reviewed through initiatives of:

- prevention (*control of pollution before it happens*),
- control (*measures to mitigate pollution once it occurs*), and
- monitoring, as mapped in **Chart 1.2**:

Chart 1.2: Water Pollution



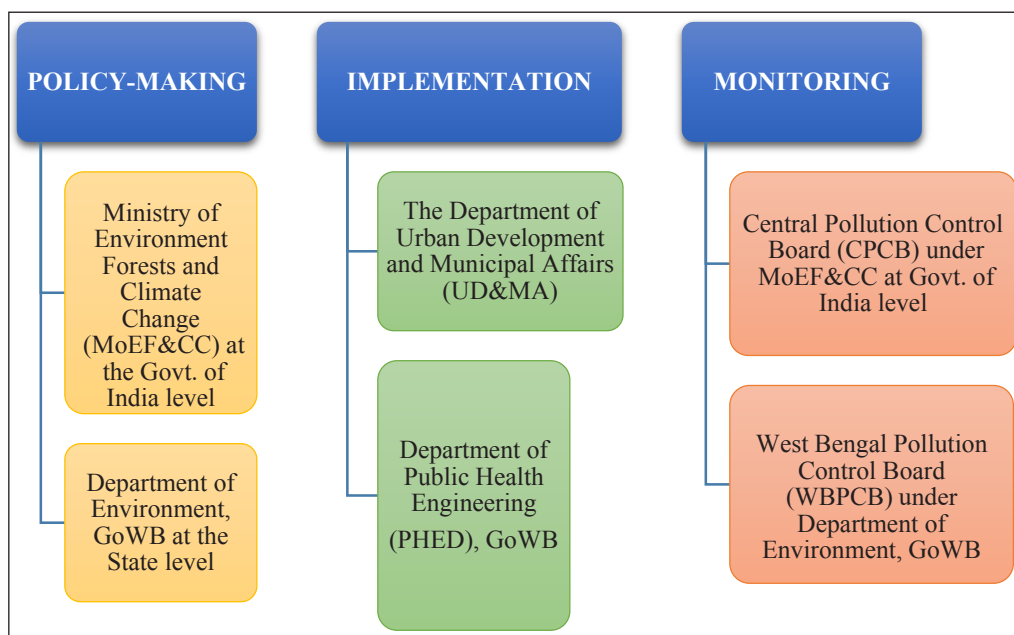
(Source: Action plans for Rejuvenation of Polluted River Stretches, State Environment Plan, Water (Prevention and Control of Pollution), Act, 1974).

1.6 Institutional arrangement for management of water pollution

Effective abatement of water pollution requires co-ordinated efforts across multiple institutional levels, ensuring that policies are not only framed but also effectively implemented and monitored for achieving the desired results. While policies for abatement of water pollution were prepared by Ministry of Environment Forests and Climate Change (MoEF&CC) and the Environment Department of West Bengal at National and State level respectively, the implementation was done by UD&MA and Public Health Engineering Departments (PHED). Both CPCB and WBPCB were responsible for the monitoring part.

Institutional arrangements based on functions for abatement of water pollution are shown in **Chart 1.3**:

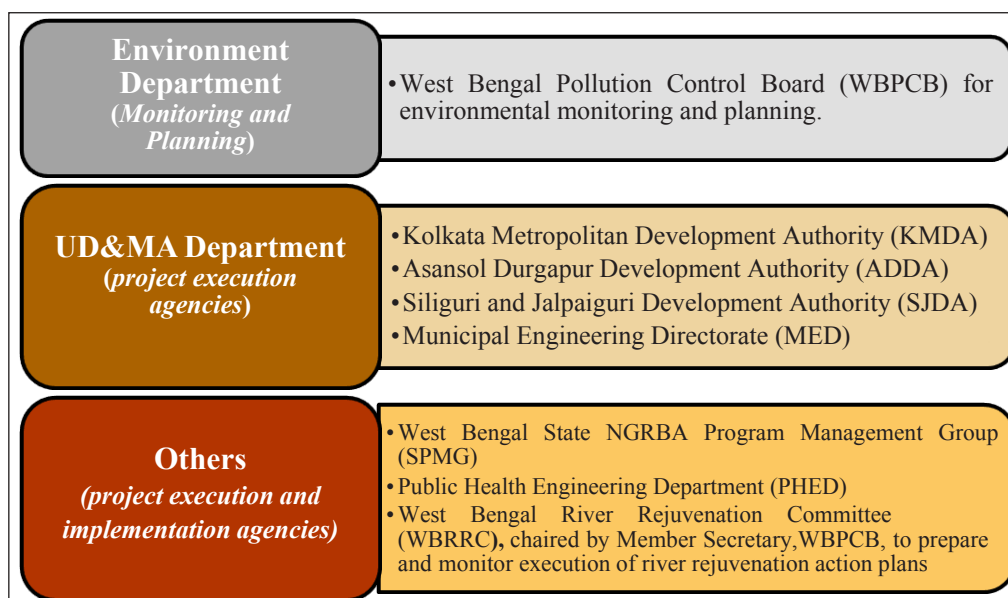
Chart 1.3: Institutional arrangement



(Source: *Water (Prevention and Control of Pollution), Act, 1974 and minutes of River Rejuvenation Committee*)

While the responsibility for monitoring and controlling pollution in West Bengal rests with the WBPCB, various other Authorities/ Departments also play a significant role in prevention of water pollution in the State. The role of these authorities in planning, execution and monitoring of various programmes for prevention of water pollution in the State are as depicted in **Chart 1.4**.

Chart 1.4: Role of various authorities in planning, execution and monitoring of the programmes for prevention of water pollution



1.7 Reasons for conduct of Audit

The National Green Tribunal (NGT) order against the Original Application (OA) No. 673/2018 dated 06 December 2018, directed States to revise, prepare

and implement Action Plans to restore polluted river stretches and to ensure 100 *per cent* treatment of sewage by 31 March 2020. The timeline for completion of all steps in the Action Plans including setting up of STPs and their commissioning was 31 March 2021.

NGT passed another order on 26 September 2019, in the matter of the OA No. 360/2018 to check compliance with several statutory requirements related to waste and environment management and advisories issued to the States. This was in response to the growing concerns regarding non-compliance with the provisions of Waste Management Rules and Regulations of 2016, and other relevant rules and regulations related to water quality and conservation, and air and noise pollution management in the States.

CPCB had identified (2017) 17 polluted river stretches where River rejuvenation programme was to be implemented.

Goal 6 of the Sustainable Development Goals (SDGs) call for access to safe and affordable drinking water, sanitation facilities, and hygiene for all by 2030. According to SDG index - 2020 of NITI Aayog, as regard the performance of West Bengal in SDG-6 (Clean water and sanitation), it was observed that the score of the State declined to 81 from 83 in 2019.

Further, research studies showed impact of water pollution on agricultural produce and aquatic animals in the State as well as risks to human health from water contamination such as *Diarrhoea, Enteric Fever, Vibrio cholera etc. and prevalence of Arsenicosis and Fluorosis*.

Thus, Audit decided to study the issue of water pollution through a Performance Audit.

CHAPTER - II

Audit Framework

CHAPTER-II

Audit Framework

2.1 Audit objective

The measures taken by the State of West Bengal to prevent and contain water pollution were examined with certain specific audit objectives in mind.

The objectives for this Performance Audit were to assess whether:

- *Steps taken by the State Government to prevent water pollution of rivers, lakes and ground water were adequate;*
- *Measures undertaken to control water pollution achieved the desired objective;*
- *Monitoring of water pollution was effective to prevent and control water pollution and*
- *Appropriate steps have been taken to achieve the relevant targets under Sustainable Developmental Goal (SDG)-6, relating to water pollution.*

2.2 Audit criteria

Audit findings are based on criteria derived from the following sources:

Government of India Acts/Rules/Guidelines	• The Water (Prevention and Control of Pollution) Act, 1974. • National Water Policy, 2012. • National Environment Policy, 2006. • NGRBA Guidelines and NGRBA Programme Framework. • Manual on Sewerage and Sewage Treatment Systems (2013). • Central Public Health and Environmental Engineering Organization (CPHEEO), Ministry of Urban Development, Government of India.
Government of WB Acts/Rules/Guidelines	• State Environment Plan. • West Bengal Prevention and Control of Water Pollution (procedure for Immersion of Idol after Pujas) Rules in September 2018.
Others	• NGT orders. • Guidelines and instructions issued by Central Pollution Control Board/ State Pollution Control Boards. • Minutes of the River Rejuvenation Committee Meetings.

Water quality criteria

Central Pollution Control Board (CPCB) has developed a concept of *designated best use* for use of water. According to this concept, out of the several uses of water of a particular water body, the use which demands highest quality is termed its *designated best use*. Five *designated best uses* have been identified.

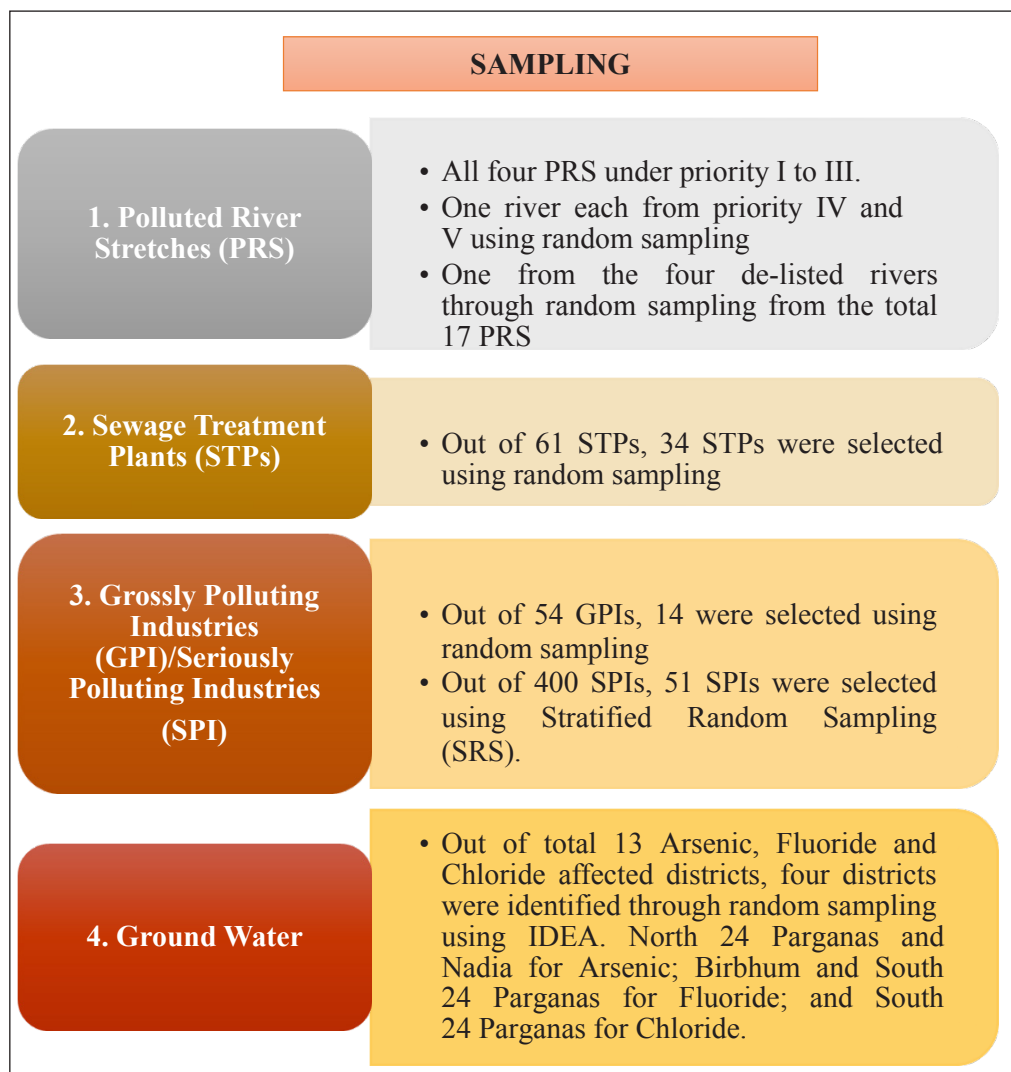
This classification helps the water quality managers and planners to set water quality targets and design suitable restoration programmes for various water bodies as shown in **Table 2.1**.

Table 2.1: Water Quality Criteria

Designated Best Use	Class of water	Criteria
Drinking water source without conventional treatment but after disinfection	A	- Total Coliforms Organism MPN/100 ml shall be 50 or less - pH between 6.5 and 8.5 - Dissolved Oxygen (DO) 6 mg/l or more - Biochemical Oxygen Demand (BOD) - five days 20°C 2mg/l or less
Outdoor bathing (Organised)	B	- pH between 6.5 and 8.5 - Dissolved Oxygen 5 mg/l or more - Biochemical Oxygen Demand - three days 20°C 3 mg/l or less - Faecal Coliforms≤500 MPN/100 ml (desirable) - Faecal Coliforms≤2500 MPN/100 ml (max permissible) - Faecal Streptococci≤100 MPN/100 ml (desirable) - Faecal Streptococci≤500 MPN/100 ml (max permissible)
Drinking water source after conventional treatment and disinfection	C	- Total Coliforms Organism MPN/100ml shall be 5000 or less - pH between 6.0 to 9.0 - Dissolved Oxygen 4mg/l or more - Biochemical Oxygen Demand - five days 20°C 3mg/l or less
Propagation of Wildlife and Fisheries	D	- pH between 6.5 to 8.5 - Dissolved Oxygen 4mg/l or more - Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	- pH between 6.0 to 8.5 - Electrical Conductivity at 25°C micro mhos/cm Max 2250 - Sodium absorption Ratio Max 26 - Boron Max 2mg/l

2.3 Audit scope and Methodology

The Performance Audit was conducted between June and November 2023, covering the period from 2018-19 to 2022-23. The Performance Audit sought to evaluate the systems and processes in place for prevention, control and monitoring of water pollution caused due to (i) urban sewage, (ii) industrial effluents and (iii) groundwater metal contamination (*i.e.* arsenic, fluoride, chloride) for the period of 2018-23.

Audit sampling included the following:**Audit Methodology included the following:**

- ✓ Analysis of records/documents and data using Computer Assisted Audit Techniques (CAAT)
- ✓ Issue of requisitions/queries/observations
- ✓ Joint physical inspections along with photographic evidence
- ✓ Independent water quality tests by engaging CPCB.

CPCB was requested to extend its water quality analysis service for testing of the quality of treated wastewater of eight STPs, four Effluent Treatment Plants (ETPs) and a Common Effluent Treatment Plant (CETP). The water from seven drains/canals and a lake were also subjected to quality analysis by soliciting services of CPCB.

An Entry Conference was held on 27 June 2023, with the Secretary, Environment Department wherein the audit objectives, scope and methodology were discussed. Representatives from other line departments and organisations such as WBPCB, State Urban Development Agency (SUDA), Kolkata Municipal Corporation (KMC), Kolkata Metropolitan Development Authority (KMDA),

State Water Investigation Directorate (SWID) and East Kolkata Wetlands Management Authority (EKWMA) also participated in the Entry Conference.

A separate meeting with Member Secretary, WBPCB was held on 11 July 2023 wherein the audit objectives, scope and methodology were also discussed.

Exit Conference was held on 12 March 2024, with the Special Secretary, Environment Department wherein the audit observations were discussed. The replies obtained from the Department have suitably been incorporated in the Report, wherever relevant.

2.4 Structure of the Audit Report

The Performance Audit Report has been structured on the basis of specific audit findings from the test checked districts and contains seven chapters.

Chapter I	• Introduction
Chapter II	• Audit Framework
Chapter III	• Planning for prevention and control of water pollution in Rivers, Lakes and Ground water
Chapter IV	• Municipal Sewage treatment for restoration of Polluted River stretches and Lakes
Chapter V	• Industrial Wastewater Management
Chapter VI	• Ground Water Quality Management
Chapter VII	• Monitoring of Water Quality

2.5 Acknowledgement

We acknowledge the co-operation extended by the Environment Department, UD&MA, PHED, WBPCB and KMDA in providing the records and information for smooth conduct of the Performance Audit. We also acknowledge the assistance through technical expertise provided for conducting water quality tests by the Regional Offices of CPCB.

CHAPTER - III

***Planning for prevention
and control of water
pollution in Rivers, Lakes
and Ground water***

Chapter- III

Planning for prevention and control of water pollution in Rivers, Lakes and Ground water

3.1 Introduction

According to the Water (Prevention and Control of Pollution) Act, 1974, WBPCB is required to plan comprehensive programmes for prevention and control of water pollution and secure execution thereof. For this purpose, identification of the water polluting sources, type and the quantity of pollutants discharged into the environment was to be done. Further, as per Section 16 (h) of the Act, CPCB must plan and cause to execute a nationwide programme for the prevention, control or abatement of water pollution.

CPCB's Report on 'River Stretches for Restoration of Water Quality (September 2018)' under National Water Quality Monitoring Programme for the year 2016-17, listed 17 stretches¹⁰ of different rivers in the State as '*polluted*'.

In September 2018, the National Green Tribunal (NGT)¹¹ directed all States to prepare Action Plans within two months to bring all the polluted river stretches under the category, "fit for at least bathing purpose" (*i.e.* BOD < 3 mg/l and FC < 500 MPN/100 ml).

In response to the order¹² of NGT, the CPCB summarised seven themes¹³, and directed the State Governments to compile information which *inter alia* included three¹⁴ of these specific thematic areas relating to abatement of water pollution *viz.* (i) **Water Quality Management Plan**, (ii) **Domestic Sewage Management Plan** and (iii) **Industrial Wastewater Management Plan**.

This Chapter deals with the planning mechanism envisaged under the State Environment Plan (SEP) and the Action Plans of the Polluted River Stretches (PRS) for implementation of the Rejuvenation programmes prepared in compliance with NGT's OA 360/2018 and 673/2018 respectively. Audit findings are discussed in succeeding paragraphs.

3.2 State Water Policy

To assess surface water and ground water resources, governments require adequate and comparable information. Thus, it is necessary to establish databases of the availability of all types of hydrologic data and to identify surface and ground water resources and potential sources of water supply and prepare national profiles.

¹⁰ Barakar, Churni, Damodar, Darakeswar, Dwaraka, Ganga, Jalangi, Kaljani, Kansai, Karala, Mathabhanga, Mahananda, Mayurakshi, Rupnarayan, Silabati, Teesta and Vidyadhari.

¹¹ Order against the Original Application No. 673/2018.

¹² In the matter of the Original Application (OA) Number 360/2018.

¹³ (i) Solid Waste Management Plan, (ii) Water Quality Management Plan, (iii) Domestic Sewage Management Plan, (iv) Industrial Wastewater Management Plan, (v) Air Quality Management Plan, (vi) Mining Activity Management Plan and (vii) Noise Pollution Management Plan.

¹⁴ The remaining themes are related to noise pollution, air pollution, mining and solid wastes.

National Water Policy, 2012 was framed to assess the existing situation of water resources of the country and to propose a plan of action with a unified national perspective. The policy envisaged that States would frame and adopt a State Water Policy.

Audit observed that the State Water Policy for West Bengal had not been framed even after a lapse of 12 years of the finalisation of the National Water Policy. Further, a standardised State level water related information database system had not been established. In the absence of a State Water Policy, issues related to water governance such as water pollution, encroachments on water bodies, adequacy of infrastructure, conservation, management of water and water pricing could not be effectively addressed, as discussed in this Report.

The Department accepted (March 2024) the audit observation and stated that the rural area water supply issues were being looked after by the PHED while the urban area water supply issues were addressed by KMDA and KMC. However, the fact remains that the Government has been in continuous default by not framing a State Water Policy in consonance with the National Water Policy 2012.

3.3 Short term Action Plan under State Environment Plan

In compliance with NGT’s OA No. 360/2018, the Environment Department, GoWB prepared (2020) the State Environment Plan (SEP) by collating information from 23 districts and 125 urban local bodies (ULBs) on seven thematic areas, as defined by the CPCB.

Further, as per the NGT order, OA No. 360/2018, the SEP was to include various short-term action plans related to abatement of water pollution. These short-term plans were to be finalised by various stakeholders¹⁵ and had to be completed within 6 to 12 months from the date of the preparation of the SEP. It was noted in Audit that during the period of 2018-19 to 2022-23, a number of Action Plans have been initiated by different implementing agencies, but none of them were completed as detailed in **Paragraphs 3.3.1 to 3.3.5.**

3.3.1 Inventory of Wetlands

Wetlands are a vital part of the hydrological cycle and are highly productive eco-systems which support rich biodiversity and provide a wide range of eco-system services such as water storage, water purification, flood mitigation, erosion control, aquifer recharge *etc.*

- A. MoEF&CC’s guidelines for implementing Wetlands (Conservation and Management), 2017 Rules required developing a list of activities, to be regulated and permitted within the notified wetlands and their zone of influence, and defining the strategies for conservation and wise use of notified wetlands.
- B. Wetlands (Conservation and Management) Rules, 2017, *inter alia*, require¹⁶ that the State Wetlands Authority (SWA) would prepare a comprehensive

¹⁵ UD&MA Department, WBPCB, ULBs *etc.*

¹⁶ Vide Rule 5(4)(d).

- digital inventory¹⁷ of all wetlands within a period of one year from the date of publication of these Rules, and upload the same on a dedicated web portal, to be developed by the Central Government for the said purpose. The inventory was to be updated every ten years.
- C. The State Environment Plan 2020, also aimed at preparation of an inventory of water bodies, as a short-term action plan.
- D. NGT¹⁸ required (22 July 2021), National Wetlands Committee to identify and inventorise wetlands with the assistance of State Governments and obtain brief documents¹⁹ of each of the identified wetlands.

Audit, however, observed that the inventory of identified water bodies could not be completed within the stipulated time period of one year and was still in progress (March 2024) as detailed below:

- Water Resources Investigation and Development Department (WRIDD), Government of West Bengal was designated as the State's Nodal agency for restoration of water bodies including wetlands *vide* Chief Secretary's notification dated 31 May 2021.
- According to the National Wetland Inventory Assessment Atlas prepared by the Space Application Centre of Indian Space Research Organization (ISRO), a total of 9,119 wetlands with an area of above 2.25 Ha each were identified in the State.
- In the first phase, the Department of Environment, GoWB entrusted the work of preparation of brief documents for 23 wetlands to the Institute of Environmental Studies and Wetland Management (IESWM²⁰) in September 2021. Subsequently, WRIDD prepared (March 2022) fact sheets of 94 wetlands.

The Department also stated (March 2024) that the work of preparation of brief documents for 23 wetlands had been completed and preparation of brief documents for 221 wetlands were at their final stages.

Even three years after the NGT order, the Department did not notify wetlands and their zone of influence and define the strategies for their conservation, in compliance with the MoEF&CC's guidelines. This leaves the wetlands with highly productive eco-system and rich biodiversity at the risk of potential damage.

3.3.2 Inventory of Ponds/ Lakes

The MoEF&CC's guidelines for implementing Wetlands (Conservation and Management) Rules 2017 requires State Wetlands Authorities to prepare brief documents for each wetland (such as lagoon, lake, marsh, urban lake *etc.*) to be notified for regulation under the Rules 2017, delineating demarcation of

¹⁷ Details of wetlands with digital maps and coordinates.

¹⁸ Vide its order in OA 351/2019.

¹⁹ The brief document would record the physical as well as socio-economic importance and Bio diversity of the wetlands, which would enable the district administration to use and manage the wetlands.

²⁰ IESWM was established in March 1986 with the primary objective of carrying out studies related to wetland functions and its ecology. The Institute is an Autonomous Body under the administrative control of the Department of Environment, Government of West Bengal.

wetlands boundary, demarcation of its zone of influence, ecological character, pre-existing rights and privileges *etc.* Audit observed that brief documents for the identified water bodies were not prepared.

Action plans, timelines, and fund requirements for conservation/protection of the identified ponds/lakes were also not prepared.

NGT also, *vide* its order dated 25 February 2020 directed States to identify ponds and lakes for assessment of water quality, to prepare action plans for restoration of prioritized ponds or lakes and execute the approved action plans. Accordingly, the Environment Department, GoWB, identified (October 2020) 15,000 water-bodies (ponds, lakes, tanks *etc.*) in the State for protection and restoration works.

Further, as per directions issued by NGT *vide* order dated 25 February 2020 these identified water bodies were to be prioritized and restored by March 2021. However, Audit observed that the State Government had only taken up the work of preparation of brief documents. Strategies for conservation of identified water bodies had not been defined till March 2024.

Due to non-inventorisation of water bodies and subsequent non-preparation of action plans for restoration, concerted efforts could not be made for conservation and effective management of water bodies. Estimation of financial intervention needed for addressing issues related to restoration of those water bodies like weed infestation, sewage discharges, encroachments *etc.* was also not possible.

Recommendation 1:

The Environment Department should complete the inventory of all wetlands and water bodies in a time bound manner and prepare Action Plans for their effective management.

3.3.3 Faecal Sludge and Septage Management

Department of UD&MA, GoWB notified (May 2022) a Faecal Sludge and Septage Management (FSSM) Policy. The Policy points out that in the absence of adequate infrastructure for treatment and disposal, faecal sludge/septage was disposed of in open nullahs/outfall channels, causing pollution of rivers, canals and other water bodies. It further states that one of the reasons of high faecal coliform concentration in rivers was due to the direct disposal of faecal sludge/septage in outfall channels leading to rivers.

The FSSM Policy cited the following three-pronged approach towards adopting State-wide FSSM system:

(a) Co-treatment of faecal sludge and septage generating in the ULBs at own or nearby STPs;

(b) Setting up of independent Faecal Sludge and Septage Treatment Plants (FSTP) at ULB level or at cluster of ULB level;

(c) In case of small town (Population < one lakh) co-treatment of Faecal Sludge and Septage in new STPs (connected with intercepting sewer with diversion)

The FSSM Policy had also drawn a time frame for setting up of FSSM systems in municipal towns. As per the time frame, all the 128 ULBs of West Bengal were to be covered under FSSM systems by the year 2024-25.

Audit observed that though FSSM systems for 50 ULBs were to be set up by the end of March 2023, only six ULBs were covered till November 2023. Further, ULB-wise data for the quantity of septage generation and the quantity treated was not maintained by UD&MA and therefore the adequacy and effectiveness of the septage treatment facility could not be ascertained.

In reply, the Department stated (March 2024) that co-treatment of septage was being considered wherever Sewage Treatment Plants were available and in other cases, the work of setting up of Faecal Sludge Treatment Plants had been initiated.

3.3.4 Zero Industrial Wastewater Plan

According to SEP-2020 issued by CPCB, WBPCB had to prepare a zero industrial wastewater plan within a period of six months to one year, to reduce discharge of untreated or partially treated industrial wastewater into water bodies.

However, WBPCB was yet to prepare a zero industrial wastewater plan (March 2024). Joint inspection of the test checked industries showed that only five²¹ out of the 27 inspected industries had the facility to store and re-use treated wastewater.

In reply, the Department stated (March 2024) that it had issued direction to paper and distillery units to comply with the Zero Liquid Discharge guidelines of CPCB.

3.3.5 Utilisation of Treated Wastewater/Effluent

According to the Benchmark devised by the Ministry of Housing and Urban Affairs, Government of India, in the context of basic municipal services related to water supply, sewerage, solid waste management and storm water drainage, at least 20 *per cent* of the treated water should be reused/recycled. SDG-6 commits Governments to halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse by 2030.

The State Government constituted a committee in April 2019 for preparation of a comprehensive Policy on ‘Treated Wastewater Re-use Policy of Urban West Bengal’. The Policy for re-use of treated wastewater was adopted in June 2020 and focused on strategies for recycling of water through appropriate centralised or decentralised technology and execution thereof in a time bound manner across urban areas. The policy set a targeted timeline of 2022 to re-use 25 *per cent* of treated wastewater.

The Policy further elucidated immediate objectives (*i.e.* those to be achieved in two years span), medium term objectives (to be achieved in next four years) and long-term objectives (in further four years).

²¹ (i) Himadri Chemicals and Industries Ltd, (ii) Jay Shree Chemical and Fertilisers, (iii) CESC coal washers, (iv) Shyam Tar Products and (v) Burdwan Kraft Board LLP.

The immediate objectives laid down in the Policy were to:

- Assess sources of generation of wastewater and quantity of wastewater production in urban West Bengal and create a Geographic Information System (GIS) enabled Management Information System (MIS)
- Identify bulk users of water like industrial clusters, Railways, Infrastructure projects *etc.* and quantify their potential water demand as bulk user of water
- Assess the existing centralised and decentralised plants of wastewater treatment especially the STPs, ETPs and CETPs and take appropriate measures for up-gradation or expansion.

The Policy also aimed at setting up of a State Level High Powered Committee under the chairmanship of Chief Secretary of the State, a State Level Steering Committee under the chairmanship of Principal Secretary of UD&MA for overall supervision, monitoring and policy advice, and a State Level Wastewater Management Cell at State Urban Development Agency (SUDA) for supervising the regular implementation and monitoring of waste water treatment and its use.

Audit scrutiny of the 34 selected STPs and 65 Industries (14 GPIs²² + 51 SPIs²³), revealed that 09 STPs and 23 industries did not have provision for re-use of treated wastewater and the treated water was discharged directly into drains. In four sampled industries, though re-use of treated water was stated to be done, the actual quantity of treated re-used wastewater could not be ascertained in the absence of a recording system.

Moreover, the stipulated GIS enabled MIS for mapping sources of generation of wastewater and quantity of wastewater production in urban West Bengal was not created till November 2023.

In reply, the Department stated (March 2024) that necessary instructions had been issued to water polluting industries and STP operators to maximise re-use of treated wastewater.

However, in absence of records regarding re-use of treated wastewater, the extent of actual re-use of wastewater could not be ascertained in Audit.

Recommendations 2:

WBPCB should ensure implementation of the State’s ‘Re-use of treated wastewater Policy’ and work towards achieving Zero industrial wastewater, as envisaged in SEP 2020.

3.4 Action Plan for abatement of pollution, rejuvenation, protection and management of identified Polluted River Stretches

In consequence to NGT’s²⁴ direction (September 2018), GoWB constituted (January 2019) a River Rejuvenation Committee (RRC) for the preparation of Action Plans for effective abatement of pollution, rejuvenation, protection and management of each of the identified polluted River stretches. ***As per the NGT***

²² GPI: Industries discharging effluents into water course and the untreated effluent which have BOD load of 100 kg per day or more, and/or handle hazardous substances.

²³ SPI: Industries discharging effluents into water course and under CPCB’s 33 SPI classified sectors.

²⁴ Order against the OA No. 673/2018.

order, Action Plans were required to be prepared within two months from the date of the said order. It was observed that though the Action Plans for all the 17 identified PRS were prepared by RRC, these Plans were approved by CPCB for implementation only between July 2019 and October 2020, *i.e.* after a delay of eight months to 23 months.

Audit observed the following deficiencies in rejuvenation of the identified polluted river stretches:

3.4.1 Identification of Polluting Sources of River Ganga

As per the Action Plan for Rejuvenation of River Ganga, the main causes of river water quality deterioration are i) discharge of industrial wastewater, ii) discharge of municipal wastewater and iii) pollution from non-point sources. To improve its water quality these three issues were required to be addressed.

It was, however, noted that the State did not have a database for non-point sources of pollution for assessment of pollution load and, therefore it was not included in the Action Plan for Rejuvenation of River Ganga. With respect to assessment of pollution from point sources viz. municipal sewage and Industrial effluents, audit comments are detailed below:

3.4.1.1 Assessment of pollution sources from municipal sewage from the Ganga front towns

Continuous assessment of water quality of important fresh water sources is a mandated responsibility of WBPCB. The river Ganga is one of the most important water sources in the State of West Bengal, covering 29 main towns in the State. The approved Action Plan (July 2020) for river Ganga identified 55 drains in the catchment of the polluted stretch of the River with approximately 1,084 MLD of total sewage generation requiring integration to existing as well as proposed STPs.

Audit observed that in 2022 CPCB monitored 104 drains, discharging untreated sewage into the river Ganga, twice a year, while WBPCB monitored 56 drains discharging into River Ganga fortnightly, leaving the rest 48 drains out of monitoring mechanism of WBPCB. Thus, designing of strategies for reducing pollution load of river Ganga, as envisaged in the Action Plan, based on continuous assessment, could not be achieved as all the identified polluting drains were not monitored by WBPCB. This was evident from the monitoring reports of CPCB (pre-monsoon 2022) that the BOD load of the 104 drains falling into river Ganga remained as high as 194.85 Ton per day (TPD).

Audit further observed that UD&MA submitted in the context of an NGT case (600/2018 in February 2022) that 402 drains had been identified by the UD&MA in 42 Ganga front towns discharging wastewater into the river Ganga.

However, Action Plan for the Ganga was not revised in consideration of the updated estimated sewage from the 402 drains, and the execution of the Action Plan continued with the initial estimation of 1,084 MLD from 29 towns consisting of 55 drains. Thus, remedial action for abatement of pollution of river Ganga was not commensurate with the actual extent of sewage discharged.

In reply, the Department stated (March 2024) that even small drains with flow less than one MLD had been included in the 402 drains list, and WBPCB presently monitors 105 major drains (with flow of one MLD and above).

However, WBPCB generates water quality monitoring reports for only 56 drains and the continuous quality assessment of remaining identified drains was yet to commence. Further, the Department did not provide any supportive documents regarding monitoring of 105 major drains by WBPCB.

3.4.1.2 Action Plan for connecting the drains falling into Ganga with STPs

According to the Action Plan for rejuvenation of river Ganga, 33 out of total 55 identified drains (29 towns) of the river Ganga were either connected or proposed to be connected to different STPs. For remaining 22 drains, as per the CPCB guidelines, the feasibility of the work in these channels was to be completed by February 2021, but the same was not completed, till December 2023.

The implementing agency, Kolkata Metropolitan Development Authority (KMDA) engaged two institutes²⁵ to assess the water quality and flow of 70 drains into river Ganga including previously identified 55 drains. The report was prepared by the institutes during 2022-23.

However, KMDA was yet to prepare project proposals for connecting the drains, falling into river Ganga, with STPs. Further, as per the CPCB’s latest report on Water Quality Monitoring of drains (pre-monsoon 2022), only one drain was tapped²⁶. As a result, untreated sewage drains into river Ganga directly causing pollution of the river.

Thus, it is evident that the Action Plan approved in July 2020 was deficient as it did not adequately address the pollution load encompassing the actual number of drains falling into Ganga. The implementation of the Action Plan was also deficient as only one drain was connected to an STP.

3.4.1.3 Assessment of Industrial effluents in the Action Plan of River Ganga

According to Section 25 and 26 of the Water (Prevention and Control of Pollution) Act 1974, no industry can discharge sewage or trade effluent into a stream or well or sewer or land beyond the permissible standards prescribed by CPCB.

Audit, however, observed that many drains²⁷ were carrying industrial effluents and coloured effluents from various industrial clusters²⁸. WBPCB had neither taken the initiative to find out the possible cause of the water pollution nor did it initiate an updating exercise of its database regarding water polluting industries during the Audit period as detailed below:

²⁵ Jadavpur University (JU) and the Indian Institute of Engineering, Science and Technology (IIEST), Shibpur.

²⁶ Construction of interception structures on the drains and diverting the drains water to STPs.

²⁷ Sarenga and Ramkrishna Ghat in Howrah, Green Channel in Haldia Churial in South 24 Parganas *etc.*

²⁸ Jalan Industrial Complex, Sankrail Industrial Complex, Food Park and Poly Park, Haldia *etc.*

(i) Source of industrial pollution through Sarenga Khal into Ganga not completely ascertained

NGT²⁹ on the issue of discharge of industrial effluents into the river Hooghly through *Sarenga Canal*³⁰, observed (July 2023) that WBPCB had not updated the numbers of water polluting industries of all the clusters³¹ in Howrah.

According to the advice of NGT, WBPCB visited (September 2023) the area in order to ascertain the status of various industrial units in the area and identify the possible sources of discharge to the said canal. Water quality analysis in August 2023 showed that the canal water had high BOD with Zero Dissolved Oxygen (DO). However, the final report on identifying the possible sources of discharge to the said canal was still to be prepared (November 2023).

A joint inspection of the *Sarenga Khal*³² in November 2023 with officials of WBPCB revealed that the canal water was brown in colour and presence of oil was palpable. Colour traces were seen in the canal water even near the confluence point.



Figure 3.1: Coloured canal water with traces of oil and grease



Figure 3.2: Coloured canal water near confluence

In reply, the Department stated (March 2024) that inspections were being carried out to identify industries polluting the canal. This indicated that source of industrial pollution through *Sarenga Khal* into river Ganga was yet to be ascertained by WBPCB.

(ii) Source of industrial pollution through Green Belt Canal yet to be ascertained.

Environment Pollution Abatement Action Plans for Haldia, *inter alia*, included monthly water quality monitoring of the **Green Belt Canal (GBC)**. The

²⁹ OA No. 75/2023/EZ.

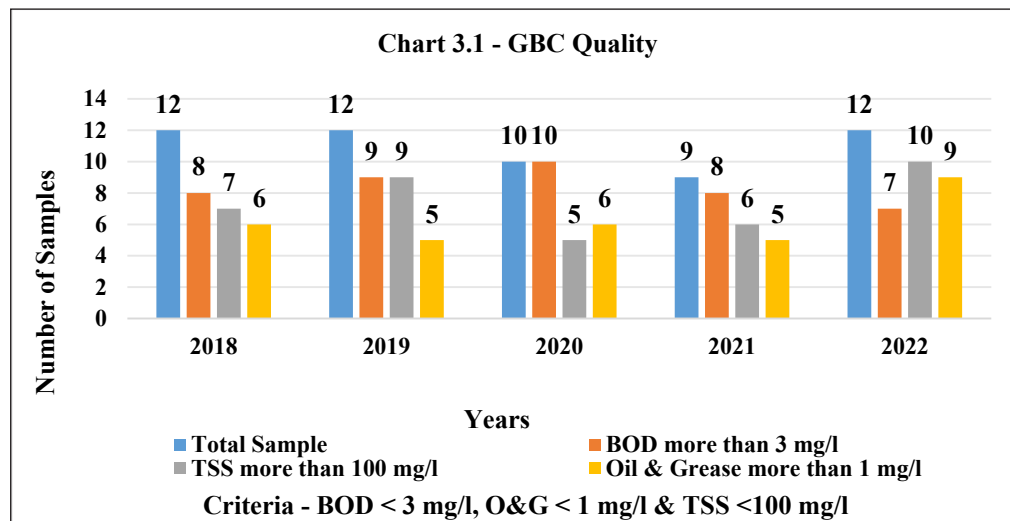
³⁰ Drainage channel of about 10.35 KM maintained by Irrigation and Waterways Department (I&WD) of GoWB, drains industrial effluent from these clusters.

³¹ Bamungachi Industrial Cluster, Food Park, Poly Park, Jalan Industrial complex and Sankrail Industrial Complex.

³² Means drain/canal carrying industrial sewage.

industries of the major industrial town-*Haldia*, discharge their treated effluents in the GBC, which drains into the *HalDI* River, a tributary of river Hooghly. The water quality of GBC is monitored monthly by WBPCB at 11 sampling stations. The rationale was that the water quality of GBC at different locations can be used as an indicator of the quality of discharges from individual industries, as most of the industries are having typical characteristic discharges to the GBC.

Analysis of the monitoring data for the period from 2018 to 2022 of the 11 sampling points of the canal revealed that the parameters like Biological Oxygen Demand (BOD), Oil and Grease (O&G) and Total Suspended Solids (TSS) regularly exceeded the norms as shown in the **Chart 3.1**.



Further, at the discharge point (*Patikhali* gate) into the river Hooghly, the above parameters were seen to be high during the period 2018-23 as in **Table 3.1**.

Table 3.1: Test result of GBC at Near *Patikhali* gate (Max in a Year)

Year	TSS (mg/l)	COD (mg/l)	BOD (mg/l)	Oil and Grease (mg/l)	Sulphide (mg/l)
2018	1,436	206.00	12.50	1.50	3.456
2019	1,488	421.81	160.00	3.04	0.390
2020	576	338.78	150.00	1.70	BDL*
2021	790	351.02	180.00	2.20	BDL
2022	576	56.84	29.06	3.40	BDL
Criteria	100	50	3	1	1

*Below Detection Level

Audit conducted a joint inspection of the GBC along with officials of the WBPCB in October 2023 and observed that at the first sampling point of GBC, Oil and Grease was distinctly visible on the water surface. It was also observed that the canal became narrow from the sampling point 6 onwards due to siltation.



Figure 3.3 :1st sampling point of GBC, Oil and Grease was distinctly visible on the water surface

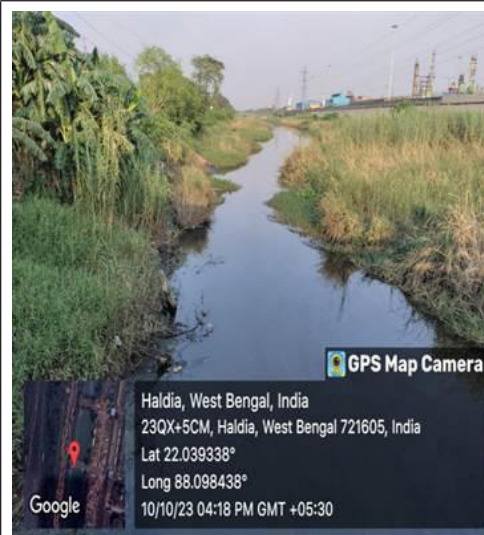


Figure 3.4: Narrow stretch of green belt canal from the sampling point 6 onwards due to siltation

However, records regarding analysis of the possible sources of water pollution were not available. In reply, the Department stated (March 2024) that inspections were being carried out to identify the polluting industries to the said canal.

(iii) Source of pollution discharging into Ramakrishna Ghat drain yet to be identified.



Figure 3.5: Ramakrishna Ghat drain

Ramakrishna Ghat drain (Howrah) is one of the drains carrying mixed effluent and discharges directly into the river Ganga. A detailed study was carried out by CPCB in April 2022 to identify the source of pollution at the catchment area of the drain. CPCB observed that untreated industrial effluent, laced with heavy metal concentrations of minerals (*i.e.* Cd, Cu, Fe, Pb, Mn, Ni and Zn), was discharged into the canal.

Based on the study report, CPCB issued (November 2022) directions to WBPCB to identify the source of discharge of high metal bearing acidic

effluent into the drain and take necessary action to stop the discharge of untreated effluent. WBPCB was also directed to prepare an action plan for interception and diversion, and treatment of the above drain.

Audit observed that WBPCB had neither updated its inventory for polluting units on the lines of CPCB's direction in November 2022, nor had it prepared an action plan for interception and diversion of the above drains. In the absence of an action plan, concerted effort could not be initiated for abating pollution to the drain.

In reply, the Department stated (March 2024) that it had conducted inspections of several units which were discharging untreated effluent to *Ramkrishna Ghat* drain, and it had ordered for closure of five units in April 2023.

However, the updated inventory for polluting units was not on record, and interception and diversion work was not initiated in respect of the *Ramkrishna Ghat* drain.

(iv) Inventory of the dyeing units discharging untreated colour effluents directly into the municipal drains

An STP with a capacity of 9.5 MLD was commissioned with effect from July 2022 at *Nabadwip*, Nadia district. Joint field inspection of the STP with the KMDA officials in November 2023 showed that the treated effluent was brown in colour with foam. Observing the treated effluent, some dyeing units were inspected on the same day, and it was noticed that the units were operating without effluent treatment facilities and the coloured discharge was directly falling into the municipal drains of *Nabadwip* town which is connected to the STP designed for treating municipal sewage only.



Figure 3.6 : Final treated discharge with colour and foam

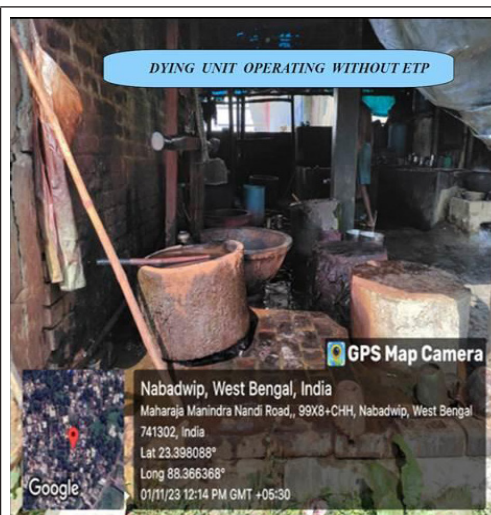


Figure 3.7 : Dyeing unit operating without ETP

Audit observed that the concerned Executive Engineer of KMDA, informed (July 2023) Barrackpore Regional office, WBPCB regarding the mixing of industrial colour/dye with drain water thereby, affecting the performance of the STP as it was equipped to treat municipal waste only.

However, remedial action taken by the WBPCB was not found on record. Moreover, an inventory of the dyeing industries in this area was also not available with WBPCB.

In reply, the Department stated (March 2024) that regulatory actions against two dyeing units at *Nabadwip* for discharging untreated effluent had since been initiated.

(v) Inventory of the dairies discharging untreated effluents

“Guidelines for Environmental Management of Dairy Farms and Gaushalas” were issued by the CPCB in July 2020. The major environmental issues, as per

the guidelines, are discharge of cow dung and urinal wastewater into drains and rivers without any treatment. To address the environmental issues, the guidelines prescribed measures for management of both solid and liquid wastes from dairy farms and gaushalas in addition to the Siting Policy³³ and Regulatory/Monitoring Mechanism of WBPCB. The guidelines, *inter-alia*, stipulated the following:

- Preparation of inventory of the dairy farms and gaushalas,
- The SPCB shall publish a public notice for dairy farms to obtain Consent To Establish (CTE) and Consent To Operate (CTO) under Water Act, 1974 as well as Air Act, 1981 as per the categorisation of industries.
- Dairies and gaushalas should ensure that the wastewater, being discharged is adequately treated so as to meet the standards as prescribed by SPCBs.

Audit further observed that WBPCB was yet to implement a plan for the Environmental Management of Dairy Farms and Gaushalas and bring these farms under consent management³⁴. Inventory of the dairy farms and Gaushalas was not prepared (November 2023).

Audit observed from the records of WBPCB that cow dung is being regularly discharged into the Damodar Valley Corporation (DVC) canal, linked to river Ganga, by more than 200 cattle sheds which exist in this stretch of the canal. Direct discharge of cow dung into the canal causes severe water pollution in the canal and a considerable part of organic load was reaching the river.

From the monitoring report (2018-22) of CPCB for the canal, it was observed that at the outfall point on River Ganga, the BOD load varied from 6.36 to 54.64 Tonnes Per Day (TPD) with an average of 24.33 TPD. The coliforms (Total and Faecal) counts were significantly high indicating the discharge of domestic wastewater into the canal. *Nazirgunj Khal* which carries the wastewater of DVC canal also indicated that the average BOD, COD concentrations (Average 49.20 mg/l and 227.60 mg/l respectively) did not comply with the general standards for discharge of environmental pollutants into inland surface waters.

NGT (March 2023) passed orders for setting up of a Bio-gas plant, dredging of DVC canal, removal of illegal khatahs/cow sheds/cattle sheds and putting in place appropriate sewerage management plan.

Audit conducted a joint inspection of the DVC canal with representatives of WBPCB, *Dankuni* Municipality and Irrigation and Waterways Department (I&WD) in November 2023, and observed the following:

- Discharge of cow dung into the canal was continuing. The Irrigation and Waterways Department (I &WD) incurred an expenditure of ₹ 6.76 crore during 2022-23 to 2023-24 to clean the canal.
- The proposed bio-gas plant was yet to come up. There were no records available in support of bringing the dairies under consent management of WBPCB.

³³ Siting policy clearly bring out the areas to be avoided for establishment of polluting industries.

³⁴ Soliciting consent from WBPCB for establishing and operating units having impact on environment.



Figure 3.8 : Dankuni Canal filled with cow dung

In reply, the Department stated (March 2024) that setting up of a bio-gas plant is under process.

Thus, inability in bringing the Dairy Farms and putting Gaushalas under consent management coupled with laxity in charting out an appropriate sewerage management plan caused considerable organic load in the DVC canal. It also led to polluted discharge into the river Ganga, with BOD concentration at an average of 28 mg/l against the norms of 3 mg/l.

Recommendation 3:

WBPCB should periodically update its database of pollution sources, including non-point sources for assessment of actual pollution load so that the pollution can be addressed before discharge into canals, rivers and other water bodies.

3.4.2 Finalisation of Action Plan for the river Vidyadhari without proper survey

Action Plan for rejuvenation of the 20 kms stretch of river *Vidyadhari*³⁵ (July 2019) stated that the river runs through rural areas and had no major towns on its banks. The major villages on its banks were *Haroa*, *Minakhan* and *Malancha*. The total sewage generation in the catchment area was estimated to be 1,539.24 MLD.

Public Health Engineering Department (PHED), Government of West Bengal entrusted (March 2021) the project “*Preparation of Concept Plan and Detailed Project Report for rejuvenation of the polluting stretch of River Vidyadhari*” to IIT Kharagpur. The Action Plan, prepared in July 2019, assumed that no municipal town contributes to the sewage flowing into the river Vidyadhari. Draft Report on ‘Preparation for Concept Plan and Detailed Project Report for Rejuvenation of the River’, submitted by IIT indicated that STPs for

³⁵ From Haroa Bridge to Malancha Burning Ghat.

six Municipalities³⁶ contributing an estimated sewage of 186 MLDs as of 2021 needed to be considered for setting up instead of PHED's original estimation of one STP for 170 MLD at *Ghusighata*.

Audit observed that detailed design work for setting up of STPs in the six municipalities could not be started due to non-availability of land, which was to be provided by the concerned ULBs. In the 15th RRC meeting (September 2022), it was decided that as river *Vidyadhari* was receiving wastewater through different canals of Kolkata Metropolitan Area, KMDA would prepare project proposals for setting up of Faecal Sludge Treatment Plants (FSTPs)/STPs wherever feasible. However, as of March 2024, such proposals for setting up of FSTPs/STPs had not been finalised.

Audit further observed that five STPs³⁷ with an aggregate sewage treatment capacity of 117.20 MLD were planned for *Bagjola-Keshopur Khal*, falling into river *Vidyadhari*, with target date of completion being May 2024. However, construction work for the five STPs had not commenced till August 2023 due to non-availability of land.

In reply, the Department stated (March 2024) that the work of setting up STPs in municipal towns had been initiated.

Thus, delay in construction of proposed STPs allowed *continued flow of untreated sewage into the river Vidyadhari*.

3.4.3 Assessment of risks of polluted water to environment and health

Polluted water in rivers, lakes and ground water poses risks to environment as well as health of people exposed to the polluted water.

Risks to human health from water borne diseases and water-based diseases because of pollution of rivers and lakes were not assessed while preparing the Action Plans for rejuvenation of polluted water stretches.

Further, Environment Department was yet to inventorise (as discussed in **Paragraphs 3.3.1 and 3.3.2**) water bodies including wetlands for their regulation to protect biodiversity and ecosystems.

In reply, the Department stated (March 2024) that in the 17th Meeting (December 2023) of the RRC, it was decided that the Department of Health, GoWB would initiate regular health check-ups at bathing ghats to gauge the health impact due to change in the water quality of the river.

³⁶ Barasat, Dumdum, Madhyamgram, New Barrackpore, North Dumdum and Rajarhat-Gopalpur.

³⁷

Sl No.	Location	Proposed capacity (MLD)
1	For Kestopur Khal- Adjacent to the premises of existing Bagjola STP at Prafullakanan, Kestopur	41
2	At Bonhooghly in Baranagar Municipality	8.7
3	At Prafullakanan in North Dum Dum Municipality	33
4	At Prafullakanan STP-1 in South Dum Dum Municipality	27
5	At Jatragachi in Bidhannagar Municipal Corporation	7.5

Recommendation 4:

The Environment Department should consider risk to human health and environment while preparing action plans for mitigation of pollution of water.

3.4.4 Non-establishment of Water Quality Review Committee

Assessment of water quality is essential for pollution control, to prevent health hazards and from an environmental angle. Government of India (GOI) vide its order (May 2001) established the Water Quality Assessment Authority (WQAA) for exercising powers under the Environment Protection Act, 1986. The role of the Authority, *inter alia*, involves issuing directions to the State Government and Local Bodies for prevention and control of water pollution. The order also directed the State Governments to constitute a State Level Water Quality Review Committee (WQRC) to improve co-ordination between Central and State agencies for effective monitoring of quality of both surface and ground water resources including identification of Hot Spots for taking necessary action for improvement of water quality.

Audit further observed that the 6th meeting of WQAA in March 2008, decided to reconstitute the State level WQRCs to make them more result oriented and have relevant linkages with water resource management at the State level. Ministry of Water Resources (MoWR) had requested (July 2008) the States to reconstitute the state level WQRC.

Audit however, noticed that WQRC was not constituted in the State even after a lapse of 23 years from the establishment of Water Quality Assessment Authority.

WBPCB stated (March 2024) that drinking water quality is guided by the Ministry of Water Resources standards, and the wastewater quality by the Ministry of Environment and Forest standards.

However, in the absence of WQRC, effective review of the quality of both surface and ground water resources and identification of Hot Spots for taking necessary action for improvement of water quality was not done.

CHAPTER - IV

Municipal Sewage treatment for restoration of Polluted River Stretches and Lakes

Chapter IV

Municipal Sewage Treatment for Restoration of Polluted River Stretches and Lakes

4.1 Introduction

According to the Seventh Schedule of the Constitution of India (Article 246), 'Water' is a State Subject, and it is the responsibility of the States/UTs to ensure cleanliness and development of rivers within their jurisdiction. The Union Government supplements efforts of the States/UTs by providing financial and technical assistance for abatement of pollution in identified stretches of rivers in the country.

CPCB in association with SPCBs/Pollution Control Committees (PCCs) in different States/ UTs has been monitoring the water quality of rivers and other water bodies across the country, through a network of monitoring stations under the National Water Quality Monitoring Programme (NWQMP). Based on water quality monitoring results, CPCB in September 2018 had identified 351 polluted stretches on 323 rivers across the country which included 17 rivers from West Bengal. The polluted locations in a continuous sequence are defined as Polluted River Stretches (PRS) and categorised in five priority classes based on BOD concentration as follows:

- (i) exceeding BOD levels >30 mg/l,
- (ii) BOD between 20 mg/l & 30 mg/l,
- (iii) BOD between 10 mg/l & 20 mg/l,
- (iv) BOD between 6 mg/l & 10 mg/l and
- (v) BOD between 3 mg/l & 6 mg/l.

NGT³⁸ in the case of Restoration of Polluted River stretches asked (December 2019) all the States and Union Territories to revise, prepare and implement action plans to restore polluted PRSs. The order directed 100 *per cent* treatment of sewage by 31 March 2020 to the extent of in-situ remediation. The timeline for completing all steps of the action plans including completion of setting up of STPs and their commissioning was March 2021.

Audit observed that due to non-processing of solid and liquid waste within the time line, the Principal Bench of the Hon'ble NGT in its order dated 01 September 2022, had directed the State Government to deposit ₹ 3,500 crore as compensation within two months.

Accordingly, the State Government deposited ₹ 3,500 crore in a ring fenced account and a sum of ₹137.10 crore has been incurred from the account till November 2023. Fund from this ring fenced account will be utilized for future purposes as and when required.

Of the 17 PRS identified (2018) by CPCB in West Bengal, seven river stretches were examined in the course of Audit. CPCB's Report on "PRS for Restoration

³⁸ Order against the OA No. 673/2018.

of Water Quality-2022” was also examined by Audit wherein it was noted that the water quality, based on the BOD level, of these seven sampled PRS changed over the period from 2018 to 2022 leading to a change in their status, as shown in **Table 4.1**.

Table 4.1: Status of sampled PRS

Sl No.	Name of River	Status in 2018	Status in 2022	Remarks on quality of water
1	Mahananda	Priority-II	Priority-I	Deteriorated
2	Churni	Priority-III	Priority-II	Deteriorated
3	Mathabanga	Priority-IV	Priority-III	Deteriorated
4	Ganga	Priority-III	Priority-IV	Improved
5	Dwarka	Priority-III	Priority-V	Improved
6	Vidyardhari	Priority-I	Priority-II	Improved
7	Mayurakshi	Priority-V	Excluded from PRS	Improved

Audit observed that although the water quality of three rivers *Dwarka*, *Vidyardhari* and *Ganga* improved in terms of BOD, the bacteriological contamination in terms of the level of Faecal Coliform (FC) was still at an alarming level as discussed in paragraphs 3.3.2, 3.7.1 and 3.4.4. Further, in contravention of the Guidelines of Water Quality monitoring issued (December 2007) by CPCB which requires that sampling stations should be located upstream and downstream of significant pollution outfalls like city, sewage drains and industrial effluent outfalls, the river *Mayurakshi* was excluded from the polluted river stretch list by CPCB on the basis of the water quality report of WBPCB for only the upstream water as discussed in detail in **Paragraph 4.6.2**.

This Chapter deals with the management of municipal sewage for abatement of pollution of the seven selected PRS and two lakes namely *Santragachi* and *Mirik* lakes.

Audit findings are discussed in the succeeding paragraphs.

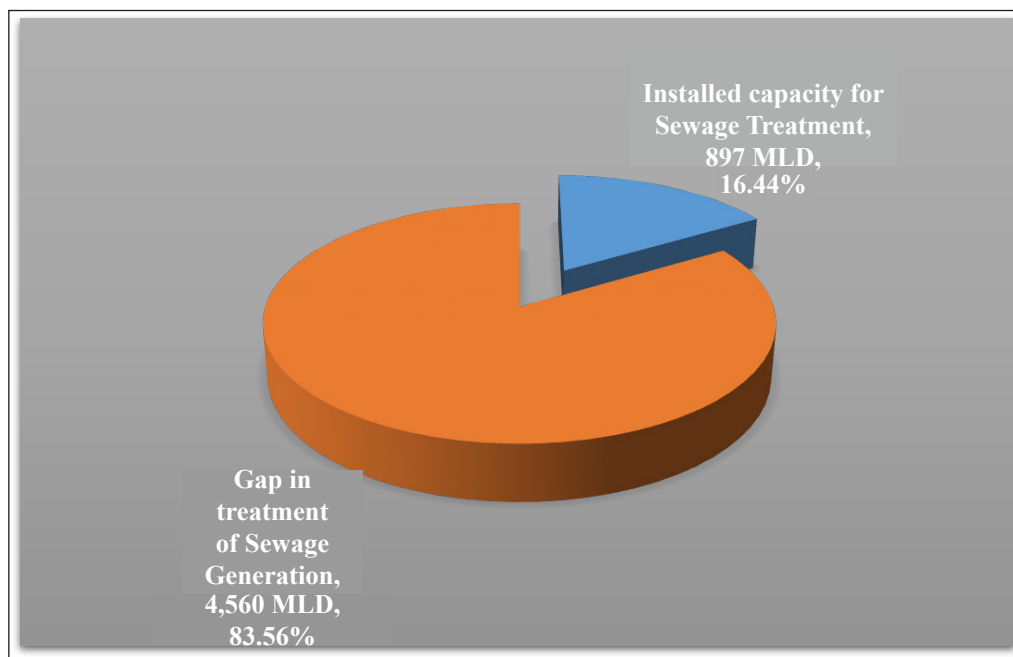
4.2 Gap in sewage treatment

STPs play a crucial role in managing wastewater. The main functions of STPs include (a) pollution reduction by removing harmful contaminants, (b) environmental protection by ensuring that discharge water meets environmental standards, (c) water recycling by reusing treated wastewater and (d) public health protection by preventing spread of diseases associated with untreated sewage.

NGT set a deadline of March 2021 to take all steps for rejuvenation of polluted river stretches including completion of setting up of STPs and their commissioning.

As of March 2021, the estimated sewage generation for the State was 5,457 MLD and the total capacity for sewage treatment of the 29 existing and 36 proposed STPs was 1,202 MLD. However, installed capacity of STPs was only 897 MLD (16.44 per cent) causing a gap of 4,560 MLD as shown in **Chart 4.1**.

Chart 4.1 : Total Sewage Generation vs Sewage Treatment



Further, out of 897 MLD of installed capacity, the operationalized capacity was 337 MLD (37.56 *per cent*) and the actual utilized capacity was only 213 MLD (63.20 *per cent*). Further the aggregate capacity of environmentally compliant STPs (i.e. STPs meeting discharge standards of MoEF&CC and NGT norms³⁹) was only 126 MLD.

In addition to the above sewage generation, there were 123 dumpsites in the State with legacy solid waste of 61.76 MT (August 2023) which also contributed to the water pollution.

Further, out of 7,322 villages in the four sampled districts of the State, only 197 villages were declared as Open Defecation Free plus (ODF+) till December 2023. The unsafe faecal disposal practice contributed to the conversion of large areas of land into faecal fields which potentially put water sources at risk of flooding with faecal material during rains.

Thus, there was a huge gap between sewage generation and the capacity available for its treatment, leading to deterioration of water quality of rivers. Considering rapid urbanisation and resultant rise in sewage generation, there is a need to bridge the existing gap on priority. Apart from filling up this gap, there is also a need to synchronise future requirement of sewage treatment capacity.

The detailed reasons for gaps in sewage treatment capacity are discussed in the succeeding paragraphs. Audit observations on municipal sewage treatment in respect of seven sampled rivers are in succeeding paragraph:

³⁹ As per MoEF&CC norms vide their order dated 13 October 2017 (i) For cities other than metro cities, state capitals and Union Territories - pH-6.5 to 9.0, BOD < 30mg/l, TSS < 100 mg/l and FC < 1,000 MPN/100 ml and as per the norms of NGT vide order dated 30 April 2019 revised the norms as BOD < 10 mg/l, pH – 5.5 to 9.0, TSS < 20 mg/l, COD < 50 mg/l; FC – desirable <100 MPN/100 ml & permissible < 230 MPN/100 ml, Nitrogen-Total < 10 mg/l and Phosphorous-Total < 1.0 mg/l.

4.3 Pollution Abatement for River Ganga

National Ganga River Basin Authority (NGRBA) was established (February 2009) with the objective of ensuring that by the year 2020 no untreated municipal or industrial effluents are discharged into the River Ganga. *Namami Gange* was approved by Government of India in 2015 to accomplish the twin objectives of effective abatement of pollution and conservation-rejuvenation of river Ganga. The Action Plan for Rejuvenation of River Ganga identified (July 2020) a total 120 kms stretch from *Tribeni* to *Diamond Harbour* encompassing 29 Towns⁴⁰ of West Bengal located on the banks of the Ganga, as polluted.

Audit observed that 17 projects (new/renovation) involving setting up of 26 STPs with an aggregate capacity of 491.68 MLD and an aggregate approved cost of ₹ 2,862.95 crore were taken up (between February 2011 and September 2020) for treating municipal sewage falling into the river Ganga. An expenditure of ₹ 1,707.39 crore was incurred on setting up of STPs along with Intersection and Diversion structures (as of June 2023). Of the 26 STPs, 19 STPs with a total capacity of 231.68 MLD were completed and operationalized by KMDA.

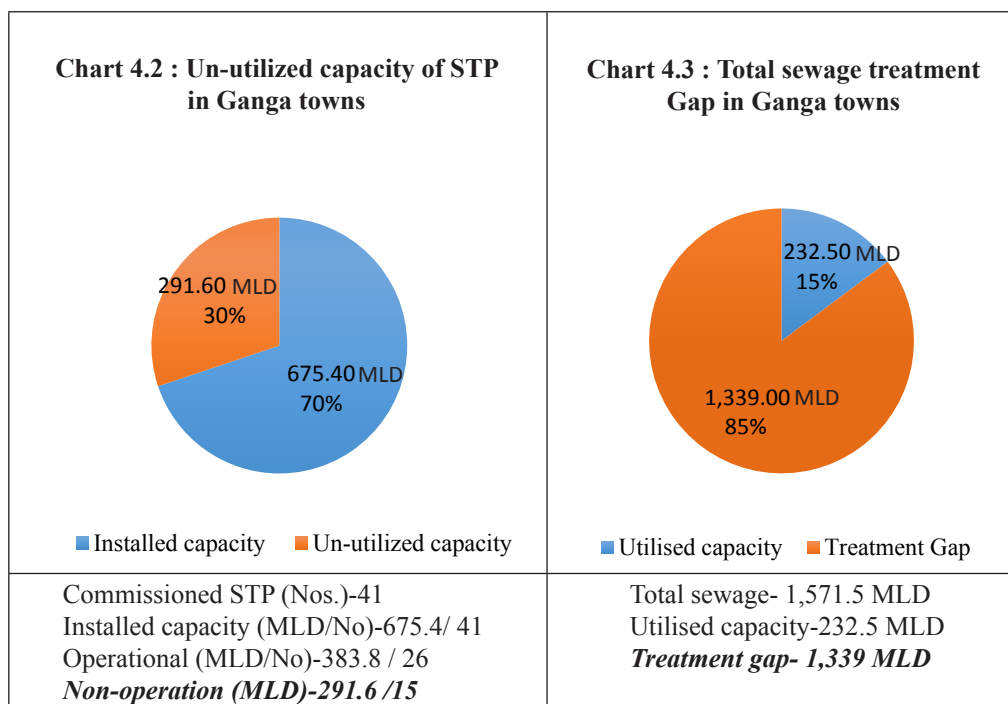
However, Audit observed that the sewage treatment capacities were impaired in the absence of adequate sewerage conveyance systems connecting to the household sewer line, non-installation of disinfection system, deficient co-ordination amongst different agencies, deficient functioning of established infrastructure, etc., as discussed below:

4.3.1 Non-achievement of targets for sewage treatment

The aim of the *Namami Gange* programme⁴¹ was to target sanitation of all anthropogenic activities, waste management of all industrial units, reduce water pollution levels etc. Sewage Treatment Plants play an important role in meeting the objectives of the Programme and controlling water pollution. The status of 41 STPs commissioned in 29 towns on the bank of river Ganga in the State as of March 2023, is detailed in **Chart 4.2** and **Chart 4.3**.

⁴⁰ Baidyabati, Bansberia, Baranagar, Barrackpore, Bhadreswar, Bhatpara, Budge Budge, Champdani, Chandannagar, Diamond Harbour, Garulia, Gayeshpur, Halisahar, Howrah, Hooghly-Chinsura, Kalyani, Kamarhati, Kanchrapara, Khardaha, Kolkata MC, Konnagar, Maheshtala, Naihati, North Barrackpore, Panihati, Rishra, Serampore, Titagarh and Uttarpara-Kotrung.

⁴¹ The Cabinet Approval to *Namami Gange* was given on 13 May 2015. The programme was to be implemented by 2020.



- Out of 41 commissioned STPs, 26 STPs were in operation with an installed capacity of 383.80 MLD. Audit observed that only 232.50 MLD was being utilized *i.e.* 60.60 *per cent* of 383.80 MLD. The underutilization of the installed capacity was mainly due to pending work of diversion of sewerage to the STPs by providing house connections and installation of Interception and Diversion (I&D) network for the drains.
- The reasons for non-operation of 15 STPs were mainly due to damaged infrastructure and wastewater load not reaching the STPs.

Thus, there was a gap of 1,339 MLD⁴² in treatment capacity and almost 85 *per cent* of total sewage generated was released into the river Ganga without treatment.

4.3.2 Compliance status of the STPs

MoEF&CC vide their order dated 13 October 2017, stipulated the standard⁴³ to be followed for treated sewage from STPs. Further, NGT *vide* order dated 30 April 2019 revised this standard⁴⁴, which *inter alia* stipulated that BOD is required to be <10 mg/l.

The Monitoring report of CPCB (for March 2023), revealed that out of total 26 operational STPs installed on the river Ganga in the State, only 13 were found to be compliant in terms of BOD and only seven STPs were compliant in terms of FC⁴⁵ criteria of the NGT norms.

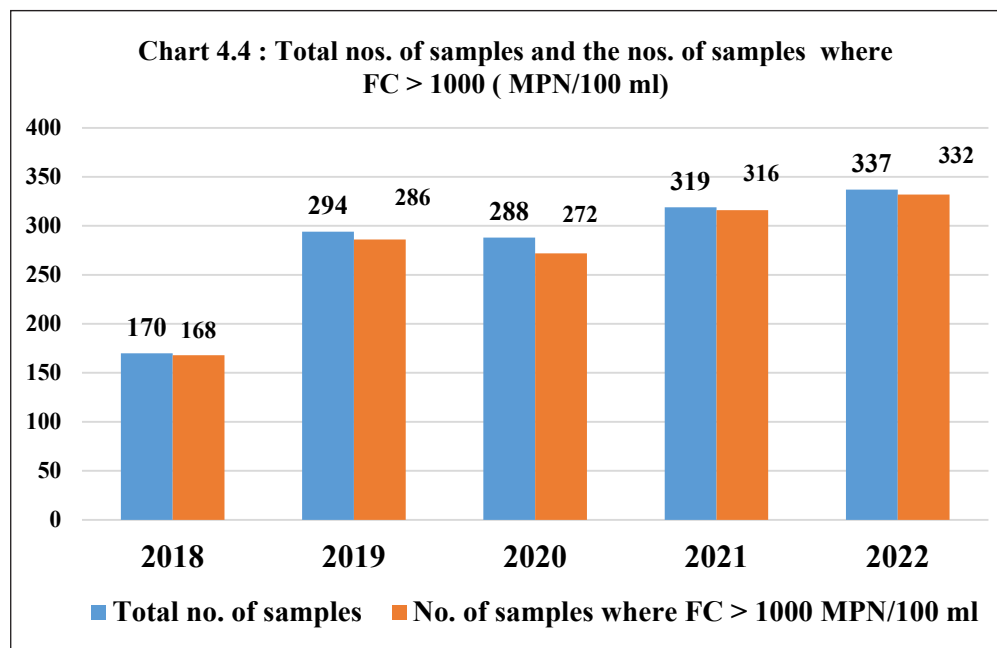
⁴² Total sewage (1,571.50 MLD) – Utilised capacity (232.50 MLD) = 1,339.00 MLD.

⁴³ (i) For cities other than metro cities, state capitals and Union Territories - pH-6.5 to 9.0, BOD <30 mg/l, TSS < 100 mg/l and FC < 1,000 MPN/100ml.

⁴⁴ pH – 5.5 to 9.0, TSS < 20 mg/l, COD < 50 mg/l; FC – desirable < 100 MPN/100 ml & permissible < 230 MPN/100 ml, Nitrogen-Total < 10 mg/l and Phosphorous-Total < 1.0 mg/l.

⁴⁵ FC > 1,000 MPN/100 ml.

Further, it was noted that the entire length of the river Ganga was polluted by Faecal Coliform bacteria, in variable degrees as was evident from the water quality data during the period 2018-22 of all the 14 monitoring stations of WBPCB as shown in **Chart 4.4**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

Audit observed that despite high bacteriological contamination which might lead to waterborne diseases, adequate steps were not being taken by the implementing agencies as mentioned in the Action Plan (like *Kolkata Municipal Corporation, Kolkata Metropolitan Development Authority etc.*), for rejuvenation of river Ganga as was evident from the STP monitoring report of CPCB (March 2023). It was also observed that disinfection system *i.e.* chlorination plants for mitigating bacteriological contamination were not available in 12 out of total 26 operational STPs.

Audit findings in sampled STPs of towns located on the river Ganga, are discussed in succeeding paragraphs:

4.3.2.1 Gayeshpur STP

The work of setting up of *Gayeshpur* STP with 8.33 MLD installed capacity was administratively approved (February 2011) by the National River Conservation Authority at an estimated cost of ₹168.67 crore for completion by February 2014. It was seen that KMDA took more than two years to finalise the tender and finally the work was awarded at a cost of ₹ 156.93 crore in October 2013. The STP started operations from September 2017.

Audit observed that since operationalization of the STP, it did not run at full capacity. As per the report⁴⁶ of March 2023, only 2.95 MLD of capacity was being utilised against an installed capacity of 8.33 MLD. It was also noted that out of 15,000 households in the catchment area, 11,575 house

⁴⁶ Monthly Progress Report sent by the WBSPMG (West Bengal State NGRBA Programme Management Group) to the NGRBA in the NGT matter OA No 673.

connections only (i.e. house sewer connected to drains) were completed till November 2023. Further, four drains were also yet to be tapped (i.e. intercepted and diverted to STP for treatment).

In reply the Department stated (March 2024) that for feeding full capacity sewage, work of Interception and Diversion of six untapped drains carrying sewage was under process.

4.3.2.2 *Panihati* STP

The work of rejuvenation of existing three STPs⁴⁷ along with lifting station & pumping station, sewage network and five years operation and maintenance was awarded in December 2019 at a tendered cost of ₹ 52.99 crore. These STPs were to cater to three municipal towns along the river Ganga viz. *Panihati*, *Garulia* and *Naihati* and were to be rejuvenated within one year of award of the contract. Audit observed the following lapses in implementation of the project:

- Joint site inspection of *Panihati* (August 2023) by Audit along with the officers of KMDA, revealed that operation and maintenance had started from July 2022, without getting CTO⁴⁸ from WBPCB and without completion of all the components viz. connection from the Lifting Station (LS) to the Main Pumping Station (MPS) intersecting the main outfall drain (PB Ghat drain) of the *Panihati* Municipality into Ganga.
- The sewer connection to the existing work and intersection with the drain could not be done as requisite approval was not received from the concerned Department⁴⁹. The letter regarding existing sewage line was addressed to the concerned Executive Engineer only in June 2022, more than two years after taking up the work in January 2020. This indicated poor planning and lack of effective co-ordination between the departments.
- Instead, a portion of the nearby drain was being diverted to the pumping station for feeding the STP. The effluents from the STP were falling into nearby ditches along the Kalyani Expressway contributing to pollution levels. Water quality test of the samples taken from the STP outlet (02 November 2023) by CPCB, in the presence of the officials of WBPCB and Audit, showed that the level of TSS and FC was higher than the permissible limit⁵⁰ in the tested samples.

⁴⁷ Waste Stabilization Pond Technology of total capacity of 22.5 MLD.

⁴⁸ Section 25 of Water (Prevention and Control of Pollution) Act, 1974 *inter alia* provides that no person shall, without the previous consent of State Board establish any treatment or disposal system which is likely to discharge sewage into a stream or well or sewer or on land.

⁴⁹ Existing manholes lying on roads belong to the Public Works Department.

⁵⁰ TSS - 277 mg/l against the permissible limit of 50 mg/l, FC-70 × 10² mg/l against the permissible limit of 1,000 mg/l.



Figure 4.1: A portion of the sewage from nearby drain was being taken to the pumping station for feeding STP.



Figure 4.2: PB Ghat drain falling into Ganga untapped.

In reply, the Department stated (March 2024) that the sewage from PB Drain was tapped partially.

Thus, the main objective of the *Panihati* STP to tap one of the most polluted drains viz. PB Ghat drain was yet to be fulfilled. This was also evident from the Report⁵¹ of WBPCB which stated that the drain had a flow of 4.76 MLD and pollution load above permissible limit⁵².

4.3.2.3 *Naihati* STP

A Sewage Treatment Plant with capacity of 6.5 MLD for *Naihati* Municipality was approved in March 2019 at a cost of ₹ 14.71 crore by NMCG. The scheduled date of completion of the STP was January 2021, however, it was completed in July 2022. The STP was jointly inspected by Audit along with representatives of KMDA in August 2023.

Audit observed that the STP was not in operation since January 2023, due to failure of one of its Waste Stabilization Ponds (WSP). The pond was found to be filled with weed and grass during the joint inspection of the STP by Audit and KMDA.

Audit also noted that the Garifa South Drain, one of the drains connected to the STP, was filled with plastic and other solid waste, and sewage was flowing into the river Ganga, without treatment.

⁵¹ Report on Assessment of Pollution Loads to River Ganga through 56 outfalls by the School of Water Resources Engineering, Jadavpur University.

⁵² COD-102 mg/l, BOD-50 mg/l, TC- 1.6×10^7 MPN/100ml and FC- 5.2×10^5 MPN/100ml.

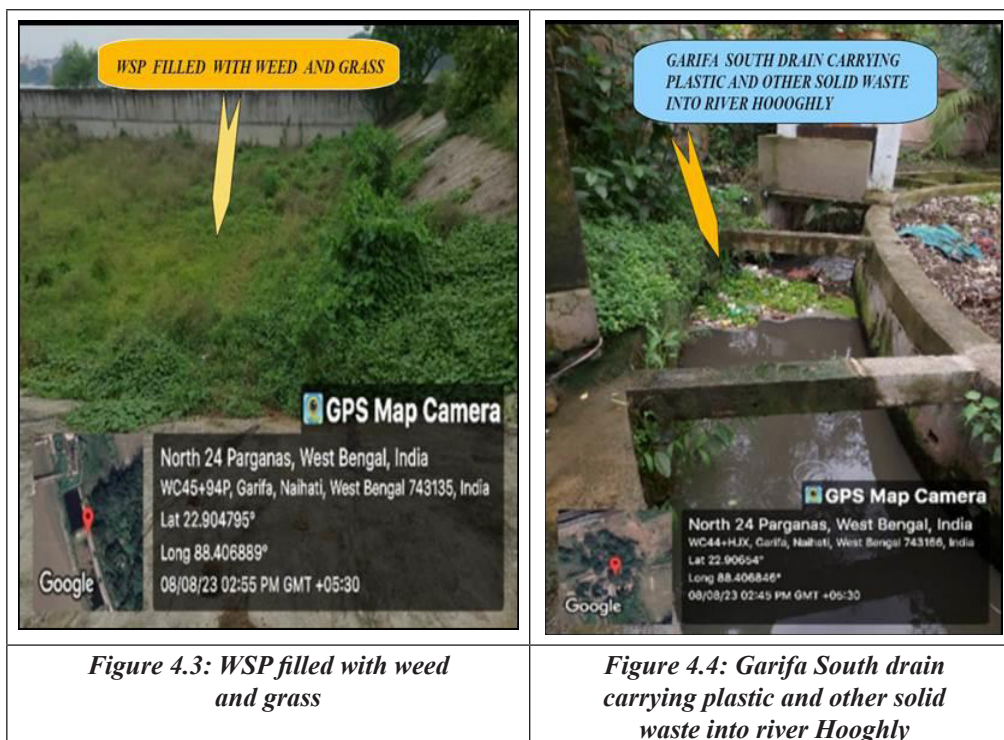


Figure 4.3: WSP filled with weed and grass

Figure 4.4: Garifa South drain carrying plastic and other solid waste into river Hooghly

In reply, the Department stated (March 2024) that due to failure of retaining wall foundation, the STP became non-operational and after rectification work the STP has become functional. KMDA further added that the drain was under control of local ULB (*Naihati Municipality*) and the responsibility of cleaning the drain on a regular basis lies with the ULB.

However, the reply may be seen in view of the fact that KMDA did not furnish any water quality test report in support of the functional status of the STP.

4.3.2.4 Budge Budge STP

The work of setting up of a 9.3 MLD capacity STP, seven lifting stations, one main pumping station, sewerage network and O&M for 10 years in *Budge Budge* Municipal town was awarded in January 2016 to a private agency by the Executive Engineer, West bank Division, Ganga Action Plan (GAP) Sector, KMDA, at a tendered cost of ₹190.09 crore for completion by January 2019.

Audit observed that the house connection work was still in progress, as of November 2023 and ₹135.93 crore had been paid to the contractor. Provisional time extension was given upto September 2023 by KMDA to complete the work. However, the incomplete *Budge Budge* STP was commissioned in February 2022 and was treating only 3.46 MLD of sewage against the required installed capacity of 9.30 MLD.

Joint site inspection (August 2023) revealed that wastewater from *Churial* drain and another unnamed drain were flowing into river Ganga. Sewage from these two drains had not been tapped and diverted to the STP, and thus, untreated wastewater of the drains was adding to the pollution load of the river. Both these drains were also not being monitored by WBPCB.

In reply, KMDA stated (March 2024) that house connection work was in progress and after completion of the work, sewage will be diverted to STP.

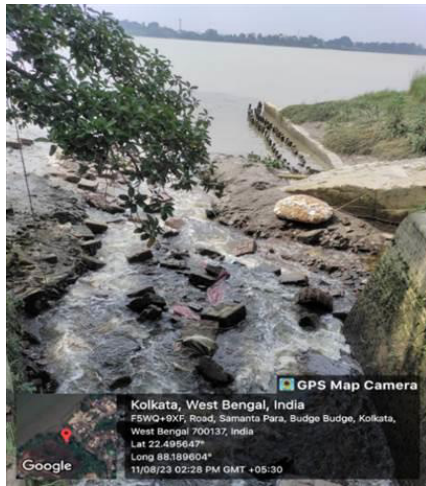


Figure 4.5: Unnamed outfall discharging in River Ganga.



Figure 4.6: Churial drain discharging in River Ganga.

4.3.2.5 Nabadwip STP

The *Nabadwip* STP with a capacity of 10 MLD was installed in 1995 for *Nabadwip* Town. Executive Engineer, Nadia Division, PHED was responsible for the operation and maintenance of the STP. However, the non-operation of the STP was reported in June 2021, by the concerned Executive Engineer, Nadia Division to the Chief Engineer, HQ, PHED. Subsequently, CPCB also reported on the non-operation of *Nabadwip* STP in its Inspection Report (December 2022) and recommended that the STP be made operational with immediate effect.

However, during joint site inspection (November 2023) by Audit with the officials of PHED, it was seen that the STP was still not functioning and PHED had not taken any action to make it operational. **It was also observed that the anaerobic pond was infested with dense vegetation, and the facultative⁵³ and maturation ponds were being used for pisciculture by *Nabadwip* Municipality.**



Figure 4.7: Anaerobic Pond infested with dense vegetation

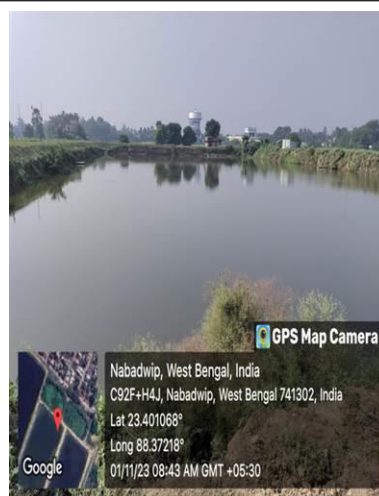


Figure 4.8: Facultative Pond used for pisciculture.

⁵³ Pond to treat wastewater through sedimentation and anaerobic oxidation of organic materials.

In response to an audit query, PHED stated (June 2023) that the STP had been handed over to the concerned *Nabadwip* Municipality for its operation and maintenance. The reply is not acceptable as the existing wastewater line and pumping works from the MPS to STP were still being maintained by PHED, whereas five waste stabilisation ponds⁵⁴ which are an integral part of this STP, were handed over (November 2013) to the concerned Municipality and were being used for pisciculture.

This indicated that there was absence of a clear delineation of duties between agencies for proper maintenance and monitoring of the created infrastructure to control pollution.

In reply, the Department stated (March 2024) that it would strive to strengthen coordination with the concerned municipality, in future.

4.3.2.6 Uttarpara-Kotrung and Konnagar STP

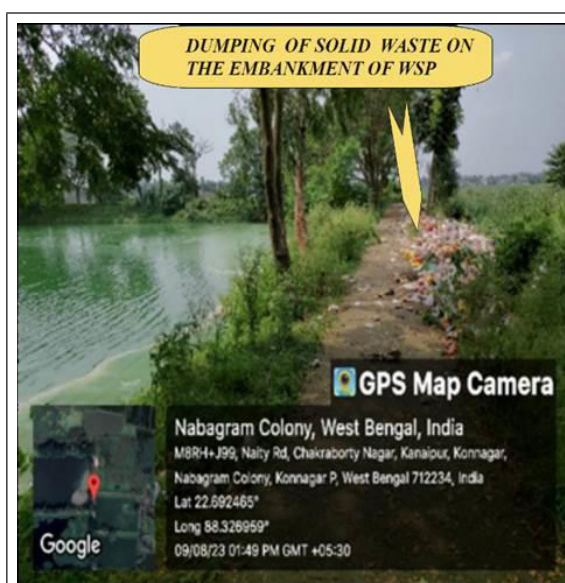


Figure 4.9: Dumping of Solid waste on the embankment of WSP

The work “*Rejuvenation of existing STP along with lifting station and pumping station including sewage network and five years of operation and maintenance at Uttarpara-Kotrung and Konnagar*” in Hooghly District was taken up in June 2020 and completed in July 2022, at a tendered value of ₹ 17.11 crore with a design capacity of 22 MLD.

However, CPCB’s Monitoring report (January-March 2023) showed that the STP was non-compliant with the discharge norms set by NGT. The existing BOD and COD levels in the

treated sewage were 36 mg/l and 64 mg/l respectively against the NGT standards of < 10 mg/l for BOD and < 50 mg/l for COD.

The amount of sewage pumped out at pumping stations must be received at the STP. To ensure that there is no leakage of sewage, flow meters are required to be installed both at the pumping station and at the STP.

Joint inspection of the STP in August 2023, along with representatives of KMDA revealed that though a flow meter was installed at the pumping station, it was not installed at the STP. Thus, the quantum of sewage received at the STP could not be ascertained. Solid waste including plastic waste was found dumped on the embankments of the Waste Stabilization Ponds (WSP).

In reply, the Department stated (March 2024) that the matter of dumping of solid waste had been taken up with the concerned Gram panchayat.

⁵⁴ Two anaerobic ponds, two facultative and one maturation.

4.3.2.7 Baidyabati and Bhadreswar STP

The work “Rejuvenation of existing STP along with lifting station and pumping station including sewage network and five years of operation and maintenance at Baidyabati and Bhadreswar under Hooghly District” was taken up in June 2021 by KMDA and completed in July 2022 at a tendered amount of ₹ 11.78 crore, with a design capacity of 7.60 MLD.

Joint inspection of the STP for *Bhadreswar* in August 2023, along with the representatives of KMDA revealed that the pond water of the STP was laced with cow dung and the water was foamy with dead fish floating in the pond. Audit also observed that the untreated drain water was being allowed to flow into the river Ganga, carrying solid waste, including plastic.

Water quality tests of the sample from the *Bhadreswar* STP outlet done (02 November 2023) by CPCB in the presence of officials of WBPCB and Audit showed that the level of FC (at 22×10^2 MPN/100 ml) was much higher than the permissible limit of 230 MPN/100 ml defined by the NGT.

In reply, the Department stated (March 2024) that slurry of cow dung was entering the STP through drains and DPR was being prepared to tap drains of *Baidyabati* and *Bhadreshwar* Municipalities.

However, the STP did not manage wastewater and ensure discharge standards even though it was under regular operation and maintenance of KMDA.

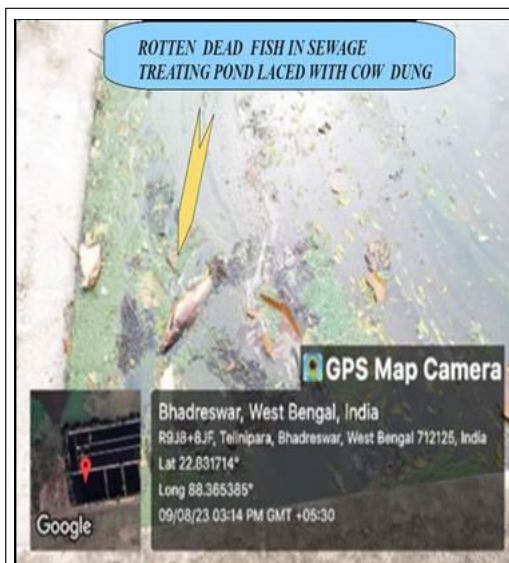


Figure 4.10: Dead fish in sewage treating pond laced with cow dung

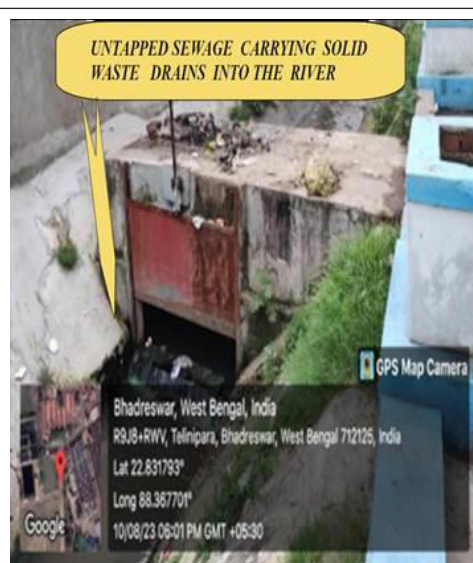


Figure 4.11: Untapped sewage carrying solid waste drains into the river

Thus, from the above illustrative cases on the inspections of the sampled STPs it was evident that the desired objective of installation of STPs was sub-optimally achieved due to factors like under-utilisation of capacity, non-integration of sewage networks and drains with STPs, absence of dis-infection systems and inadequate maintenance of the STP ponds *etc.*

4.3.3 Pollution abatement of Tolly Nullah

Tolly Nullah also called as ‘*Adi Ganga*’ was excavated for the purposes of navigation; however it has presently ceased to be a free flowing channel due

to siltation, rapid dense inhabitation along its banks, dumping of solid waste, discharge of untreated sewage, *etc.* The nullah is connected to river Hooghly at one end and to *Vidyadhari* River at its other end. The nullah carries all types of drainage and municipal wastes from 28 wards of Kolkata Municipal Corporation (KMC) along with three wards of *Rajpur-Sonarpur* Municipality and finally drains into the river *Hooghly*.

The issue of pollution in river *Adi Ganga* first came before NGT in July 2015. However, due to the continued pollution, NGT in its order dated 21 September 2020 (OA 12/2015) directed the KMC to set up an STP by December 2020, remove encroachments, rehabilitate the displaced persons within six months and clear the river of silt and hydrophytes. NGT further directed that KMC should prepare an action plan to deal with accumulation of solid waste underneath the elevated metro station and around the piers within one month and implement the plan within the next month.

In this regard, Audit observed the following:

- KMC prepared a DPR of ₹ 938.89 crore (Phase-I) and ₹ 219.64 crore (Phase-II) for Pollution Abatement Project for Rejuvenation of River *Adi Ganga* under the '*Namami Gange Program*' in August 2022. NMCG approved Phase-I of the project in December 2022 for ₹653.67 crore and issued Administrative Approval and Expenditure Sanctions (AA&ES) for the same in January 2023. However, as of November 2023, AA&ES for Phase-II had not been issued and the tendering process for Phase-I was still underway.
- Besides, dredging work was to be done for both phase-I and II, from State fund. While Phase-I⁵⁵ of the dredging work was completed (May 2023) at a cost of ₹ 10.03 crore, dredging under Phase-II⁵⁶ of *Tolly Nullah* measuring 5.37 kms, (at an estimated cost of ₹ 13.02 crore), was still in progress as of September 2023.



Figure 4.12: Dredging work in progress



Figure 4.13: Dredging work yet to be started

⁵⁵ From the confluence point to Chetla Bridge measuring 4.7 kms.

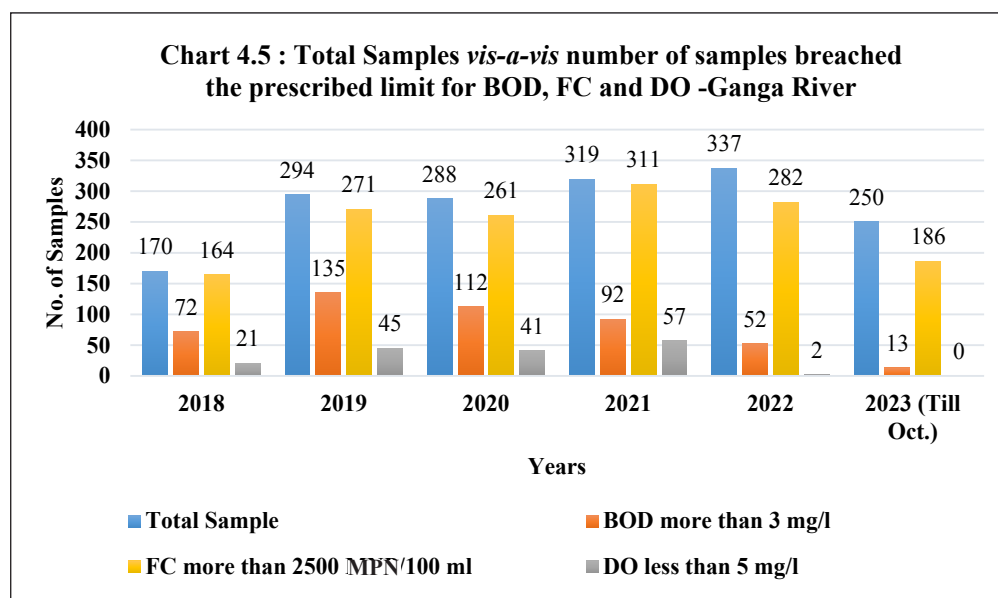
⁵⁶ From Kudghat Metro station to Chetla Bridge (Phase-II).

Thus, the project for pollution abatement of Tolly Nullah could not be completed even after eight years of the matter coming to the notice of NGT, and the untreated sewage of 25.10 MLD continued to flow into river *Adi Ganga*.

In reply, the Department stated (March 2024) that technical evaluation of bids of the project under Phase-I (under NMCG) was under process and the dredging work of Tolly Nullah would be completed by October 2025.

4.3.4 Impact on the water quality of river Ganga

Due to inadequate/inefficient sewage treatment facilities for drains discharging into the river Ganga, the pollutant load in the river water continuously exceeded the prescribed limits during the period 2018-23. While the number of times BOD breached the prescribed limit ranged between 15 per cent to 46 per cent of total tests⁵⁷ conducted, FC was above norms in 74 per cent to 97 per cent of test cases, and DO did not meet the prescribed standards in one to 18 per cent tests. Details of the same are depicted below in **Chart 4.5**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

Recommendation 5:

UD&MA Department should complete the ongoing STPs as well as operationalise the non-functional STPs at the earliest and ensure strict compliance with environmental norms in their operations.

4.4 Pollution abatement of River *Vidyadhari*

The Action Plan for rejuvenation of the river *Vidyadhari* was prepared in July 2019 by PHED encompassing management of municipal wastewater and industrial waste water management. The estimated budget for the plan was ₹ 2,515 crore and projects under it, were to be completed by March 2023.

As per the Action Plan, eight drains were initially identified as carrying 1,539 MLD of sewage from areas of KMC and its vicinity into river *Vidyadhari*.

⁵⁷ Water quality test done by WBPCB under National Water Monitoring Programme.

Further, there were nine existing STPs with a total treatment capacity of 1,233.24 MLD, including 910 MLD being treated naturally in the East Kolkata Wetland.

The work of preparing the DPR for rejuvenation of PRS of *Vidyadhari* was given to IIT, *Kharagpur* by PHED. Audit observed that IIT, *Kharagpur*, while preparing the DPR, had identified numerous other drains with outlets into the river *Vidyadhari*, in addition to the initially identified eight drains of the adjoining urban and semi urban areas which carried untreated sewage, eventually disposing into the river *Vidyadhari*. The report added that the untreated or partially treated industrial effluents from industrial cluster at Calcutta Leather Complex, housing over 500 small-medium industries were discharging about 150 kg of heavy metal Chromium on a daily basis into the urban wastewater channel that was then being drained into fishponds of the East Kolkata Wetlands.

Based on these additional drains highlighted by IIT, the RRC of the State, in its 15th meeting, on 30 September 2022, engaged KMDA to set up additional STPs/FSTPs for six municipalities⁵⁸. The work of setting up these STPs was to be carried out by KMDA. However, Audit observed that as of December 2023, no progress was made in this regard due to unavailability of site.

Audit also conducted a joint inspection of the existing nine STPs in July-August 2023 and observed that sewage with either no treatment or partial treatment, was being discharged into various municipal canals and finally falling into the Vidyadhari River as discussed below.

4.4.1 East Kolkata Wetland

East Kolkata Wetlands (EKW), is an important *Ramsar*⁵⁹ site, situated on the Eastern fringes of Kolkata and spread out over an area of 12,500 hectare⁶⁰. East Kolkata Wetlands Management Authority (EKWMA) works towards conservation and management of EKW. It is estimated that EKW naturally treats around 910 MLD of sewage generated in Kolkata city before discharging into *Vidyadhari* River. In this regard, Audit observed the following:

- EKWMA and CPCB conducted (October 2019) a study which identified the EKW as under immediate threat of species extinction and habitat destruction due to anthropogenic factors. The study showed that the sewage that enters the Wetlands consists of toxic and non-biodegradable matter, including a range of heavy metals. The result of sample test (9th, 16th and 23rd December 2018) conducted by CPCB of the raw sewage showed that pH of the sewage was alkaline (7.76 to 8.03), DO was completely absent and BOD varied from 39 to 87 mg/l. The analysis of the samples from the Wetland of EKW also indicated presence of heavy metals such as lead, cadmium, chromium.

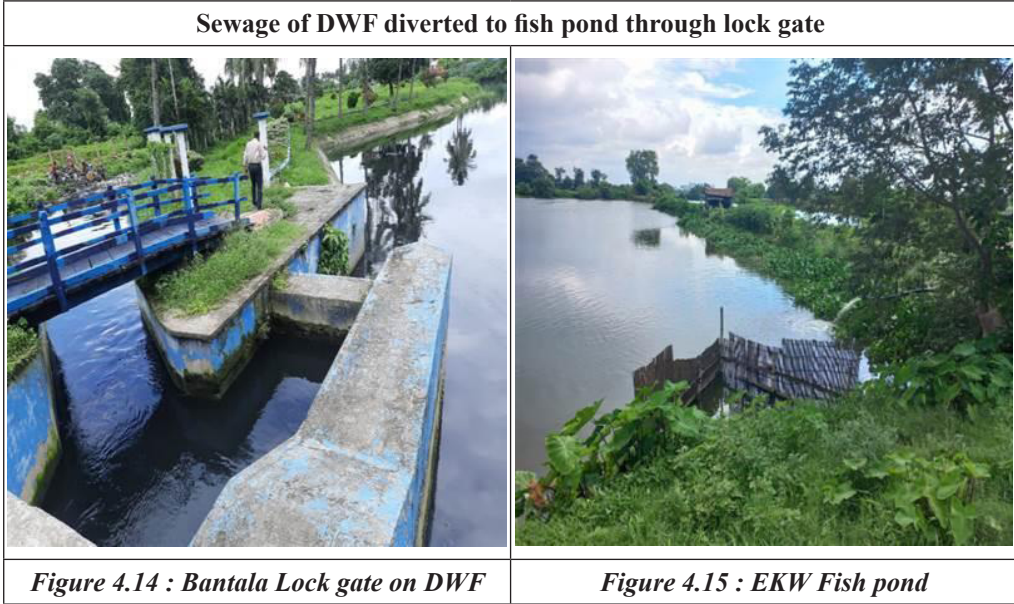
⁵⁸ i) Barasat, ii) Dum Dum, iii) Madhyamgram, iv) North Dum Dum, v) New Barrackpore and vi) Rajarhat Gopalpur.

⁵⁹ A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention, also known as “The Convention on Wetlands”, an international environmental treaty signed on 02 February 1971 in Ramsar, Iran, under the auspices of UNESCO.

⁶⁰ Approximately 45.93 *per cent* comprises water bodies and 38.92 *per cent* is agricultural land. The remaining portion is occupied by urban and rural settlement (10.42 *per cent*) and sites for garbage disposal 4.73 *per cent*.

- In consideration of the ecological importance of the EKW, WBPCB was supposed to carry out water analysis tests of EKW. Audit noted that a quality analysis of water of EKW at two outlets⁶¹ had been carried out by WBPCB during June 2018 to May 2019 (once in a month), but thereafter, no such tests were carried out. These tests revealed that as against permissible limits prescribed by the MoEFCC, the level of BOD exceeded the prescribed limit by seven times, TSS was 14 times higher and FC was in excess of 24 times of permissible level.

Joint site inspection of EKW (July 2023) revealed that the sewage flowing through Dry Weather Flow (DWF) was diverted into sewage fed fishery ponds at *Bantala* lock gate. However, there was no flow meter or other measuring mechanism to assess the actual quantity of wastewater diverted to the fish ponds. Thus, the quantity of wastewater treated through sewage fed fish ponds of EKW could not be ascertained.



Further, surveillance of physicochemical and biological properties of the wastewater that entered into EKW was not undertaken by WBPCB. In the absence of a continued monitoring mechanism, the qualitative nature of the sewage entering EKW and the efficiency of sewage treatment through aquaculture could not be assessed.

In reply, the Department stated (March 2024) that it was decided that flow meters would be installed by KMC at different points of the canals to measure the volume of sewage passing through EKW. It also added that CPCB had fixed two points within EKW where water quality sewage would be monitored. WBPCB stated (March 2024) that henceforth it would monitor water quality on a regular basis and data would be uploaded in the portal.

However, due to the absence of regular monitoring of the sewage in EKW, the adequacy of the natural treatment process and requirement of further remedial measures such as setting up of STPs, treatment of hard metals *etc.* could not be assessed.

⁶¹ Bamanghata Jalpath and Uttar hatgachha.

Recommendation 6:

WBPCB should bring EKW into its regular monitoring schedule and plan for effective remedial measures.

4.4.2 Operational status of Bangur STP

Figure 4.16: Primary Clarifier at the STP

The STP at *Bangur* with an installed capacity of 52 MLD was in operation since 2011. The STP treats wastewater from part of North Kolkata and *South Dum Dum* Municipality and discharges into *Bagjola* canal which ultimately falls into the river *Vidyadhari*. The STP received about 26 MLD raw sewage generated from parts of North Kolkata and *South Dum Dum* Municipalities. However, the treated wastewater of the STP was not being re-used and was being drained out into *Bagjola* canal. It was noted

that the STP does not have chlorination facility required for bacteriological disinfection and the treated sewage was discharged into the *Bagjola* canal laced with heavy concentration of faecal coliform. Water Analysis Reports for the period December 2022 to March 2023, as made available by KMC revealed that the treated wastewater was not compliant with treated discharge standards⁶².

Water quality test of the samples from the *Bangur* STP outlet conducted (November 2023) by CPCB in the presence of officials of WBPCB and Audit showed that the level of FC (49×10^2 MPN/100 ml) was much higher than the permissible limit of 1,000 MPN/100 ml.

Thus, the STP could not bring pollution load of sewage down to the prescribed level and continued to discharge treated sewage containing FC above prescribed limits due to absence of chlorination facilities.

In reply, the Department stated (March 2024) that tender would be floated soon for installation of chlorination facility.

4.4.3 Kestopur/Bagjola STP

The *Kestopur/Bagjola* STP, with an installed capacity of 27.27 Million Litre per Day (MLD), was receiving 19 MLD sewage from Salt Lake area. Section 17(f) of the Water (Prevention and Control of Pollution) Act, 1974 required WBPCB to inspect STPs regularly. However, against these norms, it was noted that WBPCB had not carried out inspection of the STP during 2018-19 to 2022-23.

⁶² As set in NGT order dated 30.04.2019 in OA 1069/2018 for parameters like BOD at 15-19 mg/l, TSS at 26-30 mg/l and FC at 14,706-46,808 MPN/100 ml.

Further, as per the Water (Prevention and Control of Pollution) Act, 1974, any STP is required to obtain a CTO from the relevant Pollution Control Board before commencing actual operations. However, Audit observed that the *Kestopur/Bagjola* STP was functioning without CTO and thus remained outside the regular monitoring of WBPCB for environmental compliances.

As per the latest (September 2023) water quality test report of the STP, the value of BOD in *Kestopur/Bagjola* STP was 18 mg/l, COD 60 mg/l and the FC level was 6,500 MPN/100 ml, which were not compliant with the discharge norms of NGT.

The joint inspection of the site by Audit & Engineers of the UD&MA Department (10 August 2023) revealed that the treated wastewater was not being re-used and was drained out into *Dum Dum Cantonment Canal* which later joins with *Vidyadhari* river through the *Bagjola* canal. It was noted that chlorination of treated effluents was also not done before discharging the treated water into the canal as there was no facility for chlorination at the STP. Thus, the treated sewage was loaded with heavy concentration of faecal coliform.



Figure 4.17: Treated water discharging into outlet drain



Figure 4.18: Treated water discharging into Bagjola canal through Dum Dum Cantonment canal

Thus, it is evident that the action plan for rejuvenation of river *Vidyadhari* was not implemented within the stipulated time period of March 2023. Further, STPs were not fully equipped to treat wastewater and there was lack of continuous monitoring system for drains which impaired the adequacy and efficiency of the remedial interventions for river *Vidyadhari*.

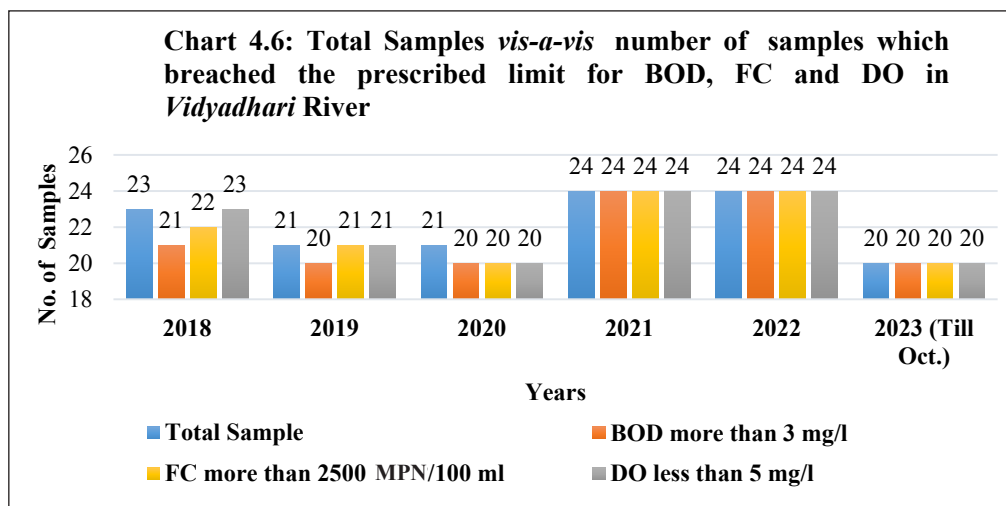
4.4.4 Impact on the water quality of the river *Vidyadhari*

WBPCB monitored the water quality at two different locations⁶³ on this river. Audit scrutiny of the results of the water quality analysis for the period 2018-23 (upto October 2023) showed that the quality parameters of the river water regularly did not meet the approved standards. During 2018-23 (up

⁶³ Upstream-Harora Bridge and downstream-Malanchara Burning ghat.

to October 2023), the water quality analysis of river *Vidyadhari* was done 132 times by WBPCB, and it was noticed that the standards for BOD were breached 129 times in the range of 3.19-29.64 mg/l, for FC 131 times in the range 4,000 -3,00,000 MPN/100 ml, for DO 111 times in the range 0.1-4.6 mg/l.

Regular failure of the river water in meeting prescribed quality standards on parameters like BOD, FC and DO underlined unabated sewage contamination of the river water as shown in **Chart 4.6**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.5 Pollution abatement of River *Mahananda*

The river *Mahananda* originates in *Darjeeling* District and enters *Siliguri* town at *Champasari* area. The river is non-tidal in nature and receives substantial amount of municipal sewage round the year from *Siliguri* city. In absence of effective remedial measures, the untreated sewage continued to flow into the river *Mahananda* resulting in further deterioration of its water quality. As a result, during the period 2018-22, the river had been degraded (i.e. from priority II to I) by CPCB. In this context, Audit observed the following:

4.5.1 Inordinate delay in finalisation of the DPR for constructing the STPs

According to the Action Plan for rejuvenation of PRS-*Mahananda* River, which was prepared (July 2019), by the Siliguri Jalpaiguri Development Authority (SJDA), there was no functional STP for treating the 44 MLD of sewage draining into the river through eight major drains on the right bank and 12 on the left bank of the *Mahananda River*. The main objective of the Action Plan was to treat municipal sewage flowing into the rivers *Mahananda* and its tributaries *Jorapani* and *Fuleswari*.

Accordingly, the Plan envisaged (July 2019) setting up of two STPs⁶⁴ with a total capacity of 47 MLD in *Siliguri* town. The STPs were to be completed within a period of 1.5 to five years. SJDA was entrusted with the task of management of municipal wastewater and setting up of STPs. Further UD&MA Departmental contemplated another STP at the right bank of River *Mahananda*.

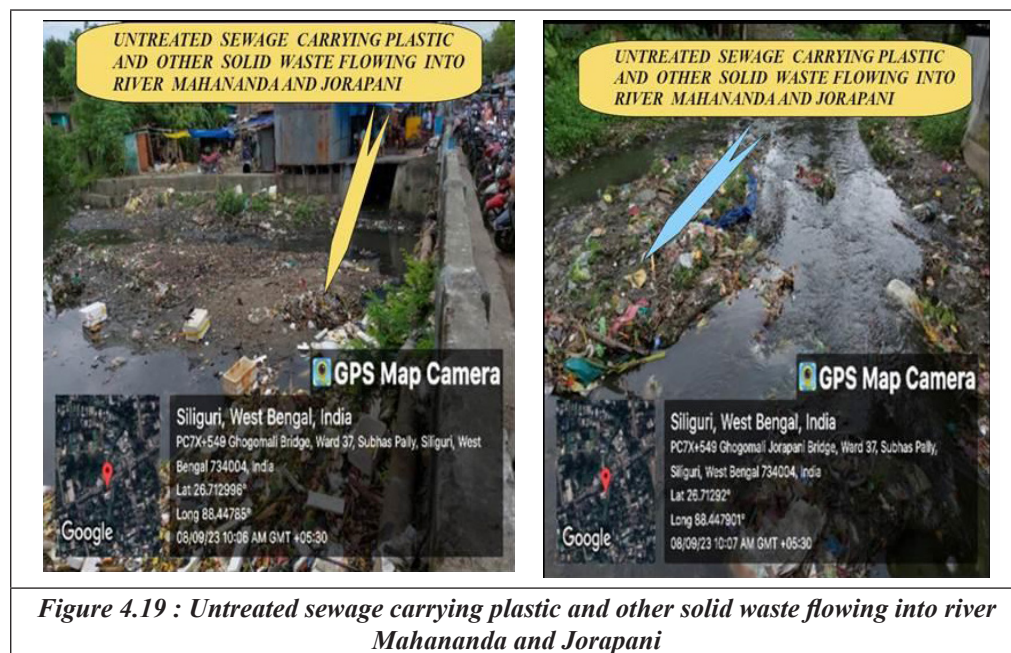
⁶⁴ Naukaghat (32 MLD) and one at Jorapani (15 MLD).

Audit observed that prior to preparation of the said Action Plan, SJDA had invited EOI in June 2018 for the preparation of a DPR to operationalize two existing but incomplete STPs (STP II and STP III) on the river *Mahananda*. This DPR which was prepared by SJDA was vetted by KMDA and its finalization took more than two years due to lack of effective co-ordination between the two entities. Finally, the DPR was submitted (February 2021) to the UD&MA Department for Administrative Approval.

However, the UD&MA Department, GoWB did not accord Administrative Approval for the work due to change in scope of work and therefore KMDA was assigned the task of preparing a fresh DPR for the project (*i.e.* for rehabilitation of STP-II and STP-III) in January 2022. This DPR was prepared and approved in June 2022, based on which, KMDA awarded (May 2023) the work⁶⁵ of Rejuvenation and Augmentation of existing two STPs at a total tendered cost of ₹ 73.33 crore to a private agency.

In respect of STP-I on the right bank of *Mahananda*, an agency was engaged by KMDA to prepare a DPR for the 48 MLD STP. Approval of the DPR was pending till August 2023 although the project was scheduled to be commissioned by March 2025 as per the affidavit submitted (March 2023) by State Government to NGT⁶⁶.

Thus, due to delay in finalisation of DPR for about 42 months, it was noted that sewage treatment infrastructure for river *Mahananda* was non-operational. Audit conducted a joint physical inspection (September 2023) of major drains near Surya Sen Park, Noukaghat with the officials of KMDA and found that the untreated sewage of the drains, carrying plastic and other solid waste, were draining into rivers *Mahananda*, *Jorapani* and *Fuleshwari*.



⁶⁵ Rejuvenation and Augmentation work for existing two STPs (54 MLD) including Interception and Diversion network for tapping existing drains falling into the River Mahananda (from the eastern bank) including operation and maintenance for a period of five years.

⁶⁶ OA_10 of 2016.

In reply, the Department stated (March 2024) that the work of rejuvenation of STP-II and STP-III was ongoing and was expected to be completed by June 2025 and added that the DPR for STP-I had been submitted in February 2024.

4.5.2 Interim measures

Due to continued delay on the part of relevant authorities in taking remedial action for controlling water pollution on the river *Mahananda*, a Committee for assessment of environmental compensation was appointed by NGT *vide* order dated 20 September 2021. The Committee assessed that an environmental compensation of ₹ 2.40 crore was to be paid and directed SJDA to deposit the amount with the District Magistrate, Darjeeling. This amount would be used for taking up works related to restoration of water quality of the river. SJDA accordingly deposited ₹ 2.00 crore with District Magistrate, *Darjeeling* as an interim compensation.

It was noticed in Audit that, out of the above ₹ 2.00 crore received as part of interim measures, the DM had taken up (December 2022) works of an estimated value of ₹ 0.80 crore⁶⁷, which *inter alia* included setting up of *in-situ* bioremediation work at two locations⁶⁸.

Audit conducted joint physical inspection (September 2023) of both the work sites with the official of KMDA and found that at *Naukaghat* the drain and the area abutting the drain were filled with plastic and other solid waste. The untreated sewage was passing into the river carrying solid waste. Further, at *Surya Sen Park* the wheel paddle aerator was not functioning and was clogged with plastic and other solid waste. The area abutting the drain was also littered with plastics and other solid waste.

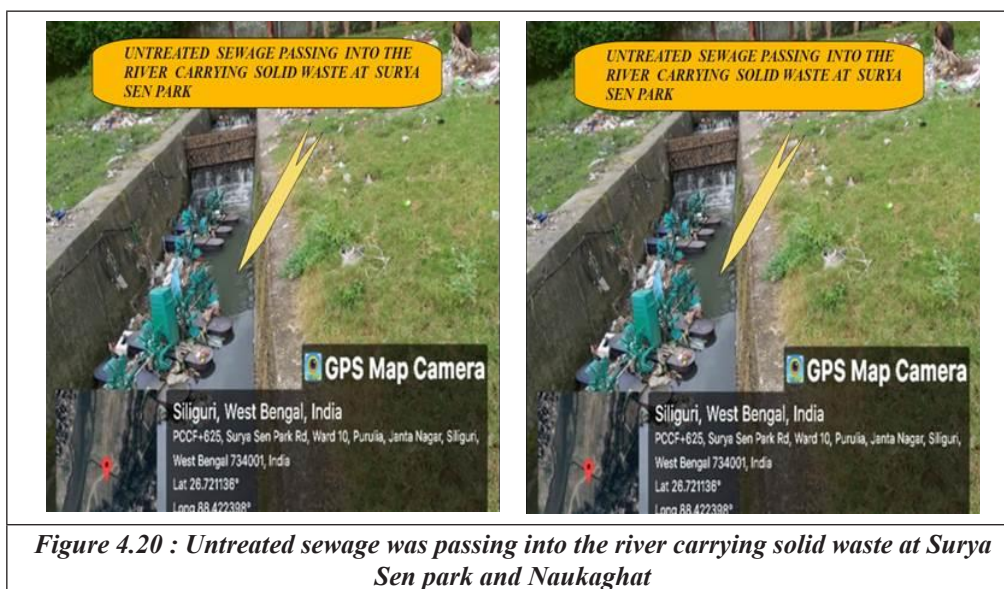


Figure 4.20 : Untreated sewage was passing into the river carrying solid waste at Surya Sen park and Naukaghat

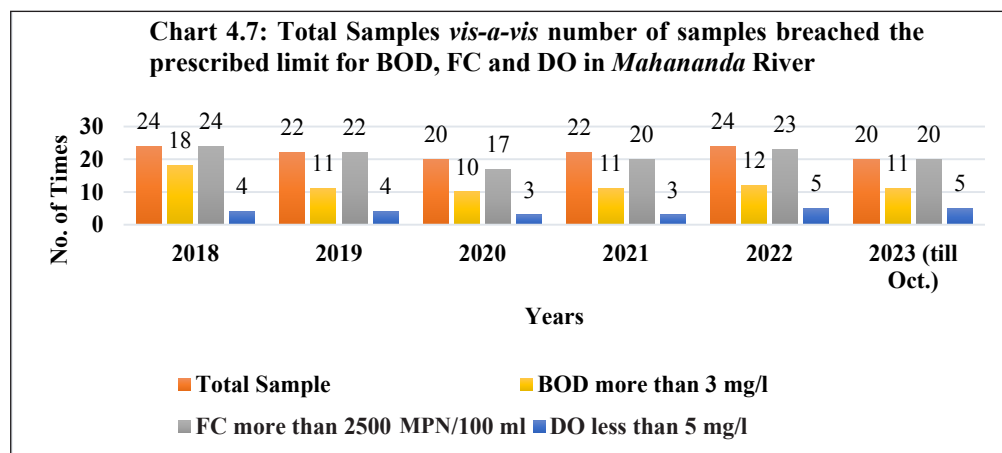
⁶⁷ (i) ₹ 0.21 crore -Installation of iron grates at the major drains falling into the river *Mahananda* at *Siliguri* Town, (ii) construction of public toilets at ₹ 0.45 crore and (iii) in-situ bioremediation work for two number of drains at ₹ 0.13 crore.

⁶⁸ (i) *Naukaghat* with cascading technology and (ii) *Surya Sen Park* with wheel paddle aerator technology.

Audit further observed that in the 16th River Rejuvenation Committee (held at the level of the Member Secretary, WBPCB, being the chairman of RRC) meeting held on 30 June 2023, the issue of pollution of the river due to discharge from cattle sheds near *Siliguri* was flagged. However, no effective remedial action was taken.

4.5.3 Impact on water quality of *Mahananda* River due to prolonged delay in implementation of Action Plan

The delay in implementation of remedial measures to control water pollution on the river *Mahananda*, deteriorated the quality of the river water over a period. Audit observed that as per the *water quality tests conducted by WBPCB* during the period 2018-23, the BOD, COD and FC exceeded the prescribed limits set by CPCB as shown in **Chart 4.7**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.6 Pollution abatement of River *Mayurakshi*

River *Mayurakshi* originates in Jharkhand, flows through the districts of *Birbhum* and *Murshidabad* in West Bengal before draining into the river *Ganga*. The 95.00 km stretch of this river from *Suri* to *Durgapur*, had been identified as a Polluted River Stretch (PRS) by CPCB. An Action Plan for Rejuvenation of the *Mayurakshi* River was submitted by RRC, West Bengal to the CPCB, in September 2020.

According to the Action Plan, *Suri* (up-stream town) and *Sainthia* (down-stream town) were the two major towns in the catchment of the identified polluted stretch, with a total of 26 drains⁶⁹ contributing to the pollution of the river with an aggregate sewage of 6.72 MLD⁷⁰. At the time of identification of the PRS, the BOD level of the river was 5.2 mg/litre and therefore, the river was put under the category of Priority-V by CPCB in 2018.

Under the approved Action Plan, the Municipal Engineering Directorate (MED) of UD&MA Department was charged with management of municipal wastewater. Further, it was also proposed to set up structures for primary

⁶⁹ 12 at *Suri* and 14 at *Sainthia*.

⁷⁰ *Suri*: 4.04 MLD and *Sainthia*: 2.68 MLD.

treatment of wastewater⁷¹ at the 26 drains by providing screens, sedimentation tanks, disinfection facilities (by due date of June 2021).

4.6.1 Primary treatment facilities for municipal wastewater at *Suri* and *Sainthia*

The UD&MA Department, GoWB accorded (March 2020) Administrative Approval of ₹ 78.96 lakh and ₹ 86.26 lakh for setting up of primary treatment facilities for municipal wastewater at *Suri* and *Sainthia*, respectively. These works were to be carried out by Executive Engineer, Birbhum Division, MED with May 2022, as the stipulated completion date.

Audit observed the following:

- Primary treatment of wastewater structures at *Suri* was not completed (till September 2023) for the 12 identified drains because the required land for the project could not be arranged by the Suri Municipality.
- The Executive Engineer, MED, *Birbhum* awarded (June 2021) the work -“In-situ and Ex-situ works for biological water treatment of drainage water for environment remediation of *Sainthia* Municipality” to a contractor at an estimated cost of ₹ 82.59 lakh to be completed within 12 months. However, progress of the work was only 70 *per cent* and no further funds were allocated for the project by the UD&MA to the Executive Engineer, MED, *Birbhum*.
- Further, as per the site inspection Report by the MED, the sustainability of the bio-remediation work depended upon diversion of existing drains and other minor adjustments, which would involve additional costs beyond the original DPR sanctioned amount. Accordingly, these additional works of in-situ and ex-situ biological water treatment of drainage water for environment remediation of *Sainthia* were awarded in June 2022 at a tendered amount of ₹ 26.72 lakh by the Executive Engineer, MED, *Birbhum* to a private agency with scheduled date of completion being within six months from issue of work order. Work valuing ₹ 9.97 lakh was completed till May 2023, with a physical progress of 40 *per cent* and no payment thereof was made to the Executive Engineer, MED, *Birbhum* by the UD&MA Department till September 2023.

Joint physical inspection of the bio-remediation work along with the officials of MED (September 2023) revealed that the construction of earthen embankment and the linking of existing drains to the treatment facilities were not completed, and therefore the primary treatment facilities could not be put to use, as shown in **Figure 4.21**.

⁷¹ (i) Biological water treatment, (ii) Construction of Chlorination system.



Figure 4.21 : In-complete bio-remediation works for treatment of drain water at Sainthia

Thus, the bio-remediation work could not be completed in any of the identified outfalls for *Suri* and *Sainthia* towns till September 2023, and the untreated sewage continued to discharge directly into the river *Mayurakshi*. This rendered the entire expenditure of ₹ 42.22 lakh⁷² on the primary wastewater treatment facilities at *Sainthia* town unfruitful as the intended outcome of treating municipal wastewater could not be achieved even after the lapse of more than one year from the scheduled date of completion (May 2022).

4.6.2 Delisting of the river from the list of PRS in disregard to the norms of CPCB

The ‘Guidelines for Water Quality Monitoring’ issued (December 2007) by CPCB require that sampling stations should be located upstream and downstream of significant pollution outfalls like city sewage drains and industrial effluent outfalls.

The water quality status of the river *Mayurakshi* was monitored by the WBPCB under the National Water Monitoring Programme on a monthly basis at the Water Intake Point for *Suri* Town i.e. up-stream of the river *Mayurakshi*. The 95 km polluted river stretch had no other monitoring station in its downstream stretch.

Audit observed that WBPCB had carried out wastewater analysis for *Sainthia* Municipality (downstream town) in June 2020, and the analysis report highlighted that the BOD levels (mg/l) were in the range of 5.37-65.83 and FC (MPN/100 ml) was in the range of 1,200-5,800, breaching the prescribed limits⁷³. Since June 2020, wastewater quality analysis was not carried out by the WBPCB for the downstream town of *Sainthia*.

It was, however, observed that based on the water quality report of only the upstream water at *Suri*, without conducting test on the downstream at *Sainthia*, the river *Mayurakshi* was delisted from the polluted river

⁷² ₹ 32.25 lakh + ₹ 9.97 lakh.

⁷³ BOD-3 mg/l and FC- 2,500 MPN/100 ml.

stretches (Priority-V) in September 2022 by CPCB. Further, none of the primary treatment of wastewater structures as envisaged in the Action plan for management of sewage were completed for either of the catchment towns (*i.e. Suri and Sainthia*) till September 2023.

In reply, the Department stated (March 2024) that setting up of another water monitoring station at a downstream town was under consideration.

4.7 Pollution abatement of river *Dwarka*

The *Dwarka* River is a tributary of River *Bhagirathi*. The *Dwarka* originates in Jharkhand, flows through *Birbhum* district and finally flows through *Murshidabad* district, where it joins the River *Bhagirathi*. The *Tarapith* to *Sadhak Bamdeb Ghat*, about 1.5 km long stretch of this river has been identified as “Polluted”. The river is non-tidal in nature and receives domestic wastewater from the adjoining area of the *Tarapith* Temple round the year. BOD and FC are the principal pollutants in this river stretch.

The work of construction of an STP with a capacity of 4.25 MLD including two lifting Stations and sewer line was awarded in February 2020 by *Birbhum* Division, PHED. This STP was partially completed and commissioned in September 2022, at a cost of ₹ 25.88 crore. Yet the household sewage connection system to feed the STP was not implemented by PHED. A DPR was prepared and submitted to the PHED in January 2021 by the Chief Engineer, Planning & Water Quality Monitoring, PHED, but the proposal was administratively approved only in June 2022, *i.e.* almost 1.5 years after the proposal. As of September 2023, only one component of the integration work had been tendered at a cost of ₹ 0.29 crore. ***As a result, all the eight major identified drains contributing to pollution of the river continued discharging into the river.***



Figure 4.22 : Untapped Drains discharging into the river

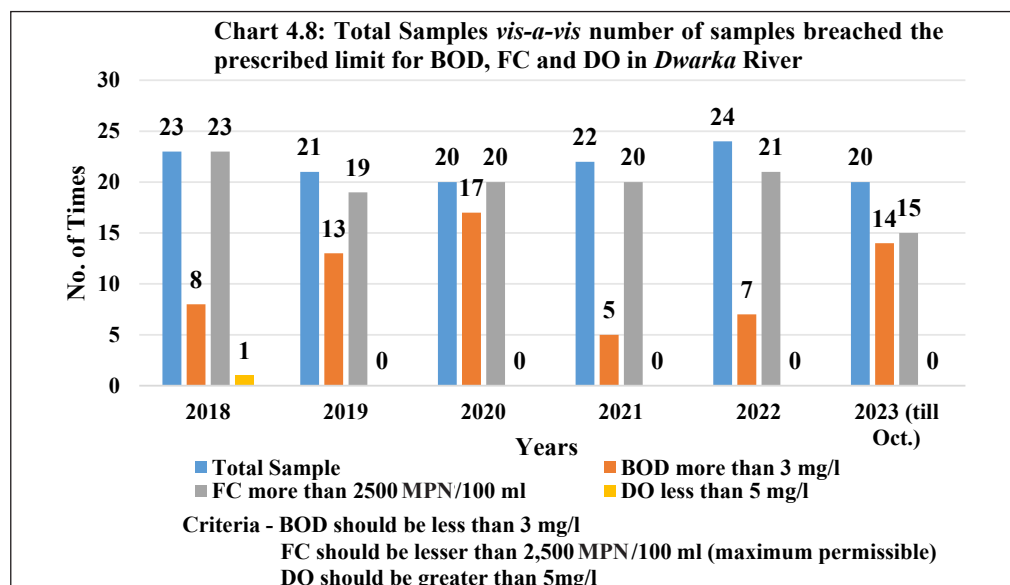
Audit further observed that 30 hotels were discharging waste directly into the river. Though the issue was discussed in the RRC meeting (16th meeting June 2023) and accordingly the implementing agency, PHED had handed over the list of the hotels to WBPCB, action was not taken to stop the discharge of untreated sewage from the hotels into the river.

Thus, inability of the implementing authority, PHED in timely taking up the integration of household sewage collection system with the STP coupled with inaction of WBPCB in restricting the hotels from unauthorised discharge directly into the river led to deterioration in the water quality of the river.

In reply, the Department stated (March 2024) that the scope for integration of various components to STP was included at a later stage and the work was delayed as the area was congested and crowded. The reply is not tenable as the scope for integration of various components to STP should have been considered before the work of construction of the STP was awarded.

4.7.1 Impact on water quality of Dwarka River

Audit observed that due to non-integration of household sewage collection system with STP, the water quality of river Dwarka deteriorated as was evident from the water quality tests conducted by WBPCB during 2018-23, where the number of times BOD breached the prescribed limit ranged between 23 per cent to 85 per cent of total times the tests were conducted while FC was found to have breached the limit in a range between 75 per cent to 100 per cent as shown in **Chart 4.8**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.8 Pollution abatement of Mathabhanga and Churni

The river *Mathabhanga* originates from the river *Padma* in *Bangladesh*, enters India at the *Gede* of *Nadia* district, and terminates near *Majhdia* splitting into two portions, one moving down south draining into the Bay of Bengal, and the other moving towards southwest as the river *Churni* to meet the Ganga at *Payradanga* in *Nadia* district.

According to the Action Plans of *Churni* and *Mathabhanga* prepared by KMDA and PHED respectively (July 2020) and proposed by RRC for approval of CPCB, the causes of pollution of these two river stretches were:

- (i) Untreated industrial wastewater discharge from a sugar mill in *Darshana* in *Bangladesh* (untreated trade effluent in the river three-to-four times during the year).
- (ii) Municipal sewage discharge from *Ranaghat* Town.

Records showed that the matter relating to effluent discharge from the sugar industries of *Bangladesh* was taken up with the Foreign Ministry (of *Bangladesh*) by the Ministry of External Affairs, GOI.

Approved Action Plan of the river *Churni* (July 2020) envisaged construction of three STPs along with Interception and Diversion (I&D) network for existing nine drains at the *Ranaghat* municipality at an estimated cost of ₹ 48.63 crore. Subsequently, total 14 drains were identified during detailed survey at the time of preparation of the DPRs. These projects were to be implemented by KMDA. In this regard Audit observed:

- Out of three STPs, KMDA awarded (November 2021) the job of construction of two STPs⁷⁴ with I&D Network for existing six number of drains falling in River *Churni* (including five years of Operation & Maintenance Period) to a contractor.
- The work was awarded (November 2021) at a tendered cost of ₹ 45.19 crore with November 2023 as the stipulated date of completion. As of October 2023, ₹ 7.07 crore was paid to the contractor by KMDA and only 27 per cent of the work was completed.
- In respect of the other proposed STP at *Chaitanya Ghat* with a capacity of 5.2 MLD which was planned for the remaining eight drains, the work could not be started, as land for the same had not been obtained by KMDA.

In reply, the Department stated (March 2024) that the work of two ongoing STPs would be completed by July 2024 and the work of remaining one STP (5.2 MLD) would commence after purchase of land.



Figure 4.23: Drains falling into the River Churni

⁷⁴ 4.0 MLD capacity at Sreenathpur and 2.6 MLD at Silver Jubilee Road.

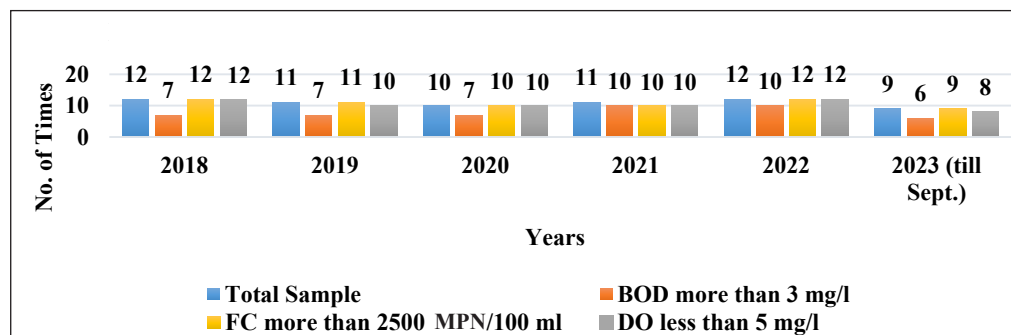
Thus, slow progress in the construction of STPs in *Ranaghat* town resulted in further degradation of the water quality of *Churni* and *Mathabhanga*.

4.8.1 Impact on water quality of *Mathabhanga* and *Churni* Rivers

(A) *Mathabhanga* River

During the period 2018-23, tests were conducted by WBPCB wherein it was observed that the number of times BOD breached the prescribed limit, ranged between 58 per cent to 83 per cent. Similarly, FC breached the prescribed limits between 75 per cent to 100 per cent of times and DO did not meet the prescribed standards between 89 per cent to 100 per cent, as shown in the **Chart 4.9**.

Chart 4.9: Total Sample vis-a-vis number or samples breached the prescribed limit for BOD, FC and Do in *Mathabhanga* River

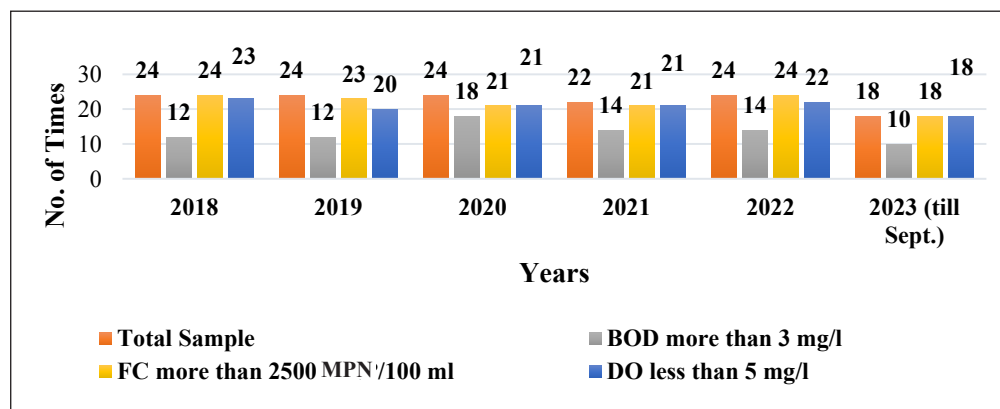


(Source: Water quality data of WBPCB under National Water Monitoring Programme)

(B) *Churni* River

During 2018-23 while the number of times BOD breached the prescribed limit ranged between 50 per cent to 75 per cent of total times tests were conducted, for FC it ranged between 88 per cent to 100 per cent, and DO did not meet the prescribed standards in 83 per cent to 100 per cent test cases, as shown in the **Chart 4.10**.

Chart 4.10: Total Sample vis-a-vis number or samples breached the prescribed limit for BOD, FC and Do-*Churni* River



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.9 Non-utilisation of sewage treatment facility for *Mirik* Lake

The hill town *Mirik*, in *Darjeeling* district is centered around tourism with *Mirik* lake being the focal point. This central lake has been losing its aesthetic value

due to growing anthropogenic activities besides natural causes like siltation. WBPCB's water quality reports of the lake water reflected this deterioration.

Gorkahaland Territorial Administration (GTA) prepared a DPR in 2013 for improvement of drainage and sewerage system in *Mirik*. Following the revision of discharge standards for treated effluents by MoEF&CC in November 2015, GTA revised the DPR without altering the sanctioned amount of ₹ 37.39 crore. The DPR envisaged construction of three STPs having sewage treatment capacity of 1,200⁷⁵ Kilo Litre Per Day (KLD) for different wards of *Mirik* Municipality. The STPs were completed in June 2019 after an expenditure of ₹ 36.30 crore was incurred by the GTA. However, the STPs were not operationalized.

Subsequently, *Mirik* Notified Area Authority took possession of the three STPs in February 2023. However, as house to house connections for feeding through the sewer network to the STPs were not included in GTA's DPR, MED prepared a DPR of ₹ 8.61 crore for house service connection along with three years Operation and Maintenance in February 2023. It was noted that despite a lapse of 50 months from completion of the STPs, work had not commenced till August 2023.

Audit conducted a joint physical inspection of the three STPs, along with representatives of the Division Office, MED, *Siliguri*, *Mirik* Municipality and the WBPCB in September 2023. This inspection revealed that:

- All the three STPs were not functional since completion of their construction as none of the drains were connected and work for house-to-house connection had not been taken up.
- Untreated sewage was flowing into the lake water and coloured wastewater was noticed beside an outfall to the lake.
- The lake water was found to be eutrophic.
- As no dredging work was carried out in the lake, sediment deposition was observed.
- Though WBPCB's water quality analysis reports of the lake indicated non-compliance with the stipulated standards, no remedial actions such as arresting discharge of untreated wastewater into the lake and periodic dredging of the lake were found to have been taken. Chairman, *Mirik* Municipality stated that due to paucity of fund, remedial action could not be taken.

⁷⁵ i.e. STP 1 (600 KLD), STP 2 (300 KLD) and STP 3 (300 KLD).

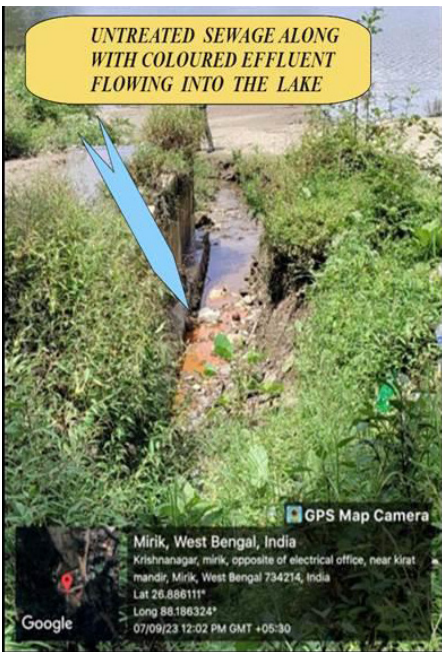


Figure 4.24: Untreated sewage along with coloured effluent flowing into the lake

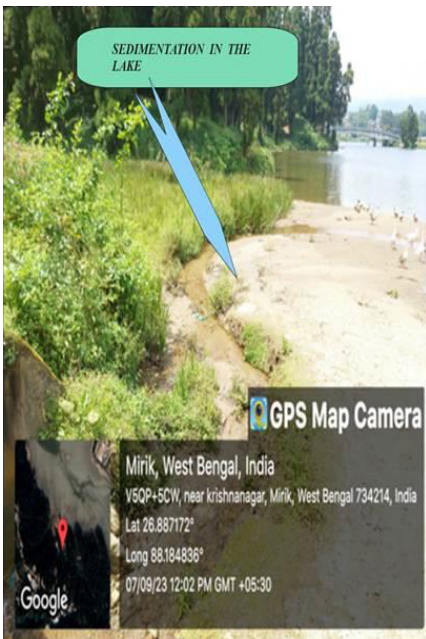


Figure 4.25: Sedimentation in the lake

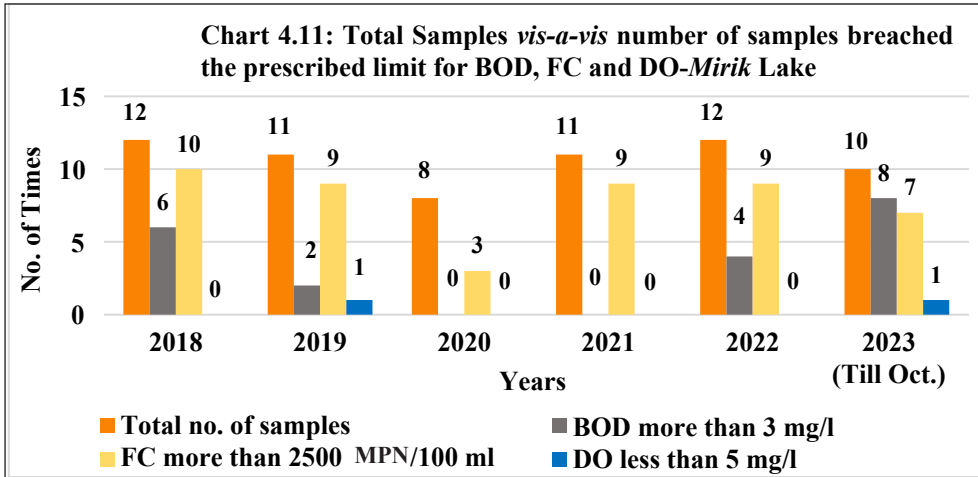
Thus, three sewage treatment facilities created at an expenditure of ₹ 36.30 crore could not be used even after four years of their completion and the pollution in the lake continued unabated.

In reply, the Department stated (March 2024) that UD&MA Department has initiated measures for making the STPs functional.

4.9.1 Impact on water quality of Mirik Lake (Darjeeling)

Audit observed that during 2018-23, BOD exceeded the prescribed limit in the years 2018, 2019, 2022 and 2023 while FC breached the limit in all the five years and DO did not meet the prescribed standards in 2019 and 2023.

The number of times BOD breached the prescribed limit ranged between zero to 80 per cent of the total times tests were conducted by WBPCB, while FC exceeded the range between 20 to 83 per cent times. It was further noted that DO did not meet the prescribed standards in zero to 10 per cent cases as shown in the **Chart 4.11**.



(Source: Water quality data of WBPCB under National Water Monitoring Programme)

4.10 Santragachi lake (Howrah)

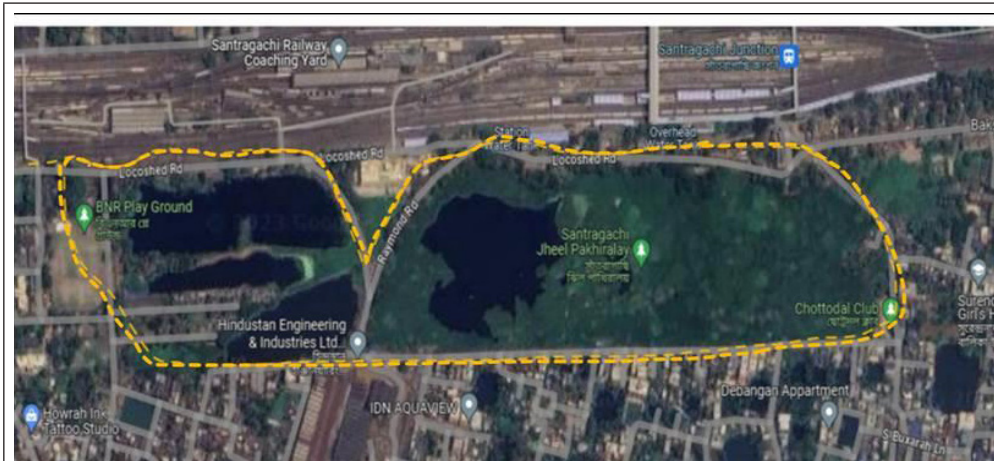


Figure 4.26: Santragachi lake

Santragachi Lake is located next to the *Santragachi Railway Station, Howrah*. The lake attracts a large number of migratory birds in winter, particularly in December and January. Observing damage to the lake due to discharge of untreated sewage and other waste from Howrah Municipal Corporation (HMC) area, in January 2016, a case was filed before the National Green Tribunal (NGT), Special Bench to prevent further damage to the lake.

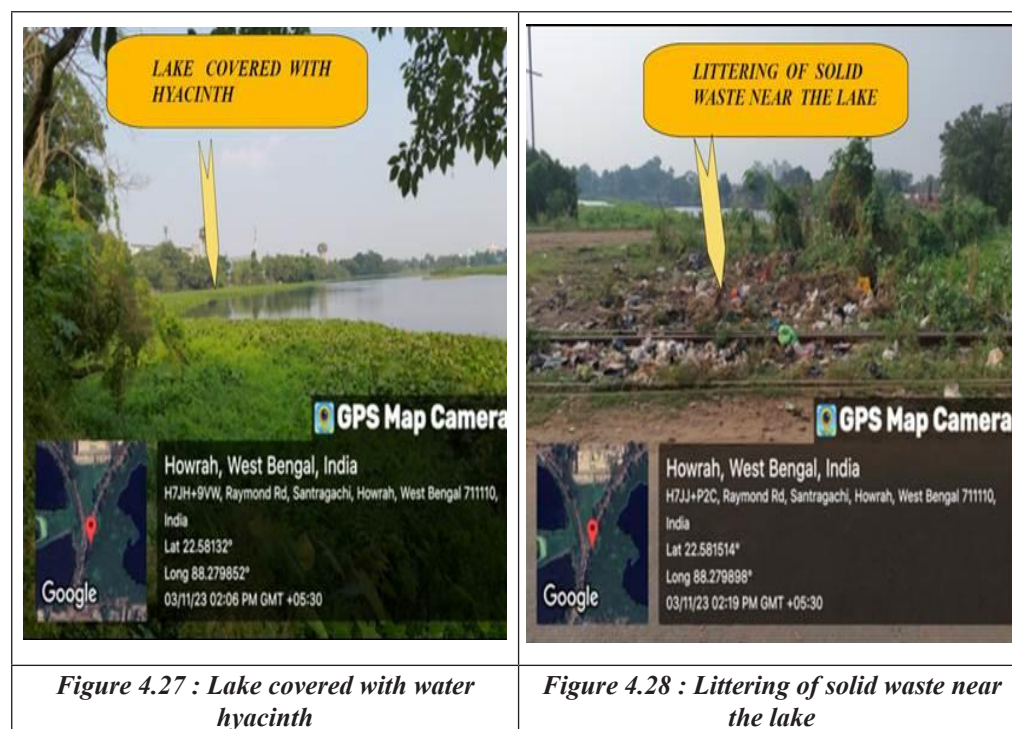
The tribunal issued (January 2016) notices to the HMC and the Forest Department to take remedial actions such as sealing of the outlets creating pollution and acting against illegal construction. The WBPCB was also directed by NGT to furnish a status report about the compliance with environmental norms. Subsequently, the Tribunal ordered the following in June 2020:

- a) The Railway Ministry was to provide land to KMDA for setting up of the STP for treatment of *Santragachi Lake* water.
- b) The cost of the project would be shared between HMC and the Railways in the ratio of contribution of sewage and,
- c) Encroachments from the Lake would be removed.

In September 2021, the Tribunal reviewed the progress and constituted a Committee to examine the Detailed Project Report (DPR) of ₹ 28.82 crore prepared by the KMDA for remedial measures to be taken to prevent pollution to *Santragachi Lake*.

Based on the DPR, audit observed that KMDA was assigned the work of construction of a garland drain around all sides of the Lake including interception and diversion of all outfalls to convey untreated effluents into the STP. KMDA proposed setting up of a low-cost sanitation treatment process by providing a Waste Stabilisation Pond (WSP), STP and two pumping stations.

Joint inspection of the Lake along with officials of WBPCB in November 2023 revealed that a major part of the Lake was covered with hyacinth. The work of the STP along with the garland drain had not yet commenced, though the NGT's stipulated period expired in November 2022. Further, residential units and shops were abutting the lake leading to direct discharge of waste into the lake.



Records also revealed that the land for setting up of the STP was not allocated by Indian Railways as of October 2023. The water quality analysis, carried out by WBPCB, in March 2023, revealed high levels of BOD (15 mg/l), high concentration of Total Coliforms (TC) (24,000 MPN/100 ml) and low levels of DO at 3.2 mg/l.

Thus, remedial measures for revival of the lake could not commence even after seven years since the matter first came before NGT in 2016, and the discharge of untreated sewage continued into the lake.

In reply, the Department stated (March 2024) that the Administrative Approval for the project from the UD&MA Department was awaited.

Recommendations 7:

UD&MA Department should complete the projects related to connections of household sewage with STPs and tapping of drains not connected with STPs on priority basis.

CHAPTER - V

Industrial Wastewater Management

Chapter V

Industrial Wastewater Management

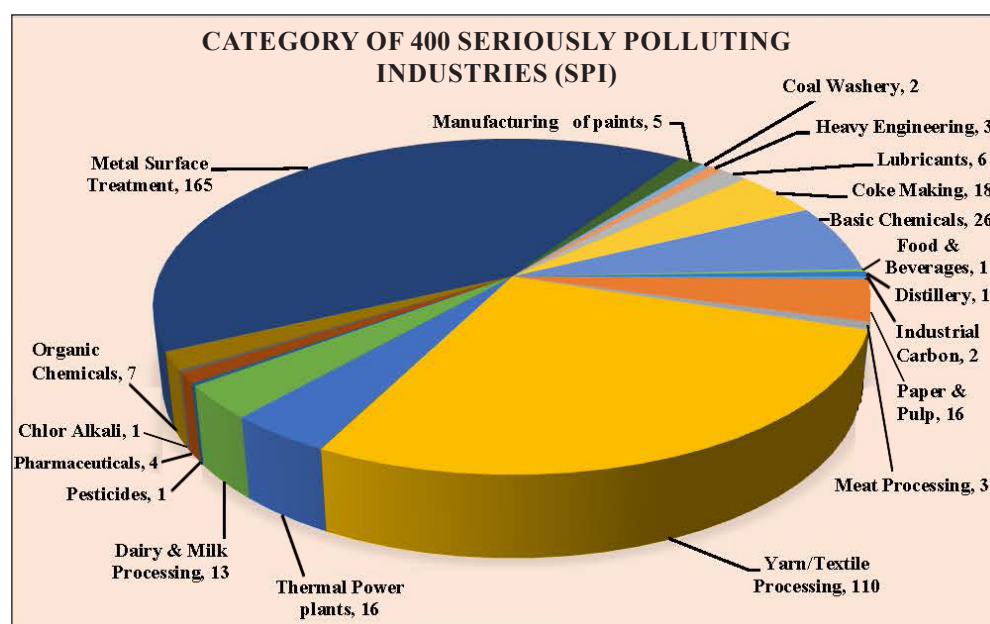
5.1 Introduction

According to Section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974, “no industry can discharge sewage or trade effluent into a stream or well or sewer or land beyond the permissible standards prescribed by CPCB”. Any contravention of the provisions, shall be punishable with imprisonment or fine under section 43/44 of the Act. The WBPCB can also issue directions for closure of an industry and disconnection of electricity in case of persistent defiance by any polluting industry under Section 33-A of the Water Act, 1974.

Under Section 17 (f) of the Water Act, 1974, the Board is responsible for inspecting sewage or trade effluents and works and plants for the treatment of sewage and trade effluents.

As per State Environment Report of 2020-21, 454 industries⁷⁶ (Grossly Polluting Industries-GPIs and Seriously Polluting Industries-SPIs) had been identified under different categories as water polluting industries of which 65⁷⁷ were selected for detailed scrutiny in audit as shown in **Charts 5.1 and 5.2**.

Chart 5.1: Category of 400 Seriously Polluting Industries

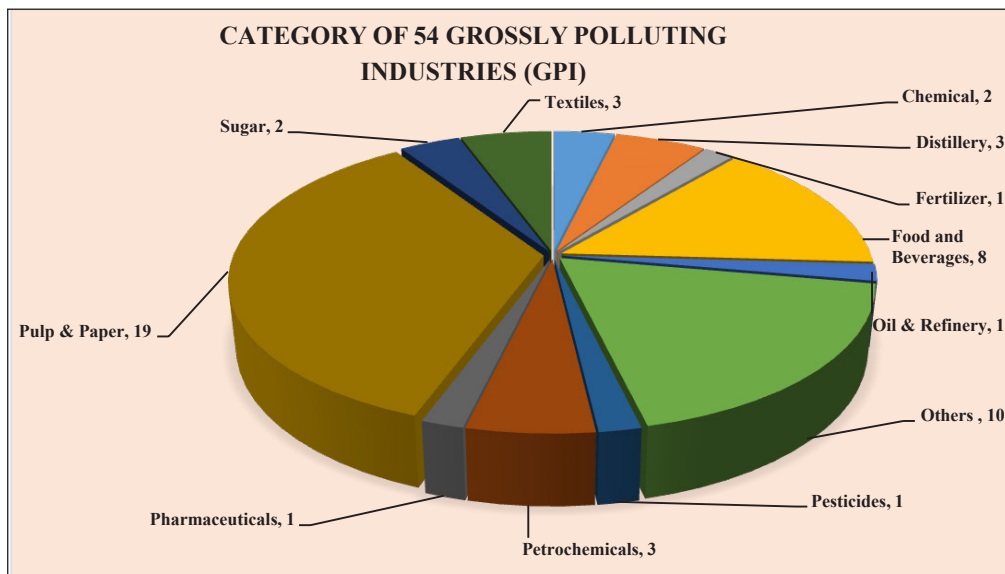


(Source: Records of WBPCB)

⁷⁶ 400 SPIs and 54 GPIs.

⁷⁷ 51 SPIs and 14 GPIs.

Chart 5.2: Category of 54 Grossly Polluting Industries



(Source: Records of WBPCB)

This Chapter deals with Industrial Wastewater Management being implemented by WBPCB through various provisions of the Water Act, 1974 and the Environment Act, 1986. Audit findings are discussed in the succeeding paragraphs.

5.2 Consent Management

According to the Water Act⁷⁸, 1974, industrial units, that started operations after obtaining Consent to Establish (CTE), issued by the WBPCB, had to apply to the WBPCB for CTO⁷⁹ which will be valid for five years. No industry can operate without a valid CTO. This CTO is granted to an industry on the basis of review of following information:

- (i) Name of the products/ by-products and the quantity to be produced per month,
- (ii) Discharge/emission parameters with prescribed standards and the frequency of effluent and emission sampling,
- (iii) Type and quantity of fuel used *etc.*

Thus, through CTO, WBPCB monitors compliance to environmental laws and standards in terms of raw material consumed, emissions, effluents, and waste discharges standards. The renewal of applications of CTO should be filed by the industry at least 120 days prior to its expiry.

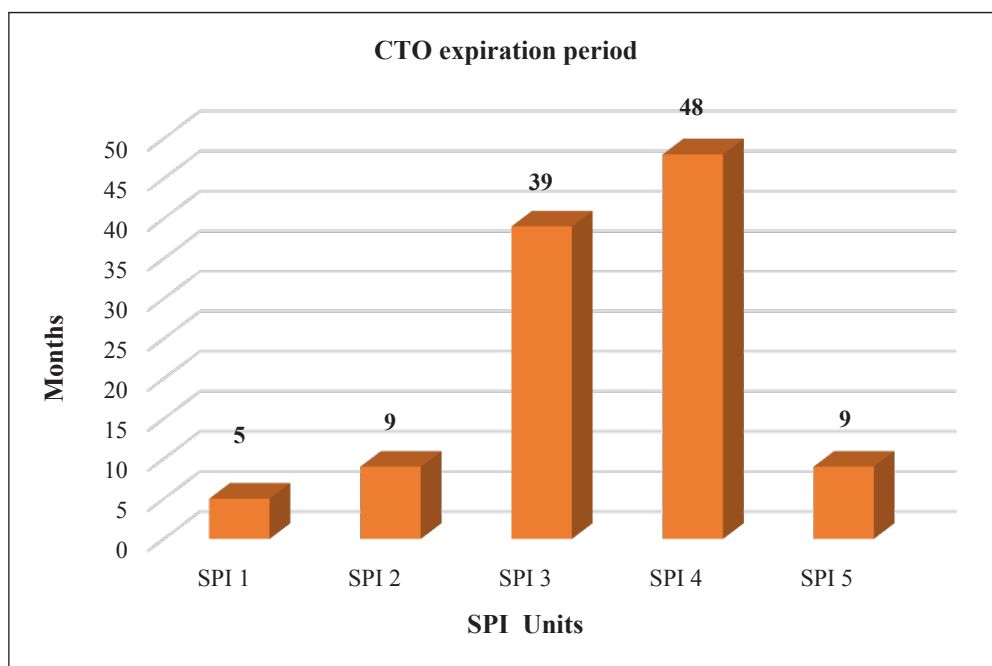
Audit observed that as of March 2023, five⁸⁰ out of 51 sampled SPIs were operating with CTOs that had already expired for periods ranging between five to 48 months, as shown in Chart 5.3.

⁷⁸ Section 25 of the Water (Prevention and Control of Pollution) Act, 1974.

⁷⁹ The validity of the CTO of Red industries was increased (June 2016) by WBPCB from three to five years.

⁸⁰ SPI 1-M/s Sreema Dyeing and Bleaching work; SPI 2-M/s Kalachand Electroplating Work; SPI 3-M/s Monoranjan Jalui; SPI 4-M/s Dhara Brothers; SPI 5-M/s Biplab Processing.

Chart 5.3: CTO Expiration Period



(Source: Records of WBPCB)

Thus, due to non-renewal/delayed renewal of CTOs, compliance with environmental laws by these industries could not be ensured by the WBPCB.

The Department did not furnish any reply in this regard.

Recommendation 8:

WBPCB should ensure that Industrial units are in possession of valid CTOs and impose penalties in case of lapses.

5.2.1 Mandatory Inspection by WBPCB for environment surveillance

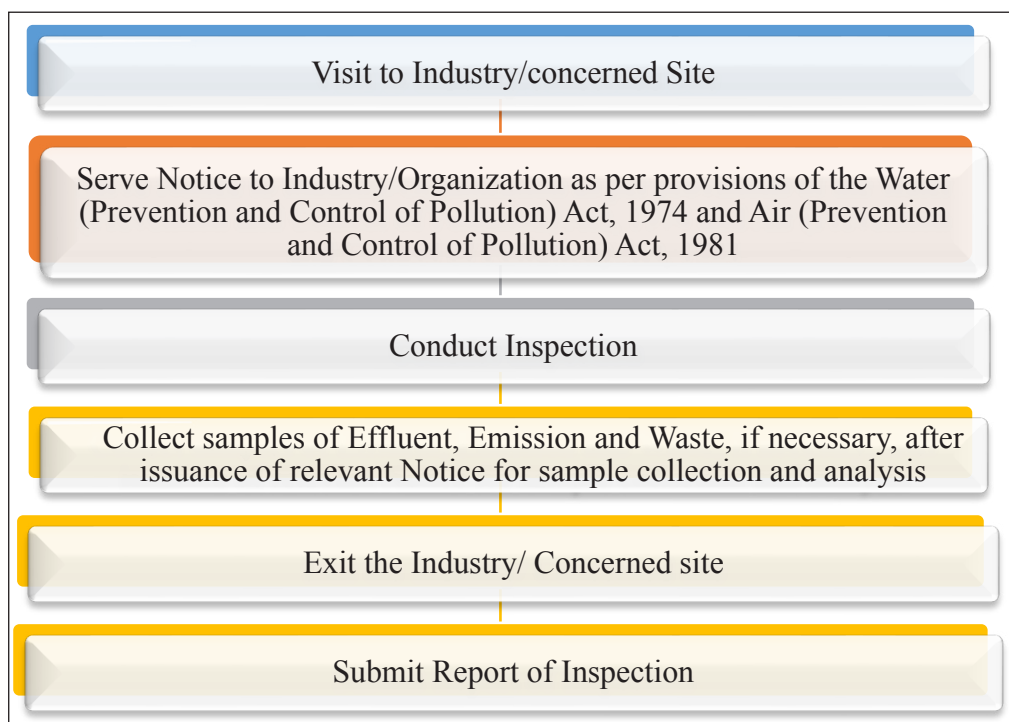
According to the Comprehensive Inspection Policy (2019)⁸¹ of WBPCB, SPIs were to be inspected once in a year. Subsequently, WBPCB, as per the directions of CPCB, issued (January 2020) an order⁸² which mandated inspection of SPIs at a frequency of six months⁸³. Inspection procedure of WBPCB is depicted in **Chart 5.4**.

⁸¹ Memo No. 1546-4A-6/2015 (Part-II) dated 29.05.2019.

⁸² Memo No. 689 (8)- 384/ WPB/ O&E/ 2020.

⁸³ Highly Polluting 17 category Industries- three months and Red category other than 17 category industries six months.

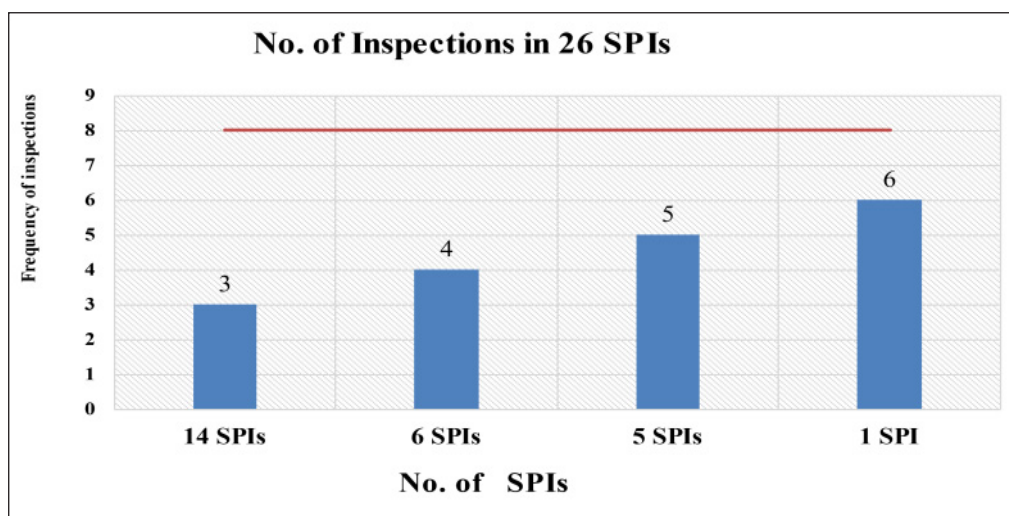
Chart 5.4: Inspection Procedure by WBPCB



Audit observed the following:

- Out of 51 sampled SPIs, 34 SPIs were operational during 2018-23.
- Records related to inspection by WBPCB in case of six out of 34 SPIs, were not available.
- Each of the SPIs was required to be inspected eight times from May 2019 to March 2023. However, it was noted that 26 operational SPIs⁸⁴ were not inspected by the WBPCB for the mandated eight times over the five years period. Audit observed that out of 26 operational SPIs, 14 SPIs were inspected up to three times, six SPIs four times, five SPIs five times and one SPI six times during 2018-23, as detailed in **Chart 5.5** and **Appendix 1**.

Chart 5.5: No of inspection in 26 SPIs



⁸⁴ 2 SPIs have been regularly inspected.

Further, as per Rule 6 of Hazardous Waste Management Rules, 2016, industries were required to apply and obtain an authorisation from WBPCB for managing hazardous waste.

Audit observed that out of 65 sampled industrial units, while all 14 GPIs had valid hazardous waste authorization, 22 out of 51 SPIs did not have this authorization.

The above issue indicated that WBPCB did not efficiently monitor compliance with the mandated frequency of inspection for effective environmental surveillance of industries.

Recommendation 9:

WBPCB should strengthen its monitoring mechanism to adhere to the required number of inspections and ensure compliance by polluting industries.

5.2.2 Action taken against non-compliant GPIs and SPIs

As per Water (Prevention and Control of Pollution) Act, 1974, Board officials conduct regular inspections of the industries under their consent management. In case of any non-compliance noticed, the industries were to be allowed reasonable time to comply with the environmental statutes. On repetitive violation of environmental norms, the defaulting units were to be served with show-cause notices/directions, followed by technical hearing, time-bound compliance submitting a bank guarantee as security and imposition of fines. Repeated non-compliance would lead to closure of the units along with disconnection of electricity under extreme circumstances.

Since 2017, GPIs in addition to the quarterly monitoring by WBPCB, were also being monitored by CPCB. The monitoring by CPCB was done by engaging joint teams of experts/third party technical institutes like IITs, NITs, etc. WBPCB had to take appropriate action such as issuance of directions to ensure implementation of pollution control measures, as suggested by CBPC within 15 days of receipt of such inspection report from CPCB. Further, in case of Show Cause Notices issued by CPCB/WBPCB the units were to be re-inspected by WBPCB and closure directions issued in case of non-compliance within 30 days. The compliance status as well as action taken by WBPCB during the period 2018-23 is detailed in **Table.5.1**.

Table 5.1: Status of action taken by WBPCB for GPIs

Year	Total No. of GPIs inspected	Non Complying GPIs (%)	Non-complying GPIs issued with Show Cause Notice (SCN)	Temporarily closed GPIs after issuance of notice	Permanently closed GPIs
2018-19	44	12(27)	8 (6 SCN & 2 Closure)	4	Nil
2019-20	48	5(10)	2 (SCN)	3	Nil
2020-21	54	23(43)	15 (SCN)	8	Nil
2021-22	55	16(29)	11 (SCN)	4	1
2022-23	56	12(21)	4 (SCN)	8	Nil

(Source: Regional Director, Kolkata, CPCB)

From the table, it can be seen that during the audit period, percentage of non-complying GPIs ranged between 10 *per cent* and 43 *per cent*, with reference to GPIs inspected.

Similarly, the instances of non-compliances were observed in case of the sampled 51 SPIs as detailed in **Table 5.2**

Table 5.2: Status of action taken by WBPCB for sampled SPIs

Year	No. of sampled SPI	Non complying SPIs (per cent)	No. of Notices issued	No. of notices issued for closure	No. of Directions issued
2018-19	51	14(27)	15	2	2
2019-20	51	12(24)	5	1	4
2020-21	51	3(6)	4	0	2
2021-22	51	6(12)	5	0	5
2022-23	51	14(27)	10	1	7

From the table, it may be seen that during the audit period, percentage of non-complying SPIs ranged between six and 27 *per cent*.

Thus, percentage of non-complying SPIs in 2022-23 in comparison with 2018-19 remained the same despite monitoring by WBPCB. Some illustrative cases highlighting failure of WBPCB in taking timely action against the non-compliant industries have been discussed in **Table 5.3**.

5.2.3 Implementation of Charter based participatory approach for reduction in water consumption, effluent generation and pollution load

Textiles, Pulp and Paper, and Distilleries industries were categorised under the 17 categories of highly water consuming and polluting industries by CPCB.

To accomplish desired level of environmental protection and to meet objectives of the National Mission for Clean Ganga, CPCB formulated (February 2015) industry specific ‘*Charter based participatory approach for reduction in water consumption, effluent generation and pollution load by adoption of cleaner technologies & training for best management practices*’.

SPCBs were to ensure proper implementation of the said Charter and were responsible for monitoring and surveillance of industries as against Charter norms. Participating units were not allowed to bypass Effluent Treatment Plant (ETP) systems and discharge partially treated/untreated effluent into any water streams.

The implementation of the Charter was considered to have commenced on the date of issue of directions/ instructions from SPCBs/PCCs and the entire action plan was to be implemented before 31 March, 2017. However, as of June 2023, WBPCB was yet to implement the Charter in these three (*Textiles, Pulp and Paper, and Distilleries Industries*) categories of industries.

According to the WBPCB’s inventory, there were 127⁸⁵ industries under these three categories, of which Audit conducted a detailed scrutiny of 14⁸⁶ units.

⁸⁵ 110 textile, 16 pulp and paper and one distillery.

⁸⁶ 11 textile, two pulp and paper and one distillery.

Scrutiny of records and joint physical inspection of the units along with officials of WBPCB revealed the following issues:

- Mandatory eight and 20 number of inspections in case of SPI and GPI respectively were not carried out by WBPCB during 2018-23 in nine industries⁸⁷.
- In nine industrial units⁸⁸ ETPs were either non-operational or did not meet the effluent discharge standards.
- Flow meters required at ETP inlets and outlets for measuring the quantity of untreated effluent received and treated effluent discharged were not installed in nine industries⁸⁹.
- Hazardous Waste Authorization⁹⁰, to be issued by WBPCB was not possessed by eight units⁹¹.
- No facility for reusing treated waste water existed in 11 industrial units⁹².
- Under the West Bengal Ground Water Resources (Management, Control and Regulation) Rules 2006, the State Water Investigation Directorate is responsible for issuing permits for ground water extraction. Audit observed that four industries⁹³ were drawing groundwater for industrial purposes without valid authorisation,
- Against the authorisation of 8.25 KLD, an industrial unit (Tirupati Udyog) extracted 44.38 KLD of ground water.

Violations of CTO conditions noticed during Joint physical verification of the selected industries are detailed in **Table 5.3**:

⁸⁷ M/s Sreema Dyeing & Bleaching Works, Sunrise Industry, M/s Bijoy Processing Industries, International Bleaching & dyeing Works, Chiranjilal Rayons Pvt. Ltd., Rupa & Co. Ltd., M/s Onkar Parivahan Finance Pvt. Ltd., East India Paper & Board Mills and Carlsberg India Pvt. Ltd.

⁸⁸ Sunrise Industry, M/s Bijoy Processing Industries, International Bleaching & dyeing Works, Chiranjilal Rayons Pvt. Ltd., Rupa & Co Ltd., Superfine Thread Co., M/s Onkar Parivahan Finance Pvt. Ltd., East India Paper & Board Mills and Carlsberg India Pvt. Ltd.

⁸⁹ M/s Sreema Dyeing & Bleaching Works, Sunrise Industry, M/s Bijoy Processing Industries, International Bleaching & dyeing Works, Krishna Tissue Pvt. Ltd., Chiranjilal Rayons Pvt. Ltd., M/s Onkar Parivahan Finance Pvt. Ltd., East India Paper & Board Mills and Burdwan Kraftboard LLP earlier name was Bardhaman Dharmaraj Paper Mill (P) Ltd.

⁹⁰ Hazardous Waste Authorization (HWA) is required for the generation, collection, reception, storage, transportation, treatment, disposal or any other manner of handling of hazardous and other wastes listed in Schedules I, II and Parts B & D of Schedule III of the Hazardous Wastes (Management and Transboundary Movement) Rules, 2016.

⁹¹ M/s Sreema Dyeing & Bleaching Works, M/s Bijoy Processing Industries, International Bleaching & dyeing Works, Krishna Tissue Pvt. Ltd., Superfine Thread Co., East India Paper & Board Mills, Carlsberg India Pvt. Ltd. and Ballavpur Paper Mfg Ltd.

⁹² M/s Sreema Dyeing & Bleaching Works, Sunrise Industry, M/s Bijoy Processing Industries, International Bleaching & dyeing Works, Chiranjilal Rayons Pvt. Ltd., Rupa & Co. Ltd., Superfine Thread Co., M/s Onkar Parivahan Finance Pvt. Ltd., East India Paper & Board Mills, Carlsberg India Pvt. Ltd. and Ballavpur Paper Mfg Ltd.

⁹³ Chiranjilal Rayons Pvt. Ltd., Superfine Thread Co, M/s Onkar Parivahan Finance Pvt. Ltd. and East India Paper & Board Mills.

Table 5.3: Violations of CTO conditions during 2018-23

Sl No.	Industry	Inspection and Test Samples	Action taken by WBPCB	Audit observation (Joint physical verification)
CATEGORY-TEXTILE				
1.	M/s Chiranjila Rayons Pvt. Ltd. (SPI)	- WBPCB inspected five times against the stipulated eight times (63 per cent). - Total five samples of the trade effluents were analysed during the audit period, all of which were found to be non-compliant with discharge standards⁹⁴.	- Show cause notice was issued in September 2019, followed by a hearing in December 2021. - WBPCB issued direction in May 2022, and an Environment Compensation (EC) of ₹ 3.15 lakh was imposed along with a Bank Guarantee of ₹ 5.00 lakh which was duly paid by the unit.	- Despite the action taken by the WBPCB, compliance with environmental norms had not been done. - ETP was not fully functional, partially treated colored effluent was being discharged. (April 2023) - Water quality tests done (23 November 2023) by CPCB in the presence of officials of WBPCB and Audit also showed that the industry was non-compliant (TSS⁹⁵-1,477 and SAR⁹⁶-71.9).
2.	M/s Onkar Parivahan Finance Pvt. Ltd. (SPI)	- WBPCB inspected five times against the stipulated eight times (63 per cent). - Two sample reports of treated effluents were made available to Audit, both were found to be non-compliant⁹⁷.	- Three (3) show-cause notices⁹⁸ were issued. - Closure order with disconnection of electricity in November 2022 which was suspended in December 2022 based on corrective action taken by the unit. - Environment Compensation of ₹ 2.00 lakh was imposed for violation of environmental norms and also Bank Guarantee of ₹ 5.00 lakh was taken as an assurance for compliance with the Board's directions as well as environmental norms.	- Despite action taken by WBPCB, compliance with environmental norms was not done. - Coloured effluent was coming out from the discharge point of the ETP and falling in the low-lying land in front of the unit's main gate. (July 2023). - Water quality tests done (23 November 2023) by CPCB in the presence of officials of WBPCB and Audit also showed that the industry was non-compliant (BOD⁹⁹-184, COD¹⁰⁰-321 and SAR -41.7).

⁹⁴ 25.04.2018 (BOD-665.70 mg/l, COD-1418.30 mg/l, O&G-12.20 mg/l, Sulphide-11.84 mg/l, TSS-370.00 mg/l), 28.08.2019 (SAR-103.84, TDS-610.00 mg/l, TSS-104.00 mg/l), 14.08.2020 (BOD-97.60 mg/l, COD-539.47 mg/l, pH-9.38, TDS-3482.00 mg/l), 27.10.2021 (BOD-213.55 mg/l, COD-674.97 mg/l, TDS-2388.00 mg/l, SAR-43.16), 26.04.2023 (COD-183.46 mg/l, TDS- 1234.00 mg/l, TSS- 166.00 mg/l, SAR- 5.04).

⁹⁵ Total Suspended Solids (Permissible limit-100 mg/l).

⁹⁶ Sodium Adsorption Ratio (Permissible limit-26 mili mol/l).

⁹⁷ 16.01.2019 (pH 9.55, TDS 2859.00) and on 27.01.2020 (SAR-165.94, pH-8.79 and TDS-2410.00 mg/l).

⁹⁸ 24.04.2019, 10.02.2020 and 22.06.2020.

⁹⁹ Biological Oxygen Demand (permissible limit-30 mg/l).

¹⁰⁰ Chemical Oxygen Demand (permissible limit-250 mg/l).

Sl No.	Industry	Inspection and Test Samples	Action taken by WBPCB	Audit observation (Joint physical verification)
3.	Sun Rise Industry (SPI)	- WBPCB inspected on three occasions against the required eight times (38 <i>per cent</i>). - Three samples tested from 2018-23. All found non-compliant¹⁰¹.	Three Show cause notices were issued in September 2018 & 2019, and July 2022.	The industry continued to operate without compliance to the discharge standard. No further action on part of WBPCB was found on records.
4.	M/s Sreema Dyeing & Bleaching Works (SPI)	- WBPCB inspected on four occasions out of required eight times (50 <i>per cent</i>). - ETP was not operational during WBPCB's inspection.	- Issued a temporary closure order with disconnection of electricity in November 2019. - Directions issued for Non-compliance with environmental norms in December 2021 by WBPCB. - Show-cause notice was issued in December 2022 for not commissioning ETP and closure notice was suspended in December 2022 without ensuring compliance by the industry.	Compliance to the discharge standards was yet to be ensured as no test report of effluent was made available, and the unit continued discharging untreated effluent directly into KMC drain.
5.	International Bleaching & Dyeing Works (SPI)	- WBPCB inspected on five out of required eight inspections. (63 <i>per cent</i>). - ETP was not operational during WBPCB's inspection.	- Show Cause Notices were issued by WBPCB in February 2019 and July 2021 followed by a hearing in May 2022. - WBPCB directed in August 2022, the concerned Regional Office to keep a vigil on the unit.	- The unit was operating without CTO during the period 2018-21 (upto 22 March 2021). - CTO was issued in March 2021 (valid up to October 2025) without ensuring operational status of the ETP. - Records regarding inspections were not available since August 2022 and during the joint site inspection, it was noticed that the ETP was non-operational and final discharge was made into KMC drain without any treatment.

¹⁰¹ 02.08.2018-(TSS-104.00 mg/l, BOD-192.77 mg/l, COD-462.80 mg/l and pH>10), 18.06.2019-(TSS-3684.00 mg/l, BOD-50.87 mg/l) and 17.06.2022- SAR-175.92.

Sl No.	Industry	Inspection and Test Samples	Action taken by WBPCB	Audit observation (Joint physical verification)
6.	M/s Tirupati Udyog (SPI)	- WBPCB inspected on two occasions out of required eight inspections (25 per cent) - ETP was not in operation.	Action taken by WBPCB was not found on record.	- No inspections were done during 2018-19 and 2021-23. - Show-Cause notice was not issued by WBPCB for non-operation of ETP, though CTO was renewed upto 30 November 2023.
CATEGORY: PULP AND PAPER				
7.	M/s Burdwan Kraft Board LLP (Formerly Bardhaman Dharmaraj Paper Mills Pvt. Ltd. (GPI)	- WBPCB inspected four out of required 20 inspections (20 per cent). - During 2018-23, WBPCB had taken three water samples for testing and found on two¹⁰² occasions that the effluent was breaching permissible limits.	Show cause notice was issued in January 2022, for non-compliance with environmental norms. Further action was not on records.	- No action had been taken after detecting non-compliance by the industries with the discharge norms in December 2022. - No test was done since December 2022.
8.	M/s Ballavpur Paper Mfg Ltd. (GPI).	- WBPCB inspected the unit 15 times out of required 20 inspections (75 per cent). - On nine¹⁰³ occasions the effluent did not meet the prescribed standards.	Primary clarifier was found in a damaged condition even though the third-party inspection (CPCB) in March 2022 recommended its repair at the earliest. However, no action was taken.	540 KLD of ground water was being extracted against the permission of 120 KLD from SWID. - No permission for hazardous waste authorisation was taken. - There was no system for re-use of treated water. - Sludge was kept in open within the premises.
CATEGORY: MILK PROCESSING AND DAIRY PLANT				
9.	M/s Mother Dairy (GPI)	- The effluent of the unit was found non-compliant on four¹⁰⁴ occasions out of total 20 inspections (quarterly) done during the period. - The unit also failed to install Online Continuous Effluent Monitoring System (OCEMS) connecting with the CPCB server.	It was seen that direction was issued only on one occasion i.e. 06.08.2021 for non-compliance with the Environment norms and an Environmental compensation of ₹ 4.25 lakh was imposed for non-compliance. However, the unit remained non-compliant on four occasions during the Audit period.	- The ETP was partially running. - The online effluent monitoring system (OCEMS) was not functioning

¹⁰² 08.11.2021 (TSS-580.00 mg/l, COD-15727 mg/l, BOD-6218.75 mg/l), 14.12.2022 (COD-272.80 mg/l, BOD-94.17 mg/l).

¹⁰³ 12.04.2018 (BOD-59.83 mg/l, COD-400 mg/l), 18.07.2018 (BOD-127.61 mg/l, COD-519.77 mg/l), 10.09.2018 (BOD-76.91 mg/l, COD-459), 18.12.2018 (TSS-134.00 mg/l, BOD-1543.75 mg/l, COD-6775 mg/l), 21.05.2019 (BOD-93.75 mg/l, COD-455.40 mg/l), 19.08.2022 (BOD-35.44 mg/l), 04.12.20 (BOD-71.25 mg/l), 24.03.2021 (BOD- 36.46 mg/l), 04.03.2022 (BOD-40.08 mg/l).

¹⁰⁴ 02.07.2020 (BOD-50.65 mg/l), 11.08.2021 (TSS-176.00 mg/l and BOD-46.13 mg/l), 29.04.2022 (TSS-208.00 mg/l) and on 06.04.2023 (BOD- 42.15 mg/l).

Sl No.	Industry	Inspection and Test Samples	Action taken by WBPCB	Audit observation (Joint physical verification)
10.	M/s Meghna Farm Products (SPI)	WBPCB inspected on four out of required eight mandatory inspections (50 per cent)	- Four¹⁰⁵ Show-cause notices were issued for non-compliance. - No further action was taken by the WBPCB.	- There was no system for re-use of treated water. - Reserve tank for effluent stores the wastewater for treatment. However, several outlets were found in the reserve tank that did not lead to ETP which indicated that untreated effluent was being discharged into the water stream.
CATEGORY- METAL SURFACE TREATMENT				
11.	M/s DMP Projects Pvt. Ltd. (SPI)	- WBPCB inspected the unit on three out of required mandatory eight inspections (38 per cent) - Effluent was found to be non-compliant¹⁰⁶ with discharge standards on all the three occasions.	Nothing was found on record regarding WBPCB's follow up action.	- Hazardous Waste Authorization expired on 31 January 2023 and has not been renewed since. - During joint inspection (July 2023) the unit was found not functioning, however hazardous waste was stored in a tank at the premises.
12.	M/s Bhusan Power and Steel Ltd. (SPI)	- WBPCB was inspected on three out of required eight inspections (38 per cent) - The unit was non-compliant on one occasion. - Presence of multiple number of outlets all along the boundary wall beside the ETP was pointed out.	Nothing was found on record regarding any follow up action by WBPCB.	No follow-up/ show cause notice was found on record

5.2.4 Trade Effluents from the tanneries in Calcutta Leather Complex

Calcutta Leather Complex (CLC) was set up in 2005, for accommodating approximately 500 tanneries, to allow them to operate in a modern and environment-friendly manner. As of 2023, 517 tanneries had relocated to CLC and obtained NOC from WBPCB. The CLC was equipped with 40 MLD CETP, comprising eight modules of five MLD each, for treating trade effluents¹⁰⁷ of the tanneries. However, as of July 2023, only four modules¹⁰⁸ i.e. Module V-VIII were functioning, after modules I-IV went out of operation in August 2022.

¹⁰⁵ 05.07.2018, 30.08.2018, 30.07.2021, 12.12.2022.

¹⁰⁶ 06.12.2018 (BOD-45.13 mg/l, Iron- 27.92 mg/l, pH- 4.98, TSS-638.00 mg/l, Zn-42.85 mg/l), 11.03.2019 (pH-4.98, TSS-638.00 mg/l, BOD-45.13 mg/l, Zinc-42.85 mg/l and Iron-27.92 mg/l) and 28.10.2021 (Zn-7.57 mg/l).

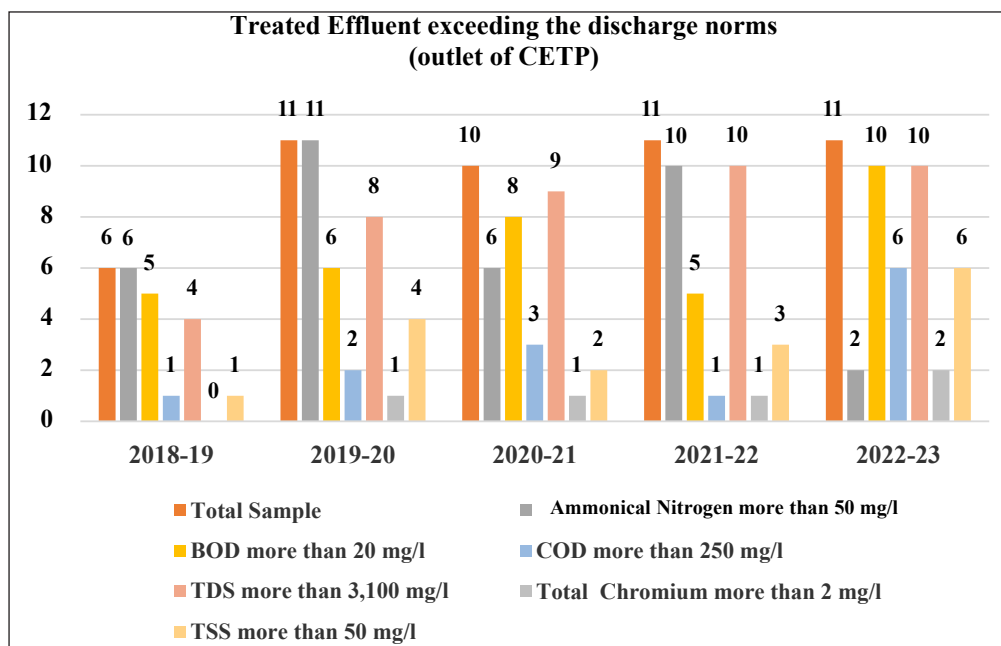
¹⁰⁷ Trade effluent is liquid waste that comes from industrial process.

¹⁰⁸ Total 20 MLD (Five MLD each).

The four modules in operation were receiving about 15-16 MLD of trade effluent. During the period 2018-19 to 2022-23, WBPCB inspected the Complex 49 times. Further, a joint inspection of CLC was also carried out by Audit with officials of KMDA (July 2023). Based on these inspections, the following was noticed:

- WBPCB carried out water quality analysis of CETP outlets 49 times during 2018-19 to 2022-23. During this analysis it was noticed that the discharge effluent standards for pollutants like Chloride and TDS regularly exceeded permissible limits, while other pollutants such as Ammonical Nitrogen, BOD, COD, TDS, TSS and Total Chromium exceeded the Design/MoEF&CC discharge standard limits by 35, 34, 13, 41, 16 and 5 times, respectively. Details of this analysis are as shown in **Chart 5.6** below.

Chart 5.6: Treated Effluent exceeding the discharge norms



All the three canals within the Complex were heavily contaminated due to unauthorised discharge of tannery effluent, bypassing the CETP. On perusal of WBPCB records it was seen that the Board had not monitored the water quality in the storm water canals regularly. Seven water quality test reports¹⁰⁹ of storm water canals for the period from May 2018 to July 2019 were found on record which showed that the levels for parameters like Sulphide, Total Chromium, TSS, COD exceeded the treated effluent

¹⁰⁹ 15 May 2018, 23 August 2018, 29 November 2018, 21 February 2019, 02 May 2019, 18 June 2019 and 31 July 2019.

discharge levels of the CETP outlet on all the seven counts¹¹⁰. This indicated that the effluents from the tanneries were being discharged directly into the canals, bypassing the CETP. Thus, CLC tanneries were discharging untreated effluents directly into canals, which were ultimately flowing into the *Vidyadhari* river causing environmental pollution.

The Joint Inspection of the CLC (July 2023) also revealed that tannery effluent was flooding the internal roads and abutting vacant plots due to leakage and overflow, and ultimately accumulating in vacant areas of the complex.

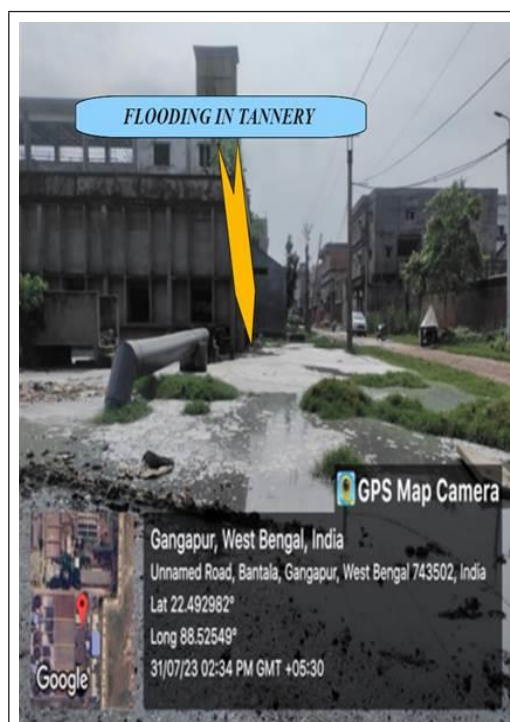


Figure 5.2: Flooding of tannery effluent due to leakage/overflow



Figure 5.3: Undisposed sludge of CETP

Water quality tests of the CLC's CETP Module (V-VIII), was also done by CPCB (in November 2023), in the presence of officials of WBPCB and Audit. These tests revealed that the CETP of the Complex was non-compliant with environmental norms as the effluent had a BOD load of 80 mg/l against an acceptable standard of 20 mg/l and COD was 276 mg/l against 250 mg/l.

From the above it is evident that the leather industry discharged effluents laced with chromium compounds and sulphides into water bodies. The International Agency for Research on Cancer under WHO had recognised chromium compounds as human carcinogens. Since the storm water canal opens into the *Vidyadhari* River, the effluents were getting widely dispersed, causing immense risk to human and aquatic health.

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Parameter	CETP outlet range	Canal water range
Sulphide	0	38.84-151.04
Total Chromium	0.26-0.36	5.4-37.52
TSS	4-79	79-1,407
COD	66.03-237.83	391.32-11,924.17

In reply, WBPCB stated (March 2024) that no untreated sewage from the tanneries was being directly discharged. They also stated that untreated sewage mixed with the process effluent generated from tannery units were being sent to CETP for final treatment.

However, from the water quality tests done (November 2023) by CPCB and the joint inspection by Audit, it was seen that there was no proper treatment of the tannery effluents and the canals continued to be heavily contaminated.

Recommendation 10:

WBPCB needs to enforce, through consent management, treatment of all industrial effluents, with special emphasis on installation of CETPs in clusters for the unorganised small industries.

5.2.5 Implementation of Comprehensive Environmental Pollution Index Action Plan

In order to assess the impact of industrial clusters on the environment, CPCB uses a Comprehensive Environmental Pollution Index (CEPI) comprising parameters for Water Environment, Air Environment and Land Environment. Industrial clusters with aggregated CEPI score of 70 and above are generally considered by MoEF&CC as critically polluted Cluster.

MoEF&CC issued a Memorandum dated 13 January 2010 imposing a moratorium on setting up of new industries and expansion of existing industries, requiring Environmental Clearance, in Critically Polluted Areas (CPAs). In West Bengal three industrial towns viz. *Haldia, Howrah and Asansol* were identified as CPAs, and thus the moratorium extended to all the three places.

To improve the environment quality, WBPCB initiated a series of time bound action plans from 2010 onwards. The CPCB conducted monitoring in the CPAs during February-April 2013 and re-assessed the CEPI scores. In view of the reassessment, MoEF&CC lifted (September 2013) the moratorium subject to the conditions that.

- (i) The concerned SPCB shall ensure compliance with approved action plans for the CPAs,
- (ii) SPCB shall review quarterly, the implementation of the action plans and report to CPCB and,
- (iii) SPCB, through third party, will undertake an annual monitoring of CPA for computing CEPI.

In this context, Audit observed that compliance reports related to the CEPI action plan for the above three CPAs were available only for the year 2014 and reports for subsequent years were not found.

Subsequently, CPCB, as per the order of the NGT¹¹¹, undertook a project for monitoring environmental qualities during 2017-18 of around 100 Polluted

¹¹¹ OA No. 1038/2018 dated 13.12.2018

Industrial Areas (PIAs) throughout the country, which includes all the above three CPAs, one Severely Polluting Area (SPA) - *Durgapur* and one additional site (*Bandel*) in the State. Accordingly, action plans were prepared (June 2019) for each of the five PIAs based on the WBPCB's monitoring of environmental qualities.

In context of the above action by WBPCB, Audit observed the following:

5.2.5.1 Implementation of Action Plans in Haldia CPA

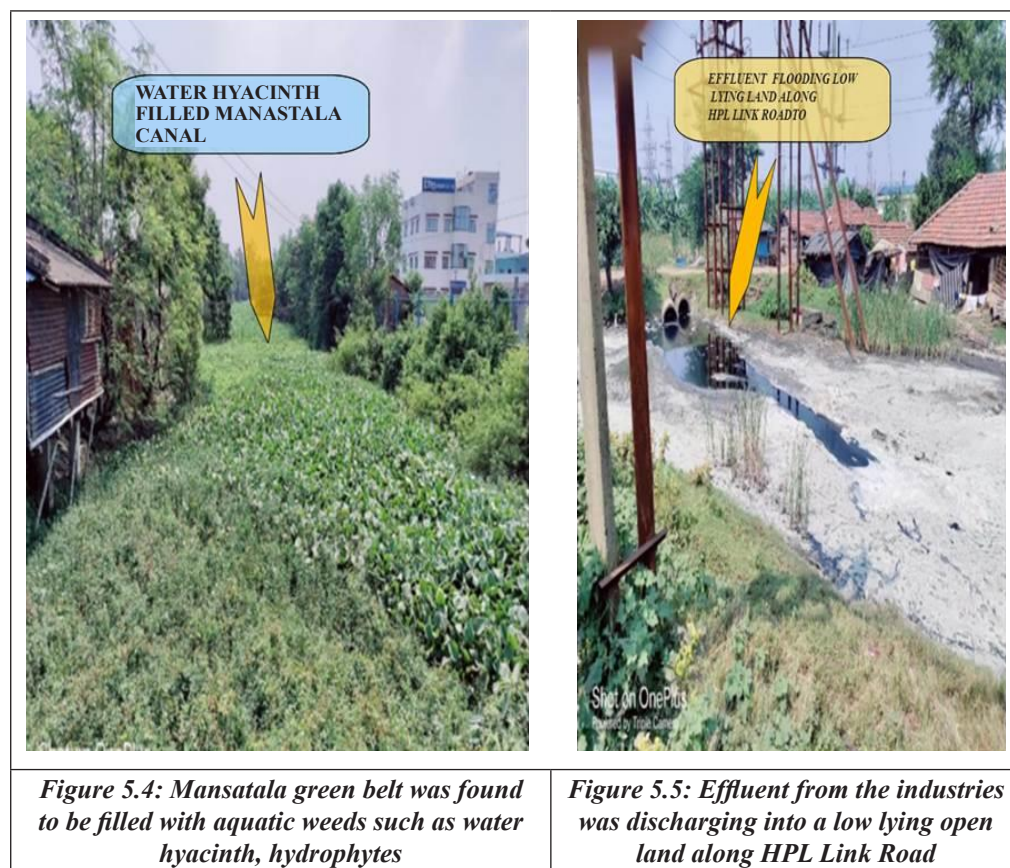
According to the Action Plan for *Haldia* CPA, prepared by WBPCB, a total amount of ₹ 720.98 crore was estimated for execution of various environmental improvement activities to be carried out by large industries in Haldia by Haldia Development Authority (HDA) and *Haldia* Municipality by December 2023. The Action Plan *inter alia* included storm water management, which was to be undertaken by HDA, *Haldia* Municipality and the Irrigation and Waterways Department. Based on audit analysis (upto September 2023) of the implementation of the Action Plan, the following points, as shown in **Table 5.4** were observed.

Table 5.4: Present status of action plan of *Haldia* CPA

Action point	Responsible Agencies	Details of Action points	Audit observation
Storm Water Management	HDA, <i>Haldia</i> Municipality and Irrigation and Waterways Department	1. Construction of drains along with road from <i>Adani Wilmar Ltd.</i> to <i>Azad Hind Nagar</i> areas.	Constructed but yet to be linked with the main drain along with HPL link road to <i>Mansatala</i> Canal. As a result, untreated effluent, was getting discharged into low-lying open land.
		2. Construction of 4 km long drain along with HPL link road to <i>Mansatala</i> Canal.	The scheme could not be executed till date. Estimate amounting to ₹15.10 crore for the work ¹¹² was prepared by the HDA and sent (December 2019) to the Member Secretary, WBPCB for approval of the project, but the same was not approved as of October 2023 by WBPCB.
		3. De-silting of <i>Mansatala</i> green belt, <i>Horekhali</i> , <i>Bhagyabantapur</i> , <i>Chunamara</i> and <i>Atafala</i> Canals and repairing of lock-gates and sluice gates of the respective canals.	Letters had been issued by WBPCB (2019 and 2020) to Irrigation and Waterways Department (I&WD) for de-silting of the Canals, but the same was not executed. I&WD carried out a preliminary survey in March 2022 for de-silting of the canals with a total approximate cost of ₹ 9.80 crore but work had not started as of March 2024.

During the joint field inspection of *Mansatala* Canal and HPL Link Road with the officials of the WBPCB in December 2023, Audit observed that the work related to the storm water management as envisaged in the Action Plan was yet to be implemented as shown in **Figure 5.4**. Further, untreated effluent, filled with white scum and foul odour, was getting discharged into a low-lying open land along the HPL road as shown in the **Figure 5.5**.

¹¹² 'Construction of RCC surface drain from Adani Wilmar Industrial Unit to Manasatala Canal along HPL Link Road'.



5.2.5.2 Implementation of Action Plans in Howrah CPA

CPCB considered two major industrial clusters of Howrah viz. *Jalan* Industrial Complex and *Bamungachi* Industrial Cluster as CPA. As per records, a total of 486 red category industries were operating from these two industrial clusters. *Barjora Khal*, a drainage channel of about 10.35 km maintained by Irrigation and Waterways Department (I&WD) of Government of West Bengal, drains industrial effluent from *Jalan* Industrial complex, *Sankrail* Industrial Complex, Food Park and Poly Park. Keeping in view the environmental load bearing capacity of the sensitive area, WBPCB had delineated (2015), *inter alia*, the following actionable measures in **Table 5.5**.

Table 5.5: Action points for Howrah CPA

Sl. No.	Action points	Responsible stake holders
1	Installation of Central Effluent Treatment Plant (CETP) at Jalan Industrial Complex.	Industry Association, Industry, WBPCB and MoEF on cost sharing basis.
2	Development of proper drainage facility in Jalan Industrial Complex.	Industry Association, Industry.
3	Embankment and desilting of effluent carrying canal at Jalan Industrial Complex.	Industry Association, Industry.
4	Development of proper drainage facility <i>Bamungachi</i> area.	<i>Howrah</i> Municipal Corporation and <i>Bally</i> Municipality.

Audit observed that the work of de-siltation of *Barjora Khal* was not taken up (as of March 2024) though a DPR for this work at an estimated cost of ₹ 7.07 crore was prepared by I&WD (September 2023).

Joint physical inspection of selected industries, in July 2023, revealed that CETP was not installed at the *Jalan Industrial Complex*, and the industrial effluent was drained through *Barjora Khal (Sarenga Khal)*. Regular water quality analysis for the *Barjora Khal* was not being done by WBPCB and thus, compliance with environmental standards could not be ensured as discussed in Paragraph no. 3.4.1.3(i).

In reply, the Department stated (March 2024) that majority of the action points involving various stakeholders, had been successfully implemented by WBPCB and overall environmental quality of these areas has improved.

However, the Department did not provide any supportive documents regarding improvement of environmental quality and implementation of the Action Plan.

5.2.6 Water Pollution of Kana Damodar River

The NGT's Principal Bench, *New Delhi*, in OA 735/2022, while hearing a petition over pollution of water in *Rajapur Canal*, *Janai* basin canal which ultimately pollutes **Kana Damodar River** (a tributary of River *Hooghly*), ordered (January 2023) the constitution of a Joint Committee comprising State PCB, District Magistrate, *Howrah* and CPCB who shall inspect the site and submit its report along with observation and recommendations for remedial action, within two months. The committee submitted its report to NGT in August 2023. The observations of the Committee *inter-alia* included the following:

- The water samples collected from different places during the inspection did not comply with the bathing standards prescribed by the CPCB.
- At the point of collection of water samples from *Janai* basin canal, the water quality was observed to be exceptionally poor with no DO, a high BOD (92.5 mg/l) and very high level of TC (2.3 lakh MPN/100 ml) level.

Consequently, four dyeing/colouring units¹¹³ were identified by WBPCB in the *Kalachara* area of *Hooghly* districts as being responsible for polluting the canals. Three out of four industries were inspected (November 2023) jointly by Audit with officials of WBPCB and it was observed that these industries were not complying with environmental norms. **Despite these violations, WBPCB did not take adequate steps to control untreated discharge into water bodies even though the industries were continuously violating environment norms during 2018-23. Joint site inspection of the canal showed coloured discharge from the industries into *Janai* Canal (Figure 5.6).**

¹¹³ (i) M/s Paul fabrics, (ii) M/s Kohinoor Sarees Pvt Ltd., (iii) M/s Uday Industries Ltd., (iv) M/s Sarat Industries.

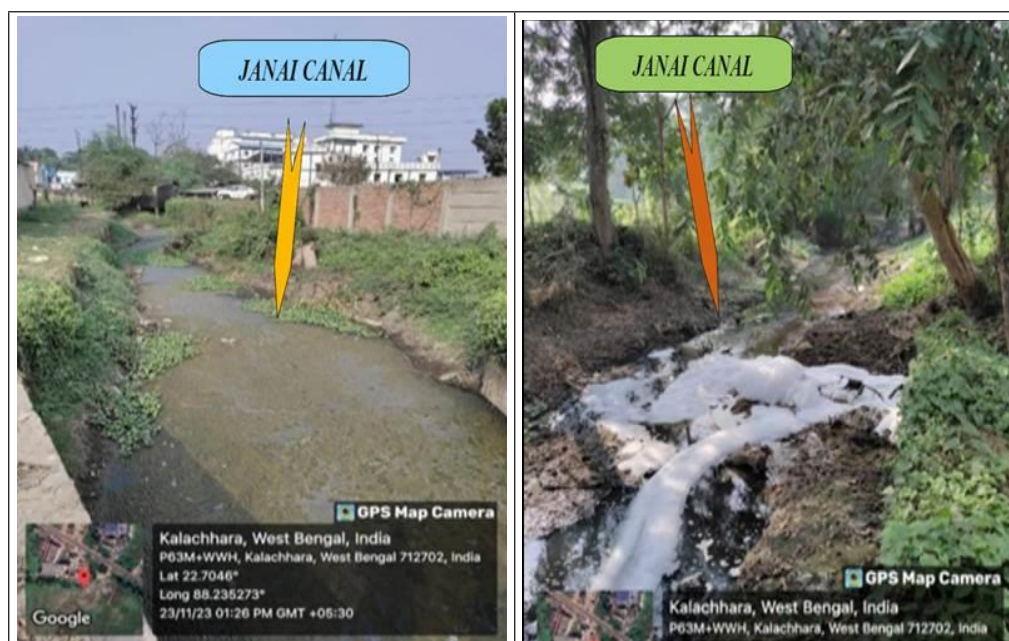


Figure 5.6: Janai canal in front of the above industries

Table 5.6: The lapses of the units and action taken by WBPCB during 2018-23 and post NGT order in May 2023

Sl No.	Industry	Inspection and Test samples	Action taken by WBPCB	Audit observation (Joint Physical verifications)
1	M/s Paul fabrics	WBPCB inspected the unit six ¹¹⁴ times during 2018-23 against the stipulated eight times. Four water quality test reports were made available, and it was observed that on all the four occasions ¹¹⁵ the effluent was non-compliant with the discharge standards.	Show Cause Notice was issued in November 2018. A Closure order was issued (May 2023) in consequence to the NGT case for non-compliance.	- ETP was not working properly and was in poor condition. - Stagnant effluent was found outside the boundary. - Effluent was being discharged into drains bypassing the sand filter. - The suspension of closure order was affected (August 2023) without ensuring compliance status of the unit.

¹¹⁴ 07.03.2019, 03.06.2019, 14.06.2022, 28.07.2022, 13.04.2023 and 23.06.2023.

¹¹⁵ 28.9.2018 (TSS-3040.00 mg/l, COD-1619.00 mg/l, BOD-300.00 mg/l), 03.06.2019 (BOD-214.83 mg/l, COD-635.67 mg/l, O&G-1.90 mg/l, Phenols-1.16 mg/l, TSS-112.00 mg/l), 14.07.2022 (BOD-106.90 mg/l, SAR-334.68, TDS-9,706.00 mg/l & TSS-472.00 mg/l) and 28.07.2022 (BOD-66.70 mg/l, SAR-491.71, TDS-9,816.00 mg/l).

Sl No.	Industry	Inspection and Test samples	Action taken by WBPCB	Audit observation (Joint Physical verifications)
2	M/s Kohinoor Sarees	WBPCB inspected the unit six ¹¹⁶ times during 2018-23, against the stipulated eight times. Three ¹¹⁷ test results of the effluent were made available, all of which were non-compliant.	Show cause notice was issued on 24 May 2022 by WBPCB. A Closure order was issued on 18 May 2023 to the unit which was suspended (04 August 2023) after levying a penalty of ₹ 50,000 and enforcing a bank guarantee of ₹ 2.00 lakh.	• The ETP was not running at the time of inspection. • The drain in front of the main gate of the unit was found to contain coloured liquid waste. • The suspension of closure order was done without ensuring compliance with discharge norms.
3	M/s Sarat Industries	WBPCB conducted four inspections ¹¹⁸ during 2018-23 against the stipulated eight times. The unit was non-compliant in three ¹¹⁹ test cases.	Closure order for Sarat industries was issued on 07 February 2020 by WBPCB due to non-compliance which was suspended in March 2020 by WBPCB.	• It was observed that no inspections were done during 2020-22 till January 2023. • A show-cause notice was issued on 31 March 2023, for non-compliance to environmental norms and unit was asked to upgrade the ETP.

CHAPTER - VI

Ground Water Quality Management

Chapter VI

Ground Water Quality Management

6.1 Introduction

According to the State Environment Plan (SEP) 2021, despite availability of adequate groundwater resources, the State is burdened with issues such as (i) Water Scarcity in hard rock areas (ii) Intensive ground water extraction in alluvial areas (iii) Quality issues such as infestation of arsenic, fluoride and salinity *etc.*

According to the data¹²⁰ of Central Ground Water Board (CGWB) of 2022, total annual ground water recharge of the State was assessed as 23.61 Billion Cubic Meter (BCM), and the annual extractable ground water resources at 21.42 BCM. The annual ground water extraction was 10.07 BCM *i.e.* 47.01 *per cent* of extractable ground water.

This chapter deals with the steps taken by the State Government in addressing quantitative and qualitative issues related to ground water resources and its impact on human health and environment.

6.2 Status of ground water abstraction

The SEP, 2021 stipulated that there was a need to review and strengthen the existing system of ground water extraction in the State. The West Bengal Groundwater Resources (Management, Control and Regulation) Act, 2005 covers extraction and sustainable use of groundwater. As per the Act, all groundwater extraction must be strictly regulated and limited to the shallow aquifer level, so that it can be easily recharged through rainwater.

The Report¹²¹ of the CGWB covering 345 blocks/Assessment Units (AU) showed that during 2020 to 2022, the number of blocks categorized as critical¹²² from the point of view of the rate of ground water extraction had increased from One block to 22 blocks. The blocks with high saline water had also increased from zero to 60. Ground water extraction had also increased from 44.60 to 47.01 *per cent* of annual ground water recharge (23.61 BCM) during this period as depicted in **Charts 6.1** and **6.2**.

¹²⁰ Dynamic Ground Water Resources of India 2022.

¹²¹ The dynamic ground water resource assessment (in 2022).

¹²² The rate of ground water extraction exceeds annual rate of recharge.

Chart 6.1: Categorisation of assessment units/blocks in terms of quality and stage of extraction

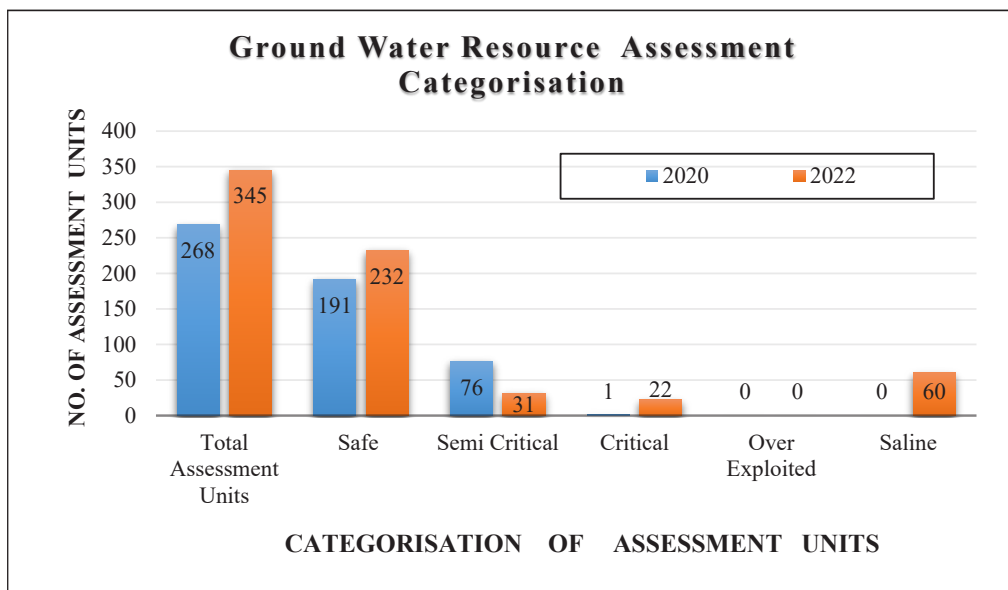
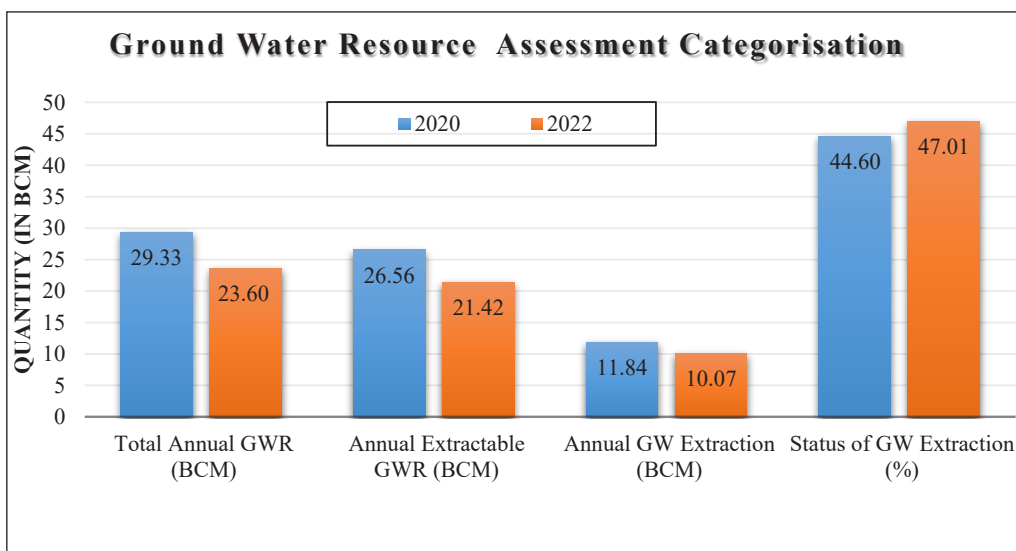


Chart 6.2: Status of Ground Water Extraction



The steady decline in water level and gradual transformation of safe and semi critical blocks into critical blocks during 2020-22 indicated that there was a sharp decline in ground water level. Audit further observed the following:

- The CTO issued by WBPCB requires an industrial unit to regularly submit a ‘**Returns of Water Consumption**’ to WBPCB. However, WBPCB did not ensure compliance of this condition before renewal of CTOs to all 65 selected industrial units during the Audit period.
- Under the West Bengal Ground Water Resources (Management, Control and Regulation) Rules 2006, the State Water Investigation Directorate is responsible for issuing permits for ground water extraction. Out of 51 sampled SPIs, 32 industries did not have a valid NOC from State Water Investigation Directorate (SWID) for extraction of ground water. Further, as flow meters were not installed at ground water intake points for recording ground water extraction, the actual extraction of ground

water by industries could not be assessed by Audit in all the test checked 51 SPIs.

- Analysis of groundwater monitoring data of CGWB for the period (2000-20) from the existing 1500 hydrograph stations in the State also showed significant fall in water level/piezometric level to the order of > 20 cm/year in eleven¹²³ districts. These districts represented areas where intensive groundwater withdrawal had taken place to meet the growing demand for water due to rapid urbanisation, agricultural and industrial activities.

Joint inspection of industries revealed that industrial use of ground water was not effectively monitored by WBPCB and SWID as NOC for extraction of ground water, installation of flow meter *etc.*, were not ensured. ***Thus, despite the alarming situation regarding depletion of ground water levels in the State, control mechanism for ensuring regulated ground water extraction and its use was not effectively invoked by strictly adhering to the provisions of the West Bengal Ground Water Resources (Management, Control and Regulation) Rules 2006.***

Recommendation 11:

Authorisation for groundwater abstraction should be strictly regulated and monitored through consent administration of WBPCB.

6.3 Qualitative aspects of ground water

Water quality refers to physical, chemical, biological and radiological characteristics of water. Protection of groundwater against geogenic and anthropogenic reasons are of foremost importance for groundwater dependent ecology and safeguarding human health. Out of 1.74 crore households in the State (as of December 2023), only 0.72 crore (*i.e.* 41 *per cent*) were provided with tap connection for supply of safe drinking water. Measures taken to address the issues related to qualitative aspects of groundwater are discussed below:

6.3.1 Arsenic contamination

Arsenic is a significant contaminant in terms of its toxic nature with exceedingly diverse manifestations of poisoning. As per Bureau of Indian Standard (BIS) 2012 (IS 10500: 2012), the acceptable limit of Arsenic is 0.01 mg/l. The State had identified 83 blocks in 8 districts¹²⁴ with about 109.26 lakh population as arsenic affected.

6.3.1.1 Status of Arsenic contamination in the sampled districts

In respect of two sampled districts *viz.* Nadia and North 24 Parganas, Audit observed that 38 out of a total 39 blocks (97.5 *per cent*) were arsenic affected. The ground water quality test reports of these two districts for the period 2018-23 revealed that 34 *per cent* of the total samples¹²⁵ including samples from Piped Water Supply Schemes (PWSS) were non-compliant in terms of the acceptable limit for arsenic. Further in respect of PWSS samples, the extent of arsenic contamination was around 51 *per cent* as detailed in the **Table 6.1**.

¹²³ Birbhum, Murshidabad, Purba Bardhaman, Nadia, Howrah, Hooghly, North and South 24 Parganas, Purba and Paschim Medinipur and Kolkata Metropolitan district.

¹²⁴ Purba Bardhaman, Nadia, Murshidabad, Malda, North 24 Parganas, South 24 Parganas, Hooghly and Howrah.

¹²⁵ Hand pumps, dug wells, community tanks, PWSS *etc.*

Table 6.1: Statement of non-compliance of samples from drinking water sources

District	Extent of arsenic contamination (for all source)			Extent of Arsenic contamination in PWSS		
	Total samples	Compliant samples	Non-compliant samples	Total samples	Compliant samples	Non-compliant samples
North 24 Parganas	1,09,511	69,277 (63 per cent)	40,234 (37 per cent)	3,545	2,210 (62 per cent)	1,335 (38 per cent)
Nadia	76,095	52,900 (70 per cent)	23,195 (30 per cent)	1,813	434 (24 per cent)	1,379 (76 per cent)
Total	1,85,606	1,22,177 (66 per cent)	63,429 (34 per cent)	5,358	2,644 (49 per cent)	2,714 (51 per cent)

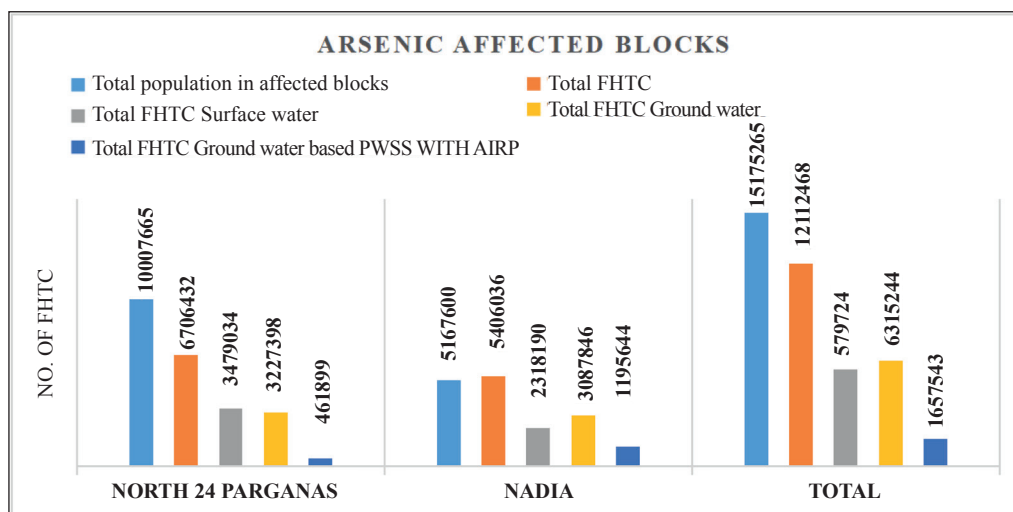
It is significant to note that the percentage of non compliant samples was higher in piped water supply schemes.

6.3.1.2 Remedial measures for Arsenic contamination

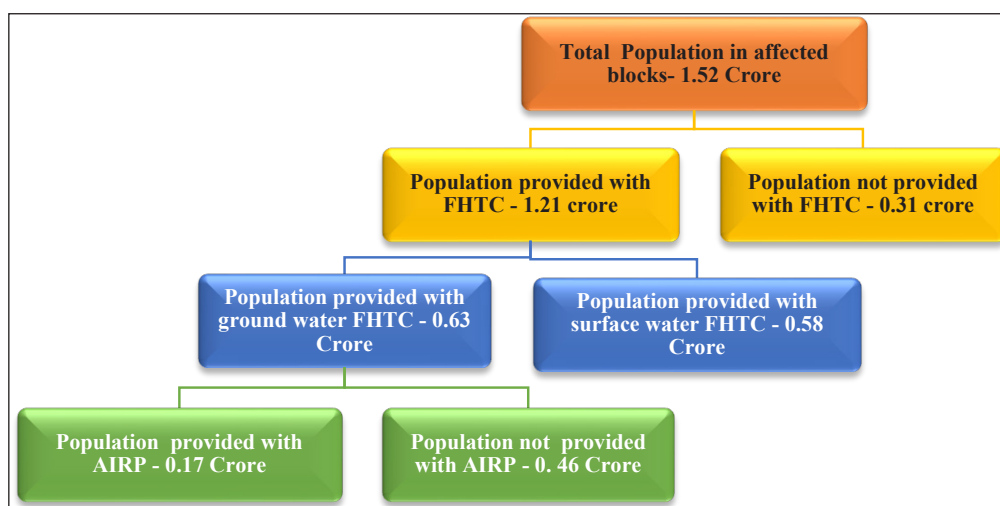
Under *Jal Jeevan Mission (JJM)* erstwhile “*National Rural Drinking Water Programme (NRDWP)*”, of Government of India, a goal was set to provide 100 per cent tap connection to all rural households by March 2024, in a mission mode, including arsenic affected villages.

Status of Functional Household Tap Connection (FHTC) under the Piped Water Supply Schemes (PWSS) of PHED of Government of West Bengal in arsenic affected blocks of the sampled districts as of March 2023 is detailed in **Chart 6.3**.

Chart 6.3: Arsenic affected blocks.



The above chart showed that a population of 1.21 crore (80 per cent) had so far been provided with FHTCs under PWSS based on ground water and surface water sources. Out of this, only 57.97 lakh (48 per cent) were provided with surface water FHTCs and the remaining 63.15 lakh with ground water FHTCs.



From the above chart it may be observed that out of a population of 63.15 lakhs covered under ground water based FHTC, 46 lakh i.e. 73 per cent were not provided with Arsenic Iron Removal Plants (AIRP) under PWSS, although the areas were arsenic affected.

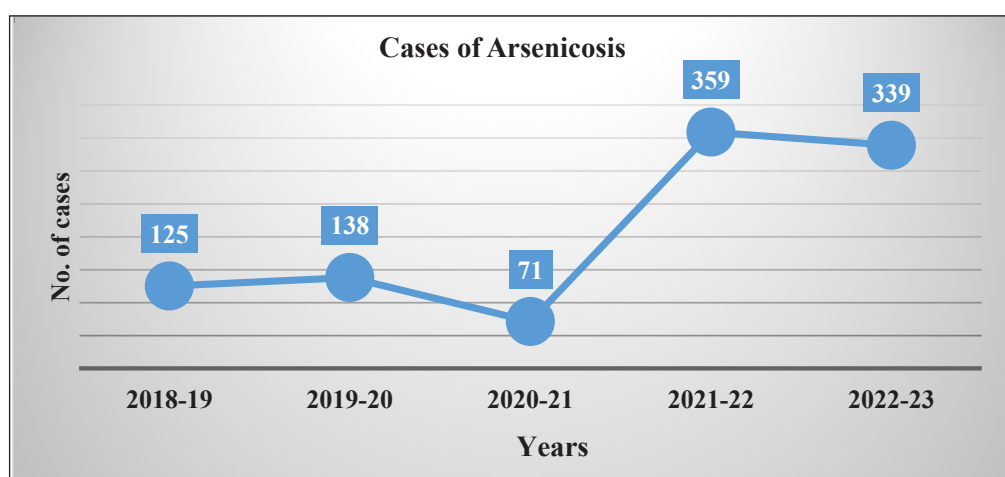
In reply, the Department stated (March 2024) that under Jal Jeevan Mission action was being taken to cover all affected areas with safe water supply by December 2024.

However, the target of providing safe drinking water in the areas was not achieved till date due to the poor quality of water supplied.

6.3.1.3 Health impact

According to the data furnished by the West Bengal Health and Family Welfare (WBH&FW) Department, the total number of people affected due to Arsenic was 1,032 during the period 2018 to 2022 as detailed in **Chart 6.4**.

Chart 6.4: Cases of Arsenicosis



The number of Arsenicosis cases (medical condition like skin lesions/ cardiovascular diseases/cancer *etc.*) detected in eight arsenic affected districts during 2018-19 was 125 and rose to 359 in 2021-22 and marginally decreased to 339 in 2022-23.

6.3.2 Fluoride contamination

While fluoride is important for bone and teeth development, intake of high fluoride content for long durations can result in dental, skeletal and non-skeletal fluorosis. The desirable limit for fluoride in drinking water in India is 1.0 mg/l, although the acceptable limit set by WHO guidelines is 1.5 mg/l.

6.3.2.1 Status of contamination

In West Bengal, 225 villages in 43 blocks of seven districts, are identified as endemic for fluorosis and people in this region are at risk of fluoride contamination. A total population of 6.15 lakh was estimated to be affected by fluoride contamination in these areas.

Out of 43 blocks affected by fluorosis¹²⁶, two sampled districts *i.e.* *South 24 Parganas* and *Birbhum* had eight blocks with fluoride concentration above 1.5 mg/l.

Four blocks of *Birbhum* district *viz.* *Khayrasole*, *Nalhati-I*, *Rampurhat-I*, and *Suri-II* were worst affected where fluoride concentration ranged between 2.28 to 7.8 mg/l. Of the 16,351 samples tested by PHED, during 2018-23, 340 samples had presence of fluoride beyond the permissible limit.

6.3.2.2 Status of mitigation measures in Birbhum District

According to the mandate of JJM, the PHED was committed to provide water of specified quality and quantity to every rural household through piped water supply by March 2024. However, as of December 2023 under the PWSS, only 1.48 lakh, out of 4.61 lakh fluoride affected households of *Birbhum* district were provided with FHTC *i.e.* only 32 *per cent* of households are getting treated piped water.

Further, according to the recommendations (September 2022) of the Fluoride Task Force (FTF)¹²⁷, pending completion of providing treated piped water to 68 *per cent* of the households, the Department would take interim measures for fluoride mitigation for the households.

Audit observed that as an interim measure, 26 Community Water Purification Plants (CWPP)¹²⁸ were installed in 10 blocks between January and December 2022, at a total cost of ₹ 5.17 crore by PHED. Out of these 26 CWPP, only seven were installed in three¹²⁹ out of the four worst affected blocks where 60 *per cent* of cases were observed. Audit further observed that one of the worst affected blocks (*Suri-II*) had not been provided with CWPP.

Thus, due to improper planning in installation of CWPP, the worst fluoride affected places remained vulnerable.

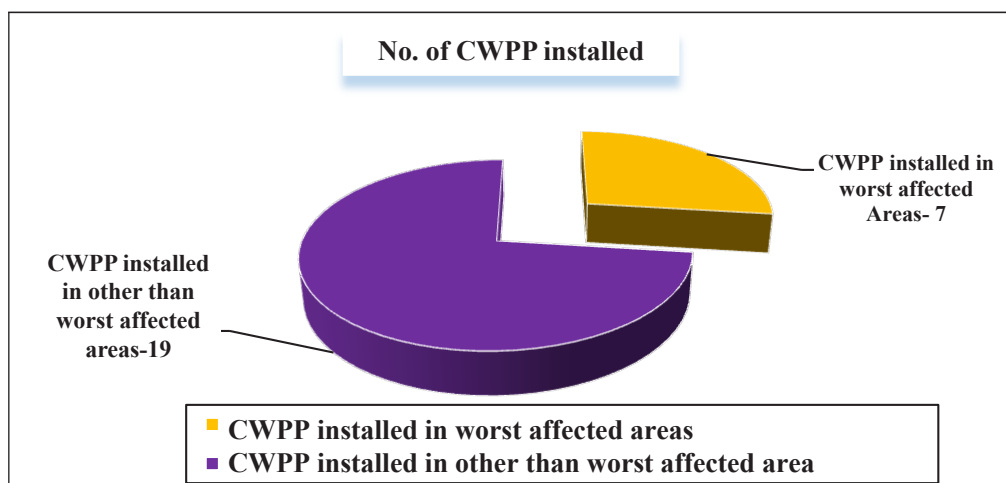
¹²⁶ Discolouration of teeth/increase in bone mass/limitation of joint movement.

¹²⁷ Fluoride Task Force was constituted by Govt of W.B. to guide PHED to mitigate the contamination of fluoride.

¹²⁸ A facility to treat, store and distribute treated water to a small community.

¹²⁹ Khayrasole, Nalhati-I, Rampurhat-I.

Chart 6.5: Community Water Purification Plant installed in fluoride affected blocks.

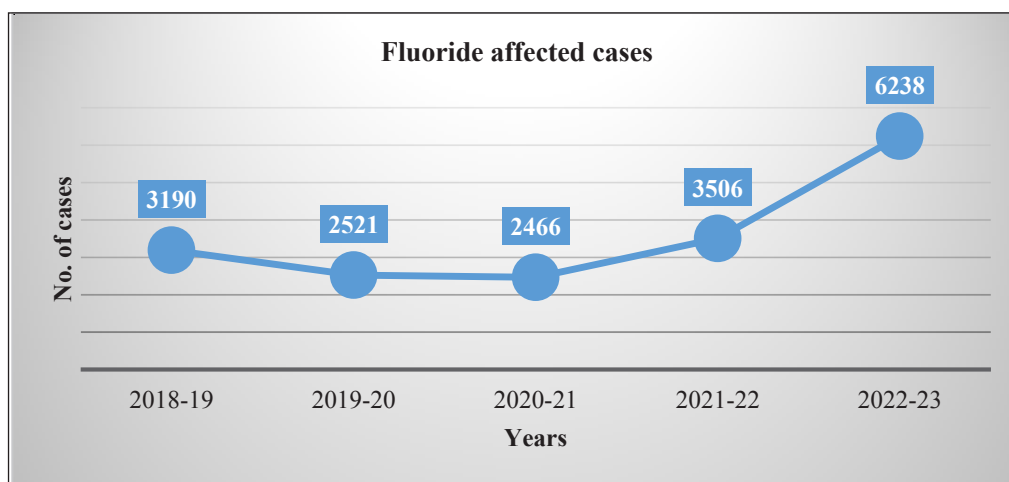


In reply, the Department stated (March 2024) that all areas affected by poor water quality would be covered with PWSS to provide safe drinking water by December 2024 under JJM.

6.3.2.3 Health Impact

As per data provided by Health and Family Welfare Department, GoWB, 17,921 fluoride affected cases were observed in the State during 2018-23 as shown in **Chart 6.6**.

Chart 6.6: Fluoride affected cases



(Source: Records of Health and Family Welfare Department, GoWB)

Despite interim mitigation measures taken by the State, the number of fluoride affected cases continued to rise, during 2018-23 and thus, remained an area of concern.

Recommendation 12:

PHED should implement schemes in a time bound manner to reduce cases of arsenic and fluoride contamination and provide safe and clean drinking water to the entire affected population.

6.3.3 Bacteriological Pollution

Bacteriological contamination of ground water may cause various water-borne diseases such as diarrhoea, typhoid, fever, dysentery, cholera, hepatitis *etc.* State Environment Plan 2021, alluded to instances of leakages in pipes used for water supply and faecal contamination from sewer drains. Audit observed that records were not maintained by PHED to register complaints received regarding such contamination. Further, audit also observed that:

- As per Department of Health and Family Welfare, GoWB, the number of bacteriological contaminated habitations in the State had increased from 3,928 in 2017-18 to 4,812 in 2020-21.
- The bacteriological test reports of the PWSS water in four sampled districts showed the presence of Total Coliform (660 cases out of total 6,096 samples tested) and E. coli (206 cases out of total 6,009 samples tested).
- As per State Environment Plan 2021 of WBPCB, 15 blocks of Purulia district were found to be contaminated. The percentage of samples found to be contaminated varied between 10 *per cent* and 58 *per cent*, indicating the pervasiveness of the problem in Purulia.

In reply, the Department stated (March 2024) that different remedial steps such as increase in testing, chlorination in PWSS, dissemination of water quality reports *etc.*, were being taken. It also added that real time monitoring of chlorine dosing and phasing out of dug wells was under process.

However, the remedial actions taken *viz.* repairing leakages in water supply pipes, disinfection with chlorination *etc.*, were sub-optimal, and 1,85,330 cases of bacteriological contamination were recorded during 2018-23. Against it, only in respect of 30,308 cases (16 *per cent*) were remedial measures, such as disinfection followed by awareness generation, taken, as seen from the records of PHED (March 2023).

6.3.3.1 Health impact of Bacteriological contamination of ground water

According to the data furnished by the West Bengal Health and Family Welfare Department for the period 2018 to 2022, 92.81 lakh people were affected by Diarrhoea, Enteric Fever, Vibrio cholera, of which 137 were reported to have died during the period.

Thus, the measures taken by PHED for dealing with bacteriological contamination of ground water were not able to adequately address prevention of water borne/ water related diseases in the State.

6.3.4 Absence of Solid Waste Treatment leading to ground water contamination

Improper handling of solid waste poses potential problem to human health. Population living close to waste dumps and those, whose water supply has become contaminated either due to waste dumping or leaching from landfill sites are more likely to be impacted. Uncollected solid waste also obstructs storm water runoff, resulting in the forming of stagnant water bodies that become breeding ground of diseases such as diarrhoea, cholera, malaria *etc.*

Solid Waste Management Rules 2016, of GoI came into force in April 2016. A time frame of two years was given as per the Rules for collection of segregated waste and setting up of solid waste processing facilities. However, it was noted that adequate infrastructure for implementation of these Rules had not been created till December 2023.

Further, audit observed the following.

- Out of 128 ULBs in the State, 79 did not have solid waste processing facilities, and the waste got disposed at dumping grounds. As per Annual Report of WBPCB for the year 2022-23 only 23 *per cent* of waste generated was processed as of March 2023.
- The unprocessed fresh waste was gradually getting converted into legacy waste and adding to dumpsites. As of August 2023, there were 123 dumpsites in the State having a legacy waste of 111.44 lakh MT, of which only 49.68 lakh MT of legacy waste was processed leaving a balance of 61.76 lakh MT.
- Out of the 123 dumpsites, only two¹³⁰ had leachate treatment facilities¹³¹ and two¹³² had geo-membrane to arrest leaching. In the absence of these treatment facilities, the possibility of water contamination from dumpsites could not be ruled out.



Figure 6.1: Leachate coming out of Dhapa dumping yard of KMC

¹³⁰ Kolkata (Dhapa) and Baidyabati (RWMC).

¹³¹ Leachate treatment facilities are designed to treat the liquid that percolates through waste materials in landfills, reducing its environmental impact by removing pollutants like organic matter, ammonia and suspended solids.

¹³² Rajpur-Sonarpur, Bhatpara

- Further, as per RRC, town-wise Solid Waste status (June 2023), 39 towns along with the seven selected PRS had generated 7,881 TPD solid waste out of which only 1,526.1 TPD was processed. Due to lack of adequate fresh waste processing facility, Audit observed that 6,354.9 TPD of solid waste was disposed of unscientifically in 39 towns.

Thus, inadequate management of solid waste could lead to problems that impair human and animal health, and ultimately result in economic, environmental and biological losses.

Recommendation 13:

UD&MA Department should take measures for effective implementation of SWM Rules, 2016 and set up adequate waste processing facilities to prevent water contamination due to leaching.

CHAPTER - VII

Monitoring of Water Quality

Chapter VII

Monitoring of Water Quality

7.1 Introduction

Monitoring of water bodies helps in identifying existing and emerging water quality problems, and in gathering information to design remedial programmes for implementing effective pollution control measures, and to ascertain extent of compliance with environmental norms.

The responsibility of monitoring water quality of surface water, including sewage and effluents, and groundwater in the State rests with following entities as shown in **Chart 7.1** below:

Chart 7.1: Responsibility of monitoring water quality in the State.

Polluted River Stretches (PRSS)	•River Rejuvenation Committee (RRC) headed by Member Secretary, WBPCB is responsible for overall monitoring of PRSS in the State.
Surface Water (Water Bodies/Lakes/Ponds/Canals/Drains)	•WBPCB: Monitors all surface water through different monitoring stations under National Water Monitoring Programme (NWMP).
Industrial effluents/ETPs/CETPs	•WBPCB: Monitors all industrial effluents through periodical inspections.
Drinking Water	•PHED: Testing of water quality and supply of drinking water in rural areas. •UD&MA: Testing and supply of drinking water in urban areas.
Ground Water	•State Water Investigation Department (SWID): Monitoring and assessment of ground water levels. •WBPCB: Monitoring of ground water quality through different monitoring stations. •PHED: Monitoring of ground water before supplying it to the beneficiaries.
Sewage Treatment Plant	•WBPCB: Monitoring of all liquid waste including STPs

Note: RRC has been constituted for the preparation of Action Plans for effective abatement of pollution, rejuvenation, protection and management of each of the identified PRS.

This chapter deals with the adequacy of the water quality monitoring system in the State with respect to surface and ground water, and achievements made with regard to SDGs therein.

7.2 Water Quality Monitoring

Under the National Water Monitoring Programme (NWMP-1978), WBPCB monitors surface and ground water quality through 140¹³³ monitoring stations of West Bengal. This monitoring is done as per the Guidelines on Water Quality Monitoring, 2017, issued by CPCB. In this context, Audit observed the following:

7.2.1 Classification of Water Quality Monitoring Stations

Guidelines on Water Quality Monitoring, 2017, delineated four different types of stations for surface water monitoring viz. (i) Baseline, (ii) Flux/Impact, (iii) Hot Spot and (iv) Trend stations.

For Ground Water, all monitoring stations were to be classified as Baseline stations and could be re-classified as Trend or Hot spot stations, wherever there is a perceived problem.

The frequency of sampling of surface and ground water and the parameters of analysis were prescribed, based on the type of monitoring stations as detailed in *Appendix-2*.

Audit observed that the monitoring stations for surface water were not differentiated by WBPCB as prescribed in the Guidelines. In absence of classification of monitoring stations, the adequacy of the tests conducted could not be ascertained by Audit. This also impacted the main objectives of water quality monitoring programmes which *inter alia* included rational planning of pollution control strategies, identification of the nature and magnitude of pollutants and evaluation of the effectiveness of pollution control efforts already in existence.

Further it was also noticed that while the Ganga River water was monitored twice a month as per the above-mentioned Guidelines, the other rivers and lakes were monitored only once in a month, though these rivers were more polluted than the Ganga.

In reply, the Department stated (March 2024) that it would select hotspots on different rivers of West Bengal.

The Guidelines on Water Quality Monitoring, were issued by CPCB in 2017, however classification of monitoring stations was not done till March 2024, impacting efficacy of the monitoring process.

7.2.2 Adequacy of Water Quality Monitoring Stations

According to CPCB’s guidelines for National Water Monitoring Programme (NWMP), 2019, monitoring stations at both upstream and downstream of a river need to be established by the State PCBs. CPCB also proposed (February 2019) that State PCBs augment the monitoring networks.

¹³³ 72 stations are Surface water monitoring stations (55 River stations, 14 Ponds/Lakes stations, two Canal stations and one marine water) and 68 are Ground water monitoring stations.

Out of the 17 PRS, Audit observed that there was only one monitoring station each against the stipulated two (upstream and downstream) for nine PRS¹³⁴.

Further, the CPCB guidelines delineated that every district needs to have at least two groundwater locations for testing and monitoring.

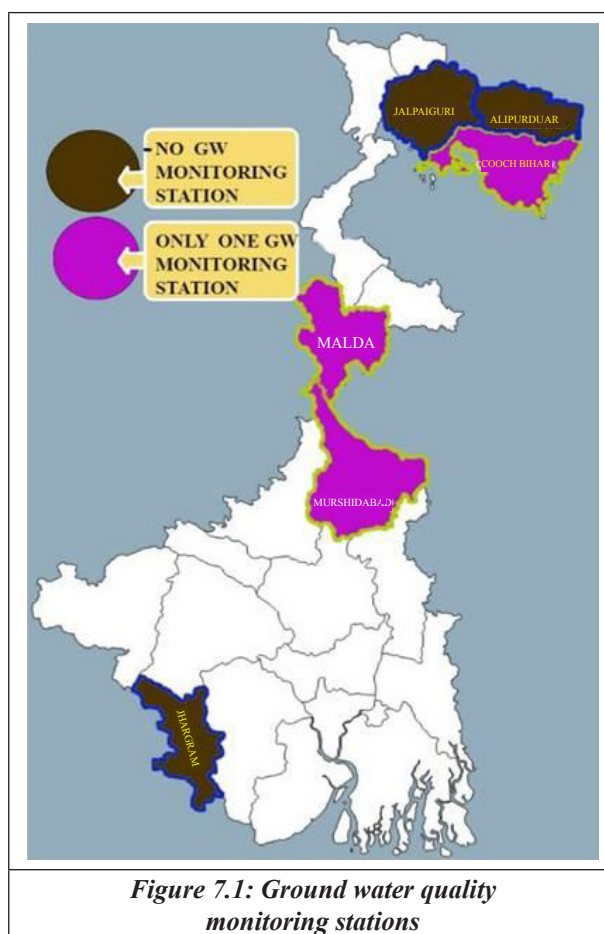


Figure 7.1: Ground water quality monitoring stations

However, Audit observed that the districts of *Jalpaiguri*, *Alipurduar*, *Jhargram*, had not identified ground water testing locations while the districts of *Malda*, *Murshidabad*, *Coochbehar* had only one location each instead of the required two.

Thus, the monitoring of ground water quality was not satisfactory as the data generated was not adequately representative, being based on a limited number of testing locations.

Further, WBPCB had not taken any initiatives to augment the existing monitoring stations. Therefore, the water quality assessment would not reflect the actual extent of pollution due to geogenic and anthropogenic activities.

In reply, the Department stated (March 2024) that it would consider establishment of more monitoring stations.

The CPCB's guidelines for augmentation of monitoring network had come into existence in 2019, however they had not been effectively implemented till March 2024 by the State.

7.2.3 Monitoring of ground water at dumping sites

According to Schedule-I of Solid Waste Management Rules, 2016 of GoI, the ground water quality within 50 meters of the periphery of a landfill site shall be periodically monitored by State PCB covering different seasons in a year to ensure that the ground water is not contaminated.

However, out of 123 landfill/dumpsites in the State, WBPCB had only one ground water monitoring station at one dumpsite (at *Dhapa*, Kolkata)

¹³⁴ Jalangi, Barakar, Dwarkeshwar, Mayurakshi, Mathabhanaga, Kaljani, Karola, Silabati and Kanshi.

In the absence of adequate number of ground water quality monitoring stations around the periphery of dumpsites, the extent of ground water contamination due to leaching could not be assessed by Audit.

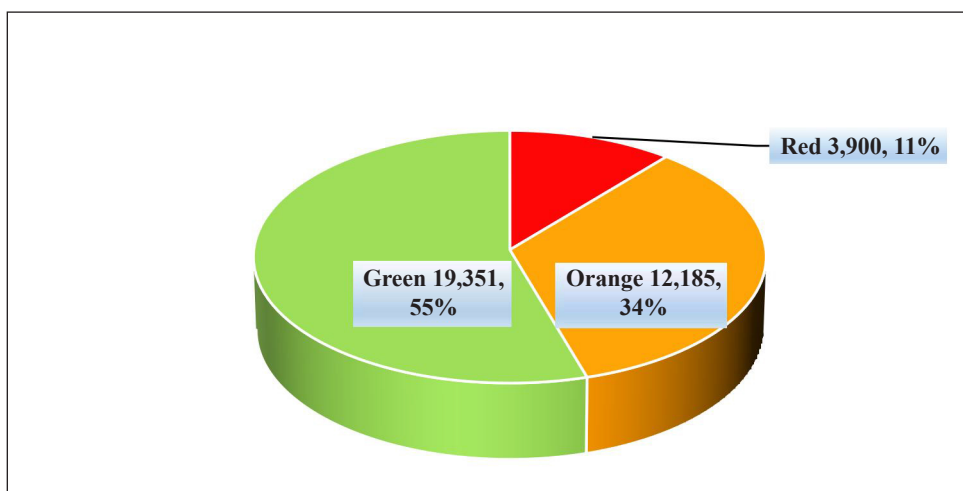
Recommendation 14:

WBPCB should establish a representative number of stations/locations for water quality monitoring, particularly in the identified hot spots.

7.3 Inspection of Industries

In compliance with the orders of NGT dated 28 August 2019, CPCB carried out a Performance Review of the WBPCB and observed (2019-20) that there were 3,900 red category industries, 12,185 orange and 19,351 green category industries as depicted in **Chart 7.2**.

Chart 7.2: Category of industries registered with WBPCB



Audit observed that WBPCB did not inspect these industries at scheduled intervals due to inadequate number of regional offices, lack of environmental laboratories as well as technical manpower during 2018-23, as discussed below:

7.3.1 Monitoring through Regional offices

WBPCB operated through 11 Regional Offices (RO) covering 23 districts of West Bengal. Audit observed that RO *Malda and Siliguri* of WBPCB, controlled four districts each while *Durgapur* and *Haldia* ROs controlled three districts each. Thus, each of the RO had to cover vast areas which impaired adequate monitoring.

WBPCB, in its 170th Board meeting highlighted (September 2019) the need for expansion of RO network and proposed the setting up of new regional offices in different districts. However, work of setting up of proposed ROs, to strengthen the monitoring infrastructure, was not taken up till date (December 2023).

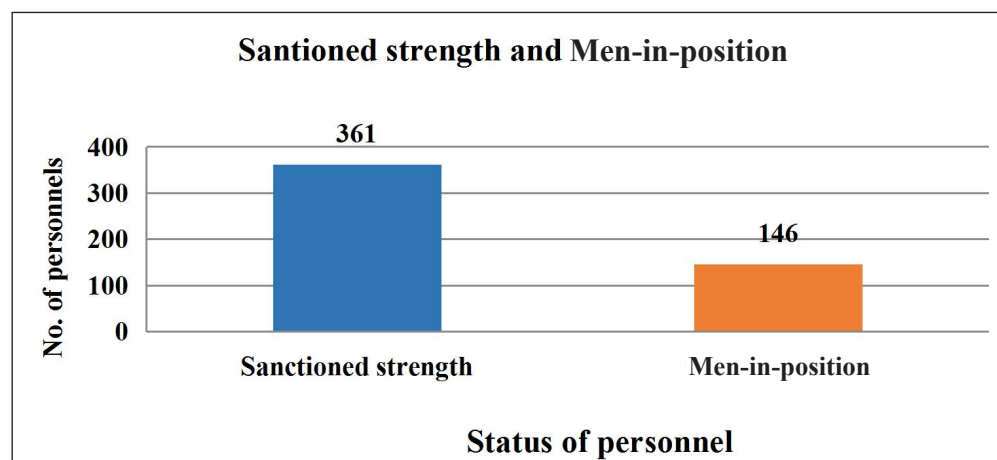
7.3.2 Availability of technical manpower

CPCB in its Report¹³⁵ recommended (September 2020) strengthening of manpower to ensure effective performance of WBPCB.

¹³⁵ Performance Audit of SPCBs placed before NGT in OA-95 of 2018.

The sanctioned strength and men-in position (MIP) of WBPCB for the period 2018-23, are detailed in **Chart 7.3**:

Chart 7.3: Details of sanctioned strength and MIP in respect of WBPCB



(Source: Annual Reports and website of WBPCB)

Thus, there were 60 *per cent* vacancies in manpower during 2018-23. The shortage of manpower had consequential effect on the discharge of mandatory functions especially monitoring, as discussed below:

Data related to inspections of industries revealed that during 2018-23, there was a significant shortfall in the number of WBPCB inspections as detailed in **Paragraph 5.2.1 (Chart 5.5) and Table 5.3**.

Thus, shortage of staff had an adverse effect on WBPCB's mandatory functions of conducting industrial inspections at prescribed intervals, and testing of industrial effluent/emission to ensure compliance with environmental norms.

In reply, the Department stated (March 2024) that considering the increase in responsibilities in many new emerging areas, the State Board recently reviewed the manpower requirement and accordingly sent a proposal to the State Government for effectively carrying out its mandated activities.

7.3.3 Environmental Laboratories

WBPCB had a Central Laboratory at its Head Office in Kolkata and five¹³⁶ Regional Laboratories which catered to the 23 districts of the State.

Ministry of Environment Forest & Climate Change (MoEF&CC) directed (August 2011) that all SPCB Laboratories and/Central Laboratories must acquire accreditation¹³⁷ under the Environment (Protection) Act (EPA), 1986, along with Occupational Health and Safety Management System-18001 (OHSMS) Certification before getting recognised under the Environment (Protection) Act, 1986. Further, all the existing recognised laboratories needed to acquire accreditations within a period of one year from the date of issue of the above MoEF&CC direction.

¹³⁶ Barrackpore, Hooghly, Durgapur, Haldia and Siliguri.

¹³⁷ ISO-17025 (NABL Accreditation) or ISO-9001.

Audit observed that only the Central Laboratory at Kolkata received all the three required certifications while the Regional Laboratories were yet to obtain these accreditations, as detailed in **Table 7.1**.

Table 7.1: Status of accreditation of WBPCB’s laboratory as of March 2024

Requirement	NABL Accreditation	OHSMS accreditation	EPA
Central Lab	☑	☑	☑
Hooghly Lab	☒	☒	☒
Barrackpore Lab	☒	☑	☒
Haldia Lab	☒	☒	☒
Siliguri Lab	☒	☒	☒
Durgapur Lab	☒	☒	☒

(Source: Records of WBPCB)

In reply, the Department stated (March 2024) that WBPCB was in the process of obtaining the required accreditation for all its Laboratories.

In the absence of accreditations, audit could not derive an assurance on the quality of testing by these Laboratories.

7.3.3.1 Strengthening of laboratories under Namami Gange Programme

National Mission for Clean Ganga (NMCG) granted (June 2018) administrative approval and expenditure sanction of ₹ 12.93 crore for the project on “*Strengthening of laboratories under Namami Gange Programme*”.

Under the above project, the existing laboratories at *Kolkata, Barrackpore* and *Malda/ Berhampur* were proposed to be strengthened by the West Bengal State Level Program Management Group (WBSPMG) and completed within nine months from the date of sanction of the project. All laboratories to be strengthened under this project were to perform as Ganga monitoring Centres and would further strengthen the work of NMCG. A fund of ₹ 12.93 crore was placed with WBSPMG by NMCG. The executing agency for the project was the WBPCB. Audit observed that as of March 2023, an expenditure of only ₹ 4.70 crore had been incurred by WBPCB. The reasons for non-completion of the project, even after a lapse of more than four years were not made available to Audit.

Further, all the sanctioned posts for the project were not filled even after six years of the project being sanctioned. The details of sanctioned strength *vis-a-vis* person in position of the Laboratories under the project is shown in **Table 7.2**.

Table 7.2: Men in Position *vis a vis* Sanctioned Strength at Kolkata, Barrackpore and Malda/ Berhampur Laboratories

Sl No.	Designation	Sanctioned Strength (SS)	Person in Position (PIP) as on March 2023	Vacancies
1.	Junior/Senior Research Fellow	12	08	04
2.	Jr. Lab Asstt.	09	09	00

Sl No.	Designation	Sanctioned Strength (SS)	Person in Position (PIP) as on March 2023	Vacancies
3.	Attendant	09	05	04
5.	Field Attendant	06	04	02
6.	MTS	03	02	01
Total		39	28	11

(Source: Records of WBPCB)

Thus, WBPCB failed to achieve the NMCG objective of putting in place a strengthened water quality monitoring mechanism for the river Ganga as envisaged.

Recommendations:

15. Government should implement the proposal of the State Board on engagement of manpower and strengthen the water quality monitoring mechanism for effectively carrying out its mandate.

16. WBPCB should develop and upgrade its laboratories and obtain NABL Accreditation, OH&SMS certification and EPA recognition by MoEF&CC to enhance assurance level.

7.4 Monitoring of STPs

CPCB issued directions, under section 18(1) (b) of the Water (Prevention and Control of Pollution) Act, 1974 to WBPCB in March 2017 to take up monitoring of STPs discharging into the river Ganga on a monthly basis and forward the reports to CPCB.

Audit observed that WBPCB, however, monitors STPs discharging into Ganga once in three months as per its internal orders dated 14 January 2020. The status of WBPCB's monitoring of STPs on the Ganga during the period 2018-23 is as detailed in **Table 7.3**.

Table 7.3: Monitoring of STPs by WBPCB

Year	No. of commissioned STPs in the State	Frequency of Monitoring required (Quarterly)	Frequency of monitoring actually done (Quarterly)	Percentage of monitoring
2018-19	33	396	12	3
2019-20	40	480	46	10
2020-21	41	164	41	25
2021-22	41	164	66	40
2022-23	41	164	76	46

(Source: Inspections and water quality Monitoring reports of WBPCB)

From the above table, it can be seen that during 2018-23, the monitoring frequency of STPs by WBPCB ranged between 03 *per cent* and 46 *per cent* only. Further, from the test reports of WBPCB it was noticed through test check of records that STPs were non-compliant with discharge standards for FC and BOD ranging between 83 *per cent* to 100 *per cent* and 52 *per cent* to 71 *per cent* respectively. Audit, however, observed that the WBPCB did not act against the non-compliant STPs as discussed in Chapter III.

7.4.1 Non-operational STPs

CPCB issued directions (June 2019), under Section 18(1)(b) of the Water (Prevention and Control of Pollution) Act, 1974, to WBPCB regarding non-operational STPs in West Bengal and stated that:

- (a) WBPCB shall impose environmental compensation on the operators for not operating STPs.
- (b) WBPCB shall direct the concerned authorities to prepare and submit time bound action plans for up-gradation and rehabilitation of non-operational STPs.

According to CPCB’s status report for West Bengal STPs as of March 2023, there were 11 non-operational STPs out of a total of 41 on the river Ganga.

Audit observed that due to the non-operation of STPs, the management of municipal sewage, as conceived in related action plans, could not be effectively undertaken, and the river Ganga continued to receive untreated sewage.

7.5 Online Continuous Effluent Monitoring System (OCEMS)

Central Pollution Control Board in February 2014 issued instructions to State Pollution Control Boards and Pollution Control Committees to direct industries, Common Effluent Treatment Plants (CETPs) and STPs *etc.*, to install Online Continuous Emission Monitoring System (OCEMS), developed by CPCB, to help track the discharges of pollutants units.

Audit observed that only 16 industrial units had OCEMS out of 65 sampled industries.

CPCB, further, instructed (June 2019) WBPCB to direct all concerned local bodies/authorities operating STPs to install OCEMS at the outlet of STPs to monitor performance against established parameters and provide connectivity to CPCB and WBPCB servers for continuous monitoring within three months.

Audit observed that out of the sampled 34 STPs being operated by local bodies/authorities, none had installed the OCEMS till December 2023.

Thus, the real time tracking of discharge of pollutants could not be effectively implemented even after more than four years of CPCB’s instruction.

Recommendation 17:

WBPCB should monitor all the STPs regularly and take action to ensure that the STPs were working and were complying with the discharge standards. It should also ensure installation of OCEMS for STPs/ETPs and use the data for effective surveillance and monitoring.

7.6 Utilisation of funds under Water Quality Monitoring & Surveillance

Para 10.2 of the Operational Guidelines (December 2019) of National Jal Jeevan Mission (JJM), Government of India, stipulated that up to two *per cent* of the allocation under JJM to States could be utilized for carrying out Water Quality Monitoring and Surveillance (WQM&S) activities. The Guidelines also provided that the fund could be utilized for activities like setting up of laboratories,

upgrading of existing laboratories which *inter alia* included procurement of equipment, instruments, chemicals/ reagents, glassware, consumables, etc.

Audit observed that PHE Department, Government of West Bengal, during the period 2019-20 to 2022-23, could utilise only 26 *per cent* of the fund earmarked for WQM&S activities, and an aggregate fund of ₹ 389.85 crore remained unutilised, as shown in the **Table 7.4**.

Table.7.4: Allotment and utilisation of funds for WQM&S under JJM

(₹ in Crore)

Year	Total allotted fund under JJM (Centre & State)	Earmarked WQM&S fund (2 <i>per cent</i> of the total allotted fund)	Total expenditure incurred in WQM&S activities (Centre & State)	Un-utilised fund under WQM&S activities
2019-20	1,658.88	33.18	11.25	21.93
2020-21	2,690.30	53.80	37.00	16.80
2021-22	11,664.95	233.30	29.20	204.10
2022-23	10,300.42	206.00	58.98	147.02
Total	26,314.55	526.28	136.43	389.85

In reply, the Department stated (March 2024) that Water Quality Monitoring activities, within the fund ceiling of two *per cent* of the allotted fund under Jal Jeevan Mission, were carried out as per approved Annual Action Plan (AAP) for WQMS, and there was no scope to take up WQMS activity beyond the approved AAP. However only 26 *per cent* of earmarked fund for Water Quality Monitoring could be utilised.

7.7 Monitoring of Drains

Due to rapid urbanisation, industrialisation and increase in anthropogenic activities in the past few decades, most of the canals have been converted to drains and are treated as mode of disposal of pollutants. Most of these drains are man-made and carry municipal, industrial and mixed waste in addition to natural storm water. To address this surface water pollution issue, it is a must to have accurate information available about the sources of pollution.

CPCB carried out the monitoring of 104 drains discharging into the River Ganga in West Bengal on a half yearly basis (Pre and Post Monsoon). In comparison, WBPCB monitors only 56 drains along the river Ganga on a quarterly basis. It was further seen that WBPCB and UD&MA in the matter of NGT case (OA No. 600/2018) mentioned (February 2022) that 402 drains had been identified as discharging into the Ganga in the State.

Thus, WBPCB should have prepared an Action Plan to monitor all the identified drains instead of monitoring a limited number of discharge points.

Further, analysis of water quality test reports of WBPCB from January to March 2023 of these 56 drains being monitored by WBPCB showed that:

- 18 drains had Faecal Coliform in the range of 78,000 and 7,90,00,000 (MPN/100ml) and rest of the 37 drains were not monitored for FC (*Appendix-3*).

- 50 drains had BOD between 10.11 mg/l and 366.67 mg/l, and 45 drains had COD between 50.35 mg/l and 995.32 mg/l which was much higher than the permissible limit¹³⁸ (*Appendix-4*).

7.8 Sustainable Development Goals

The 2030 Agenda for Sustainable Development set at the Sustainable Development Summit held at United Nations Headquarters in September 2015, contained 17 Goals and 169 targets. The action for achievement of Sustainable Development Goals (SDGs) started on 01 January 2016 and these were expected to be achieved by 31 December 2030.

Of the 17 SDG goals, Goal 6- ‘Ensure availability and sustainable management of water and sanitation for all’ is relevant for the extant audit.

According to the SDG index-2020 of NITI Aayog, as regards the performance of West Bengal against SDG 6 (Clean water and sanitation), it was observed that the score of the State declined to 81 from 83 in 2019¹³⁹. The achievement of West Bengal against target specified under SDG 6-Clean Water and Sanitation is detailed in **Table 7.5**.



Figure 7.2: SDG 6

Table 7.5: Achievement of following targets under SDG 6

Targets	Indicator	Audit observations
6.1	6.1.1	Only 48.12 per cent of households in the State of West Bengal were provided with tap connected drinking water against the national average of 76.59 per cent as per data of Jal Jeevan Mission.
To achieve universal and equitable access to safe and affordable drinking water for all by 2030.	Proportion of population using safely managed drinking water services.	
6.3	6.3.1	The gap in sewage treatment of about 84 per cent indicated that the State’s wastewater management, planning, and monitoring had not been effectively converged with the vision set in SDG 6. (<i>Chart 4.1 under para no. 4.2</i>)
To improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally, by 2030.	Tracks the proportion of wastewater flows from households, services and industrial economic activities that are safely treated before it is discharged into the environment.	<i>Issues on treatment of industrial effluent were pointed out in paras 5.2.2, 5.2.3, 5.2.4 and 5.2.6.</i>
	6.3.2	As discussed in Chapter IV and Chapter V of this Report, the sewage/effluent flowing into water bodies had pollution loads in excess of prescribed limits.
	Track proportion of bodies of water with good ambient water quality.	

¹³⁸ Permissible limit for STP as per order of NGT dt 30.04.2019, pH-(5.5-9.0), BOD-10 mg/l, COD-50 mg/l, FC-100(MPN/100 ml).

¹³⁹ No report of NITI Aayog since 2020 was available on records to assess the subsequent performance of the State against this SDG for the period covered under Audit.

Targets	Indicator	Audit observations
		Further as pointed out in Chapter VI there was contamination of the ground water due to leaching and of the surface water due to unscientific waste dumping and faecal disposal. Chapter VII highlights inadequate infrastructure and manpower to carry out monitoring as per prescribed schedule, which in turn impaired assessment of water quality and achievement of targeted goal of reducing water pollution.
6.4	6.4.1	The extent of re-use of treated wastewater (municipal and industrial) and abstraction of groundwater without authorization were pointed out in Para 3.3.4 and 3.3.5 of Chapter III of this Report.
To substantially increase water use efficiency across all sectors and ensure sustainable withdrawals and supply of fresh water to address water scarcity and substantially reduce the number of people suffering from water scarcity.	6.4.2	
	Level of Water Stress: fresh water withdrawals as a proportion of available fresh water resources.	The control and monitoring mechanism for ensuring regulated ground water extraction and its use was not effectively invoked, as detailed in para 6.2 of Chapter VI.

KOLKATA

The 05 MAY 2025



(MANISH KUMAR)

Principal Accountant General
(Audit-II) West Bengal

Countersigned



NEW DELHI

The 07 MAY 2025

(K. SANJAY MURTHY)

Comptroller and Auditor General of India

Appendices

APPENDIX

Appendix 1 (Paragraph: 5.2.1, Chart-5.5) No. of inspections in 28 SPIs

Sl. No.	Name of Industries	Category	Name of Regional Office	Industry Operational status	Inspection date	No. of inspections
1	Allied Blenders and Distillers Pvt. Ltd.	SPI/Food & Beverage	Hooghly	Operational	08.11.2021	1
2	Chittaranjan Locomotive Works	SPI/Heavy Engineering	Asansol	Operational	10.07.2023	1
3	Sunrise Industry	SPI/Dyeing & Bleaching unit	Salt Lake	Operational	02.08.2018, 18.06.2019	2
4	Process Galvaniser	SPI/Galvanising	Howrah	Operational	24.07.2019, 14.07.2022	2
5	Carlsberg India Pvt. Ltd.	SPI/Distillery including Fermentation Industry	Hooghly	Operational	31.01.2018, 14.01.2020	2
6	M/S Bhusan Power & Steel Ltd.	SPI	Hooghly	Operational	06.12.2019, 10.12.2021	2
7	Indian Oil Corporation	SPI/Oil & Grease	Alipore	Operational	20.08.2019, 23.11.2020	2
8	Sterile Extrusion Pvt Ltd.	SPI/Industry or process involving metal surface treatment or process.	Asansol	Operational	11.03.2019, 17.12.2020	2
9	M/s. Sreema Dyeing & Bleaching Works	SPI/ Bleaching Unit	Salt Lake	Operational	25.06.2019, 07.09.2021, 12.12.2022	3
10	Kalachand electroplating Works	SPI/Galvanising	Salt Lake	Operational	28.05.2019, 03.11.2020, 04.12.2020	3
11	Vishnu Chemical Works	SPI/Basic Chemicals	Salt Lake	Operational	20.07.2018, 25.07.2019, 27.01.2022	3
12	Chiranjilal Rayons Pvt. Ltd.	SPI/Yarn, textile dyeing and bleaching.	Howrah	Operational	28.08.2019, 14.08.2020, 27.10.2021	3
13	Monoranjana Jalui	SPI/Galvanising	Howrah	Operational	08.09.2018, 28.09.2020, 05.05.2022	3
14	Himadri Chemicals & Industries Ltd.	SPI/Coke making, Liquefaction.	Hooghly	Operational	17.09.2019, 23.06.2021, 10.05.2022	3
15	International Bleaching & dyeing Works	SPI/Dyeing, Bleaching	Salt Lake	Operational	26.11.2018, 21.01.2021, 15.07.2021, 11.01.2022	4

Sl. No.	Name of Industries	Category	Name of Regional Office	Industry Operational status	Inspection date	No. of inspections
16	Dhara Brothers	SPI/Galvanising	Howrah	Operational	22.03.2018, 19.02.2019, 20.01.2020, 16.01.2023	4
17	M/s Onkar Parivahan Finance Pvt. Ltd.	SPI , Dyeing Activity with Digital Printing & Embroidery	Howrah	Operational	16.01.2019, 27.01.2020, 28.07.2021, 24.11.2022	4
18	DIC India Ltd.	SPI/printing ink manufacturing	Kolkata	Operational	05.08.2019, 17.08.2021, 24.02.2022, 24.08.2022, 24.02.2023	5
19	Marathon Electric Motor India Ltd.	SPI/Galvanising	Kolkata	Operational	09.10.2020, 08.04.2021, 26.11.2021, 24.05.2022	4
20	Indian Government Mint	SPI/Galvanising	Kolkata	Operational	28.11.2018, 20.08.2019, 23.11.2020, 30.11.2022	4
21	East India Paper & Board Mills	SPI	Howrah	Operational	26.02.2018, 08.02.2019, 25.02.2021, 05.08.2021, 07.02.2023	5
22	Nirmal Wires Private Ltd.	SPI	Howrah	Operational	26.06.2018, 25.07.2018, 26.07.2019, 19.07.2022, 25.01.2022	5
23	Fabiricon(DAD)	SPI/Galvanising	Alipore	Operational	10.01.2019, 17.01.2020, 11.01.2021, 08.03.2022, 23.08.2022	5
24	Meghna Farm Products	SPI/Milk Processing	Alipore	Operational	03.07.2018, 12.04.2021, 18.11.2021, 11.11.2022, 12.07.2023	5
25	Philips Carbon Black Ltd.	SPI/Industrial Carbon	Durgapur	Operational	10.04.2019, 04.09.2020, 05.04.2021, 06.04.2022	4

Sl. No.	Name of Industries	Category	Name of Regional Office	Industry Operational status	Inspection date	No. of inspections
26	Rupa & Co. Ltd.	SPI/Yarn, textile dyeing and bleaching.	Howrah	Operational	15.05.2018, 14.08.2020, 29.12.2020, 01.10.2021, 06.05.2022, 01.03.2023	6
27	M/S Bijoy Processing Industries	SPI/Dyeing, Bleaching	Salt Lake	Operational	09.01.2018, 29.09.2018, 17.01.2019, 14.01.2020, 21.01.2021, 15.07.2021, 18.01.2022, 07.07.2022, 14.01.2023	9
28	NTPC - SAIL Power Company Ltd.	SPI/Thermal Power	Durgapur	Operational	28.02.2019, 10.12.2019, 14.02.2020, 25.11.2020, 05.05.2021, 05.08.2021, 23.11.2021, 01.02.2022, 21.11.2022	9

Appendix-2

(Paragraph: 7.2.1)

Types of Stations *vis-à-vis* frequency of Water Quality Monitoring

Source of Water	Type of Station	Definition of Station	Frequency
Surface	Baseline	Location where there is no influence of human activity on Water quality.	Perennial rivers and lakes/reservoirs: Six times a year. Seasonal rivers: Six times during flow period.
	Trend, Flux/ Impact and Hot Spots	Trend: a particular point on a watercourse to exhibit variance due to both geogenic and anthropogenic activities. Flux/Impact: location on main river stem for measuring mass of particular pollutant. Hot Spots: location where concentration of a particular parameter or a group of parameters, except bacteriological parameters, exceeds permissible limit of drinking water quality as prescribed in BIS code IS 10500-2012.	Trend: Once every month. Flux: Twice every month. Hot Spots: Twice every month.
Ground Water	Baseline	All stations are classified as base station	Twice in a year

Appendix-3

(Paragraph: 7.7)

Drains having Faecal Coliform beyond limit (100 MPN/100 ml)

SI No	Name of Drain/Channel	Date of Collection	Date of Reporting	Faecal Coliform (MPN/100ml)
1.	SHIBPUR BURNING GHAT	27.12.2022	04.01.2023	7,90,00,000
2.	TELKAL GHAT	27.12.2022	04.01.2023	2,40,00,000
3.	130, FORESHORE ROAD	27.12.2022	04.01.2023	2,40,00,000
4.	DHANKHETI KHAL, GARDEN REACH	15.12.2022	04.01.2023	1,30,00,000
5.	CIRCULAR CANAL (CHITPUR GHAT DRAIN)	18.10.2022	04.01.2023	84,00,000
6.	JAGANNATH DRAIN	27.12.2022	04.01.2023	49,00,000
7.	COSSIPORE DRAIN	18.10.2022	04.01.2023	46,00,000
8.	DEWANGAZI DRAIN	27.12.2022	04.01.2023	33,00,000
9.	NAZERGUNJ KHAL	16.11.2022	04.01.2023	23,00,000
10.	KUTHIGHAT DRAIN	18.10.2022	04.01.2023	17,00,000
11.	NIMTALA BURNING GHAT	18.10.2022	04.01.2023	17,00,000
12.	TOLLY NULLAH (ADI GANGA)	14.11.2022	04.01.2023	13,00,000
13.	SINGHI MORE KHAL	17.11.2022	04.01.2023	13,00,000
14.	N.C. PAL KHAL, SANKRAIL	16.11.2022	04.01.2023	7,80,000
15.	MUNIKHALI KHAL	16.11.2022	04.01.2023	7,80,000
16.	DRAIN @ AKHRA FOOD GHAR	16.11.2022	04.01.2023	2,30,000
17.	BAZARPARA, GARIGHAT DRAIN	17.11.2022	04.01.2023	1,30,000
18.	SARASWATI KHAL	17.11.2022	04.01.2023	78,000

Appendix-4

(Paragraph: 7.7)

Drains having BOD & COD beyond limit (BOD < 10 mg/l; COD <50 mg/l)

Sl No.	Name of Drain/Channel	Date of Collection	Date of Reporting	COD	BOD
1	Shibpur Burning Ghat	27.12.2022	04.01.2023	995.32	366.67
2	Kamarhati Jute Mill Drain	13.02.2023	13.03.2023	947.69	313.33
3	Bhatpara Drain	01.02.2023	06.03.2023	675.42	282.50
4	Barrackpur Khal (S.P.Bungalow)	24.01.2023	20.02.2023	727.93	200.00
5	Alliance Mill Drain	01.02.2023	06.03.2023	468.31	186.67
6	Telkal Ghat	27.12.2022	04.01.2023	609.66	175.00
7	Dhankheti Khal, Garden Reach	15.12.2022	04.01.2023	356.91	160.00
8	Jangipur Drain	02.02.2023	06.03.2023	321.72	151.25
9	Bagh Khal	06.02.2023	06.03.2023	501.13	145.00
10	Jagannath Drain	27.12.2022	04.01.2023	365.82	145.00
11	130, Foreshore Road	27.12.2022	04.01.2023	357.73	140.00
12	Titagarh Drain	07.02.2023	06.03.2023	354.16	128.57
13	Khardah Khal	13.02.2023	13.03.2023	203.01	117.50
14	Champdani Ferry Ghat Drain	20.02.2023	13.03.2023	231.38	110.00
15	Bhatpara Open Pucca Drain	01.02.2023	06.03.2023	239.39	105.00
16	Ramkrishna Mallick Ghat	27.12.2022	04.01.2023	257.15	92.50
17	Thanarkhal	01.02.2023	06.03.2023	196.19	86.25
18	Debitala Panchakhal	16.02.2023	13.03.2023	217.51	82.40
19	Garifa Drain (South)	17.01.2023	15.02.2023	164.99	77.00
20	Drain Near Pb Ghat at Kamarhati	07.02.2023	13.03.2023	193.69	75.00
21	Kuthighat Drain	18.10.2022	04.01.2023	148.00	73.75
22	Balurghat Monirampur Pucca Drain	24.01.2023	20.02.2023	141.63	71.00
23	Pratapnagar Rajbari Drain	16.02.2023	13.03.2023	164.54	69.17
24	Garifa Drain (North)	17.01.2023	15.02.2023	142.99	68.75
25	Imambara Khal	14.02.2023	13.03.2023	199.72	66.67
26	N.C. Pal Khal, Sankrail	16.11.2022	04.01.2023	220.00	53.12
27	Dewangazi Drain	27.12.2022	04.01.2023	139.52	52.50
28	Cossipore Drain	18.10.2022	04.01.2023	102.00	50.00
29	Monirampur Barrackpur Drain	24.01.2023	20.02.2023	120.82	47.50
30	Halisahar Drain	09.01.2023	09.02.2023	143.07	46.67
31	Nimtala Burning Ghat	18.10.2022	04.01.2023	175.00	44.69
32	Rosbora Khal	14.02.2023	13.03.2023	88.65	43.00
33	Chinsurah Majir Rasta Drain	14.02.2023	13.03.2023	87.05	36.67
34	Barrackpur Drain(Adjacent to Ramkrishna Mission)	24.01.2023	20.02.2023	70.81	35.00
35	Majher Char Khal	09.01.2023	09.02.2023	82.54	33.33

SI No.	Name of Drain/Channel	Date of Collection	Date of Reporting	COD	BOD
36	Chandni Ghat Drain	14.02.2023	13.03.2023	47.19	27.50
37	Dhopa Ghat Drain	14.02.2023	13.03.2023	65.71	27.50
38	Nazergunj Khal	16.11.2022	04.01.2023	76.00	25.00
39	Circular Canal (Chitpur Ghat Drain)	18.10.2022	04.01.2023	40.00	23.13
40	Tolly Nullah (Adi Ganga)	14.11.2022	04.01.2023	71.00	20.63
41	Drain at Akhra Food Ghar	16.11.2022	04.01.2023	58.00	20.00
42	Singhi More Khal	17.11.2022	04.01.2023	104.12	19.17
43	Halisahar Municipality Drain	09.01.2023	09.02.2023	52.09	15.63
44	New Bager Khal	09.01.2023	09.02.2023	50.35	15.00
45	Saraswati Khal	17.11.2022	04.01.2023	64.49	13.25
46	Baidyabati Drain	20.02.2023	13.03.2023	54.59	13.00
47	Bagher Khal (Fodder Khal)	09.01.2023	09.02.2023	37.18	12.60
48	Bazarpara, Garighat Drain	17.11.2022	04.01.2023	52.84	10.83
49	Dhobi Ghat Drain	24.01.2023	20.02.2023	24.00	10.25
50	Munikhali Khal	16.11.2022	04.01.2023	31.00	10.11

Glossary of Abbreviations

GLOSSARY OF ABBREVIATIONS

Abbreviation	Full form
AAP	Annual Action Plan
ADDA	Asansol Durgapur Development Authority
AIRP	Arsenic Iron Removal Plants
AU	Assessment Unit
BCM	Billion Cubic Meter
BIS	Bureau of Indian Standard
BOD	Biological Oxygen Demand
CAAT	Computer Assisted Audit Techniques
CEPI	Comprehensive Environmental Pollution Index
CETPs	Common Effluent Treatment Plants
CGWB	Central Ground Water Board
CLC	Calcutta Leather Complex
COD	Chemical Oxygen Demand
CPA	Critically Polluted Area
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
CTE	Consent To Establish
CTO	Consent to Operate
CWPP	Community Water Purification Plant
DO	Dissolved Oxygen
DPR	Detailed Project Report
DVC	Damodar Valley Corporation
EC	Environment Compensation
EKW	East Kolkata Wetland
EKWMA	East Kolkata Wetlands Management Authority
EPA	Environment (Protection) Act, 1986
ETP	Effluent Treatment Plant
FC	Faecal Coliform
FHTC	Functional Household Tap Connection
FSSM	Faecal Sludge and Septage Management
FSTP	Faecal Sludge and Septage Treatment Plant
FTF	Fluoride Task Force
GAP	Ganga Action Plan
GBC	Green Belt Canal
GIS	Geographic Information System
GoI	Government of India
GoWB	Government of West Bengal
GPIs	Grossly Polluting Industries

Abbreviation	Full form
GTA	Gorkhaland Territorial Administration
HDA	Haldia Development Authority
HMC	Howrah Municipal Corporation
HWA	Hazardous Waste Authorization
IESWM	Institute of Environmental Studies and Wetland Management
IEST	Indian Institute Engineering, Science and Technology
I&D	Interception and Diversion
ISRO	Indian Space Research Organization
I&WD	Irrigation and Waterways Department
JJM	Jal Jeevan Mission
JU	Jadavpur University
KLD	Kilo Liter Per Day
KMC	Kolkata Municipal Corporation
KMDA	Kolkata Metropolitan Development Authority
LLP	Limited Liability Partnership
LS	Lifting Station
MED	Municipal Engineering Directorate
MIP	Men In Position
MIS	Management Information System
MLD	Million Litre Per Day
MoEF&CC	Ministry of Environment Forests and Climate Change
MoWR	Ministry of Water Resources
MPN	Most Probable Number
MPS	Main Pumping Station
MT	Metric Ton
NABL	National Accreditation Board for Testing and Calibration Laboratories
NGRBA	National Ganga River Basin Authority
NGT	National Green Tribunal
NMCG	National Mission for Clean Ganga
NOC	No Objection Certificate
NRDWP	National Rural Drinking Water Programme
NWMP	National Water Monitoring Programme
NWQMP	National Water Quality Monitoring Programme
OA	Original Application
OCEMS	Online Continuous Emission Monitoring System
ODF+	Open Defecation Free Plus
O&G	Oil and Grease
OH&SAS	Occupational Health and Safety Assessment Specification
OHSMS	Occupational Health and Safety Management System
PCC	Pollution Control Committees

Abbreviation	Full form
PHED	Public Health Engineering Department
PIAs	Polluted Industrial Areas
PIP	Person in Position
PRS	Polluted River Stretch
PWSS	Piped Water Supply Schemes
RO	Regional Office
RRC	River Rejuvenation Committee
RWMC	Regional Waste Management Centre
SDG	Sustainable Development Goals
SEP	State Environment Plan
SJDA	Siliguri Jalpaiguri Development Authority
SPA	Severely Polluting Area
SPCB	State Pollution Control Board
SPMG	State Program Management Group
SPIs	Seriously Polluting Industries
SS	Sanctioned Strength
STP	Sewage Treatment Plants
SUDA	State Urban Development Agency
SWA	State Wetlands Authority
SWID	State Water Investigation Directorate
TC	Total Coliform
TPD	Ton Per Day
TSS	Total Suspended Solid
UD&MA	Urban Development & Municipal Affairs
ULBs	Urban Local Bodies
WBH&FW	West Bengal Health and Family Welfare
WBPCB	West Bengal Pollution Control Board
WBRRRC	West Bengal River Rejuvenation Committee
WBSPMG	West Bengal State Level Program Management Group
WHO	World Health Organization
WQAA	Water Quality Assessment Authority
WQM&S	Water Quality Monitoring and Surveillance
WQRC	Water Quality Review Committee
WRIDD	Water Resources Investigation and Development Department
WSP	Waste Stabilization Ponds

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