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No. CM-13013/6/2021-TECH-RD-BENGALURU-RD(Bengaluru) Date: 18.11.2021

To,

The Chairman,

Karnataka State Pollution Control Board

"Parisara" Bhavan", No #49, Church Street ,

Bengaluru - 560001

DIRECTIONS UNDER SECTION 18(1) (b) OF THE WATER (PREVENTION AND CONTROL OF POLLUTION) ACT, 1974 FOR NON COMPLYING STPs UNDER OPERATION IN CATCHMENT OF ULSOOR LAKE.

WHEREAS, amongst others, under Section 17 of the Water (Prevention and Control of Pollution) Act, 1974, one of the functions of the State Pollution Control Board (SPCB) constituted under the Water (Prevention & Control of Pollution) Act, 1974 is to inspect sewage or trade effluents works and plants created for treatment of sewage and trade effluents and to review plans, specifications or other data relating to plants set up for the treatment of water and wastewater and the system for the disposal of sewage or trade effluents or in connection with the grant of any consent as required by this act; and

WHEREAS, sewage is a major cause for poor water quality in water bodies and adversely impacting human health and aquatic life. Discharge of untreated or partially treated or treated sewage not meeting standards, is further adding to the problem of water pollution; and

WHEREAS, Central Government had notified General Discharge Standards for Environmental Pollutants from various sources including municipal wastewater under the Environment (Protection) Act, 1986 and the Rules framed thereunder (Schedule VI); and

WHEREAS, CPCB has earlier issued directions vide letter dated 22.05.2015 under section 18(1)(b) of Water (Prevention and Control of Pollution) Act, 1974 to Karnataka State Pollution Control Board in the matter of contamination of Bellandur and Varthur lake; and

WHEREAS, CPCB has earlier issued directions vide letter dated 04.04.2016 under section 18(1)(b) of Water (Prevention and Control of Pollution) Act, 1974 to Karnataka State Pollution Control Board in the matter of contamination of Ulsoor lake; and

WHEREAS, Hon'ble NGT in its Order dated 28.08.2019 in the matter of OA No. 593/2017 titled Paryavaran Suraksha Samiti & Anr. v/s Union of India & Ors directed that all the Local Bodies and/or concerned departments of the State Government have to ensure 100% treatment of generated sewage and in default to pay compensation, which is to be recovered by the States/UTs, with effect from 01.04.2020. In default of such collection, the States/UTs are liable to pay such compensation as decided by NGT vide order dated 28.08.2019 which the CPCB is to collect and utilize for restoration of the environment; and

WHEREAS, in compliance to direction of Hon'ble NGT in the matter of Original Application (O.A.) 54 of 2016 (SZ), a Joint Committee comprising of the Deputy Commissioner of Bengaluru (Urban), Senior Scientist from Regional Office of Central Pollution Control Board (CPCB), Bengaluru, Karnataka State Pollution Control Board (KSPCB) and the Commissioner, Bruhat Bengaluru Mahanagara Palike (BBMP) inspected STPs, (Sewage Treatment Plants), ETTPs (Effluent Treatment Plants), Storm Water Drain in the catchment of Ulsoor lake on 28.07.2021. During the inspection made by the Joint Committee on 28/07/2021, wastewater samples from the outlet of 2 MLD STP operated by BWSSB at Ulsoor Lake and 100 KLD STP operated by Madras Engineering Group & Centre, were also collected. It is observed from the analysis results of the treated sewage collected from the outlet of 2 MLD STP operated by BWSSB at Ulsoor Lake and 100 KLD STP operated by Madras Engineering Group & Centre on 28/07/2021 that the effluents are not complying with the prescribed

standards for COD and Faecal Coliforms. Inspection report and analysis results are presented in the annexure.

NOW, THEREFORE, in exercise of the powers conferred under section 18 (1) (b) of the Water (Prevention & Control of Pollution) Act 1974, Chairman, Karnataka State Pollution Control Board (KSPCB) is hereby directed as follows:


1. KSPCB shall issue directions to concerned authorities (Madras Engineering Group & Centre and Bengaluru Water Supply and Sewerage Board (BWSSB)) to ensure that sewage treatment plants are optimally operated so as to comply with the prescribed norms.
2. KSPCB shall direct the BWSSB to ensure that entire sewage generated in the catchment of Lake Ulsoor is conveyed to Sewage Treatment Plants (STPs) and these STPs are operated at the designed capacity and conform to the prescribed norms.
3. KSPCB shall impose Environment Compensation on Local Municipal Bodies / State Level Authorities for discharge of untreated wastewater into Ulsoor Lake.

Action taken report shall be submitted by Karnataka State Pollution Control Board (KSPCB) to CPCB within 30 days from the date of receipt of these directions along with a time bound action plan for compliance of the directions. KSPCB shall also acknowledge the receipt of these directions to CPCB by return mail.

15th 22/11/21
(Tanmay Kumar)
Chairman

Copy to

1. The Secretary,
Ministry of Environment, Forests, & Climate Change
Indira Paryavaran Bhawan, Aliganj, Jorbagh Road,
New Delhi-110003
2. The Secretary
Ministry of Jal Shakti
626, Shram Shakti Bhawan, Rafi Marg,
New Delhi 110001
3. The Secretary
Ministry of Housing and Urban Affairs
Mulana Azad Road, Rajpath Area
Central Secretariat , New Delhi- 110001
4. DII-WQM-I Division, CPCB Delhi
- ✓ 5. DII-IT Division , CPCB Delhi


(Prashant Gargava)
Member Secretary



**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
SOUTHERN ZONE, CHENNAI**

ORIGINAL APPLICATION NO. OF 54 OF 2016 (SZ)

IN THE MATTER OF:

Suo Motu based on the news item published in

The Hindu dated 08.03.2016 titled

"Lake in heart of Bengaluru City turns 'Graveyard for fish',

... Applicant(s)

V/s

Government of Karnataka

and Ors.

...Respondent(s)

INDEX

S. No.	Particulars	Page No.
1.	Affidavit	1 - 3
2.	Report of Joint Committee, as per Hon'ble NGT orders in the matter of OA 54 of 2016 (SZ)	3 - 36
3.	Annexure 1: NGT order dated 10.06.2021	37 - 39
4.	Annexure 2: Flow meter readings at the outlet of BWSSB STP	40 - 41
5.	Annexure 3: Status report furnished by BWSSB	42 - 46
6.	Annexure 4: KSPCB - Analysis reports of samples collected at outlet of MLD STP	47 - 52
7.	Annexure 5: List of works installed by BWSSB	53 - 57
8.	Annexure 6: Flow measurement at storm water drain (C-100) at downstream of Ulsoor lake	58
9.	Annexure 7: Analysis report of water samples collected at storm water drain	59
10.	Annexure 8: Government of Karnataka Notification for dual pipeline and STP	60 - 63
11.	Annexure 9: BBMP Annual maintenance contract for removal of debris	64 - 67
12.	Annexure 10: BBMP Work Order for appointment of Marshalls	68 - 69
13.	Annexure 11: BBMP Micro Action Plan dt 05/05/2020	70 - 79
14.	Annexure 12: BBMP Micro Action Plan dt 05/05/2020	80 - 82



15.	Annexure 13: BWSSB Tender invited for installation of OUTFALLS	83 - 84
16.	Annexure 14: BWSSB Analysis report of samples collected at outlet of 2 MFD STP	85 - 86
17.	Annexure 15: KSPCB inspection report of M/s Civil Slaughter house, Lamery Road	87 - 105
18.	Annexure 16: Department of Fisheries report on bioaccumulation of heavy metals in fish	106 - 123
19.	Annexure 17: KSPCB Analysis reports of samples collected at outlet of MFG STP	124
20.	Annexure 18: MFG letters dt 15/7/2021 & 11/08/2021	125 - 128
21.	Annexure 19: Status report furnished by KSPCB	129 - 130
22.	Annexure 20: KSPCB letters to 25 establishments for installation of STP	131 - 153
23.	Annexure 21: KSPCB Water quality report of Ulsoor lake 01/04/2020 to 31/03/2021	154 - 170
24.	Annexure 22: Analysis report of water quality monitoring water quality monitoring of Ulsoor Lake on 28/07/2021	171 - 180

Place: Bengaluru

Date: 16/09/2021



S. Suresti
16/09/2021
DEPONENT

S. SURESTI

REGIONAL DIRECTOR
CITY WATER SUPPLY & SEWERAGE CONTROL BOARD
BENGALURU DEVELOPMENT AUTHORITY
BANGALORE - 560001
KARNATAKA GOVT. APARTMENT

BEFORE THE NATIONAL GREEN TRIBUNAL (SOUTHERN ZONE) CHENNAI
ORIGINAL APPLICATION NO. OF 54 OF 2016 (SZ)

IN THE MATTER OF:

Suo Motu based on the news item published in

The Hindu dated 08.03.2016 titled

"Lake in heart of Bengaluru City turns "Graveyard for fish".

...Applicant(s)

V/s

Government of Karnataka

and Ors.

...Respondent(s)

REPORT OF THE JOINT COMMITTEE FILED BY CENTRAL POLLUTION CONTROL BOARD (CPCB) WITH REGARD TO HON'BLE TRIBUNAL ORDER DATED JUNE 10th, 2021

I, S. Suresh, Son of Sh S.R. Sathyanarayana, Hindu, aged about 59 years, having office at the Regional Directorate, Central Pollution Control Board, 1st & 2nd Floors, Nisarga Bhavan, A-Block, Himmaiah Main Road, 7th D Cross, Shivnagar, Bengaluru - 560 079 do hereby solemnly affirm and sincerely state as follows:

2. That I am presently working as Scientist 'E' & Regional Director, Regional Directorate (South), Central Pollution Control Board (hereafter called as CPCB), Bengaluru and have been authorized to file the present report. I am fully conversant with the facts of the case and hence, competent and authorized to depose and swear the present report as under:
3. That the Hon'ble National Green Tribunal (Southern Zone), Chennai in O A No. 54 of 2016 vide order dt June 10, 2021 directed the Joint Committee to provide further progress report regarding implementation of the recommendations and suggestions of the Joint Committee by the respective regulators. Accordingly, the Joint Committee conducted a review meeting with respective regulators on July 12, 2021 and carry out on inspections and monitoring on July 28, 2021 and August 03, 2021. The Joint Committee report is enclosed as **Appendix**.



4. Out of four members of the Joint Committee, three members from CPCB, KSPCB and Kadhalur - Bengaluru North have signed the report. As one of the members is from BBMP and the joint committee in its report estimated an environmental compensation to impose on BBMP for non-compliance of the discharge standards, the signature from the joint committee member from BBMP is awaited.

Signed and verified on this on September 16th, 2021 at Bengaluru.

COUNSEL FOR
CPCB



[Handwritten Signature]
DEPONENT

DEPONENT
REGIONAL COLLECTOR
WASTE AND WATER CONTROL BOARD
REGIONAL OFFICE (ORATE (SOUTH))
DEPT. OF THE FORESTS & CC, GOVT. OF INDIA
BENGALURU - 560 079, MOB : 9480672128

REPORT OF THE JOINT COMMITTEE SUBMITTED BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, SOUTHERN ZONE, CHENNAI — IN THE MATTER OF O. A. 54 OF 2016 (SZ) (SUO MOTU BY NGT V/s. GOVT. OF KARNATAKA AND OTHERS) REGARDING POLLUTION AND MASSIVE FISH DEATH CAUSED IN ULSOOR LAKE, BENGALURU DUE TO INDISCRIMINATE DISCHARGE OF SEWAGE

1.0 PREAMBLE

The Original Application (O.A.) 54 of 2016 (SZ) is a Suo Motu case taken by the Hon'ble National Green Tribunal (NGT), South Zone, Chennai based on the news item published in "The Hindu" dated 08/03/2016 titled "Lake in heart of Bengaluru city turns graveyard for fish". In continuation, Bruhat Bengaluru Mahanagara Palike (BBMP) filed Interlocutory Application (I.A.) 28 of 2019 (SZ) to implead them as additional respondent stating that they are the persons who are in charge of development and maintenance of Ulsoor Lake.

In view of above, the Hon'ble NGT, Southern Zone, Chennai vide Order dated 19/02/2020 directed the following

"(9) it is appropriate to appoint a Joint Committee comprising of the Deputy Commissioner of Bengaluru (Urban), Senior scientist from Regional Office of Central Pollution Control Board (CPCB), Bengaluru, Karnataka State Pollution Control Board (KSPCB) and the Commissioner, Bruhat Bengaluru Mahanagara Palike (BBMP) to inspect the area in question and find out the source of pollution and persons who are responsible for causing pollution, whether the additional fourth respondent had taken any steps to implement the recommendations made by the KSPCB in their reply filed before this Tribunal on 26/09/2018, the present stage of the lake and also suggest the remedial measures to be taken to restore the lake to its original position, in respect to sewage treatment and dumping of garbage and illegal encroachments if any, in the lake.

(13) Central State Pollution Control Board will be the nodal agency for co-ordination and for providing the necessary logistics for this purpose".

In compliance to the above order, the Joint Committee comprising of the following members was constituted:

S. No.	Name of Member	Department
1.	Sh. G. Thirumurthy Additional Director	Regional Directorate Central Pollution Control Board Bengaluru
2.	Sh. S. Madhusudhan Senior Environmental Officer – Bengaluru City	Karnataka State Pollution Control Board Bengaluru
3.	Sh. K. Ravi Executive Engineer (Lakes)	Bruhat Bengaluru Mahanagara Palike Bengaluru
4.	a) Sh. Shivraju, KAS Tahsildar - Bengaluru North b) Sh. Dayananda Bandari KAS Asst. Commissioner – Bengaluru North	Deputy Commissioner Office DC Office Bengaluru Urban Bengaluru

Based on the field inspection, analysis results of wastewater, groundwater and surface water samples collected and verification of the official documents furnished by the concerned departments, the Joint Committee submitted a detailed report dated 10/08/2020 to the Hon'ble NGT.

The Hon'ble NGT considered the Joint Committee report vide order dt 10/06/2021 directed the following (Annexure D):

“(4) Both the counsel appearing for the State respondents and Pollution Control Board wanted some more time to file further action taken report as directed by this Tribunal. The committee also wanted some more time for filing further progress report regarding the implementation of the recommendations and suggestions made by them by the respective regulators.

(5) Considering the circumstances, we feel that some more time can be granted to the committee as well as to the official respondents to file their respective further progress report and action taken report.”

Consequent of transfer of Sh. G. Thirumurthy, CPCB, Sh. S. Madhusudhan, KSPCB and Sh. Shivraju, Tahsildar - Bengaluru North the following officials were nominated from the respective departments to the Joint Committee:

S. No.	Name of Member	Department
1.	Smt Sowmya D Scientist D	Regional Directorate Central Pollution Control Board Bengaluru
2.	Sh. B S Murulidhara Senior Environmental Officer - Bengaluru City	Karnataka State Pollution Control Board Bengaluru
3.	Sh. K. Ravi Executive Engineer (Lakes)	Bruhat Bengaluru Mahanagara Palike Bengaluru
4.	Sh. Balakrishna, KAS Tahsildar - Bengaluru North	Deputy Commissioner Office DC Office Bengaluru Urban Bengaluru

2. STATUS OF MEASURES IMPLEMENTED AS PER JOINT COMMITTEE RECCOMENDATIONS

In compliance to the order, as per the decision of the Joint Committee, the Nodal Agency, CPCB addressed letters dt 02/07/2021 to the concern officers of Madras Engineering Group & Centre (MEG), BBMP- Strom Water Drain (SWD), BBMP – Lakes, Bengaluru Water Supply and Sewerage Board (BWSSB) and KSPCB to furnish the information to verify the compliance. The Joint Committee members conducted a meeting on 12/07/2021 at CPCB, Regional Directorate, Bengaluru with the officials of BBMP - SWD, BBMP – Lakes, BWSSB and KSPCB and reviewed the status of implementation of the recommendations made by the Joint Committee in the report dt 10/08/2020.

On 28/07/2021 and 03/08/2021, the Joint Committee members along with officials of concerned departments inspected Ulsoor lake and STPs, ETP, Storm Water Drain in the catchment and verified the measures implemented by concerned departments to comply with the recommendation of the Joint Committee. During the inspection, wastewater samples from the outlet of 2 MLD STP operated by BWSSB at Ulsoor Lake and 100 KLD STP operated by Madras Engineering Group & Centre were collected with the help of CPCB and KSPCB staffs. The water samples were collected from three locations at Ulsoor lake and combined storm water drain C-100 near Gurudhwar. The water and wastewater samples collected were analysed at Central Laboratory, KSPCB, Bengaluru and sample of storm water drain was analysed at Laboratory of CPCB, Regional Directorate, Bengaluru for the parameters such as pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS),

Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Fecal Coliforms (FC). Subsequently, Joint Committee meeting was held at CPCB, regional Directorate, Bengaluru on 06/09/2021 and reviewed the measures implemented by concerned departments.

The status of measures implemented by stakeholder departments as per the recommendations and suggestions in the Joint Committee report dt 10/08/2020 are as follow:

2.1 Status of measures implemented by Bengaluru Water Supply and Sewerage Board (BWSSB)

Sl	Suggestions of the Joint Committee in the report dt 10/08/2020	Measures implemented
1	To operate the existing STP of 2 MLD at its full capacity with a compliance to the discharge Standards, so that additional 0.5 MLD can be discharged to Ulsoor Lake, may adequate to maintain loss of water due to evaporation, infiltration etc.	<ol style="list-style-type: none"> 1. During the inspection by the Joint Committee on 28/07/2021, the STP was operating at 1.8 MLD capacity. The daily flow meter readings recorded by BWSSB during June and July, 2021 were verified. It is observed that from 01/06/2021 to 08/07/2021, STP was operated at an average capacity of 0.9 MLD and in the range 0.94 MLD to 1.52 MLD. 2. During 09/07/2021 to 27/07/2021, the STP was operated in the range of 1.7 to 1.9 MLD capacity and average capacity of treatment was 1.84 MLD. The records of flow meter readings at the outlet of the STP from 01/06/2021 to 27/07/2021 is enclosed at Annexure 2. 3. It is reported by the BWSSB that remaining 0.20 MLD of sewage will be treated in the STP by modifying the inlet arrangements within one month i.e 31/08/2021(Annexure 3). <i>The recommendations of the Joint Committee are partially complied.</i>

4. Every month, KSPCB is monitoring the quality of treated sewage discharged from the outlet of the STP. The grab sample was collected at the outlet of the STP on 28/07/2021 in presence of Joint Committee members and samples were analysed at KSPCB Laboratory.

The analysis results of the treated sewage collected from the STP on 01/03/2021, 01/04/2021, 03/05/2021 by KSPCB and during Joint Committee visit on 28/07/2021 are as follow (Annexure 4):

Parameter	Standard	Concentrations in treated wastewater at the outlet of the STP			
		01/03/2021	01/04/2021	03/05/2021	28/07/2021
pH@25°C	5.5-9.0	7.0	7.4	7.8	7.2
BOD (3days @ 27°C)(mg/L)	< 10	5.0	6.2	5.0	5.0
COD (mg/L)	< 50	55	54.5	67	35
TSS (mg/L)	< 20	12	2.0	6.0	8.0
Ammonical Nitrogen (mg/L)	< 5	27.1	2.74	3.0	1.0
Total Nitrogen (mg/L)	< 10	37.0	5.69	7.0	3.0
Fecal Coliform (MPN/100 ml)	Less than 100	27 x 10 ⁴	33 x 10 ³	23 x 10 ³	14 x 10 ³

The results show that the treated sewage is not complying with the discharge standards with reference to COD and Fecal coliform.

The recommendations of the Joint Committee are not complied.

- | | | |
|---|--|--|
| 2 | To identify all the missing links and illegal discharge of wastewater into storm water drain and also to complete all the works taken up with respect to upgradation / rehabilitation of sub mains and lateral sewer lines by December 2020, as committed to stop 17 MLD flowing in the Storm Water Drains during dry weather. | <ol style="list-style-type: none"> In order to prevent sewage flow into storm water drain, BWSSB proposed to install 20 works under wastewater management zone and 16 works under maintenance zone to upgradation / rehabilitation of sub mains and lateral sewer lines. The list of works undertaken by BWSSB are enclosed at Annexure 5. It was reported by BWSSB that as on 31/06/2021 out of 36 works, 34 works were |
|---|--|--|

completed and remaining 2 works are proposed to complete before December 31, 2021 by maintenance Zone.

3. On 3/08/2021, the Joint Committee members from CPCB and KSPCB visited the site and verified the status of compliance and observed that 34 works were completed.
4. The flow in the combined storm water drain (C- 100) at downstream of Ulsoor lake near Gurudhwar was monitored by the officials of BWSSB using float method in presence of committee members during dry weather on 3/08/2021. The details of the flow are enclosed at Annexure 6 and photographs at Figure 1 & 2. The average flow in the storm water drain during day time is 5.18 MLD. This shows that there is reduction of approximately 12 MLD of sewage discharged to the storm water drain.
5. The grab sample of water was collected from the storm water drain on 3/08/2021 and analysed at CPCB laboratory (Annexure 7). The analysis results are as follow:

Parameter	Concentration
pH@25°C	7.6
BOD (3 days, 27°C) (mg/L)	69
COD (mg/L)	114
TDS (mg/L)	368
TSS (mg/L)	26

The analysis result shows that partially treated/untreated sewage is mixed in the storm water drain.

		<i>The recommendations of the Joint Committee are partially complied.</i>
3	To ensure the implementation of Notification No. FEE 316 EPC 2015, dated 19.01.2016 issued by Forest, Ecology & Environment Secretariat w.r.t. installation of STP and reuse of Treated Sewage.	<p>1. BWSSB vide notification No. BWSSB/C/CAO-S/4138/2015-16, Bengaluru dt 25/02/2016 and amended vide notification No. BWSSB/CAO-S/ 5008 /2017-18 dt 21/2/2018, mandated installation of STP and Dual Piping System in following buildings as per Regulation 4A of Bengaluru Sewage Regulation (Annexure 8):</p> <p><i>"No water supply or sewerage connection shall be granted by the Board on the application of owner or builder or occupier of new Building Projects, unless sewage treatment plant is established and facilities for reuse of treated effluent by providing dual piping system one for toilet flushing purpose and the other for all purposes in respect of:</i></p> <p><i>i. Residential buildings consisting of 20 and above apartments or measuring 2,000 m² and above whichever is lower; or</i></p> <p><i>ii. Commercial building measuring 2,000 m² and above; or</i></p> <p><i>iii. Buildings of educational institutions measuring 5,000 m² and above."</i></p> <p>2. The BWSSB reported that 34 numbers of buildings have installed individual STP as 31/06/2021 (Annexure 3). The details of numbers of building in the catchment of Ulsoor lakes mandated to install STPs are not furnished by BWSSB.</p>

		<i>The recommendations of the Joint Committee are partially complied.</i>
4	To ensure the implementation of BWSSB (Rain Water Harvesting) Regulations 2010 and subsequent amendments w.r.t providing rain harvesting structure by the owner or occupier of the residential building.	<p>1. As per the Bengaluru Water Supply and Sewerage Act, 2010-72A, every owner or occupier of a building having site area of not less than 216 m² or every owner who propose to construct a building on a site area of not less than 108 m² shall provide the rain water harvesting structure for use or ground water recharge (Annexure 3).</p> <p>2. BWSSB reported that around 1661 numbers of buildings have implemented the rain water harvesting system as on 31/06/2021. Further the details of numbers of building in the catchment of Ulsoor lakes mandated to install rainwater harvesting system are not furnished by BWSSB.</p> <p><i>The recommendations of the Joint Committee are partially complied.</i></p>
5	To avoid laying of Under Ground Drainage (UGD) lines & manholes within Storm Water Drains and also to execute work with an approval of BBMP – Storm Water Drain Division.	<p>BWSSB reported that UGD line are laid in Buffer zone, if Buffer zones are available along the SWD. In case if there is no space, the UGD lines are laid inside SWD after obtaining approval by BBMP – SWD (Annexure 3).</p> <p>During the inspection of the Joint Committee on 03/08/2021, it was observed that UGD lines were laid in the buffer zones and at a few sites, where space in buffer zones were not available, UGD lines were laid inside the SWD.</p> <p><i>The recommendations of the Joint Committee are complied.</i></p>

2.2 Status of measures implemented by Bruhat Bengaluru Mahanagara Palike (BBMP)

Sl	Suggestions of the Joint Committee in the report dt 10/08/2020	Measures implemented
1	To remove accumulated floating debris / solid waste from wetland and main water body of Ulsoor Lake.	<p>1. During the visit on 28/07/2021, the Joint Committee observed that floating debris/solid waste from wetland and lake were removed. Lake and wetland are regularly maintained. A small quantity of debris were observed in the wetlands (Figure 3 & 4). It was reported by BBMP that the debris and floating material enters the lake during wet weather/rainfall through overflow from the storm water drain.</p> <p>2. The accumulated floating debris/solid waste from wetland and main water body of Ulsoor Lake are removed by BBMP. It was observed that the records of quantity of floating debris/solid waste removed from wetland are not maintained.</p> <p><i>The recommendations of the Joint Committee are complied.</i></p>
2	To provide / install appropriate screen to arrest entry of floating matter at each stage i.e. Secondary drain to Primary drain, at regular interval may be of 1000 m in Primary drain. Also to develop system to remove accumulated debris from the screen on regular interval to protect and improve its functionality, also ensure disposal of debris removed to SWM processing	<p>1. The screens at regular interval in primary drains and outlet of secondary drains to primary drains are not installed.</p> <p>2. Silt traps in primary and secondary drains are not installed.</p> <p>3. Pilot drains are not provided in the drain bed.</p> <p><i>The recommendations of the Joint Committee are not complied.</i></p>

	<p>facility. In addition, a section of 0.8 M width and 0.6 M depth pilot drain shall be constructed at the middle in all primary and secondary drains to carry dry weather flow and will help in collecting / removing solid waste. BBMP may explore deputing scavengers for supervising and removing of solid wastes from the drains. To provide silt traps at appropriate locations in the primary and secondary drains to avoid carryover of silts to the Lakes and easy removal from the drains too.</p>	<p>4. As per the records of BBMP, annual maintenance contract for removal of debris and silt from SWD is given to a firm M/s Yoga & Co, Bengaluru for 3 years vide work order dt 09/04/2019. The copy of the work order is enclosed at Annexure 9. The records of silt removed and disposed are not maintained by BBMP.</p> <p>5. Marshalls were appointed in 198 wards of BBMP to monitor and avoid disposal of solid waste into SWD. The copy of the work order dt 28/12/2020 furnished by BBMP is enclosed at Annexure 10 and it shows contract period was expired on 01/01/2021. The work order or records for existing contract are not furnished to the Joint Committee.</p> <p><i>The recommendations of the Joint Committee are partially complied.</i></p>
3	<p>The existing screen provided to arrest entry of floating debris into wetland found inadequate and BBMP has planned to install floating screen for the same. The committee of the opinion that the entry of water during wet weather is nothing but a diluted wastewater /sewage and carries lot of organic wastes along with it. The existing treated sewage from BWSSB STP (2 MLD) and MEG STP (100 KLD) may be adequate to maintain the water level of Ulsoor Lake. So, it is suggested to replace the existing</p>	<p>1. During the visit of the Joint Committee on 28/07/2021, it was observed that the screen provided to arrest entry of floating debris into wetland is replaced with 24m wide floating barrier (Figure 5 & 6).</p> <p><i>The recommendation of the Joint Committee is complied.</i></p> <p>2. The existing weir is not replaced with sluice gates to stop entry of diluted sewage into the wetland and Ulsoor Lake.</p> <p>3. As per the records furnished by BBMP, under 15th finance Commission pertaining to</p>

	weir with sluice gates to stop entry of diluted sewage into wetland / Ulsoor Lake.	solid waste management infrastructure development in BBMP jurisdiction, provision of Rs. 400.00 lakhs is made in the Action plan to provide trash barriers for selected lakes to avoid the solid waste entering into the lakes. The copy of 15 th finance Commission Action plan highlighting the provision made for installing trash barriers is enclosed at Annexure 11.
		<p>4. The floating debris in the wetland and characteristic of water in storm water drain and lake, indicates that during wet weather and rainfall, overflow of storm water drain carrying diluted wastewater /sewage is discharged to the wetland.</p> <p><i>The recommendations of the Joint Committee are not complied.</i></p>
4	The treated water from STPs shall be discharged into wetland structure after complete cleaning to act as polishing process for removal of remaining suspended solids and biological oxygen demand making the water more hygienic and environmentally safe before release in to main course of Lake.	<p>During the visit of the Joint Committee on 28/07/2021, it was observed that the treated wastewater from STP is discharged into a wetland prior to the main course of lake (Figure 7).</p> <p><i>The recommendation of the Joint Committee is complied.</i></p>
5	To provide Cascade Aerators for discharging treated sewage into wetland helps in removing odour due to Hydrogen Sulfide, if any. Also micro bubble and fountains may be	<p>1. During the visit of the Joint Committee on 28/07/2021, it was observed that cascade aerators for discharging treated sewage are not installed.</p> <p>2. As per the records furnished by BBMP, under</p>

	<p>planned by ensuing available D.O., if required.</p>	<p>15th finance Commission pertaining to solid waste management infrastructure development in BBMP jurisdiction, provision of Rs. 400.00 lakhs is made in the Action plan for installation of diffused aerator systems in Ulsoor. The copy of 15th finance Commission Action plan highlighting the provision made for installing trash barriers is enclosed at Annexure 12.</p> <p><i>The recommendations of the Joint Committee are not complied.</i></p>
6	<p>To install online monitoring system to assess the water quality of Ulsoor Lake on real time monitoring basis at appropriate location. Until installation of online system, BWSSB may start monitoring pH, DO and Temperature on daily basis along with STP monitoring records.</p>	<ol style="list-style-type: none"> 1. The online monitoring system to assess the water quality of Ulsoor Lake on real time monitoring basis is not installed. 2. BWSSB is not monitoring water quality parameters such as pH, DO and Temperature of Ulsoor lake on daily basis. Records of monitoring were not furnished to the Joint Committee members. 3. Online effluent monitoring system at outlet of the STP is not installed. As per the records of BWSSB, tender is invited for installation of online monitoring system at the outlet of STP to monitor quality of treated sewage prior to discharge. The copy of tender document is enclosed at Annexure 13. 4. Daily, BWSSB is monitoring pH, BOD, COD, TSS, ammoniacal nitrogen, nitrate nitrogen, total phosphate, TKN and fecal coliform in treated wastewater at the outlet of the STP prior to discharge to the wetland. The monitoring

		<p>result from 01/06/2021 to 27/07/2021 are enclosed at Annexure 14 . It is observed that fecal coliform in treated wastewater is consistently reported as <100 MPN/100ml, whereas the analysis results of the samples collected on 01/03/2021, 01/04/2021, 03/05/2021 by KSPCB and on 28/07/2021 in presence of the Joint Committee shows that the concentrations of Fecal coliform are 27×10^4,</p>
		<p>33×10^3, 23×10^3 and 14×10^3 MPN/100 ml, respectively. This shows that the BWSSB is not carrying out the analysis properly.</p> <p><i>The recommendations of the joint committee are not complied.</i></p>
7	<p>To renew the consent issued by KSPCB under the Water (Prevention & Control of Pollution) Act, 1974 for operating Slaughter House and 50 KLD ETP immediately. To upgrade and operate the ETP complying to the effluent discharge Standards and also to recycle the treated water for slaughter house washing/cleaning purposed. The effluent generated from mutton stalls located within slaughter house premises shall be treated in ETP and not to dispose directly into UGD. Also to implement the Notification No.PCB/WMC/SEO/2013-14/6271 dated 05.02.2014 issued by KSCB as per the Guidelines for Slaughter House prepared by CPCB</p>	<ol style="list-style-type: none"> 1. BBMP has not applied for renewal of consent for operation of Slaughter House and 50 KLD ETP from KSPCB and it is in operation since 30/06/2009 without valid consent to operation from KSPCB. KSPCB has issued prohibitory order dated 19/04/2013. 2. As per the records of KSPCB, KSPCB has filed the criminal case 1065 of 2013 in the Hon'ble High Court of Karnataka against the BBMP authorities during 2013 for noncompliance and case is under hearing stage in the Court. 3. KSPCB has formed a Watch Dog Committee for slaughter houses on 18/02/2014 consisting of BBMP, KSPCB, Animal Husbandry and People Associations for regular monitoring of compliances. 4. KSPCB has inspected the unit several times and issued directions dt 29/07/2017 and 25/06/2020.

5. The KSPCB inspected the slaughter house on 16/06/2021 and observed that the effluent generated is partly diverted to ETP and remaining is bypassed through open drain to the BWSSB sewer. The inspection report of the KSPCB and sample analysis report are enclosed at Annexure 15. The analysis report of the sample collected at the outlet of the ETP are as follow:

Parameter	Concentrations	Standard
pH@25°C	7.1	5.5 – 9.0
BOD (3 days, 27°C) (mg/L)	162	350
COD (mg/L)	645	250
TDS (mg/L)	2338	2100
TSS (mg/L)	40	600
Chloride (mg/L)	796	600
Sulphate (mg/L)	102	1000
Fluoride (mg/L)	0.2	1.5
Phenolic compounds(mg/L)	BDL	5.0
Hexavalent chromium Cr ⁶⁺ (mg/L)	BDL	2.0
Ammonical Nitrogen (mg/L)	1.0	50
Cynide (mg/L)	BDL	0.2
Oil and Grease (mg/L)	BDL	20
Zinc (mg/L)	0.13	1.5
Iron (mg/L)	2.13	3.0
Copper (mg/L)	BDL	3.0
Nickel (mg/L)	BDL	3.0
Total Chromium (mg/L)	BDL	2.0

The treated effluent at the outlet of the ETP is not complying with the discharge standards with reference to COD, TDS and Chloride.

6. The Joint Committee members from CPCB

		<p>and KSPCB inspected the ETP operated by the Slaughter House on 28/07/2021. The slaughter house was in operation and the ETP was not operated scientifically. Aerators and pumps were rusted indicating that the ETP is not operated regularly. There was no discharge from the ETP during the inspection. The ETP operator informed that only after 6.00 PM effluent will be treated in filtration unit and discharged. It was observed that the connecting pipes to filtration unit were dismantled (Figure 8 - 10). The effluent was stored in the ETP. There was no any improvements in the status of operation of the ETP compared to the observations made during earlier inspections by the Joint Committee and KSPCB. BBMP has not implemented any measures to improve the condition of the ETP.</p>
		<p><i>The recommendations of the joint committee are not complied.</i></p>

2.3 Status of measures implemented by Department of Fisheries

Sl	Suggestions of the Joint Committee in the report dt 10/08/2020	Measures implemented
1	To prescribe appropriate physio-chemical and biological parameters in the contract / agreement to carryout water quality monitoring while appointing contractor for fishing.	<p>As per the records of Department of Fisheries, the contract for fishing is given to Fisheries-cooperative society on lease. The lease has not carried out water quality monitoring periodically.</p> <p><i>The recommendations of the committee are</i></p>

		<i>not complied.</i>
2	To carryout study of bio accumulation of heavy metals in some tissues of fishes in Ulsoor Lake.	Department of Fisheries has conducted the study on bioaccumulation of heavy metals in fish through Karnataka Veterinary, Animal and Fisheries Sciences University, Fisheries Research and Information Centre, Hebbal, Bengaluru. The report states that the heavy metal in fish tissue in Ulsoor lake is below permissible limit. The report is enclosed at Annexure 16. <i>The recommendations of the committee are complied.</i>
3	To maintain the cleanliness of the Ulsoor Lake and disposal of aquatic plants by pit composing method or any other means.	During the visit of the Joint Committee on 28/07/2021, it was observed that cleanliness of the lake is maintained . The debris, solid waste and eutrophic plants are regularly removed. <i>The recommendation of the committee is complied.</i>

2.4 Status of measures implemented by Madras Engineering Group and Centre

Sl	Suggestions of the Joint Committee in the report dt 10/08/2020	Measures implemented
1	To apply and obtain Consent (CFO) for discharge of effluents under the Water (Prevention & Control of Pollution) Act, 1974 and emissions under the Air (Prevention & Control of Pollution) Act, 1981 for operating & discharging of treated sewage from KSPCB	The Joint Committee inspected the 100 KLD STP installed by Madras Engineering Group and Centre on 28/07/2021. MEG has not applied for Consent for Establishment and Consent for Operation from KSPCB for installation and operation of STP and discharge of treated sewage. The STP is operated

	immediately.	without valid consent. <i>The recommendation of the committee is not complied.</i>																								
2	To operate the ETP complying to the effluent discharge Standards and not with discharge treated effluent directly into storm water drain. Shall lay a pipeline to discharge treated sewage with cascade aeration system in Wetland of Ulsoor Lake. Also to install flow meter and maintain proper records of the same.	<p>1. The treated sewage is discharged to the storm water drain from the outlet of the STP. The grab sample was collected at the outlet of the STP on 28/07/2021 in presence of Joint Committee members by KSPCB and CPCB staff and samples were analysed at KSPCB Laboratory. The analysis results of the treated sewage collected from the STP are as follow (Annexure 17):</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Standard</th> <th>Concentrations in treated wastewater at outlet of STP</th> </tr> </thead> <tbody> <tr> <td>pH@25°C</td> <td>5.5-9.0</td> <td>7.5</td> </tr> <tr> <td>BOD (3days @ 27°C)(mg/L)</td> <td>< 10</td> <td>8.0</td> </tr> <tr> <td>COD (mg/L)</td> <td>< 50</td> <td>68</td> </tr> <tr> <td>TSS (mg/L)</td> <td>< 20</td> <td>9.0</td> </tr> <tr> <td>Ammonical Nitrogen (mg/L)</td> <td>< 5</td> <td>1.0</td> </tr> <tr> <td>Total Nitrogen (mg/L)</td> <td>< 10</td> <td>5.0</td> </tr> <tr> <td>Fecal Coliform (MPN/100 ml)</td> <td>Less than 100</td> <td>16 x 10³</td> </tr> </tbody> </table> <p>2. The results show that the treated sewage is not complying with the discharge standards with reference to COD and Fecal coliform.</p> <p>3. Pipeline and cascade aeration system to discharge treated wastewater to wetland of</p>	Parameter	Standard	Concentrations in treated wastewater at outlet of STP	pH@25°C	5.5-9.0	7.5	BOD (3days @ 27°C)(mg/L)	< 10	8.0	COD (mg/L)	< 50	68	TSS (mg/L)	< 20	9.0	Ammonical Nitrogen (mg/L)	< 5	1.0	Total Nitrogen (mg/L)	< 10	5.0	Fecal Coliform (MPN/100 ml)	Less than 100	16 x 10 ³
Parameter	Standard	Concentrations in treated wastewater at outlet of STP																								
pH@25°C	5.5-9.0	7.5																								
BOD (3days @ 27°C)(mg/L)	< 10	8.0																								
COD (mg/L)	< 50	68																								
TSS (mg/L)	< 20	9.0																								
Ammonical Nitrogen (mg/L)	< 5	1.0																								
Total Nitrogen (mg/L)	< 10	5.0																								
Fecal Coliform (MPN/100 ml)	Less than 100	16 x 10 ³																								

		<p>Ulsoor Lake are not installed.</p> <p>4. The flow meter is not installed at the outlet of the STP and the records of quantity of treated sewage discharged are not maintained.</p> <p><i>The recommendations of the committee are not complied.</i></p>
3	To propose and construct additional STP to treat additional 4200 KLD of domestic sewage generated from MEG and stop discharging untreated sewage into UGD in time bound manner.	<p>1. The additional STP for treating 4200 KLD of domestic sewage generated from MEG is not installed.</p> <p>2. As per the records furnished to the Joint Committee by M/s Garrison Engineer (North), the service provider to sewage disposal of MEG, Bengaluru, proposal for installing 600 KLD and 300 KLD STPs are initiated (Annexure 18).</p> <p><i>The recommendations of the committee are not complied.</i></p>

2.5 Status of measures implemented by Karnataka State Pollution Control Board

Sl	Suggestion of the Joint Committee in the report dt 10.08.2020	Measures implemented
1	To ensure the implementation of Notification No. FEE 316 EPC 2015, dated 19/01/2016 issued by Forest, Ecology & Environment Secretariat w.r.t. installation of STP and reuse of Treated Sewage.	1. As per the records of KSPCB there are 62 units of commercial complexes, residential apartments, hotels, industries, software companies, slaughter house, and health care establishments located in the catchment of Ulsoor Lake generating 3212 MLD of sewage and are mandated to install STPs to treat the sewage generated.

		<p>2. Out of 62 units, 37 units have installed individual STP/ETP to treat 60% of the wastewater generated in the catchment. The treated effluent is reused for secondary purposes. KSPCB is regularly monitoring STP /ETPs in 37 units.</p> <p>3. Remaining 25 units are discharging the untreated wastewater into UGD with the permission of BWSSB due to space constraints. KSPCB has issued letters to 25 units for installation of individual STPs (Annexure 19).</p> <p><i>The recommendations of the committee are partially complied.</i></p>
2	<p>Out of 62 units, only 37 units (59.67%) are provided with STP / ETP to treat the wastewater generated and the remaining units are permitted to discharge untreated wastewater in to UGD with a permission of BWSSB. KSPCB shall reinvestigate & take appropriate action to install STP/ETP in remaining 25 units, if applicable.</p>	<p>1. As per the records of KSPCB, out of 62 units, 25 units are established prior to notification dated 19/01/2016 and are discharging the untreated wastewater into BWSSB UGD. The same sewage/effluent is being treated in the STPs operated by BWSSB.</p> <p>2. KSPCB has issued letters to 25 units of commercial complexes, residential apartments, Hotels, industries, software companies, and health care establishments for installation of STP and reuse of the treated effluent (Annexure 20).</p> <p><i>The recommendations of the committee are partially complied.</i></p>

3.0 WATER QUALITY OF ULSOOR LAKE

The Karnataka State Pollution Control Board is monitoring Ulsoor Lake water quality every month under National Water Quality Monitoring Programme and the Board's Programme. The analysis reports of water samples collected during 01/04/2020 to 31/03/2021 are enclosed at Annexure 21. As per the report of KSPCB, the water quality of Ulsoor Lake conforms to designated-best-use classification Class "D" i.e. Water is fit for propagation of wildlife and fisheries and Class "E" i.e. Irrigation, Industrial Cooling, Controlled Waste disposal. In March 2021, dissolved oxygen level in the lake was in the range of 4.3 to 4.8 mg/L and was classified as Class "E". For propagation of wildlife and fisheries, required dissolved oxygen level is 4 mg/L.

The Joint Committee has carried out water quality monitoring of Ulsoor Lake at three locations on 28/07/2021. The samples are analysed at Central Laboratory, KSPCB and analysis reports are enclosed at Annexure 22. The water quality analysis results are as follow:

Water Quality Analysis Results of Ulsoor Lake				
Sl	Parameter	Concentrations		
		Location 1	Location 2	Location 3
1	pH at 25°C	8.5	8.3	8.5
2	EC µs/cm at 25° C	369	367	366
3	TSS mg/L at 103-105°C	70	68	72
4	TDS mg/L at 180°C	248	246	244
5	COD mg/L	164	160	168
6	BOD mg/L at 27°C, 3 days	15	15	16
7	Dissolved Oxygen, mg/L	4.2	4.1	4.4
8	Chloride, mg/L	68	56	56
9	Sulphates, mg/L	8.0	8.0	8.0
10	Phosphate as P, mg/l.	BDL	BDL	BDL
11	Nitrate as N, mg/L	3.5	3.36	3.38
12	Ammonia as N, mg/L	0.26	0.18	0.14
13	Total Coliform (MPN/100 ml)	5400	16 X10⁴	16 X10³
14	Fecal Coliform (MPN/100 ml)	410	110X10²	1500

Where,

Location 1 – Ulsoor lake – Near temple

Location 2 – Ulsoor lake – Near fishing centre

Location 3 – Ulsoor lake – Near Kalyani

The analysis results shows that the water quality of Ulsoor Lake confirms to designated-best-use classification Class "D" i.e. Water is fit for propagation of wildlife and fisheries i.e. pH: between 6.5 to 8.5, DO : ≥ 4 mg/L, and N : ≤ 1.2 mg/L.

The analysis results show that the water quality of Ulsoor lake has higher concentrations of BOD, COD, Total Coliform and Fecal Coliform. This indicates untreated/partially treated sewage is discharged to the lake. The water quality of the lake is not improved compared to the water quality during the earlier inspection of the Joint Committee in May, 2020.

4.0 OBSERVATIONS

On reviewing the status of implementation of the recommendations and suggestions in the Joint Committee report dt 10/08/2020, the following are observed:

1. As per the records of KSPCB, the water quality in Ulsoor Lake confirms to designated-best-use classification Class "D" and Class "E" and there is no improvement in the water quality of the lake.
2. The BWSSB has increased the present operational capacity of 2 MLD STP to 1.8 MLD capacity and augmentation of remaining 0.2 MLD capacity is in process. However, treated sewage at the outlet of the STP is not complying with the discharge standards. It has completed 34 works out of 36 works proposed and remaining 2 works are committed to complete before December 31, 2021. At present, implementation of 34 works has led to reduction of 15 MLD sewage discharged to storm water drain.
3. The BBMP is maintaining the lake regularly by removing the accumulated floating debris/solid waste, desilting of storm water drains and marshals are appointed to monitor and avoid disposal of solid waste into the storm water drains.
4. The screen at regular interval in primary and secondary drains, silt traps and cascading aerators are not installed.

5. The BBMP has not applied for renewal of consent for operation from KSPCB for operation of Slaughter House and 50 KLD ETP. The slaughter house and ETP are in operation since 30/06/2009 without valid consent for operation and also discharging partially treated effluent to storm water drain inspite of directions issued by KSPCB under the Water Act several times.
6. The Department of Fisheries has conducted the study on bioaccumulation of heavy metals in fish and furnished the report. It is reported that the heavy metal content in fish tissues are within the permissible limits.
7. Madras Engineering Group and Centre has not applied for Consent for Operation from KSPCB for operation of STP and to discharge treated sewage to storm water drain. The treated sewage is not complying with prescribed discharge standards prior to disposal. The KSPCB officials visited the site on 13/07/2021 to verify the status of implementation and compliance of STP. The Joint Committee members also visited the site on 28/07/2021 and informed MEG to obtain consent for operation. However, till date it has not applied for consent to operation for the STP operated by them.
8. The laying of pipeline to discharge treated sewage, installation of cascade aeration, flow meter and STP to treat additional 4200 KLD of domestic sewage are yet to be installed by Madras Engineering Groups and Centre, Bengaluru.
9. Out of 62 units located in the catchment of Ulsoor Lake, 37 units have installed individual STP/ETP to treat the wastewater generated, the treated effluent is reused for secondary purposes. The remaining 25 units are established prior to notification dated 19/01/2016 and are discharging the untreated wastewater in to BWSSB UGD with prior permission. The same sewage/effluent is being treated in the 2 MLD STP of BWSSB established at Ulsoor Lake premises.

5.0 Estimation of Environmental Compensation (EC)

Based on the observations, the Joint Committee estimated the environmental compensation for non-compliance of ETP operated by M/s BBMP Civil Slaughter House, 2 MLD STP operated by BWSSB and 100 KLD STP operated by MEG. The environmental compensation is estimated based on the pollution index method developed by

Central Pollution Control Board in the guidelines "Report of the CPCB in-house committee on methodology for assessing environmental compensation and action plan to utilize the fund".

The following equation is used for estimating environmental compensation:

$$EC = PI \times N \times R \times S \times LF$$

Where,

EC = Environmental Compensation in ₹

PI = Pollution Index of industrial sector

N = Number of days of violation took place

R = A factor in Rupees (₹) for EC

S = Factor for scale of operation

LF = Location factor

I. EC for non-compliance of the ETP of M/s Civil Slaughter house operated by BBMP at Tannery Road, Frazer Town, Bengaluru

M/s BBMP Civil Slaughter House and 50 KLD ETP in Tannery Road, Bengaluru is in operation since 30/06/2009 without valid consent for operation from KSPCB. BBMP is operating the slaughter house and the ETP. KSPCB has filed a criminal case in the Hon'ble High Court of Karnataka against the BBMP for noncompliance and issued directions dt 29/07/2017 and 25/06/2020. The KSPCB inspected the slaughter house on 16/06/2021 and observed that the effluent generated is partly diverted to ETP and remaining was bypassed through open drain to the BWSSB sewer. The treated effluent discharged from the ETP was also not complying the discharge standards. During inspection on 28/07/2021, the Joint Committee members observed that the ETP was not regularly operated and effluent was stored in the ETP.

In view of above, environmental compensation is calculated as follow:

i. Pollution Index of industrial sector (PI)

The Karnataka State Pollution Control Board has categorized slaughter house into RED category of industries and accordingly the consents are issued. For red category of industries, average pollution index is 80. Thus, PI is considered as 80 in the EC estimation for slaughter house.

ii. **Number of days of violation (N)**

The number of days for which violation took place is considered as the period between the day of violation observed and day of compliance verified by the committee. The Slaughter house and 50 KLD ETP are in operation since 30/06/2009 without valid consent for operation from KSPCB. During inspection by KSPCB on 29/07/2017, 25/06/2020 and 16/06/2021 it was observed that treated effluent was not meeting the discharge standards. During the joint committee inspection on 28/07/2021, ETP was not scientifically operated and effluent was stored in the ETP. In view of this, period of non-compliance is considered from 30/06/2009 to the date of hearing i.e 17/09/2021. Total number of days violation observed are 4459 days.

iii. **Scale of operation (S):**

As per the records of KSPCB, the M/s BBMP Civil Slaughter House is considered as medium scale. Thus, scale of operation (S) for EC estimation is considered as 1.0.

iv. **Location factor (LF):**

M/s BBMP Civil Slaughter House is located within Bengaluru city having population >10 Million. Thus location factor (LF) is considered as 2 for EC estimation.

v. **Factor in Rupees (R) (Rs):**

As per the environmental compensation estimation guidelines, factor of rupees may be minimum of Rs 100/- and maximum of Rs 500/-. In the guidelines it is suggested to consider R as Rs 250/- as environmental compensation in case of violation. As M/s BBMP Civil Slaughter House is consistently violating the discharge standards and has not obtained consent for operation since 2009, inspite of repeated directions, factor of rupees R is considered as Rs. 250/- for EC calculation.

Thus, the estimated environmental compensation is

$$EC (Rs) = 80 \times 250 \times 1.0 \times 2.0 \times 4459$$

$$EC (Rs) = 40,000 \times 4459$$

EC (Rs) = 17,83,60,000/- (Rupees Seventeen crores eighty three lakhs sixty thousand only)

2. EC for non-compliance of 2 MLD STP operated by BWSSB at Ulsoor Lake.

BWSSB is operating STP of 2 MLD at Ulsoor Lake and average operational capacity 1.84 MLD (Range - 1.7 to 1.9 MLD). KSPCB is monitoring the quality of treated sewage discharged from the outlet of the STP every month. The analysis results of the treated sewage collected from the STP on 01/03/2021, 01/04/2021, 03/05/2021 by KSPCB and during Joint Committee visit on 28/07/2021 show that the treated sewage is not complying with the discharge standards with reference to COD and Fecal coliform. Thus the EC is estimated as follow:

i. Pollution Index of industrial sector (PI)

The Karnataka State Pollution Control Board has categorized sewage treatment plants of capacity >100 KLD into Large scale and RED category and accordingly the consents are issued. For red category of industries, average pollution index is 80. Thus, PI is considered as 80 in the EC estimation for STP.

ii. Number of days of violation (N)

The earlier Joint Committee inspected the STP on 14/05/2020 and verified the compliance to the discharge standards. The analysis of the samples collected on 14/05/2020 showed that STP was complying with discharge standards except fecal coliform. Thus the date of first instance of noncompliance observed is considered as 14/05/2020. The period of non-compliance is considered from 14/05/2020 to the date of hearing i.e 17/09/2021. The number of days violation observed are 491 days.

iii. Scale of operation (S):

As per the records of KSPCB, the 2 MLD STP is considered as large scale. Thus, scale of operation (S) for EC estimation is considered as 1.5.

iv. Location factor (LF):

The STP is located within the Bengaluru city having population >10 Million. Thus location factor (LF) is considered as 2 for EC estimation.

v. **Factor in Rupees (R) (Rs):**

As per the environmental compensation estimation guidelines, factor of rupees may be minimum of Rs 100/- and maximum of Rs 500/-. In the guidelines it is suggested to consider R as Rs 250/-, as environmental compensation in case of violation. As treated effluent is not complying with the discharge standards with reference to COD and Fecal coliform, factor of rupees R is considered as Rs. 250/- for EC calculation.

Thus, the estimated environmental compensation is

$$EC (Rs) = 80 \times 250 \times 1.5 \times 2.0 \times 491$$

$$EC (Rs) = 60,000 \times 491$$

$$EC (Rs) = 2,94,60,000/- \text{ (Rupees Two crore ninety four lakhs sixty thousand only)}$$

3. **EC for non-compliance of 100 KLD STP operated by MEG & C**

Based on the water consumption data, the Joint Committee in its report dt 10/08/2020 estimate that 4300 KLD of sewage is generated in Madras Engineering Group and Centre campus. Out of this 100 KLD is treated in the STP installed by Madras Engineering Group and Centre and remaining 4.2 MLD is discharged to UGD system installed by BWSSB. Treated sewage from STP is discharged to the storm water drain. MEG has not applied for Consent for Establishment and Consent for Operation from KSPCB for installation and operation of STP and discharging of treated sewage. The STP is operated without valid consent. During the Joint Committee inspection on 14/05/2020, it was observed that treated sewage was not complying the discharge standards with reference to BOD, COD, Ammonia and fecal coliform. During the Joint Committee inspection on 28/07/2021, again it was observed that treated sewage was not complying with the discharge standards with reference to COD and Fecal coliform. Thus the EC is estimated as follow:

i. **Pollution Index of industrial sector (PI)**

The Karnataka State Pollution Control Board has categorized of sewage treatment plants of capacity >100 KLD into Large scale and RED category and accordingly the consents are issued. For red category of industries, average pollution index is 80. Thus, PI is considered as 80 in the EC estimation for STP.

ii. **Number of days of violation (N)**

The number of days for which violation took place is considered as the period between the day of violation observed and day of compliance verified by the committee. The earlier Joint Committee inspected the STP on 14/05/2020 and verified the compliance to the discharge standards. The analysis of the samples collected on 14/05/2020 showed that STP was not complying with discharge standards with reference to BOD, COD, Ammonia and fecal coliform. Thus the date of first instance of noncompliance observed is considered as 14/05/2020. The period of non-compliance is considered from 14/05/2020 to the date of hearing i.e 17/09/2021. The number of days violation observed is 491 days.

iii. **Scale of operation (S):**

As per the records of KSPCB, the 100 KLD STP is considered as large scale. Thus, scale of operation (S) for EC estimation is considered as 1.5.

iv. **Location factor (LF):**

The STP is located within the Bengaluru city having population >10 Million. Thus location factor (LF) is considered as 2 for EC estimation.

v. **Factor in Rupees (R) (Rs):**

As per the environmental compensation estimation guidelines, factor of rupees may be minimum of Rs 100/- and maximum of Rs 500/-. In the guidelines it is suggested to consider R as Rs 250/-, as environmental compensation in case of violation. As treated effluent is not complying with the discharge standards with reference to COD and Fecal coliform, factor of rupees R is considered as Rs. 250/- for EC calculation.

Thus, the estimated environmental compensation is

$$EC (Rs) = 80 \times 250 \times 1.5 \times 2.0 \times 491$$

$$EC (Rs) = 60,000 \times 491$$

$$EC (Rs) = 2,94,60,000/- \text{ (Rupees Two crore ninety four lakhs sixty thousand only)}$$

6.0 RECOMMENDATIONS

It is observed that the recommendations and suggestions made in the Joint Committee report dt 10/08/2020 are partially implemented by the respective Authorities and the lake water quality is yet to be improved. In view of above, the following are recommended:

1. The environment compensation of following amount may be imposed on BBMP, BWSSB and MEG:


1.	BBMP: For operating Civil Slaughter House Tannery Road, Bengaluru and ETP without valid consent and non-compliance of the discharge standards	Rs. 17,83,60,000 /- (Rupees Seventeen crores eighty three lakhs sixty thousand only)
2.	BWSSB: For non-compliance of the discharge standards in 2 MLD STP operated at Ulsoor Lake by BWSSB	Rs. 2,94,60,000/- (Rupees Two crore ninety four lakhs sixty thousand only)
3.	Madras Engineering Group and Centre: For non-compliance of the discharge standards in 100 KLD STP operated by MEG	Rs. 2,94,60,000/- (Rupees Two crore ninety four lakhs sixty thousand only)

2. The Bengaluru Water Supply and Sewerage Board, Bruhat Bengaluru Mahanagara Palike, Department of Fisheries, Madras Engineering Group and Centre and Karnataka State Pollution Control Board shall implement all the recommendations and suggestions of the Joint Committee dt 10/08/2020 in time bound manner.
3. The BBMP shall apply for renewal of Consent for Operation from KSPCB for operation of Slaughter House and 50 KLD ETP on priority and comply with the prescribed standards prior to disposal of effluent.
4. Madras Engineering Group and Centre, Bengaluru shall apply for Consent for Operation from KSPCB for operation of existing STP and to construct an


additional STP to treat additional 1200 KLD of sewage generated from Madhu Engineering Groups and Centre, Bengaluru, in time bound manner.

- > The KSPCB shall regularly monitor the compliance of ETPs and STPs operating in the catchment of Ulsoor Lake and ensure compliance.


Smt. Sowmya D
Secretary
KSPCB


Sh. B.S. Murulidhara
Senior Environmental Officer
KSPCB

Sh. K. Ravi
Executive Engineer (Water)
BBMP


Sh. Balakrishna, KAS
Tahsildar - Bengaluru North
DC Office Bengaluru Urban

PHOTOGRAPHS



Figure 1: Flow measurement at storm water drain C-100 downstream of Ulsoor Lake



Figure 2: Flow at storm water drain C-100 downstream of Ulsoor Lake

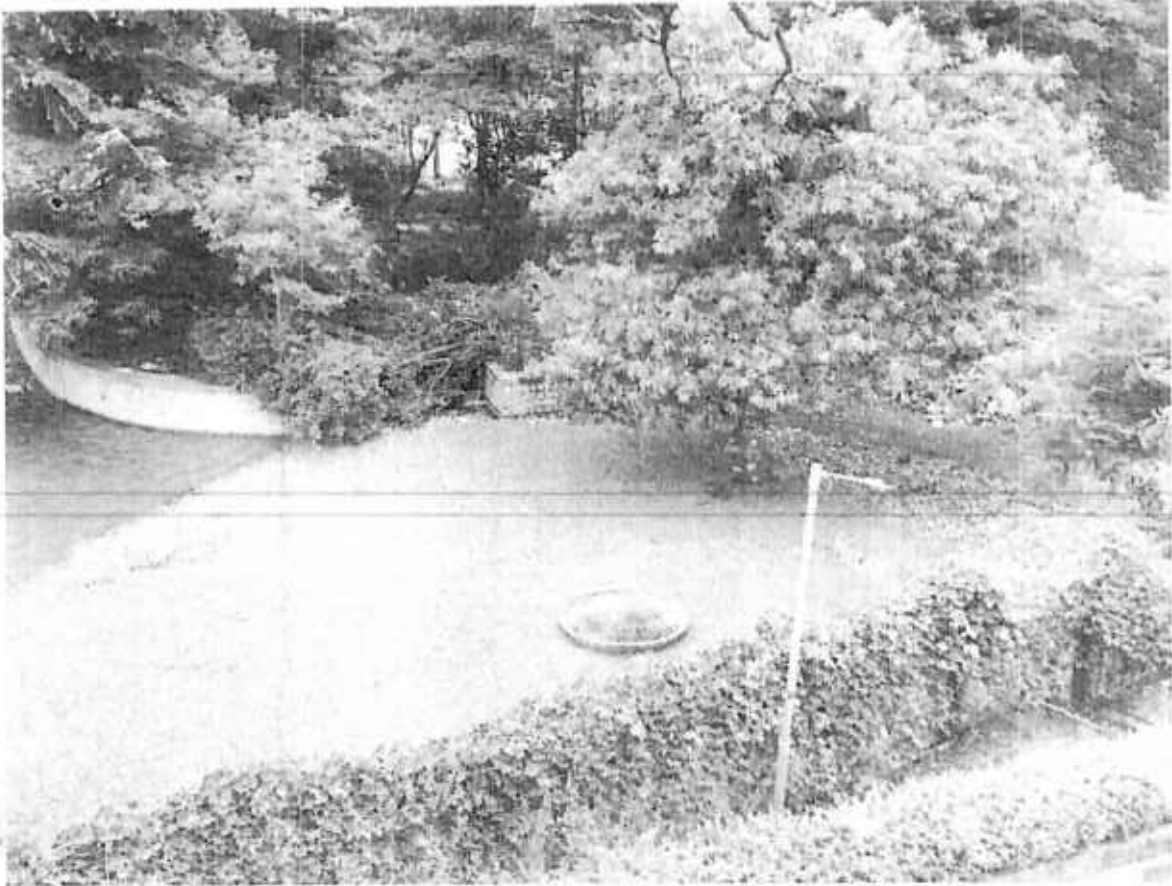


Figure 3: Floating debris in wetland near STP



Figure 4: Floating debris in wetland near STP



Figure 5: Screen installed by BBMP at inlet of wetland in Ulsoor Lake



Figure 6: Debris collected at the screen installed at inlet of Ulsoor Lake

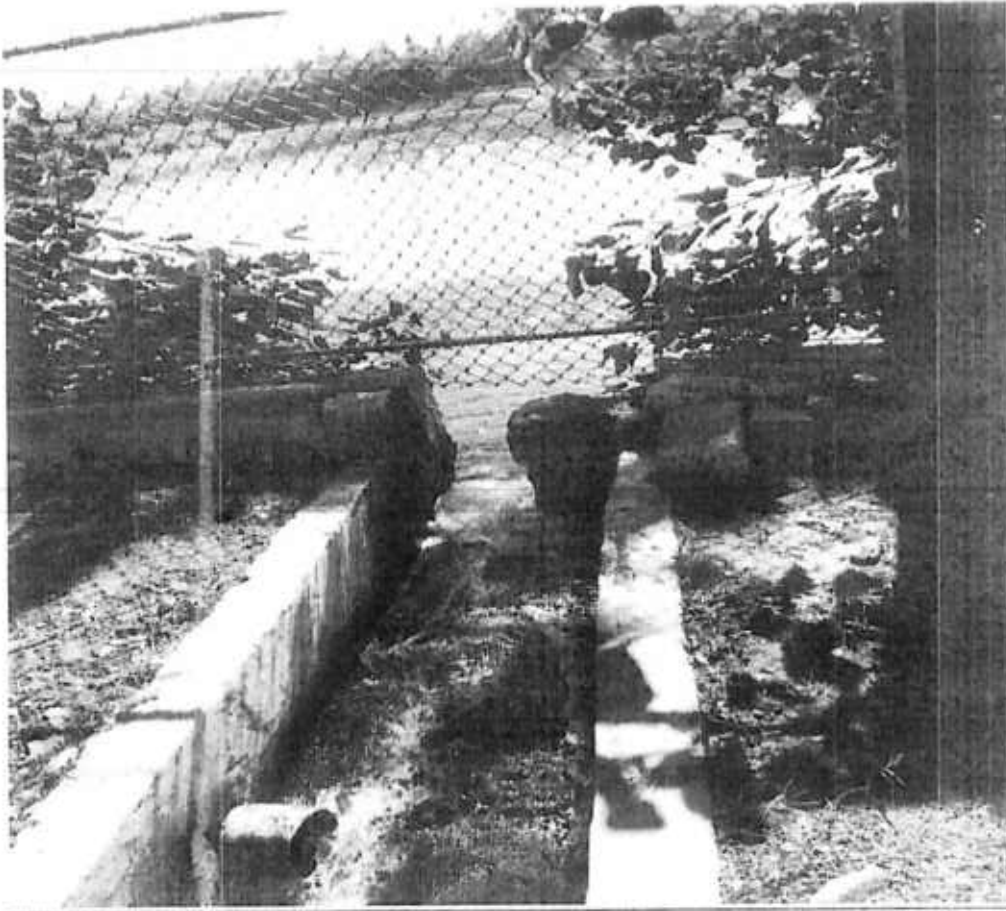


Figure 7: Treated wastewater disposed from BWSSB STP to wetland



Figure 8: ETP at Slaughter house operated by BBMP

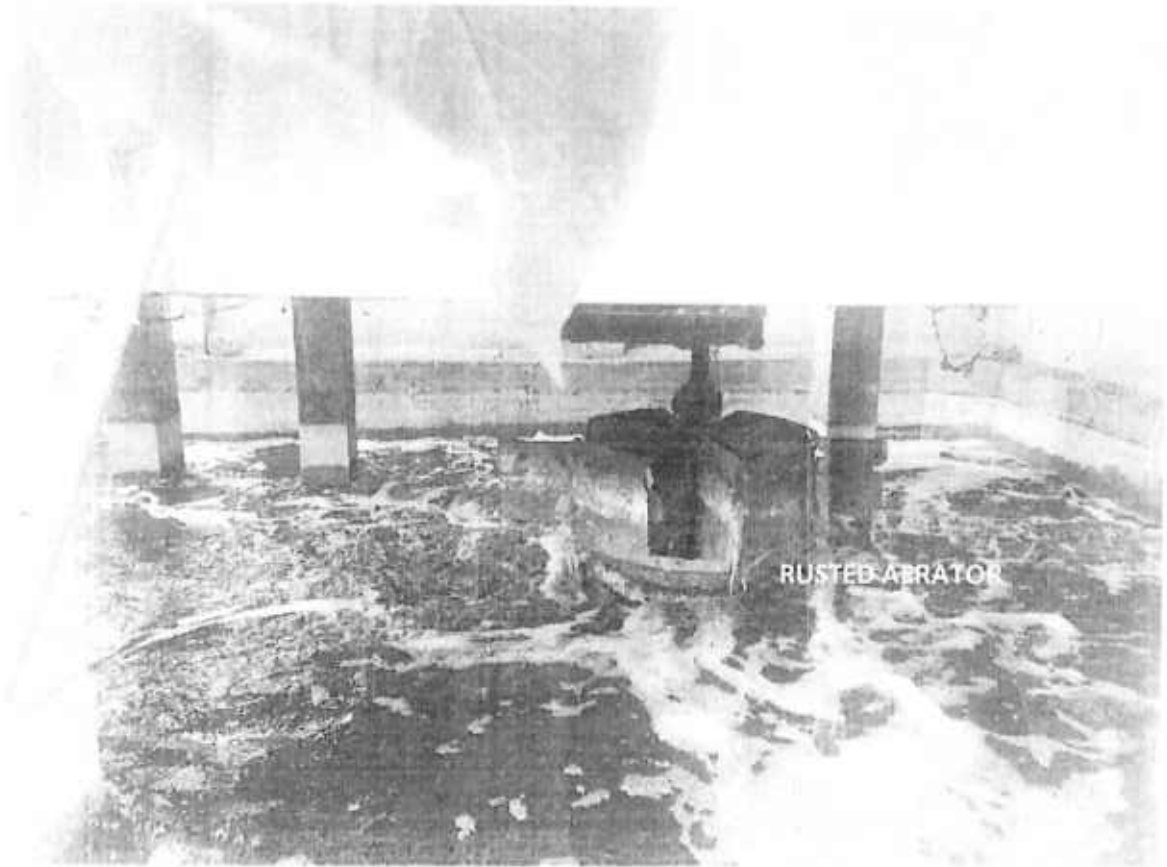


Figure 9: Rusted aerator at Slaughter house ETP operated by BBMP

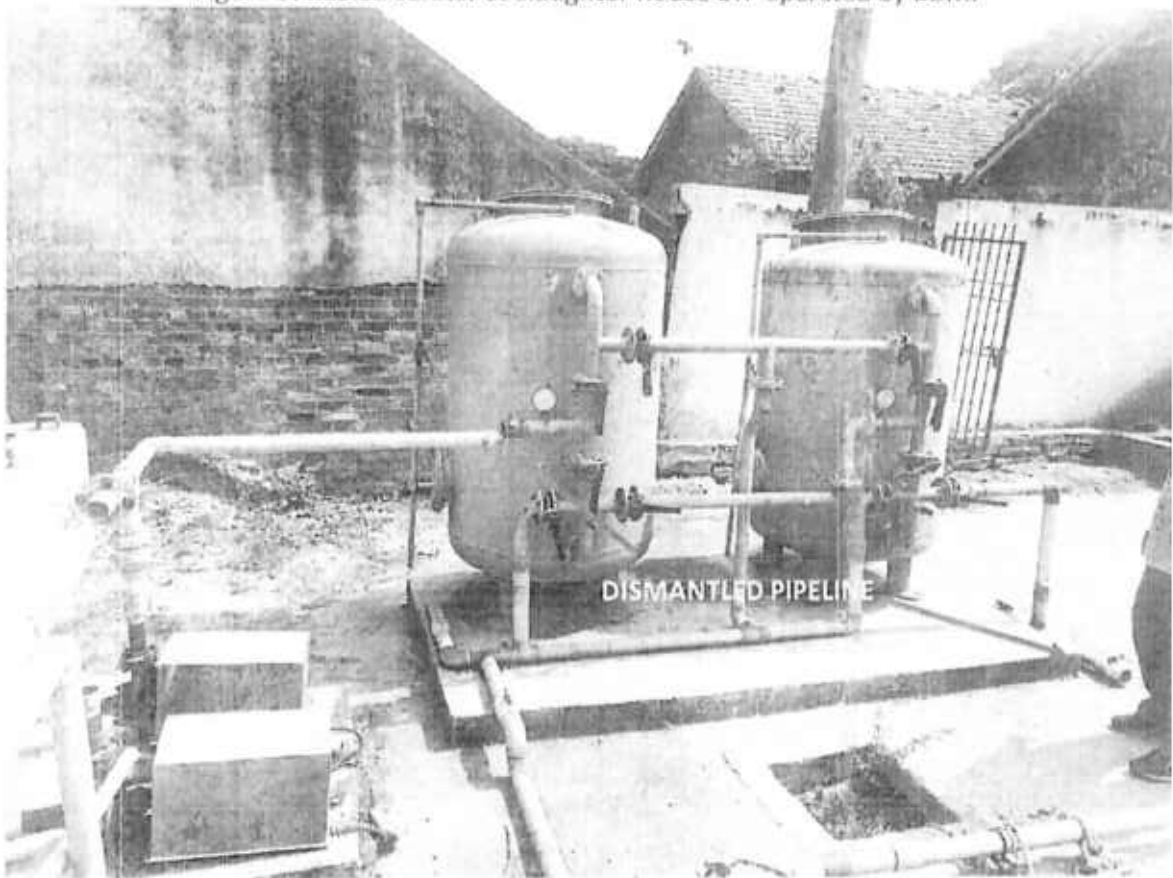


Figure 10: Pipeline connecting to filtration system dismantled at Slaughter house ETP