

**THE HON'BLE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH, NEW DELHI**

**ORIGINAL APPLICATION NO. 383/2022,**

**WITH RESPECT TO:** News item published in the Newspaper named, DHNS, Mangaluru dated 15.05.2022 titled “**Officials term discoloring of Water in beaches as algal bloom**”

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**REPORT OF JOINT COMMITTEE APPOINTED BY HON'BLE NATIONAL GREEN TRIBUNAL PRINCIPAL BENCH, NEW DELHI (NGT) IN MATTER OF O.A NO. 383 OF 2022), DATED 23.05.2022, WITH RESPECT TO: News item published in the Newspaper named, DHNS, Mangaluru dated 15.05.2022 titled “Officials term discoloring of Water in beaches as algal bloom”**

**1.0 Preamble:**

Hon'ble NGT, Principal Bench, New Delhi registered suo-moto case and has passed an order vide OA No:383 of 2022 dated: 23.05.2022 based on the News item published in the Newspaper named, DHNS, Mangaluru dated: 15th May, 2022, titled “**Officials term discoloring of water in beaches as algal bloom**”, the order read as follows:

*“Proceedings have been initiated in this matter in the light of captioned media report of violation of environmental norms against damage to the environment by discoloration of seawater near Surathkal Beach to Algal bloom in Dakshina Kannada District of Karnataka. Though it is stated that the water sample rule out presence of oil and grease, the fact remain that there is discoloration of sea water which adversely affects the sea bass fish. Part of cage farming in Phalguni River in Thannirbhavi and Bangrakulur areas were found to be dead, raising concern among fishermen and environmentalists. Tarball were formed out of oil waste dumped by ships mid sea.*

The order further reported that *in view of the above, sources of pollution need to be identified and addressed. Hon'ble NGT, Principal Bench, New Delhi constituted a joint committee comprising of the CPCB, State PCB, District Magistrate, Dakshina Kannada, Indian Coast Guard, Mangaluru, Central Marine Fisheries Research Institute, Mangaluru and Department of Ocean Development, Chennai with State PCB as the nodal agency for coordination and compliance. The joint Committee was directed to meet within two weeks and after ascertaining facts by undertaking the site visit and interaction with the stakeholders, to submit the report to the Tribunal within two months by e-mail at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in) preferably in the form of searchable PDF/ OCR Support*

PDF and not in the form of Image PDF. Order of the Hon'ble NGT is attached as **Annexure-1**.

## 2.0 Constitution of Committee:

In compliance to Hon'ble NGT Order, the Member Secretary, Karnataka State Pollution Control Board (KSPCB) constituted a committee vide Office Memorandum No. KSPCB /NEIA-OB/NGT-383/2022-2023, dated: 21.07.05.2022 and No. 3674, dated: 26-08-2022 consisting of the following members, the copy of the same is enclosed as **Annexure- 2**. Composition of the Committee is given in **Table 1** below: -

**Table1: Constitution of Committee as per Hon'ble NGT Order**

Sl. No	Name & Designation	Details
1	Deputy Commissioner, Dakshina Kannada District	Chairman
2	Commander, Indian Coast Guard, Panambur Beach Road, New Mangalore, P.O. 19, Panambur, Mangaluru-575 010	Member
3	Regional Director, Central Pollution Control Board, Nisarga Bhavan, Basaveshwara Nagar, Bengaluru-560010	Member
4	Principal Scientist & Head, Mangalore Regional Centre of CMFRI, Post Box No. 224, Bolar, Mangaluru-575 001, Dakshina Kannada District, Karnataka	Member
	Director, National Institute of Ocean technology, Velacherry Tambaram Main Road, Narayanapuram, Chennai	Member
5	Senior Environmental Officer, Zonal Office, Mangaluru	Member
6	Environmental Officer, KSPCB, Mangaluru	Member Convener

First meeting of the Joint Committee along with other invitees was held on **11.08.2022** under the Chairmanship of Deputy Commissioner, Dakshina Kannada District. In the said meeting, Hon'ble Deputy Commissioner,

Mangalore D.K District after obtaining inputs from members of the committee has directed to schedule the spot inspection on 17.08.2022.

## 2.1: Site Visit:

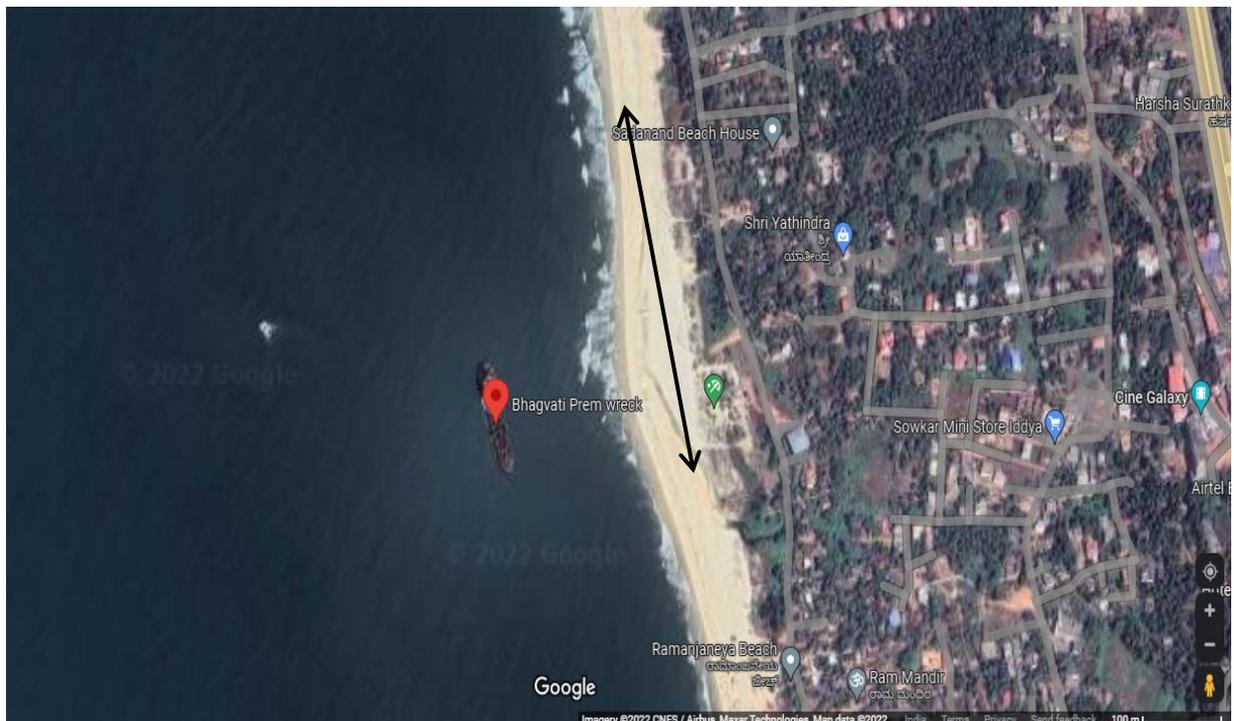
The joint committee made a Spot inspection along with other invitees on 17-08-2022, with prior intimation to all the members of the Joint Committee and the concerned line Departments. Discussions were held by the Joint Committee during the spot visit i.e., *Surathkal* Guddekoppalu *Beach*. The members and invitees who attended the spot inspection are as below:

Sl. No	Name & Designation	Details
1	<b>Dr. Rajendra K.V</b> , Deputy Commissioner, Dakshina Kannada District.	Chairman
2	<b>Sri Coumit R. Biswas</b> , DHQ-3, DOPO on behalf of Commander, Indian Coast Guard, Panambur Beach Road, New Mangalore, P.O. 19, Panambur, Mangaluru-575 010.	Member
3	<b>Shri J.Chandra Babu</b> , Regional Director, Central Pollution Control Board, Nisarga Bhavan, Shivanahalli, Bengaluru-560010	Member
4	<b>Dr. Pratibha Rohith</b> , Principal Scientist & Head, Mangalore Regional Centre of CMFRI, Post Box No. 224, Bolar, Mangaluru-575 001, Dakshina Kannada District, Karnataka	Member
5	<b>Dr. Prince Prakash Jeba Kumar J.</b> , Scientist E, Costal Environmental Engineering Division, National Institute of Ocean Technology, Tamil Nādu	Member
6	<b>Smt. Vijaya Hegde</b> , Senior Environmental Officer, Zonal Office, Mangaluru	Member
7	<b>Sri K. Keerthi Kumar</b> , Environmental Officer, KSPCB, Mangaluru	Member Convener

8	<b>Prof. G. Srinikethan</b> , Director Research, Nitte Education Trust, Nitte.	Invitee
9	<b>Dr. Lakshmipathi M.T</b> , Professor, Department of Aquatic Environment Management, College of Fisheries, Mangaluru	Invitee

## 2.2: Location of the Algal Bloom:

- The location of the algal bloom resulting in discoloration of sea was observed to be around 1 K.M stretch along Guddekoppalu Beach near Surathkal, Guddekoppalu Beach on 14.05.2022.
- Sample of sea water was collected on 14.05.2022 by KSPCB near Guddekoppalu Beach, at Latitude 12.993240, Longitude 74.791753.



**3.0 Observations Made by the Joint Committee during the Visit on 17.08.2022:** Joint Committee visited the site of the algal bloom on 17.08.2022 and observed as follows:

- No fish Kill was seen at the visited spot in the sea, neither there was algal bloom.

- The Committee observed that cage farming activities are mainly focused at Phalguni River near Thannirbhavi and Bangrakalur areas and that area is altogether different from the spot of algal bloom which is approximately 8 K.M away. Committee visited this area also and observed that there was no fish death at the time of inspection. However, the Committee also noted that there is separate complaint filed at Hon'ble NGT vide OA No.307/2022 with respect to discharge of domestic and industrial effluents into Phalguni River and detailed report about the incident is under preparation and will be submitted before the Hon'ble NGT in due course.
- Representative of the Coast Guard Mangalore who was present during inspection informed that they have not seen any tarballs in the mid sea off the Coast of Mangalore or Surathkal in recent times, neither it was observed on the day of algal bloom incident.
- Committee observed no sewage/sullage joining at the spot of algal bloom. It was noticed that landward side (Surathkal) adjoining the area of incident (discoloration of sea) is sewerred with terminal sewage treatment plant.
- In this regard, one of the members of the Committee, from CMFRI informed that algal bloom can happen when sudden outrush of runoff due to rains joins the sea, mostly during the first splash of monsoon rains which carry the nutrient rich water into the sea and the committee observed that two days before the incident there was heavy pre-monsoon rains in this coastal belt which might have caused the algal bloom in the area.
- Photographs taken during the joint committee visit to the spot is enclosed as **Annexure-3**.

#### **4.0 Inspection of the Site by the Officials on the day of the Algal Bloom:**

Algal Bloom incident occurred on 14-05-2022. As soon as the matter was reported in the local media officials of KSPCB, CRZ, District Disaster Management Authority, officials of Mangalore Refineries and Petrochemicals, Mangaluru Special Economic Zone jointly inspected the spot and observed

that sea water around one kilometer stretch along Guddekoppalu Beach towards Sasihithlu area was observed to have turned to light brown in color. There was no sheen of oil in the water and also there were no death of fishes. Photographs taken during inspection enclosed as **Annexure-4**. However, samples of sea water were collected by KSPCB for analysis of dissolved oxygen, Oil and Grease, nutrients like nitrates and phosphates as well as phytoplanktons. Samples were handed over to College of Fisheries, Mangalore and CMFRI for analysis.

Further, as there were media reports about death of sea bass fish in the cage farming area of Phalguni River near Bangrakulur area, the spot was inspected on 16.05.2022 by KSPCB officials and samples of river water were drawn for analysis. A Copy of analysis report is enclosed as **Annexure-5**.

#### **4.1: Results of Analysis**

It was found that the river water showed low level of dissolved oxygen of 3.5 mg/L as against minimum required 4.0 mg/L. However, the analysis report of CMFRI showed dissolved oxygen (DO) level of 2.54 mg/L and high temperature of 30.13<sup>o</sup> C, low salinity (**32.83 ppt**) at the sampled site and high DIP/DIN ratio indicating eutrophication and occurrence of Phytoplankton Bloom in the area. As per the analysis reports there was no presence of Oil and Grease in the collected samples, analysis report enclosed as **Annexure-6**. The sample showed high Chlorophyll C concentration indicating the presence of diatoms and predominance of single species with very low plankton diversity in the sample indicated bloom of predominant diatom *Diatoma vulgaris* at the sampling point. Report from CMFRI, Mangaluru is enclosed as **Annexure-7**.

Further, Karnataka Veterinary, Animal and Fisheries Sciences University, Department of Aquatic Environment Management, College of Fisheries, Mangaluru have also conducted plankton analysis of the samples and their analysis report also confirms the presence of more of diatoms,

dinoflagelletes and algae. Report from College of Fisheries, Mangalore is enclosed as **Annexure-8**.

#### **5.0: Opinion of National Institute of Ocean Technology, Chennai**

Dr. Prince Prakash Jeba Kumar J. Scientist E, Coastal Environmental Engineering Division, National Institute of Ocean Technology, Tamilnadu India, and also one of the members in the joint Committee appointed by Hon'ble NGT is of the opinion that May 2022 algal bloom seemed to be a fresh water algal species along the beaches of Surathkal. ***As per the said Scientist, this process may happen due to seasonal upwelling and monsoonal forcing caused by high Nethravathi- Gurupura riverine discharge resulting in nutrient enriched waters that provide a viable edge for the blooming of phytoplankton species. Therefore, algal blooms are anticipated during the upwelling period, such as withdrawal of south-west monsoon and pre-monsoon periods along the west coast of India.***

***However, he has also opined that iron concentrations in water can induce algal blooms as recorded in many studies. Since iron is one of the essential mineral elements for algal growth and with the presence of iron palletization unit along the Mangalore Coast, he has expressed his concern over the issue and recommended to monitor the process effluent discharges if any during the withdrawal of South west monsoon and pre monsoon periods as a precautionary measure.*** A Copy of Dr. Prince Prakash Jeba Kumar J opinion is enclosed as **Annexure-9**.

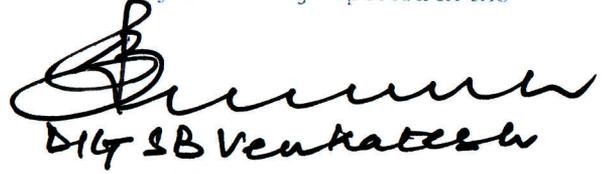
## **6.0 Conclusions and Recommendations:**

1. Committee is of the opinion that discoloring of sea water on 14.05.2022 at the Beach near Surathkal is due to algal bloom. Reasons for the formation of algal Blooms could be many. During extreme events of rainfall, the combined volume of run-off from non-point sources of pollution in the ocean system will be greater than the point sources of pollution. The characteristic of the water flow into the ocean is based on the catchment area of the non-point sources of pollution. The non-point sources, generally nutrient rich waters, of pollution outlets and natural channels from the city during extreme events and during monsoon season drain directly into the sea creating a conducive condition for the formation of plankton blooms.
2. Algal blooms are anticipated during the upwelling period, such as the withdrawal of the southwest monsoon and pre monsoon periods along the west coast of India.
3. Results of analysis of sea water collected at the incident site also confirm the presence of very high ratio of DIP/DIN which could be the cause of eutrophication and occurrence of plankton bloom. Results also indicate the predominance of diatomic species which make their presence both in freshwater and ocean system.
4. Since, the NIOT, Chennai report raises concern over iron concentrations inducing algal bloom and there is iron pelletization unit along the coast of Mangalore, it is recommended that KSPCB monitor the process effluent discharges during the withdrawal of South west monsoon and pre monsoon periods as a precautionary measure.

5. Further, Mangalore city Corporation has to take up the work of UGD and connection of missing links to terminal STP so as to ensure that there is no possible entry of untreated sewage/sullage into the sea from non-point sources across the jurisdiction.
6. As per the analysis report, there is no presence of oil and grease in the sea water. Discoloration of sea water at Surathkal Beach, death of seabass fishes in cage farming at Phalguni River at Thannirbhavi, and tarball formation due to offshore ship discharges are separate incidence knitted as media scoop.
7. The incident must have occurred due to high pre-monsoon shower that occurred preceding the incident which could have carried the nutrient rich surface run-off from non point sources in the catchment area.
8. On the previous day to the Occurrence of bloom in the area, there was heavy rain, on such occasions the combined entry of large volume of non-point sources to the marine system with possible nutrients. Hence during the monsoon season such entry of such nutrients load to a specific area (directly) to the Sea might create a **conducive for** the formation of Plankton Blooms. These are very commonly reported in the coastal Environment.



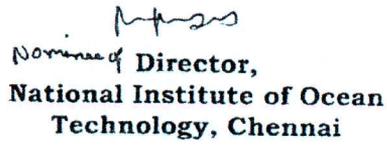
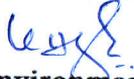
**Regional Director  
Central Pollution Control Board,  
Bengaluru**

  
D/G SB Venkatesh

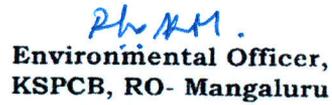
**Commander,  
Indian Coast Guard, Panambur  
Mangaluru**



**Principal Scientist & Head,  
Mangalore Regional Centre of  
CMFRI, Mangaluru**

  
Nominee of Director,  
National Institute of Ocean  
Technology, Chennai

**Senior Environmental Officer,  
Zonal Office, KSPCB, Mangaluru**

  
Environmental Officer,  
KSPCB, RO- Mangaluru  
Deputy Commissioner,  
Dakshina Kannada District

# ANNEXURE -1

Item No. 13

(Court No. 1)

**BEFORE THE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH, NEW DELHI**

(By Video Conferencing)

Original Application No. 383/2022

In re: News item published in the Newspaper named, DHNS, Mangaluru dated: 15<sup>th</sup> May, 2022, titled "**Officials term discolouring of water in beaches as algal bloom**"

Date of hearing: 23.05.2022

**CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON  
HON'BLE MR. JUSTICE SUDHIR AGARWAL, JUDICIAL MEMBER  
HON'BLE PROF. A. SENTHIL VEL, EXPERT MEMBER**

## ORDER

1. Proceedings have been initiated in this matter in the light of captioned media report of violation of environmental norms against damage to the environment by discoloration of seawater near Surathkal Beach to Algal Bloom in Dakshina Kannada District of Karnataka. Though it is stated that the water samples rule out presence of oil and grease, the fact remain that there is discoloration of seawater which adversely affects the Sea bass fish. Part of cage farming in Phalguni river in Tannirbhavi and Bangrakulur areas were found to be dead, raising concern among fishermen and environmentalists. Tarballs were formed out of oil waste dumped by ships mid-sea.
2. In view of above, sources of pollution need to be identified and addressed. We constitute a joint Committee of CPCB, State PCB, District Magistrate Dakshina Kannada, Indian Coast Guard, Mangaluru, Central Marine Fisheries Research Institute, Mangaluru and Department of

Ocean Development, Chennai. State PCB will be the nodal agency for coordination and compliance. The joint Committee may meet within two weeks and after ascertaining facts by undertaking site visit and interaction with the stakeholders, submit its report within two months by email at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in) preferably in the form of searchable PDF/OCR Support PDF and not in the form of Image PDF.

List for further consideration on 26.07.2022.

A copy of this order be forwarded to CPCB, State PCB, District Magistrate Dakshina Kannada, Indian Coast Guard, Mangaluru, Central Marine Fisheries Research Institute, Mangaluru and Department of Ocean Development, Chennai by e-mail for compliance.

Adarsh Kumar Goel, CP

Sudhir Agarwal, JM

Prof. A. Senthil Vel, EM

May 23, 2022  
Original Application No. 383/2022  
AVT

# ANNEXURE-2

/ Fax : 080-25586321

ಮೇಲ್ / Email : ho@kspcb.gov.in

ವೆಬ್‌ಸೈಟ್ / Website : http://kspcb.gov.in



080-25581383, 255891;  
080-25589113, 255891'

## ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ Karnataka State Pollution Control Board

"ಪರಿಸರ ಭವನ", 1 ರಿಂದ 5ನೇ ಮಹಡಿಗಳು, ನಂ. 49, ಚರ್ಚ್ ಸ್ಟ್ರೀಟ್, ಬೆಂಗಳೂರು - 560 001, ಕರ್ನಾಟಕ ರಾಜ್ಯ, ಭಾರತ  
"Parisara Bhavan", 1st to 5th Floor, # 49, Church Street, Bangalore - 560 001, Karnataka State, India

No. KSPCB/NEIA-OB/NGT-383/2022-23/ 2022

Date:

21 JUN 2022

### OFFICE MEMORANDUM

Sub: Constitution of Joint Committee in the matter of OA No. 383/2022 pertaining to the Officials term discoloring of water in beaches as algal bloom-reg.

Ref: The Hon'ble National Green Tribunal, Principal Bench, New Delhi order dated: 23.05.2022 in respect of OA No. 383/2022

\*\*\*\*\*

#### Preamble:

In the light of captioned media report of violation of environmental norms against damage to the environment by discoloring of water in beaches as algal bloom in violation of the environmental norms against damage to the environment by discoloration of Seawater near Surathkal Beach to Algal Bloom in Dakshina Kannada District of Karnataka. Though it is stated that the water samples rule out presence of oil and grease, the fact remain that there is discoloration of seawater which adversely affects the Sea bass fish. Part of cage farming in Phalguni river in Tannirbhavi and Bangrakur areas were found to be dead, raising concern among fishermen and environmentalists. Tarballs were formed out of oil waste dumped by ships mid-sea, the Hon'ble National Green Tribunal, Principal Bench, New Delhi has passed an order Dated: 23.05.2022.

In the said order, the Hon'ble NGT felt that the sources of pollution need to be identified and addressed. Thereby constitute a Joint Committee comprising of CPCB, State PCB, District Magistrate Dakshina Kannada, Indian Coast Guard, Mangaluru, Central Marine Fisheries Research Institute, Mangaluru and Department of Ocean Development, Chennai with the State PCB as Nodal agency for co-ordination & Compliance.

In compliance to the Hon'ble NGT directions, the following Joint Committee is constituted consisting of the of the following Departments:

Sl. No.	Name & Designation	Committee Particulars	Name & Contact No
1	Deputy Commissioner, Dakshina Kannada District.	Chairman	
2	Commander, Indian Coastal Guard, Panambur Beach Road, New Mangalore, P.O. 19, Panambur, Mangaluru-575010.	Member	Sri S.B.Venkatesh. Phone No. 0824-2405260.
3	Principal Scientist & Head, Mangalore Regional Centre of CMFI, Post Box No. 244, Bolar, Mangalore -575001, Dakshina Kannada, Karnataka.	Member	Dr. Prathibha Rohit. Mob: 99161-29255.

4	Director, National Institute of Ocean Technology, Velacherry-Tambaram Rain Road, Narayanapuram, Chennai.	Member	Representative to be nominated
5	Senior Environmental Officer Zonal Office, Mangaluru.	Member	Smt. Viaya Hedge, SEO. Mb: 98453-80806.
6	Environmental Officer, Regional Office, KSPCB Mangaluru.	Member Convener	Sri. K.Keerthikumar, Environmental Officer. Mb: 94482-68171.

As per the directions of Hon'ble NGT,

- The Joint Committee may meet within two weeks, undertake site visits and after ascertaining facts by undertaking site visit and interaction with the stakeholders, submit its report within two months by e-mail at [judicial-ngt@gov.in](mailto:judicial-ngt@gov.in) preferably in the form of searchable PDF/OCR support PDF and not in the form of Image PDF.

Encl.: NGT order dated: 23.05.2022 in respect of OA No. 383/2022 (PB).

  
MEMBER SECRETARY

To,

- Deputy Commissioner,  
Dakshina Kannada District.
- Commander, Indian Coastal Guard,  
Panambur Beach Road,  
New Mangalore, P.O. 19, Panambur,  
Mangaluru-575010.
- Principal Scientist & Head,  
Mangalore Regional Centre of CMFI,  
Post Box No. 244, Bolar, Mangalore -575001,  
Dakshina Kannada, Karnataka.
- The Director, National Institute of Ocean Technology,  
Velacherry-Tambaram Rain Road, Narayanapuram, Chennai-601302, Tamil Nadu  
for information and to nominate the representative for the Member with Name and  
Mobile Number to the Member Convener.
- Senior Environmental Officer,  
KSPCB, Zonal Office, Mangaluru.
- Environmental Officer,  
KSPCB, Regional Office, Bikampady Industrial Area,  
Mangaluru.

Phone : 080-25582559

E-mail : contact@kspcb.gov.in

Website : kspcb.karnataka.gov.in



080-25581383, 25589112  
080-25589113, 25589114

ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ

**Karnataka State Pollution Control Board**

"ಪರಿಸರ ಭವನ", 1 ರಿಂದ 5ನೇ ಮಹಡಿಗಳು, ನಂ.49, ಚರ್ಚ್ ಸ್ಟ್ರೀಟ್, ಬೆಂಗಳೂರು-560001, ಕರ್ನಾಟಕ ರಾಜ್ಯ, ಭಾರತ  
"Parisara Bhavan", 1st to 5th Floor, # 49, Church Street, Bangalore - 560 001, Karnataka State, India

No. KSPCB/NEIA-OB/NGT-383/2022-23/ 3674

Date:

26 AUG 2022

**ADDENDUM**

Sub: Constitution of Joint Committee in the matter of OA No. 383/2022 pertaining to the Officials term discoloring of water in beaches as algal bloom-reg.

Ref: 1) The Hon'ble National Green Tribunal, Principal Bench, New Delhi order dated: 23.05.2022 in respect of OA No. 383/2022

2) Board Office Memorandum No.KSPCB/NEIA-OB/NGT-383/2022-23/2027 dated 21.06.2022

3. CPCB letter No.F.Tech/39/Legal / RDS/2022-23/184 dated 09.06.2022.

\*\*\*\*\*

**Preamble:**

In compliance to the Hon'ble NGT directions in the order dated 23.05.2022 in respect of OA No.383/2022, the Board has constituted Joint Committee vide Board Office Memorandum No. KSPCB/NEIA-OB/NGT-383/2022-23/2027 on 21.06.2022. In this connection, CPCB vide ref (3) has nominated Sri. J Chandra Babu, Regional Director as a member of the Joint Committee to represent CPCB and Dr. V Deepesh, Scientist C as the alternate member of the joint committee. Hence, in addition to the committee constituted vide ref (1) following members are included for the Joint Committee.

Sl. No.	Name & Designation	Committee Particulars	Name & Contact No
1	Regional Director Central Pollution Control Board Nisarga Bhavan, Basaveshwara Nagar, Bengaluru	Member	Sri. J Chandra Babu, Regional Director (Email: <a href="mailto:jcb.cpcb@nic.in">jcb.cpcb@nic.in</a> ) Contact No. 9868278903)  Dr. V Deepesh, Scientist C (Email: <a href="mailto:deepesh.cpcb@nic.in">deepesh.cpcb@nic.in</a> ) Contact No. 9611128895)

All other Terms and Conditions mentioned in the OM cited under ref(1) remains unaltered.

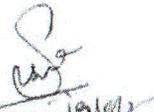
  
MEMBER SECRETARY

to,

1.	The Regional Director Central Pollution Control Board Nisarga Bhavan, Basaveshwara Nagar, Bengaluru
2.	Deputy Commissioner, Dakshina Kannada District.
3.	Commander, Indian Coastal Guard, Panambur Beach Road, New Mangalore, P.O. 19, Panambur, Mangaluru-575010.
4.	Principal Scientist & Head, Mangalore Regional Centre of CMFI, Post Box No. 244, Bolar, Mangalore -575001, Dakshina Kannada, Karnataka.
5.	The Director, National Institute of Ocean Technology, Velacherry-Tambaram Rain Road, Narayanapuram, Chennai-601302, Tamil Nadu for information and to nominate the representative for the Member with Name and Mobile Number to the Member Convener.
6.	Senior Environmental Officer, KSPCB, Zonal Office, Mangaluru.
7.	Environmental Officer, KSPCB, Regional Office, Bikampady Industrial Area, Mangaluru.
8.	Dr. V Deepesh, Scientist C Central Pollution Control Board Nisarga Bhavan, Basaveshwara Nagar, Bengaluru

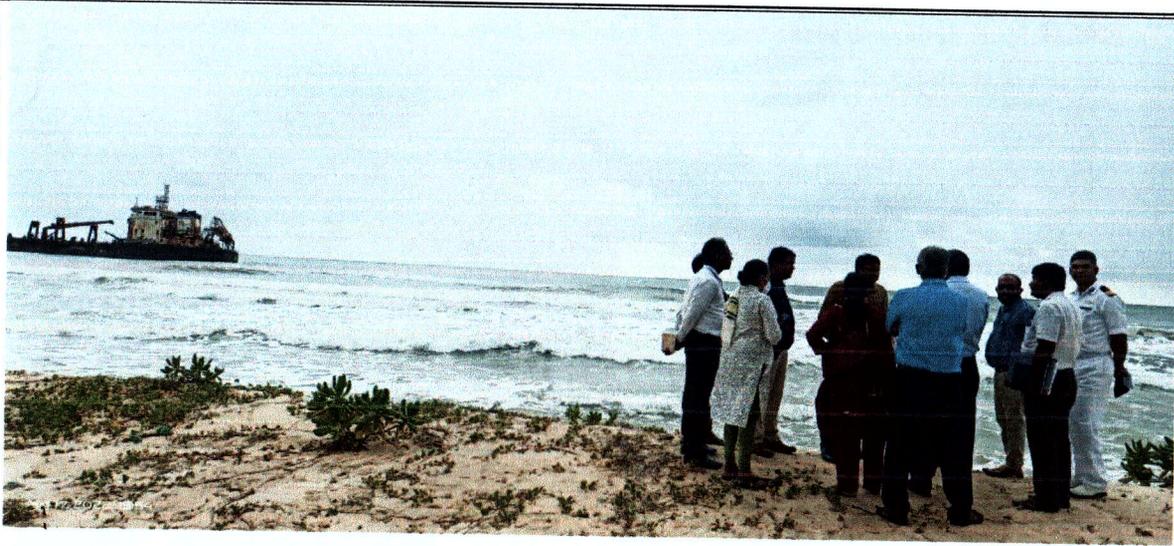
**Copy to:**

1. Technical Officer to Chairman with request to bring the matter to kind notice of the Chairman.
2. Law Officer, KSPCB, for information & necessary action.
3.  Case File

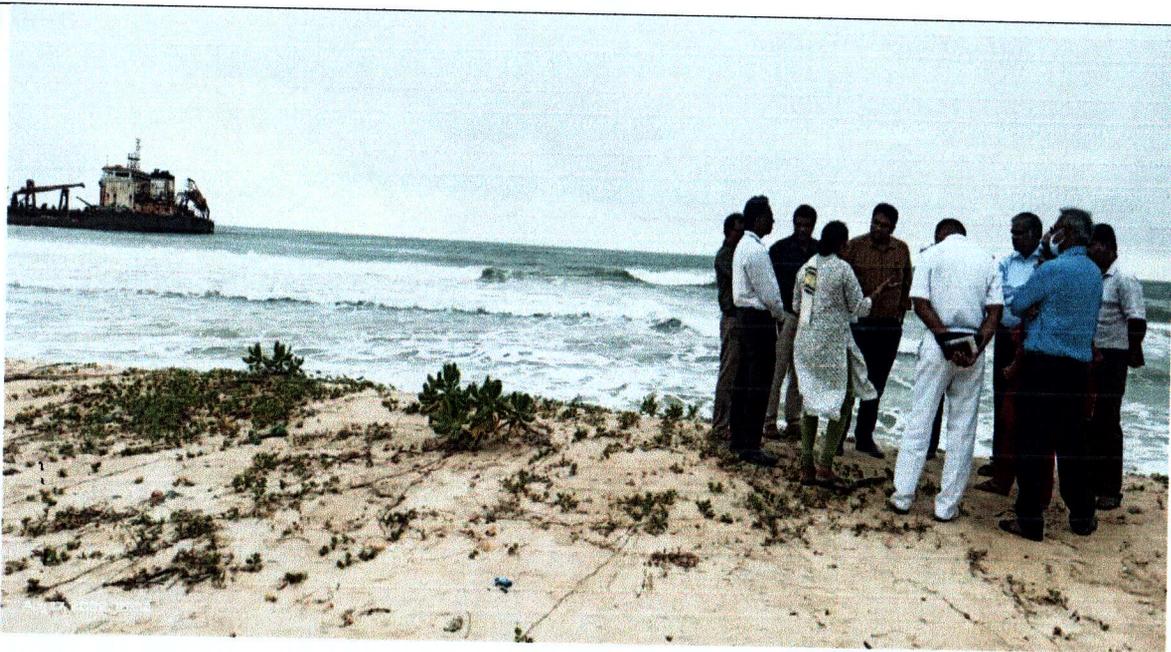
  
**SENIOR ENVIRONMENTAL OFFICER**

# ANNEXURE -3

**Annexure- 3: Photographs taken during inspection by Joint Committee Near Guddekoppalu Beach Surathkal**



**Inspection and Discussion by the Joint Committee during the spot inspection on 17.08.2022**



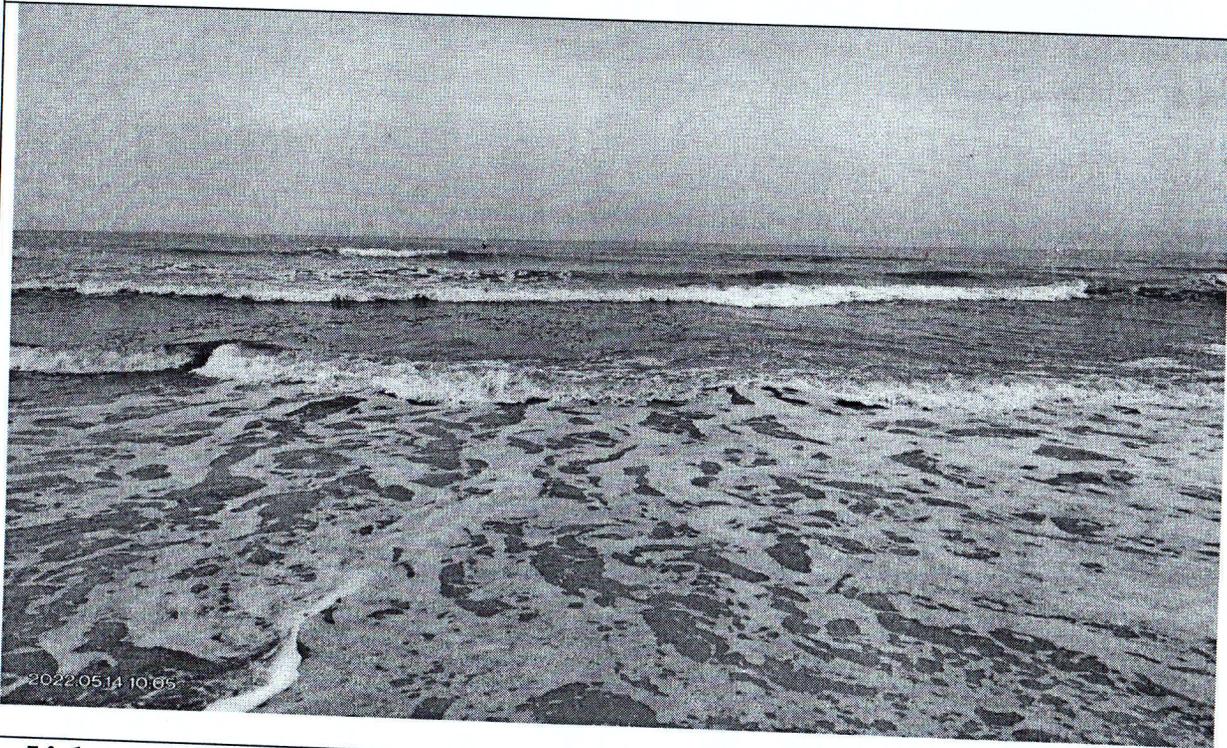
**Discussions being held during the Spot Inspection on 17.08.2022**

# ANNEXURE-4

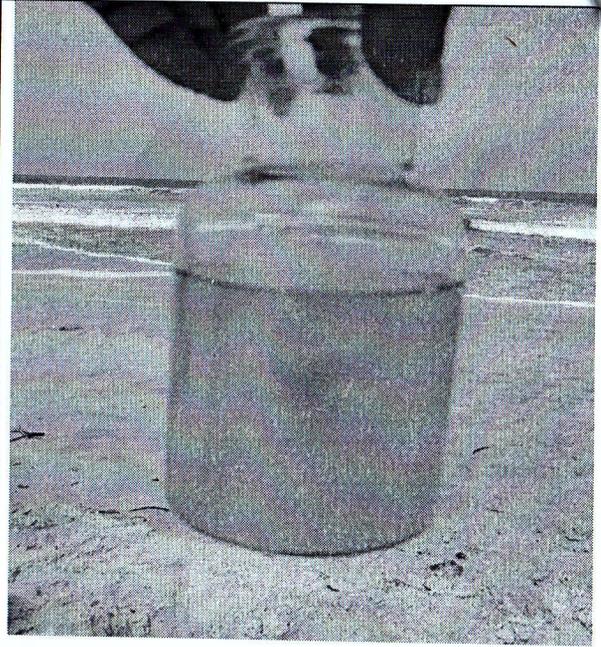
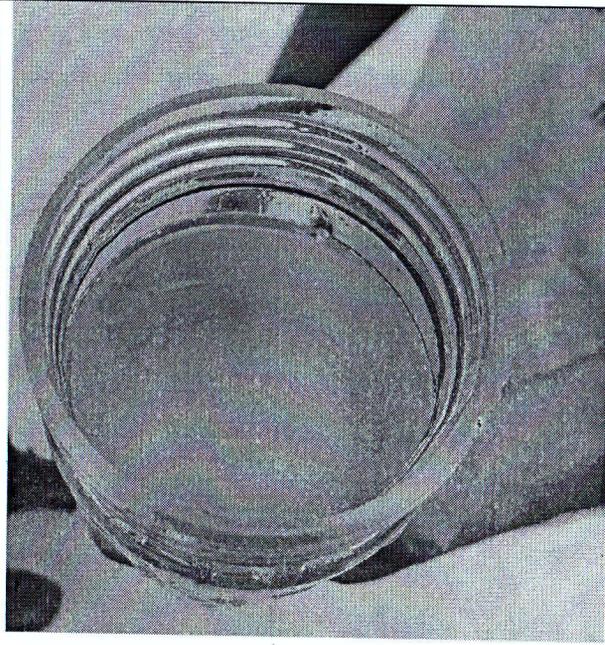
**Annexure- 4: Photographs taken during inspection on 14.05.2022 near Guddekoppalu Beach Surathkal**



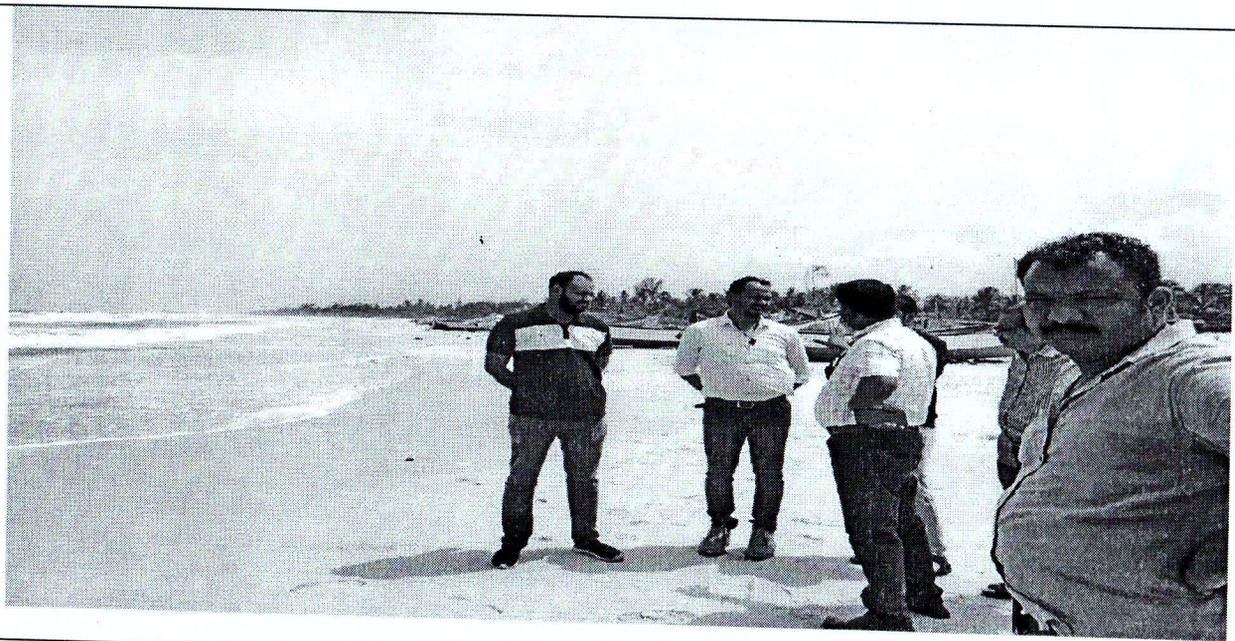
**Sea Discoloration as observed during inspection on 14.05.2022**



**Light Brown Algal Bloom at the Gudde Koppalu Beach as seen on 14.05.2022**



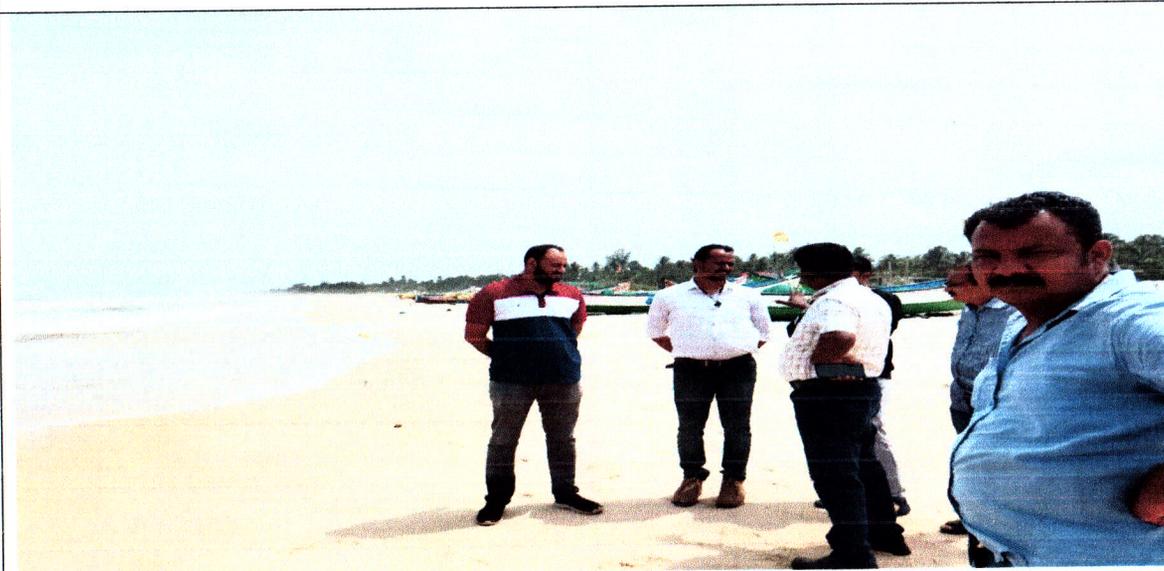
**Light Brown Colored Sea Water Sample collected during inspection on 14.05.2022**



**Joint Inspection by KSPCB, DDMA, Department of Factories and Boilers, MRPL, MSEZ officials carried out on 14.05.2022**



**Light Brown Colored Sea Water Sample collected during inspection on 14.05.2022**



**Joint Inspection by KSPCB, DDMA, Department of Factories and Boilers, MRPL, MSEZ officials carried out on 14.05.2022**



# KARNATAKA STATE POLLUTION CONTROL BOARD

No 10 B, Industrial Area Baikampady Mangalore 575011 Ph No: 0824-2408420

PCB/RO(MNG)/RBW-128/2022-23/R No : 68

Date: 15/06/2022

## ANALYSIS REPORT OF WATER QUALITY REGIONAL LABORATORY

NAME OF THE LOCATION :		River water of Gurupura, collected near Fish harvesting point downstream of Kuloor Bridge, Mangaluru	
SAMPLE COLLECTED BY :		EO, Mangaluru.	
DATE OF COLLECTION :		16.05.2022	
DATE OF RECEIPT :		16.05.2022	
SAMPLE NO & PARTICULARS OF SAMPLE COLLECTED:		River backwater (128)	
Sl No.	Parameters Analysed	Unit	Results
1	pH		Sample No.128
2	Suspended Solids	pH unit	7.5
3	BOD (3 days @ 27 <sup>o</sup> C)	mg/L	16
4	Sulphide	mg/L	5
5	Ammoniacal Nitrogen	mg/L	BDL
6	TKN	mg/L	BDL
7	Free Ammonia	mg/L	BDL
8	Dissolved Phosphate	mg/L	BDL
9	Total Residual Chlorine	mg/L	BDL
10	Oil and Grease	mg/L	BDL
11	Total Dissolved Solids	mg/L	BDL
12	Sulphate	mg/L	25356
13	Copper	mg/L	1808
14	Total Chromium	mg/L	0.02
15	Cadmium	mg/L	BDL
16	Nickel	mg/L	BDL
17	Lead	mg/L	0.296
18	Zinc	mg/L	BDL
19	Iron	mg/L	0.023
20	Dissolved Oxygen	mg/L	0.534
INFERENCE			3.5

Note:

1. The above results pertain only to the sample tested.
2. The method of analysis is as per the Standard Method for the examination of Water and Waste Water, and Indian Standard Publication.
3. ND: Not detected.
4. BDL: Below detection limit
5. COD was not carried out due to high interference from Chloride

*Snpato*

Scientific Assistant

ANALYSED BY

KSPCB/RL/FO/O4

*G*

Scientific Assistant

VERIFIED BY

*R*

Scientific Officer

LAB HEAD

VALID FROM 01/06/2018 RV-00



# KARNATAKA STATE POLLUTION CONTROL BOARD

No 10 B, Industrial Area Baikampady Mangalore 575011 Ph No: 0824-2408420

PCB/RO(MNG)SW-126 & 127/2022-23/R No : 35

Date: 16/05/2022

## ANALYSIS REPORT OF WATER QUALITY REGIONAL LABORATORY

NAME OF THE INDUSTRY :		Sea water Samples Guddekoppala, Surathkal Mangalore, DK District			
SAMPLE COLLECTED BY :		DEO, Mangaluru.			
DATE OF COLLECTION :		14.05.2022			
DATE OF RECEIPT :		14.05.2022			
SAMPLE NO & PARTICULARS OF SAMPLE COLLECTED:		1.Sea water collected near Bhagavathi ship sinking place north side of Guddekoppala, Surathkal Mangalore, DK District (126) 2..Sea water collected near Bhagavathi ship sinking place north side of Guddekoppala, Surathkal Mangalore, DK District (10mtr distance from the 1st sample location (127)			
SI No.	Parameters Analysed	Unit	Standard	Results	
				Sample No:126	Sample No:127
1	Oil&Grease	mg/L	—	BDL	BDL

### INFERENCE

**Conforming**

- Note:
1. The above results pertain only to the sample tested.
  2. The method of analysis is as per the Standard Method for the examination of Water and Waste Water, and Indian Standard Publication.
  3. ND: Not detected.
  4. BDL: Below detection limit

*Sripa*  
Scientific Assistant  
ANALYSED BY

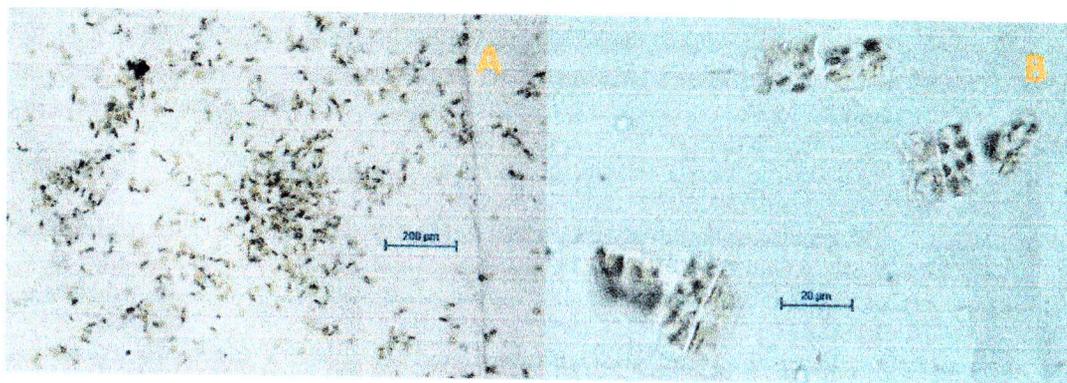
*[Signature]*  
Scientific Assistant  
VERIFIED BY

*[Signature]*  
Scientific Officer  
LAB HEAD

# ANNEXURE - 7

## Report on the water sample collected by KSPCB on 14.5.2022 and handed over to CMFRI, Mangalore Regional Centre on 17.5.2022

The sample collected from the location (Latitude 12.993240, Longitude 74.791753) contained the diatom *Diatoma vulgare* (after Blanco & Willams 2015). Diatoma cells form zig-zag chains and are found submerged in rocks, concrete, pipes, and other structures as they are benthic diatoms. The presence of chlorophyll and accessory pigments, especially fucoxanthin, give them a golden color (Fig. 1 and 2) and served to harvest light energy from the sun. Diatoms are predominantly autotrophic or holophytic organisms. Fatty oil is the principal product of assimilation in the diatoms. Oil is stored in vacuoles as reserve-food material. Oil prepared by extraction from masses of diatoms has the characteristic odor of fish oil. Diatoms that are neritic live near the coast and reproduce efficiently under coastal conditions as they adapted to changing conditions by forming resting spores. The spores remain on the bottom in shallow coastal water until conditions favor their germination. Nitrogen, phosphorus, potassium, magnesium, oxygen, hydrogen, carbon, sulfur, and iron are as essential to the normal development of diatoms as to that of higher plants. The sample had a count of  $1.25 \times 10^5$  cells of diatom per milliliter. The chlorophyll a of  $717 \text{ mg/m}^3$  was observed in the sample of KSPCB. The sample contained predominantly of *Diatoma vulgare* indicating a bloom at the location. It is stated that *Diatoma vulgare* survives both in fresh and marine conditions (World Register of Marine Species Id 149347).



A *Diatoma vulgare* Under 10X magnification Zig-Zag arrangement of colonies  
B under 100x magnification

Date	Station	WT °C	pH	DO (mg/l)	TDS(g/L)	TSS (mg/L)	Sal ppt	Density pt
14.5.2022	Latitude 12.993240, Longitude 74.791753	30.13	8.07	2.54	30.1	576.0	32.83	20.2

Date	Station	Nitrate mg/L	Nitrite mg/L	Silicate mg/L	Phosphate mg/L	Ammonia mg/L	DIP/ DIN	Chl a mg/m <sup>3</sup>	Chl b mg/m <sup>3</sup>	Chl c mg/m <sup>3</sup>
14.5. 2022	Latitude 12.993240 , Longitude 74.791753	0.006	0.002	0.472	0.434	BDL	54.5 7	717.38	-17.56	381.1

The dissolved oxygen was low at the sampled site (sample given by KSPC Board on 17.5.2022), and a high DIP/DIN ratio led to eutrophication and the occurrence of a plankton bloom in the area. A high Chl c in the sample indicated the presence of the diatoms and the predominance of a single species with very low plankton diversity indicated a bloom of the predominant diatom *Diatoma vulgare* at the sampling point. Sampling from a single point can also affect plankton diversity in the sample collected.

The reasons for the formation of blooms are many. During extreme events of rainfall, the combined volume of non-point sources of pollution in the ocean system will be greater than the point sources of pollution. The characteristic of the water flow into the ocean is based on the catchment area of the non-point sources of pollution. The non-point sources, generally nutrient-rich waters, of pollution outlets and natural channels from the city during extreme events and during monsoon season drain directly into the sea creating a conducive condition for the formation of plankton blooms.

#### Reference

Blanco Lanza, S.; Williams, D. M. (2015). Corrections to the nomenclature of genus *Diatoma* (Bacillariophyta: Fragilariaceae). *Phytotaxa*. 202(3): 225., available online at <https://doi.org/10.11646/phytotaxa.202.3.7>

Kociolek, J.P.; Blanco, S.; Coste, M.; Ector, L.; Liu, Y.; Karthick, B.; Kulikovskiy, M.; Lundholm, N.; Ludwig, T.; Potapova, M.; Rimet, F.; Sabbe, K.; Sala, S.; Sar, E.; Taylor, J.; Van de Vijver, B.; Wetzel, C.E.; Williams, D.M.; Witkowski, A.; Witkowski, J. (2022). DiatomBase. *Diatoma vulgare* Bory de Saint-Vincent, 1831. Accessed through: World Register of Marine Species at: <https://www.marinespecies.org/aphia.php?p=taxdetails&id=149347> on 2022-06-12

  
 अध्यक्ष / Head  
 मंगलूर क्षेत्रीय केंद्र  
 पशु प. केन्द्रीय समुद्री पारिस्थिकी  
 अनुसंधान संस्थान का मंगलूर क्षेत्रीय केंद्र  
 Mangalore Regional Centre of  
 ICAR - Central Marine Fisheries  
 Research Institute  
 पोस्ट बॉक्स नं. 244 Post Box No 244  
 जलो वजार, मंगलूर - 575001  
 Dazar, Mangalore-575001

# ANNEXURE - 8

KARNATAKA VETERINARY, ANIMAL AND FISHERIES SCIENCES UNIVERSITY



Dept of Aquatic Environment Management

College of Fisheries, Kankanady, Mangaluru - 575 002 Phone : 0824-2249256

Fax : 0824-2248366

Mobile : +919945145452

Email : [mtlaem2020@gmail.com](mailto:mtlaem2020@gmail.com)

Date: 30-08-2022

To,

The Environmental Officer,  
Karnataka State Pollution Control Board  
Parisara Bhavan 10B, Bikampady Industrial Area,  
Mangaluru-575011

Phone: 0824-2406586,2408239

Email: [manglore@kspcb.gov.in](mailto:manglore@kspcb.gov.in)

Sir,

Sub.: Plankton analysis report -regd.

Ref. No. KSPCB/EO/MNG/Sample/2022-23/229, date 16.05.2022

The sample collected from the location Guddekoppal, Surathkal, Mangalore (Latitude 12.993240, Longitude 74.791753) from KSPCB on 14.5.2022 and handed over on 17.05.2022 to college of Fisheries, Mangalore for analysis of phytoplankton. The received samples were analyzed, which contains more of Diatoms, dinoflagellates and algae. The results were expressed in No./cells (Table 1.) because the collection procedure was unknown. More of debris and dead detritus were found. The identification was done according to Edmondson, (1965) and Mitra *et al.* (2006).

Table No. 1

Sl. No	Species	Count (No./cells)
1.	<i>Oscillatoria sp.</i>	08
2.	<i>Skeletonema sp.</i>	03
3.	<i>Ceratium fusus</i>	06
4.	<i>C. longipes</i>	04
5.	<i>Diatoma vulgaris</i>	07
6.	<i>Coscinodiscus sp.</i>	15
7.	Others	04

#### Reference:

Edmondson, W. T., 1959. Freshwater Biology Ward and Whipple. 2 edn. John Wiley, New York.

Mitra Abhijit, Kakoli Banerjee and D. P. Bhattacharya, 2006. Marine Phytoplankton. Narendra House, Delhi. Pp.1-13

(Dr. Lakshmipathi M.T.)

Professor & Head  
Dept. of Aquatic Environment Management  
Karnataka Veterinary, Animal and Fisheries  
Sciences University  
College of Fisheries, Mangaluru-2



राष्ट्रीय समुद्र प्रौद्योगिकी संस्थान

वेलच्येरी - तामबरम रोड, नारायणपुरम, पल्लिकरणी, चेन्नई - 600 100, भारत.

**National Institute of Ocean Technology**

Velachery - Tambaram Road, Narayanapuram, Pallikaranai, Chennai - 600 100 INDIA

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सूचना का  
अधिकार  
RIGHT TO  
INFORMATION

Dr.Prince Prakash Jebakumar  
Scientist - E

Date : 01.09.2022

### Spot inspection report in the matter of OA No.383/2022

The discoloration of seawater along the Surathkal beach, Mangalore, Karnataka seems to be an algal bloom by fresh water microalgae as ascertained by CMFRI & Fisheries College, Mangalore. In general, algal blooms are formed while high nutrients ( $\text{NO}_3\text{-N}$ ,  $\text{PO}_4\text{-P}$ , and  $\text{SiO}_4\text{-Si}$ ) and low salinity trigger Prymnesiophyceae, Rhodophyceae, Bacillariophyceae, and most of the Dinophyceae blooms in the marine environment. However, the May 2022 algal bloom seems to be a freshwater algal species along the beaches of Surathkal. This process may happen due to seasonal upwelling and monsoonal forcing caused by high Nethravathi-Gurpur riverine discharge resulting in nutrient-enriched waters that provide a viable edge for the blooming of phytoplankton species. Therefore, algal blooms are anticipated during the upwelling period, such as the withdrawal of the southwest monsoon and pre-monsoon periods along the west coast of India.

It is also equally crucial that iron concentrations induce algal bloom, as recorded in many studies. Iron is one of the essential mineral elements for algae growth and plays a vital role in physiological processes such as photosynthesis, respiration, nitrogen fixation, protein, and nucleic acid synthesis. Therefore, with the possible discharges from the major iron pelletization unit and its allied industrial discharges along the Mangalore coast, it is recommended to monitor the process effluent discharges during the withdrawal of the southwest monsoon and pre-monsoon periods as a precautionary measure to avoid algal bloom in the near future.

It has been concluded that the discoloration of seawater at Surathkal beach; death of seabass fishes in cage farming at Phalguni River at Tannirbhavi; and Tarball formation due to offshore ship discharges are separate incidences knitted as media scoop.

By Dr.Prince Prakash Jebakumar, J, Scientist E, Coastal Environmental Engineering division, National Institute of Ocean Technology, Chennai, Tamil Nadu, India.

(Prince Prakash Jebakumar)  
Scientist - E

