BEFORE THE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

Original Application No. 324 of 2021

IN THE MATER OF:

In re : News item published on 21.11.2021 in the Indian Ex press titled "Lakes of Bengaluru : Industrial effluents, raw sewage; stinky tale of Chandrapura lake"

Date of Hearing 10.10.2022.

INDEX

New Delhi

Date 08/10/2022

Filled By :-

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BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
O.A. NO. 324/2021

IN THE MATTER OF:

In re: News item published on 21.11.2021 in the Indian Express titled "Lakes of Bengaluru: Industrial effluents, raw sewage; stinky tale of Chandrapura lake"

REPORT ON BEHALF OF THE CHIEF SECRETARY, GOVERNMENT OF KARNATAKA IN COMPLIANCE TO THIS HON'BLE TRIBUNAL'S ORDER DATED 29.03.2022

MOST RESPECTFULLY SHOWETH:

1. That vide order dated 26.11.2021, this Hon'ble Tribunal took *suo moto* cognizance of the present matter, based on an article titled *"Lakes of Bengaluru: Industrial effluents, raw sewage; stinky tale of Chandrapura lake"* published in the English Daily the Indian Express, on 21.11.2021.

2. That vide order dated 29.03.2022 in the present matter, this Hon'ble Tribunal directed *inter alia* as follows:

> *"Accordingly, we direct the Chief Secretary, Karnataka to forth with hold a meeting with the concerned authorities particularly the District Magistrates, Bengaluru Urban, KIADB, State Wetland Authority, Karnataka State PCB and the Environment Department. In the said meeting outline of action plan be discussed which may be finalised within one month with the assistance of such experts / institutions as may be*

identified with a view to ensure rehabilitation of the lake in time bound manner. Action to be taken may include removal of encroachments, closing the sources of pollution and fixing accountability for the past violations on 'Polluter Pays' principle and also by way of prosecution / other coercive action."

3. That accordingly, on 06.07.2022, a meeting was Convened by the Chief Secretary to the Government of Karnataka, which was attended by the following officials among other:

- The Additional Chief Secretary to Government, Forest, Ecology and Environment Department
- The Principal Secretary to Government (Ecology and Environment), Forest, Ecology and Environment Department
- The Secretary to Government, Minor Irrigation Department
- The Regional Director, Central Pollution Control Board, Bengaluru
- The Chief Executive Officer, Karnataka Industrial Area Development Board
- The District Commissioner, Bengaluru Urban District
- The Member Secretary, Karnataka Bio-diversity Board and Karnataka State Wetland Authority
- Dr. Lakshminarayana Rao, Director, Indian Institute of Science, Bengaluru
- The Member Secretary, Karnataka State Pollution Control Board, Bengaluru

4. It is respectfully submitted that the name of the lake in question is erroneously mentioned in the Newspaper report dated 21-11-2021 as Chandrapura Lake, the correct name of the lake is Chandapura lake.

5. That during the said meeting, in order to carry out the suggestions of the Joint Committee Report dated 24.03.2022, the Chief Secretary gave the following directions to various authorities responsible for the maintenance of the lake in question:

Directions given by the Chief Secretary to the Urban Local Bodies in Catchment Area of Chandapura Lake including the District Magistrate, Bangalore Urban –

(a) Direction to the District Magistrate, Bangalore Urban to carry out mapping in Chandapura lake catchment area to identify all drains carrying mixed effluents and entering the lake within one week of time;

(b) Direction to KUWSDB to divert Nala/ Stop entry of sewage to Chandapura Lake;

(c) Directed the Scientist, IISc to submit a detailed report on use of cost effective methods to reduce pollution in the lake;

(d) Direction to the DC & the KSPCB to co-ordinate with the said Scientist and install a demonstration unit near the lake;

(e) Direction to the Department of Urban Development to submit details *qua* details of Government Land required for Solid Waste Management;

Directions given by the Chief Secretary to the Karnataka Industrial Area Development Board ('*KIADB*')

(a) Direction to KIADB to submit an Action plan;

(b) Direction to KIADB to ensure setting up of CETPs in all industrial areas.

Direction given by the Chief Secretary to the Karnataka State Pollution Control Board ('*KSPCB*')

(a) Direction to KSPCB to issue orders for stoppage of production activities for Industries without functional ETPs to which KSPCB informed that such direction had already been issued.

(b) Direction to KSPCB to have Environmental Audit conducted for industries situated in the catchment of the lake to which KSPCB informed that RV College of Engineering, Bengaluru had already been identified to conduct the Environmental Audit.

(c) Direction to KSPCB for collection of samples from the drains leading to the lake for forensic analysis to which KSPCB informed that samples had been

collected and are being collected from drains leading to the lake.

(d) Direction to KSPCB to conduct awareness program with regard to treatment of effluent and sewage management.

Directions given by the Chief Secretary to the State Wetland Authority –

(a) Direction to the Karnataka Tank Conservation and Management Authority to submit an action plan *qua* conservation of the lake as envisaged under Wetland Rules, 2017.

6. The minutes of the meeting dated 06.07.2022 are annexed here to as **Annexure R-1.**

7. That following the directions furnished by the Chief Secretary, an action plan was prepared by the Deputy Commissioner, Bangalore Urban District. The same has also been filed before this Hon'ble Tribunal on 01.08.2022.

The action plan notes the following to be carried out by the Deputy Commissioner:

8. That the map of Chandapura lake catchment area and flow details of natural drains have been obtained from

Karnataka State Remote Sensing Application Centre (KSRSAC). It is stated that the total station survey of Chandapura lake catchment area is under process by the Deputy Director of Land Records. The mapping as per the directions by Hon'ble NGT will be completed by 30.10.2022.

9. That the ULBs in the catchment areas of Chandapura lake such as Hebbagaodi CMC, Jigani TMC, Bommasandra TMC and Chandapura TMC have been directed to take immediate steps to stop the discharge of untreated effluents into the drains joining Chandapura lake through other intermediate lakes. That the Office of the Deputy Commissioner has contacted an expert from IISc Bangalore, namely Professor Lakshminarayan for guidance and to start Inline Water Treatment in the drains carrying untreated water into Chandapura lake. It is stated that awareness programs have been conducted for the staff and elected representatives of ULBs on 19.09.2022. Further Deputy Commissioner Bangalore Urban district has given permission on 14.09.2022 to Minor Irrigation Department to treat polluted water entering into

Chandapura Lake through Wetland Treatment method. The work is likely to be completed by March 2023.

10. Regarding treatment of polluted water of other lakes in the catchment area of Chandapura lake, it has been stated that 4 ULBs which are in Chandapura lake catchment have been instructed to take action to control the discharge of sewage/effluent directly into the lake.

    Kittaganahalli lake of Bommasandra TMC is developed by Bommasandra Industrial Area Association under CSR fund. It is further stated that the DPR for rejuvenation of Kammasandra lake of Hebbagodi CMC has been submitted to Karnataka Tank Conservation and Development Authority (KTCDA) for approval. M/s CDD India will take up the rejuvenation work after approval from KTCDA. In the same manner the DPR's for rejuvenation of other lakes in Chandapura lake catchment area will also be taken up with CSR funds of private companies/Government grants.

11. As a permanent solution to keep the lakes contamination free, the DPRs for implementation of UGD system of Hebbagodi CMC of around Rs. 153

crores, and for Bommasandra TMC of around Rs. 109 crores have been submitted to Government for consideration.

12. It is further stated therein that water samples of borewells in the ULBs are being tested for potability of drinking water status. 415 number of borewells have been already tested and remaining 109 borewells samples will be tested by 30.11.2022.

13. It is submitted therein that Lands have been identified and allotted to all four ULBs in the catchment area of the Chandapura lake for establishing SWM plants. It is further stated therein that all the four ULB's are having MOU with Sahas Zero Waste Management Pvt. Ltd. for disposal of dry waste. Further, bio medical waste is being given for disposal to Maridi Bio Industries Pvt. Ltd. The action plan further provides that for wet waste, Action Plans for 3 Biomethanisation plants of a capacity of 2 tonnes per day for Rs.60 Lakhs each have been approved for Hebbagodi CMC, Jigani and Chandapura TMCs and that the said plants will be operational by December 2022. A vermicomposting unit is being established in Bommasandra TMC which will be

operational by February 2023. True Copy of the Action Plan submitted by the Deputy Commissioner, Bangalore Urban is annexed hereto as **Annexure R-2.**

The following has been submitted by the KSPCB vide its Action Plan for the Rejuvenation of Chandapura Lake:

14. The Karnataka State Pollution Control Board has filed an action plan following the directions furnished to it during the meeting dated 06.07.2022.

15. It has been stated that the KSPCB has not accorded permission to any industry having captive ETP to discharge its effluents into the CETP.

16. It has been stated that KSPCB has engaged RV College of Engineering, Bangalore to conduct Environmental Audit of all the industries existing in the catchment area of Chandapura Lake.

17. It has been stated by the KSPCB that the Regional Officers have been directed to collect samples from the drains leading to Chandapura lake for the Forensic analysis / trace pollutant studies which are under process. It is submitted that sample collection and

evidencing the samples is a continuous process and the same is being carried out by KSPCB.

18. Regarding the samples already collected, for which the analysis reports have been received, reports are enclosed with the Action Plan submitted by KSPCB.

19. It is further submitted that KSPCB has approved the issuance of closure directions to 17 industries located in the catchment area of Chandapura lake.

20. It is stated in the Action Plan that KSPCB has already developed e-manifest and the same is in use for the industries which are linked with various CETPs in Veerasandra Industrial Area, coming under the catchment area of Chandapura lake. It is stated that a strict vigilance on the movement of vehicles carrying the trade effluent is being maintained by engaging Marshals in the area.

21. It is further mentioned that an awareness program on alternate technologies such as wetland treatment has been organized in association with IISc Bengaluru with the elected representatives of four ULBs namely Jigani, Bommasandra, Chandapura and Hebbagodi coming

under the catchment area of Chandapura lake on 19.09.2022.

22. True copy of the Action Plan submitted by the Karnataka State Pollution Control Board dated 05.09.2022 is annexed hereto as **Annexure R-3.**

The following has been stated in compliance report submitted by KIADB:

23. The Karnataka Industrial Area Development Board ('***KIADB***') has provided a compliance report, following the meeting held on 06.07.2022.

24. To carry out the mapping of drainage network and for exploring the possibility for establishing Common Effluent Treatment Plant (CETP) within the industrial areas of Chandapura lake catchment, KIADB has issued the work order to M/S Eco Green Solutions Systems Pvt Ltd on 14-07-2022. The consultants M/S Eco Green Solutions Systems Pvt Ltd have submitted the report comprising the drainage map, developed map of industrial areas, land use and land cover map of the area in the catchment of Chandapura lake.

25. Major industries of Jigani, Jigani-Bommasandra link road and Veerasandra Industrial Estates are having their own ETP facilities. Small industries have been directed to convey their trade effluents to CETPs either in the same industrial area or to CETPs located nearby and the same is monitored regularly.

26. True copy of the Compliance Report submitted by the Karnataka Industrial Area Development Board is annexed hereto as **Annexure R-4.**

The following has been submitted by the Karnataka Tank Conservation and Development Authority in its Report:

27. It has been submitted by Karnataka Tank Conservation and Development Authority (‘***KTCDA***’) that Chandapura lake comes under the administrative control of Chandapura Town Municipal Council. It is stated that a Lift Irrigation Project is being implemented by the MINOR IRRIGATION Department to fill up 69 tanks in

Anekal taluk. The said Lift Irrigation Project is on trial run from April 2022. The Secondary treated water pumped from Bellandur STP reaches to Ghattahalli Bommanakere tank through rising main pipe. The Secondary treated water flows to Muthanallur tank by gravity. It is found that the water quality at Muthanallur tank pumped from STP meets the guidelines issued by the Hon'ble National Green Tribunal.

28. The said authority has also reiterated that upon coming to know the contamination of some lakes which were contemplated to be filled by the Lift Irrigation Scheme, it was observed that polluted water from Chandapura lake is letting out into the Muthanallur tank without treatment. Owing to the above, officials from the KTCDA inspected the tanks and have tested water for quality parameters. Upon testing it was observed that out of 35 parameters only three parameters are beyond the permissible limits and have recommended that the water which is being let into Muthanallur tank from Chandapura lake can be treated using wet land treatment process which is eco-friendly.

29. It has been stated that orders have been issued from Minor Irrigation Department to take up the work on DBOT method, for "Providing Natural Treatment arrangements for untreated water of Chandapura tank". True copy of Government letter along with copy of the Report filed by the Karnataka Tank Conservation and Development Authority is annexed hereto as **Annexure R-5.**

30. In view of the above, it is hereby reiterated that the Chief Secretary in compliance with this Hon'ble Tribunal's directions has convened a meeting and has issued various directions to the authorities, which have in turn prepared action plans and are carrying out the execution of action plans to ensure rejuvenation of Chandapura Lake. In view of the same, it is humbly prayed that the present Original Application may be disposed of.

Chief Secretary
Government of Karnataka

VANDITA SHARMA
Chief Secretary

Annexure R-1

(167)

Proceedings of the Meeting regarding O.A. No. 324 of 2021 of Hon'ble NGT scheduled on 06.07.2022 at 11:00 AM headed by the Chief Secretary to Government

PRESENT:

1) The Chief Secretary to Government.
2) The Additional Chief Secretary to Government, Forest, Ecology and Environment Department.
3) The Principal Secretary to Government (Ecology and Environment), Forest, Ecology and Environment Department
4) The Secretary to Government, Minor Irrigation Department
5) The Regional Director, Central Pollution Control Board, Bengaluru.
6) The Chief Executive Officer, Karnataka Industrial Area Development Board
7) The District Commissioner, Bengaluru Urban District
8) The Member Secretary, Karnataka Bio-diversity Board and Karnataka State Wetland Authority
9) Dr. Lakshminarayana Rao, Director, Indian Institute of Science, Bengaluru.
10) The Member Secretary, Karnataka State Pollution Control Board, Bengaluru.

The Principal Secretary to Government, Forest, Ecology & Environment Department welcomed all the Officers present in the meeting.

~~Further,~~ The Additional Chief Secretary to Government, Forest, Ecology & Environment (FEE), GoK briefed about the status of the case and directions given by the Hon'ble NGT in the matter of O.A. No. 324 of 2021.

Hon'ble NGT, Principal Bench, New Delhi registered Suo-moto in the Matter of O.A. No. 324 of 2021 on the basis of News item published on 21.11.2021 in the Indian express titled 'Lakes of Bengaluru: Industrial effluents, raw Sewage: stinky tale of Chandrapura lake'' wherein it was reported that the condition of the Chandrapura lake has worsened due to encroachment, dumping of sewage and industrial effluents. The report mentions that the buffer zone of lake has been encroached upon and waste is being dumped into the lake which is an ancient one.

Hon'ble NGT vide its order dated 26.11.2021, constituted a seven member Joint Committee comprising of members of Central pollution control board, Karnataka State Pollution Control Board, Indian Institute of Science, Bengaluru, Karnataka State Environment Impact Assessment Authority, National Wetland Authority and District Magistrate, Bengaluru. The Nodal agency for coordination and compliance will be CPCB and the State PCB.

Accordingly, field visits are undertaken and committee observed that there is a clear indication of both sewage and industrial contamination in the lakes and drains. However, detailed investigations required to be carried out to identify the defaulters.

In this regard recommendations are suggested by the Joint Committee to the concerned authorities / stakeholders.

Further, The Hon'ble NGT during the hearing on 29.03.2022, noted from the Joint Committee report that water of the lake is being polluted by different sources, including the sewage and industrial pollution, particularly effluents from pharma industries. According to the Committee, the trade effluents could be from M/s. Kumar Organic Products Ltd. There is concentration of COD and also Zinc and other heavy metals.

The Hon'ble NGT opined that remedial action is required promptly and sternly including making law violators and erring officers accountable for breach of law to the detriment of public health and environment which has to be taken seriously. ***Further, it has been directed that the Chief Secretary, Karnataka to forthwith hold a meeting with the concerned authorities particularly the District Magistrates, Bengaluru Urban, KIADB, State Wetland Authority, Karnataka State PCB and the Environment Department to outline action plan be which may be discussed and finalised with the assistance of such experts/institutions as may be identified with a view to ensure rehabilitation of the lake in time bound manner.***

The Hon'ble NGT further directed that an action taken report mentioning the compliance status as on 30.06.2022 shall be filed by e-mail by 15.07.2022. The O.A. No. 324/2021 has been listed for further consideration on 03.08.2022.

In this regard the Chief Secretary to Government, Karnataka discussed the matter with the officers present in the meeting and also perused the suggestion given by the Joint Committee and after discussion directed the concerned authorities to submit point wise action taken report before 12th July 2022.

1) **District Magistrate (Bengaluru urban) and local bodies in the catchment of Chandrapura lake:**

Sl No	Suggestions	Action
1.	To carry out mapping in Chandrapura lake catchment area to identify all drains carrying mixed effluents and entering the lake	Directed the concerned Officer to carry out mapping in Chandrapura lake catchment area to identify all drains carrying mixed effluents and entering the lake within one week of time.
2.	To take immediate steps to control the discharge of untreated effluents into the drains.	Directed the KUWSB to divert nala / stop entry of sewage to Chandrapura lake

3.	Alternative technologies or any other sustainable technologies shall be explored immediately on priority, based on the feasibility with respect to field conditions.	The Scientist from IISc has suggested cost effective methods to reduce the pollution load. The Chief Secretary to Government directed the Scientist, IISc & Scientist, CPCB to submit detailed report in this regard. The Chief Secretary to Government also directed the DC & KSPCB to co-ordinate with the concerned and install demonstration unit near the Chandrapura lake.
4.	To prepare time bound short- and long-term action plans for rejuvenation of the lakes in the catchment area.	DC, Bangalore urban/ has brought to the notice of the Chair that proposal with the cost of Rs. 21 lakh has already been prepared and submitted for approval.
5.	To ensure the treatment and conformity to the drinking water standards of bore well water before supplying it for drinking purposes, since some of the bore wells are having a high concentration of Nitrates, NH3, SO4 and/or hardness.	Scientist from IISc informed to the Chair that the water samples were collected from borewell, as per results these borewells were contaminated with faecal coliforms (*Escherichia coli*) & high concentration of Nitrate, NH3, SO4 which is not suitable for drinking (potable) purpose. In this regard the Chief Secretary directed to take corrective measures.
6.	To explore decentralized composting methods for treatment of municipal solid waste	The Chief Secretary directed Urban Development Department to submit details of Government land required for Solid Waste Management (SWM).

2) **Karnataka Industrial Area Development Board:**

1.	To carry out the mapping of drainage network for industrial and submit the report to Hon'ble Tribunal	The Chief Secretary directed to submit the action plan within One week. KIADB officials agreed to submit drainage network for industrial units.
2.	To explore the possibilities of construction of CETPs within industrial estates with tamperproof and	The Chief Secretary directed KIADB to ensure that CETPs are set up in all industrial areas.

	closed conduct system for Pumping of trade effluents with individual online flow meters. This will help in tracking the records on quantity of effluents being sent to CETPs and identify the illegal discharges if any.	

3) **Karnataka State Pollution Control Board :**

1.	Not to accord permissions to industries (having ETPs) to send their trade effluents to CETP. KSPCB shall direct such industries to stop their productions till their ETPs made functional.	The officials of the KSPCB informed the chair that direction has already been issued to stop the production activities.
2.	To conduct Environmental audit of all industries in the catchment area through reputed institutes such as IISc, IITs, and/or NEERI in order to keep strict vigilance, since the Jigani Industrial Area is declared as Critically Polluted Area under *CEPI*.	It is informed that KSPCB has already identified RV College of Engineering, Bengaluru to conduct Environmental audit. The Chief Secretary directed to submit the Report within 15 days.
3.	To carryout environmental forensic analysis /pollutant tracer studies at all the drains connected to industrial estates in the catchment area	Environment Officer, Anekal informed the Chair that they have already collected samples from drains which are leading to Chandrapur lake. The Chief Secretary directed to submit forensic report within one week.
4.	To develop the e-manifest system for discharging of trade effluents from industries to CETPs with GPS tracking system in all the vehicles carrying trade effluents	KSPCB has already developed e-manifest system and is in use for the industries which are linked with all CETPs also in Veerasandra industrial area coming under the catchment area of Chandapura Lake. A strict vigilance on the movement of vehicles carrying the

		trade effluent is being maintained by engaging Marshals in the area.
5.	To issue directions to local bodies to expedite alternative/ decentralized treatment technologies for sewage treatment till the establishment and functioning of STPs.	It is brought to the notice of the meeting that notices have already been issued from KSPCB. The Chief Secretary directed to conduct awareness program with regard to treatment of effluent and sewage management.

4) **Karnataka State wetlands authority:**

1.	To ensure protection of wetlands (>2.25 hectare) as per Rule 4 of the Wetlands Rules, 2017, in general and Chandrapura lake. in specific, on top priority, in compliance to the direction of Hon'ble Supreme Court.	The Secretary, Minor Irrigation Department remained absent for the meeting. The Chief Secretary directed the Minor Irrigation Department and MD, Karnataka Tank Conservation and Development Authority to submit the action plan within One week.
2.	To take requisite actions as envisaged under the Wetlands Rules, 2017, in general and for Chandrapura lake, in specific	
3.	To consider notification of Chandrapura lake under the Wetlands Rules, 2017.	

On this note, meeting concluded with vote of thanks.

(**Vandita Sharma**)
Chief Secretary to Government
of Karnataka.

ANNEXURE – R2

Hon'ble National Green Tribunal, principal Bench, New Delhi in its Original Application No. 324/2021. Related to Chandapura Lake of Chandapura TMC limits has constituted a technical committee. On 06.07.2022 committee under the Chairmanship of Chief Secretary, Government of Karnataka has given directions to submit Action Plan to control the discharge of effluents into the drains connecting Chandapura lake. The ULBs coming under the catchment area of Chandapura lake such as Hebbagodi CMC, Bommasandra TMC, Jigani TMC and Chandapura TMC have prepared an action plan as per directions of Technical Committee Recommendation as mentioned below.

1.	To carryout mapping in Chandapura lake catchment area to identify all drains carrying mixed effluents and entering the lake.	That the map of Chandapura lake catchment area and flow details of natural drains have been obtained from Karnataka State Remote Sensing Application Centre (KSRSAC). It is stated that the total station survey of Chandapura lake catchment area is under process by the Deputy Director of Land Records. The mapping as per the directions by Hon'ble NGT will be completed by 30.10.2022.
2	To take immediate steps to control the discharge of untreated effluents into the drains.	That the ULBs in the catchment areas of Chandapura lake such as Hebbagaodi CMC, Jigani TMC, Bommasandra TMC and Chandapura TMC have been directed to take immediate steps to stop the discharge of untreated effluents in to the drains joining Chandapura lake through other intermediate lakes. That the Office of the Deputy Commissioner has contacted an expert from IISC Bangalore, namely Professor Lakshminarayan for guidance and to start Inline Water Treatment in the drains carrying untreated water into Chandapura lake. It is stated that awareness programs have been conducted for the staff and elected representatives of ULBs on 19.09.2022. Further Deputy Commissioner Bangalore Urban district has given permission on 14.09.2022 to Minor Irrigation Department to treat polluted water entering into Chandapura Lake through Wetland Treatment method. The work is likely to be completed by March 2023.
3	Alternative technologies or any other sustainable technologies shall be explored immediately on priority, based on the feasibility with respect to field conditions.	
4	To prepare time bound short- and long-term action plans for rejuvenation of the lakes in the catchment area.	Regarding treatment of polluted water of other lakes in the catchment area of Chandapura lake, it has been stated that 4 ULBs which are in Chandapura lake catchment have been instructed to take action to control the discharge of sewage/effluent directly into the lake. Kittaganahalli lake of Bommasandra TMC is developed by Bommasandra Industrial Area Association under CSR fund. It is further stated that the DPR for rejuvenation of Kammasandra lake

		of Hebbagodi CMC has been submitted to Karnataka Tank Conservation and Development Authority (KTCDA) for approval. M/s CDD India will take up the rejuvenation work after approval from KTCDA. In the same manner the DPR's for rejuvenation of other lakes in Chandapura lake catchment area will also be taken up with CSR funds of private companies/Government grants. As a permanent solution to keep the lakes contamination free, the DPRs for implementation of UGD system of Hebbagodi CMC of around Rs. 153 crores, and for Bommasandra TMC of around Rs. 109 crores have been submitted to Government for consideration.
5	To ensure the treatment and conformity to the drinking water standards of borewell water before supplying it for drinking purposes, since some of the borewells are having a high concentration of Nitrates, NH3, SO4 and / or hardness.	It is further stated therein that water samples of borewells in the ULBs are being tested for potability of drinking water status. 415 number of borewells have been already tested and remaining 109 borewells samples will be tested by 30.11.2022

6	To explore decentralized composting methods for treatment of municipal solid waste	1.	It is submitted therein that Lands have been identified and allotted to all four ULBs in the catchment area of the Chandapura lake for establishing SWM plants. It is further stated therein that all the four ULB's are having MOU with Sahas Zero Waste Management Pvt. Ltd. for disposal of dry waste. Further, bio medical waste is being given for disposal to Maridi Bio Industries Pvt. Ltd. The action plan further provides that for wet waste, Action Plans for 3 Biomethanisation plants of a capacity of 2 tonnes per day for Rs.60 Lakhs each have been approved for Hebbagodi CMC, Jigani, and Chandapura TMC and that the said plants will be operational by December 2022. A vermicomposting unit is being established in Bommasandra TMC which will be operational by February 2023.

Ramaswamy K.

Project Director,
District Development Cell,
Bangalore Urban District.

ANNEXURE – R3

Action Plan to be submitted to Hon'ble NGT in the OA No 324/2021 as per the decisions of the meeting held on 06/07/2022 at Room No 313 Meeting hall Vidhana Soudha Bangalore.

Hon'ble NGT, Principal Bench, New Delhi registered Suo-moto in the Matter of O.A. No. 324 of 2021 on the basis of News item published on 21.11.2021 in the Indian express titled 'Lakes of Bengaluru: Industrial effluents, raw Sewage: stinky tale of Chandrapura lake'' wherein it was reported that the condition of the Chandrapura lake has worsened due to encroachment, dumping of sewage and industrial effluents. The report mentions that the buffer zone of lake has been encroached upon and waste is being dumped into the lake which is an ancient one.

The Hon'ble NGT during the hearing on 29.03.2022, noted from the Joint Committee report that water of the lake is being polluted by different sources, including the sewage and industrial pollution, particularly effluents from pharma industries. According to the Committee, the trade effluents could be from M/s. Kumar Organic Products Ltd. There is concentration of COD and also Zinc and other heavy metals.

The Hon'ble NGT opined that remedial action is required promptly and sternly including making law violators and erring officers accountable for breach of law to the detriment of public health and environment which has to be taken seriously. Further, it has been directed that the Chief Secretary, Karnataka to forthwith hold a meeting with the concerned authorities particularly the District Magistrates, Bengaluru Urban, KIADB, State Wetland Authority, Karnataka State PCB and the Environment Department to outline action plan be which may be discussed and finalised with the assistance of such experts/institutions as may be identified with a view to ensure rehabilitation of the lake in time bound manner.

According to the directions issued by the Hon'ble NGT , the Chief Secretary govt of Karnataka held the meeting with all the different stake holders on 06/07/2022 at Room No 313 in Vidhana Soudha Bangalore and directed the KSPCB to submit the action plan before 15/07/2022 for submission to Hon'ble NGT. Hence the action plan for the implementation of the directions issued by the Hon'ble NGT vide order dated 29/03/2022 is as given;

Sl no	Directions issued by the Hon'ble NGT	Compliance to the directions by KSPCB
1	Not to accord permissions to industries (having ETPs) to send their trade effluents to CETP. KSPCB shall direct such industries to stop their productions till their ETPs made functional	KSPCB has not accorded permission to any industry having captive ETP to discharge its effluents into the CETP.
2	To conduct Environmental audit of all industries in the catchment area through reputed institutes such as IISc, IITs, and/or NEERI in order to keep strict vigilance, since the Jigani Industrial Area is declared as Critically Polluted Area under *CEPI.*	KSPCB has engaged RV College of Engineering, Bangalore to conduct Environmental Audit of all the industries existing in the catchment area of Chandapura Lake.
3	To carryout environmental forensic analysis /pollutant tracer studies at all the drains connected to industrial estates in the catchment area	It has been stated by the KSPCB that the Regional Officers have been directed to collect samples from the drains leading to Chandapura lake for the Forensic analysis / trace pollutant studies which are under process. It is submitted that sample collection and evidencing the samples is a continuous process and the same is being carried out by KSPCB. Regarding the samples already collected, for which the analysis reports have been received, reports are enclosed with the Action Plan submitted by KSPCB. It is further submitted that KSPCB has approved the issuance of closure directions to 17 industries located in the catchment area of Chandapura lake.
4	To develop the e-manifest system for discharging of trade effluents from industries to CETPs with GPS tracking system	It is stated in the Action Plan that KSPCB has already developed e-manifest and the same is in use for the industries which are linked with various CETPs in Veerasandra Industrial Area,

	in all the vehicles carrying trade effluents	coming under the catchment area of Chandapura lake. It is stated that a strict vigilance on the movement of vehicles carrying the trade effluent is being maintained by engaging Marshals in the area.
5	To issue directions to local bodies to expedite alternative/ decentralized treatment technologies for sewage treatment till the establishment and functioning of STPs	It is further mentioned that an awareness program on alternate technologies such as wetland treatment has been organized in association with IISC Bengaluru with the elected representatives of four ULBs namely Jigani, Bommasandra, Chandapura and Hebbagodi coming under the catchment area of Chandapura lake on 19.09.2022.

This is herewith submitted for your kind information.

Member Secretary
KSPCB

Annexure – I

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TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY
MoEF RECOGNISED ENVIRONMENTAL LABORATORY
ISO/IEC 17025 Accredited Testing Laboratory by NABL Vide Certificate Number TC-5487
ISO 9001:2015 and ISO 45001:2018 CERTIFIED LABORATORY

K.S.P.C.B., "Nisarga Bhavan"
7th D Cross, Thimmaiah Road,
Shivanagar, Bangalore - 560079

ANALYSIS REPORT

Date : 30/08/2022

NAME OF THE LAKE :	Lake Water Sample collected from the outlet of Chandapura lake(Cholarakatte) GPSR: 12°48'27"N+77°42'26"E)	Page 1 of 2
SAMPLE COLLECTED BY :	Sri. CR Manjunatha,EO RO:Sarjapura	DATE OF COMMENCEMENT OF TEST :24.08.2022
DATE OF COLLECTION :	24.08.2022	DATE OF COMPLETION OF TEST : 29-08-2022
DATE OF RECEIPT :	24.08.2022	SAMPLE REPORT NO. : W-1529
PARTICULARS	Lake Water Sample	SAMPLE NO. : W-1529

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH at 25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.2	IS 3025 (Part 11)
2	Conductivity @ 25°C	µs/cm	-	-	-	-	2250	1359	IS 3025 (Part 14)
3	Oxygen (Dissolved)	mg/L	6	5	4	4	-	2.1	IS 3025 (Part 38)
4	Biochemical Oxygen Demand(3 days @ 27° C)	mg/L	2	3	3	-	-	20	IS 3025 (Part 44)
5	Chemical Oxygen Demand	mg/L	-	-	-	-	-	161	IS 3025 (Part 58)
6	Total coliforms	MPN/ 100mL	50	500	5000	-	-	35000	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
7	Sodium Absorption Ratio	-	-	-	-	-	26	2.42	IS 11624
8	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH3- D)
9	Boron as B	mg/L	-	-	-	-	2	BDL	APHA 23rd edition (4500-B B)
10	Copper as Cu	mg/L	-	-	-	-	-	0.030	APHA 23rd edition (part 3125B)
11	Zinc as Zn	mg/L	-	-	-	-	-	0.145	

P.T.O

12	Nickel as Ni	mg/L	-	-	-	-	-	0.106	APHA 23rd edition (part 3125B)
13	Manganese as Mn	mg/L	-	-	-	-	-	0.521	
14	Total Chromium as Cr	mg/L	-	-	-	-	-	0.018	
15	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	
16	Lead as Pb	mg/L	-	-	-	-	-	BDL	
17	Iron as Fe	mg/L	-	-	-	-	-	2.003	
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use -Irrigation, Industrial cooling, Controlled Waste disposal							

Note: 1. The above results pertain only to the sample tested.

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3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
   Free Ammonia as NH_3:1.0; Boron as B:0.1;Cadmium as Cd:0.001;Lead as Pb:0.002.

Radha. M. N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

Authorized Signatory (Chemical)
(Farhath Jabeen)
Deputy Scientific Officer

———End of Report———

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7th D Cross, Thimmaiah Road,
Shivanagar, Bangalore – 560079

ANALYSIS REPORT

Date : 30/08/2022

NAME OF THE LAKE :	Lake Water Sample collected from the Kammasandra and Bommasandra lake outlet(Bommasandra lake Kodi) GPSR: 12°49'01"N+77°42'00"E)	Page 1 of 2
SAMPLE COLLECTED BY :	Sri. CR Manjunatha,EO RO:Sarjapura	DATE OF COMMENCEMENT OF TEST : 24.08.2022
DATE OF COLLECTION :	24.08.2022	DATE OF COMPLETION OF TEST : 29-08-2022
DATE OF RECEIPT :	24.08.2022	SAMPLE REPORT NO. : W-1530
PARTICULARS	Lake Water Sample	SAMPLE NO. : W-1530

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH at 25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.3	IS 3025 (Part 11)
2	Conductivity @ 25°C	µs/cm	-	-	-	-	2250	1430	IS 3025 (Part 14)
3	Oxygen (Dissolved)	mg/L	6	5	4	4	-	1.1	IS 3025 (Part 38)
4	Biochemical Oxygen Demand(3 days @ 27° C)	mg/L	2	3	3	-	-	22	IS 3025 (Part 44)
5	Chemical Oxygen Demand	mg/L	-	-	-	-	-	182	IS 3025 (Part 58)
6	Total coliforms	MPN/ 100mL	50	500	5000	-	-	92000	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
7	Sodium Absorption Ratio	-	-	-	-	-	26	2.61	IS 11624
8	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH3- D)
9	Boron as B	mg/L	-	-	-	-	2	BDL	APHA 23rd edition (4500-B B)
10	Copper as Cu	mg/L	-	-	-	-	-	0.008	APHA 23rd edition (part 3125B)
11	Zinc as Zn	mg/L	-	-	-	-	-	BDL	

P.T.O

12	Nickel as Ni	mg/L	-	-	-	-	-	0.028	APHA 23rd edition (part 3125B)
13	Manganese as Mn	mg/L	-	-	-	-	-	0.448	
14	Total Chromium as Cr	mg/L	-	-	-	-	-	0.005	
15	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	
16	Lead as Pb	mg/L	-	-	-	-	-	BDL	
17	Iron as Fe	mg/L	-	-	-	-	-	1.590	
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use -Irrigation, Industrial cooling, Controlled Waste disposal							

Note: 1. The above results pertain only to the sample tested.
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3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
Free Ammonia as NH_3:1.0; Boron as B:0.1;Cadmium as Cd:0.001;Zinc as Zn:0.002;
Lead as Pb:0.002.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

Authorized Signatory (Chemical)
(Farhath Jabeen)
Deputy Scientific Officer

———End of Report———

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7th D Cross, Thimmaiah Road,
Shivanagar, Bangalore - 560079

ANALYSIS REPORT

Date : 30/08/2022

NAME OF THE LAKE :	Lake Water Sample collected at the inlet of Chandapura lake, near PHC chandapura, Attibele Hobli, Anekal Taluk, Bengaluru Urban District. GPSR: 12°48'14"N+77°42'20"E)	Page 1 of 2
SAMPLE COLLECTED BY :	Sri. CR Manjunatha,EO RO:Sarjapura	DATE OF COMMENCEMENT OF TEST : 24.08.2022
DATE OF COLLECTION :	24.08.2022	DATE OF COMPLETION OF TEST : 29-08-2022
DATE OF RECEIPT :	24.08.2022	SAMPLE REPORT NO. : W-1528
PARTICULARS	Lake Water Sample	SAMPLE NO. : W-1528

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH at 25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.0	IS 3025 (Part 11)
2	Conductivity @ 25°C	µs/cm	-	-	-	-	2250	1392	IS 3025 (Part 14)
3	Oxygen (Dissolved)	mg/L	6	5	4	4	-	3.2	IS 3025 (Part 38)
4	Biochemical Oxygen Demand(3 days @ 27° C)	mg/L	2	3	3	-	-	19	IS 3025 (Part 44)
5	Chemical Oxygen Demand	mg/L	-	-	-	-	-	156	IS 3025 (Part 58)
6	Total coliforms	MPN/ 100mL	50	500	5000	-	-	54000	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
7	Sodium Absorption Ratio	-	-	-	-	-	26	2.33	IS 11624
8	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH3- D)
9	Boron as B	mg/L	-	-	-	-	2	BDL	APHA 23rd edition (4500-B B)
10	Copper as Cu	mg/L	-	-	-	-	-	0.013	APHA 23rd edition (part 3125B)
11	Zinc as Zn	mg/L	-	-	-	-	-	0.034	

P.T.O

12	Nickel as Ni	mg/L	-	-	-	-	-	0.015	APHA 23rd edition (part 3125B)
13	Manganese as Mn	mg/L	-	-	-	-	-	1.027	
14	Total Chromium as Cr	mg/L	-	-	-	-	-	0.005	
15	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	
16	Lead as Pb	mg/L	-	-	-	-	-	0.005	
17	Iron as Fe	mg/L	-	-	-	-	-	2.501	
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use -Irrigation, Industrial cooling, Controlled Waste disposal							

Note: 1. The above results pertain only to the sample tested.

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3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
   Free Ammonia as NH_3:1.0; Boron as B:0.1;Cadmium as Cd:0.001;

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

Authorized Signatory (Chemical)
(Farhath Jabeen)
Deputy Scientific Officer

----End of Report----

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Shivanagar, Bangalore - 560079

ANALYSIS REPORT

Date : 30/08/2022

NAME OF THE LAKE :	Lake Water Sample collected from the outlet of Heelalige lake, Sarjapura Hobli, Bengaluru GPSR: 12°48'54"N+77°42'14"E)	Page 1 of 2
SAMPLE COLLECTED BY :	Sri. CR Manjunatha,EO RO:Sarjapura	DATE OF COMMENCEMENT OF TEST :24.08.2022
DATE OF COLLECTION :	24.08.2022	DATE OF COMPLETION OF TEST : 29-08-2022
DATE OF RECEIPT :	24.08.2022	SAMPLE REPORT NO. : W-1531
PARTICULARS	Lake Water Sample	SAMPLE NO. : W-1531

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH at 25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.2	IS 3025 (Part 11)
2	Conductivity @ 25°C	µs/cm	-	-	-	-	2250	1385	IS 3025 (Part 14)
3	Oxygen (Dissolved)	mg/L	6	5	4	4	-	3.3	IS 3025 (Part 38)
4	Biochemical Oxygen Demand(3 days @ 27° C)	mg/L	2	3	3	-	-	21	IS 3025 (Part 44)
5	Chemical Oxygen Demand	mg/L	-	-	-	-	-	165	IS 3025 (Part 58)
6	Total coliforms	MPN/ 100mL	50	500	5000	-	-	1600000	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
7	Sodium Absorption Ratio	-	-	-	-	-	26	2.49	IS 11624
8	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH3- D)
9	Boron as B	mg/L	-	-	-	-	2	BDL	APHA 23rd edition (4500-B B)
10	Copper as Cu	mg/L	-	-	-	-	-	0.006	APHA 23rd edition (part 3125B)
11	Zinc as Zn	mg/L	-	-	-	-	-	BDL	

P.T.O

12	Nickel as Ni	mg/L	-	-	-	-	-	0.022	APHA 23rd edition (part 3125B)
13	Manganese as Mn	mg/L	-	-	-	-	-	0.405	
14	Total Chromium as Cr	mg/L	-	-	-	-	-	0.004	
15	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	
16	Lead as Pb	mg/L	-	-	-	-	-	BDL	
17	Iron as Fe	mg/L	-	-	-	-	-	1.339	
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use -Irrigation, Industrial cooling, Controlled Waste disposal							

Note: 1. The above results pertain only to the sample tested.

2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
   Free Ammonia as NH_3:1.0; Boron as B:0.1;Zinc as Zn:0.002;Cadmium as Cd:0.001;Lead as Pb:0.002.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

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Shivanagar, Bangalore - 560079

ANALYSIS REPORT

Date : 30/08/2022

NAME OF THE LAKE :	Lake Water Sample collected from the Veerasandra lake outlet Opp. To Gopalan lake from apartment veerasandra, Bengaluru GPSR: 12°50'24"N+77°40'33"E)	Page 1 of 2
SAMPLE COLLECTED BY :	Sri. CR Manjunatha,EO RO:Sarjapura	DATE OF COMMENCEMENT OF TEST : 24.08.2022
DATE OF COLLECTION :	24.08.2022	DATE OF COMPLETION OF TEST : 29-08-2022
DATE OF RECEIPT :	24.08.2022	SAMPLE REPORT NO. : W-1532
PARTICULARS	Lake Water Sample	SAMPLE NO. : W-1532

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH at 25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	6.5	IS 3025 (Part 11)
2	Conductivity @ 25°C	µs/cm	-	-	-	-	2250	512	IS 3025 (Part 14)
3	Oxygen (Dissolved)	mg/L	6	5	4	4	-	5.4	IS 3025 (Part 38)
4	Biochemical Oxygen Demand(3 days @ 27° C)	mg/L	2	3	3	-	-	5.0	IS 3025 (Part 44)
5	Chemical Oxygen Demand	mg/L	-	-	-	-	-	52	IS 3025 (Part 58)
6	Total coliforms	MPN/ 100mL	50	500	5000	-	-	16000	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
7	Sodium Absorption Ratio	-	-	-	-	-	26	2.01	IS 11624
8	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH3- D)
9	Boron as B	mg/L	-	-	-	-	2	BDL	APHA 23rd edition (4500-B B)
10	Copper as Cu	mg/L	-	-	-	-	-	0.006	APHA 23rd edition (part 3125B)
11	Zinc as Zn	mg/L	-	-	-	-	-	BDL	

P.T.O

12	Nickel as Ni	mg/L	-	-	-	-	-	0.046	APHA 23rd edition (part 3125B)
13	Manganese as Mn	mg/L	-	-	-	-	-	0.244	
14	Total Chromium as Cr	mg/L	-	-	-	-	-	0.005	
15	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	
16	Lead as Pb	mg/L	-	-	-	-	-	0.014	
17	Iron as Fe	mg/L	-	-	-	-	-	0.509	
INFERENCE		Class "D"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use -Propagation of Wild Life, Fisheries							

Note: 1. The above results pertain only to the sample tested.

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3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
   Free Ammonia as NH_3:1.0; Boron as B:0.1;Zinc as Zn:0.002;Cadmium as Cd:0.001;
   Lead as Pb:0.002.

Radha. M.N

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Shivanagar, Bangalore - 560079

ANALYSIS REPORT

Date : 30/08/2022

NAME OF THE LAKE :	Sample collected from the drain Opp.To Puma lift, BIA, Attibele Hobli, Bengaluru urban District GPSR: $12^0$48'41"N+$77^0$41'10"E).	Page 1 of 2
SAMPLE COLLECTED BY :	Sri. CR Manjunatha,EO RO:Sarjapura	DATE OF COMMENCEMENT OF TEST : 24-08-2022
DATE OF COLLECTION :	24.08.2022	DATE OF COMPLETION OF TEST : 29-08-2022
DATE OF RECEIPT :	24.08.2022	SAMPLE REPORT NO. : W-1533
PARTICULARS	Lake Water Sample	SAMPLE NO. : W-1533

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH at 25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.3	IS 3025 (Part 11)
2	Conductivity @ 25°C	µs/cm	-	-	-	-	2250	3060	IS 3025 (Part 14)
3	Oxygen (Dissolved)	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Biochemical Oxygen Demand(3 days @ 27° C)	mg/L	2	3	3	-	-	130	IS 3025 (Part 44)
5	Chemical Oxygen Demand	mg/L	-	-	-	-	-	487	IS 3025 (Part 58)
6	Total coliforms	MPN/ 100mL	50	500	5000	-	-	9200	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
7	Sodium Absorption Ratio	-	-	-	-	-	26	4.75	IS 11624
8	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH3- D)
9	Boron as B	mg/L	-	-	-	-	2	BDL	APHA 23rd edition (4500-B B)
10	Copper as Cu	mg/L	-	-	-	-	-	0.061	APHA 23rd edition (part 3125B)
11	Zinc as Zn	mg/L	-	-	-	-	-	7.652	

P.T.O

12	Nickel as Ni	mg/L	-	-	-	-	-	3.572	IS 3025 (Part 54)
13	Manganese as Mn	mg/L	-	-	-	-	-	2.884	APHA 23rd edition (part 3125B)
14	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	
15	Lead as Pb	mg/L	-	-	-	-	-	0.007	
16	Total Chromium as Cr	mg/L	-	-	-	-	-	0.226	IS 3025 (Part 52)
17	Iron as Fe	mg/L	-	-	-	-	-	1.15	IS 3025 (Part 53)
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use -Irrigation, Industrial cooling, Controlled Waste disposal							

Note: 1. The above results pertain only to the sample tested.

2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
   Free Ammonia as NH_3:1.0; Boron as B:0.1;Cadmium as Cd:0.001;

Radha. M. N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

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3rd D Cross, Thummaiah Road,
Shivanagar, Bangalore – 560079

ANALYSIS REPORT

Date : 30/08/2022

NAME OF THE LAKE :	Sample collected from the drain located at the entrance of Kithaganahalli Lake, Bommasandra Attibele Hobli, Anekal Taluk, Bengaluru urban District GPSR: 12°48'36"N+77°41'15"E)	Page 1 of 2
SAMPLE COLLECTED BY :	Sri. CR Manjunatha,EO RO:Sarjapura	DATE OF COMMENCEMENT OF TEST : 24.08.2022
DATE OF COLLECTION :	24.08.2022	DATE OF COMPLETION OF TEST : 29-08-2022
DATE OF RECEIPT :	24.08.2022	SAMPLE REPORT NO. : W-1534
PARTICULARS	Lake Water Sample	SAMPLE NO. : W-1534

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH at 25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	2.2	IS 3025 (Part 11)
2	Conductivity @ 25°C	µs/cm	-	-	-	-	2250	5160	IS 3025 (Part 14)
3	Oxygen (Dissolved)	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Biochemical Oxygen Demand(3 days @ 27° C)	mg/L	2	3	3	-	-	138	IS 3025 (Part 44)
5	Chemical Oxygen Demand	mg/L	-	-	-	-	-	767	IS 3025 (Part 58)
6	Total coliforms	MPN/ 100mL	50	500	5000	-	-	-	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
7	Sodium Absorption Ratio	-	-	-	-	-	26	4.85	IS 11624
8	Free Ammonia	mg/L	-	-	-	1.2	-	-	APHA 23rd edition (4500 NH3- D)
9	Boron as B	mg/L	-	-	-	-	2	BDL	APHA 23rd edition (4500-B B)
10	Copper as Cu	mg/L	-	-	-	-	-	14.057	IS 3025(Part 42)
11	Zinc as Zn	mg/L	-	-	-	-	-	16.401	APHA 23rd edition (part 3125B)

P.T.O

12	Nickel as Ni	mg/L	-	-	-	-	-	10.64	IS 3025 (Part 54)
13	Manganese as Mn	mg/L	-	-	-	-	-	3.074	APHA 23rd edition (part 3125B)
14	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	
15	Lead as Pb	mg/L	-	-	-	-	-	0.421	
16	Total Chromium as Cr	mg/L	-	-	-	-	-	1.495	IS 3025 (Part 52)
17	Iron as Fe	mg/L	-	-	-	-	-	10.638	IS 3025 (Part 53)
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use -Irrigation, Industrial cooling, Controlled Waste disposal							

Note: 1. The above results pertain only to the sample tested.

2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
5. Sample is acidic,hence Free Ammonia & Total coliforms parameter could not be tested.
6. BDL: Below Detection Level in mg/L.
   Boron as B:0.1;Cadmium as Cd:0.001;

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

Authorized Signatory (Chemical)
(Farhath Jabeen)
Deputy Scientific Officer

———End of Report———

Regional Office: Bangalore -Anekal
2nd Floor "NISARGA BHAVAN"
7th 'D' Cross, Thimmaiah Road,
Sanegoravanahalli, Shivanagar
Bengaluru -560 010
Tel/Fax: 080 -23229538

ಪ್ರಾದೇಶಿಕ ಕಛೇರಿ: ಬೆಂಗಳೂರು – ಆನೇಕಲ್
೨ನೇ ಮಹಡಿ, "ನಿಸರ್ಗ ಭವನ",
7ನೇ 'ಡಿ' ಅಡ್ಡ ರಸ್ತೆ, ತಿಮ್ಮಯ್ಯ ರಸ್ತೆ,
ಸಾಣೆಗೊರವನಹಳ್ಳಿ, ಶಿವನಗರ,
ಬೆಂಗಳೂರು - 560 010
ದೂರವಾಣಿ: 080- 23229538

No. KSPCB/RO-Anekal/NGT /2022-23/491

Date: 9 AUG 2022

DESPATCHED

To,

The Member Secretary,
Karnataka State Pollution Control Board,
No. 49, Church Street,
Bengaluru – 560 001

Kind Attn :- Chief Environmental Officer-2

Sir,

Sub: - Submission of the forensic Analysis report for trace elements of the sample collected from the drains leading to Chandapura Lake – reg.

Ref: - Board office Memo No. 3602 dtd: 23.08.2022

****

With referece to the subject, please find herewith enclosed analysis report of samples collected from drain which leads to Lakes pertaining to Regional Office, Anekal.

Sl No	Address of Sample Collected	Date of Sample Collection	Inferance of the report
01.	Inlet point of Hennagara Lake(Behind M/s Mankind Pharma Wherehouse), Jigani Hobli, Anekal Taluk, Bangalore Urban District	19.01.2022	Class "E"
		09.06.2022	Class "E"
		06.07.2022	Class "E"
02.	Opp. M/s.HCL Technologies Ltd., Bommasnadra-Jigani Link Road, Anekal Taluk, Bangalore Urban District	18.01.2022	Class "E"
		09.06.2022	Class "E"
		Sample was unable to collect due to drainage cleaning work by TMC	
03.	Near Solid Waste Dumping site, inlet to Haragadde Kunte, Sy. No.260, Haragadde Village, Jigani Hobli, Anekla Taluk,	19.01.2022	Collected by CPCB
		09.06.2022	Class "E"
		06.07.2022	Class "E"

O/C

04.	Opp. Grave Yard, Yarandahalli Village, Jigani Hobli, Anekal Taluk.	18.01.2022	Class "E"
		14.06.2022	Class "E"
		06.07.2022	Class "E"

Encl's: As above

Yours Sincerely
Sd
Environmental Officer
R.O.-Anekal

Copy submitted to: - RSEO, Bengaluru South office for kind information.

Environmental Officer
R.O.-Anekal

080-23238458

TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY
MoEF RECOGNISED ENVIRONMENTAL LABORATORY
ISO/IEC 17025 Accredited Testing Laboratory by NABL Vide Certificate Number TC-5487
ISO 9001:2015 and ISO 45001:2018 CERTIFIED LABORATORY

Email:centrallab@kspcb.gov.in
Website : http://kspcb.gov.in

K.S.P.C.B. "Nisarga Bhavan"
7th D Cross, Thimmaiah Road,
Sivanagar, Bangalore 560079

ANALYSIS REPORT (ACCREDITED PARAMETERS)

Date : 19.07.2022

NAME OF THE LOCATION :	Waste water sample collected drain which connected to Hennagara lake at Inlet Point, Backside of Mankind Industry (Near Saahas Zero Waste), Jigani Hobli, Anekal Taluk, Bengaluru Urban District. (GPSR: 12°50'24.6"N+ 77°40'33"E)	Page 1 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 07.07.2022
DATE OF COLLECTION :	06.07.2022	DATE OF COMPLETION OF TEST : 16.07.2022
DATE OF RECEIPT :	07.07.2022	SAMPLE REPORT NO: WW-722
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-722

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH@25^0 C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.3	IS 3025 (Part 11)
2	Conductivity@25^0 C	µs/cm	-	-	-	-	2250	1745	IS 3025 (Part 14)
3	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Turbidity	NTU		-	-	-	-	26.6	IS 3025 (Part 10)
5	Total Dissolved Solids	mg/L	-	-	-	-	-	1206	IS 3025 (Part 16)
6	Total Kjeldhal Nitrogen as N	mg/L	-	-	-	-	-	49.2	IS 3025 (Part 34)
7	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH_3- D)
8	Biochemical Oxygen Demand (3 days @ 27 ^{0} C)	mg/L	2	3	3	-	-	56	IS 3025 (Part 44)
9	Chemical Oxygen Demand	mg/L	-	-	-	-	-	227	IS 3025 (Part 58)
10	Fluoride as F	mg/L	-	-	-	-	-	0.24	IS 3025 (Part 60)
11	Total Phosphate as P	mg/L	-	-	-	-	-	7.6	IS 3025 (Part 31)
12	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	396	IS 3025 (Part 21)
13	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	208	IS 3025 (Part 40)
14	Magnesium as $MgCO_3$	mg/L	-	-	-	-	-	45.7	IS 3025 (Part 46)
15	Sodium as Na	mg/L	-	-	-	-	-	174	IS 3025 (Part 45)
16	Potassium as K	mg/L	-	-	-	-	-	56.35	IS 3025 (Part 45)
17	Sodium Absorption Ratio	-	-	-	-	-	26	3.8	IS :11624
18	Chloride as Cl	mg/L	-	-	-	-	-	412	IS 3025 (Part 32)
19	Nitrate as N	mg/L	-	-	-	-	-	19.87	APHA 23rd edition (4500 NO_3-D)

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
20	Phenolic Compounds	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 43)
21	Sulphate as SO_4	mg/L	-	-	-	-	-	91	IS 3025 (Part 24)
22	Boron as B	mg/L	-	-	-	-	2.0	BDL	APHA 23rd edition (4500-B B)
23	Copper as Cu	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 42)
24	Zinc as Zn	mg/L	-	-	-	-	-	0.111	IS 3025 (Part 49)
25	Nickel as Ni	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 54)
26	Manganese as Mn	mg/L	-	-	-	-	-	0.3	APHA 23rd Edition (3111B)
27	Total Chromium as Tcr	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 52)
28	Iron as Fe	mg/L	-	-	-	-	-	0.927	IS 3025 (Part 53)
29	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 41)
30	Lead as Pb	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 47)
31	Total Coliform	MPN/ 100ml	50	500	5000	-	-	9200000	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: 1. Additional analysis report No: WW-722A dated 19.07.2022 shall also be read for declaration of inference of the sample Tested.

2. The above results pertain only to the sample tested.
3. The report shall not be reproduced without the written approval of the laboratory.
4. Samples will be stored for a period of 15 days from the date of issue of report.
5. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
6. BDL: Below Detection Level in mg/L.
   Dissolved Oxygen: 0.5; Free Ammonia: 1.0; Total Chromium as Tcr: 0.2; Cadmium as Cd: 0.4; Lead as Pb: 0.2; Phenolic Compounds; 0.1;Boron as B: 1.0;Nickel as Ni: 0.1.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

H Roopadevi

Authorized Signatory (Chemical)
(Dr. H.Roopadevi)
Senior Scientific Officer

----End of Report----

ANALYSIS REPORT (NON ACCREDITED PARAMETERS)

Date : 19.07.2022

NAME OF THE LOCATION OF VALLEY	Waste water sample collected drain which connected to Hennagara lake at Inlet Point, Backside of Mankind Industry (Near Saahas Zero Waste), Jigani Hobli, Anekal Taluk, Bengaluru Urban District. (GPSR: 12°50'24.6"N+ 77°40'33"E)	Page 3 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 07.07.2022
DATE OF COLLECTION :	06.07.2022	DATE OF COMPLETION OF TEST : 16.07.2022
DATE OF RECEIPT :	07.07.2022	SAMPLE REPORT NO: WW-722A
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-722

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Total Fixed Solids	mg/L	-	-	-	-	-	988	IS 3025 (Part 18)
	INFERENCE	Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: Additional analysis report No: WW-722 dated 19.07.2022 shall also be read for declaration of inference of the sample Tested.

Section Head
Waste Water Testing Laboratory

----End of Report----

080-23233458

TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

MoEF RECOGNISED ENVIRONMENTAL LABORATORY
ISO/IEC 17025 Accredited Testing Laboratory by NABL Vide Certificate Number TC-5487
ISO 9001:2015 and ISO 45001:2018 CERTIFIED LABORATORY

Email: centrallab@kspcb.gov.in
Website : http://kspcb.gov.in

K.S.P.C.B., Nisarga Bhavan, 7th D Cross, Thimmaiah Road, Shivanagar, Bangalore - 560079

ANALYSIS REPORT (ACCREDITED PARAMETERS)

Date : 19.07.2022

NAME OF THE LOCATION :	Waste water sample collected at culvert located near inside of solid waste dumping site, inlet to Haragadde Kunte, Sy No. 260, Haragadde Village, Jigani Hobli, Anekal Taluk, Bengaluru. (GPSR: 12°46'08.5"N+ 77°38'53.9"E)		Page 1 of 3
SAMPLE COLLECTED BY :	Smt. Vani A.. DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 07.07.2022	
DATE OF COLLECTION :	06.07.2022	DATE OF COMPLETION OF TEST : 16.07.2022	
DATE OF RECEIPT :	07.07.2022	SAMPLE REPORT NO. WW-723	
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-723	

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	6.3	IS 3025 (Part 11)
2	Conductivity@25° C	µs/cm	-	-	-	-	2250	3680	IS 3025 (Part 14)
3	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Turbidity	NTU		-	-	-	-	237	IS 3025 (Part 10)
5	Total Dissolved Solids	mg/L	-	-	-	-	-	2610	IS 3025 (Part 16)
6	Total Kjeldhal Nitrogen as N	mg/L	-	-	-	-	-	21.7	IS 3025 (Part 34)
7	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition ($4500\ NH_3$- D)
8	Biochemical Oxygen Demand (3 days @ 27 ° C)	mg/L	2	3	3	-	-	810	IS 3025 (Part 44)
9	Chemical Oxygen Demand	mg/L	-	-	-	-	-	1681	IS 3025 (Part 58)
10	Fluoride as F	mg/L	-	-	-	-	-	2.6	IS 3025 (Part 60)
11	Total Phosphate as P	mg/L	-	-	-	-	-	0.71	IS 3025 (Part 31)
12	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	780	IS 3025 (Part 21)
13	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	420	IS 3025 (Part 40)
14	Magnesium as $MgCO_3$	mg/L	-	-	-	-	-	87.51	IS 3025 (Part 46)
15	Sodium as Na	mg/L	-	-	-	-	-	496	IS 3025 (Part 45)
16	Potassium as K	mg/L	-	-	-	-	-	40.28	IS 3025 (Part 45)
17	Sodium Absorption Ratio	-	-	-	-	-	26	7.7	IS :11624
18	Chloride as Cl	mg/L	-	-	-	-	-	1110	IS 3025 (Part 32)
19	Nitrate as N	mg/L	-	-	-	-	-	49.00	APHA 23rd edition ($4500\ NO_3$-D)

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
20	Phenolic Compounds	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 43)
21	Sulphate as SO_4	mg/L	-	-	-	-	-	109.	IS 3025 (Part 24)
22	Boron as B	mg/L	-	-	-	-	2.0	0.28	APHA 23rd edition (4500-B B)
23	Copper as Cu	mg/L	-	-	-	-	-	0.15	IS 3025 (Part 42)
24	Zinc as Zn	mg/L	-	-	-	-	-	10.77	IS 3025 (Part 49)
25	Nickel as Ni	mg/L	-	-	-	-	-	0.208	IS 3025 (Part 54)
26	Manganese as Mn	mg/L	-	-	-	-	-	1.5	APHA 23rd Edition (3111B)
27	Total Chromium as Tcr	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 52)
28	Iron as Fe	mg/L	-	-	-	-	-	81.76	IS 3025 (Part 53)
29	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 41)
30	Lead as Pb	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 47)
31	Total Coliform	MPN/ 100ml	50	500	5000	-	-	160000000	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: 1. Additional analysis report No: WW-723A dated 19.07.2022 shall also be read for declaration of inference of the sample Tested.

2. The above results pertain only to the sample tested.
3. The report shall not be reproduced without the written approval of the laboratory.
4. Samples will be stored for a period of 15 days from the date of issue of report.
5. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
6. BDL: Below Detection Level in mg/L.
   Dissolved Oxygen: 0.5; Free Ammonia: 1.0; Total Chromium as Tcr: 0.2; Cadmium as Cd: 0.4; Lead as Pb: 0.2; Phenolic Compounds; 0.1.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

H Roopadevi

Authorized Signatory (Chemical)
(Dr. H.Roopadevi)
Senior Scientific Officer

----End of Report----

ANALYSIS REPORT (NON ACCREDITED PARAMETERS)

Date : 19.07.2022

NAME OF THE LOCATION OF VALLEY	Waste water sample collected at culvert located near inside of solid waste dumping site, inlet to Haragadde Kunte, Sy No. 260, Haragadde Village, Jigani Hobli, Anekal Taluk, Bengaluru. (GPSR: 12°46'08.5"N+ 77°38'53.9"E)	Page 3 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 07.07.2022
DATE OF COLLECTION :	06.07.2022	DATE OF COMPLETION OF TEST : 16.07.2022
DATE OF RECEIPT :	07.07.2022	SAMPLE REPORT NO: WW-723A
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-723

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Total Fixed Solids	mg/L	-	-	-	-	-	932	IS 3025 (Part 18)
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: Additional analysis report No: WW-723 dated 19.07.2022 shall also be read for declaration of inference of the sample Tested.

Section Head
Waste Water Testing Laboratory

---End of Report---

Ph : 080-23238458

Email: centrallab@kspcb.gov.in
Website : http://kspcb. gov.in

TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

MoEF RECOGNISED ENVIRONMENTAL LABORATORY
ISO/IEC 17025 Accredited Testing Laboratory by NABL Vide Certificate Number TC-5487
ISO 9001:2015 and ISO 45001:2018 CERTIFIED LABORATORY

K.S.P.C.B., "Nisarga Bhavan"
7th D Cross, Thimmaiah Road,
Shivanagar, Bangalore - 560079

ANALYSIS REPORT (ACCREDITED PARAMETERS)

Date : 01.07.2022

NAME OF THE LOCATION :	Waste water sample collected from open drain which leads towards Yarandahalli Lake at Opposite to Grave Yard, Yarandahalli Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District. (GPSR: 12°48'36.6"N+ 77°40'01.7"E)	Page 1 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 15.06.2022
DATE OF COLLECTION :	14.06.2022	DATE OF COMPLETION OF TEST : 24.06.2022
DATE OF RECEIPT :	15.06.2022	SAMPLE REPORT NO: WW-508
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-508

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	6.0	IS 3025 (Part 11)
2	Conductivity@25° C	µs/cm	-	-	-	-	2250	2920	IS 3025 (Part 14)
3	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Turbidity	NTU		-	-	-	-	5895	IS 3025 (Part 10)
5	Total Dissolved Solids	mg/L	-	-	-	-	-	2232	IS 3025 (Part 16)
6	Total Kjeldhal Nitrogen as N	mg/L	-	-	-	-	-	42.9	IS 3025 (Part 34)
7	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH_3- D)
8	Biochemical Oxygen Demand (3 days @ 27 ° C)	mg/L	2	3	3	-	-	195	IS 3025 (Part 44)
9	Chemical Oxygen Demand	mg/L	-	-	-	-	-	600	IS 3025 (Part 58)
10	Fluoride as F	mg/L	-	-	-	-	-	0.29	IS 3025 (Part 60)
11	Total Phosphate as P	mg/L	-	-	-	-	-	0.5	IS 3025 (Part 31)
12	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	890	IS 3025 (Part 21)
13	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	470	IS 3025 (Part 40)
14	Magnesium as $MgCO_3$	mg/L	-	-	-	-	-	102	IS 3025 (Part 46)
15	Sodium as Na	mg/L	-	-	-	-	-	285	IS 3025 (Part 45)
16	Potassium as K	mg/L	-	-	-	-	-	28	IS 3025 (Part 45)
17	Sodium Absorption Ratio	-	-	-	-	-	26	4.2	IS :11624
18	Chloride as Cl	mg/L	-	-	-	-	-	876	IS 3025 (Part 32)
19	Nitrate as N	mg/L	-	-	-	-	-	53	APHA 23rd edition (4500 NO_3-D)

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
20	Phenolic Compounds	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 43)
21	Sulphate as SO_4	mg/L	-	-	-	-	-	51	IS 3025 (Part 24)
22	Boron as B	mg/L	-	-	-	-	2.0	1.31	APHA 23rd edition (4500-B B)
23	Copper as Cu	mg/L	-	-	-	-	-	0.52	IS 3025 (Part 42)
24	Zinc as Zn	mg/L	-	-	-	-	-	6.71	IS 3025 (Part 49)
25	Nickel as Ni	mg/L	-	-	-	-	-	0.67	IS 3025 (Part 54)
26	Manganese as Mn	mg/L	-	-	-	-	-	0.82	APHA 23rd Edition (3111B)
27	Total Chromium as Cr	mg/L	-	-	-	-	-	3.5	IS 3025 (Part 52)
28	Iron as Fe	mg/L	-	-	-	-	-	17.4	IS 3025 (Part 53)
29	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 41)
30	Lead as Pb	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 47)
31	Total Coliform	MPN/ 100ml	50	500	5000	-	-	$1600X10^3$	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: 1. Additional analysis report No: WW-508A dated 01.07.2022 shall also be read for declaration of inference of the sample Tested.

2. The above results pertain only to the sample tested.
3. The report shall not be reproduced without the written approval of the laboratory.
4. Samples will be stored for a period of 15 days from the date of issue of report.
5. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
6. BDL: Below Detection Level in mg/L.
   Dissolved Oxygen: 0.5; Lead as Pb: 0.2; Cadmium as Cd:0.04; Phenolic Compounds: 0.1;Free Ammonia: 1.0.

Radha M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

H.Roopadevi

Authorized Signatory (Chemical)
(Dr. H.Roopadevi)
Senior Scientific Officer

----End of Report----

ANALYSIS REPORT (NON ACCREDITED PARAMETERS)

Date : 01.07.2022

NAME OF THE LOCATION OF VALLEY	Waste water sample collected from open drain which leads towards Yarandahalli Lake at Opposite to Grave Yard, Yarandahalli Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District.	Page 3 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 15.06.2022
DATE OF COLLECTION :	14.06.2022	DATE OF COMPLETION OF TEST : 24.6.2022
DATE OF RECEIPT :	15.06.2022	SAMPLE REPORT NO: WW-508A
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-508

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Total Fixed Solids	mg/L	-	-	-	-	-	1642	IS 3025 (Part 18)
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: Additional analysis report No: WW-508 dated 01.07.2022 shall also be read for declaration of inference of the sample Tested.

Section Head
Waste Water Testing Laboratory

----End of Report----

080-23238458
080-23238300

Email:centrallab@kspcb.gov.in
Website : http://kspcb. gov.in

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

Legal 42(3)/87.1(P)ACT, 1986 RECOGNISED ENVIRONMENTAL LABORATORY
ISO/IEC 17025 Accredited Testing Laboratory by NABL Vide Certificate Number TC-5487
ISO 9001 : 2015 and ISO 45001:2018 CERTIFIED LABORATORY

TC-5487

K.S.P.C.B., "Nisarga Bhavan"
7th D Cross, Thimmaiah Road,
Shivanagar, Bangalore – 560079

ANALYSIS REPORT

Date: 27-01-2022

NAME OF THE LAKE :	Lake water sample collected from Hennagara Lake at Inlet point, Backside of Mankind Industry (Near Saahas Zero Waste) Jigani Hobli, Anekal Taluk, Bengaluru Urban District. (GPSR:12°50'24.6"N+77°40'33"E)	Page 1of 1
		DATE OF COMMENCEMENT OF TEST: 20-01-2022
SAMPLE COLLECTED BY :	Sri. Asif Khan, EO, RO: Anekal	DATE OF COMPLETION OF TEST: 24-01-2022
DATE OF COLLECTION :	19-01-2022	
DATE OF RECEIPT :	20-01-2022	SAMPLE REPORT NO: W-3020
PARTICULARS :	Lake water sample	SAMPLE NO : W-3020

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	6.7	IS 3025 (Part 11)
2	Conductivity@25° C	µs/cm	-	-	-	-	2250	2990	IS 3025 (Part 14)
3	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Biochemical Oxygen Demand (3 days @ 27 ° C)	mg/L	2	3	3	-	-	72	IS 3025 (Part 44)
5	Total Coliform	MPN/ 100ml	50	500	5000	-	-	920×10^3	APHA 23rd edition (9221 A, B,C). 9-68 to 9-75
6	Sodium Absorption Ratio	-	-	-	-	-	26	6.5	IS;11624
7	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH3-D)
8	Boron as B	mg/L	-	-	-	-	2.0	BDL	APHA 23rd edition (4500-B B)
9	Ammonia as N	mg/L	-	-	-	-	-	38	IS 3025 (Part 34)
10	Chemical Oxygen Demand	mg/L	-	-	-	-	-	407	IS 3025 (Part 58)
11	Phosphate as P	mg/L	-	-	-	-	-	3.1	IS 3025 (Part 31)

INFERENCE	Class "E" –As per Primary water quality criteria-CPCB.
	Designated best use – Irrigation, Industrial cooling, Controlled Waste disposal

Note:1. The above results pertain only to the sample tested.
2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 10 days from the date of issue of report.
4. Decision Rule: "Statement of conformity / non conformity applies only to test results as per standard stipulated by regulatory authority".
5. BDL: Below Detection Level in mg/L.
Dissolved Oxygen : 0.5; Boron as B:0.1; Free Ammonia:1.0.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

Authorized Signatory (Chemical)
(Farhath Jabeen)
Deputy Scientific Officer

----End of Report---

REGIONAL LABORATORY
CENTRAL POLLUTION CONTROL BOARD,
(Ministry of Environment, Forest & Climate Change Govt. Of INDIA)
REGIONAL DIRECTORATE, BENGALURU

Recognised under E(P) Act, 1986
(Legal 42(3)/87, dated 6th March, 2017)

TC-7739

TEST REPORT

Name & Contact details of the customer Smt Anjana Kumari. Scientist "D" CPCB RD, Bengaluru	Sampling locations: Drain water samples in and around Chandapura Area, Anekal Taluk, Bengaluru Rural District.
Nature of sample: Waste water	Sampling plan& Type: As Per CPCB/RLB/QSP/7.3/1 & Grab
Date of sampling: 18.01.2022 & 19.01.2022	Date of receipt: 22.01.2022
Place. Date of commencement and completion of analysis: Bengaluru. 22.01.2022 -16.02.2022.	Date of report issue: 17.02.2022
Code no. of sample: WW/01/2022/31,38,45,47,49	Req. slip no. / Date: 15 F /22.01.2022.
Page No: 03-03	Report issue no.: WW/02/2022/31,38,47.49

Sl. No	Name of the Parameter with unit	Sampling location					Limit of Detection	Test Method Specification
		31	38	45	47	49		
1.	Copper, mg/L	0.1o	BDL	0.67	BDL	0.13	0.1	APHA 3120-B 23rd Edition 2017
2.	Cadmium, mg/L	BDL	BDL	BDL	BDL	BDL	0.1	
3.	Total chromium, mg/L	BDL	BDL	0.98	BDL	BDL	0.1	
4.	Iron, mg/L	23.36	0.110	18.85	1.16	7.30	0.1	
5.	Manganese, mg/L	0.64	BDL	1.08	0.23	0.58	0.1	
6.	Nickel, mg/L	BDL	BDL	0.2	BDL	0.31	0.1	
7.	Lead ,mg/L	BDL	BDL	BDL	BDL	BDL	0.1	
8.	Zinc, mg/L	1.05	BDL	23.2	0.19	2.88	0.1	
9.	*Arsenic, mg/L	BDL	BDL	BDL	BDL	BDL	0.1	
10.	Cobalt, mg/L	BDL	BDL	0.18	BDL	BDL	0.1	

31. Drain water sample collected which leads towards Hennagara Lake at opposite HCL technologies limited, Bommasandra-Jigani link road, Anekal Taulk, Bangalore.
38. Sample collected from the drain located at the entrance of Kithaganahalli Lake, Bommasandra, Attibele Hobali, Anekal Taluk, Bangalore Urban District.
45. Drain sample collected from the Veerasandra Lake Opp.to Gopalan Lake Front Apartment Veerasandra, Bengaluru.
47. Drain samples opposite to mankind-sahas.
49. Drain samples Inlet to Hargadde Lake.

Authorized signatory

REGIONAL LABORATORY
CENTRAL POLLUTION CONTROL BOARD,
Ministry of Environment, Forest & Climate Change Govt. Of INDIA)
REGIONAL DIRECTORATE, BENGALURU

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(Legal 42(3)/87, dated 5th March, 2017)

TC-7739

TEST REPORT

Name & Contact details of the customer: Smt Anjana Kumari, Scientist "D" CPCB RD, Bengaluru	Sampling locations: Drain samples Inlet to Hargadde lake
Nature of sample: Waste water	Sampling plan& Type: As Per CPCB/RLB/QSP/7.3/1 & Grab
Date of sampling: 18.01.2022	Date of receipt: 22.01.2022
Place, Date of commencement and completion of analysis: Bengaluru, 22.01.2022 -16.02.2022.	Date of report issue: 17.02.2022
Code no. of sample: WW/01/2022/49	Req. slip no. / Date: 13 W & 14 W /22.01.2022.
Page No: 01	Report issue no.: WW/02/2022/49

Sl. No	Name of the Parameter with unit	Range of testing / Limit of Detection	Sampling location: Drain samples Inlet to Hargadde lake	Test Method Specification
1.	pH at 25°C	1-14	8.3	APHA, 4500-H⁺B., 23rd Ed., 2017
2.	EC at 25°C µs/cm	5 - 20000 µS/cm	5290	
3	COD, mg/L	4 - 150000 mg/L	1044	IS 3025 (part 58): 2006
4.	$BOD_{3d, 27°C}$, mg/L	2 - 75000 mg/L	567	IS: 3025, Part 44-1993, Reaffirmed 2009
5.	TDS at 180°C, mg/L	5 - 100000 mg/L	3501	APHA, 2540 C, 23rd Ed., 2017
6.	Ammonical Nitrogen as N, mg/L	1 - 500 mg/L	22	APHA, 4500-NH_3 B & C, 23rd Ed., 17
7.	Dissolved Oxygen, mg/L	1 – 10 mg/L	1.4	APHA (23rd Ed.,): 2017 4500-O,

Authorized signatory

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- Compliance/non-compliance opinion not sought by customer
- Samples will be stored for a period of 15 days from the date of issue of test report.
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- Parameters marked * are not under NABL scope.

REGIONAL LABORATORY
CENTRAL POLLUTION CONTROL BOARD,
Ministry of Environment, Forest & Climate Change Govt. Of INDIA)
REGIONAL DIRECTORATE, BENGALURU

Recognised under E(P) Act, 1986
(Legal 42(3)/87, dated 6th March, 2017)

TC-7739

TEST REPORT

Name & Contact details of the customer: Smt Anjana Kumari, Scientist 'D' CPCB RD, Bengaluru	Sampling locations: Ground water, surface water samples in and around Chandapura Area, Anekal Taluk, Bengaluru Rural District.
Nature of sample: Fresh water	Sampling plan& Type: As Per CPCB/RLB/QSP/7.3/1 & Grab
Date of sampling: 18.01.2022 & 19.01.2022	Date of receipt: 22.01.2022
Place, Date of commencement and completion of analysis: Bengaluru, 22.01.2022 -16.02.2022.	Date of report issue: 17.02.2022 .
Code no. of sample: FW/01/2022/40-44,46,48	Req. slip no. / Date: 13 F & 14 F /22.01.2022.
Page No: 02/03	Report issue no.: FW/02/2022/38-44

Sl. No	Name of the Parameter with unit	Sampling location							Limit of Detection	Test Method Specification
		40	41	42	43	44	46	48		
1.	Copper, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	APHA 3120-B 23rd Edition 2017
2	Cadmium, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
3	Total chromium, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
4.	Iron, mg/L	0.23	0.17	0.11	BDL	0.21	0.94	BDL	0.1	
5	Manganese, mg/L	0.20	0.20	0.23	BDL	BDL	0.33	0.28	0.1	
6.	Nickel, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
7.	Lead ,mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
8.	Zinc, mg/L	0.43	0.31	BDL	BDL	BDL	BDL	BDL	0.1	
9	*Arsenic, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
10.	Cobalt, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	

40. Lake water sample collected at the inlet of chandapura lake near PHC Chandapura, Attibele, Hobli, Anekal , Bengaluru urban District.
41. Bore well water sample collected from the borewell located adjacent TMC chandapura compound wall.
42. Lake water sample collected from the outlet of Chandapura Lake. (Cholarakatte)
43. Borewell water sample collected from the borewell located at Heelalige, Gunduthopu.
44. Lake water sample collected from the outlet of Heelalige lake, Sarjapura, Hobli, Bengaluru.
46. Lake water sample collected from the outlet of hebbagodi lake, near hebbagodi police station, Bengaluru.
48. Lake sample konarandae outlet-Adjacent to rubber industry.

Authorized signatory

The report shall not be reproduced, except in full, without the written approval of the laboratory

- Compliance/non-compliance opinion not sought by customer
- Samples will be stored for a period of 15 days from the date of issue of test report.
- The above results pertain only to sample tested
- Parameters marked * are not under NABL scope

REGIONAL LABORATORY
CENTRAL POLLUTION CONTROL BOARD,
Ministry of Environment, Forest & Climate Change Govt. Of INDIA)
REGIONAL DIRECTORATE, BENGALURU

TC-7739

Recognized under E(P) Act, 1986
(Legal 42(3)/87, dated 6th March, 2017)

TEST REPORT

Name & Contact details of the customer: Smt Anjana Kumari. Scientist "D" CPCB RD. Bengaluru.	Sampling locations. Ground water, surface water samples in and around Chandapura Area, Anekal Taluk, Bengaluru Rural District.
Nature of sample: Fresh water	Sampling plan& Type. As Per CPCB/RLB/QSP/7.3/1 & Grab
Date of sampling. 18.01.2022 & 19.01.2022	Date of receipt 22.01.2022
Place. Date of commencement and completion of analysis. Bengaluru. 22.01.2022 -16.02.2022	Date of report issue. 17.02.2022
Code no. of sample: FW/01/2022/30. 32-37. 39.	Req. slip no. / Date: 13 F & 14 F /22.01.2022.
Page No. 01/03	Report issue no.: FW/02/2022/30, 32-37, 39.

Sl. No	Name of the Parameter with unit	Sampling location								Limit of Detection	Test Method Specification
		30	32	33	34	35	36	37	39		
1	Copper. mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	APHA 3120-B 23rd Edition 2017
2.	Cadmium. mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
3.	Totalchromium, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
4.	Iron. mg/L	1.86	0.230	BDL	0.41	1.29	BDL	0.44	0.16	0.1	
5.	Manganese, mg/L	0.12	0.210	BDL	0.16	0.11	BDL	0.22	0.2	0.1	
6.	Nickel, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
7	Lead mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
8	Zinc, mg/L	BDL	BDL	0.15	BDL	0.36	BDL	BDL	0.27	0.1	
9	*Arsenic mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	
10.	Cobalt, mg/L	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.1	

30: Lake water sample collected from jigani lake, at outlet near sewage entry point from jigani village,Anekal Taluk,Bangalore

32: Lake Water sample collected from Hennagara lake at outlet point, Jigani Hobali, Anekal Taluk,Bangalore.

33: Borewell sample collected from Hennagara Village. Jigani Hobli, Anekal Taluk, Bangalore Urban District.

34: Lake Water sample collected from Mastenahalli Lake, Jigani Hobli, Anekal Taluk, Bangalore Urban District.

35: Lake Water sample collected from Yarandahalli Lake at diverted drain point Jigani Hobli, Anekal Taluk, Bangalore Urban District.

36: Bore well sample collected from Yarandahalli Village, Jigani Hobli, Anekal Taluk, Bangalore Urban District.

37: Lake Water sample collected from Kachanayakanahalli Lake, (Kondareddy Lake) at outlet Point JiganiHobli, Anekal Taluk, Bangalore Urban District.

39. Borewell water sample collected from the borewell near the Bommasandra TMC STP of Capacity 250 KLD.

Authorized signatory

- Compliance/non-compliance opinion not sought by customer
- Samples will be stored for a period of 15 days from the date of issue of test report.
- The above results pertain only to sample tested
- Parameters marked * are not under NABL scope.

Ph : 080-23238458

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TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

MoEF RECOGNISED ENVIRONMENTAL LABORATORY
ISO/IEC 17025 Accredited Testing Laboratory by NABL Vide Certificate Number TC-5487
ISO 9001:2015 and ISO 45001:2018 CERTIFIED LABORATORY

K.S.P.C.B., "Nisarga Bhavan"
7th D Cross, Thimmaiah Road,
Shivanagar, Bangalore - 560079

ANALYSIS REPORT (ACCREDITED PARAMETERS)

Date : 24.06.2022

NAME OF THE LOCATION :	Waste water sample collected which lead toward Hennagara Lake at opposite HCL Technologies Limited, Bommasandra-Jigani Link road, Jigani Hobli, Anekal Taluk, Bengalur Urban District. (GPSR: 12° 47'06.8"N+ 77°39'04.4"E)	Page 1 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 10.06.2022
DATE OF COLLECTION :	09.06.2022	DATE OF COMPLETION OF TEST : 18.06.2022
DATE OF RECEIPT :	10.06.2022	SAMPLE REPORT NO: WW-482
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-482

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH@25^0 C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	6.9	IS 3025 (Part 11)
2	Conductivity@25^0 C	µs/cm	-	-	-	-	2250	1513	IS 3025 (Part 14)
3	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Turbidity	NTU		-	-	-	-	210	IS 3025 (Part 10)
5	Total Dissolved Solids	mg/L	-	-	-	-	-	1060	IS 3025 (Part 16)
6	Total Kjeldhal Nitrogen as N	mg/L	-	-	-	-	-	58	IS 3025 (Part 34)
7	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH_3- D)
8	Biochemical Oxygen Demand (3 days @ 27 ^{0} C)	mg/L	2	3	3	-	-	93	IS 3025 (Part 44)
9	Chemical Oxygen Demand	mg/L	-	-	-	-	-	267	IS 3025 (Part 58)
10	Fluoride as F	mg/L	-	-	-	-	-	0.3	IS 3025 (Part 60)
11	Total Phosphate as P	mg/L	-	-	-	-	-	0.4	IS 3025 (Part 31)
12	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	380	IS 3025 (Part 21)
13	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	168	IS 3025 (Part 40)
14	Magnesium as $MgCO_3$	mg/L	-	-	-	-	-	212	IS 3025 (Part 46)
15	Sodium as Na	mg/L	-	-	-	-	-	190	IS 3025 (Part 45)
16	Potassium as K	mg/L	-	-	-	-	-	17	IS 3025 (Part 45)
17	Sodium Absorption Ratio	-	-	-	-	-	26	4.0	IS :11624
18	Chloride as Cl	mg/L	-	-	-	-	-	300	IS 3025 (Part 32)
19	Nitrate as N	mg/L	-	-	-	-	-	8.0	APHA 23rd edition (4500 NO_3-D)

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
20	Phenolic Compounds	mg/L	-	-	-	-	-	0.2	IS 3025 (Part 43)
21	Sulphate as SO_4	mg/L	-	-	-	-	-	46	IS 3025 (Part 24)
22	Boron as B	mg/L	-	-	-	-	2.0	0.1	APHA 23rd edition (4500-B B)
23	Copper as Cu	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 42)
24	Zinc as Zn	mg/L	-	-	-	-	-	0.1	IS 3025 (Part 49)
25	Nickel as Ni	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 54)
26	Manganese as Mn	mg/L	-	-	-	-	-	0.3	APHA 23rd Edition (3111B)
27	Total Chromium as Tcr	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 52)
28	Iron as Fe	mg/L	-	-	-	-	-	1.5	IS 3025 (Part 53)
29	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 41)
30	Lead as Pb	mg/L	-	-	-	-	-	0.3	IS 3025 (Part 47)
31	Total Coliform	MPN/ 100ml	50	500	5000	-	-	$49X10^4$	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: 1. Additional analysis report No: WW-482A dated 24.06.2022 shall also be read for declaration of inference of the sample Tested.

2. The above results pertain only to the sample tested.
3. The report shall not be reproduced without the written approval of the laboratory.
4. Samples will be stored for a period of 15 days from the date of issue of report.
5. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
6. BDL: Below Detection Level in mg/L.
   Dissolved Oxygen: 0.5; Free Ammonia: 1.0; Copper as Cu: 0.05; Cadmium as Cd:0.04; Nickel as Ni :0.1;
   Total Chromium as Tcr: 0.2; Cadmium as Cd: 0.04.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

----End of Report----

H Roopade.

Authorized Signatory (Chemical)
(Dr. H.Roopadevi)
Senior Scientific Officer

ANALYSIS REPORT (NON ACCREDITED PARAMETERS)

Date : 24.06.2022

NAME OF THE LOCATION OF VALLEY	Waste water sample collected which lead toward Hennagara Lake at opposite HCL Technologies Limited, Bommasandra-Jigani Link road, Jigani Hobli, Anekal Taluk, Bengalur Urban District. (GPSR: 12° 47'06.8"N+ 77°39'04.4"E)	Page 3 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 10.06.2022
DATE OF COLLECTION :	09.06.2022	DATE OF COMPLETION OF TEST : 18.06.2022
DATE OF RECEIPT :	10.06.2022	SAMPLE REPORT NO: WW-482A
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-482

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Total Fixed Solids	mg/L	-	-	-	-	-	836	IS 3025 (Part 18)
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: Additional analysis report No: WW-482 dated 24.06.2022 shall also be read for declaration of inference of the sample Tested.

Section Head
Waste Water Testing Laboratory

----End of Report----

Ph : 080-23238458

Email:centrallab@kspcb.gov.in
Website : http://kspcb. gov.in

TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

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K.S.P.C.B., "Nisarga Bhavan"
7th D Cross, Thimmaiah Road,
Shivanagar, Bangalore - 560079

ANALYSIS REPORT (ACCREDITED PARAMETERS)

Date : 24.06.2022

NAME OF THE LOCATION :	Waste water sample collected drain which connected to Hennagara Lake at Inlet Point, Backside of Mankind Industry (Near Saahas Zero Waste), Jigani Hobli, Anekal Taluk, Bengalur Urban District.	Page 1 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 10.06.2022
DATE OF COLLECTION :	09.06.2022	DATE OF COMPLETION OF TEST : 18.06.2022
DATE OF RECEIPT :	10.06.2022	SAMPLE REPORT NO: WW-483
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-483

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH@25^0 C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	7.3	IS 3025 (Part 11)
2	Conductivity@25^0 C	µs/cm	-	-	-	-	2250	1715	IS 3025 (Part 14)
3	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Turbidity	NTU		-	-	-	-	245	IS 3025 (Part 10)
5	Total Dissolved Solids	mg/L	-	-	-	-	-	1200	IS 3025 (Part 16)
6	Total Kjeldhal Nitrogen as N	mg/L	-	-	-	-	-	96	IS 3025 (Part 34)
7	Free Ammonia	mg/L	-	-	-	1.2	-	1.0	APHA 23rd edition (4500 NH_3- D)
8	Biochemical Oxygen Demand (3 days @ 27 ^{0} C)	mg/L	2	3	3	-	-	140	IS 3025 (Part 44)
9	Chemical Oxygen Demand	mg/L	-	-	-	-	-	348	IS 3025 (Part 58)
10	Fluoride as F	mg/L	-	-	-	-	-	0.3	IS 3025 (Part 60)
11	Total Phosphate as P	mg/L	-	-	-	-	-	0.5	IS 3025 (Part 31)
12	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	492	IS 3025 (Part 21)
13	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	236	IS 3025 (Part 40)
14	Magnesium as $MgCO_3$	mg/L	-	-	-	-	-	256	IS 3025 (Part 46)
15	Sodium as Na	mg/L	-	-	-	-	-	187	IS 3025 (Part 45)
16	Potassium as K	mg/L	-	-	-	-	-	23	IS 3025 (Part 45)
17	Sodium Absorption Ratio	-	-	-	-	-	26	4.0	IS :11624
18	Chloride as Cl	mg/L	-	-	-	-	-	288	IS 3025 (Part 32)
19	Nitrate as N	mg/L	-	-	-	-	-	10	APHA 23rd edition (4500 NO_3-D)

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
20	Phenolic Compounds	mg/L	-	-	-	-	-	0.2	IS 3025 (Part 43)
21	Sulphate as SO_4	mg/L	-	-	-	-	-	49	IS 3025 (Part 24)
22	Boron as B	mg/L	-	-	-	-	2.0	0.1	APHA 23rd edition (4500-B B)
23	Copper as Cu	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 42)
24	Zinc as Zn	mg/L	-	-	-	-	-	0.2	IS 3025 (Part 49)
25	Nickel as Ni	mg/L	-	-	-	-	-	0.2	IS 3025 (Part 54)
26	Manganese as Mn	mg/L	-	-	-	-	-	0.3	APHA 23rd Edition (3111B)
27	Total Chromium as Tcr	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 52)
28	Iron as Fe	mg/L	-	-	-	-	-	1.5	IS 3025 (Part 53)
29	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 41)
30	Lead as Pb	mg/L	-	-	-	-	-	0.4	IS 3025 (Part 47)
31	Total Coliform	MPN/ 100ml	50	500	5000	-	-	$34X10^4$	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: 1. Additional analysis report No: WW-483A dated 24.06.2022 shall also be read for declaration of inference of the sample Tested.

2. The above results pertain only to the sample tested.
3. The report shall not be reproduced without the written approval of the laboratory.
4. Samples will be stored for a period of 15 days from the date of issue of report.
5. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
6. BDL: Below Detection Level in mg/L.
   Dissolved Oxygen: 0.5; Copper as Cu: 0.05; Cadmium as Cd:0.04; Total Chromium as Tcr: 0.2; Cadmium as Cd: 0.04.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

----End of Report----

H Roopadevi

Authorized Signatory (Chemical)
(Dr. H.Roopadevi)
Senior Scientific Officer

ANALYSIS REPORT (NON ACCREDITED PARAMETERS)

Date : 24.06.2022

NAME OF THE LOCATION OF VALLEY	Waste water sample collected drain which connected to Hennagara Lake at Inlet Point, Backside of Mankind Industry (Near Saahas Zero Waste), Jigani Hobli, Anekal Taluk, Bengalur Urban District.	Page 3 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 10.06.2022
DATE OF COLLECTION :	09.06.2022	DATE OF COMPLETION OF TEST : 18.06.2022
DATE OF RECEIPT :	10.06.2022	SAMPLE REPORT NO: WW-483A
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-483

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Total Fixed Solids	mg/L	-	-	-	-	-	920	IS 3025 (Part 18)
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: Additional analysis report No: WW-483 dated 24.06.2022 shall also be read for declaration of inference of the sample Tested.

H Koopade

Section Head
Waste Water Testing Laboratory

---End of Report---

Ph : 080-23238458

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TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

MoEF RECOGNISED ENVIRONMENTAL LABORATORY
ISO/IEC 17025 Accredited Testing Laboratory by NABL Vide Certificate Number TC-5487
ISO 9001:2015 and ISO 45001:2018 CERTIFIED LABORATORY

K.S.P.C.B., "Nisarga Bhavan"
7th D Cross, Thimmaiah Road,
Shivanagar, Bangalore – 560079

ANALYSIS REPORT (ACCREDITED PARAMETERS)

Date : 24.06.2022

NAME OF THE LOCATION :	Waste water sample collected at culvert located near inside of solid waste dumping site, inlet to Haragadde Kunte, Sy No. 260, Haragadde Village. Jigani Hobli, Anekal Taluk, Bengaluru. (GPSR: 12°46'08.5"N+ 77°38'53.9"E)	Page 1 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 10.06.2022
DATE OF COLLECTION :	09.06.2022	DATE OF COMPLETION OF TEST : 18.06.2022
DATE OF RECEIPT :	10.06.2022	SAMPLE REPORT NO: WW-484
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-484

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	6.5	IS 3025 (Part 11)
2	Conductivity@25° C	µs/cm	-	-	-	-	2250	3520	IS 3025 (Part 14)
3	Dissolved Oxygen	mg/L	6	5	4	4	-	BDL	IS 3025 (Part 38)
4	Turbidity	NTU		-	-	-	-	300	IS 3025 (Part 10)
5	Total Dissolved Solids	mg/L	-	-	-	-	-	2904	IS 3025 (Part 16)
6	Total Kjeldhal Nitrogen as N	mg/L	-	-	-	-	-	78	IS 3025 (Part 34)
7	Free Ammonia	mg/L	-	-	-	1.2	-	BDL	APHA 23rd edition (4500 NH_3- D)
8	Biochemical Oxygen Demand (3 days @ 27 ° C)	mg/L	2	3	3	-	-	203	IS 3025 (Part 44)
9	Chemical Oxygen Demand	mg/L	-	-	-	-	-	517	IS 3025 (Part 58)
10	Fluoride as F	mg/L	-	-	-	-	-	1.5	IS 3025 (Part 60)
11	Total Phosphate as P	mg/L	-	-	-	-	-	1.0	IS 3025 (Part 31)
12	Total Hardness as $CaCO_3$	mg/L	-	-	-	-	-	1000	IS 3025 (Part 21)
13	Calcium as $CaCO_3$	mg/L	-	-	-	-	-	468	IS 3025 (Part 40)
14	Magnesium as $MgCO_3$	mg/L	-	-	-	-	-	532	IS 3025 (Part 46)
15	Sodium as Na	mg/L	-	-	-	-	-	683	IS 3025 (Part 45)
16	Potassium as K	mg/L	-	-	-	-	-	47	IS 3025 (Part 45)
17	Sodium Absorption Ratio	-	-	-	-	-	26	9.0	IS :11624
18	Chloride as Cl	mg/L	-	-	-	-	-	832	IS 3025 (Part 32)
19	Nitrate as N	mg/L	-	-	-	-	-	16	APHA 23rd edition (4500 NO_3-D)

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
20	Phenolic Compounds	mg/L	-	-	-	-	-	0.3	IS 3025 (Part 43)
21	Sulphate as SO_4	mg/L	-	-	-	-	-	129	IS 3025 (Part 24)
22	Boron as B	mg/L	-	-	-	-	2.0	0.5	APHA 23rd edition (4500-B B)
23	Copper as Cu	mg/L	-	-	-	-	-	0.07	IS 3025 (Part 42)
24	Zinc as Zn	mg/L	-	-	-	-	-	0.9	IS 3025 (Part 49)
25	Nickel as Ni	mg/L	-	-	-	-	-	0.1	IS 3025 (Part 54)
26	Manganese as Mn	mg/L	-	-	-	-	-	0.4	APHA 23rd Edition (3111B)
27	Total Chromium as Tcr	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 52)
28	Iron as Fe	mg/L	-	-	-	-	-	17	IS 3025 (Part 53)
29	Cadmium as Cd	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 41)
30	Lead as Pb	mg/L	-	-	-	-	-	BDL	IS 3025 (Part 47)
31	Total Coliform	MPN/ 100ml	50	500	5000	-	-	$63X10^4$	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: 1. Additional analysis report No: WW-484A dated 24.06.2022 shall also be read for declaration of inference of the sample Tested.

2. The above results pertain only to the sample tested.
3. The report shall not be reproduced without the written approval of the laboratory.
4. Samples will be stored for a period of 15 days from the date of issue of report.
5. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".
6. BDL: Below Detection Level in mg/L.
   Dissolved Oxygen: 0.5; Lead as Pb: 0.2; Cadmium as Cd:0.04; Total Chromium as Tcr: 0.2; Cadmium as Cd: 0.04; Free Ammonia: 1.0.

Radha. M.N

Authorized Signatory (Biological)
(Radha M.N)
Assistant Scientific Officer

----End of Report----

H Roopadevi

Authorized Signatory (Chemical)
(Dr. H.Roopadevi)
Senior Scientific Officer

ANALYSIS REPORT (NON ACCREDITED PARAMETERS)

Date : 24.06.2022

NAME OF THE LOCATION OF VALLEY	Waste water sample collected at culvert located near inside of solid waste dumping site, inlet to Haragadde Kunte, Sy No. 260, Haragadde Village, Jigani Hobli, Anekal Taluk, Bengaluru. (GPSR: 12°46'08.5"N+ 77°38'53.9"E)	Page 3 of 3
SAMPLE COLLECTED BY :	Smt. Vani A., DEO RO: Anekal	DATE OF COMMENCEMENT OF TEST : 10.06.2022
DATE OF COLLECTION :	09.06.2022	DATE OF COMPLETION OF TEST : 18.06.2022
DATE OF RECEIPT :	10.06.2022	SAMPLE REPORT NO: WW-484
PARTICULARS:	Waste Water sample	SAMPLE NO : WW-484

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1	Total Fixed Solids	mg/L	-	-	-	-	-	2492	IS 3025 (Part 18)
INFERENCE		Class "E"- As per Primary Water Quality Criteria – CPCB.							
		Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal.							

Note: Additional analysis report No: WW-484 dated 24.06.2022 shall also be read for declaration of inference of the sample Tested.

Section Head
Waste Water Testing Laboratory

----End of Report----

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080-23238300

TC-5487

KARNATAKA STATE POLLUTION CONTROL BOARD
CENTRAL ENVIRONMENTAL LABORATORY

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K.S.P.C.B., "Nisarga Bhavan"
7th D Cross, Thimmaiah Road
Shivanagar, Bangalore – 560079

ANALYSIS REPORT

Date: 27.01.2022

NAME OF THE INDUSTRY :	Drain Water sample collected which lead towards Hennagara Lake at opposite HCL Technologies Limited, Bommsandra- Jigani Link road, Jigani Hobli, Anekal Taluk, Bengaluru Urban District. (GPSR: 12°47'06.8'' N+77°39'04.4''E)	Page 1 of 1 DATE OF COMMENCEMENT OF TEST:20.01.2022
SAMPLE COLLECTED BY :	Sri. Mr.Asif Khan E.O. R.O. Anekal	DATE OF COMPLETION OF TEST:25.01.2022
DATE OF COLLECTION :	18.01.2022	
DATE OF RECEIPT :	19.01.2022	SAMPLE REPORT NO: WW-2027
PARTICULARS :	Drain Water Sample	SAMPLE NO : WW-2027

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1.	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	6.8	IS 3025 (Part 11)
2.	Dissolved Oxygen	mg/L	6	5	4	4	-	1.8	IS 3025 (Part 38)
3.	Conductivity@25° C	µs/cm	-	-	-	-	2250	2034	IS 3025 (Part 14)
4.	Chemical Oxygen Demand	mg/L	-	-	-	-	-	287	IS 3025 (Part 58)
5.	Biochemical Oxygen Demand (3 days @ 27 °C)	mg/L	2	3	3	-	-	78	IS 3025 (Part 44)
6.	Ammonical Nitrogen	mg/L	-	-	-	-	-	27	IS 3025 (Part 34)
7.	Free Ammonia	mg/L	-	-	-	1.2	-	0.05	APHA 23rd edition (4500 NH3-D)
8.	Total Phosphate	mg/L						0.60	IS 3025 (Part 31)
9.	Sodium Absorption Ratio	-	-	-	-	-	26	3.19	IS;11624
10.	Boron as B	mg/L	-	-	-	-	2.0	0.27	APHA 23rd edition (4500-B B)
11.	Total Coliform	MPN/ 100ml	50	500	5000	-	-	350X10⁵	APHA 23rd edition (9221 A, B,C). 9-68 to 9-75

INFERENCE	Class "E"- As per Primary water quality Criteria – CPCB.
	Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal

Note: 1. The above results pertain only to the sample tested.
2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 15 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".

Radha. M. N
Authorized Signatory (Biological)
(Radha M. N)
Assistant Scientific Officer

H Roopadevi
Authorized Signatory (Chemical)
(Dr. H.Roopadevi)
Senior Scientific Officer

----End of Report----

80-23238458
080-23238300

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KARNATAKA STATE POLLUTION CONTROL BOARD
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Legal 42(3)/87 L(P)ACT, RECOGNISED ENVIRONMENTAL LABORATORY
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Email: centrallab@kspcb.gov.in
Website : http://kspcb.gov.in

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K.S.P.C.B. "Nisarga Bhavan"
7th D Cross, Thimmaiah Road,
Shivanagar Bangalore - 560079

ANALYSIS REPORT

Date: 27.01.2022

NAME OF THE INDUSTRY :	Drain Water sample collected from open drain which lead towards Yarandahalli Lake at opposite to Grave Yard, Yarandahalli Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District. (GPSR: 12°48'36.6''N +77°40'01.7''E)	Page 1 of 1 DATE OF COMMENCEMENT OF TEST:20.01.2022
SAMPLE COLLECTED BY :	Sri. Mr.Asif Khan E.O. R.O. Anekal	DATE OF COMPLETION OF TEST:25.01.2022
DATE OF COLLECTION :	18.01.2022	
DATE OF RECEIPT :	19.01.2022	SAMPLE REPORT NO: WW-2028
PARTICULARS :	Drain Water Sample	SAMPLE NO : WW-2028

Sl. No	Parameters	Unit	Water Quality Criteria					Result	Test Method
			A	B	C	D	E		
1.	pH@25° C	-	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	6.8	IS 3025 (Part 11)
2.	Dissolved Oxygen	mg/L	6	5	4	4	-	1.7	IS 3025 (Part 38)
3.	Conductivity@25° C	µs/cm	-	-	-	-	2250	3120	IS 3025 (Part 14)
4.	Chemical Oxygen Demand	mg/L	-	-	-	-	-	508	IS 3025 (Part 58)
5.	Biochemical Oxygen Demand (3 days @ 27° C)	mg/L	2	3	3	-	-	140	IS 3025 (Part 44)
6.	Ammonical Nitrogen	mg/L	-	-	-	-	-	21	IS 3025 (Part 34)
7.	Free Ammonia	mg/L	-	-	-	1.2	-	0.04	APHA 23rd edition (4500 NH3-D)
8.	Total Phosphate	mg/L						0.62	IS 3025 (Part 31)
9.	Sodium Absorption Ratio	-	-	-	-	-	26	6.86	IS;11624
10.	Boron as B	mg/L	-	-	-	-	2.0	1.67	APHA 23rd edition (4500-B B)
11.	Total Coliform	MPN/ 100ml	50	500	5000	-	-	920×10^6	APHA 23rd edition (9221 A, B, C). 9-68 to 9-75

INFERENCE	Class "E"- As per Primary water quality Criteria – CPCB.
	Designated best use - Irrigation, Industrial cooling, Controlled Waste disposal

Note: 1. The above results pertain only to the sample tested.
2. The report shall not be reproduced without the written approval of the laboratory.
3. Samples will be stored for a period of 15 days from the date of issue of report.
4. Decision Rule: "Statement of conformity applies only to analysis of results which meets the standards stipulated by regulatory authority".

Radha. M. N
Authorized Signatory (Biological)
(Radha M. N)
Assistant Scientific Officer

H Roopadevi
Authorized Signatory (Chemical)
(Dr. H.Roopadevi)
Senior Scientific Officer

----End of Report----

ಕರ್ನಾಟಕ ಕೆರೆ ಸಂರಕ್ಷಣೆ ಮತ್ತು ಅಭಿವೃದ್ಧಿ ಪ್ರಾಧಿಕಾರ

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ವಿಷಯ:– ಮಾನ್ಯ ರಾಷ್ಟ್ರೀಯ ಹಸಿರು ನ್ಯಾಯಪೀಠ, ನವದೆಹಲಿ, ಇಲ್ಲಿ ಬೆಂಗಳೂರಿನ ಚಂದಾಪುರ ಕೆರೆಯ ಮಾಲಿನ್ಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ದಾಖಲಾಗಿರುವ ಓ.ಎ.ನಂ 324/2021 ರಲ್ಲಿ ದಿನಾಂಕ29–03–2022 ರಂದು ನೀಡಿರುವ ಆದೇಶದ ಕುರಿತು ಚರ್ಚಿಸಲು ಮಾನ್ಯ ಸರ್ಕಾರದ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿ, ಕರ್ನಾಟಕ ರವರ ಅಧ್ಯಕ್ಷತೆಯಲ್ಲಿ ದಿನಾಂಕ:06–07–2022 ರಂದು ಜರುಗಿದ ಸಭೆಯ ನಡವಳಿಗಳಿಗೆ ಪಾಲನಾ ವರದಿ.

4) Karnataka State wetlands authority :

Sl.no	Suggestions	Action	Compliance Report
1.	To ensure protection of wetlands (> 2.25 hectare) as per rule 4 of the Wetlands Rules, 2017, In general and Chandapura lake. In specific, on top priority, in compliance to the direction of Hon'ble Supreme Court.	The Secretary, Minor Irrigation Department remained absent for meeting. The Chief Secretary directed the Minor Irrigation Department and MD, Karnataka Tank Conservation and Development Authority to submit the action plan within One week .	The Chandapura lake which was a Zilla Panchayath tank, at present is under administrative control of Chandapura Town Municipal Corporation. It is a tank constructed by GoK to meet the irrigation needs of that area in earlier years. The Wetland Authority is under the control of Ecology and Environment Department. Now, a Lift Irrigation Project is being implemented by M.I. Department to fill 69 tanks in Anekal taluk. The Lift Irrigation Project is on trial run from April 2022. The Secondary treated water pumped from Bellandur STP reaches to Ghattahalli Bommanakere tank through rising main. This water flows to Muthanallur tank by gravity. It is found that the water quality at Muthanallur tank pumped from STP meets the IS standards of the effluent which is as per guidelines issued by the Hon'ble National Green Tribunal. There was a News Report published in Local language Newspaper regarding contamination of some lakes which were filled by LIS. In this regard, action was taken to check the quality of raw sewage entering from Chandapura draft channel into the Muthanallur tank.
2.	To take requisite actions as envisaged under Wetlands Rules, 2017, In general and Chandapura lake in specific		
3.	To consider notification of Chandapura lake under the Wetlands Rules, 2017.		

			Action was taken by M.I. to check the quality of the samples extracted from the entry point of Muthanallur tank to Chandapur lake. The analysis of the raw sewage was tested as per IS standards. The analysis was made available on 19.07.2022 indicates out of 35 parameters for which the analysis carried out, the sewage meets the requirements except for 3 parameters viz., odour, dissolved phosphate and bioassay. In this background, the Minor Irrigation and KTCDA authorities inspected the tank and suggested the remedial measures. It is planned to adopt Natural aeration by detention of sewage and placing nutrient absorbing species, plants as a process of treatment in engineered ,wetland method.
			As per the directions and discussions with the Karnataka Tank Conservation and Development Authority, Minor Irrigation Department has prepared a PIR for taking up the work. The cost of the proposal is reported to be Rs.3.00 crores for which the Government accorded necessary approval.

31/X/2022

Chief Executive Officer
Karnataka Tank Conservation and Development Authority
Bangalore

ANNEXURE – R4

The detailed compliance report with regard to the directions issued by the Hon'ble NGT to KIADB in respect of OA 324/2021

Sl No	Directions given by the Hon'ble NGT	Compliance by KIADB
1	To carry out the mapping of drainage network for industrial estates in the catchment area in order to ascertain any industrial discharge into the natural water bodies and submit the report to Hon'ble Tribunal.	To carry out the mapping of drainage network and for exploring the possibility for establishing Common Effluent Treatment Plant (CETP)within the industrial areas of Chandapura lake catchment area, KIADB has issued the work order to M/S Eco Green Solutions Systems Pvt Ltd on 14-07-2022. The consultantsM/S Eco Green Solutions Systems Pvt Ltd have submitted the report comprising the drainage map, developed map of industrial areas, land use and land cover map of the area in the catchment of Chandapura lake.
2	To explore the possibilities of construction of CETPs within industrial estates with tamperproof & closed conduit system for pumping of trade effluents with individual online flow meters. This will help in tracking the records on quantity of effluents being sent to CETPs and identify the illegal discharged. If any.	Major industries of Jigani, Jigani-Bommasandra link road and Veerasandra Industrial Estates are having their own ETP facilities. Small industries have been directed to convey their trade efluents to CETPs either in the same industrial area or to CETPs located nearby and the same is monitored regularly.

for Chief Executive Officer,
KIADB, Bengaluru

REPORT ON

- MAPPING OF CATCHMENT AREA OF CHANDAPURA LAKE
- MAPPING OF DRAINAGE NETWORK OF ENTIRE INDUSTRIAL AREA COMING UNDER CATCHMENT AREA OF CHANDAPURA LAKE
- EXPLORING THE POSSIBLE LOCATION OF ESTABLISHING CETP WITHIN THE INDUSTRIAL AREA

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Submitted To:

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INTRODUCTION

The Ground and surface water is contaminated from many sources such as garbage dumps, toxic waste and chemical storage and intentional dumping of solid & hazardous waste. The Lake pollution in urban cities across the country is a common phenomenon due to runoff from streets carrying oil, dust, heavy metals, and other contaminants along with discharge of untreated or partially treated sewage containing fecal Coli-form bacteria, nitrates, phosphorus, chemicals, and other bacteria. Industrial areas developed around the city may also pose threat for existence of lake due to illegal discharge of treated /untreated waste water.

The natural water drainage channels are the geomorphic features that convey the flow of water (Hadley, 1968). These are part of the earth's natural drainage system that has developed over the ages. After precipitation, the part of storm water that does not immediately infiltrate into the soil becomes runoff. This runoff flows over the land surface and moves to the nearest channel as sheet flow. Channel conveys this runoff to the lakes, ponds, or rivers and ultimately to the seas and oceans in the form of streams.

These natural drainage channels play a crucial role in maintaining the hydrological cycle of an area. These do not necessarily have water throughout the year. Based on the permanency of the stream flow, these natural drainage channels are classified in to 3 Types i.e Ephemeral, Intermittent, and Perennial (Levick et al., 2008). In *Ephemeral drainage channels*, the stream flows slowly in direct response to precipitation in the immediate vicinity, and the channel bed is always above the groundwater reservoir. Other than the rainy season, these channels are merely dry conduits for the rest of the year. *Intermittent drinage channels* also have nonpermanent stream flow. These channels receive water from surface sources like precipitation and groundwater sources like springs. At low flow, there may be dry segments alternating with flowing segments. The *Perennial drainage channels* have permanent stream flow throughout the year. The base flow is maintained by groundwater discharge to the channel bed because groundwater

elevation adjacent to these channels is typically higher than the channel bed's elevation.

Storm water runoff, refers to excess water generated from rain, that flows over the ground, and then flows into nearby water bodies. Urbanization has put enormous stress on the drainage and management of storm water runoff. The change of land cover has significantly altered the storm water flows. In natural areas, the amount of runoff is significantly reduced by the processes of evapo-transpiration and infiltration. Due to the increase of impervious surfaces along with the decrease of vegetation and pervious areas, the larger volume and higher velocity of runoff is produced, which finally creates urban flood and erosion problems.

In addition to impacts on the amount and speed of runoff, urban development seriously affects the quality of water. In urban areas, runoff that flows over pavements—especially streets, industrial, residential and commercial areas picks up varieties of pollutants and becomes polluted runoff . Some of the principal contaminants found in storm water runoff include heavy metals, toxic chemicals, organic compounds, pesticides and herbicides, pathogens, nutrients, sediments, and salts and other compounds." This polluted runoff causes many adverse effects, particularly the degradation of water quality and the broad deterioration of ecosystems.

The problems created by urban storm water runoff have catalyzed the development of sustainable storm water management, which refers to an approach to manage runoff which replicates natural hydrologic regimes. This innovation emphasizes decentralized and landscape-based strategies, which combine a variety of techniques—especially retaining, detaining, harvesting, infiltrating, and filtering runoff—in order to achieve effective runoff management, allow groundwater recharge, reduce contaminant pollution, and protect sensitive ecosystems.

Hence Underground drainage network is provided for conveying sewerage system or wastewater collection system in a scientific manner and consists of network of pipes, pumping stations, and appurtenances that convey sewage /waste water from generation points to point of treatment and disposal. One of the main functions of drainage system is to collect sewage from residential houses/trade effluent from industries and carry in a closed conduit to the treatment plant for final treatment and disposal (either STP in case of sewage and ETP in case of trade effluent). The drainage system must also protect the substructure from erosion, from becoming sodden, and from losing its load-bearing capacity and stability. The most important use of a good drainage system is, it allows free flow of waste water and in most cases prevents accumulation that can lead to flooding.

Hence, it is necessary to have proper drainage networking to carry rain water, sewage and industrial trade effluent to treatment plant, before the same is discharged in to the environment. The drainage basin is the topographic region which receives runoff, through surface flow and groundwater flow. The number, size, and shape of the drainage basin found in an area may vary based on the drainage pattern. The larger the topographic area, more information on the drainage basin is available.

DRINAGE MAPPING

The Drainage mapping is a useful tool to gather information about the status of natural drainage pattern in the surrounding area. They are governed by topography of the land, to know whether a particular region is dominated by hard or soft rocks, and the gradient of the land. A Geographic Information System (GIS) is a special type of information system which is used in mapping of drainage in which the observation on spatially distributed features and procedures to collect, store, retrieve, analyze, and display geographic data is undertaken. The integration of digital mapping and database capabilities is what sets GIS apart from other information systems

The GPS/GIS applications are more important to wastewater management for Mapping, Monitoring, Modeling, and Maintenance. These '4 M's define the four most important activities which can be conducted efficiently using GIS/GPS systems. GPS provides the following applications for wastewater management:

1. Increase the accuracy of existing drainage maps by verifying and correcting locations of the waste water/sewer network.
2. Create new drainage system to carry waste water/ sewer system maps if they do not exist.
3. Modify existing drainage network to carry waste water/ sewer through mapping.

The drainage mapping is extended for conveyance of waste water generated from an industrial area. It is helpful for carrying waste water generated from individual industries to the treatment plant for final treatment and disposal. The principles of interception, relief, or pumped-well drainage may be applied while designing proper drainage network to each, according to the pattern of subsurface flow.

CONCEPT OF EFFLUNET TREATMENT – FOR PREVENTION OF WATER POLLUTION

The concept of effluent treatment, through collective effort, has assumed reasonable gravity for cluster of small-scale industries. The Common effluent treatment plants (CETPs) are treatment systems specifically designed for collective treatment of effluent generated from small-scale industrial facilities in an industrial cluster. The Common effluent treatment plant (CETP) not only helps the industries in controlling water pollution, but also acts as a step towards cleaner environment and service to the society at large by conservation of natural resources viz water. The Small scale industries cannot benefit much from economies of scale and therefore installing & operating pollution- control equipment's will have burden on them.

Realizing this practical problem, under the policy statement for abatement of pollution, the Government extends the scheme for promoting combined facilities for treatment of effluent for clusters of small-scale industrial units and also to provide technical support for prevention and control of pollution.

The concerted approach of common effluent treatment provisions has many advantages. Wastewater from individual industries often contains significant concentration of pollutants; and to reduce them by individual treatment up to the desired concentration, becomes techno-economically not viable. The combined treatment provides a better and economical option because of the equalization and neutralization taking place in the CETP. Other important issues for the merit of common treatment include scarcity of land at the industry's level and a comparatively easier availability of professional and trained staff for the operation maintenance of CETP, which is otherwise difficult, at the individual industry level. For the regulatory authorities also, common treatment facility offers a comparatively easier means of ensuring compliance of stipulated norms.

NEED FOR THE PROPOSED STUDY

The untreated sewage & industrial effluents from Kachanayakanahalli lake flow into Chandapura lake. It also receives raw sewage from Chandapura town through the storm water drains. Nearly 2 acres of the lake in Chandapura town has been encroached by construction activities.

The buffer zone of the lake has been encroached by a Government Hospital and local shops. The fence around the lake has been broken and garbage is littered on its boundaries. There are number of water tanker Lorries supplying water directly from bore wells situated next to the lake to consumers in Bengaluru for their domestic needs. There are water packaging industries in Bommasandra that supply water to the entire city. IISc in its report on water quality in the lakes has warned about the deteriorating water quality in Anekal area.

The sewage-laden storm water drains flowing between the lakes in Anekal also pass through many farms and vegetable plots, where farmers grow vegetable produce and supply to the local market. There is no buffer zone between Jigani – Bommasandra industrial area and the adjoining residential areas. The area is so packed that the compound wall of an electroplating industry is shared by residential houses.

Further during 21.11.2021,considering the deterioration of water quality of Chandapura Lake in the recent past due to increased urbanization, industrial activity in the surrounding area, a news article was published in English daily "Indian Express" titled *"Lakes of Bengaluru": 'Industrial effluents, raw sewage: stinky tail of Chandapura lake'*. This news report was considered as a Sumoto PIL (public interest litigation) by Hon'ble NGT vide OA NO. 324 of 2021 (I A No. 48/2022 and I A No. 71/2022).This news article, had also reported severe pollution, encroachment of lake area and discharge of untreated sewage and industrial trade effluent into the lake aquatic system.

Under Sumoto PIL Hon'ble NGT has constituted 7 member Joint-Committee with the specific Terms of Reference.

As directed by Hon'ble NGT, the Join-Committee has collected the samples from the affected areas, apart from undertaking visual inspections and drone footage. With these backups, Join-Committee submitted the report to Hon'ble NGT with recommendations.

In accordance with the recommendations of the Join-Committee, the Hon'ble NGT during the hearing dated 29.03.2022 has issued specific orders to concerned stakeholders like KSPCB, District Magistrate (Bangalore Urban), Local bodies in the catchment area of Chandapuralake including KIADB and Karnataka Wetland Authority. KIADB has been issued with following directions to be complied with for implementation, which reads as follows:

1. To carry out the mapping of drainage network for industrial estates in the catchment area in order to ascertain any industrial discharge into the natural water bodies and submit the report to Hon'ble Tribunal.
2. As per the records provided by KSPCB, 206 industries out of 543 industries (129/385 in Jigani-Bommasandra Phase- IV industrial Estate & 77/158 Bommasandra Industrial Estate Phase I and Veerasandra industrial estate) are sending their trade effluents to CETPs either in the same industrial estate or to CETPs located at around 25 KM to 84 KM through tankers and there may be chances of illegal discharge of effluents into drains/valleys/water bodies by the tankers. It is recommended to explore the possibilities of construction of CETPs within industrial estates with tamperproof & closed conduit system for pumping of trade effluents with individual online flow meters. This will help in tracking the records on quantity of effluents being sent to CETPs and identify the illegal discharged. If any.

In this regard in order to comply with the directions of Hon'ble NGT, KIADB has engaged M/s Eco Green Solution Systems Pvt Ltd.,for providing the consultancy services for carrying out Mapping of drainage network and feasibility for providing CETP in the industrial area, for treatment of Industrial trade effluent generated from industries, among 1318 industries who have not provided ETP for treating their effluents and to prevent illegal discharge of effluents into drains/ valleys /water bodies by the tankers/pipe line/through storm water as per the date of KIADB.

OBJECTIVE OF THE PROPOSED STUDY

- Identification and mapping of catchment area of Chandapura lake.
- Identification of Industrial areas within the catchment area of Chandapura Lake.
- Mapping of Drainage network of entire Industrial areas coming under the catchment area of Chandapura lake.
- Inventorisation of existing industries with respect to effluent generation, existing ETPs, generation of excess treated/untreated wastewater.

- Inventarisation of industries who are transporting their effluent to authorized CETP with quantity of Effluent disposed.
- Exploring the possible location of establishing CETP within the industrial area.

PROJECT PROMOTER

KIADB is a nodal agency for developing industrial areas in the state of Karnataka. So far, KIADB has developed 186 industrial areas across the state of Karnataka. Around Chandapura lake catchment area, several industrial areas have been established by KIADB. Among these, Bommasandra industrial area 1st, 2nd and 3rd phase in an extent of 903.52 acres were established during the year 1971. Further, 1st and 2nd Phase of Jigani Industrial areas were developed in an extent of 640 acres during the year 1981. Subsequently 4th phase of Bommasandra industrial area was developed in an extent of 214.36 acres during the year 1998. Bommasandra-Jigani link road industrial area to an extent of 712 acres was developed during the year 2003. Several industries were under operation in this industrial area.

INVENTORY OF STUDY AREA FOR ASSESSMENT OF POLLUTION OF LAKES IN THE REGION

Traditionally, the lakes in Anekal, located around 25 km from Bengaluru, have played an important role in the supply of drinking water and in meeting domestic and agricultural needs. Besides recharging groundwater, they have also been home to many animals, birds, aquatic species and prevented flooding.

One of the major pollutants of the lakes in the region has been the mushrooming of Red Category industries (industries having pollution index score of 60 and above) in the Jigani-Bommasandra industrial area and discharge of effluents into lakes in violation of the zero liquid discharge (ZLD) policy of the government. Under the ZLD water management system, no untreated water is supposed to be released into lakes.

However, untreated effluents from industries continuously enter stormwater drains and flow into the lakes of Anekal. There are around 195 red category industries in the Jigani-Bommasandra area which include drug manufacturing companies, electroplating, powder coating, pickling, heat treatment, galvanizing, casting, lead-acid battery manufacturing, used oil reprocessing, lead smelting and chemical industries.

There may be chances of illegal discharge of effluents into drains/valleys/water bodies by the tankers. It is recommended to explore the possibilities of construction of CETPs within industrial estates with tamperproof & closed conduit system for pumping of trade effluents with individual online flow meters. This will help in tracking the records on quantity of effluents being sent to CETPs and identify the illegal discharged. If any.

In this regard to comply with the directions of Hon'ble NGT, KIADB has engaged M/s Eco Green Solution Systems Pvt Ltd. for providing the services of carrying out the Mapping of drainage network and feasibility of providing CETP in the industrial area for treatment of Industrial trade effluent generated for those industries among 1318 industries who have not provided ETP for treating their effluents and also to prevent illegal discharge of effluents into drains/ valleys /water bodies by the tankers who carries the effluents to CETP.

PROBABLE TECHNICAL SOLUTION FOR PREVENTION OF WATER POLLUTION IN THE REGION - NECESSITY OF CETP

The concept of effluent treatment, by means, of a collective effort, has assumed reasonable gravity by being especially purposeful for cluster of small scale industrial units. Common effluent treatment plant (CETP) not only helps the industries in easier control of pollution, but also act as a step towards cleaner environment and service to the society at large. Small scale industries, by their

very nature of job cannot benefit much from economies of scale and therefore the burden of installing & operating pollution- control equipment, falls heavy on them. Realizing this practical problem, under the policy statement has been evolved by the Government for abatement of water pollution.

The concerted approach of common effluent treatment provisions has many advantages. Wastewater of individual industries often contain significant concentration of pollutants; and to reduce them by individual treatment up to the desired concentration, becomes techno-economically difficult.The combined treatment provides a better and economical option because of the equalization and neutralization taking place in the CETP. Other important issues for the merit of common treatment include scarcity of land at the industry's level and a comparatively easier availability of professional and trained staff for the operation of CETP, which is otherwise difficult, at the individual industry level. For the regulatory authorities also, common treatment facility offers a comparatively easier means of ensuring compliance of stipulated norms.

CAUSES FOR POLLUTION OF CHANDAPURA LAKE- PROBLEM STATEMENT

Chandapura lake is now being choked by rapid encroachments and industrial effluents, like its upstream feeder lake — Kachanayakanahalli lake. The industrial effluents from Kachanayakanahalli lake drain into Chandapura lake without being treated. It also receives raw sewage from Chandapura town through the storm water drains.

The lake is spread over 7.2 acres in Heelalige village and 17.27 acres in Chandapura town. Out of the total 24.27 acres, nearly two acres of the lake in Chandapura town has been encroached by construction activities. The buffer zone of the lake has been encroached by a government hospital and local shops.

The fence around the lake has been broken and garbage is littered on its boundaries.

There are numerous water tanker lorries supplying water directly from bore wells next to the lake to consumers in Bengaluru for domestic needs. There are water packaging industries in Bommasandra that supply water to the entire city. IISc in its report on water quality in the lakes has warned about the deteriorating water quality in Anekal area.

The sewage-laden stormwater drains flowing between the lakes in Anekal also pass through many farms and vegetable plots where farmers grow produce and supply it to the local market. "There is no buffer zone between Jigani – Bommasandra industrial area and the adjoining residential areas. The area is so packed that the compound wall of an electroplating company could be shared by residential houses.

ACTION PLAN:

In accordance with the recommendations of the Joint- Committee, Hon'ble NGT during the hearing dated 29.03.2022 issued specific orders to concerned stakeholders like KSPCB, District Magistrate (Bangalore Urban), Local bodies in the catchment area of Chandapura lake including KIADB and Karnataka Wetland Authority. KIADB has been given with the following directions to be complied with for implementation, which reads as follows

To carry out the mapping of drainage network for industrial estates in the catchment area in order to ascertain any industrial discharge into the natural water bodies and submit the report to Hon'ble Tribunal.

As per the records of KSPCB, 206 industries out of 543 industries (129/385 in Jigani-Bommasandra Phase- IV industrial Estate & 77/158 Bommasandra

Industrial Estate Phase I and Veerasandra industrial estate) are sending their trade effluents to CETPs either in the same industrial estate or to CETPs located at around 25 KM to 84 KM through tankers and there may be chances of illegal discharge of effluents into drains/valleys/water bodies by the tankers. It is recommended to explore the possibilities of construction of CETPs within industrial estates with tamperproof & closed conduit system for pumping of trade effluents with individual online flow meters. This will help in tracking the records on quantity of effluents being sent to CETPs and identify the illegal discharges.

DESCRIPTION OF STUDY AREA-CHANDAPURA LAKE

Traditionally, the Chandapura lake in Anekal, is located around 25 KM from Bengaluru. It was built during the Chola dynasty to meet the drinking water requirement and other domestic water requirements of the local villagers like bathing, cloth/ animal washing etc. The Chandapura lake is situated in east side of Bommasandra industrial area. The Chandapura lake is spread over 7.2 acres in Heelalige village and 17.27 acres in Chandapura town. Out of the total 24.27 acres, nearly two acres of the lake in Chandapura town has been encroached by construction activities. The GPS coordinates of Chandapura lake is 12.805571° N and 77.705281°E.

Earlier, this lake has played an important role in the supply of drinking water and in meeting domestic and agricultural needs of the Region, apart from maintaining micro temperature control around the area. Besides recharging groundwater, lake has also been home to many animals, birds, aquatic species and prevented flooding. The Catchment area of Chandapura lake is submitted in the **Figure -1** below;

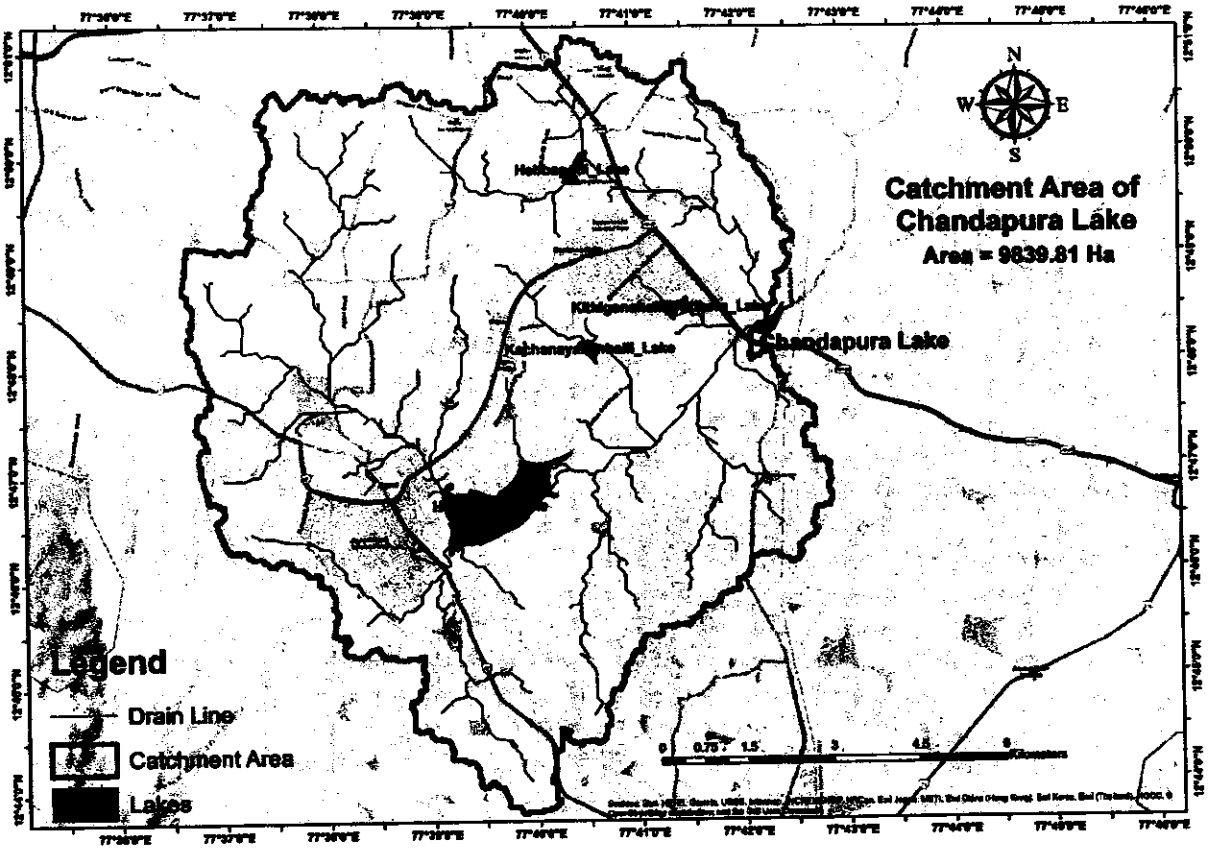


Figure-1: Catchment area of Chandapura lake

DESCRIPTION OF INDUSTRIAL AREA AROUND CHANDAPURA LAKE

Jigani and Bommasandra industrial areas are located in Anekal taluk of Bangalore Urban District, Karnataka, India. The industrial areas are situated at a distance of approximately 30 Kms from Bangalore city railway station towards the southern direction. The Chandapuralake is situated in east side of Bommasandra industrial area. **Figure-2** below shows the landuse & landcover of study area including industrial areas developed by KIADB and the lakes situated around these industrial areas.

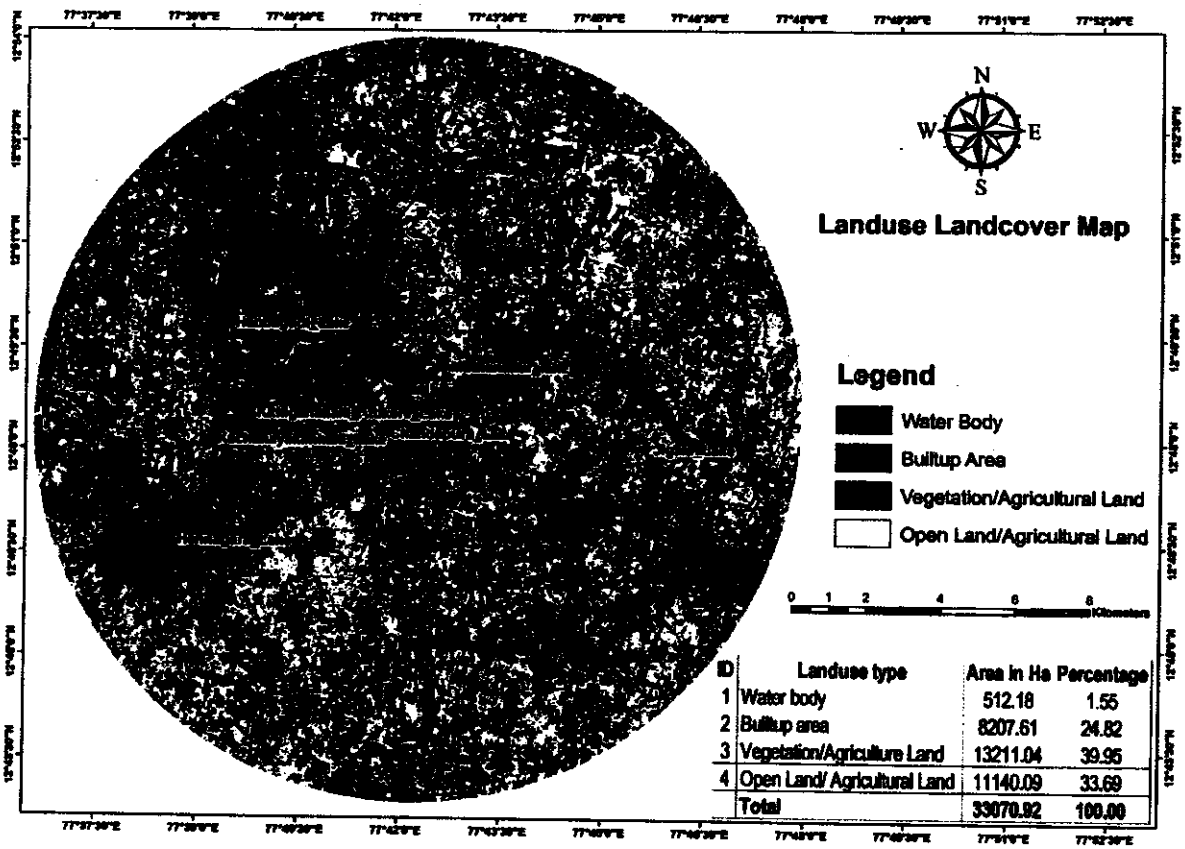


Figure 2 Landuse & Landcover map of study area

It can be observed that increase in the built up area to a tune of 24.82% itself has made significant impact on the quality and extent of water bodies in the region. If the present vegetation/agricultural land which is available to an extant of 39.95% and open land/agricultural land which is available to an extant of 33.69 % is converted in to an built up area, then the environmental impact which is going to cause to the surrounding area cannot be measured.

Total Study area of 10 km has been taken as buffer from the boundary of Chandapura lake.

Some of other major lakes which are situated near Chandapura lake are given in **Table 1**:

Table-1: Some of major lakes near Chandapura Lake

S.No	Name of Lake	Latitude (N)	Longitude (E)	Distance from Chandapura Lake
1.	HebbagodiKere	12.830757°	77.674474°	4.34 km, NW
2.	KithiganahalliAttikere	12.808490°	77.689945°	1.34 km, W
3.	Kachanayakanahalli	12.802293°	77.676702°	2.64 km, SW
4.	Hennagara	12.777382°	77.661321°	3.84 km, SSW
5.	Muthanallur	12.818549°	77.725574°	1 km, NNE
6.	Jigala	12.799858°	77.773401°	6.45 km, E

In the study area, total extent of area of water body is around 512 ha. This figure could be on the little higher side due to algal bloom, as it is become difficult to distinguish the water body. Water body is around 1.55 percent of total area. The built-up area in the study area is 8207 ha, which is 25 % of total study area. Out of this total built up area of 8207 ha, the Jigani and Bommasandra industrial areas is around 1241 ha. Though this figure is indicative and the actual area can vary on proper verification.

Presently the entire Jigani industrial area is coming under Town Municipal Council (TMC) of Jigani, whereas the Bommasandra industrial area Phase-I is in the jurisdiction of CMC, Hebbogodi and Bommasandra industrial area Phases II,III & IV are coming under TMC, Bommasandra jurisdiction. The major industries which are significant from pollution point of view are Bulk drug industries, Electroplating, used oil re-processing, Lead refining and Pharmaceuticals Formulations, and General engineering.

The combined layout map of study area including industrial areas and surrounding water bodies/lakes are submitted in the **Figure -3** below;

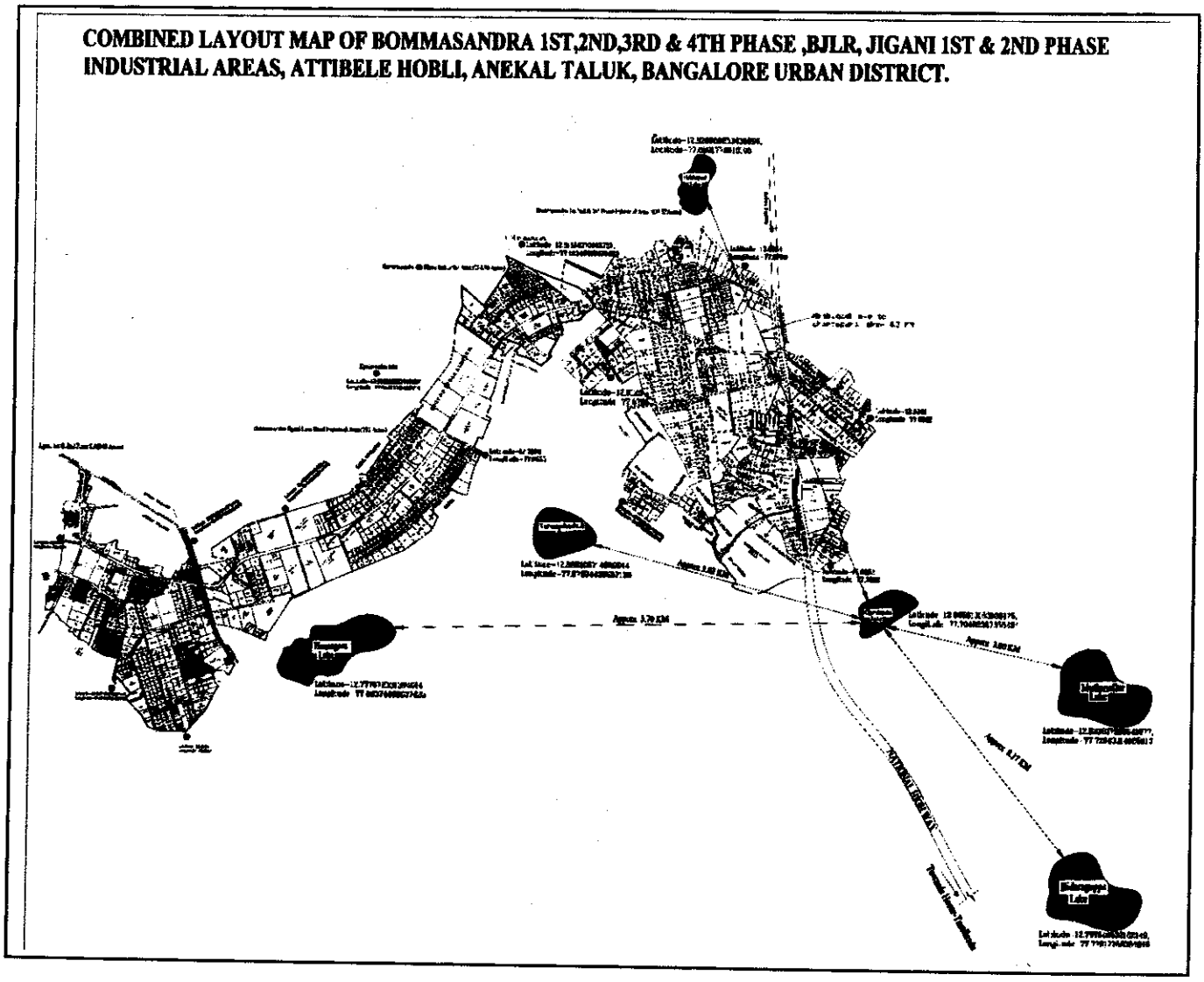


Figure 3: Combined Layout Map of Study Area

From the above layout map, it can be observed that around 5 water bodies are present on the downstream of industrial area and mostly have cascading effects. Any change in the land use/ land cover on the upstream industrial area has serious impact on the downstream water bodies. Hence it is necessary to examine all the issues before changing the land use of the area.

DESCRIPTION ON CLIMATOLOGY AND METEOROLOGY OF THE REGION

TEMPERATURE:

The long period records of the City Central Observatory may be taken as representative of the meteorological conditions in the district in general as they pertain to long period. The mean monthly values of air temperature were obtained by taking the half-sums of the mean maximum and mean minimum temperatures. On the basis of mean monthly temperatures, April is usually the hottest month with the mean daily maximum temperature at 34^{0}C and the mean daily minimum at 21.2^{0}C. On individual days, in hot seasons, the temperatures often go above 36^{0}C. With the onset of the monsoon early in the month of June, there is appreciable drop in the day temperatures but the drop in night temperature is only slight. During October, the temperatures are due to south-west monsoon season. Thereafter temperature decreases. January is generally the coolest month with the mean daily maximum temperature at 15.2^{0}C and the mean daily minimum at 9.4^{0}C. Nights during January are however slightly colder than during December. On individual days during the period December to February, the minimum temperature drops down to about 8^{0}C. The highest maximum temperature recorded at Bengaluru is 38.9^{0}C on 1935 May, 22nd. The lowest minimum was 7.8^{0}C on 1884 January, 13th. The mean annual range of temperature (defined as mean temperature of the warmest month minus the mean temperature of the coolest month) is only about 70C.

The curves of mean monthly maximum and minimum temperature indicate that the mean maximum temperature is the highest in April (36.2^{0}C) and the mean minimum temperature is the lowest in January (11.4^{0}C). Thus, the mean of the extreme annual range of the temperature is i.e. of the difference between the highest and lowest temperature recorded in a year is about 24^{0}C. The monthly mean diurnal range of temperature is maximum (about 15^{0}C) in February, March and minimum in July-August (about 9^{0}C). The maximum

temperature of the day occurs at about 3 p.m. and the minimum temperature at about 6 a.m. except from May to July when it occurs about an hour or so earlier. The temperature at 9-30 a.m. and 9.0 p.m. is the mean temperature of normal day within half a degree Celsius.

RELATIVE HUMIDITY:

The humidity aspect of climate is a crucial study depending on the nature and purposes of the activity through almost in all cases low relative humidity are most desirable. The mean monthly relative humidity is the lowest in the month of March (44%), the morning and evening observations being 63% and 24% respectively. Relative humidity is high during the period June to October, on an average is being between 80% and 85% on the average. Humidity decreases thereafter and in the period February to April, the air is comparatively drier, the afternoon relative humidity being 25% to 35%.

From May, the relative humidity increases. The maximum relative humidity during the day occurs at about 6 a.m. and the minimum occurs at about 3 p.m. The total annual range between the maximum morning and minimum evening observations is 64% which is of significance in several industrial operations such as textiles, plastics, fertilizers, etc. The vapor pressure which represents the absolute moisture content of the atmosphere is however minimum in January, being equal to 12 mm. The largest number of hours of bright sunshine (9.5 hours) occurs in February-March. The number of sunshine hours decreases in later months reaching a minimum of 3.8 hours in July and increases later. The decrease in the sunshine hours between May and June by about 3.9 hours is the most marked.

RAINFALL:

Bengaluru has three different rainy periods covering eight months of the year, followed closely one after the other. The average rainfall of Bengaluru urban district in the year 2017 was 1244.1 mm, which was 43% more than the normal rainfall of 870 mm. The average annual rainfall observed based on the

10 years IMD data is 939mm. Of these, June to September is the principal rainy season. About 56.21% of the total annual rainfall is received in the south-west monsoon period (June -September) with a rainfall of 699.4 mm and about 23% of the total annual rainfall is received in the post monsoon period (October to December) with a rainfall of 286.2 mm and about 20.73% of the total annual rainfall is received in the pre monsoon period (March to May) with a rainfall of 257.9 mm and about 0.06% of the total annual rainfall is received in the winter season (January to February) with a rainfall of 0.5 mm.

WIND:

The surface winds over Bengaluru have a fairly clear seasonal character with Easterly components predominating in one period and Westerly component in the other. During the period May to September, the winds are WSW to W while during the period from November to March, they are ENE to ESE. April and October are transition months when the change over from the Easterly to the Westerly wind regime and takes place vice versa take place. The annual variation of the monthly mean wind speed shows two maxima and minima. The primary minimum is in July when the westerly winds are prominent, with a mean speed of is about 17 kmph and the secondary maximum in January when the Easterly winds are prominent, with a mean speed of about 10 kmph.

The two minima occur in the two transition months, April and October when the mean velocity is about 8-9 kmph. The diurnal variation of wind speed also shows two maxima and minima. The principal maximum occurs generally between mid-day and 2 p.m. and the principal minimum between 4 and 6 a.m. The subsidiary minimum occurs between 7 and 9 a.m. The diurnal variation in wind direction is not prominent during June to September when the direction is mainly WSW or in November to February. The direction is mainly ENE in November, ENE to E in December and January and ESE to E in February. In March and April, winds have a slight southerly component in the morning and night after 6 p.m. and Northerly component in the morning. The highest wind

speed recorded so far is 106 kmph at 3.20 p.m. in a squall from NE on May 1950. Two other severe squalls occurred on 10 May 1948 and 26 May 1947 when the highest wind speed reached was 102 and 99 kmph respectively. The mean daily wind speeds in kmph at Bengaluru (based on the data 1969- 80, height of sensor 19.2 m above ground level) are as follows. January 8.8, February 8.3, March 7.8, April 6.8, May 9.2, June 13.1, July 13.3, August 12.4, September 8.6, October 7.1, November 7.7, December 9.2 and Annual 9.4.

METHODOLOGY OF STUDY-DETAILS OF MODEL USED

The watershed of any area is an upslope area that contributes water flow as concentrated drainage. This area can be delineated from a digital elevation model (DEM) using the Hydrology toolset from the Spatial Analyst tool box of ArcGiS 10.5 software.

First Create a Depression Less DEM: The Fill tool in the Hydrology tool box in ArcGiS software is used to remove any imperfections (sinks) in the digital elevation model. A sink is a cell that does not have an associated drainage value. The drainage values indicate the direction of water that will flow out of the cell, and are assigned during the process of creating a flow direction grid for the landscape. The resulting drainage mapping network depends on finding the 'flow path' of every cell in the grid, so it is important that the fill step is performed prior to creating a flow direction grid.

Then Create Flow Direction Grid. A flow direction grid assigns value to each cell to indicate the direction of flow – that is, the direction of water that will flow from that particular cell based on the underlying topography of the landscape. This is a crucial step in hydrological modeling, as the direction of flow will determine the ultimate destination of the water flowing across the surface of land.

There After Create Flow Accumulation Grid. The Flow Accumulation tool calculates the flow into each cell by identifying the upstream cells that flow into each downslope cell. In other words, each cell's flow accumulation value is

determined by the number of upstream cells flowing into it based on landscape topography.The new flow accumulation raster will be added to map document. Each cell in the grid contains a value that represents the number of cells upstream from that particular cell. Cells with higher flow accumulation values should be located in areas of lower elevation, such as valleys or drainage channels where water flows naturally while it is following the landscape. If the flow accumulation raster appears dark and the cell values are difficult to visualize then it will be necessary to alter the layer symbology.

Finally Create Outlet (Pour) Points. Pour point placement is an important step in the process of watershed delineation. A pour point should exist within an area of high flow accumulation because it is used to calculate the total contributing water flow to that given point. Based on pour points watershed is delineated. The Flow diagram for methodology which is used for delineating watershed is given in the **Figure- 4** below.

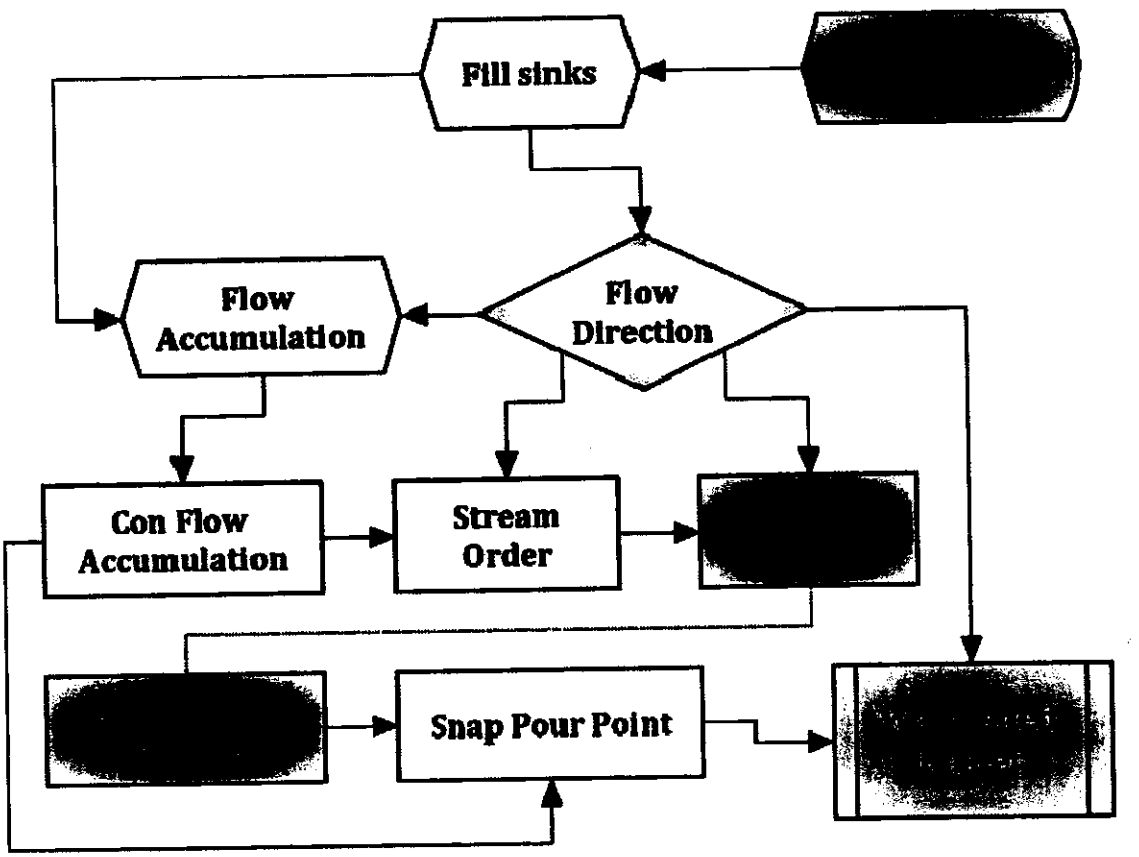


Figure-4: Flow diagram for methodology used for delineating watershed

RESULT AND DISCUSSION

DRINAGE MAPPING FEATURES OF CHANDAPURA LAKE CATCHMENT AREA

1. Catchment area of Chandapura lake

The catchment area of Chandapura Lake is already shown in **Figure-1** above which comprises of total area 9839 Ha. Although there are other lakes which are also present in between the catchment area of Chandapura lake. Total catchment of Chandapura lake is covering two streams into the Chandapura lake. One stream is flowing from North-West direction and other is from South direction.

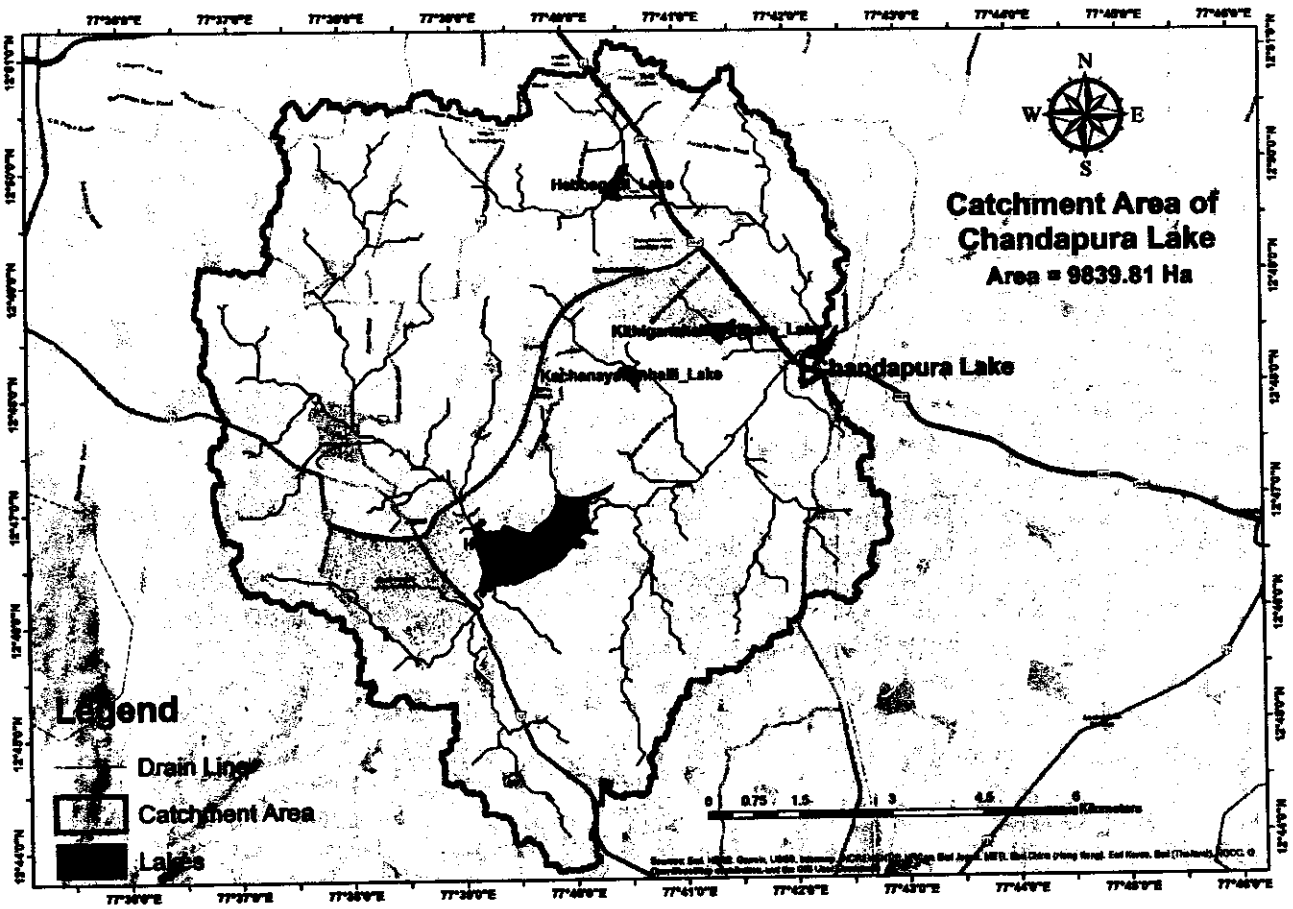


Figure-1 Catchment area of Chandapura lake (Already Given earlier)

2. Micro-watershed of Chandapura lake

The Micro-watershed management is essential for the solving water scarcity issues of the drought region. This could help in oisture conservation measures like the contour bunds to resist the runoff flowing down the slope by an embankment and the overall land development. The block plantations, horticultural development program will increase the green cover of the region and enhance the groundwater recharge rate. It is also necessary for restoration and the improvement of water resource and enables de-siltation of water tanks, there by improves the water availability for drinking and irrigation. The micro water shed of the region is submitted in the **Figure- 5** Below.

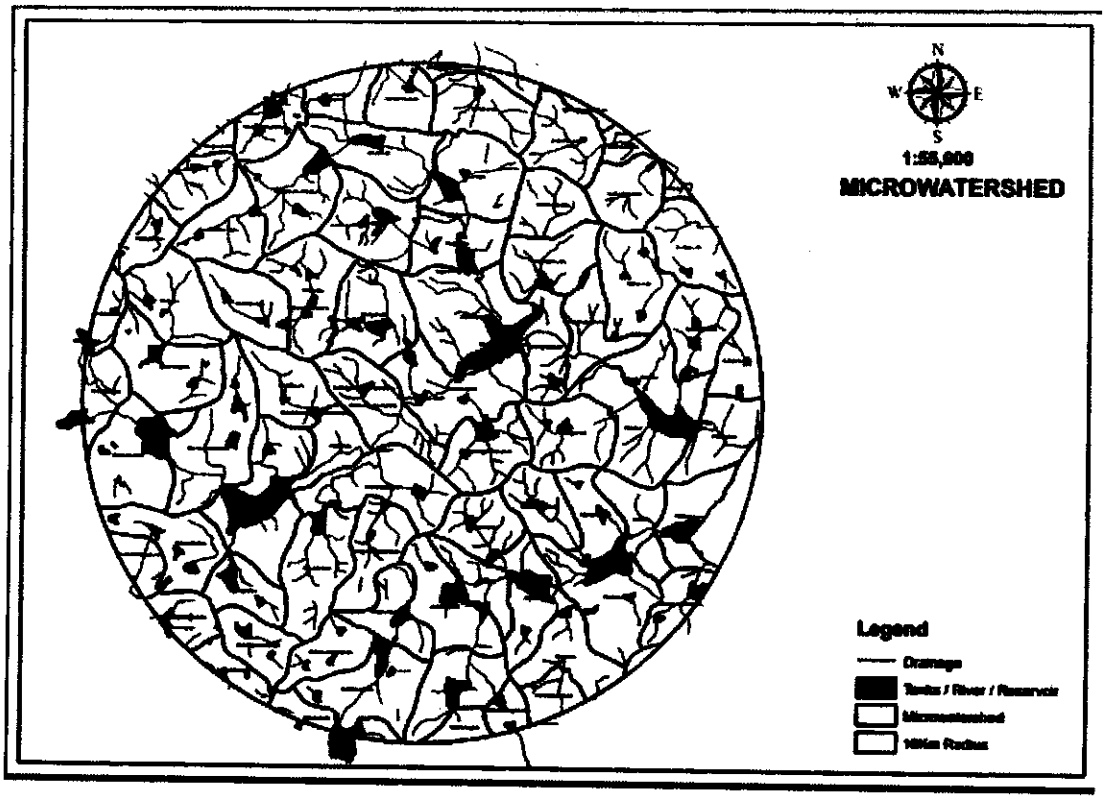


Figure-5- Micro water shed of the Region within 10 KM radius.

Micro-watershed of Chandapura lake is shown in **Figure-6** below. There are total 12 sub-basin in catchment of Chandapura lake. Sub-basin 1,2,6,7,8 and 11 are major contributors of water is Chandapura lake. The area of each sub-basins are also marked in **Figure 6**. The other sub-basin are contributing indirectly into catchment area of Chandapura lake.

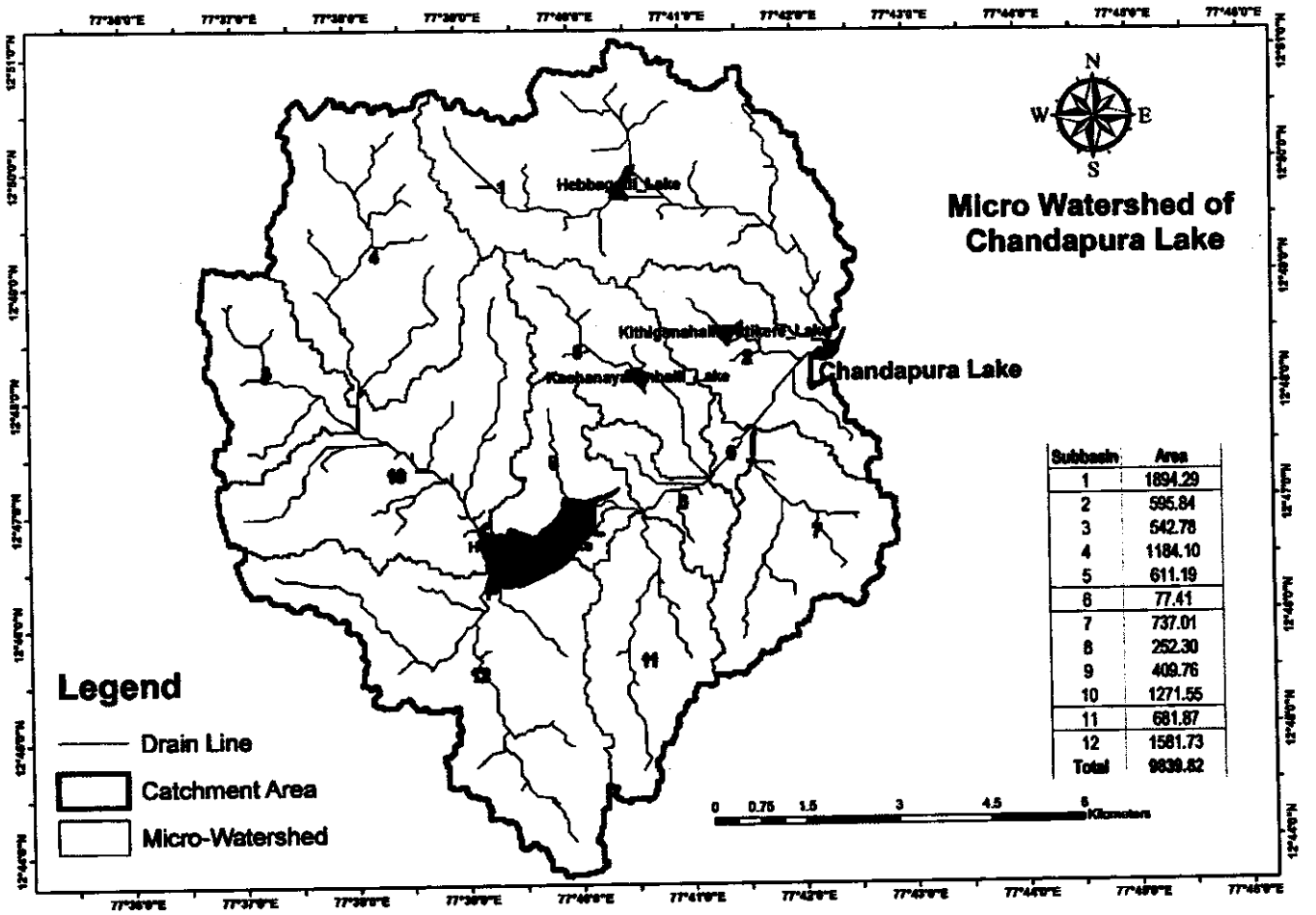


Figure-6 Micro-watershed of Chandapura lake

NOTE: Catchment area means that the area from which rain flows into a particular river or lake. As we can see from drainage map (Fig 5(a) and 5(b)) that major flow of water is from south-west to North-East till Muthanallur lake. The Chandapura lake is lying between the Hennagara lake and Muthanallur lake which means that Hennagara lake is included in catchment area of Chandapura lake but as soon water flows out from Chandapura lake that will not count in catchment of Chandapura lake. Muthanallur lake and Jigala lake is receiving water from Chandapura lake it is therefore both these lakes will not come in catchment area of Chandapura lake.

3. Water Quality Status of Chandapura Lake:

The deterioration of water quality of Chandapura Lake is due to discharge of untreated /treated sewage from the surrounding area and industrial effluent discharge through its upstream feeder lake — Kachanayakanahalli lake apart from rapid encroachments.

One of the major reason for pollution of lake is due to operation of Red category industries (industries having pollution index score of 60 and above) operating in the Jigani-Bommasandra industrial area and discharge of effluents into lakes in violation of the zero liquid discharge (ZLD) policy of the Government. Under waste water management through ZLD system, no untreated water/treated water shall supposed to be discharged into the lake.

However, untreated effluents from industries continuously enter storm water drains and flow into the lakes of Anekal. There are around 195 Red category industries operating in the Jigani-Bommasandra industrial area, which include drug manufacturing companies, electroplating, powder coating, pickling, heat treatment, galvanizing, casting, lead-acid battery manufacturing, used oil reprocessing, lead smelting and chemical industries.

There may be chances of illegal discharge of effluents into drains/valleys/water bodies through tankers. It is recommended to explore the possibilities of construction of CETPs within industrial estates with tamperproof & closed conduit system for pumping of trade effluents with individual online flow meters. This will help in tracking the records on quantity of effluents being sent to CETP and identify the illegal discharge, if any.

4. Land Use & Land Cover of Jigani – Bommasandra Industrial Area

As we are aware Land resource is a finite resource and it is necessary to adopt strategy for efficient use of land resources for different economic development. The land use planning is necessary in order to regulate land use in an efficient and ethical way, thus preventing abuse/ over exploitation of land resource and also to prevent land use conflicts in the society. All the local Governments use

land use planning to manage the development of land within their jurisdictions thereby the government agency can plan for the needs of the community, while safeguarding natural resources. Hence, land use planning is the systematic assessment of land and water potential, alternatives for land use, and economic and social conditions in order to select and adopt the best land use options. The efficient land use plan provides a vision for the future possibilities of development in neighborhoods, districts, cities, or any defined planning area.

The Land cover refers to the vegetation, soil, physical characteristics, water spread area, which naturally shield the earth's surface including the infrastructure created by humans. The land use refers to the land which is created and used by human being. Increased demand of land, due to increased population, migration to the cities have led to mismanagement of land and resulted in crisis. Development of cities has put pressure on the limited land resource and hence natural resources are exploited due to change in the land use pattern. The below **Figure-7** gives the land use and land cover of the area within 10 KM radius.

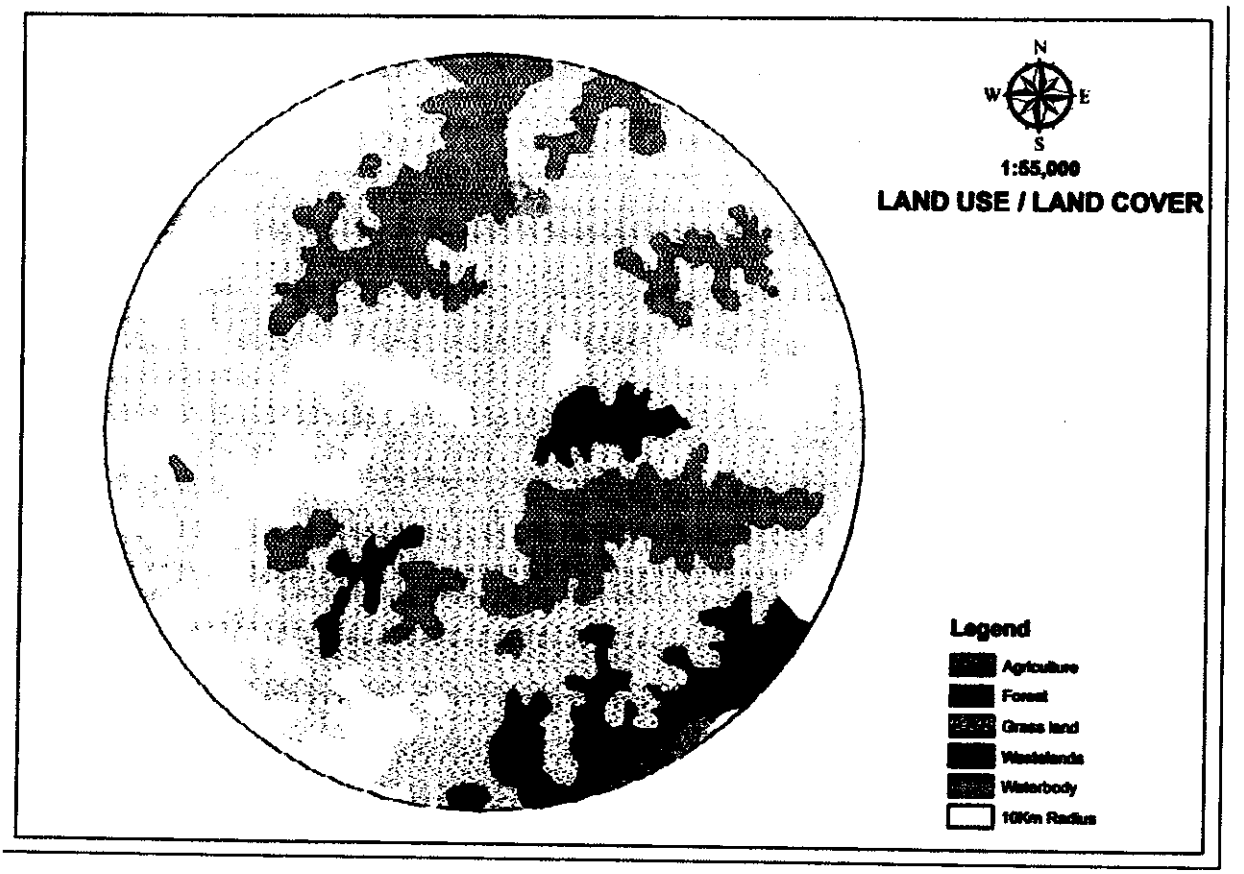


Figure-7 The land use and land cover of the area within 10 KM radius.

The Change in land use has adverse effects on the biodiversity, soil & water quality, biosphere and climate. Hence the Land use /cover information is essential for planning the optimal use of these resources, not only for the present, but also in future due to increasing human demand. The data will also help in studying the dynamics of change due to increased population. Precise and Timely information about the change of land use, helps in understanding the association between nature and human being for better decision making. The invention & advancements of Remote Sensing and GIS technologies, helped to study the change in land use / cover accurately in short period. Timely monitoring of land use change and percent change can be tabulated with GIS technologies.

In the context of sustainable development, land use planning is political and technical-administrative decision-making process based on social, economic,

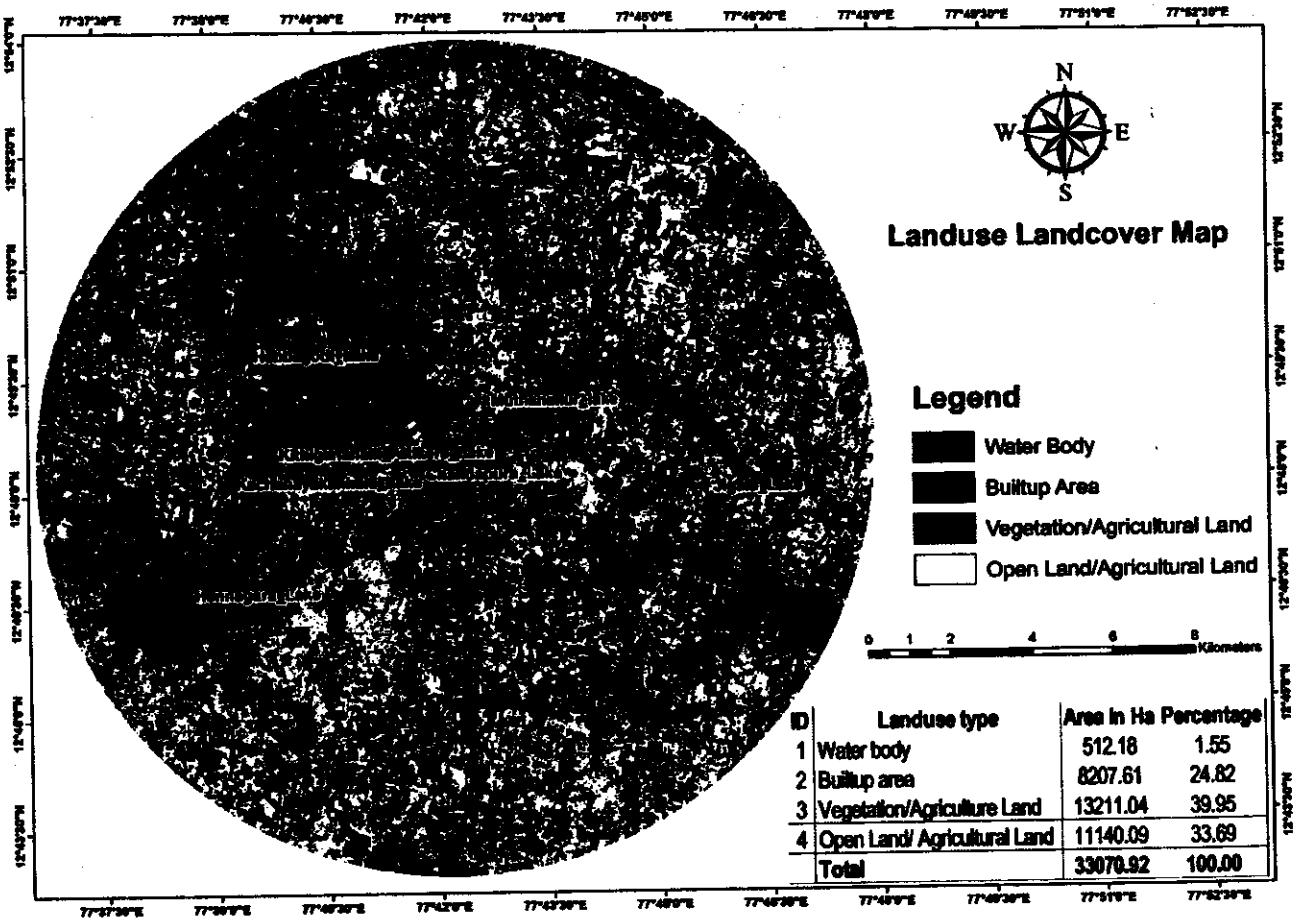
political and technical factors, for orderly occupation and sustainable use of the land under development. In order to achieve efficient land utilization, it is necessary to have regulation and promotion of the location and sustainable development of human settlements, economic and social activities, and spatial physical development, based on the identification of potentialities and limitations that consider environmental, economic, socio-cultural, institutional and geopolitical criteria. By and large, these parameters are put in place in order to make sure that the environment is protected during land use or land cover development.

In the process of development, land is assigned a high importance for the development of human life as it is the fundamental support for its permanence and development, this being the most important objective of the policy of human settlements. The land resource is recognized as an essential element, which supports the social, political and economic formation of society. The use of land refers to the occupation of a certain area according to its agrological capacity and therefore its development potential, is classified according to its location as urban or rural. It represents fundamental element for development of the city and its inhabitants. For this reason, there is a need to ensure sustainability of land use and land cover planning in order to ensure the we continue to enjoy the benefits that come from urban planning and to ensure that future generations will continue enjoying these benefits.

In the 19th& 20th century, there was a global push to develop large cities quickly to accommodate the people who were migrating from rural areas to cities for jobs. In order to create environmentally viable urban landscapes, it is necessary to promote green energy use, encourage green-friendly transportation. Hence, land use planning is a useful tool in changing these aspects of energy usage in a way that would be beneficial to both residents and the surrounding environment.

A sustainable urban development includes, Methods for reducing waste through adoption of reuse/recycling and composting programs that are easily accessible to residents. Reducing/preventing pollution through easy access to necessities and encouraging access to facilities, goods, and services and encouraging public transportation usage wide spread network within a city. The land use Dynamics of Bangalore from 1973-2010 explains that, the built-up area percentage (urban) is increasing (from 1973 to 2010) in all directions with the decline in Green Cover/vegetation area. The overall increase in the built up area in all the directions is due to compact growth of residential areas, commercial complex areas by converting open spaces and vegetated areas in to built-up. The urban land is increasing in all directions due to more residential areas by declining the vegetation cover in the region.

The land use and land cover map of the jigani- Bommasandra Industrial Area is given in the **Figure – 8** Below



ID	Landuse type	Area in Ha	Percentage
1	Water body	512.18	1.55
2	Builtup area	8207.61	24.82
3	Vegetation/Agriculture Land	13211.04	39.95
4	Open Land/ Agricultural Land	11140.09	33.69
	Total	33070.92	100.00

Figure-8 Land use Land cover map of study area

The above map clearly indicates the change of land use from vacant/water body to development of residential/ commercial and industrial area over the years. There are rising levels of environmental degradation due to change in the land use and land cover for development of cities and its neighborhoods. Land use is assigned on the basis on physical and functional characteristics in the urban structure, and with the aim of occupying the space in an orderly manner and according to their physical capacity (occupation of areas suitable for urban development and environmental sustainability), it translates into a harmonious growth of the city. This establishes general guidelines that should be taken into account for the development of urban cities with the goal to protect the environment.

Adding to the increased built up area of residential and commercial complexes, there is also an increase in the industrial area in the then out skirts of Bangalore due to more commercial/financial services/activities declining in the area of vegetation cover and water bodies in the region. Asia's biggest Industrial area- Peenya Industrial estate and its expansion has resulted in the decline of vegetation cover and water bodies. In this region urban growth expansion due to manufacturing industrial activities is observed due to establishment of Medium Scale and small scale industries.

In 2010 Built-up has increased due to new residential areas of moderate density (Hoskote residential area) and industries (part of Bommasandra Industrial area) due to small residential layouts, industries (part of Bommasandra Industrial area) of technical, transport and communication infrastructure due to the land use changes from open spaces and land under vegetation to builtup, large/medium and Small scale Industries established near Anekal is driving these changes.

Further, during 2010 Built-up percentage is high with decline of water bodies and vegetation due to large scale small residential layouts and Jigani Industrial estate. Similar trend is observed due to small residential layouts, part of Jigani Industrial estate (SSE) and also residential complexes due to the proximity of Bommasandra- Jigani Industrial area.

5. Industrial areas within the catchment Area of Chandapura Lake:

The abstract of industries located within the Jigani and Bommasandra industrial cluster are provided in **Table:2**. below: The total area industrial zone is around 1002 ha has also shown in **Figure 9**. The actual figure on map may differ.

Table 2: Status of industries located in Jigani-Bommasandra industrial area

Category	Red	Orange	Green	White*

Large	60	54	102	07
Medium	16	16	66	04
Small	119	78	568	45
Total	**195**	**148**	**736**	**56**

Note: **Exempted from obtaining consent of the KSPC Board*

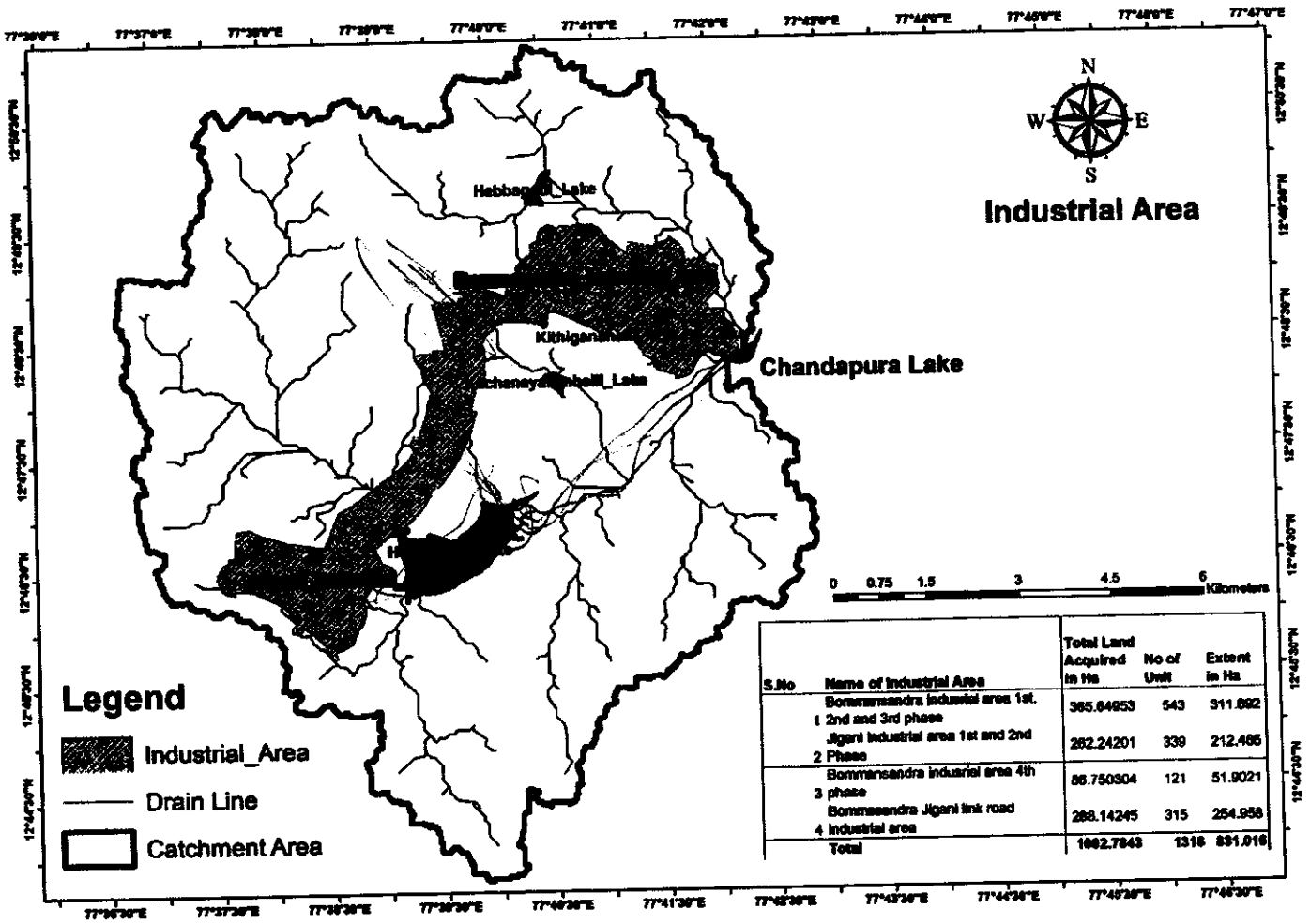


Figure-9 Industrial zone in Catchment of Chandapura lake

There are 13 numbers of 17 category highly polluting industries operating in CPA of which 11 are Bulk drug /API manufacturing industries, and the

remaining are Red category industries mainly include Electroplating, Powder coating, Pickling, Heat treatment, Galvanizing, Casting, R&D, Lead acid Battery Manufacturing, Used oil reprocessing, Lead smelting and Chemical industries.

Drainage Map of the region within 10 KM radius is given in the below **Figure-10**

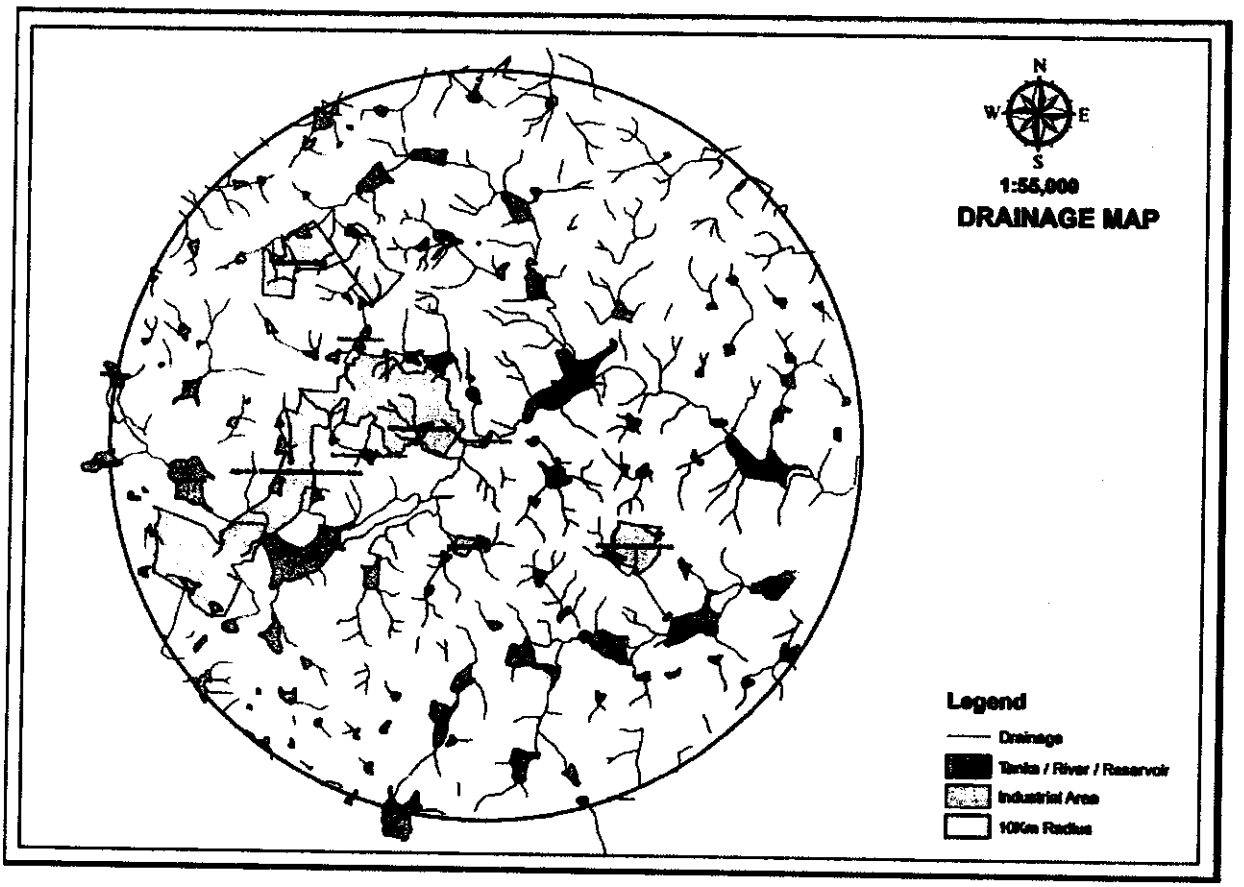


Figure-10- Drainage Map of the region within 10 KM radius

The Karnataka State Pollution Control Board (KSPCB) directs the electroplating and other surface treatment industries to comply with 5 Point criteria to prevent contamination of the Soil and ground water in the area viz., Impervious flooring in the process area, providing above ground level process and effluent collection tanks, conducting Leak test for process tanks, Installation of Scrubber/APC equipment, providing primary treatment plant before offloading

to CETP and Maintenance of records of water consumption, waste water generation and timely disposal.

Also, about 185 granite cutting and polishing industries are operating in the jurisdiction of Jigani and Bommasandra industrial areas and they are re-categorized by CPCB under green category. All the granite cutting and polishing industries are treating the slurry generated through series of settling tanks and reusing the supernatant. The solid waste (sludge) generated from these industries are disposed in the abandoned quarry identified by Jigani Granite Industries Owners Welfare Association. The drainage map showing the industrial zone is submitted in the **Figure-11** below.

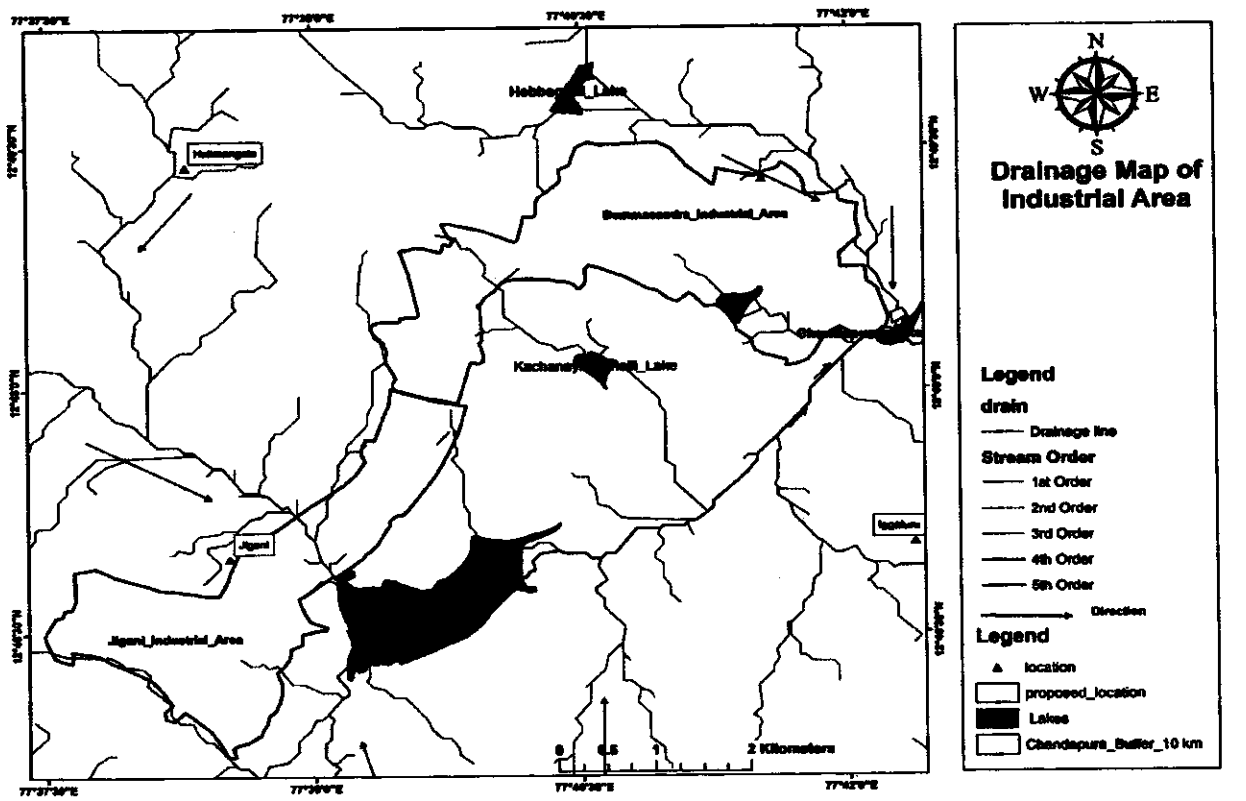


Figure-11 Drainage map showing Industrial zone

6. Existing Effluent Disposal Methods within the Industrial Area:

All the 13 numbers of 17 category highly polluting industries operating in the Jigani and Bommasandra industrial areas have adopted Zero Liquid Discharge

(ZLD) system and other small Red category industries are handing over the effluents to CETPs after pre-treatment. Other industries are treating the industrial effluent through in-house Effluent Treatment Plants (ETP) and the treated trade effluent is being utilized for the secondary purposes viz., on land gardening/irrigation and for utilities within the premises.

Majority of the General engineering and allied industries have made provision to dispose the domestic sewage into septic tank and soak pits. The industries who havenot provided sewage treatment plants (STPs) are handing over their domestic sewage to Common Sewage Treatment Plant of capacity 100 KLD established by M/s. Golden Enviro Creators located at # 278, Bommasandra - Jigani Link Road, JiganiHobli, Anekal Taluk, Bangalore.

Further it is to mention that, there are three local bodies abutting the industrial area namely TMC, Jigani; CMC, Hebbagodi and TMC, Bommasandra. The domestic sewage generated from these local bodies also enters the industrial area through storm water drains passing through the industrial area and joins nearby lakes.

At present small scale units have provided septic tank and soak pits and the sludge generated needs to be managed and properly disposed.

7. Drainage and Topography of the Industrial Area

Anekal Taluk covers part of Cauvery River and Krishna River basin and has no major rivers run through the region, Anekal has a handful of freshwater lakes and water tanks, Chandapura lake is also located in this region. A minor tributary of the Arkavathi river, which arises within the Bangalore city, flows in the district before joining the Arkavathi rivers, together carry much of Bangalore's sewage. Overall drainage pattern of study area is towards the eastern side which shown in **Figure-12** below. In southern part, drainage is towards northeast side and in northern part, drainage is towards south later in middle it moves towards east.

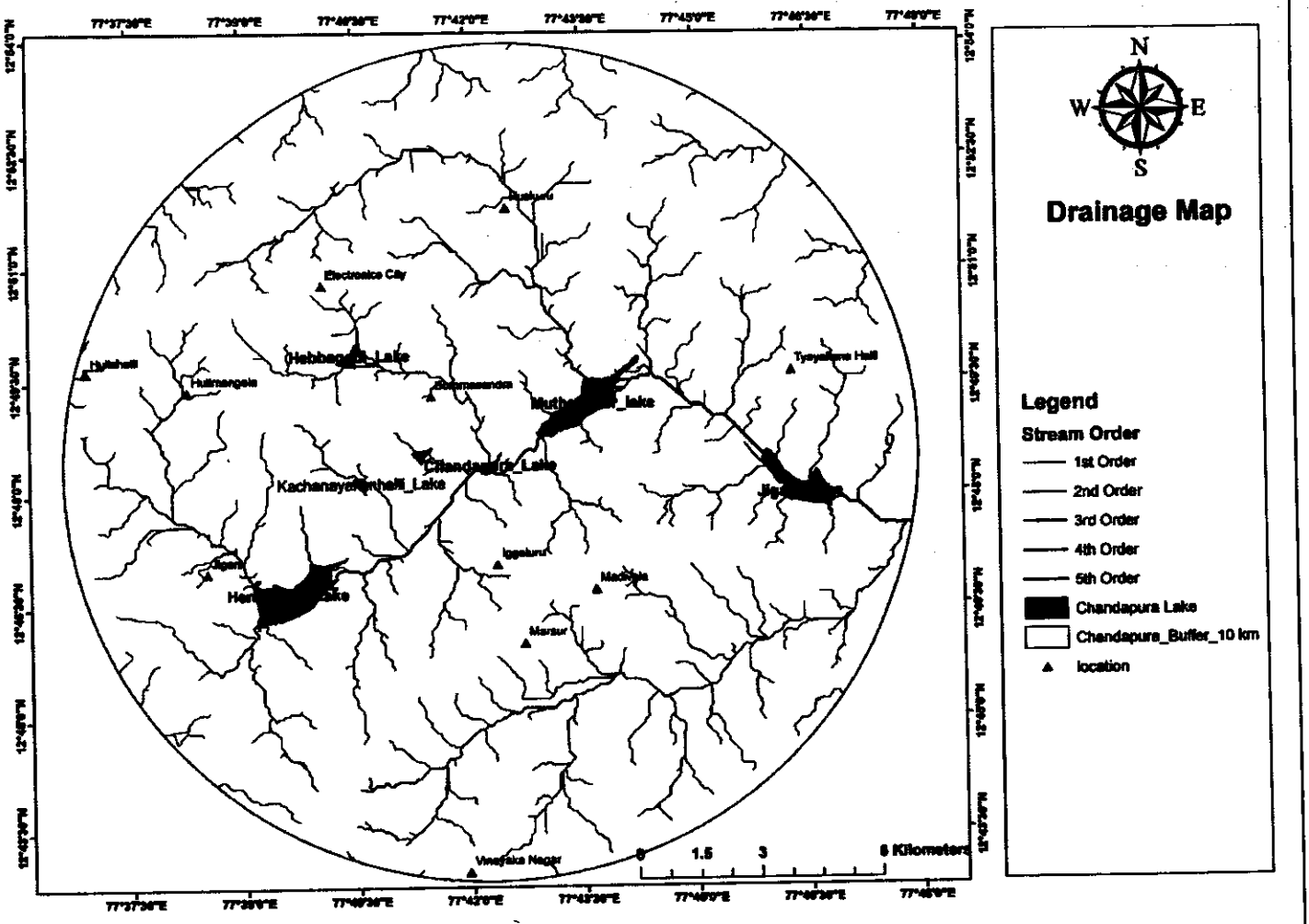


Figure-12 Drainage Map of Study Area (Industrial Area)

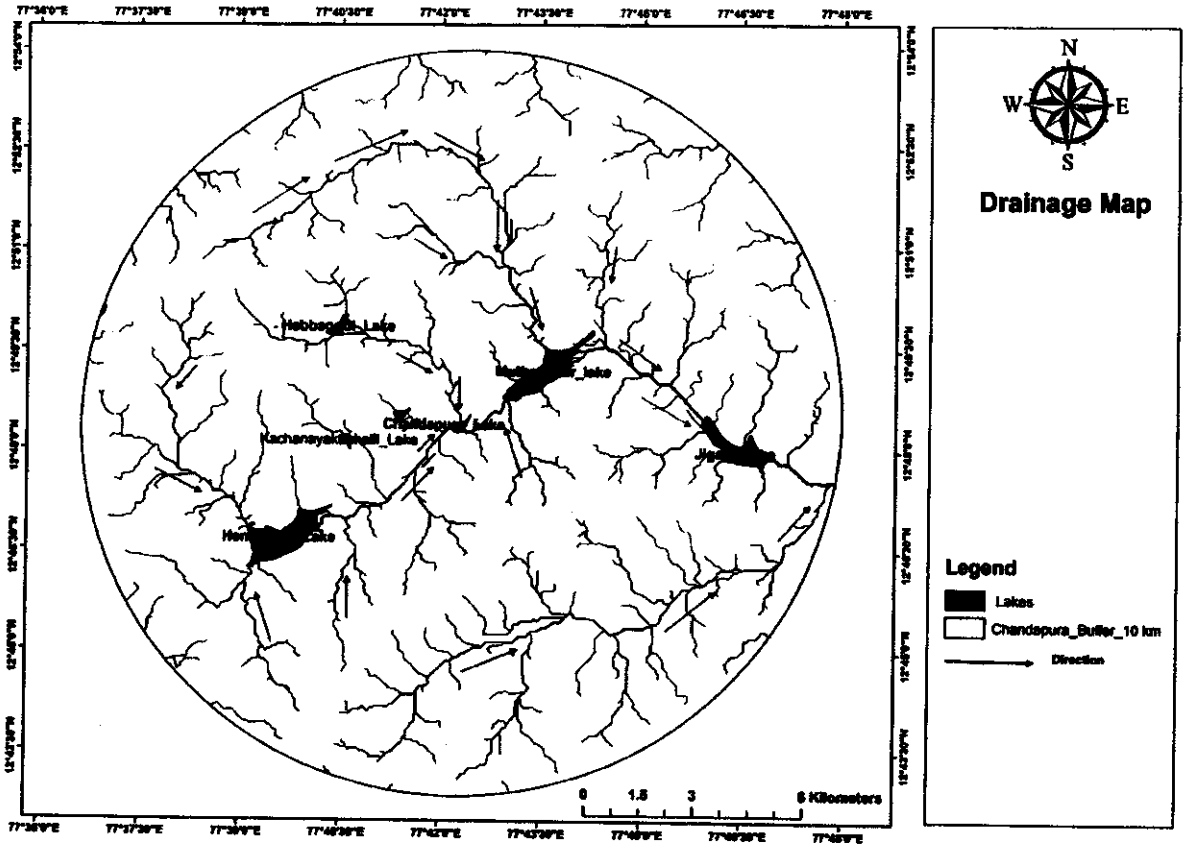


Figure-13 Drainage Map of Study Area (Chandapura Lake Area)

The topography of study area is undulating. The highest point is towards west side of study area, which is 940 m and lowest is 870 m which is at eastern part of study area **(Figure-13).**

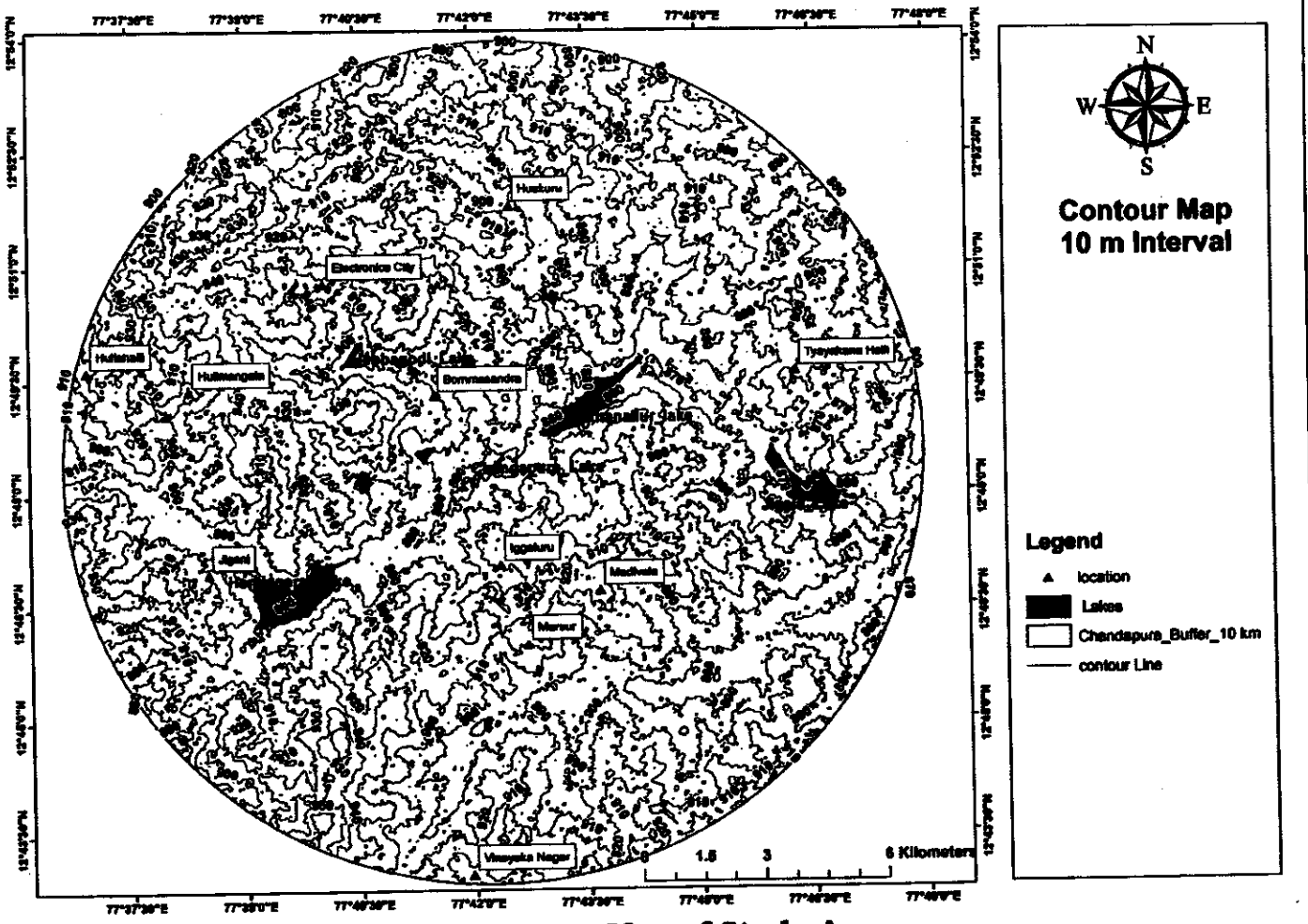


Figure-13 Contour Map of Study Area

Exploring the possible location for CETP:

Following are the general the criteria for selection of location for CETP:

- The location of the treatment units should be suitable for carrying out proper wastewater collection system according to the topography of the region. Generally the topography shall be such that the sewage/effluent flow into the site by gravity/natural slope of the drainage and thus the pumping of waste water can be avoided.

- The location of CETP should be relatively high for the rest of the land to protect from rain and floods.

- Hydraulic position of the facility – as far as possible, a straight flow path between the units is recommended to minimize loss of load and to ensure equal consistency of flow separation.

- The location of the treatment plants shall not interfere with the planning of future expansion areas needed by the city and shall permit the extension of the future wastewater collection network.

The water inflow patter for Chandapura lake is from two sources as shown in the (**Figure-14).** One drainage line is coming from Hebbagodi lake from north-west side of Chandapura lake and other is coming from Hennagara lake from south-west part of Chandapura lake. The two pour point as water source from chandapura lake is given in the **Figure-14** below:

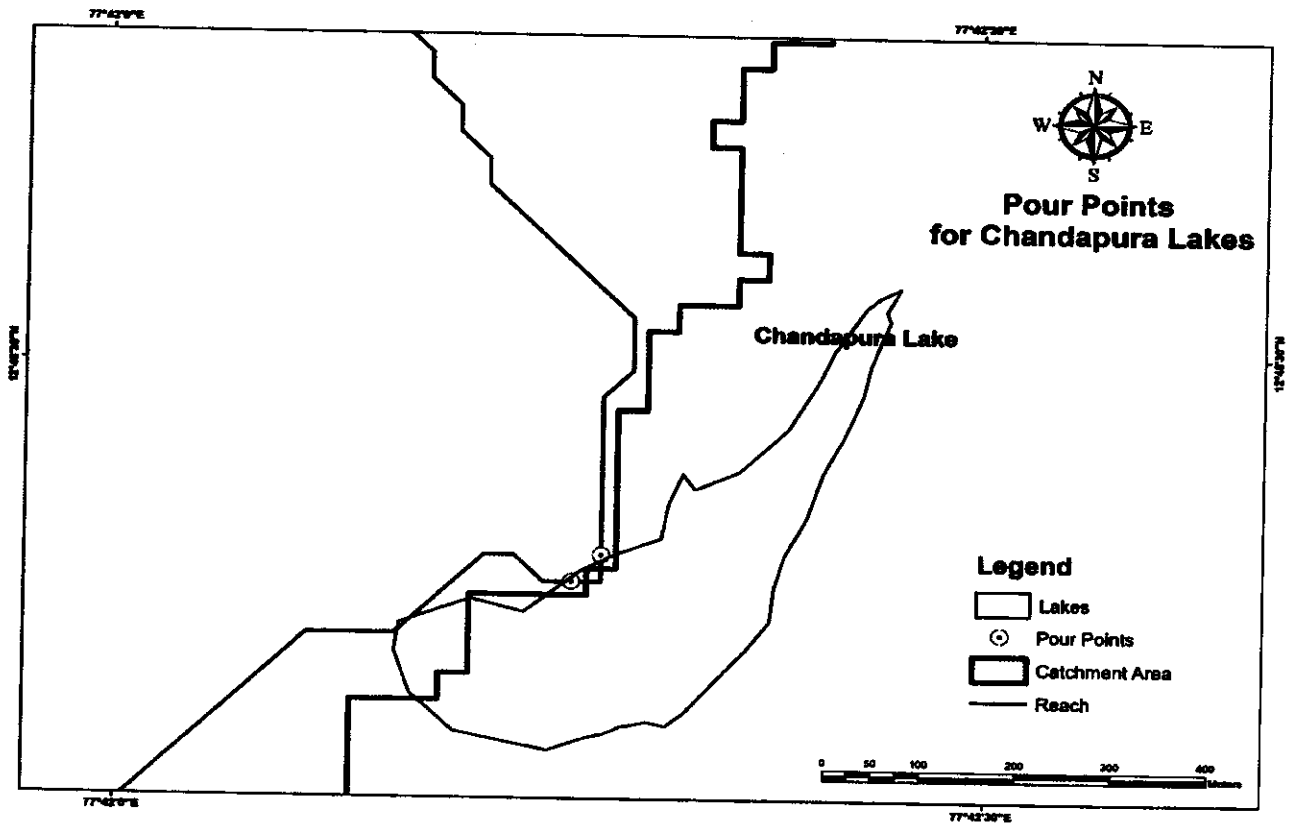


Figure-14: Water Pour Points (lowest elevation point) for Chandapura Lake

As per above criteria and need to cater all industrial requirement, CETP has been proposed near the pour point so that less pumping will be required for CETP. The zoom layout of Industrial area and Chandapura lake is given in the **Figure-15** below:

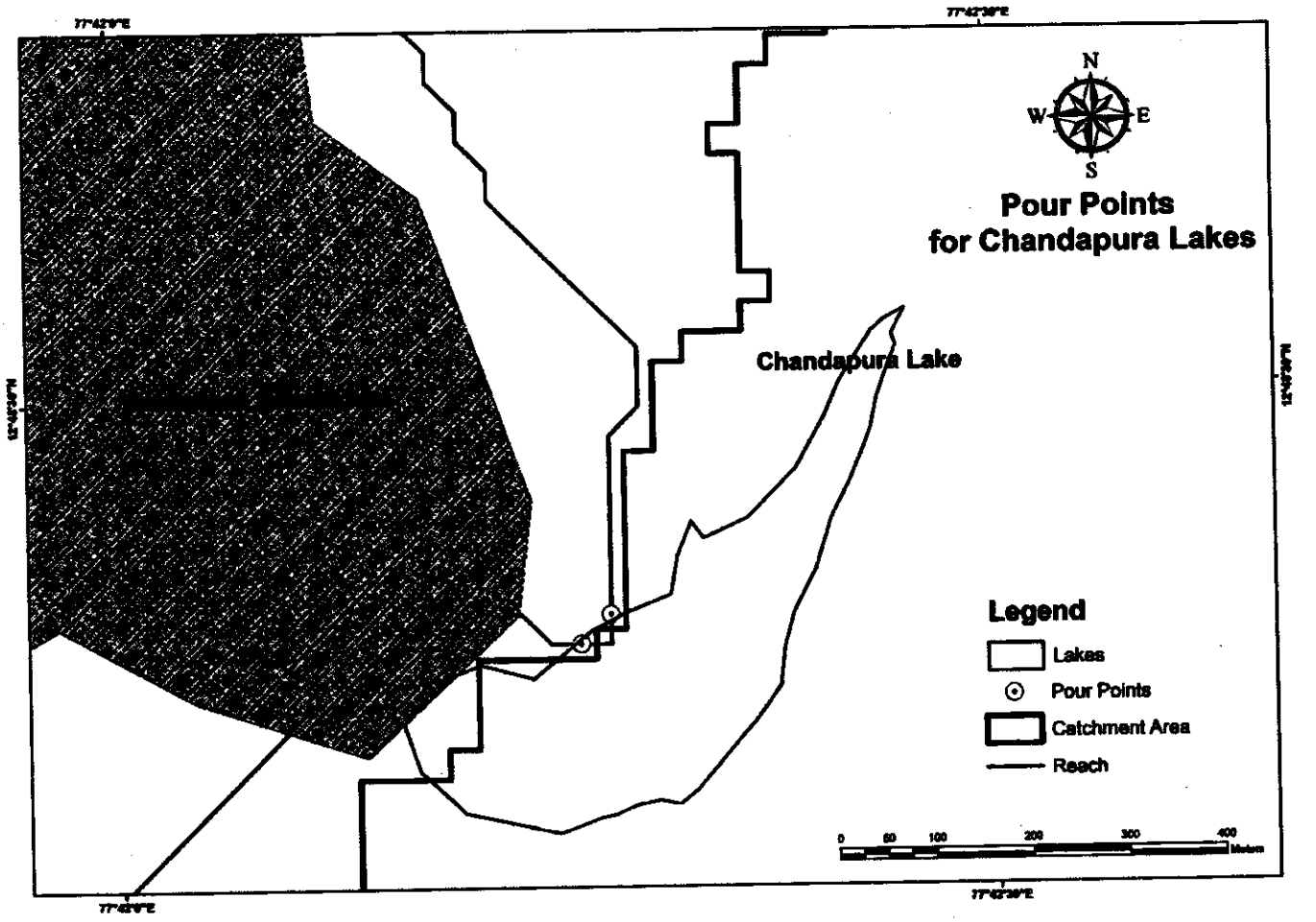


Figure-15 Zoom layout of Industrial area and Chandapura lake

The Combined map of Industrial area, drainage line and Chandapura lake submitted in the **Figure-16**, below:

Taking in to consideration of the drainage pattern study and after identification of the 2 major water pour points, the KIADB will explore the possibility of installing Common Effluent Treatment Plant (CETP) at

the marked area in the map below (Figure- 15) with installed capacity of 1.5 MLD and also explore the possibility of installing 3 Sewage Treatment Plants (STP"s) of treatment capacity 1 MLD each as per the date available with KIADB.

However detailed inventorization of the scheme of treatment unit process and actual capacity of CETP and STP required to be established is necessary before finalizing the DPR for establishment of CETP and STP.

BEST LOCATION FOR CETP

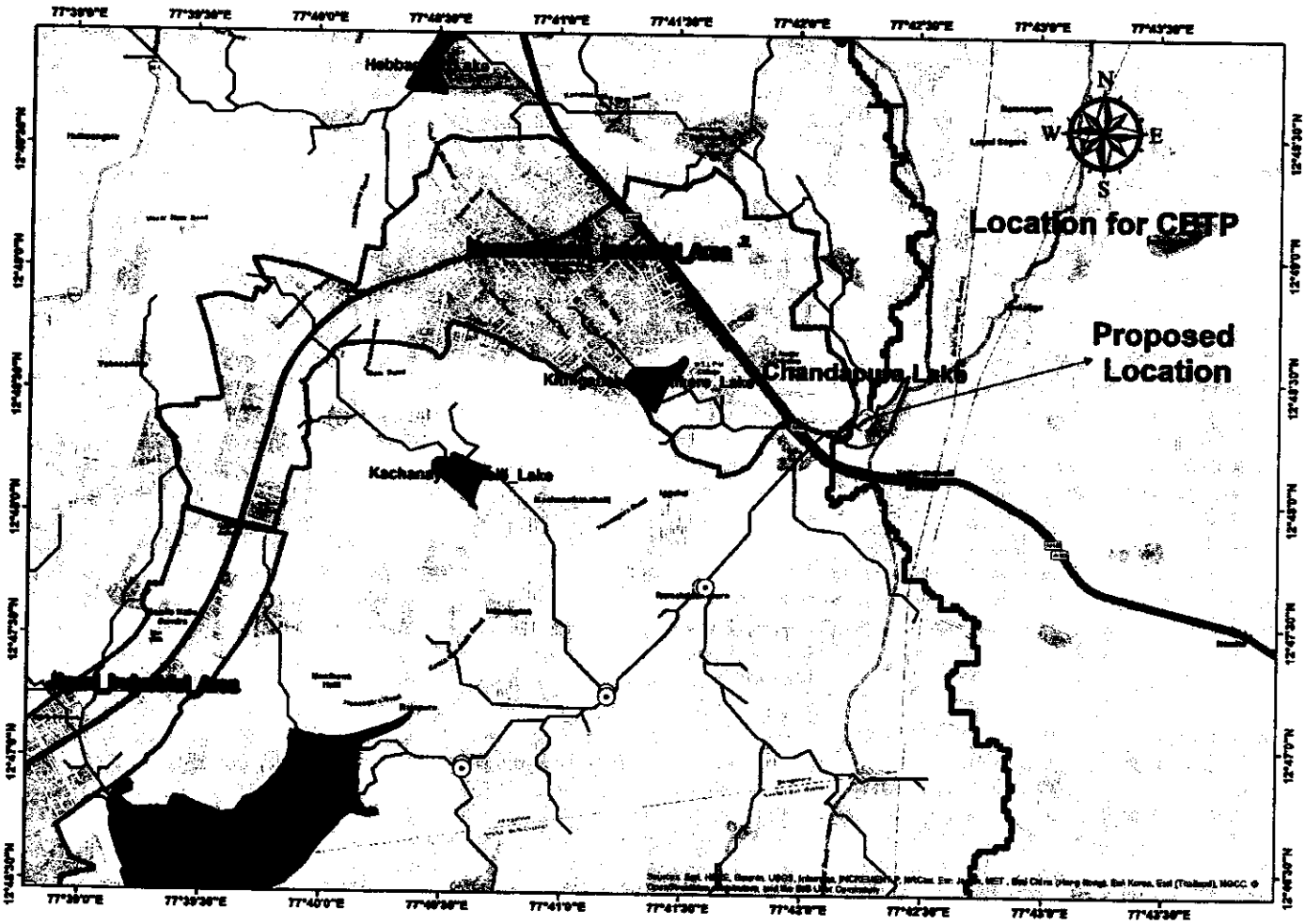


Figure-16 Industrial area, Drainage line of Chandapura Lake

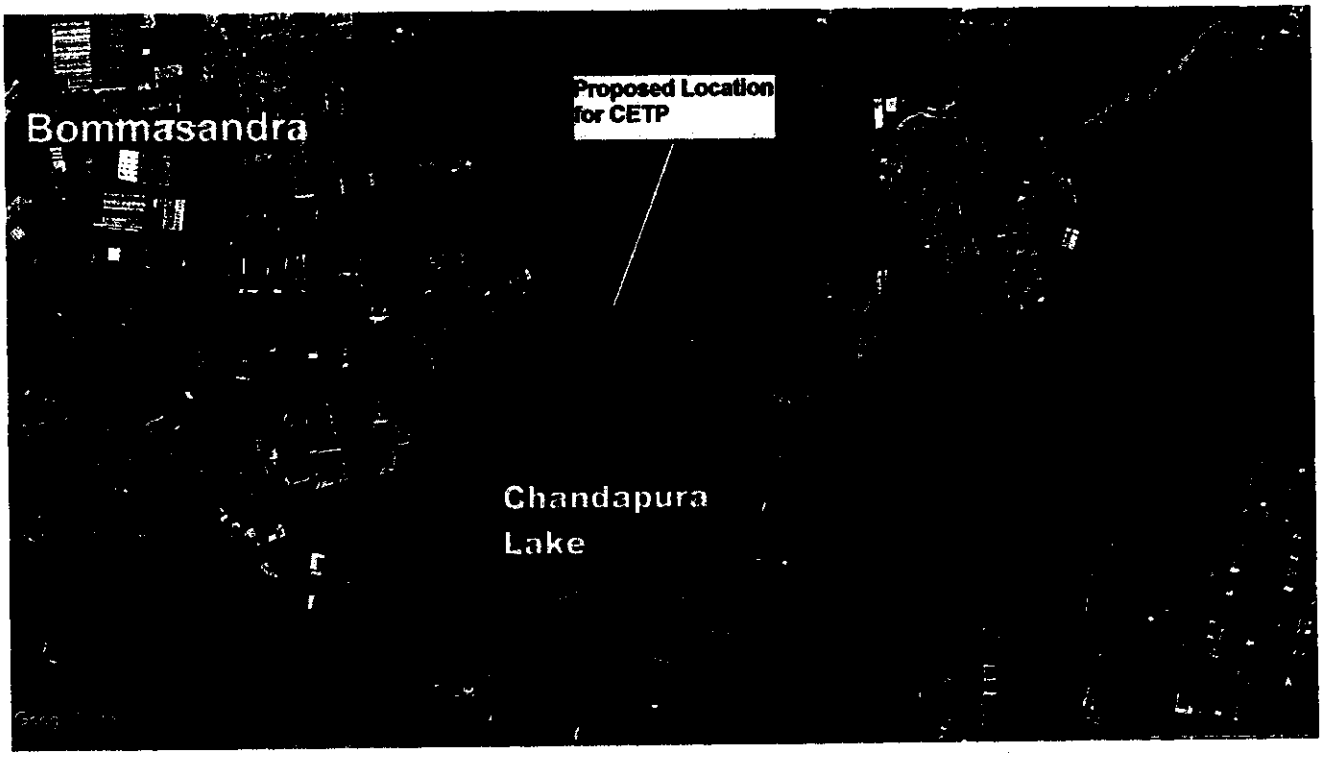


Figure-16 Google Map of Proposed location for CETP

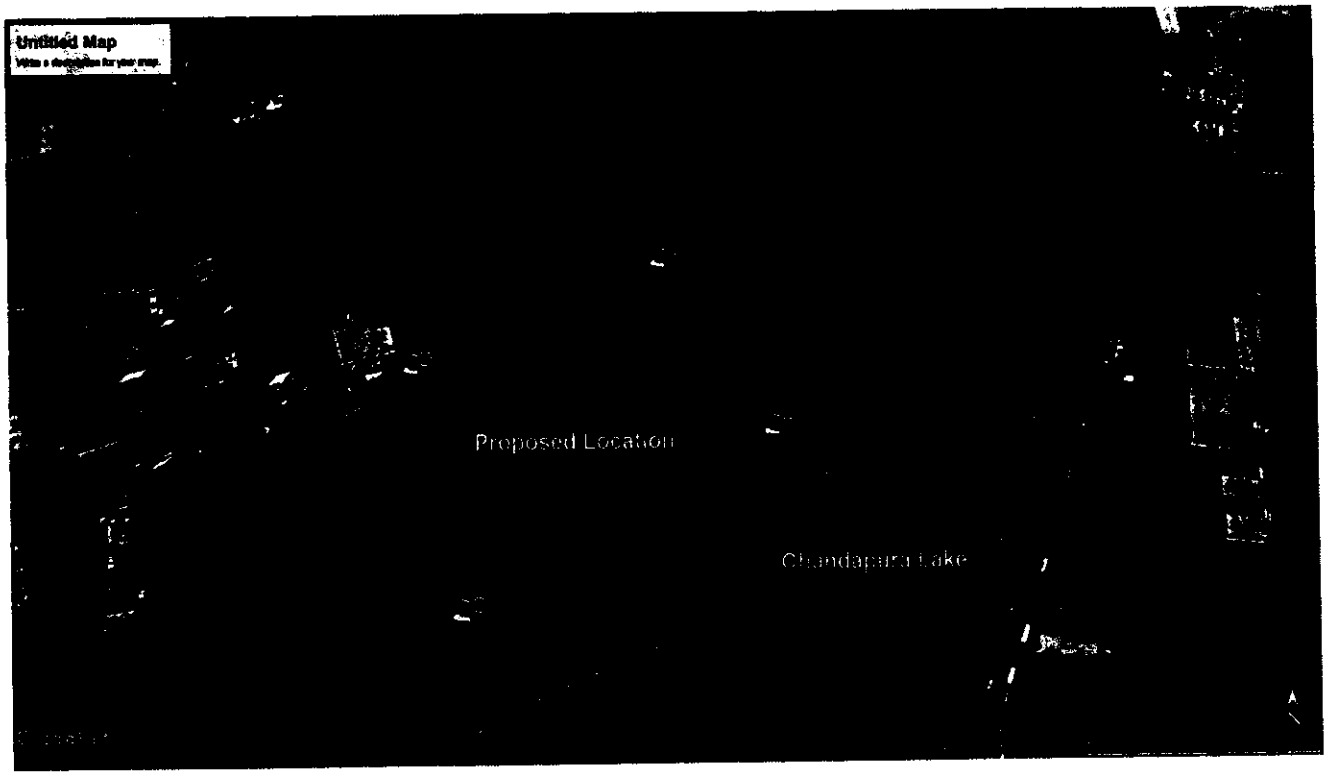


Figure-16 Google Map of Proposed location for CETP

Table 3: Latitude and longitude of area identified for CETP

Sl.No	Extent Name	Latitude	Longitude
1.	A	12.808072°	77.705159°
2.	B	12.807263°	77.705648°
3.	C	12.806509°	77.704323°
4.	D	12.807568°	77.704040°

The area identified suitable for CETP as per drainage of the area is marked in above map. The area measures 1.69 Ha. This is a vacant land as per the recent google imaginary.

Karnataka Tank Conservation and Development Authority

Karnataka Government

Subject:– Compliance to the proceedings of the meeting held under the chairmanship of Chief Secretary, Government of Karnataka on 06-07-2022, to review the action taken by the respective departments with respect to the directions issued by the Hon'ble National Green Tribunal in O.A.No.324/2021 order dated 29-03-2022 in case of Chandapura lake, Bangalore.

4) Karnataka State wetlands authority :

Sl.no	Suggestions	Action	Compliance Report
1.	To ensure protection of wetlands (> 2.25 hectare) as per rule 4 of the Wetlands Rules, 2017, In general and Chandapura lake. In specific, on top priority, in compliance to the direction of Hon'ble Supreme Court.	The Secretary, Minor Irrigation Department remained absent for meeting. The Chief Secretary directed the Minor Irrigation Department and MD, Karnataka Tank Conservation and Development Authority to submit the action plan within One week .	The Chandapura lake which was a Zilla Panchayath tank, at present is under administrative control of Chandapura Town Municipal Corporation. It is a tank constructed by GoK to meet the irrigation needs of that area in earlier years. The Wetland Authority is under the control of Ecology and Environment Department. Now, a Lift Irrigation Project is being implemented by M.I. Department to fill 69 tanks in Anekal taluk. The Lift Irrigation Project is on trial run from April 2022. The Secondary treated water pumped from Bellandur STP reaches to Ghattahalli Bommanakere tank through rising main. This water flows to Muthanallur tank by gravity. It is found that the water quality at Muthanallur tank pumped from STP meets the IS standards of the effluent which is as per guidelines issued by the Hon'ble National Green Tribunal. There was a News Report published in Local language Newspaper regarding contamination of some lakes which were filled by LIS. In this regard, action was taken to check the quality of raw sewage entering from Chandapura draft channel into the Muthanallur tank.
2.	To take requisite actions as envisaged under Wetlands Rules, 2017, In general and Chandapura lake in specific		
3.	To consider notification of Chandapura lake under the Wetlands Rules, 2017.		

			Action was taken by M.I. to check the quality of the samples extracted from the entry point of Muthanallur tank to Chandapur lake. The analysis of the raw sewage was tested as per IS standards. The analysis was made available on 19.07.2022 indicates out of 35 parameters for which the analysis carried out, the sewage meets the requirements except for 3 parameters viz., odour, dissolved phosphate and bioassay. In this background, the Minor Irrigation and KTCDA authorities inspected the tank and suggested the remedial measures. It is planned to adopt Natural aeration by detention of sewage and placing nutrient absorbing species, plants as a process of treatment in engineered wetland method. As per the directions and discussions with the Karnataka Tank Conservation and Development Authority, Minor Irrigation Department has prepared a PIR for taking up the work. The cost of the proposal is reported to be Rs.3.00 crores for which the Government accorded necessary approval.

3.x.2022

Chief Executive Officer
Karnataka Tank Conservation and Development Authority
Bangalore